

# **RALPH WIEN MEMORIAL AIRPORT MASTER PLAN UPDATE**

## **KOTZEBUE, ALASKA**

**1998**

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State of Alaska  
Department of Transportation and Public Facilities

prepared by

*ASCG Incorporated*

in association with

*Black & Veatch*

## **REQUIRED STATEMENT**

### **Ralph Wien Memorial Airport Master Plan Update July 1, 1998**

The following statement is provided as required by Paragraph 429.a of Federal Aviation Administration Order 5100.38, *Airport Improvement Program (AIP) Handbook*:

“The preparation of this document was financed in part through a planning grant from the Federal Aviation Administration as provided under Section 505 of the Airport and Airways Development Act of 1982. The contents do not necessarily reflect the official views or policy of the FAA. Acceptance of this report by the FAA does not in any way constitute a commitment on the part of the United States to participate in any development depicted therein nor does it indicate that the proposed development is environmentally acceptable in accordance with appropriate public laws.”

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# EXECUTIVE SUMMARY

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## **INTRODUCTION**

This report summarizes the findings and recommendations of the Airport Master Plan Update for the Ralph Wien Memorial Airport in Kotzebue, Alaska. The State of Alaska DOT&PF initiated an update to the master plan to respond to Kotzebue's current goals, objectives, and airport issues. In addition, the master plan study reviewed projects accomplished to date, examined alternative projects, and made recommendations for future capital improvement needs.

## **BACKGROUND**

Kotzebue is located in Northwest Alaska within the Northwest Arctic Borough. It is 26 miles north of the Arctic Circle, on the northwest shore of Baldwin Peninsula. The City of Kotzebue is located on a small spit of land, separated from the mainland to the east by a large lagoon.

Ralph Wien Memorial Airport (Kotzebue), at an elevation of 11.5 feet MSL; is located adjacent to and south of the City of Kotzebue, on an irregular-shaped parcel of 1,805 acres, of which an estimated 15 to 20 percent is land. The Airport is owned and maintained by the State of Alaska, Department of Transportation and Public Facilities (DOT&PF).

## **PUBLIC INVOLVEMENT**

Several opportunities for public access to the planning process were provided throughout the study. General public involvement in the Master Plan Update was made possible through information workshops/open houses held at key points in the study process. These sessions provided background information, described findings and results of work completed, and addressed public comments and questions. Three project newsletters were distributed during the course of the study. The public involvement process also involved regular contact with air carriers, airport tenants and users, local agencies and organizations involved in regional and economic development and other affected or interested parties.

## **AIRPORT ISSUES**

The master planning process was initiated with the identification of airport issues. Early identification of issues facilitated the formulation of the Study's strategy. Kotzebue's airport issues were defined by investigating airport records, interviewing personnel associated with the airport from the State, Borough, and City; soliciting discussion during the first public meeting; and surveying opinions through questionnaires. Twelve questionnaires about issues were completed, reflecting the views of three commercial pilots, seven airport tenants, the Airport Manager, and the City Manager.

Pavement maintenance and funding for airport development were rated by all survey respondents as very important or important. Issues rated as very important or important by more than 80% included: improvement of Runway 8-26 safety area; adequacy of itinerant/GA aircraft parking; leaseholder tiedown areas located within the taxiway safety area; and condition of the fire station.



Opinions on the importance of the following issues were very diverse, but at least half of those surveyed rated them as very important or important:

- Runway security compromised by road to beach
- Condition of maintenance equipment building
- Expansion of automobile parking
- Scarcity of gravel resources
- Accommodation of future lease lot demand
- Accommodation of float planes from Isaac Lake
- Local difficulties with national security requirements
- Community involvement in airport development and operation
- Access to beach west of the runway after Lagoon Road built
- Aircraft fueling facilities' penetration of airspace
- Multi-user passenger terminal building

The only issue suggested that was clearly not important to most (75%) of the survey respondents was improvement of aircraft access to the Alaska Airlines terminal.

## GOALS AND OBJECTIVES

Careful preparation of goals (broad policy statements) and objectives (specific, attainable, and measurable actions) are essential to the success of a master plan process. The goals and objectives selected for this study were designed to meet community guidelines, address relevant public concerns, and consider the many different interests and factors which exist at Ralph Wien Memorial Airport.

The following list of study goals and objectives was compiled as a result of pre-project research and meetings. These represented an initial set of desired conditions to be achieved in the study. They were used throughout the study to guide the work effort.

**Goal:** To provide airport facilities and services for all users in a fiscally responsible manner that maximizes safety, efficiency, and opportunity for use.

### **Objectives:**

- To develop the airport in a manner which balances the need to conform to physical development standards as established by federal, state, and local agencies, with community needs and the serious physical and financial constraints.
- To evaluate the alternative of airport relocation.
- To document rationale for recommendations through a complete investigation of concepts and alternatives on technical, economic, and environmental grounds.
- To establish an action plan for the state's future capital improvement program.



**Goal:** To develop aviation demand forecasts that are responsive to expected socioeconomic factors, economic development potential, and demand levels in Kotzebue.

**Objectives:**

- To develop estimates of short- (2003), intermediate- (2008), and long-term (2018) aviation activity levels at Kotzebue.
- To identify the possible characteristics of future air travel demand.
- To maintain flexibility in programming based on forecasts.

Note: The air traffic forecast assumptions that were selected as having the best probability in the 1989 master plan were based on significant mining expansion occurring in the Northwest Arctic region, particularly in the Red Dog/Lik and Ambler mining districts. To date, there has been no development at Ambler. Significant expansion is occurring at Red Dog, but the anticipated increases in air traffic at Kotzebue as a result may not be as large as expected. This may be due to an increase in direct air service to Red Dog, rather than through Kotzebue. The actual activity levels occurring today as compared to what was predicted in 1989 helped us predict the future traffic more accurately.

**Goal:** To ensure airport compatibility with local land use patterns and plans.

**Objectives:**

- To define airspace requirements of the airport and identify existing and potential obstructions to these.
- To identify on-airport land uses and assess their impacts on the contiguous areas.
- To examine alternative uses of airport property, considering site constraints, that would enhance compatibility.
- To strive for the minimal amount of environmental impact in the development of the airport facilities.

**Goal:** To produce a plan for airport development that meets the needs and desires of the Kotzebue area.

**Objectives:**

- To develop a public awareness of the airport planning and development process.
- To encourage and utilize comments from all sectors of the aviation community in developing an airport master plan update that can be adopted, endorsed, and implemented.
- To ensure that the public, along with federal, state, and local officials, has an opportunity to participate in the decision-making process during the development of the plan.
- To develop a phased program of specific airside and landside facility improvements to accommodate the forecasts of future aviation demand for Kotzebue.

## AVIATION DEMAND FORECASTS

The aviation demand forecasts provide a basis for determining the type, size, and timing of airport facility requirements. Table 1 provides a summary of the aviation demand forecasts for the airport.

**Table 1**

Aviation Demand Forecast Summary	1995	2003	2008	2018
<b>Annual Passenger Enplanements</b>				
Air Carrier	30,728	33,300	34,900	41,200
Air Taxi	<u>25,176</u>	<u>33,300</u>	<u>39,300</u>	<u>51,000</u>
<b>Total Passenger Enplanements</b>	<b>55,904</b>	<b>66,600</b>	<b>74,200</b>	<b>92,200</b>
<b>Annual Air Cargo Tonnage</b>				
Freight	13,846	16,480	18,380	22,840
Mail	<u>7,827</u>	<u>9,920</u>	<u>11,500</u>	<u>15,450</u>
<b>Total Cargo</b>	<b>21,673</b>	<b>26,400</b>	<b>29,880</b>	<b>38,290</b>
<b>Based Aircraft</b>	<b>79</b>	<b>97</b>	<b>107</b>	<b>130</b>
<b>Annual Aircraft Operations</b>				
Major Air Carrier	2,000	2,170	2,270	2,680
Commuter Air Carrier	20,000	23,660	25,850	28,670
Air Cargo	*	924	1,020	1,255
General Aviation	37,000	45,400	50,500	60,800
Military	<u>1,000</u>	<u>1,000</u>	<u>1,000</u>	<u>1,000</u>
<b>Total Operations</b>	<b>60,000</b>	<b>73,154</b>	<b>80,640</b>	<b>94,405</b>

\* Estimated at 784, but not originally broken out of air carrier /air taxi operations for 1995.

**Passenger Enplanements.** Over the past ten years, the number of passengers enplaned on scheduled flights has increased 22%. The 10-year peak, 57,861, occurred in 1992. Over the last 10 years, about half the passengers were on air carrier aircraft and half were on commuter aircraft. The ratio of passengers per operation has grown from 1.53 in 1986 to 2.54 in 1995, with a peak of 2.63 in 1989. Total annual passenger enplanements are projected to grow 65% over the planning period, which is 1995 to 2018.

**Air Cargo.** The two components of air cargo are mail and freight. Recent data for 1995, which excludes all-cargo aircraft on unscheduled flights, includes "belly" cargo on passenger flights and cargo carried in the main cabin of a "combi"-configured aircraft. 1995 data for scheduled cargo indicates that the freight/mail percent split for enplaned cargo is 54/46 percent and deplaned is 17/83 percent. Cargo projections in this study are calculated at approximately 1.36 times the growth rate of passenger enplanements forecast. Cargo is projected to grow 77% over the planning period.

**Air Carrier and Air Taxi Operations.** Following the preparation of passenger enplanement and air cargo projections, operational levels were forecast.

**Passengers:** Kotzebue's historical passengers-per-operation (PPO) ratio was examined along with projections made by other planning studies. This study selected the PPO ratio similar to that used in FAA's Terminal Area Forecasts (TAF) projections -- 15.36 for air carrier and a progressively increasing PPO for air taxi (from 1.26 to 1.78). This represents an estimated 43% growth in passenger operations over the planning period.

**All-Cargo Operations:** While most of the air cargo demand is carried on passenger aircraft (referred to as belly freight), the remaining air cargo demand is carried by all-cargo operators. All-cargo operations were projected using an estimated tons-per-operation (TPO) ratio that was derived from the input received from two all-cargo carriers. All-cargo is projected to grow 60% over the planning period.

**General Aviation.** Based aircraft forecasts were developed using the Alaska Aviation System Plan (AASP) annual growth rates for based aircraft: 2.9% to 2000, 2.2% from 2000 to 2005, and 1.9% after 2005. Operations forecasts were projected using operations-per-based-aircraft (OPBA). Based aircraft and GA operations are projected to grow 64% over the planning period.

**Military.** For this study, military operations were projected to continue at their current level throughout the planning period.

## CAPACITY ANALYSIS AND FACILITY REQUIREMENTS

To set the stage for discussion of airport development alternatives, key findings and assumptions from the capacity analysis and facility requirements tasks are recapped here. These findings guided the thought processes behind the identification of airport development alternatives.

- Runway operational capacity is more than adequate to meet demand through 2018.
- Runway Lighting and Nav aids are adequate.
- Runway safety area/object free area surfaces are not in compliance with FAA design standards. Compliance with these standards for Runway 17-35 would require moving the access road and the aircraft parking area west of the runway. Compliance with these standards for Runway 8-26 would require moving the access road and expanding safety area off each runway end to meet 1000-foot requirement.
- The access road's close proximity to Runway 17-35 makes it an obstruction to airspace. Modified/controlled access is needed to eliminate or minimize the impact.
- The level of operations justifies a full-length parallel taxiway for Runway 8-26.
- Isaac Lake no longer serves floatplanes.
- Current GA aircraft parking areas are adequate to meet current and projected demand, but possible displacement of GA aircraft parking currently adjacent to Runway 17-35 or possible displacement of GA parking by lease lot expansion in the terminal area would need to be accommodated.
- Projected lease lot demand in the terminal area will exceed lease lot capacity, and the current terminal apron congestion will grow. Terminal area lease lot demand requires lease lot expansion and/or a multi-use terminal building. Because most lease lots along the terminal apron include little apron area, many leaseholders park aircraft on the apron outside their lease

lot boundaries. The terminal apron has become congested, particularly since the advent of all-cargo service by large jets. Another problem with the current location of large jet aircraft parking is that the parked aircraft penetrate the runway's protected airspace.

- Other landside facility issues requiring attention include road access, ARFF/snow removal equipment building replacement, vehicle parking, security fencing, Flight Service Station and National Weather Service Station relocation, utilities, and aircraft fueling relocation. The majority of improvements for these facilities are driven by the location and extent of improvements for the primary functions (e.g. terminal area, general aviation area, runway/taxiway).

## ALTERNATIVES ANALYSIS

The objective of the alternatives analysis was to determine the most suitable development to meet the needs of the Kotzebue Airport.

*Alternatives Identification.* Following review of the Airport's facility requirements as well as opportunities and constraints for development at and around the airport, airside and landside development alternatives were identified. Initially, development of each airport function was considered independently. In other words, runway alternatives were identified separately from terminal area alternatives. Then, the preferred alternative could be any combination of the airside and landside alternatives. In addition to the development alternatives proposed for the various functional elements at the airport, a set of general airport alternatives were also proposed for evaluation. Budgetary costs for these alternatives were compared. Table 2 describes the various alternatives.

**Table 2 - Development Alternatives**

<b>PRIMARY RUNWAY 8-26</b>	<b>TAXIWAY</b>
<p><b>R1:</b> No action</p> <p><b>R2:</b> Safety Area (RSA) Improvement - 1,000-foot Runway 8 end extension into ocean to accommodate RSA requirements while maintaining a 5,900-foot take-off run in either direction. In other words, the runway pavement would be 6,900 feet in length, but an aircraft taking off on Runway 8 or 26 would only count the first 5,900 feet of runway in front for takeoff and the last 1,000 feet would be defined as RSA to meet FAA standards (using FAA-defined declared distances). In addition, the RSA would be widened the full-length of the runway to the 500-foot standard.</p> <p><b>R3:</b> Safety Area (RSA) Improvement - 1,000-foot extension off Runway 26 end towards hill east of the Airport to accommodate RSA requirements while maintaining a 5,900-foot take-off run in either direction. This alternative is the same as R2, but with the extension at the opposite end of runway.</p>	<p><b>TW1:</b> No Action</p> <p><b>TW2:</b> Full-length parallel taxiway for primary Runway 8-26. This alternative assumes that the full-length parallel taxiway would correspond with any of the three runway alternatives (R1, R2, and R3).</p>
<b>TERMINAL AREA</b>	<b>GENERAL AVIATION</b>
<p><b>T1:</b> No Action</p> <p><b>T2:</b> Multi-use terminal. This alternative proposes to relieve apron congestion and prevent parked jet aircraft from obstructing airspace by locating the terminal farther north. Itinerant GA tiedowns would remain in their existing location in the terminal area.</p> <p><b>T3:</b> Lease Lot expansion with large aircraft parking. Like T2, this alternative also proposes to remedy the apron congestion and airspace obstruction problems by moving large aircraft parking. This would involve moving some of the terminal area operators farther east.</p> <p><b>T4:</b> Lease Lot expansion. This alternative assumes that lease lot expansion would be accomplished without filling the lagoon, relocating current leaseholders, or moving large aircraft parking. The airspace obstruction problem would remain.</p>	<p><b>G1:</b> No Action</p> <p><b>G2:</b> B-II aircraft tiedowns northwest of Runway 17-35. This implies that the access road to serve this area would remain on the west side.</p> <p><b>G3:</b> B-II aircraft tiedowns northeast of Runway 17-35. This implies that the access road to serve this area would be built out on the east side.</p> <p><b>G4:</b> B-II aircraft tiedowns east of Runway 17-35. This implies that the access road to serve this area would be built out on the east side similar to G3.</p> <p><b>G5:</b> B-II aircraft tiedowns southwest of Runway 17-35. This implies that access road to serve this area would remain on the west side similar to G2.</p>
	<b>FLOAT POND</b>
	<p><b>FP1:</b> No Action</p> <p><b>FP2:</b> Acquire Isaac Lake</p> <p><b>FP3:</b> Develop float pond facility on Kotzebue Lagoon.</p>
	<b>GENERAL AIRPORT ALTERNATIVES</b>
	<p><b>A1:</b> No Action</p> <p><b>A2:</b> Improve existing airport comparable to a relocated airport facility.</p> <p><b>A3:</b> Relocate Airport</p> <p><b>A4:</b> Relocated Air carrier runway w/taxiway.</p>



## ***Evaluation***

The next task in the master plan update analyzed and compared the different alternatives. During this analysis, a set of evaluation criteria were used:

- Ability to serve forecast demand
- Compatibility with goals and objectives of the Master Plan Update
- Airspace compatibility
- Impact on surface transportation system
- Environmental compatibility
- Development, operating and maintenance costs
- Cost/benefit relationship of Kotzebue Airport relocation
- Construction feasibility
- Operational feasibility

## **SELECTION OF PREFERRED DEVELOPMENT PLAN**

The selection of a preferred development plan for the 20-year planning period resulted from comments made during the public meeting held September 16, 1997 in Kotzebue and from DOT&PF, FAA, City, Borough, and air carrier comments. Alternative selections were also influenced by the constraint of an assumed budget of about \$30 million (1998 dollars) over the 20-year planning period. Exhibit 1 illustrates the Preferred Development Plan through 2018.

While Exhibit 1 reflects the proposed improvements to the existing airport through 2018, the long-term development plan is to relocate the airport, identified as Alternative A4.

***General Airport: A4 - Airport Relocation (more than 20 years in the future):*** The existing airport property has sufficient capacity for the projected 2018 aviation demand. However, improving the existing airport so that it complies with FAA design standards would approximate the cost of a new airport. Even with these costly improvements, however, the existing airport would still not provide the long-range future expansion capability that a different, less constrained airport site would. Moreover, a new airport site would allow development of a multi-use terminal and t-hangars, better separation of large and small aircraft, and better navigational aids. Land south of the Air Force radar facility is the best site within the city limits for an airport with a primary runway up to 10,000 feet long. This land should be reserved for construction of a new airport when it becomes economically feasible.

Airport relocation may not be economically feasible for many years. Meanwhile, the existing airport must be maintained and improved to adequately serve the community. The following development alternatives for the existing airport are those that will provide the most benefit for their cost, considering the eventual airport relocation.

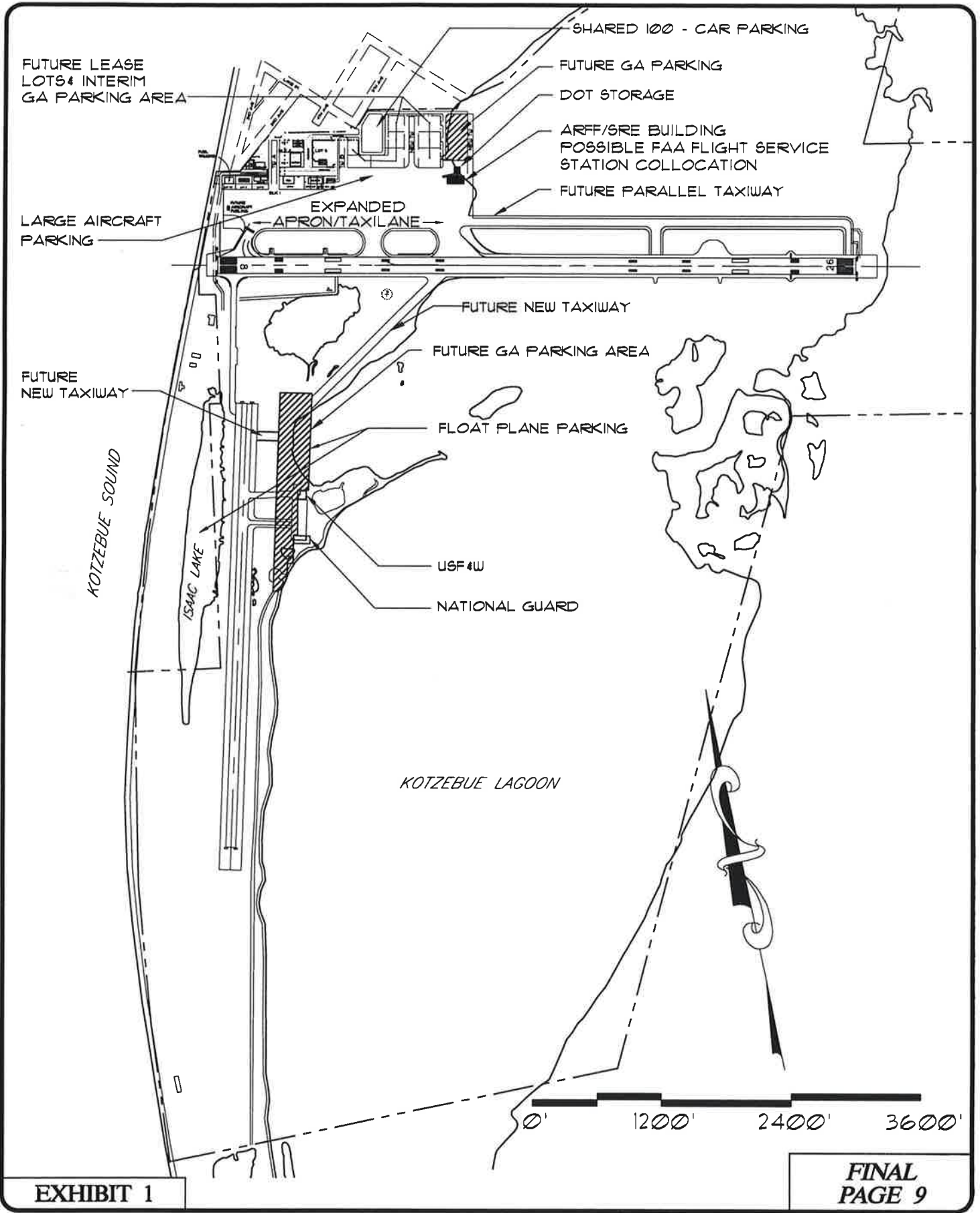


EXHIBIT 1

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**RALPH WIEN MEMORIAL AIRPORT**  
KOTZEBUE, ALASKA  
**PREFERRED DEVELOPMENT PLAN**

STATE OF ALASKA  
DEPARTMENT OF TRANSPORTATION AND PUBLIC FACILITIES

**Primary Runway: R1 - No Action:** The expense of complying with FAA design standards for runway safety areas at Kotzebue Airport is prohibitive. An FAA deviation allows current operation within the existing runway safety areas.

**Taxiway: TW2 - Full Length Parallel Taxiway for Runway 8-26 (in two phases in the long-term future):** Runway usage currently exceeds the FAA's recommended threshold of 20,000 annual operations for a parallel taxiway, and aircraft operations are projected to increase more than 50% in the next 20 years. However, due to the expense (\$15 million), this improvement will not likely be affordable within 20 years. Also, before such a large investment in the existing airport is made, the feasibility and timing of airport relocation should also be reevaluated. A parallel taxiway should remain on the Airport Layout Plan, justifying it for Airport Improvement Program funding in case its priority should rise or funding becomes available. To improve its financial feasibility, the parallel taxiway should be programmed in two phases. Most operators on Runway 8-26 do not need the full 5,900-foot runway length. The first phase of parallel taxiway extension could serve 4,000 feet of the runway at about half the cost of serving the full runway length.

**General Aviation: G3 Modified - Tiedowns in Northeast Area (in two phases):** The existing tiedown area west of Runway 17-35 should be relocated outside the runway object free area (OFA) for Group II. Users prefer Alternative G3's tiedown location, north of the U.S. Fish and Wildlife Service (USF&WS) hangar, because it is convenient to both runways.

Due to the high cost, the access road parallel to and east of Runway 17-35 will not be relocated and will continue to penetrate the runway object free area (OFA) and Part 77 surface. However, road usage will be more limited, once the BIA hillside road provides the public an alternate route to areas south of the airport.

Other revisions to Alternative G3 will reduce the financial impact by reconfiguring the tiedown area so that it takes less landfill to construct and by dividing tiedown construction into two phases. The tiedown area will be narrower and longer, taking advantage of a strip of land about 200 feet wide, but 300 feet from the runway centerline, stretching from west of the USF&W and National Guard apron northward to the pond between the two runways. The long-term USF&W and National Guard leases now include some of this land, although it is not developed or used. The land included in these current leases would become the second phase of tiedown development, allowing time for the lease expiration or re-negotiation that would be required to develop the property for GA tiedowns.

**Float Pond: FP2 - Isaac Lake and FP3 - Lagoon (modified):** The user preference for a floatplane facility is Isaac Lake, after completion of KIC's dewatering and gravel extraction. For strong crosswinds or when a plane's load requires more takeoff distance than available in Isaac Lake, the lagoon should still be accessible to floatplanes. This might be best accomplished by a ramp in the vicinity of the new GA tiedown area north of the USF&WS hangar. Mooring/parking of floatplanes should be along the shores of Isaac Lake, rather than at an expensive floatplane dock on the lagoon.



**Terminal Area: T3 Modified - Lease lot Expansion with Large Aircraft Parking:** Eventual relocation of large jet aircraft to the east end of the terminal apron will reduce apron congestion and eliminate Part 77 airspace penetrations by large jet aircraft parked at the Alaska Airlines and FBX facilities. Buildings on existing lease lots in Block 1 (Lots K, L, M) and Block 2 (Lots 1, 2, 3, and 4) must be demolished or moved to realize the ultimate terminal plan. However, demolition or relocation will not occur until the existing leases expire (2000 in Block 1 and 2015 in Block 2) and demands for additional lease lots warrant the action. The terminal lease lot expansion will be programmed in two phases; the north, undeveloped half will be the first phase and the south half will be programmed to occur after existing leases expire. Existing leaseholders operating or serving large jets on the west end of the apron need not be pressured to relocate. The three proposed lease lots fronting the apron should be reserved for large jet operators, new or relocated. Until demand for the new lease lots occurs, the area can be used for GA tiedowns, allowing postponement of the costly construction of new GA tiedowns on fill in the lagoon.

It is envisioned that a multi-use cargo terminal would occupy the eastern large jet lease lot. (One cargo handler, FBX, serves more than one all-cargo carrier now, suggesting the feasibility of a future joint-use cargo terminal.) DOT&PF should encourage private development and operation of a cargo terminal.

Unlike T3, the Aircraft Rescue and Firefighting Facility (ARFF) should be combined with the Snow Removal Equipment (SRE) building. This DOT&PF ARFF/SRE building should be sited at the east end of the apron area where it has immediate access to the airfield. The existing DOT&PF location would serve well for housing fuel trucks, which now occupy a building that will be demolished or moved.

As in T3 the terminal apron will be expanded southward and the fueling facility relocated to the west end of the apron.

If, or when, FAA decides to rebuild their FSS in Kotzebue, they should choose a location that can best serve aviation in general, and GA in particular. Locating the FSS in an upper floor of the DOT&PF building is an option that has merit for several reasons, and the new DOT&PF building location would provide a clear view of all parts of the airfield from the FSS.

The National Weather Service (NWS) prefers to continue to be located with the FSS. Care should be taken to ensure that any new location for the NWS provides adequate open area for the release of weather balloons.

## **AIRPORT PLANS**

The details of the preferred development plan were refined and illustrated in a set of drawings referred to as an airport layout plan (ALP) set. The ALP set shows the existing conditions as well as the proposed development for the Airport. The ALP set includes:

- Airport Layout Plan
- Terminal Area Plan
- Approach Surface Plan and Profiles
- Airspace Plan/Part 77

## **ENVIRONMENTAL OVERVIEW AND LAND USE ANALYSIS**

An overview of possible environmental impacts was also prepared. These impacts, which will need to be addressed in detail in an Environmental Assessment (EA) prior to any major development, included:

- wetlands fill in the GA development area and the ultimate terminal expansion area
- water quality impacts associated with potential increase in runoff of pollutants into lagoon with increased aviation activity near lagoon
- archeological impacts in areas previously undisturbed
- upland habitats and vegetation impacts

The land use analysis conducted for Ralph Wien Memorial Airport addressed both on-airport and off-airport land uses. The on-airport land use analysis addressed four land use areas identified as: 1) air operations; 2) aviation support; 3) open; and 4) land acquisition and control. The off-airport land use analysis addressed: 1) airspace, 2) noise, and 3) other compatibility issues. The resulting Land Use Plan for the airport adopted general FAA criteria for the use of airport property, as follows:

- Adherence to standards in support of safe aircraft operations.
- Non-interference with line of sight or other restrictions for navigation aids and weather equipment.
- Use of existing facilities, insofar as possible and depending on their location, condition, and obligations with respect to their use.
- Attention to factors that may affect construction cost, such as available utilities and topography.
- Flexibility in being able to accommodate changes in demand and expansion, both vertically and horizontally.
- Efficiency in ground access to the community.
- Priority accorded aeronautical activities where available land is limited.
- Encouragement of revenue producing land uses which support an aviation-oriented infrastructure.
- Flexibility of non-aeronautical uses so as to permit expansion of aeronautical facilities.

## **IMPLEMENTATION PLAN**

The last task in the airport master planning process was the implementation plan. The Implementation Plan was summarized in the last chapter of the Master Plan, Chapter IX. The Plan outlines the phased development for the preferred development plan and associated cost estimates. A brief summary of the Plan is presented in Table 3.

**Table 3 - Phased Development Program**  
**CAPITAL IMPROVEMENT PROGRAM**

Project	Cost	Federal Funding <sup>1</sup>	State Match <sup>1</sup>
<b>PHASE I (1999-2003)</b>			
Apron/Taxilane Extension & Connecting Taxiway	\$ 2,879,300	\$2,465,000	\$ 164,300
Reconstruct Existing Terminal Apron & Vehicle Parking Lot	\$ 2,580,129	\$2,128,000	\$ 141,900
DOT&PF ARFF/SRE Building	\$4,908,800	\$4,602,000	\$306,800
SRE Equipment Purchase	\$585,000	\$548,400	\$36,600
Interim GA Parking Area	\$2,398,700	\$2,248,800	\$149,900
Lagoon Island Obstruction Removal	\$936,000	\$877,500	\$58,500
Isaac Lake Acquisition for Float Pond	\$94,400	\$88,500	\$5,900
Subtotal	\$14,382,329	\$12,958,200	\$863,900
<b>PHASE II (2004-2008)</b>			
DOT&PF Material Storage Building	\$1,168,200	\$1,095,200	\$73,000
SRE Equipment Purchase	\$560,000	\$525,000	\$35,000
GA Parking Expansion Phase I	\$3,703,100	\$3,471,700	\$231,400
Master Plan Update	\$300,000	\$281,200	\$18,800
Rehabilitation of Runway 17-35 & Connecting Taxiway	\$1,127,000		
Subtotal			
<b>PHASE III (2009-2018)</b>			
Reconstruct Existing Runway	\$4,784,300	\$4,485,300	\$299,000
Lease Lot & Taxiway Construction Phase II	\$3,096,900	\$2,903,300	\$193,600
GA Parking Expansion Phase II	\$2,233,200	\$2,093,600	\$139,600
Parallel Taxiway Phase I	\$4,550,300	\$4,265,900	\$284,400
Subtotal	\$14,664,700	\$13,748,100	\$916,600
<b>Total 20-Year CIP</b>	<b>\$34,218,100</b>	<b>\$32,079,400</b>	<b>\$2,138,700</b>
<b>BEYOND III (2019 OR LATER) - NOT IN 20-YEAR CIP</b>			
Hill Obstruction Removal (Runway 8-26)	\$16,624,800	\$15,585,700	\$1,039,100
Parallel Taxiway Phase II	\$5,140,300	\$4,819,000	\$321,300
Airport Relocation <sup>2</sup>	\$61,761,200	\$57,901,100	\$3,860,100
Subtotal	\$83,526,300	\$78,305,800	\$5,220,500

<sup>1</sup>Based on maximum eligibility percentage for Federal Airport Improvement Program Grant funding

<sup>2</sup>Excludes cost of land acquisition.

Note: Figures are rounded. Costs are in 1998 dollars.



## **1.1 STUDY BACKGROUND**

Kotzebue is located in Northwest Alaska, on the northwest shore of Baldwin Peninsula approximately 26 miles north of the Arctic Circle. Alaska's unique geographic and weather conditions make transportation vital to the social and economic well-being of the residents of the State of Alaska. Ralph Wien Memorial Airport takes on a unique and important role in this context.

Kotzebue is a regional hub and business center for the Northwest Arctic Borough serving 11 area communities and generating considerable activity. The Ralph Wien Memorial Airport is the primary access for the community and is located less than a half-mile from the community center. While its location is convenient, the airport constrains growth and activity for the community to the south. The Kotzebue area has no surface transportation system and marine access is seasonal only.

Currently the airfield accommodates a variety of aviation activities. Air carrier, commuter, and air taxi operations serve the community from Ralph Wien Memorial Airport. Air carrier jets share the facility with small general aviation aircraft.

Although the 1989 Master Plan addressed several issues and made recommendations for future development, existing conditions and a number of current issues require attention.

## **1.2 STUDY PURPOSE**

The purpose of this master plan study is to update the 1989 plan by responding to the goals, supporting objectives, and airport issues. In addition, the master plan study will review projects accomplished to date, examine other needs, and make recommendations for future capital improvement projects.

The Master Plan Update will be prepared in a manner consistent with the needs of the community and region served by the Ralph Wien Memorial Airport and in conformance with applicable guidelines established by the FAA.

## **1.3 GOALS & OBJECTIVES**

Careful preparation of goals (broad policy statements) and objectives (specific, attainable, and measurable actions) are essential to the success of a master plan process. The goals and objectives selected for this study are designed to meet community guidelines, address relevant public concerns, and consider the many different interests and factors which exist at Ralph Wien Memorial Airport.

The following list of study goals and objectives was compiled as a result of pre-project research and meetings. These represent an initial set of desired conditions to be achieved in the study. They will be used throughout the study to guide the work effort.

**Goal:** To provide airport facilities and services for all users in a fiscally responsible manner that maximizes safety, efficiency, and opportunity for use.

**Objectives:**

- To develop the airport in a manner which balances the need to conform to physical development standards as established by federal, state, and local agencies, with community needs and considering the serious physical and financial constraints.
- To evaluate the alternative of airport relocation.
- To document rationale for recommendations through a complete investigation of concepts and alternatives on technical, economic, and environmental grounds.
- To establish an action plan for the state's future capital improvement program.

**Goal:** To develop aviation demand forecasts that are responsive to expected socioeconomic factors, economic development potential, and demand levels in Kotzebue.

**Objectives:**

- To develop estimates of short- (2003), intermediate- (2008), and long-term (2018) aviation activity levels at Kotzebue.
- To identify the possible characteristics of future air travel demand.
- To maintain flexibility in programming based on forecasts.

**Note:** The air traffic forecast assumptions that were selected as having the best probability in the 1989 Master Plan were based on significant mining expansion occurring in the Northwest Arctic region, particularly in the Red Dog/Lik and Ambler mining districts. To date, there has been no development at Ambler. Significant expansion is occurring at Red Dog, but the anticipated increases in air traffic at Kotzebue as a result may not be as large as expected. This may be due to an increase in direct air service to Red Dog, rather than through Kotzebue. The actual activity levels occurring today as compared to what was predicted in 1989 will help us predict the future traffic more accurately.

**Goal:** To ensure airport compatibility with local land use patterns and plans.

**Objectives:**

- To define airspace requirements of the airport and identify existing and potential obstructions to these.
- To identify on-airport land uses and assess their impacts on the contiguous areas.
- To examine alternative uses of airport property, considering site constraints, that would enhance compatibility (aviation uses should have priority).
- To strive for the minimal amount of environmental impact in the development of the airport facilities.

**Goal:** To produce a plan for airport development that meets the needs and desires of the Kotzebue area.

**Objectives:**

- To develop a public awareness of the airport planning and development process.
- To encourage and utilize comments from all sectors of the aviation community in developing an airport master plan update that can be adopted, endorsed, and implemented.
- To ensure that the public, along with federal, state, and local officials, has an opportunity to participate in the decision-making process during the development of the plan.
- To develop a phased program of specific airside and landside facility improvements to accommodate the forecasts of future aviation demand for Kotzebue.

#### 1.4 ISSUES

Early identification of airport issues facilitates the formulation of the Study's strategy. Airport issues of greatest concern were defined using four methods:

- conducting a preliminary investigation of issues;
- interviewing personnel associated with the airport from the state, borough, City, and federal governments;
- soliciting discussion during public meetings; and
- surveying opinions through distribution of a questionnaire.



### *Preliminary Investigation*

Existing knowledge of the airport, several discussions with personnel historically familiar with the airport, and review of the previous 1989 Master Plan resulted in identifying the following preliminary list of issues.

**Aircraft access.** It is difficult for some air taxis and commuter operators to access the Alaska Airlines terminal building.

**Lease lot demand.** Although the present demand appears to be satisfied, there are no lots currently available for long-term lease. There are a number of options to accommodate more lease lots, and the long-term interests of the airport, the community, and the DOT&PF need to be considered in coming up with the best recommendation.

**New ARFF and Snow Removal Equipment Building.** The existing facilities may not meet building code and safety standards. Additionally, they may be of inadequate size for current equipment needs. Construction of new facilities is a priority of the Kotzebue Airport Manager.

**Automobile parking.** Access and parking at both the Alaska Airlines terminal and for adjacent lessees does not appear to be adequate.

**Multi-use terminal.** The current airport master plan continues to reserve space for a multi-use terminal. The economics of building such a terminal have not been in place to date. This recommendation needs to be reconsidered in light of current and projected air traffic at Kotzebue, options for available funding, other priorities, etc.

**Safety areas.** Runway 8-26 is deficient in safety area. This has been a long-term problem. Because of the topography and the proximity of the Kotzebue Lagoon, high costs to remedy the safety area have prevented this from being a high priority. This will need to be reassessed in light of current FAA concerns.

**Runway security.** Automobile traffic around the west end of runway 8-26 continues to be both a safety and a security concern. The pending construction of the Lagoon Road by the BIA will establish an alternate route.

**Aircraft fueling.** Existing fuel pit facilities are non-conforming with FAA Part 77 surface penetration requirements. Crowley Marine has only a temporary lease and a new site is pending the airport master plan update with recommendations.

**Itinerant/general aviation parking.** Demand may exceed supply depending on analysis of the best use of remaining available land space.



**Isaac Lake.** The village corporation, KIC, is dredging this area. The impact on the future use of float plane operations will need to be reassessed. Whether or not there are significant float plane operations that will need accommodation in Kotzebue will need evaluation.

**Leaseholder tie-down areas.** Existing leaseholders are parking aircraft within taxiway safety areas apparently due to inadequate space within their own lease lots. This may be an additional demand which needs to be evaluated.

**Gravel resources.** Lack of gravel remains a limiting factor on costs and recommendations for work needed at the Kotzebue Airport. Because of the scarcity of gravel, prior airport plans and recommendations included complex excavation and gravel extraction construction methods which may need to be reevaluated.

**Beach recreation.** Use of the beach in the areas adjacent to the airport is an issue. Construction of the Lagoon Road will reduce the need for access across the safety area.

**Pavement management.** Evaluation and recommendations for a pavement management system are required by current FAA policies. This will need to be analyzed from the practicality of conditions in Kotzebue: normally pavement fails in the Kotzebue permafrost areas from thermal fatigue rather than an inadequate maintenance and pavement management program.

**Funding.** Funding for project needs at the Kotzebue Airport is a concern in evaluating and proposing recommendations. The primary airport category in Alaska, which includes Kotzebue, has many more needs than available funding from the FAA can address.

**Security.** Continually increasing national aviation security requirements have enormous impacts on the Kotzebue Airport. Solutions that work elsewhere are not always workable or cost effective in the space constraints and adverse environmental conditions that occur in Kotzebue. One example is the electronic gate across the west end of Runway 8-26. This was instituted to satisfy security concerns, but had difficulty operating and was not a satisfactory solution. Another difficulty was some of the security fencing which caused maintenance problems with snow drifts. Security needs must be addressed, but recommendations have to be cost effective and must work in Kotzebue.

The previous 1989 Master Plan presented several recommendations for airport improvements, listed here, that represent some of the same issues identified above.

- Pavement rehabilitation.
- Construct additional aircraft parking apron (in three phases) and vehicle parking area. Following construction, remove restriction on Runway 17-35 operations. Also, establish a helicopter landing area on the apron.
- Complete construction of taxiway lighting between 17-35 and 8-26.
- Construct float plane facilities (dock, storage, etc.).

- Navigational Facilities for Runway 8-26
- Relocate the north-south access road to the west side of Runway 17-35
- Relocate existing apron taxiway closer to the runway
- Relocate fueling facility
- Construct new ARFF facility
- Extend utilities to airport facilities
- Widen Runway 8-26 Safety Area to meet FAA guidelines
- Construct parallel taxiway for Runway 8-26
- Relocate two lease lot holders to accommodate proposed multi-use terminal
- Construct multi-use terminal building including parking and passenger transfer area
- Relocate National Weather Service (NWS)

Since the 1989 Plan, Runway 8-26 has been rehabilitated, additional taxiway lighting has been installed, and airport tenants have constructed additional hangars. As evident in the above list of recommended improvements, many additional improvements are still necessary.

In order to build and refine the preliminary list of airport issues, interviews were conducted, a public meeting was held, and a survey questionnaire was distributed.

### *Interviews*

The Borough Mayor and the City Manager are interested in the eventual relocation of the airport to another site. The relocation of the airport would allow the community to expand to the south and eliminate many of the constraints to airport improvements that exist at the present site. The Borough Mayor thought that Kotzebue's passenger traffic has grown to a level that needs to be served by a consolidated passenger terminal. The City Manager thought that a local advisory committee should participate in the master planning process.

### *Public Meeting*

During the public meeting, the major airport issue discussed (in addition to those expressed by the City Manager) was access from town to the beach south of the airport. The road passes directly next to the primary runway threshold. People are accustomed to this route to the south, but the FAA may insist on the road's closure for safety and security reasons. Relocating the road farther to the west was suggested.

### *Survey*

A questionnaire was distributed to public meeting attendees and airport leaseholders, and extra copies were available in the City and airport offices. Additional information was gathered through phone conversations and direct interviews. A sample of this questionnaire is shown in Exhibit 1.1, at the end of this chapter.

Twelve questionnaires were completed, reflecting the views of three commercial pilots, seven airport tenants, the Airport Manager, and the City Manager.

All rated the following issues as very important or important:

- Pavement maintenance
- Funding for airport development

Over 80% rated the following issues as very important or important:

- Improvement of Runway 8-26 safety area
- Adequacy of itinerant/GA aircraft parking
- Leaseholder tiedown areas located within the taxiway safety area
- Condition of the fire station

Opinions on the importance of the following issues were very diverse, but at least half of those surveyed rated them as very important or important:

- Runway security compromised by road to beach
- Condition of maintenance equipment building
- Expansion of automobile parking
- Scarcity of gravel resources
- Accommodation of future lease lot demand
- Accommodation of float planes from Isaac Lake
- Local difficulties with national security requirements
- Community involvement in airport development and operation
- Access to beach west of the runway after Lagoon Road built
- Aircraft fueling facilities' penetration of airspace
- Multi-user passenger terminal building

The only issue suggested that was clearly not important to most (75%) of the survey respondents was improvement of aircraft access to Alaska Airlines terminal.

Several survey respondents wrote in issues and concerns that were not suggested on the questionnaire. These were:

- Winter taxiway access to Cape Smythe Air Service & the existing GA ramp
- Approach to 26 should be lowered by removing the hill
- Approach lighting system for Runway 8 with ILS
- Snow removal
- Access to ski operations areas
- Aircraft access to Runway 17-35 from east side of runway
- Pavement for air carrier ramps
- Fencing

The completed questionnaires are on file with the Northern Region office of DOT&PF, along with the ongoing interview process, and were incorporated into the Inventory and subsequent chapters.

## 1.5 STUDY APPROACH

The study approach has been designed with guidance from the FAA Advisory Circular 150/5070-6A, *Airport Master Plans*. This approach requires a series of interdependent steps for systematic development of an airport master plan.

The methodology incorporates five basic phases. First, study purpose and program goals and objectives are identified. Next, airport requirements are highlighted based on forecasted activity. Alternatives are then identified and analyzed, with one subsequently selected to best serve the future conditions. Finally, this information is synthesized and documented in an implementation plan. Overlying each of these phases is regular coordination with the DOT&PF and the public, and documentation of each phase as it occurs.

The development of the plan will take place within the context of a public coordination program to assure community input at each important decision stage. The work program designed to accomplish the study objectives is summarized as follows.

Phase I: Identification of Study Purpose - Program Goals and Objectives. This initial step included formulation of the project goals and objectives as well as the important issues which guided the planning process. The study purpose was also identified. Results of this phase are contained within this report and have been refined through the remaining master planning phases.

Phase II: Determination of Airport Requirements. The second phase determined expected growth at Kotzebue, evaluated the capacity with regard to demand, identified facility requirements, and evaluated the Airport's specific needs in relation to the Alaska airport system as a whole.

- Baseline conditions for the study were established upon compilation of existing environmental, airport, socioeconomic, financial, and relevant community data.
- Aviation demand was forecasted for the short (2003), intermediate (2008), and long term (2018).
- A capacity analysis considering both airside and landside facilities was performed to determine the facilities' ability to accommodate forecasted demand.
- Facility requirements in the three planning periods were identified.

Phase III: Analysis of Alternatives. Existing and new alternative concepts to meet the needs identified in earlier phases were developed and evaluated. A plan which best meets the overall needs of the Airport was selected considering operational, environmental, and economic factors; the

position in the context of the Alaska airport system; and the project goals and objectives identified at the outset.

**Phase IV: Implementation Plan.** The focus of the last phase was implementation of the provisions of the plan. Proposed development staging, cost estimates, and an economic feasibility analysis were prepared. In addition, an environmental overview was provided to identify potential conflicts and recommended items requiring environmental approval for implementation. The airport plans were prepared by the State of Alaska Department of Transportation (ADOT&PF) during this phase.

**Phase V: Coordination and Documentation.** Tasks associated with this phase have been carried out on a continuing basis throughout the Master Plan Update project.

## **1.6 PROJECT COORDINATION AND PUBLIC PARTICIPATION**

Development of an airport master plan update for Ralph Wien Memorial Airport required input from a variety of sources. A plan sensitive to the needs of the airport owner, users, and the community is important to the success of the master plan update process. As appropriate, the findings and recommendations of the work program were coordinated with representatives of the ADOT&PF, City of Kotzebue, Northwest Arctic Borough, the airport users, the community, the FAA, airport users, other state agencies, and local and regional agencies.

A comprehensive public participation program was an integral part of the planning process. The program was tailored to address local concerns and the full spectrum of airport planning issues. This included the publication of three newsletters and the scheduling of four public meetings.

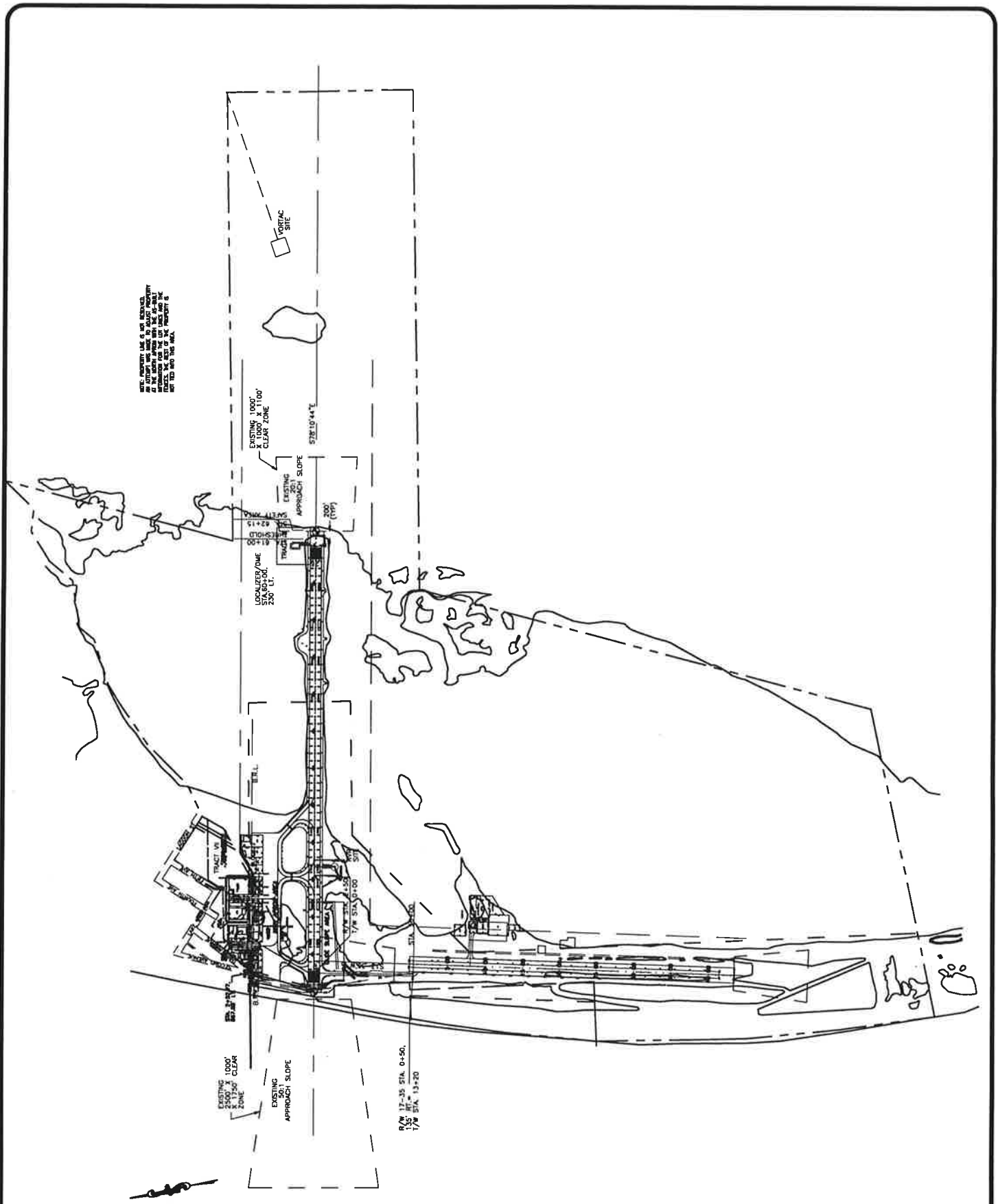
**Public Participation Meetings.** Four public meetings were held as an integral part of the planning process. They served to:

- Foster an awareness of the airport planning and development process in the community.
- Solicit input to further identify local concerns.
- Provide a forum for explanation and discussion of the interim study recommendations and conclusions.

During the course of the Master Plan Update, preliminary draft chapters for each of the major study elements of the Master Plan Update were prepared. These included:

<u>Chapter</u>	<u>Title</u>
1	Introduction
2	Inventory
3	Aviation Demand Forecasts
4	Demand/Capacity Analysis & Facility Requirements
5	Alternatives Analysis
6	Environmental Overview
7	Airport Plans
8	Land Use
9	Implementation





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**RALPH WIEN MEMORIAL AIRPORT**  
 KOTZEBUE, ALASKA  
 1989 AIRPORT LAYOUT PLAN

STATE OF ALASKA  
 DEPARTMENT OF TRANSPORTATION AND PUBLIC FACILITIES





## 2.1 INTRODUCTION

This chapter presents information collected on the Ralph Wien Memorial Airport (OTZ) and its surrounding environs in order to establish baseline conditions for the Airport Master Plan Update. Data was collected through various sources including an on-site visit, excerpts from the 1989 Airport Master Plan, survey questionnaires completed by air carrier and air taxi operators, interviews with key people and organizations familiar with airport conditions and issues, and a review of other pertinent airport area documents and files. Data assembled is presented as follows:

- **Kotzebue and the Airport Service Area.** A brief background description of the airport service area is provided.
- **Regional Socioeconomic characteristics.** The community's economic base, employment and population is discussed.
- **Airport Inventory.** Existing airside and landside facilities at the Airport are identified and described.
- **Airport Activity.** This summary of airport activity is an important component in the characterization of existing conditions at the Kotzebue Airport.
- **Airport Environment.** The airport's current physical environment is summarized here to preface the discussion of potential environmental impacts later in the plan.

Regional and community information described in the 1989 Master Plan which is unchanged has been used for this Chapter to the fullest extent possible. Those conditions which have changed since 1989 are fully described.

## 2.2 Kotzebue and the Airport Service Area

Kotzebue is located in Northwest Alaska within the Northwest Arctic Borough. It is 26 miles north of the Arctic Circle, on the northwest shore of Baldwin Peninsula. The City of Kotzebue is located on a small spit of land, separated from the mainland to the east by a large lagoon. This spit is about three miles long and varies in width between 1,100 and 3,600 feet.

Kotzebue is a regional transportation center serving the remote villages of northwest Alaska. Historically, Kotzebue was the transfer point between ocean and inland shipping because it was strategically located with easy access to the three major rivers of the region: the Noatak, Kobuk, and Selawik Rivers. Through this original function as a regional water transportation and distribution center, it became the focus also for the regional air transportation system.

Overland transportation in northwest Alaska is not well developed. There are no roads between Kotzebue and other communities within the region, nor to the rest of the state. There are approximately 11 miles of streets and roads in the City of Kotzebue.

Because of its central location and the availability of public services, Kotzebue remains an active regional center for trade, transportation, and distribution. With growth, Kotzebue has become the regional hub for health care, communication, administration, and education, serving the villages of Noatak, Selawik, Ambler, Kobuk, Shungnak, Buckland, Deering, Pt. Hope, Noorvik, Kiana, and Kivalina. Administration of four national parks and one national wildlife refuge is also centered in Kotzebue.

### 2.3 REGIONAL SOCIOECONOMIC CHARACTERISTICS

This section serves as an inventory of the community to identify pertinent socioeconomic factors which are likely to affect air transportation demand. These factors include economic indicators, local and statewide growth patterns, and population characteristics, distribution, and numbers.

#### Economic Base And Employment

Federal, state, and local governmental agencies, and the Indian Health Service Hospital (constructed in 1994) are major employers in Kotzebue, accounting for approximately 60 percent of the employment distribution. The Red Dog Mine, 82 miles north of Kotzebue is a major source of employment for Northwest Arctic Borough residents. Other major fields of employment include medical, mining, construction, transportation, tourism, warehousing and distributing, harvesting of renewable resources, communication, and utilities. Exhibit 2-1 summarizes the last decade of employment statistics for the Northwest Arctic Borough.

#### EXHIBIT 2-1 EMPLOYMENT STATISTICS

Year	NW Arctic Borough	Avg. Annual Growth Rate	Year	NW Arctic Borough	Avg. Annual Growth Rate
1985	1,822	--	1991	2,190	-1.4%
1986	1,823	0.0%	1992	2,227	1.7%
1987	1,732	-5.0%	1993	2,298	3.2%
1988	1,785	3.0%	1994	2,465	7.3%
1989	1,991	11.6%	1995*	2,509	1.8%
1990	2,220	11.5%			

Source: Alaskan State Department of Labor, Research and Analysis Section \* Last year for which data is available.

The regional native corporation established under the Alaska Native Claims Settlement Act (ANSCA) is the Northwest Arctic Native Association (NANA). The local village corporation established under ANSCA is the Kikiktagruk Inupiat Corporation (KIC).

Kotzebue is the regional urban center for the villages in the NANA Region, and it is here that the impact of the Alaska Native Claims Settlement Act has been most strongly felt. NANA Regional Corporation and Kikiktagruk Inupiat Corporation (the local village corporation), as a result of ANSCA, have created approximately 50 full-time jobs in Kotzebue.

Commercial fisheries of the Kotzebue area have established an important economic base for the region, even though these fisheries are not as productive as those of Bristol Bay or the Yukon River. The primary commercial species is chum salmon. In recent years commercial fishing has waned due to low prices.

Reindeer herding, introduced into Alaska in the late 1800s, has been an important industry in the Kotzebue area.

Mineral resources in the region have contributed to growth in the local economy. Known mineral deposits include copper, gold, lead, zinc, and silver.

Currently, the Red Dog Mine is the only large-scale, active mine within the Kotzebue area. The mine contains world class deposits of zinc. The mine employs 400 people of whom approximately 200 are area residents.

The Chukchi Sea and the Navarin Basin, two of the region's potential oil-bearing geologic structures, are in the vicinity of Kotzebue. However, their potential economic impact on the region would be in the long range future due to the time required to address environmental concerns and economic feasibility. There are no plans at this time for any significant exploration or development.

Historically, tourism has accounted for approximately 8,000 - 9,000 enplanements per year, and is anticipated to remain stable for the next 10 years.

### **Population**

Kotzebue's population has grown from 200 people in the 1880s, when it was an Eskimo fish camp, to about 2,800 in 1996. This growth can be attributed to the emergence of Kotzebue as a major arctic community. The large increase in population between 1980 and 1985 can be attributed to the opening of Red Dog Mine which attracted residents to Kotzebue from outlying areas. Population growth has shown a slight increase since that time. The population growth from 1920 to 1996 is shown in Exhibit 2-2.

**EXHIBIT 2-2**  
**POPULATION STATISTICS**

Year	Kotzebue	Avg. Annual Growth Rate	Kobuk Region*	Avg. Annual Growth Rate
1920	230		1,229	
1930	291	2.6%	1,289	0.5%
1940	372	2.8%	1,647	2.8%
1950	623	6.7%	1,947	1.8%
1960	1,290	10.7%	3,236	6.6%
1970	1,696	3.1%	4,048	2.5%
1980	2,054	2.1%	4,831	1.9%
1985	2,633	5.6%	5,790	4.0%
1990	2,751	0.9%	3,362	-8.4%
1995	2,888	1.0%	3,715	2.1%
1996**	2,821	-2.3%	3,704	0.0%

Source: Alaskan State Department Of Labor, Research and Analysis Section - Demographic Unit

\* Census Region: Includes Kotzebue in Total. \*\* Last year for which data is available.

Seasonal fluctuations in the population are produced by summer season transient groups. The increased availability of construction and transportation employment, and fishing attract between 200 and 400 additional residents during the summer months.

## 2.4 AIRPORT INVENTORY

The Kotzebue Airport, at an elevation of 11.5 feet MSL, is located adjacent to and south of the City of Kotzebue, on an irregular-shaped parcel of 1,805 acres, of which 80 to 85% is water. Commercial aviation operations, the majority of general aviation tie-downs, and the associated paved apron area and taxiways are located in the northwest section of the Airport property. The Airport is owned and maintained by the State of Alaska, Department of Transportation and Public Facilities.

Existing airport facilities described here include:

- airfield
- airspace & navigational aids
- terminal area facilities & aircraft storage
- ground access and auto parking
- utilities
- other support facilities

### **2.4.1 AIRFIELD**

The airfield consists of three major elements: the runways, the taxiways, and the apron areas. At OTZ, the majority of these airfield facilities are paved with asphalt while the others are gravel. Since the 1989 Master Plan, a federal grant of \$4.3 million was provided to the Airport for the reconstruction of Runway 8-26, installation of distance remaining and guidance signage, paving of Taxiways "A" and "B", security fencing, and the purchase of new snow removal equipment. The work was completed in the fall of 1994.

Exhibit 2-3 summarizes the current airfield facilities at the Kotzebue Airport.

**EXHIBIT 2-3****EXISTING AIRFIELD FACILITIES**

<b>Airfield Facility</b>	<b>Description</b>	<b>Lighting/Approach Aids</b>
<b>PRIMARY RUNWAY 8-26</b>	5,906 x 150' / asphalt 100,000 lbs SW/ 128,000 lbs DW 162,000 lbs STW/ 240,000 lbs DTW .075% effective gradient	HIRL Precision Approach VASI
<b>CROSSWIND RUNWAY 17-35</b>	3,800' x 100' / gravel	MIRL Visual Approach
<b>TAXIWAYS</b>	Paved access Taxiways A and B from terminal area apron to lease lot areas. Paved access Taxiways C, D, and E from Rnwy 8-26 to terminal area apron. Connecting gravel Taxiway F from Rnwy 17 end to Rnwy 8 end. Gravel access Taxiway G off Rnwy 17-35 northeast end.	Txwys A, B, C, D, E, lighted; Txwys F and G are not lighted
<b>TERMINAL AREA AIRCRAFT PARKING APRON</b>	300' x 1,850' 100,000 lbs SW/ 128,000 lbs DW 162,000 lbs ST/ 240,000 lbs DT	No official apron lighting; adjacent buildings have flood lights attached which provide apron area lighting
<b>GA AIRCRAFT PARKING APRON</b>	219' x 269' / gravel w/ 10 tiedowns adjacent to Txwy B, north of terminal apron Gravel area within safety area of Rnwy 17-35 also used for GA parking (no tiedowns)	No lighting
<b>UNOFFICIAL FLOATPLANE FACILITIES (NOT CERTIFIED)</b>	East of Rnwy 17-35: Lagoon area Note: In the past, float planes also used Isaac Lake (west of Rnwy 17-35) which has been dewatered to allow gravel extraction	



### *Primary Runway 8-26*

Runway 8-26, over 5,900 feet in length, is constructed of asphalt underlain with polystyrene foam board insulation from 200 feet west of the west threshold to the lagoon. It was paved in 1970. More than half of the runway length is constructed on fill in the lagoon to the east of Kotzebue Spit. According to the FAA Flight Service Station, approximately 75 percent of all aircraft operations at Kotzebue are conducted on Runway 8-26. Runway 8, which has precision instrument approach capability, is used for an estimated 75% of all Runway 8-26 operations.

### *Crosswind Runway 17-35*

The gravel surface length of Runway 17-35 is 4,350 feet. The usable length was reduced to 3,800 feet to provide safety area beyond each runway threshold. The threshold was relocated to meet the FAA standards for runway safety area. Currently, there is an aircraft parking area along the west side of Runway 17-35 within the runway obstacle free area. Runway 17 is used for an estimated 60% of all Runway 17-35 operations.

### *Taxiways*

Runway 8-26 has no parallel taxiway. There is a taxiway loop that extends from the west end of the runway northward to the apron, along the apron edge to the east 1,200 feet, and then south to connect with the runway. These taxiways are designated as Taxiways C and D. A diagonal taxiway, identified as Taxiway E, connects the east side of the main apron area with Runway 8-26. There is a short taxiway, identified as Taxiway F, that connects the west end of Runway 8-26 with the north end of Runway 1735. Also connected to Runway 17-35 is Taxiway G that serves the gravel apron on lease Block 6.

### *Apron Areas*

The terminal area aircraft apron measures approximately 300 feet by 1,850 feet. The entire apron area is paved in asphalt. The terminal apron pavement strength is equivalent to that of the primary Runway 8-26. The GA apron area is north of the terminal area apron and accessed by Taxiway B. Other GA aircraft parking is along the west side of Runway 17-35 in an area of approximately five acres.

### *Floatplane Facilities*

The Kotzebue Lagoon to the east serves as an unofficial floatplane landing area. Isaac Lake to the west of Runway 17-35, was previously used by float planes, but has since been dewatered for gravel extraction purposes.

### *Signage*

Taxiway, distance remaining, and guidance signage is located along the runway. The signage was installed during the Runway 8-26 reconstruction project during the 1993-1994 time frame, and meets current FAA standards.

## 2.4.2 AIRSPACE AND NAVIGATIONAL AIDS

According to the FAA Airport Master Record (Form 5010-1), Airport Facility Directory, and the existing airport layout plans, obstructions to navigable airspace include the hills in the Runway 26 approach, a road within the Runway 8 safety area, a road which obstructs the crosswind runway's approaches to 17 and 35, and parked aircraft within the Runway 17-35 obstacle free area. The hills in the Runway 26 approach path are approximately 120 feet in elevation. The Kotzebue Airport airspace is defined under FAR Part 77 Imaginary Surfaces which describes standard approach slopes for varying instrument approaches. Instrument approaches and actual approach slopes for Kotzebue Airport are listed here:

<u>INSTRUMENT APPROACHES</u>	<u>APPROACH SLOPES</u>
ILS/DME - Runway 8	Runway 8 - 50: 1
VOR/DME or GPS - Runway 8	Runway 26 - 15: 1*
VOR/DME 2 or GPS - Runway 26	Runway 17 - 1: 1**
VOR - Runway 8	Runway 35 - 10: 1 **
VOR - Runway 26	
VOR/DME - Runway 26	
NDB or GPS-A - All runways (circling)	

\* Standard approach slope for this runway is 34:1. Terrain obstructs the 34:1 standard slope reducing it to a 15:1 clearance. This was previously noted as a deviation from standard on the Airport Layout Plan.

\*\* Standard approach slope for this runway is 20:1. The road's close proximity to the runway obstructs the 20:1 standard slope reducing it to a 1: 1 clearance for Runway 17 and a 10:1 clearance for Runway 35.

The Kotzebue Airport does not have an air traffic control tower. The FAA operates a Flight Service Station (FSS) providing up-to-date field condition reports for landing strips near Kotzebue, as well as pre-flight and in-flight weather briefings. The FSS which previously operated as a 24-hour facility, now operates daily between the hours of 8:00 a.m. to 11 :45 p.m.; the Fairbanks FSS takes over frequencies for radio communication from 11:45 p.m. to 8:00 a.m. In recent years, about half of the FSS in Alaska have been closed, reduced to part-time operation, or staffed to match seasonal demands. The goal of the program was to consolidate to three AFSS in the state - Fairbanks, Juneau, and Kenai. Problems with automated weather reporting and protests by the aviation community have slowed/alterd the program. The FSS provides emergency direction-finding (DF) services, accepts requests for practice DF steers and approaches, and provides air traffic and weather advisory information for departing and approaching aircraft. Enroute IFR traffic for all of Alaska is handled

from the Anchorage Air Route Traffic Control Center (ARTCC); direct telephone lines to ARTCC are available at the FSS.

As previously described in the 1989 Plan, the airport is equipped with a photocell-controlled rotating beacon, lighted wind cone, medium-intensity runway lights (MIRL) (pilot-activated) on Runway 17-35, high-intensity runway lights (HIRL) on Runway 8-26, an instrument landing system (ILS) with a localizer and glide slope on Runway 8, and visual approach slope indicators (VASI) on Runway 8-26. Other navigational aids include distance-measuring equipment (DME), the Hotham non-directional beacon (NDB) broadcasting scheduled weather reports at 15 minutes past each hour, and a very high frequency (VHF) omnidirectional range/tactical air navigation station (VORTAC) which also provides distance and directional information. The National Weather Service operates an office at Kotzebue, providing current weather information.

### **2.4.3 TERMINAL AREA FACILITIES & AIRCRAFT STORAGE**

The Kotzebue Airport does not have centralized passenger terminal facilities. However, a centralized facility has been proposed in the past. Currently, passengers are processed through the individual operators' facilities. Exhibit 2-5 summarizes the existing terminal area facilities by operator, building size, and date and type of construction.

These facilities are used by several types of operators including: scheduled carriers, air taxis, contract carriers, cargo carriers, and the Civil Air Patrol. The Appendix provides a summary of the lease lots associated with these facilities. Facilities serving the U.S. Fish and Wildlife Service and Alaska Fish and Wildlife Protection are located on the south side of the airport adjacent to Runway 17-35. Additional discussion of facilities is provided in the Capacity Analysis and Facility Requirements Chapters.

**EXHIBIT 2-4  
EXISTING TERMINAL AREA  
FACILITIES  
Ralph Wien Memorial Airport**

Operator	Building Dimensions	Date of Construction	Construction Type
Former MarkAir Passenger Terminal Building	35'x 95'	1965	Wood-frame, Single-story
Baker Aviation Hangar	40'x 60'	1977	Steel-frame, Insulated
	80'x 120'	1991	Steel-frame, Insulated
Baker Aviation Offices	30'x 60'	1978	Steel-frame, Insulated, 2-story
Former MarkAir Hangar/Cargo	80'x 107'	1966	Steel-frame, Insulated
Alaska Airlines	60'x 120'	1985	Steel-frame, Insulated, 2-story
Bering Air	40'x 80'	1978	Steel-frame, Insulated
Walker Air Service (sublet)	40'x 60'	1979	Steel-frame, Insulated
Civil Air Patrol	60'x 60'	1980	Steel-frame, Insulated
Arctic Transportation Services	30'x 78'	1981	Wood-frame, 2-story
Northwestern Aviation	80'x 90'	1981	Steel-frame, Insulated
Cape Smythe Air	60'x 80'	1991	Steel-frame, Insulated
Hageland Aviation Services	60'x 80'	1996	Steel-frame, Insulated
Mike Spisak, dba Ram Aviation	40'x 60'	1991	Steel-frame, Insulated

Source: DOT & PF

#### **2.4.4 SURFACE ACCESS AND AUTOMOBILE PARKING**

Existing surface access to the Terminal Area from Kotzebue is by Third and Fifth Avenues. Third Avenue was paved in 1996, the first paved road in Kotzebue.

Access roads serving the existing terminal area buildings, air taxi operators within Block 3, and GA aircraft parking run east-west along the north side of Block 3 and north-south between lease lots. There is limited automobile parking available, all of it unpaved, between the Alaska Airlines and Cape Smythe Facilities.

The only road leading south from town passes through the airport within Runway 8's safety area. The road is used to access summer fish camps, the sanitary landfill, an Air Force radar site, and properties along the coast to the south. The gate controlling access to the airport operating area via this road is inoperable. In the near future, the Bureau of Indian Affairs (BIA) plans to begin construction of a road east of Kotzebue Lagoon that will connect Kotzebue to areas south of town, such as the new sanitary landfill and the Air Force Station. The new road will also provide circuitous access to activities adjacent to Runway 17-35.

#### **2.4.5 SUPPORT FACILITIES AND OTHER BUILDING AREAS**

Support facilities include those for aircraft rescue and firefighting, and fuel storage and distribution.

##### *ARFF*

Aircraft rescue and firefighting equipment and personnel are supplied by the DOT & PF. The airport maintains a mutual-assist fire cooperative agreement with the City of Kotzebue Fire Department. In the event of an airport emergency, the Kotzebue Fire Department will lend assistance.

Ralph Wien Memorial Airport is currently classified as Index B per Federal Aviation Regulation Part 139, and is equipped with an Oshkosh T-1500, aircraft rescue and firefighting unit with the capacity of 1,500 gallons of water, 200 gallons of aqueous film-forming foam (AFFF) concentrate, and 700 pounds of dry chemical.

The fire station's water system is connected to the City Water System. The station is accessible by volunteers and is separated from the adjacent maintenance and operations shop by a personnel door and walkway.

### *Fueling Services*

Crowley Marine Services is the only fuel vendor (Chevron) located on the airport. Their fueling station was located on Lot 1, Block 4, on the south side of the terminal apron, between Taxiways C and D. The facility served Jet A, 100/130 and 80 octane between the hours of 8:00 a.m. and 5:00 p.m., seven days a week excluding holidays. This fueling station violated the primary surface of Runway 8-26 and, therefore, was removed during 1998. Fueling is now done from trucks.

Crowley Marine maintains its aircraft refueling trucks which park in a 30-foot by 40-foot insulated steel-frame building (constructed in 1968). The building is located on Lot M of Block 1.

Some of the operators have individual fuel storage tanks on their lease-holds.

### *Other Building Areas*

Other building areas include the FAA flight Service Station (FSS), National Weather Service (NWS), FAA housing, DOT&PF shop buildings, the Alaska National Guard Hangar, and the U.S. Fish and Wildlife Service Hangar.

#### FSS

The FSS is located west of Runway 17-35. From the FSS, it is impossible to reliably see the terminal area apron or Runway 8-26 because of the structures. There has been discussion of relocating the FSS to the north. From the present location, they cannot see the whole length of the main runway, particularly runway departures. Also, because of the inconvenient location, pilots do not often go to the FSS for briefings.

#### NWS

The NWS office is located in the same building as the FSS. If the FSS relocates, the NWS anticipates moving with them. The NWS office is currently attended 16 hours/day. Two weather balloons are released each morning and two each evening. The automated weather reporting station (ASOS) has been operating almost two years, but is not ready to be commissioned because of reliability problems. The NWS plans to continue as a data collection center after the ASOS is commissioned.

#### DOT&PF

The DOT&PF owns three insulated, steel-frame buildings: one serves as a shop, one is used for storage, and one houses the crash-fire-rescue vehicle. These structures are located on Lot AA, Block 1; Lot 1B, Block 3, and Lot 2, Block 2. The structures on Lot AA measure 40 feet by 60 feet each; the structure on Lot 1 measures 40 feet by 80 feet. These buildings are connected to the city's water and sewer system.



National Guard

The Alaska Army National Guard previously occupied Lot 3, Block 6, in a 10,296-square-foot hangar. Since the Guard closed this facility, the hangar has been vacant. Proposals for use of the vacant hangar are being considered.

FAA

The FAA has some housing at the airport for personnel on temporary duty, but most of the housing has been removed in recent years. FAA maintenance personnel work from Kotzebue on a rotation basis, servicing navigation aids throughout the region.

U.S. Fish and Wildlife Service

The U.S. Fish and Wildlife Service maintains a field office in Kotzebue to manage the Selawik National Wildlife Refuge. The USFWS operates a Piper PA-18 Super Cub on floats in the summer, and on skis in the winter. The PA-18 is housed in a small hangar on Lots 1 and 2, Block 6, adjacent to the lagoon. Although the USFWS officially only has one based aircraft, they make an effort to work with and support other federal and state agencies with aircraft at Kotzebue. The USFWS hangar has room for up to four aircraft, so the other agencies have used the hangar space to park their aircraft. These aircraft include the Alaska Department of Fish and Game's Super Cub, the National Park Service's Super Cub and Cessna 185, and the State Public Safety/Fish and Wildlife Protection Officer's Super Cub.

**2.4.6 UTILITIES**

Utilities on the airport include water, sewer, telephone, electrical service, and solid waste disposal, as follows:

<u>Utility</u>	<u>Provider /Source</u>
Water	City of Kotzebue
Sewer	City of Kotzebue
Telephone	OTZ Telephone Cooperative
Electric	Kotzebue Electric Association
Solid Waste Disposal	City of Kotzebue

### Water

The primary water source is Devil's Lake, located approximately 3 miles east of the Airport. Water is piped into the City. A suspension bridge supports the crossing of the lagoon outlet. Steel piling and wood timbers support the water transmission line above the surface of the tundra. Water is filtered and treated and held in a 1.5-million-gallon insulated storage tank in town. The water distribution system for the town was developed in 1966. All lease lots on Block 1 and Block 3 are connected to the city's water service. Other lease areas are served by water and sewage haul tanker trucks.

### Sewer

The city's sewer system was constructed through the Indian Health Service. The City of Kotzebue now operates and maintains the system through a use agreement. Construction of the system began in 1969. A major expansion took place in 1976. Over 80 percent of the City is now connected to the sewer system. Sewage flows to an aeration lagoon located to the west of Runway 17-35. All lease lots on Blocks 1 and 3 are connected to the city's sewer system.

### Telephone

The OTZ Telephone Cooperative provides telephone service to all facilities on the airport. The existing system was installed in 1977. Long distance communication is through the use of Alascom's satellite.

### Electric

The electrical power plant is located on Lagoon Street, near the airport. All facilities on the airport have electrical service; however, there is no general standby service for anything other than FAA facilities. The FAA has a standby 75 KW power plant for communications and FAA-maintained navigation aids including the ILS, RVR, and VASI's. Service within runway primary surfaces is underground.

### Solid Waste

The City's refuse site is now approximately one mile south of Runway 17-35. Solid waste is handled through a baling system in town, with the bales then disposed of in cells at the landfill site. The previous landfill, which is being closed, was located adjacent to the south end of Runway 17-35.

## **2.5 AIRPORT ACTIVITY**

In addition to the physical facilities inventory of Kotzebue Airport, discussion of aviation activity levels is important to a complete understanding of the airport. The most significant aviation activity is by general aviation and air carrier/air taxi operators.

In order to obtain the most accurate and reliable data available on the air carrier and air taxi operators serving Kotzebue, a survey questionnaire was distributed. Copies of the completed survey questionnaire identifying the air carrier and air taxi operators contacted (Spring 1997) is on file. The survey questionnaire requested information regarding:

- Type of operation (Part 121, 135)
- Services offered
- Type of aircraft
- Type, location, and adequacy of facilities at Kotzebue Airport
- Current and projected activity levels for operations and cargo/passenger volumes
- Other pertinent data

This data served to verify much of the airport inventory data collected.

Historical data collected on total operations and based aircraft from the survey and other sources is briefly summarized here. Detailed discussion of aviation activity is presented in Chapter 3, Aviation Demand Forecasts.

### **2.5.1 ENPLANEMENTS**

Enplanement activity grew by 22% over the last decade, even though there was a decrease between 1992 and 1995. Enplanements peaked in 1992 at 57,861. Current 1995 enplanements were recorded at 55,904. Air taxi and air carrier enplanements are close to a 50/50 split, with the ratio of enplanements per operation progressively increasing.

### **2.5.2 OPERATIONS**

According to the FAA's Terminal Area Forecast (TAF), annual aircraft operations at Kotzebue totaled 46,000 in 1986, grew twenty-five percent to 60,000 in 1989, and have stayed near that level through 1995. Exhibit 2-6 summarizes the estimated operations for 1995.

**EXHIBIT 2-5  
SUMMARY OF ESTIMATED TOTAL OPERATIONS FOR 1995**

<b>Operations Type</b>	<b>Total Operations</b>
Air Carrier	2,000
Air Taxi	20,000
GA	37,000
Military	1,000
<b>Total</b>	<b>60,000</b>

Source: FAA Terminal Area Forecast, 1996

### 2.5.3 BASED AIRCRAFT

Exhibit 2-7 represents the breakout of the total 79 based aircraft at Kotzebue in 1995, down from 87 in 1990.

**EXHIBIT 2-6  
SUMMARY OF BASED AIRCRAFT FOR 1995**

<b>Aircraft Type</b>	<b>No. of Based Aircraft</b>
Single Engine	68
Multi-Engine	10
Helicopter	1
<b>Total</b>	<b>79</b>

Source: FAA Terminal Area Forecast 1996

Notes: 1) 1995 data is derived from 1993 Airport Master Record, FAA Form 5010, and FAA's 1996 Terminal Area Forecast.

2) Survey

## 2.6 AIRPORT ENVIRONMENT

This section provides a description of the physical airport area environment to include land use, biotic communities, air quality, wind and weather conditions, geographic data, and natural hazards at and around the airport area.

### **2.6.1 Land Use**

The incorporated limits of Kotzebue encompass 26.5 square miles, of which less than 1 square mile is located on the spit north of the airport. Most of the higher land on the spit is developed, with remaining areas in lowlands subject to flooding. Development within Kotzebue is intermixed with commercial development mixed with residences. The City's planning commission is developing a land use plan to maximize use of remaining land on the spit. The majority of land within the city limits is on the mainland east of the lagoon. A bridge connects the spit to the mainland, with a road approximately three miles long to the City's main water source at Devil's Lake. The mainland geology is comprised of ice rich, thaw unstable silts. No development on the mainland has occurred due to poor soil conditions, combined with isolation from City facilities by the lagoon. The airport constrains development to the south on the spit, which has more favorable soil conditions for development.

The National Park Service manages several large areas surrounding Kotzebue, all of which were established by the Alaska National Interest Lands Conservation Act (ANILCA) in 1980. The sites are: the Bering Sea Land Bridge National Preserve to the south on the Seward Peninsula; Cape Krusenstern National Monument, Gates of the Arctic National Park, Noatak National Preserve, and Kobuk Valley National Park to the north and east.

According to the Park Service administration, as of 1997 there were 17 permanent staff administering the park sites from Kotzebue, up from nine staff members in 1987. During the summer season, staffing increases by 10 to 27. There are no significant increases expected in staff over the next 20 years. Fluctuations in staffing are based on annual appropriations and special projects.

The Selawik National Wildlife Refuge, located to the east, includes six permanent staff to administer the Refuge from Kotzebue.

### **Biotic Communities**

In the northwest regions of Alaska, the biotic communities are affected by, and have adapted to, the extremely cold temperatures, permanently frozen soils, low precipitation, and great variations in amount of available daylight.

The northwest region supports terrestrial vegetation of the following types: moist, alpine, and wet tundra, upland spruce-hardwood forest, high brush, bottomland spruce-poplar forest, and lowland spruce-hardwood forest. The predominant type is moist tundra, which generally completely covers the ground of low rolling hills. The very moist, even saturated soil supports a variety of sedges, shrubs, herbs, grasses, lichens, mosses, and fungi.

Mammals found in the tundra areas of the Kotzebue Sound region include arctic and red foxes, lemmings, musk oxen, wolves, grizzly bears, ground squirrels, Dall sheep, moose, caribou, and reindeer.

Birds of the region include eagles, hawks, owls, ptarmigan, grouse, geese, cranes and many species of songbirds and shorebirds.

Fish of the region include primarily chum, supplemented by silver and king salmon, arctic grayling, herring, smelt, burbot, arctic char, arctic cod, whitefish, and sheefish.

Marine mammals include Beluga whales, walrus, bearded, ringed, and harbor seals. Sea birds include ducks, sea ducks, puffins, and auklets.

The threatened arctic peregrine falcon nests in the tundra cliff areas of northwest Alaska, and migrates through the Kotzebue area. There are no known nest sites within 15 miles of the airport. The Spectacled eider has been placed on the endangered species list, and the Stellar's eider is a Category 1 candidate for the endangered species list. Both types of eider may migrate through the Kotzebue area, but neither species is known to breed near Kotzebue.

A portion of the airport (southern end) is near one of seven locations of a Category 2 plant species (*Oxytropis arctica* var. *barnebyana*). The site is a mixed willow/heath area on the beach west of Runway 17-35.

### **Air Quality**

No air quality monitoring stations are located in the Kotzebue area. However, the air quality in Kotzebue is assumed to be good.

### **Wind and Weather**

The climate of the Kotzebue Sound area is primarily maritime when the water is free of ice, which is roughly from late May to late October. The maritime zone is characterized by frequent light precipitation and relatively cool summers and warm winters. The region averages 93 frost-free days and less than 20 inches of precipitation, including 50 to 60 inches of snow, annually.

The winter season climate, October to May, is primarily continental. The area experiences frequent storms, especially from October to April. These storms are accompanied by high winds and blizzard conditions during the winter months.

On the coast, surface winds are generally strong and persistent, and average 10 to 15 knots year round. Calm conditions occur 5 to 15 percent of the time. During the spring and summer, prevailing winds are from the west; during winter, they are from the east.

Ice break-up and freeze-up occurrence is important because of its impact on marine activity. On Kotzebue Sound, break-up occurs as early as mid-May and as late as early June, and average around the end of May. Freeze-up occurs as early as early October and as late as early November, and averages around late October. Delivery of goods and services is limited to air from late October to late May.



Due to the northerly location, Kotzebue experiences extreme seasonal variations in daylight hours. During three summer months, the sky is always light. At the opposite end of the spectrum, mid-winter offers only two to three hours of daylight.

### **Geographic Data**

The Kotzebue Spit, bounded on the west by Kotzebue Sound and on the east by the lagoon, is low and flat, with elevations of 10 to 15 feet MSL. This fairly level land presents poor and unintegrated surface drainage, which causes rain and meltwater to collect in low areas, establishing lakes, ponds, and swampy areas.

Permafrost, which is continuous under Kotzebue, and low evaporation add to the drainage problem.

Due to the process of deposition by which it was formed, soil and subsoil characteristics vary considerably within the small area of the spit. The seaward side is underlain by a gravel bench, while the inland side adjacent to the lagoon is underlain by gravel, which is in turn covered by a layer of silt and fine sand.



### 3.1 INTRODUCTION

The aviation demand forecasts provide a basis for determining the type, size, and timing of airport facility requirements.

The Ralph Wien Memorial Airport demand forecasts presented in this chapter are intended to update the 1989 Master Plan forecasts. This analysis will compare activity levels forecast in the 1989 plan with activity levels actually experienced through 1995 (and 1996 where data is available). The planning period for this update covers a 20-year period divided into short term (2003), medium term (2008), and long term (2018).

The updated forecasts for Ralph Wien Memorial Airport (Kotzebue Airport) include:

- Air Carrier & Air Taxi Demand
  - Passenger Enplanements
  - Aircraft Operations
  - Aircraft Fleet Mix
  - Peak Demand
- General Aviation
  - Based Aircraft
  - Fleet Mix
  - Aircraft Operations
    - Local, itinerant, touch & go
    - VFR/IFR
  - Peak Demand
- Military Demand

### 3.2 FORECASTING METHODOLOGY

Airport activity forecasts are developed through a combination of mathematical, analytical, and judgmental approaches. Historical patterns are examined for trends and possible relationships between different conditions. From these, projections are made and then evaluated in comparison to forecasts from other sources. These may include other aviation demand forecasts or projections by governmental agencies for socioeconomic directions.

The following summarizes the five primary elements used for determining Kotzebue's current and future aviation activity:

- Consideration of current socioeconomic trends
- Evaluation of available data on historical and current activity
- Testing of forecasting models (where input data is available)

- Reviewing existing federal, state, and local forecasts
- Interviewing air carrier and air taxi operators at Kotzebue

The following sections contain forecasts for Kotzebue Airport. These include passenger enplanements, aircraft operations, based aircraft, peaking characteristics, and fleet mix. Forecasting data is provided in Appendix III as supplemental information to this chapter and as reference.

The results of the forecasting process provide input for the facility requirements analysis of the next chapter as well as all subsequent elements of this study.

### **3.3 SOCIOECONOMIC ACTIVITY**

The anticipated economic future of Kotzebue and the region is important to help determine the probable growth in Kotzebue Airport aviation activity. While key local, regional and state offices were contacted for population and employment data, very little data was available for the Kotzebue area. In addition, the most recent forecasts prepared for these socioeconomic elements (1989 time frame, according to the AK Department of Labor) are outdated and have proven over the last several years that they are highly inflated and not appropriate for forecasting models.

Therefore, employment and population discussion is centered on historical data only. Since current estimations of growth have not been published, they were unavailable for the forecasting models. Agency staff providing the historical data have indicated that in many cases, a growth rate less than two percent annually may be more practical.

This section briefly discusses what is known about the socioeconomic activity in the area.

#### **3.3.1 ECONOMIC BASE AND EMPLOYMENT**

According to the May 1997 edition of *Alaska Economic Trends 1997-1998 Forecast*, published by the Alaska Department of Labor, Alaska's economy is expected to continue its slow growth primarily in the sectors of air cargo handling services, hard rock mining, trade and tourism. This section briefly discusses the economic base and employment for the Kotzebue area.

##### **Mining**

Red Dog is the major active mine in the region. A recent find has increased the estimated life of the mine from about 40 more years to approximately 50 to 75 more years. The NANA \$180 million construction project (to increase production at Red Dog) will continue year-round through 1999.

Due to high transportation costs, new mineral development is largely dependent on improvement of the transportation system. Several optional transportation corridors have been identified. Ambler has potential for copper, and mining could occur there within 10 to 20 years. There is no activity at Bornite now. Several other locations in the area have a history of mining or potential for mineral development. Historical examples include Klery Creek, Candle, Inmachuk River area, and the Kobuk area. Chicago Creek has been looked at for coal potential. Potential for North Slope Coal development, while outside the area, could have a profound effect on the Kotzebue transportation system.

### **Tourism**

Three years ago, tourists to Kotzebue peaked at 10,000. The number declined to 8,700 in 1996, and the forecast for the next five years is 8,000 to 9,000. The decline is partly attributed to Mark Air going out of business. Alaska Airlines has tour packages that include a night in Kotzebue and a night in Nome. However, Alaska Airlines' package tours to Fairbanks and Barrow are reportedly more profitable. Barrow's tourism has grown while Kotzebue's has declined. In recent years Kotzebue has experienced increasing competition for tourists from other rural Arctic communities. Although tourism from outside the region to Kotzebue has declined, tourism from Kotzebue to the neighboring villages has increased slightly.

Tourism demand could increase if there is additional investment in the region's five national parks, preserves, and monument.

### **Oil and Gas**

On-shore, some preliminary exploration has occurred, but it will be at least five to ten years before there is an agreement in place for more exploration. Production within the master plan's 20-year planning period is questionable. Off-shore exploration and production is less likely to occur within the planning period.

### **Other Factors**

Actual aviation demand at the Kotzebue Airport has been lower than that projected by the 1989 Master Plan. It is estimated that along with other factors discussed, the lower demand is partly attributed to the decline in the commercial fishery market.

### **3.3.2 POPULATION**

As previously shown in Exhibit 2-2, of the Inventory Chapter, population in Kotzebue and the Kobuk census region has historically fluctuated, but recently stabilized. In fact, Kotzebue population grew by just under 1.0% annually between 1990 and 1995, then dropped by 2.3% between 1995 and 1996. The Kobuk census region population has also stabilized with zero growth in the 1995-1996 period. The Kobuk region had shown a sharp 8.4% decline in population between 1985 and 1990, but then gradually recovered at a 2.1% annual growth rate between 1990 and 1995.

The large increase in population between 1980 and 1985 (5.6% average annual growth) can be attributed to the opening of Red Dog Mine which attracted residents to Kotzebue. Population growth has shown a slight increase since that time. Barring a major economic event, population growth rates are anticipated to be low within the foreseeable future.

### **3.4 AVIATION DEMAND FORECASTS**

Aviation demand forecasts are presented here by activity element to include: air carrier and air taxi operators (passenger enplanements and air cargo), general aviation operators and military. In addition, total operations, fleet mix, peaking characteristics are also presented.

#### **3.4.1 AIR CARRIER AND AIR TAXI DEMAND**

As previously discussed in the Inventory Chapter, air carrier and air taxi operators serving Kotzebue were provided with an air carrier/ air taxi survey questionnaire (see Appendix II.f). While less than half of the operators responded, the results combined with other data resources provided insight into the historical and projected activity of the air carrier/air taxi operators.

##### **Passenger Enplanements**

###### *Historical*

Data on passenger enplanements was compiled from the FAA Terminal Area Forecasts (TAF), Airport Master Records, and the 1989 Master Plan.

Over the past ten years, the number of passengers enplaned on scheduled flights has increased 22%, from 45,957 in 1986 to 55,904 in 1995. The 10-year peak, 57,861, occurred in 1992. Over the last 10 years, about half the passengers were on air carrier aircraft and half were on commuter aircraft. The ratio of passengers per operation has also grown from 1.53 in 1986 to 2.54 in 1995, with a peak of 2.63 in 1989.

###### *1989 Master Plan Forecast*

The 1989 Kotzebue Master Plan projected passenger enplanements would grow to 88,100 in 1995, then decline to 70,000 in 2005. Its forecast for 1995 was more than 50% higher than the actual number of enplaned passengers that year. The 1989 Master Plan examined three scenarios to produce low, medium, and high forecasts. The medium forecast was adopted. The low forecast postulated no mineral or energy development and assumed an annual growth rate of 1.5%.



Of the three scenarios, the low forecast came closest to actual activity in 1995. Its projection for 1995, 49,400 enplaned passengers, was 12% below the actual number, 55,904.

The medium (adopted) forecast was based on substantial mining of lead and zinc at Red Dog added to existing gold and jade mining in the Kobuk area. Between 1985 and 1995, the projected average annual growth rate was 7.31%. After 1995 the rate declined to an annual decrease of 0.70%. Additional mining activity has occurred in the Red Dog area since the 1989 Master Plan. However, it has caused less growth of the City of Kotzebue and its airport than predicted. Many more mine employees commute directly between Anchorage and the Red Dog airfield than were expected.

The high forecast in the 1989 Master Plan added oil and gas development to the increased mining activity. Between 1985 and 1995 the projected average annual growth rate was 11.40%. Between 1995 and 2005 the rate declined to an annual decrease of 4.27%.

#### *FAA Terminal Area Forecast (TAF)*

The FAA's 1996 TAF projected no growth in air carrier passengers from 1995 through 2010. The TAF for commuter passenger enplanements used regression analysis and projected an annual growth rate that declined from 2.6% to 1.91% over the 15-year forecast period. Total enplanements projected for 2010 were 65,728.

#### *AASP Forecast*

In 1994 the Alaska Aviation System Plan (AASP) Update developed forecasts for the largest Alaskan airports, including Kotzebue. The AASP projected 68,546 passenger enplanements in 2010, slightly more than the TAF. The forecast used growth rates from the 1990 Alaska Tiltrotor, Vertiport Study, which were based on population growth projections.

#### *Current Master Plan Forecast Models*

Due to the lack of current and reliable socioeconomic data for the Kotzebue area, forecasting models used in developing passenger enplanement projections were limited to:

- **Trend Model:** measured the trend in Kotzebue Airport enplanements and projected a continuation of this trend into the future.
- **Growth Model:** calculated Kotzebue Airport historical enplanement (air carrier and air taxi) activity as a percentage of the U.S. commercial domestic passenger enplanements (and applied percentage to FAA domestic enplanements forecasts to derive Kotzebue Airport enplanements).

The results of these two models produced enplanement activity levels with an average annual growth rate of 1.4% for the trend model and 3.9% for the growth model through the year 2010.

The trend model projected 69,300 enplanements in 2010, approximately 1.1% above the AASP projections and 5.4% above the TAF projections for the same period.

The growth model results are useful if a close correlation can be made between Kotzebue growth and national growth, but a close correlation does not exist. The uniqueness of Alaska and the Kotzebue area dictates the need to rely on regional socioeconomic rather than national trends to project growth.

### *Future Growth Scenarios*

Following a review of the current socioeconomic conditions of the region, described earlier, three growth scenarios were defined for enplanement projections. High, medium, and low aviation demand forecasts were developed using the three scenarios. These growth scenarios are summarized here:

#### Low Growth Scenario

This scenario assumes that the growth in mineral development, energy development, and/or tourism in the region is insignificant. The average annual growth rate in passenger enplanements from 1987 to 1995 was just under 1.0%. This scenario applies an annual growth rate (AGR) of 1.1%, similar to the growth rate projected by the FAA TAF.

#### Medium Growth Scenario

The medium growth scenario is based on the assumption that the proposed Red Dog Mine expansion and/or tourism will induce moderate growth in the Kotzebue area to an AGR of 2.2%. This is twice the growth rate estimated for the low growth scenario. This rate is also close to the AASP-projected 2.1% AGR (between 1991 and 2010). Under this scenario, it is assumed that of the total mining employment increase, only a portion will reside in and travel from the Kotzebue area with others primarily out of Anchorage -- similar to the current Red Dog commuting arrangements. Past Red Dog development has indicated that the regional government and native corporations want economic growth, but as a matter of policy and implementation, they seek to moderate the growth in order to avoid the negative social impacts of booms/busts.

#### High Growth Scenario

This scenario is based on significant growth resulting from one factor or a combination of factors. This high growth is projected to be a 4.4% AGR. This rate, which is twice the medium growth scenario is based on the following:

- More significant impact from the Red Dog Mine expansion than currently anticipated
- Tourism increases (potentially resulting from marketing efforts)
- Significant recovery in the commercial fishing market

- Other mining developments such as copper at Ambler are made feasible due to transportation system improvements

### *Selected Forecast*

The selected forecast is the medium growth scenario. Exhibit 3-1 summarizes the enplanement forecasts for the years 2003, 2008, and 2018 under this scenario. It is projected that the air taxi/air carrier split will gradually shift its current 45/55 percent split (air carrier with higher percentage) to the reverse 55/45 percent split (air taxi with higher percentage of enplanements). This projected split generally follows the projections of the FM TAF.

### **EXHIBIT 3-1**

#### **SELECTED PASSENGER ENPLANEMENT FORECAST - MEDIUM GROWTH SCENARIO**

	Actual 1995	2003	2008	2018
Air Taxi Enplanements	25,178	33,267	39,317	50,994
Air Carrier Enplanements	30,728	33,267	34,866	41,223
<b>Total Enplanements</b>	<b>50,904</b>	<b>66,534</b>	<b>74,183</b>	<b>84,200</b>
Air Taxi/ Air Carrier % Split	45/55	50/50	53/47	55/45

Note: Passenger enplanement projections under the low and high growth scenarios are on file in the offices of DOT&PF, Northern Region, in Fairbanks, Alaska.

For comparison purposes, the enplanement projections from the 1989 Master Plan, the AASP, the FAA TAF, the two forecasting models, and the recommended forecast are presented in Exhibit 3-2. The enplanement levels are shown for the years 2000, 2005, 2010, since these were the critical years referenced in the 1989 Master Plan, the AASP, and the FAA's TAF. Exhibit 3-3 graphically illustrates the comparison of the various forecasts.

**EXHIBIT 3-2  
COMPARISON OF PASSENGER ENPLANEMENT FORECAST**

Year	Recommended 1997 Forecast	Master Plan '89	AASP	FAA TAF	1997 Forecast Models	
					Trend	Growth
1995	55,904	88,100	50,116	55,904	55,904	55,904
2000	62,330	75,100	55,628	59,178	60,700	69,100
2005	69,500	70,000	61,748	62,453	65,000	82,900
2010	77,500	-	68,546	65,728	69,300	99,400
AGR	2.2%	-1.0%	2.1%	1.1%	1.4%	3.9%

**Air Cargo**

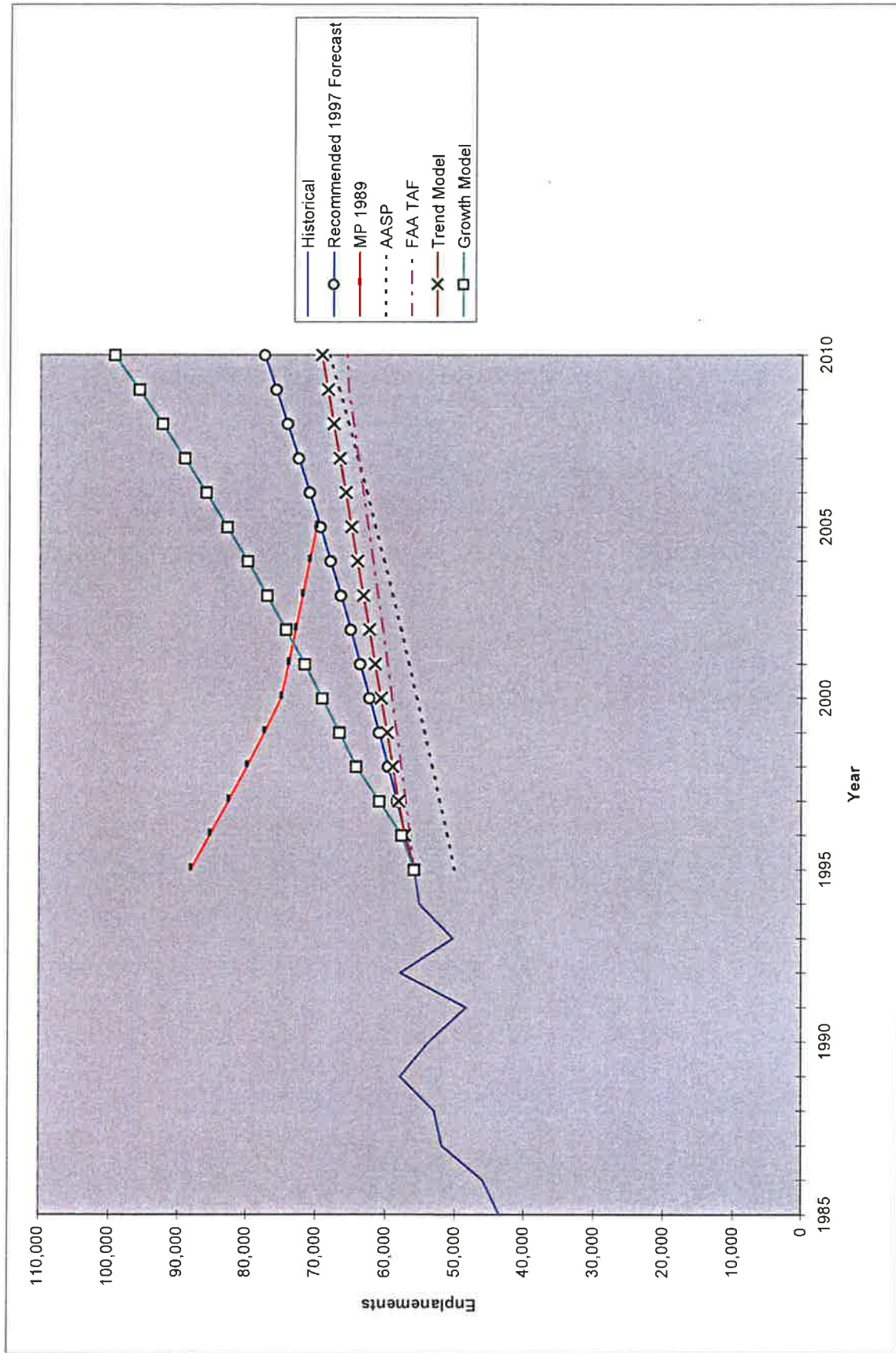
*Historical*

The two components of air cargo are mail and freight. Statistics on air cargo are not readily available, are incomplete, and often are not comparable when they come from different sources. The US Department of Transportation in Anchorage maintains records on freight and mail carried by scheduled air carrier and commuter flights. The US DOT office does not maintain records for cargo transported by all-cargo aircraft on unscheduled flights. Therefore, much of the mail and freight data referred to is estimated only.

Although cargo statistics from different sources vary widely, they are consistent in showing that more cargo is deplaned at Kotzebue than is enplaned. Data and estimates available in the 1989 Master Plan showed nearly twice as much cargo was deplaned as was enplaned in 1980.

Recent data for 1995, which excludes all-cargo aircraft on unscheduled flights includes "belly" cargo on passenger flights, and cargo carried in the main cabin of "combi"-configured aircraft. 1995 data for scheduled cargo indicates that the freight/mail percent split for enplaned cargo is 54/46 percent and deplaned is 17/83 percent. Review of these figures combined with other historical data available, recently completed surveys, and past reports show that the percent split of freight/mail for both scheduled and non-scheduled varies from that represented by scheduled cargo alone.

Exhibit 3-3  
Comparison of Passenger Enplanement Forecast Chart





*1989 Master Plan Forecast*

The 1989 Master Plan's mail forecast was based on an average annual growth rate 1.5 times the passenger growth rate. Freight was projected to fluctuate more than mail and to grow at a lower rate than mail. Total cargo was projected to peak at 26,689 tons in 1990 and then decline to 22,961 tons by 2005.

*AASP Forecast*

The AASP reported and projected only enplaned, not deplaned cargo, for Kotzebue. In 1991, total enplaned cargo was 16,016 tons, including 15,466 tons of freight and 550 tons of mail. These amounts exceeded the 1989 Master Plan forecast for 1990, 6,598 tons of freight and 3,658 tons of mail, totaling 10,256 tons of enplaned cargo.

The AASP forecasts for cargo were based on growth rates derived from the 1990 Alaska Tiltrotor, Vertiport Study. Enplaned freight was projected to grow to 21,500 tons in 2010, at an average annual growth rate of 0.9% from 1991 to 1995 and 2.0% after 1995. Enplaned mail was projected to reach 900 tons in 2010 at the following average annual growth rates for the four forecast periods: 2.2%, 3.1%, 2.7%, and 2.4%.

*FAA Terminal Area Forecast (TAF)*

The TAF did not include data or projections for air cargo.

*Current Master Plan Forecasts*

Similar to the passenger enplanements forecasting, a review of the current socioeconomic conditions of the region was conducted. In addition, air carrier/ air taxi surveys were reviewed to seek out all-cargo activity data that is not currently reported. A few surveys were completed and returned with some input to the all-cargo data collection process. The air carrier and air taxi operators that responded with air cargo data revealed a broad range of freight and mail tonnage growth – operators indicated that they anticipate between zero and a 3.9% percent average AGR in freight and mail. For example, Alaska Airlines anticipates an AGR of nearly 2.0% through the year 2018. One all-cargo carrier provided a completed survey questionnaire reporting that annual all-cargo activity totaled over 1,905 tons. A second all-cargo carrier was contacted by phone for similar information; that carrier reported 3,090 annual cargo tons. The following summarizes the data collected from these two sources.

	<b>Freight</b>	<b>Mail</b>	<b>Total</b>
Enplaned Cargo	509.4	121.7	631.1
Deplaned Cargo	<u>1,728.6</u>	<u>2,635.8</u>	<u>4,364.4</u>
	2,238.0	2,757.5	4,995.5

For Kotzebue, it is estimated that the all-cargo carriers that reported activity represent approximately 65 percent of the total all-cargo tonnage for Kotzebue. This would mean total tonnage would be estimated at 7,685 for the all-cargo carriers at Kotzebue.



Here, the three average annual growth rates (AGR) for air cargo (mail and freight) are presented which produced the low, medium, and high air cargo forecasts:

**Mail**

For this study, mail tonnage projections are defined by three growth rates, but it is recognized that Kotzebue mail activity is highly sensitive to changes in the U.S. Postal Service's by-pass mail system. By-pass mail refers to direct shipment of mail without going through the regional hub at Kotzebue. Low, medium, and high mail tonnage forecasts were produced from:

- Low growth scenario:     **1.5% AGR**
- Medium growth scenario: **3.0% AGR**
- High growth scenario:    **6.0% AGR**

Based on the review of the 1989 Master Plan mail tonnage data and forecasting methodology as well as review of more recent available mail data, projections in this study are calculated at approximately 1.36 times the growth rate of the low, medium and high passenger enplanement forecast scenarios. The enplaned/deplaned mail split is estimated to be 8%/ 92% presently for part 121 carriers and is used to project enplaned/deplaned activity through the planning period.

**Freight**

Freight forecast scenarios are based on the same growth rates for the passenger enplanement forecasts since these AGR's are tied to socioeconomic growth:

- Low growth scenario:     **1.1% AGR**
- Medium growth scenario: **2.2% AGR**
- High growth scenario:    **4.4% AGR**

Enplaned/deplaned freight split is estimated at 35/65 percent. This split is projected into future years of the planning period.

Exhibit 3-4 summarizes the recommended medium growth scenario for total (enplaned and deplaned) mail and freight.

**EXHIBIT 3-4  
SELECTED AIR CARGO FORECAST**

	Est. 1995	2003	2008	2018
Air Freight Tonnage	13,846	16,479	18,373	22,840
Mail Tonnage	7,827	9,915	11,494	15,447
<b>Total Air Cargo</b>	<b>21,673</b>	<b>26,394</b>	<b>29,867</b>	<b>38,287</b>

Note: Forecast represents total air cargo based on selected medium growth scenario for air freight (2.2% AGR) and mail (3.0% AGR) for a total air cargo AGR of 2.5%.

## Air Carrier and Air Taxi Operations

Following the preparation of passenger enplanement and air cargo projections, operational levels can be forecast.

### *Passenger Operations*

First, Kotzebue's historical passengers-per-operation (PPO) ratio was examined along with projections made by other planning studies. This resulted in the forecast of a PPO ratio for both air carrier and air taxi. This study has selected the PPO ratio similar to that used in FAA's TAF projections -- 15.36 for air carrier and a progressively increasing PPO for air taxi (from 1.26 to 1.78). Exhibit 3-5 summarizes the end results of this correlation between air carrier and air taxi operations and passenger enplanement demand.

#### **EXHIBIT 3-5 PASSENGER ENPLANEMENT OPERATIONS**

	Est. 1995	2003	2008	2018
Air Carrier	2,000	2,170	2,270	2,680
Air Taxi	20,000	23,660	25,850	28,670
<b>Total Passenger Operations</b>	<b>22,000</b>	<b>25,830</b>	<b>28,120</b>	<b>31,350</b>

### *All-Cargo Operations*

While most of the air cargo demand is carried on passenger aircraft (referred to as belly freight), the remaining air cargo demand is carried by all-cargo operators. All-cargo operations were projected using an estimated tons-per-operation (TPO) ratio. This ratio was derived from the input received from two all-cargo carriers (one responding to the air carrier and air taxi survey, the other via telephone). No other recent or reliable data was available for these projections. Exhibit 3-6 summarizes the projected all-cargo operations through the planning period.

#### **EXHIBIT 3-6 AIR CARGO OPERATIONS**

	Est. 1995	2003	2008	2018
Projected all-cargo tonnage demand	7,685	9,146	10,200	12,677
Tons-per-operation	9.8	9.9	10.0	10.1
<b>All-cargo operations</b>	<b>784</b>	<b>924</b>	<b>1,020</b>	<b>1,255</b>

Note: Forecast of all-cargo operations is based on selected medium growth scenario for air freight and mail.

### Air Carrier and Air Taxi Fleet Mix

Exhibit 3-7 summarizes the estimated fleet mix for air carrier and air taxi operators. Fleet mix projections are derived from analysis of existing aircraft serving Kotzebue Airport and the fleet changes anticipated through the planning period. Since only a portion of the air carrier and air taxi survey questionnaires were returned, base data for 1995 is estimated. Aircraft fleet reported included aircraft such as the B737-200/400, Beech 200, Cessna 207, Cessna 402, and the Navajo.

**EXHIBIT 3-7  
AIR CARRIER & AIR TAXI FLEET MIX**

	Est. 1995	2003	2008	2018
Air Carrier: 2-engine	5.3%	5.3%	5.4%	5.4%
Air Taxi: <15 passengers	93.0%	92.9%	92.7%	92.6%
>15 passengers	1.7%	1.8%	1.9%	2.1%

### 3.5 GENERAL AVIATION DEMAND

#### *Historical*

The accuracy of records on based aircraft is questionable, and different sources provide inconsistent data. The seasonal nature of GA at Kotzebue contributes to inconsistent data.

According to a December 1992 inspection reported on the Airport Master Record (FAA Form 5010), 79 aircraft are based at Kotzebue. Previous Airport Master Records indicated 66 based aircraft in 1979, growing to 68 in 1981 and 1987, peaking at 87 in 1990, and declining to 79 in 1991 and 1992. According to the TAF, historic numbers of based aircraft have grown from 66 in 1980 to 79 in 1995, at a 1.5% average annual growth rate. A survey in fall of 1986 revealed 95 aircraft based at the airport, considerably more than the 66 aircraft reported by the TAF for that year.

#### *1989 Master Plan Forecasts*

The 1989 Master Plan projected based aircraft to grow at the same rate as GA operations. Projections for 1990 and 1995, 129 and 166, respectively, were much higher than actual numbers reported by the TAF and Airport Master Records (FAA 5010 Forms). The 1989 Master Plan projected based aircraft at Kotzebue would grow to 131 by 2005.

#### *Alaska Aviation System Plan (AASP)*

The AASP forecast, using 1990 - 1992 base data, calculated the number of based single engine aircraft

for Kotzebue from a projection of registered aircraft in the region. Historical data on registered aircraft were found to correlate closely with population. Regional population was 20,380 in 1990 and was projected by the Alaska Department of Labor to grow as follows:

<u>Year</u>	<u>Northern Economic Region* Population</u>
1995	24,080
2000	27,771
2005	31,052
2010	33,864

\*One of six economic regions, defined by the Alaska Office of Employment Security.

Registered aircraft per capita in the region was 0.0158 in 1990, and this ratio was used to project registered aircraft through 2010. The number of based aircraft at Kotzebue was found to be 20% of the region's registered aircraft in 1990. This ratio was used to project Kotzebue based aircraft through 2010. Thus, according to the AASP, based aircraft growth would mirror regional population growth, averaging annual rates of 3.4% from 1990 to 1995, 2.9% from 1995 to 2000, 2.2% from 2000 to 2005, and 1.9% from 2005 to 2010.

#### *FAA TAF*

The TAF projected that growth in based aircraft will slow to an annual growth rate of 1.1%, and the number of based aircraft will reach 93 in 2010. The annual growth rate projected for Kotzebue is higher than the 0.9% nationwide annual growth rate projected for GA operations from 1995 to 2010. The TAF used two methods to forecast based aircraft at Kotzebue. For single-engine piston aircraft it used regression analysis, which resulted in an annual growth rate of about 1.4%. For jet engine, multi-engine, helicopter, and other light aircraft, the TAF projected zero growth, consistent with national projections.

#### *Current Master Plan Forecasts*

The AASP projection for 1995, 77 aircraft, was very close to the 79 aircraft reported by the TAF in 1995. Therefore, adoption of the AASP annual growth rates for based aircraft is recommended: 2.9% to 2000, 2.2% from 2000 to 2005, and 1.9% after 2005. Using these growth rates, Kotzebue should have 130 based aircraft by 2018. Operations forecasts are projected using operations-per-based-aircraft (OPBA). The current OPBA for Kotzebue Airport is 468. This translates to approximately 60,800 GA operations in the year 2018 (also a 2.2% AGR).

#### VFR/IFR

Visual flight rules (VFR) and instrument flight rules (IFR) operations statistics are not readily available for Kotzebue Airport. An estimated percentage split of 81%/19% for VFR/IFR operations for GA activity is estimated based on similar activity documented/estimated in the region. This translates to an estimated 30,000 VFR operations and 7,000 IFR operations by GA in 1995. In 2018, GA operations will

include 49,300 VFR and 11,500 IFR.

General Aviation and Military Fleet Mix

The fleet mix of based aircraft, according to the latest (1992) Airport Master Record is:

Single Engine	82.3%
Multi Engine	12.6%
Jet	0.0%
Helicopter	1.3%
Other (Military)	3.8%

The AASP used this fleet mix in its based aircraft forecast through 2010, implying all types of aircraft would experience the same growth rate. However, a survey conducted in 1995 and included in the AASP suggested the air carrier fleet in Alaska will change in composition. It showed that over the next 20 years single-engine piston aircraft would decline from 61% to 51%, that multi-engine piston aircraft would decline from 29% to 25%, that turboprop aircraft would grow from 10% to 23%, and jet aircraft would grow from 0% to 1%. Note that these fleet mix changes were applied to the commercial fleet, not the GA fleet.

The TAF projected fleet mix for the year 2010 is:

Single Engine	82.8%
Multi-Engine	12.9%
Jet	0.0%
Helicopter	1.1%
Other	3.2%

Since the relocation of the National Guard from Kotzebue, no military aircraft are based at the airport. It is recommended that the future fleet mix be adjusted as follows to eliminate based military aircraft and that the same fleet mix be used throughout the planning period:

Single Engine	85.5%
Multi-Engine	13.2%
Helicopter	1.3%

Applying the fleet mix to the based aircraft forecast results in the following shown in Exhibit 3-8.

**EXHIBIT 3-8  
BASED AIRCRAFT FLEET MIX FORECAST**

	Single Engine	Multi Engine	Helicopter	TOTAL
1995	68	10	1	79
2003	83	13	1	97
2008	92	14	1	107
2018	111	17	2	130

Note: 1995 data is derived from 1993 Airport Master Record, FAA Form 5010, and FAA's 1996 Terminal Area Forecast.

**3.6 MILITARY DEMAND**

Historically, military operations has averaged a total of 1,000 annually. According to the FAA TAF, the military will continue to conduct the same level of annual military operations (1,000) without change in the future. In the past, Kotzebue had an Army National Guard unit based at the Airport. The Guard has since relocated and moved their operation out of Kotzebue Airport so there are no military aircraft based at the airport. No current data was available on military demand.

For this study, military operations are projected to continue at its current level of 1,000 operations throughout the planning period.

**3.7 TOTAL AIRCRAFT OPERATIONS**

*Historical*

According to the TAF, annual aircraft operations at Kotzebue totaled 46,000 in 1986, grew to 60,000 in 1989, and have stayed at that level through 1995.

*1989 Master Plan Forecast*

The 1989 Master Plan projected annual aircraft operations would grow to 96,900 by 1995, then decline to 70,500 by 2005. The 1989 Master Plan used a historic average of 11.86:1 enplanements-to-departures to project air carrier operations. Air taxi operations were projected using 1.2:1 enplanements-to-departures, based on the historic average. GA's growth rate was assumed to be two-thirds that of commercial operations. Zero growth was assumed for military operations. Local operations were estimated using the historic ratio of itinerant and local operations.



*Alaska Aviation System Plan (AASP)*

The AASP used growth rates from the 1992 TAF to project commercial, air taxi, and GA itinerant operations. Zero growth was assumed for military operations. Local GA operations were estimated by using the ratio of local and itinerant operations from the base year, which was the most recent FAA Form 5010. For total aircraft operations, the annual growth rate slowed over the 15-year planning period from 2.6% to 1.2%. The AASP operations forecast through 2010 never reached the peak of 96,900 projected by the 1989 Master Plan. However, the AASP forecast for 2005, 73,800 operations, was slightly higher than the 1989 Master Plan forecast for that year. The AASP projected 78,400 aircraft operations for 2010.

*FAA Terminal Area Forecast*

The TAF projected no growth in aircraft operations except itinerant, air taxi, and commuter aircraft operations, which were projected by regression analysis. The average annual growth rate was projected to vary from 0.14% to 2.60%. The TAF projected aircraft operations would grow very slightly, reaching 61,990 in 2010.

*Current Master Plan Forecast*

Exhibit 3-9 summarizes the total predicted aircraft operations for each activity element previously described.

**EXHIBIT 3-9**

**TOTAL AIRCRAFT OPERATIONS (BASED ON MEDIUM GROWTH FORECAST)**

	1995	2003	2008	2018
<b>Itinerant Operations</b>				
Air Carrier (pax/cargo)	2,000	2,170	2,270	2,680
Air Taxi (pax/cargo)	20,000	23,660	25,850	28,670
All-cargo	(see note)	924	1,020	1,255
General Aviation	30,000	36,800	40,900	49,250
Military	1,000	1,000	1,000	1,000
<b>Local Operations</b>				
General Aviation*	7,000	8,600	9,600	11,550
<b>Total Operations</b>	<b>60,000</b>	<b>73,154</b>	<b>80,640</b>	<b>94,405</b>

Note: All-cargo operations for 1995 are estimated at 784, but were not originally broken out of the air carrier and air taxi operations.

\*It is estimated that all local general aviation operations at Kotzebue Airport are touch-and-go operations.

### **3.8 PEAK DEMAND OPERATIONS**

Calculation of peak demand is important as it is one of the driving factors in determining facility requirements for an airport. Here, three key factors are presented for peak demand at Kotzebue Airport: peak month, average day of peak month, and peak hour.

**Peak Month:** According to the data available for Kotzebue Airport, July is the peak month for passenger enplanement activity and August is the peak month for cargo activity. 1995 estimates indicate that July represents 16% of the total passenger enplanement activity for the year. While peak cargo demand data was quite limited, review of available data indicates that August represents approximately 11% of the annual total cargo demand.

**Average Day of Peak Month:** Activity is calculated for the average day of the peak month by dividing the total peak month activity by the number of days in the month (31 days for July and August).

**Peak Hour:** Peak hour activity levels are derived by multiplying an established percentage of the average day. Exhibit 3-10 summarizes peak demand for passenger enplanements and cargo. For air carrier passenger activity, the peak hour percentage was taken from data provided by Alaska Airlines, which included commuter airlines. Since close to half of the air carrier's passengers on an average day are enplaned during this peak period, the peak hour percentage used for 1995 is 41% (peak hour activity levels were extracted from the air carrier's records). This percentage is projected to slowly decrease through the planning period since the air carrier passenger percentage of the total will gradually decrease in the planning period. For air taxi passengers, peak hour data is more limited. An examination of the input from operators completing the survey questionnaire indicates that the peak hour represents 15% of the average day. Air cargo peak hour has been estimated at 13% of the average day in the peak month based on a review of the limited data available.

The implications of these peak demand levels will be addressed in the capacity analysis and facility requirements master planning tasks.

EXHIBIT 3- 10

**PEAK DEMAND - PASSENGER ENPLANEMENTS AND CARGO**

	1995	2003	2008	2018
<b>Annual Air Carrier:</b>				
Passenger Enplanements	30,728	33,267	34,866	41,223
Peak Month (Jul)	4,916	5,323	5,579	6,596
Average Day	159	172	180	213
Peak Hour	65	69	70	81
<b>Annual Air Taxi:</b>				
Passenger Enplanements	25,176	33,267	39,317	50,994
Peak Month (Jul)	4,028	5,323	6,291	8,159
Average Day	130	172	203	263
Peak Hour	19	26	30	39
<b>Total Annual Passengers:</b>				
Passenger Enplanements	55,904	66,535	74,183	92,218
Peak Month (Jul)	8,945	10,646	11,869	14,755
Average Day	289	343	383	476
Peak Hour	85	94	101	120
<b>Annual Cargo Tonnage:</b>				
Peak Month (Jul)	21,673	26,394	29,867	38,287
Average Day	3,468	4,223	4,779	6,126
Peak Hour	112	136	154	198
Peak Hour	15	18	20	26



## 4.1 BACKGROUND

The demand/capacity analysis and facility requirements tasks serve to:

- 1) determine whether the existing airside and landside facilities at Ralph Wien Memorial Airport can accommodate the forecast demand levels presented in the previous chapter and quantify the shortfalls;
- 2) translate the capacity shortfalls into specific airport development needs through the planning year 2018;
- 3) define other requirements relating to meeting FAA airport design standards and remedying facilities in poor condition.

This chapter summarizes the results of the capacity analysis and facility requirements for the various airport components under two major categories: 1) airside, and 2) landside.

## 4.2 AIRSIDE

Airside facility requirements presented in this section include: runways; taxiways; airfield pavement; airfield lighting and marking; airspace; and other airside facilities. While the aircraft parking apron is related to both airside and landside facilities, discussion of the apron area is presented later in the landside section following discussion of terminal area facilities. Here a brief summary of the airside capacity analysis and facility requirements are presented with a detailed discussion following.

- Runway 8-26 is defined as a C-III runway (approach category C is an aircraft with an approach speed of 121 knots or more but less than 141 knots; design group III is an aircraft with a wingspan from 79 feet up to but not including 118 feet ).
- Runway 17-35 is defined as a B-II runway (approach category B is an aircraft with an approach speed of 91 knots or more but less than 121 knots; design group II is an aircraft with a wingspan from 49 feet up to but not including 79 feet ).
- Runway dimensions and operational capacity are adequate to accommodate demand throughout the planning period (2018).
- Runway Lighting and Nav aids are adequate.
- Runway safety area/object free area surfaces are not in compliance with design standards for B-II and C-III runways. Compliance with these standards for Runway 17-35 would require modification to the access road location as well as the GA aircraft parking area west of the runway. Compliance with these standards for Runway 8-26 would also require modification to the access road location as well as expansion of safety areas off each runway end to meet 1000-foot requirement.
- Terrain obstructs approach to Runway 26 (1999 project).
- The access road's close proximity to Runway 17-35 makes it an obstruction to FAR Part 77 airspace - modified/controlled access is needed to eliminate/minimize impact.

- Full-length parallel taxiway for Runway 8-26 is needed.
- Floatplane facilities are needed.

#### 4.2.1 Runways

##### *Runway Capacity Analysis*

The capacity of the runway system to accommodate existing and forecast demand is determined by three statistical measurements. Standard techniques for producing these measurements are derived from FAA Airport Capacity and Delay (*Advisory Circular 150/5060-5*) to include:

- Annual Service Volume (ASV): The number of annual aircraft operations that can be accommodated on a runway system under a full range of airport operating conditions that would be encountered over a year's time.
- Hourly Capacity: The maximum number of aircraft operations that can occur on a runway system in a particular hour under two operating scenarios -- visual flight conditions and instrument flight conditions.
- Aircraft Delay: The average amount of time aircraft will be delayed as a result of a demand/capacity deficit, expressed in minutes per operation or annual hours.

Using information from the FAA advisory circular, the existing ASV for OTZ is estimated at 218,000 operations. As annual aircraft operations approach ASV, the average delay per operation will typically increase rapidly.

Exhibit 4-1 presents a comparison between ASV and forecast demand at OTZ. As shown, the runway system capacity is adequate to accommodate the demand projected throughout the planning period.

#### EXHIBIT 4-1

##### FORECAST DEMAND VS. ANNUAL SERVICE VOLUME (ASV)

Year	Operations Demand Forecast	ASV	Demand as % of ASV
1995	60,000	218,000	27.5
2003	73,154	218,000	33.6
2008	80,640	218,000	37.0
2018	94,405	218,000	43.3

Note: ASV is based on existing airfield configuration (no full-length parallel taxiways).

Source: FAA Airport Capacity and Delay (Advisory Circular 150/5060-5).



Exhibit 4-2 presents the estimated hourly capacity and peak hour demand under VFR and IFR conditions. This comparison concludes that hourly capacity will not be reached during the planning period, but that OTZ will continue to experience some delay during peak hour operations. Exhibit 4-3 summarizes the results of the FAA's annual delay computer model using the hourly capacity input for VFR and IFR conditions.

**EXHIBIT 4-2****HOURLY DEMAND / CAPACITY ANALYSIS**

Year	Peak Hour Operations Demand		Average Hourly Capacity		Peak Demand as Percent of Hourly Capacity	
	VFR	IFR	VFR	IFR	VFR	IFR
1995	33	22	98	50	33.7 %	44.0 %
2003	40	28	98	50	40.8 %	56.0 %
2008	45	29	98	50	45.9 %	58.0 %
2018	51	32	98	50	52.0 %	64.0 %

Note: IFR Demand includes all air carrier/ air taxi peak hour operations, but only 20 percent of GA peak hour operations.

Source: FAA Airport Capacity and Delay (Advisory Circular 150/5060-5) and ASCG demand forecast.

**EXHIBIT 4-3****AVERAGE DELAY**

Year	Operations Demand	Average Delay* (per operation)	Annual Delay* (total operations)
1995	60,000	0.1 minute	100 hours
2003	73,154	0.1 minute	122 hours
2008	80,640	0.2 minute	269 hours
2018	94,405	0.2 minute	315 hours

\*Figures rounded.

Source: FAA Airport Capacity and Delay (Advisory Circular 150/5060-5).

The existing taxiway system at OTZ limits the potential capacity of the runways by about 13%.

*Runway Dimensions*

In addition to runway capacity and delay measurements, it is important to determine whether the runway dimensions (length, width) are adequate to serve the type of aircraft operating at OTZ. To accomplish this, the airport's classification and service role within the region must be identified first.

In developing the airport's classification and facility requirements, the two criteria to be considered are:

- **Determination of Aircraft Approach Category:** This identifies the operational characteristics (approach speed) of the aircraft. This information is derived for the most demanding aircraft (highest approach speed) that will operate at the airport.
- **Determination of the Airplane Design Group:** This identifies the physical characteristics (wingspan) of the aircraft. This information should be derived from the most demanding aircraft (largest wingspan) that will operate at the airport on a regular basis (typically more than 500 annual operations, but less for many Alaskan airports).

Based on a review of the aircraft operating at OTZ, the Aircraft Approach Category is C and the Airplane Design Group is III. This combination, C-III, forms the FAA alphanumeric Airport Reference Code (ARC) for OTZ.

Exhibit 4-4 specifically defines the criteria associated with each approach category and design group.

**Exhibit 4-4**

**Aircraft Approach Categories and Design Groups**

Aircraft Approach Categories		Aircraft Design Groups	
Category	Approach Speed	Group	Wingspans
A	Less than 91 knots	I	up to but not including 49 feet
B	91 knots or more but less than 121 knots	II	49 feet up to but not including 79 feet
C	121 knots or more but less than 141 knots	III	79 feet up to but not including 118 feet
D	141 knots or more but less than 166 knots	IV	118 feet up to but not including 171 feet
E	166 knots or more	V	171 feet up to but not including 197 feet
		VI	197 feet up to but not including 262 feet

Source: FAA AC 150/5300-13, Airport Design

Some typical airport reference codes derived from these characteristics are:

- A-I Single Engine Aircraft (i.e. Cessna 182)
- B-II Multi-Engine and Small Jet Aircraft (i.e. Beech 1900, King Air, Cessna Citation)
- C-II Larger Multi-Engine and Corporate Jet Aircraft (i.e. Gulfstream III, Sabre 80)
- C-III Medium-Sized Air Carrier Aircraft ( i.e. Boeing 737, 727, DC-9)
- D-IV Larger Air Carrier Aircraft (i.e. Boeing 707, Lockheed 1011)
- D-V All Larger Air Carrier Aircraft (i.e. Boeing 747, B-52)

While an ARC can represent the most demanding aircraft operating at the Airport, a secondary runway (e.g. crosswind) may be used by aircraft with less demanding characteristics. For OTZ, crosswind Runway 17-35 is defined as a B-II, since Runway 8-26 accommodates the C-III traffic. This separate classification is important when identifying design requirements for each runway. With this runway classification complete, the following summarizes the non-standard conditions for B-II and C-III design standards (i.e. runway safety area, object free area) at OTZ:

- Runway 17-35 Safety Area (RSA) - GA aircraft parking area inside safety area (B-II RSA standard is 150 feet wide / 75 feet either side of runway centerline).
- Runway Safety Area /Object Free Area for Runways 8, 17 and 35 - road crosses both areas (C-III RSA standard is 500 feet wide / 250 feet either side of runway centerline).
- Runway Safety Area for Runways 8 and 26 is inadequate off both runway ends (Standard is 1,000 feet) and width (150 feet required) is inadequate for full-length of runway.

Runway dimensions (length and width) were reviewed with respect to the B-II and C-III aircraft operating at OTZ. The FAA Airport Design Model was used in the runway length analysis. Results for Kotzebue are reflected in Exhibit 4-5.

Primary Runway 8-26 at an actual length of *5,900 feet* is adequate as it falls within the required lengths for large aircraft serving Kotzebue. In addition, air carrier operators have indicated that runway length is adequate. Crosswind Runway 17-35 at an actual length of *3,800 feet* is adequate for small aircraft and can accommodate some large aircraft (greater than 12,500 lbs.).

The City and Borough have expressed their support for an 11,000-foot runway to accommodate a higher percentage of large aircraft such as the Boeing 747. According to Boeing Airplane Characteristics for the B747-400, a takeoff length of 10,500 feet is needed at maximum takeoff weight (850,000 lbs.) and 59° Fahrenheit.

Runway width is also adequate for both runways as shown here:

	<u>Standard</u>	<u>Existing</u>
Runway 8-26	100 feet	150 feet
Runway 17-35	75 feet	100 feet

For Airplane Design Group C-III, serving aircraft with maximum certified takeoff weights greater than 150,000 pounds requires a standard runway width of 150 feet (which includes the Boeing 727).

**Exhibit 4-5****FAA Computer Model - Runway Length Requirements for Kotzebue****AIRPORT AND RUNWAY DATA**

Airport elevation . . . . .	11 feet
Mean daily maximum temperature of the hottest month . . . . .	59.00 F.
Maximum difference in runway centerline elevation . . . . .	1 feet
Length of haul for airplanes of more than 60,000 pounds . . . . .	500 miles
Wet and slippery runways	

**RUNWAY LENGTHS RECOMMENDED FOR AIRPORT DESIGN**

Small airplanes with approach speeds of less than 30 knots . . . . .	300 feet
Small airplanes with approach speeds of less than 50 knots . . . . .	800 feet
Small airplanes with less than 10 passenger seats	
75 percent of these small airplanes . . . . .	2,190 feet
95 percent of these small airplanes . . . . .	2,720 feet
100 percent of these small airplanes . . . . .	3,220 feet
<i>Small airplanes with 10 or more passenger seats . . . . .</i>	<i>3,730 feet</i>
Large airplanes of 60,000 pounds or less	
<i>75 percent of these large airplanes at 60 percent useful load</i>	<i>5,230 feet</i>
<i>75 percent of these large airplanes at 90 percent useful load</i>	<i>6,610 feet</i>
100 percent of these large airplanes at 60 percent useful load	5,330 feet
100 percent of these large airplanes at 90 percent useful load	7,000 feet
Airplanes of more than 60,000 pounds . . . . .	Approximately 5,020 feet

Note: Italicized data represents key lengths for runways at OTZ

Reference: Chapter 2 of AC 150/5325-4A, Runway Length Requirements for Airport Design, no Changes included.

***Runway Facility Requirements***

Runway 8-26 is generally aligned with the prevailing winds with 93% wind coverage at 15 mph. FAA guidelines state that a crosswind runway may be necessary if wind coverage is less than 95%. While many aircraft operating at OTZ can use Runway 8-26 during crosswind conditions, Group II aircraft, such as the Caravan, need a crosswind runway. Therefore, crosswind Runway 17-35 dimensions should be maintained for Group II aircraft.

Primary Runway 8-26 and crosswind Runway 17-35 are both considered adequate in length and width to meet projected demand. However, the associated surfaces for both runways need improvements as they are not in compliance with applicable FAA design standards and airspace

regulations. These surfaces primarily include the runway safety area (RSA), object free area (OFA) and the airspace transitional surfaces. Improvements needed for each runway follows:

- Runway 17-35 requires a 150-foot wide RSA and 500-foot wide OFA that extends the full length of the runway plus 300 feet off each end. The airspace transitional surface that extends off the sides of the runway's primary surface at a 7:1 is also penetrated. To comply with these FAA standards, relocation of the current GA aircraft parking/tiedown area to the west of the runway and the current access road that runs along the runway is required.
- Runway 8-26 requires a 500-foot wide RSA and a 800-foot wide OFA that extends the full length of the runway plus 1,000 feet off each end. The airspace transitional surface that extends off the sides of the runway's primary surface at a 7:1 is also penetrated. To comply with these FAA standards, the access road that crosses these areas as well as the fuel storage in the terminal apron area requires relocation. In addition, the RSA needs to be extended off both runway ends and widened the full length of the runway to meet grading criteria.

#### 4.2.2 Taxiways

The FAA recommended threshold for determining the need for a parallel taxiway is 20,000 operations. ICAO uses 50,000 operations as a threshold. An estimated 75 percent of all OTZ operations are conducted on Runway 8-26. This translates to 45,000 of the 60,000 total annual operations in 1996, exceeding the FAA threshold and nearing the ICAO threshold for needing a parallel taxiway.

While many airports still operate at similar levels without a parallel taxiway, it will become increasingly difficult for OTZ operators during peak demand as operations at the Airport grow in the future. Currently, aircraft must taxi west on Runway 8-26 to turn around for Runway 26 departures. After a Runway 8 arrival, many aircraft have to taxi back to the east to reach an exit taxiway to the apron. Lack of a parallel taxiway to Runway 8-26 increases the delay per operation during peak hours, even though off-peak periods may experience little or no delay. It is estimated that the lack of a parallel taxiway reduces the airfield capacity by approximately 13%.

OTZ does not currently have a full-length parallel taxiway for Runway 8-26 nor 17-35. Operations levels on primary Runway 8-26 justify the need for a full-length parallel taxiway. This improvement should include the development of adequate exit and entrance taxiways as well as associated taxiway safety and object free areas. A full-length parallel taxiway for 8-26 will improve runway capacity and increase the margin of safety during air and ground operations as the runway is currently used for taxiing before takeoff and after landing.

Activity levels on Runway 17-35 are much less than 8-26 and do not justify a parallel taxiway.



### 4.2.3 Airfield Pavement

Airfield pavement (including runways, taxiways, and aircraft aprons) is measured by its ability to accommodate the load of specific aircraft types at a design volume of traffic as well as by its condition. In August 1997, a field investigation of OTZ pavement conditions was conducted. The following summarizes the strength and condition for each pavement area:

**Runway 8-26:** Runway surface is paved with asphalt concrete (AC). Strength rating is 100,000 pounds for single wheel loading (SW); 128,000 pounds for dual wheel loading (DW); and 240,000 pounds for dual tandem wheel loading (DTW). Runway 8-26 was reconstructed in 1994 and is in relatively good condition, but transverse cracking is evident along the entire length of runway. Crack sealing should be completed regularly as part of the annual maintenance activities to prevent loss of materials below AC surface and to reduce the possibility of water and/or chemicals reaching the thermally unstable permafrost foundation soils.

**Runway 17-35:** Runway surface is gravel and not rated for strength. Gravel surface is rutted (typically less than an inch deep) along takeoff and landing areas. It is recommended that surface and subsurface drainage along the runway be improved to reduce rutting from loss of subgrade strength during spring break-up and other wet periods.

**Taxiways:** Taxiways A and B are in fair condition with a strength rating of less than 60,000 lbs gross weight. Taxiways C, D, and E, also in fair condition, have the same strength rating as Runway 8-26. All taxiways will need improvements during the planning period.

**Terminal Area Apron:** This apron was constructed, expanded and paved during a number of projects over the past 30+ years. The estimated age of the terminal area apron pavement ranges from about 25 years (western area) to 14 years (eastern area). This range in age, as well as the closely spaced block cracking across these pavements, especially in the western portion, indicate that this apron area will likely have to be re-paved in the near future.

### 4.2.4 Airfield Lighting and Marking

Runway 8-26 has HIRL to complement the ILS system and Runway 17-35 has MIRL for its visual approaches. These runway lighting systems are adequate to meet future demand, but airport personnel have indicated that there have been continuing problems with the power lines to the lights along both runways. It was also noted that there was a manhole to the power conduit under the terminal area apron which was covered over with pavement in 1983. A new power line should be constructed between the regulator (in the DOT&PF building) and the first light along Runway 8-26. Additionally, a new regulator should be provided for Runway 17-35.



Taxiways A, B, C, D, and E are lighted, but Taxiways F and G are not lighted. It is recommended that if a full-length parallel taxiway and associated connecting taxiways are constructed for Runway 8-26, as recommended, that MITL be installed. In addition, existing Taxiways F and G should be lighted.

Runway 8-26 is marked as a precision instrument runway. Runway 17-35 is not marked. Entrance/exit taxiways are appropriately marked with centerlines and holdlines.

Runway 8-26 was marked with white paint following reconstruction in 1994, in accordance with current FAA guidelines. Prior to that, the runway was marked with yellow paint, in accordance with the former FAA guidelines. Airport maintenance personnel have stated that the yellow paint was preferred since it is difficult to see the white strip through drifting snow and frost slowing maintenance.

#### **4.2.5 Airspace**

Airspace in the vicinity of an airport should be clear and free of obstructions which can be hazardous to aircraft. There are several obstructions to airspace at OTZ to include:

- Fueling station in the primary surface for Runway 8-26
- Terrain (hills) in the Runway 26 approach surface
- Road in runway end approach surfaces to Runways 8, 17, and 35 and transitional surface for Runway 17-35
- GA aircraft parked in the transitional surface west of Runway 17-35
- Parked aircraft on the terminal area apron in the transitional surface

The following actions would eliminate these obstructions:

1. Relocate the fueling station that is currently in the primary surface for Runway 8-26 to a location in the terminal area that clears all runway surfaces and protected airspace.
2. Remove, to the extent feasible, the terrain obstructions in the Runway 26 approach.
3. Close/relocate the road that currently penetrates the protected airspace and some runway surfaces for Runway 17-35 and Runway 8.
4. Relocate the GA aircraft parked in the protected airspace (transitional surface) west of Runway 17-35.
5. Relocate the aircraft parked in the protected airspace (transitional surface) on the terminal area apron.

#### 4.2.6 Other Airside Facilities

##### *Floatplane Facilities*

Facilities for floatplanes have been identified as inadequate by airport users. Isaac Lake (now drained) is currently not available. Kotzebue Lagoon does not have docking facilities. Floatplane operators which previously used Isaac Lake (before it was drained) do not have acceptable facilities on Kotzebue Lagoon. It is recommended that a location for such facilities be identified in the ultimate plan of development.

##### *Skiplane Facilities*

Skiplane operators are currently using the area adjacent to Runway 17-35. These facilities are considered adequate for operations through the year 2018.

##### *Helicopter Facilities*

Helicopter operators are currently using the aircraft parking apron area as a helipad. Helicopter operations on the apron have not presented a problem in the past. Their continued operation on the apron is adequate as helicopter operations make up only 1.3% of total operations and based helicopters are not expected to exceed a total of two through 2018.

##### *Navigational Aids*

Nav aids at OTZ include an ILS with a localizer and glide slope on Runway 8 and visual approach slope indicators (VASI) on Runway 8-26, distance-measuring equipment (DME), the Hotham non-directional beacon (NDB), and a very high frequency (VHF) omnidirectional range/ tactical air navigation station (VORTAC). These nav aids are considered adequate to meet the demand at OTZ, but the current ILS approach procedure for CAT I is considered to be a limiting operational factor. Occasionally, aircraft attempting to land in instrument weather conditions have had to divert to Nome or return to Anchorage when the approach minimums (i.e. decision height, visibility/runway visual range) were not met to allow a landing. Any reduction in instrument approach minimums requires coordination with the FAA. In the case of OTZ, existing penetrations to protected airspace by terrain, airport facilities, and parked aircraft may dictate to what extent, if any, the minimums can be improved.

#### 4.3 LANDSIDE FACILITIES

Landside facilities consist of the terminal area facilities, terminal area aircraft parking apron, vehicle parking, roadway access, general aviation facilities, and aviation support facilities. Here a brief summary of the landside capacity analysis and facility requirements are presented with a detailed discussion following.

- Replacement of the existing DOT&PF snow removal equipment (SRE) and aircraft rescue and firefighting (ARFF) facilities.
- Potential new site for the FAA's Flight Service Station (FSS) and National Weather Service (NWS), which are now housed in an inadequate building.
- Relocation of the fueling facility, which is within the runway object free area. Aircraft parked at the fueling facility penetrate the transitional airspace protected by FAR Part 77. Also, the fueling facility's location next to the apron taxiway causes apron congestion and the mixing of large and small aircraft.
- Removal of the Part 77 penetration by large jet aircraft tails parked at Alaska Airlines and the FBX (former Mark Air) cargo facility.
- Inadequate apron area for the number of airplanes that park there. The lease lots directly fronting the apron include very little apron area, so that those leaseholders' airplanes are parked on the apron rather than within the lease lot. Apron congestion is a problem near Bering Air's lease lot and, when large jet aircraft flight schedules coincide, near the FBX and Alaska Airlines facilities.
- Lease lot demand has nearly reached capacity and the only land available for lease lot expansion is now reserved for a multi-use passenger and cargo terminal building.

#### 4.3.1 Terminal Area Facilities

Terminal area facilities at OTZ include facilities serving both passenger and cargo activity. These facilities are currently constrained by existing lease lots as operators are generally independent of each other. Capacity and future development needs are assessed here.

In the mid 1980s, about 12 leaseholders had apron access and demand for lease lots with apron access was approaching capacity. Since then, lease lots were expanded northward. By the mid 1990s, 15 lease holds with apron access were available and leased. (Lease lots used by DOT&PF or by the fueling tenant are excluded from this inventory, and multiple, contiguous lots leased to the same entity are counted as a single lease hold.)

The 15 existing lease holds with apron access total 8.5 acres. Since the mid 1980s, the average lease hold size has grown 28% and the trend toward larger lease holds is expected to continue as operators' businesses grow. A slight increase in the number of operators is also expected as aviation demand grows. Although Alaska Airlines is the only major air carrier now serving Kotzebue passengers, that was not the case before Mark Air's bankruptcy. The terminal area should be planned to accommodate two major passenger airlines during the 20-year planning period. Recently Kotzebue has experienced strong growth in all-cargo service by large jet aircraft; the presence of such all-cargo carriers should be assumed to remain throughout the 20-year planning period.

If a multi-use terminal is not developed, lease lots must increase to accommodate projected growth in passengers, tonnage, and aircraft operations. Forecasts for 20-year growth in passengers, cargo, and aircraft operations average 60%. Lease lot growth should be less than

60%, since existing businesses will grow larger and land utilization will be more efficient as the airport becomes busier. By 2018, lease holds are projected to increase 25% to 19 and acreage is projected to increase 40% to 11.9.

If a multi-use terminal for passengers, cargo, or both is built, lease lots will be available for activities other than the processing of passengers and cargo, such as aircraft maintenance and parking. Based upon 2018 projected passenger demand, a consolidated passenger terminal size would range from 8,000 square feet (based on the FAA's guideline of 150 square feet per peak hour enplaned passenger) to 46,100 square feet (based on 0.5 square feet per annual enplaned passenger typical of terminals in Alaska). Based on 2018 projected cargo demand, a consolidated cargo facility could be up to 67,000 square feet in size (based on the national average of 1.75 square feet per ton annual cargo).

#### 4.3.2 Terminal Area Aircraft Parking Apron

Currently, based commercial operators in the terminal area have lease lots to park their aircraft, but many are on or partially overlap the terminal area aircraft parking apron where the transient air taxi and air carrier operators park. Using FAA guidelines for calculating aircraft parking apron needs, a demand/capacity analysis was conducted. A brief summary of the analysis is presented in this section with an outline of future requirements following. Figures presented in the Chapter III, Forecasts, are used for existing and ultimate (2018) demand and estimates of the existing aircraft parking areas were used for aircraft parking capacity.

##### Existing and Ultimate Demand\*

1995: Air Carrier = 5 aircraft x 1.1 = 6 parking spaces x 600 s.y. =	3,600 s.y.
Air Taxi = 28 aircraft x 1.1 = 31 parking spaces x 360 s.y. =	<u>11,160</u> s.y.
Total	<b>14,760 s.y.**</b>
2018: Air Carrier = 6 aircraft x 1.1 = 7 parking spaces x 600 s.y. =	4,200 s.y.
Air Taxi = 40 aircraft x 1.1 = 44 parking spaces x 360 s.y. =	<u>15,840</u> s.y.
Total	<b>20,040 s.y.**</b>

\* 50% of itinerant airplanes on a busy day (110% of average day of peak month)

\*\* Based on most efficient distribution of parked aircraft without consideration for existing operational scenario (where all aircraft park near their associated lease lot or current operational activity)

##### Existing Capacity:

Terminal area aircraft parking apron:	61,700 s.y. (estimated)
Less apron area circulation:	<u>(27,000)</u> s.y. (estimated)
Total transient aircraft parking capacity	<b>31,700 s.y.</b>

### **Demand/Capacity Ratio**

1995: 14,760 s.y. demand / 31,700 s.y. existing = 46.6 %

2018: 20,040 s.y. demand / 31,700 s.y. existing = 63.2 %

While the demand/capacity percentages imply that the existing aircraft parking area is adequate, these figures are theoretical as they are based on the most efficient distribution of the parked aircraft (also noted above under the demand calculations). This theoretical approach would be applicable if current lease lots and associated air taxi and air carrier parking/staging locations were completely reorganized and redistributed. Since this is impractical for OTZ, a more practical approach to calculating demand requires that the current operational scenario on the apron be considered. Under current conditions, air carrier and air taxi operators are experiencing congestion during peak hour operations. This also takes into account the fact that helicopters have and will continue to use the apron area for their takeoff and landing operations as noted in the earlier airside facilities discussion.

### ***Terminal Area Apron Facility Requirements***

Air carrier and air taxi aircraft parking apron requirements for 2018 include seven parking spaces (4200 s.y.) for air carrier aircraft and 44 parking spaces (15,840 s.y.) for air taxi operators or a total of 20,040 s.y. The current terminal area apron can accommodate the parking space demand, but there are two problem issues. One is that parking large aircraft too close to Runway 8-26 on the current apron presents an airspace obstruction and the second issue is that the terminal area apron does not provide adequate taxiing circulation and turnaround areas during peak hour operations. This is partially due to the inefficient distribution of operator activities along the apron where small and large aircraft are intermingled. Development alternatives addressing these issues will offer opportunities for more efficient distribution and separation of the various operators.

### **4.3.3 Vehicle Parking**

OTZ has limited automobile parking available in the terminal area. The parking area is unpaved and can accommodate an estimated 60 vehicles between the Alaska Airlines and Cape Smythe facilities. While public parking demand data is limited, it is estimated that current demand is approximately 100 vehicle spaces and projected to grow to 150 by the year 2018, a growth rate comparable to the projected growth in passengers.

### **4.3.4 Roadway Access**

Surface access from town to the Airport is by Third and Fifth Avenues. Third Avenue is paved. Access roads serving the existing terminal area buildings, air taxi operators within Block 3, and GA aircraft parking run east-west along the north side of Block 3 and north-south between lease lots. This access is currently adequate for the airport users and operators.



The only road leading south from town passes through the Airport within the protected airspace of Runway 17-35 and Runway 8 end. In addition, the road goes through the Runway 8 safety area. The road is used to access summer fish camps, the sanitary landfill, and a surveillance site maintained by the FAA (feeding data to both the Air Force and FAA), and other properties to the south. The gate controlling access to the airport operating area via this road is inoperable and, thus, presents a safety concern for Airport operations. The Bureau of Indian Affairs has plans to begin construction of a new road east of Kotzebue Lagoon which will connect Kotzebue to areas south of town and provide circuitous access to the beach area west of the airport from town. This proposed road is considered adequate, but any additional development south of Runway 8-26 will require possible access modifications.

#### 4.3.5 General Aviation Facilities

Based on 1995 estimates, 45 of the 79 total aircraft currently based at OTZ are GA. In 2018, 76 of the forecast 130 based aircraft will be GA. Many of the current GA based aircraft are parked along the west side of Runway 17 as well as in the northcentral terminal area. Other GA aircraft are stored on lease lots in hangars. It is important to note that the existing GA tiedown area conditions west of Runway 17-35 are not in compliance with FAA standards. Therefore, the capacity numbers presented here include facilities that may require relocation.

##### Existing and Ultimate Demand

<b>1995:</b>	300 s.y. x 45 GA based aircraft	=	13,500 s.y.
	360 s.y. x 7 transient* GA aircraft	=	<u>2,520</u> s.y.
	Subtotal		16,020 s.y.
	Add 20% for circulation		<u>3,200</u> s.y.
	<b>Total</b>		<b>19,220 s.y.</b>

\*Transient GA aircraft were calculated by assuming that transient aircraft tiedown requirements are typically 15% of the based aircraft total: 45 based aircraft x 15% = approximately 7.

<b>2018:</b>	300 s.y. x 76 GA based aircraft	=	22,800 s.y.
	360 s.y. x 12 transient* GA aircraft	=	<u>4,320</u> s.y.
	Subtotal		27,120 s.y.
	Add 20% for circulation		<u>5,430</u> s.y.
	<b>Total</b>		<b>32,550 s.y.</b>

\*Same calculation as shown for 1995, but using 2018 GA based aircraft: 76 based aircraft x 15% = approximately 12.



**Existing Capacity:**

GA aircraft parking/tiedown area near Taxiway B:	6,550 s.y. (estimated)
GA aircraft parking area west of Runway 17-35:	<u>26,700</u> s.y. (estimated)
Total GA aircraft parking capacity	<b>33,250 s.y.</b>

**Demand/Capacity Ratio**

1995: 19,220 s.y. demand / 33,250 s.y. existing = **57.8 %**

2018: 32,550 s.y. demand / 33,250 s.y. existing = **97.9 %**

GA based and transient aircraft will require an estimated 32,550 square yards (s.y.) of aircraft parking/ tiedown space for the year 2018. The current GA aircraft parking areas, while adequate to meet forecast demand, will require relocation to meet FAA design standards. In addition, possible development in the terminal area may impact the GA aircraft currently parking there. The current tiedown area is substandard and without power. There are no tiedown fees currently charged, but there are Title 17 initiatives to charge them.

**4.3.6 Aviation Support Facilities**

Aviation support facilities include utilities, fuel storage, deicing chemical storage, aircraft rescue and fire fighting (ARFF) facilities, DOT&PF airport maintenance and snow removal equipment (SRE) facilities, security, and drainage.

***Utilities***

This section briefly presents the capacity analysis and facility requirements of the various utilities at the Kotzebue Airport. Included are electrical, telephone, water, sanitary sewer, and solid waste service.

<u>Utility</u>	<u>Provider</u>	<u>Description</u>
Electric & Telephone	Kotzebue Electrical Assoc. (KEA); OTZ Telephone Cooperative	<ul style="list-style-type: none"> <li>All lease areas have access to electrical and telephone service.</li> <li>No standby power generation exists to maintain DOT&amp;PF-operated airport lighting.</li> </ul>
Water & Sanitary Sewer	City of Kotzebue	<ul style="list-style-type: none"> <li>All lease areas north of Runway 8-26 and east of Taxiway B have access to piped water and sewer.</li> <li>Lot K of Block 1 also has piped water and sewer.</li> <li>Water and sanitary sewer haul services are by tanker truck and provided by a private company.</li> <li>All individual service lines should have circulation pumps installed to prevent service line freezing.</li> </ul>
Solid Waste Disposal	City of Kotzebue	<ul style="list-style-type: none"> <li>All lease areas are served for solid waste disposal.</li> </ul>

### ***Fuel Storage***

There are two licensed fuel vendors at Kotzebue Airport, Crowley Marine Services and Alaska Island Air, however, Crowley Marine Services is the only active fuel vendor.

Crowley Marine Services maintains a fueling station at Block 4, Lot 1. The station has two underground 12,000 gallon tanks and one underground 2,000 gallon tank. Only one 12,000 gallon tank is currently in service. The location is within the Runway 8-26 protected airspace and is considered an obstruction. Previous planning efforts have indicated that the fueling station should be relocated. Crowley also maintains two tanker trucks at the airport for aircraft fueling. The tanker trucks are stored in a garage on Block 1, Lot M. Fuel to the airport is delivered from the Crowley tank farm at the port with the tanker trucks.

Crowley Marine sells approximately one million gallons of AV Gas and Jet fuel on an annual basis at the airport. Crowley anticipates a steady increase in aviation fuel sales as freight traffic and bypass mail through Kotzebue is anticipated to increase. Crowley also sells an average 250,000 gallons of heating fuel annually at the airport, which is flown to outlying villages not accessible by river barge. The amount of heating fuel flown from Kotzebue varies on a yearly basis depending on river levels and village fuel usage. Noatak is the only village totally inaccessible by barge, and requires approximately 150,000 gallons of heating fuel annually.

Many of the leaseholders and air taxi operators maintain fuel storage on their lease lots. Crowley provides fuel delivery to these customers by tanker truck. Crowley also fuels airfreight carriers. Alaska Airlines maintains their own fuel tank, and supply approximately 95% of their fuel needs, with the remainder provided by Crowley. Transient aircraft use the fueling station for refueling.

Crowley Marine Services is mandated by the Alaska Department of Environmental Conservation to remove their buried fuel tanks by December of 1998, as the tanks do not meet current regulatory requirements. Crowley plans on removing the tanks by April, 1998, prior to the spring thaw. Crowley has indicated that future tanks at the airport will be aboveground due to high groundwater and regulatory requirements. Crowley also indicated that new tanks will not be installed at Kotzebue Airport until a long term lease at another location is negotiated. In the interim, Crowley will provide fuel service by tanker truck. Relocation of the fueling facility requires frontage on the main ramp for aircraft access. Crowley has indicated that two 12,000-gallon aboveground saddle tank would be adequate for long term storage needs at Kotzebue Airport. A possible location previously identified at the current ADOT&PF Maintenance/ARFF location after these facilities are relocated.

### ***Deicing Chemical Storage***

There is limited area and no shelter for storing the deicing chemicals. These chemicals are presently stored outdoors at the east end of the terminal area apron. Historically, E-36 containers have not weathered well in the Kotzebue environment, but Airport personnel have stated that this chemical is now provided in more durable containers.

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

FAA regulations establish levels of emergency response capability for air carrier airports, which are expressed in terms of designated material availability and rates of material discharge. Based upon the current aircraft fleet mix and operations volume, OTZ is required to meet an "Index B" level of response capacity. Aircraft rescue and firefighting (ARFF) equipment and personnel are supplied by the DOT & PF. ARFF future facility requirements include a new ARFF facility.

### ***DOT&PF Airport Maintenance and Snow Removal Equipment (SRE)***

The DOT&PF currently has three buildings for a shop, storage, and an ARFF vehicle. Consolidation of maintenance and snow removal equipment facilities is recommended. As discussed above, a new ARFF facility is recommended. SRE equipment could be stored with the ARFF equipment.

### ***Security***

The surface gates at both the north and south edges of the Runway 8 threshold primary surface are non-operational. Additional security fencing and controlled gates are recommended.

### *Drainage*

The ditch along the west side of Runway 17-35 reportedly fills in the spring from snow melt and leaching from the sewage lagoons. The water often floods a portion of the runway, especially near the mid-length. During these periods, Runway 17-35 is temporarily closed to aircraft. The drainage conditions along the west side of the entire runway need to be improved.

The majority of surface water drainage on the airport is by sheet flow to safety areas, wetlands, or the lagoon. A few catch basins are located on the main ramp, these basins drain to the safety area between the ramp and Runway 8-26. Within the lease lot areas, particularly Block 3 there is standing water during spring break-up, as the subsurface ground is frozen, and surface slopes are extremely flat.

The Kotzebue area has low yearly precipitation (9 inches average, of which 48 inches is snowfall). Summer rain generally percolates into the ground within unpaved areas. There is a culvert located under Third Avenue near the airport access road, and culverts under Taxiways D and E. There is also a culvert beneath Access Road AA behind Lot M, Block 1 draining the GA tiedown ramp. The culverts are difficult to maintain and generally do not thaw and allow surface flow until well after warmer temperatures melt accumulated snowfall. To keep culverts from freezing snow cover is maintained at the outlets for insulation. The water level within the safety areas rise and fall with tidal action, dewatering activity at the Isaac Lake borrow pits, and snowmelt/precipitation. The safety area communicates with the ocean and borrow areas as the ocean heat maintains a thaw zone allowing subsurface water flow. The taxiway culverts allow communication with the lagoon from the safety area as permafrost blocks subsurface flow. There are no maintenance or demand requirements to install storm drains within developed areas of Kotzebue Airport.

Any airport improvements, including lease area expansions, ramp improvements or safety area improvements should be planned with surface drainage as much as possible, and not piped storm drains, as storm drains are difficult to maintain and prone to freezing. Storm drain systems would be costly to install and difficult to maintain, due to permafrost and frost susceptible fills. Storm drain piping as well as other underground utilities move with seasonal frost and thaw action making gravity flow difficult to maintain. The catch basins would fill with silts and gravels in non-paved areas (the majority of the airport).

## 5.1 INTRODUCTION

The objective of the alternatives analysis is to determine the most suitable development to meet the needs of the Kotzebue Airport. Steps involved in this process include:

- Identification of opportunities and constraints
- Identification of various airside/landside development alternatives to meet the existing and future needs of the Airport
- Evaluation and refinement of the development alternatives
- Selection of the most suitable development alternative (preferred alternative)

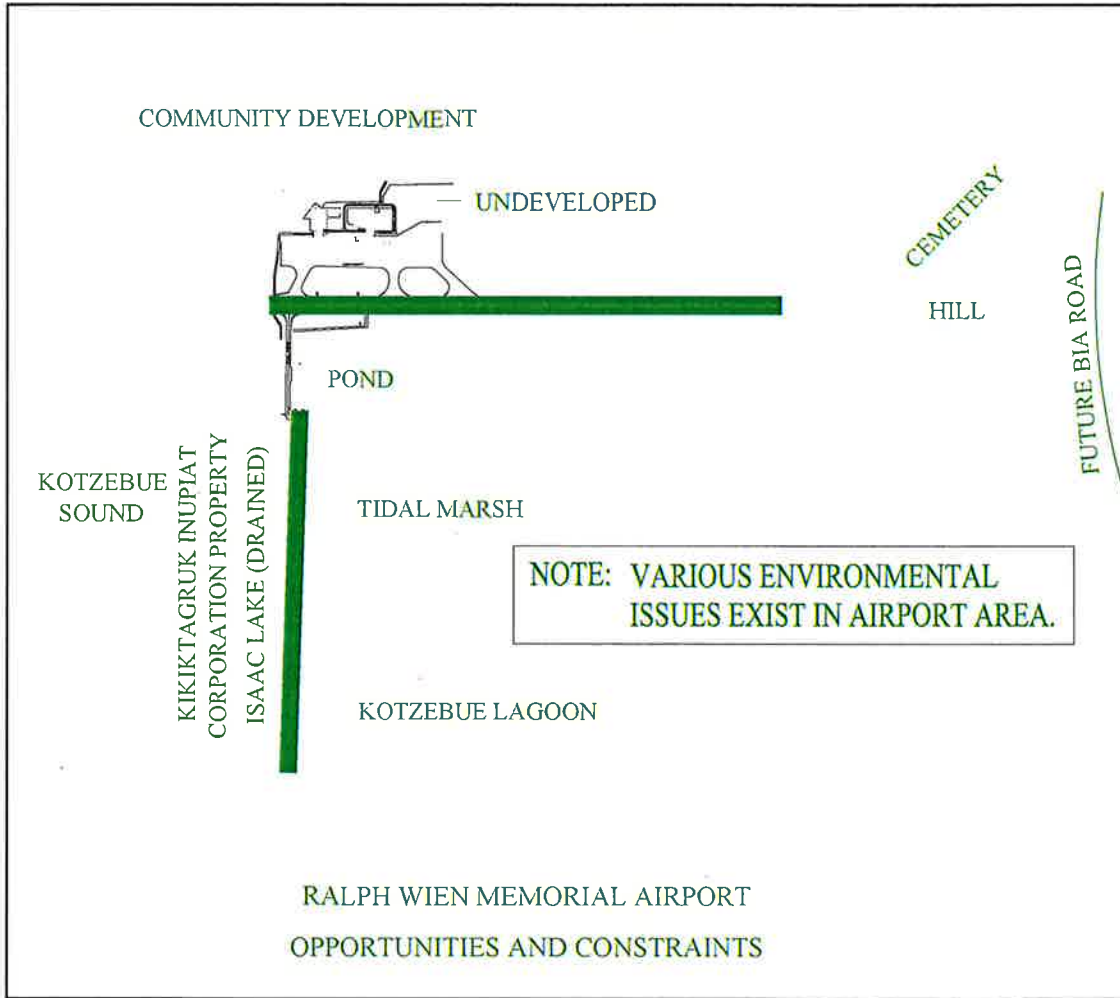
## 5.2 OPPORTUNITIES AND CONSTRAINTS

Exhibit 5-1 identifies the opportunities and constraints outlined for the Airport which have the greatest influence on possible future development. Airport opportunities offer flexibility in the alternatives identification process by increasing the possibilities for development. Airport constraints are challenges or limitations to airport development. While some constraints may limit or prohibit development in certain areas, other constraints may be overcome by responding with mitigation and /or engineering solutions which could be costly.

### *Opportunities*

- Undeveloped/ underutilized property in the terminal area
- Underutilized lease lots & surrounding area east of Runway 17-35
- Undeveloped property west of Runway 17-35
- Proposed BIA road construction
- Existing Infrastructure (roads, utilities)
- Isaac Lake as a gravel resource
- Isaac Lake/Kotzebue Lagoon areas near GA parking for future floatplane operations

**Exhibit 5-1: Opportunities & Constraints**





### *Constraints*

- Kotzebue Sound off Runway 8 end
- Kotzebue Lagoon encompassing the east side of the Airport
- Existing and expanding community development north of the Airport
- KIC property west of Runway 17-35
- Cemetery to the northeast
- Terrain (hill) off Runway 26 end
- Archaeological sites
- Biotic communities

### **5.3 ALTERNATIVES IDENTIFICATION**

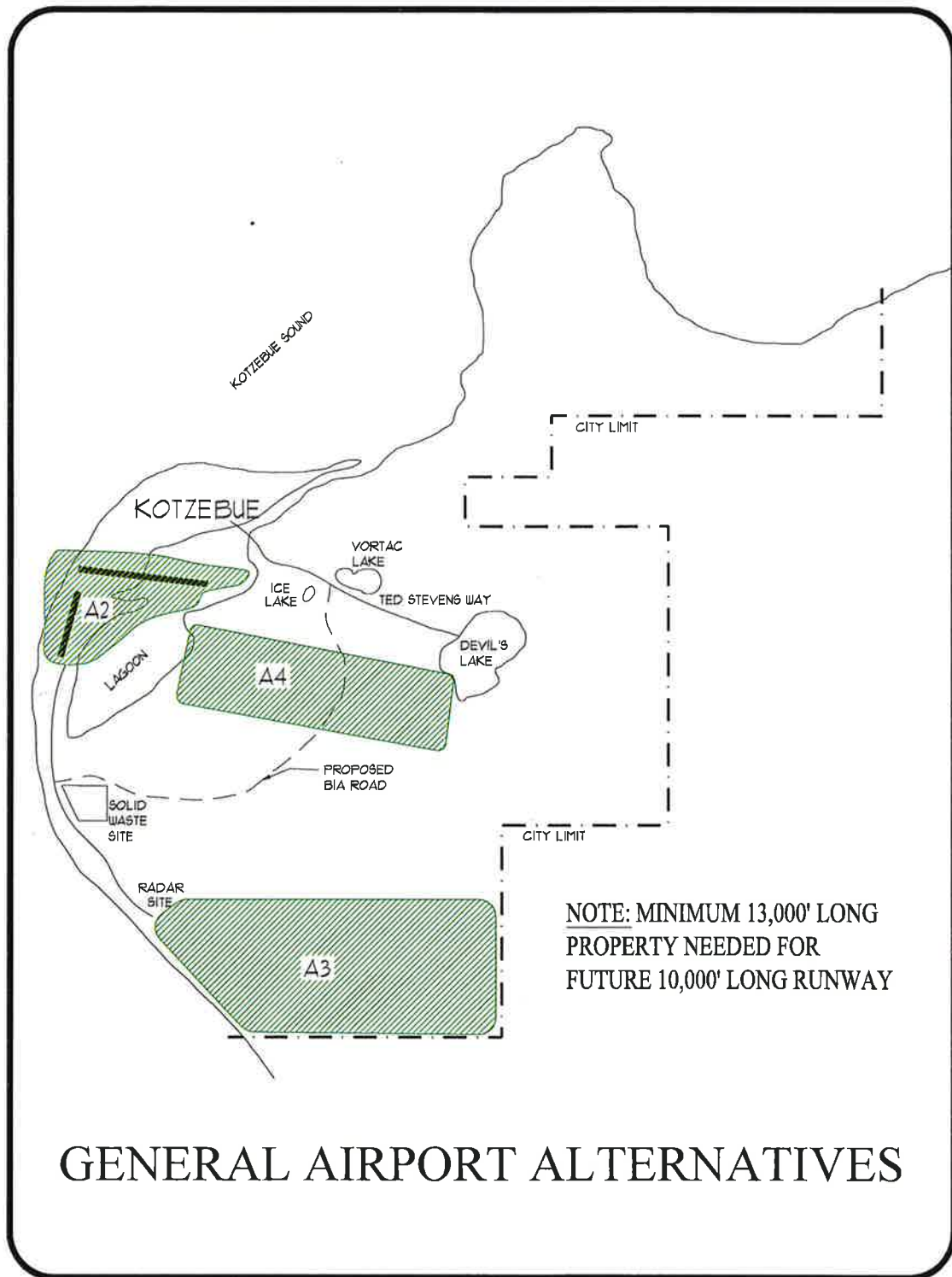
Following review of the Airport's opportunities and constraints, general airport alternatives as well as specific airport component alternatives were identified. These alternatives were identified using the following assumptions:

- Proposed BIA road will be constructed
- Runway widths will not change
- Runway 17-35 will continue to operate without a parallel taxiway
- Proposed development alternatives will include consideration for all applicable FAA design standards and airspace regulations

General airport alternatives were first identified to address the community's concerns associated with the existing constrained site. Since the existing site is severely constrained from future growth and from improvements to make it comply with design standards, the general alternatives provide a vehicle to compare the differences. The general airport alternatives proposing development are shown in Exhibit 5-2, General Airport Alternatives, and summarized here:

<b>Alternative</b>	<b>Description</b>
A1	No action
A2	Improve existing airport comparable to a relocated airport facility
A3	Relocate airport
A4	Relocated air carrier runway w/taxiway

**EXHIBIT 5-2: GENERAL AIRPORT ALTERNATIVES**



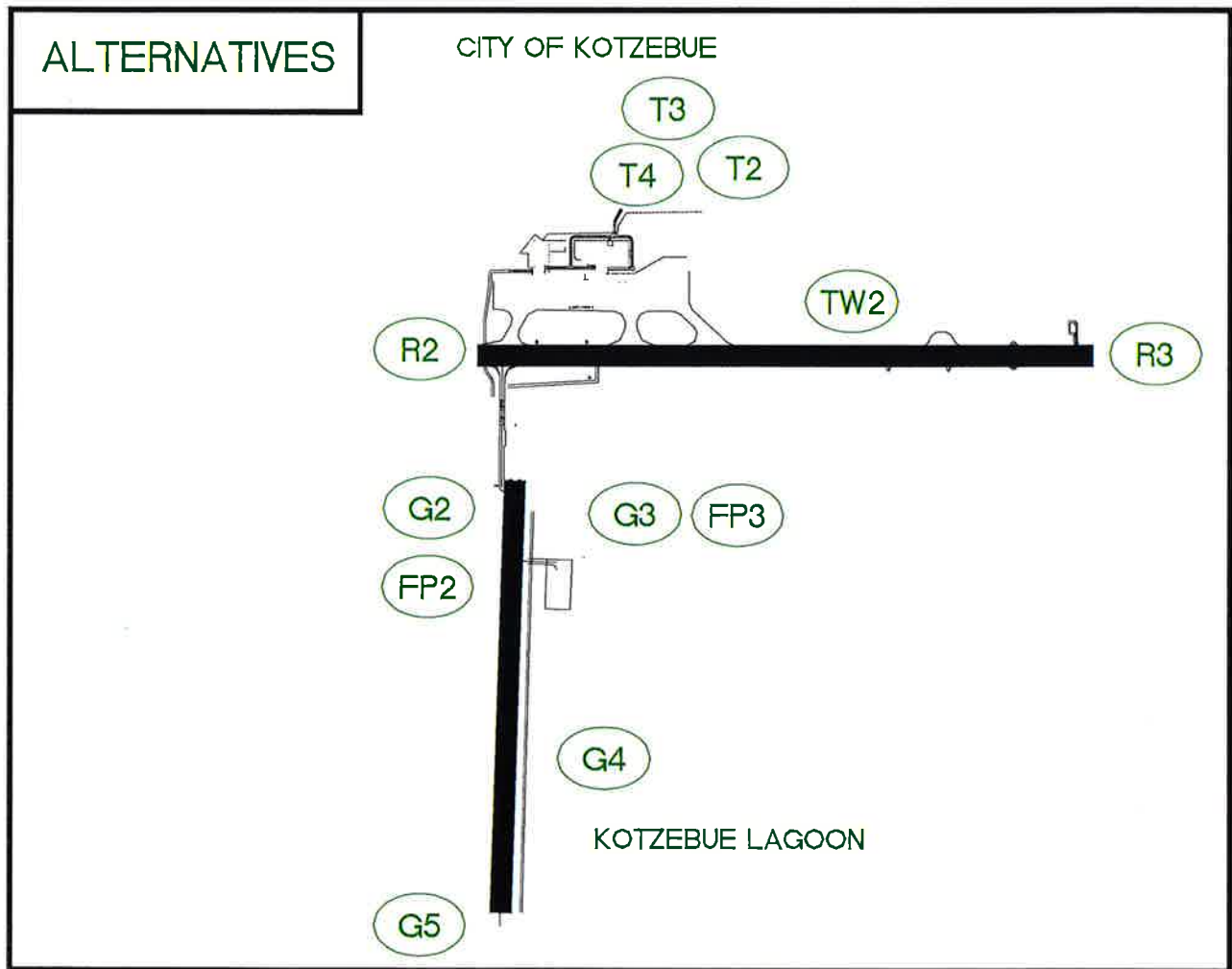
Specific airport component alternatives identified fell into one of two categories: airside or landside. While the airside facilities discussed in Chapter IV included runways, taxiways, and floatplane, skiplane, and helicopter facilities, this chapter also includes general aviation (GA) tiedowns under the airside rather than the landside. This is because the float pond and GA alternatives are presented together.

Terminal area facilities are presented in the landside alternatives. This includes terminal area buildings and lease lots, aircraft parking, and various support facilities.

The general area of each component alternative proposing development is graphically illustrated in Exhibit 5-3, Airport Component Alternatives. From the various airside and landside alternatives, the preferred alternative was selected. The preferred alternative, described later in Section 5.5, is a combination of the best alternatives for each; the runway, the taxiway, the GA apron, the float pond, and the terminal area.

**EXHIBIT 5-3: AIRPORT COMPONENT ALTERNATIVES**

The following is a reference to alternatives that have been considered. Each alternative is fully depicted on the pages indicated: R2 and R3, page 5-9; TW2, page 5-11; G2/FP3, page 5-13; G4/FP3, page 5-14; G5/FP2, page 5-15; G3/FP3, page 5-16; T2, page 5-21; T3, page 5-22; and T4, page 5-23.



### 5.3.1 AIRSIDE ALTERNATIVES

Airside alternatives include development concepts for Primary Runway 8-26, a parallel taxiway, general aviation parking/tiedown space, and float pond facilities. These development alternatives are based on facility requirements identified in Chapter IV.

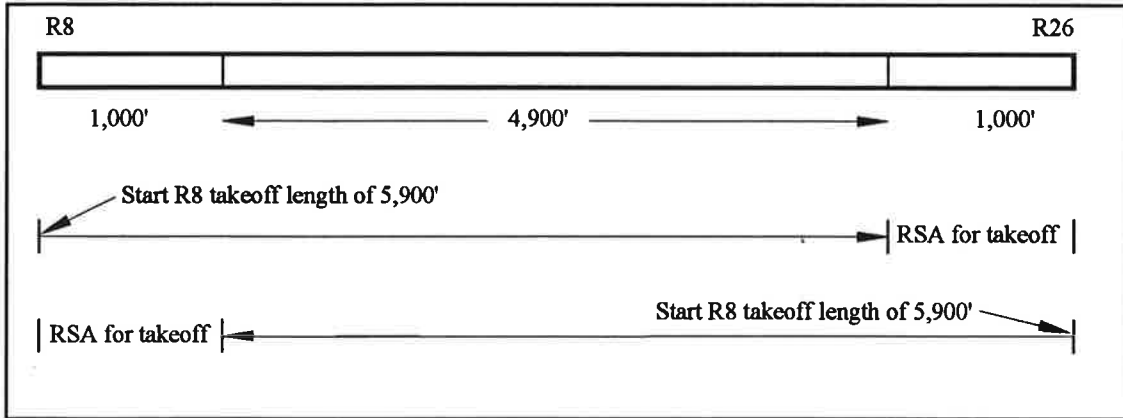
#### *Primary Runway 8-26*

The earlier runway length analysis identified that the current 5,900-foot length for Runway 8-26, a C-III runway, is adequate. Therefore, alternatives identified for this runway focus on the runway safety area (RSA) issue.

C-III standards for an instrument runway require that the RSA be 500 feet wide and extend the full length of the runway plus 1,000 feet off each runway end. To comply with these FAA design standards without impacting the runway length, the RSA would have to be widened to 500 feet (from its current width of 280 feet) and lengthened to extend 1,000 feet off each runway end. Currently, there is no safety area extension past the west end, due to the road located at the threshold, and the safety area extends only 250 feet past the east end of the runway. If the safety areas were extended, this would mean that 1,000 feet of fill into Kotzebue Sound would be required off Runway 8 end and a significant amount of cut into the hillside would be necessary off Runway 26 end. Another option would be to use part of the runway length for safety area by relocating each runway threshold to accommodate a 1,000 foot RSA thereby reducing the runway length. While this would avoid development into Kotzebue Sound and the hill to the east, this option is operationally unacceptable since the existing 5,900 feet of runway is needed to serve the larger aircraft currently operating at Kotzebue Airport. The only other option considered for Runway 8-26 was a compromise between the both of the previous options. This entailed using declared distances. According to FAA Advisory Circular 150/5300-13, Airport Design, "...use of declared distances shall be limited to cases of existing constrained airports where it is impracticable to provide the runway safety area, runway object free area, or runway protection zone in accordance with the design standards."

Using the declared distances guidelines, two alternatives plus a "no action" alternative were formally identified for evaluation. In lieu of extending the RSA off both runway ends for a total of 2,000 feet of new RSA, each alternative proposes to extend the runway pavement by a total of 1,000 feet off one runway end or the other. This additional 1,000 feet will provide on departure the necessary RSA in front of the aircraft in either direction, as illustrated in Exhibit 5-4.

**EXHIBIT 5-4  
DECLARED DISTANCES WITH RUNWAY EXTENSION**



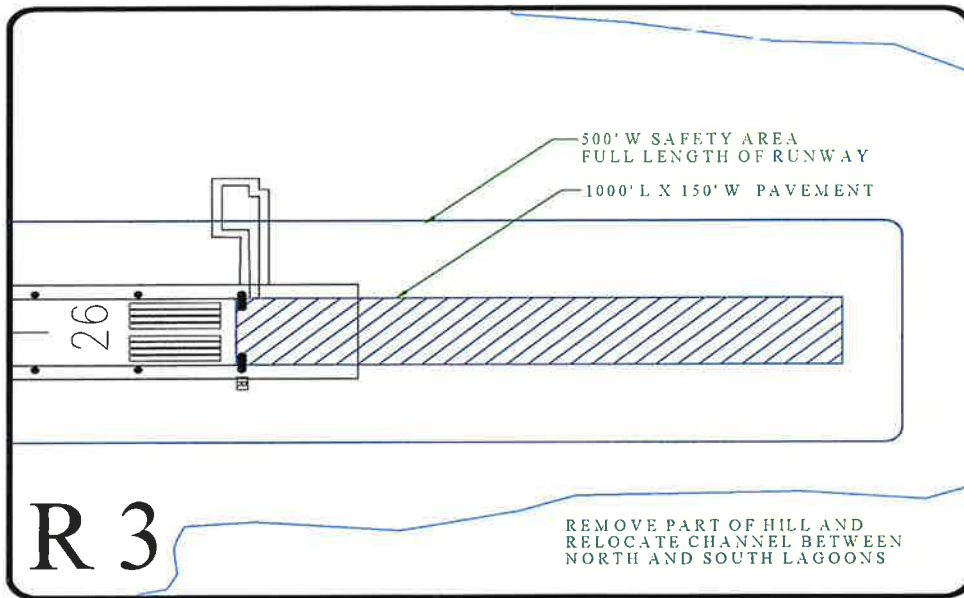
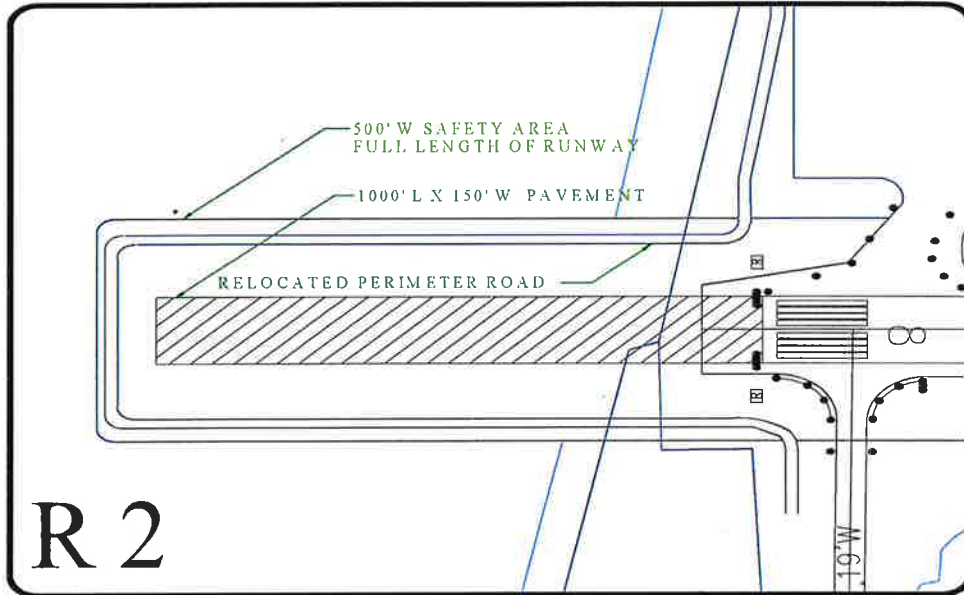
The three runway alternatives are specifically defined as:

**Alternative    Description**

- R1            No action
  
- R2            Safety Area Improvement - 1,000-foot Runway 8 end extension into Kotzebue Sound to accommodate safety area requirements while maintaining a 5,900-foot take-off run in either direction using FAA-defined declared distances. In addition, the safety area would be widened the full-length of the runway to the 500-foot standard.
  
- R3            Safety Area Improvement - 1,000-foot Runway 26 extension towards the hill east of the Airport to accommodate safety area requirements while maintaining a 5,900-foot take-off run in either direction using FAA-defined declared distances. In addition, the safety area would be widened the full-length of the runway to the 500-foot standard. This alternative is the same as R2, but with the extension at the opposite end of the runway.



**EXHIBIT 5-5: RUNWAY ALTERNATIVES**



*Parallel Taxiway*

The growing aviation activity at Kotzebue Airport is evidence of the need for a parallel taxiway to Runway 8-26. Aircraft currently use the runway to taxi which causes delays during peak hour operations. Since the runway serves C-III aircraft, this requires that the proposed taxiway be constructed 400 feet from runway centerline at a width of 50 feet.

The two taxiway alternatives include:

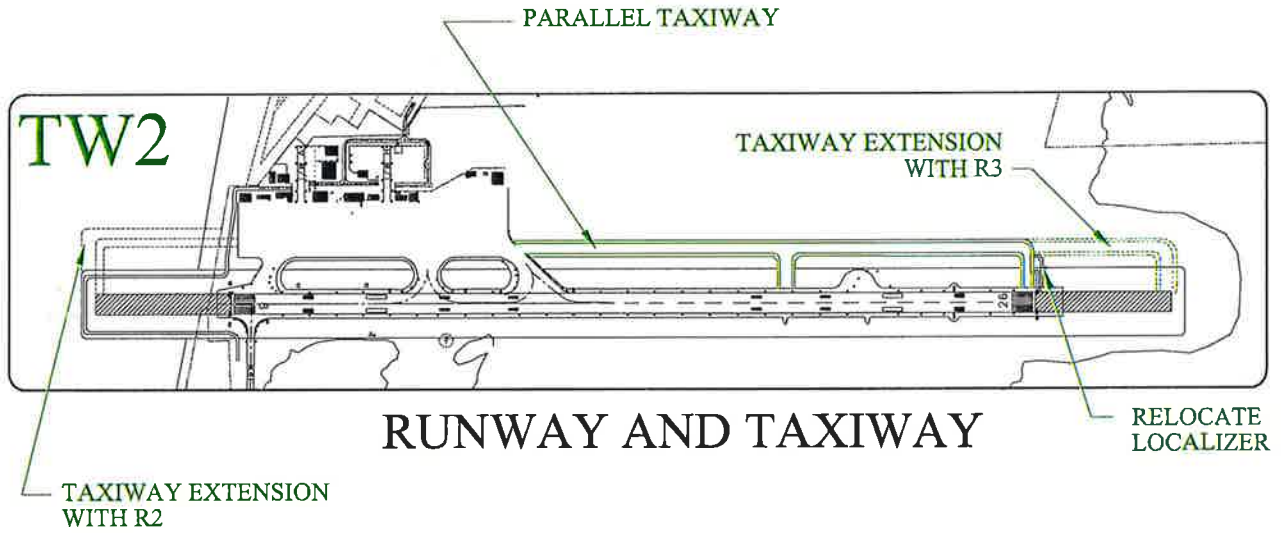
**Alternative    Description**

TW1            No Action

TW2            Full-length parallel taxiway for primary Runway 8-26. This alternative assumes that the full-length parallel taxiway would correspond with any of the three runway alternatives (R1, R2, and R3). This includes the development of adequate entrance and exit taxiways.

Exhibit 5-6 illustrates Alternative TW2 if it were combined with R1, R2, or R3.

**EXHIBIT 5-6: TAXIWAY ALTERNATIVES**



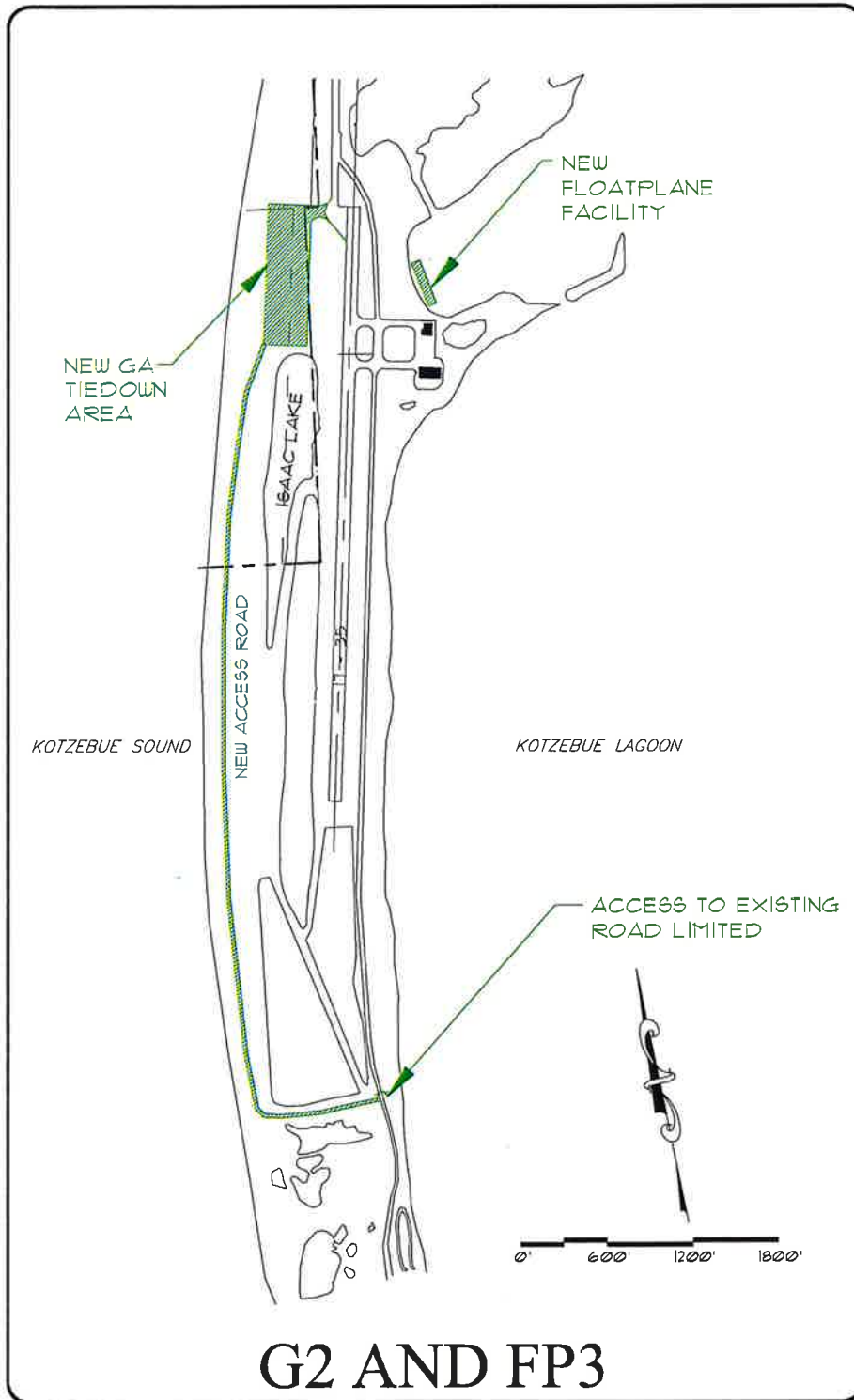
### *General Aviation and Float Pond*

General aviation (GA) growth is projected to be steady through the year 2018. If the current GA tiedown space west of Runway 17-35 is removed to comply with FAA design standards, then a new location to accommodate the projected growth is necessary. The development alternatives proposed for a GA tiedown area and an associated float pond facility are illustrated in Exhibits 5-7A, 5-7B, 5-7C, and 5-7D, and outlined here.

<b>GA Alternative</b>	<b>Description</b>
G1	No Action
G2	B-II aircraft tiedowns in Northwest quadrant of the runway 17-35 area. This implies that the access road to serve this area would remain on the west side, but would require relocation farther to the west outside the protected airspace of Runway 17-35.
G3	B-II aircraft tiedowns in Northeast quadrant of the runway 17-35 area. This implies that the access road to serve this area would be built out on the east side, but outside the protected airspace of Runway 17-35.
G4	B-II aircraft tiedowns in the East side of runway 17-35, south of the National Guard Hangar. This implies that the access road to serve this area would be built out on the east side similar to G3.
G5	B-II aircraft tiedowns in the Southwest quadrant of the runway 17-35 area. This implies that the access road to serve this area would remain on the west side similar to G2.

<b>Float Pond Alternative</b>	<b>Description</b>
FP1	No Action
FP2	Acquire Isaac Lake (currently dewatered)
FP3	Develop float pond facility on Kotzebue Lagoon

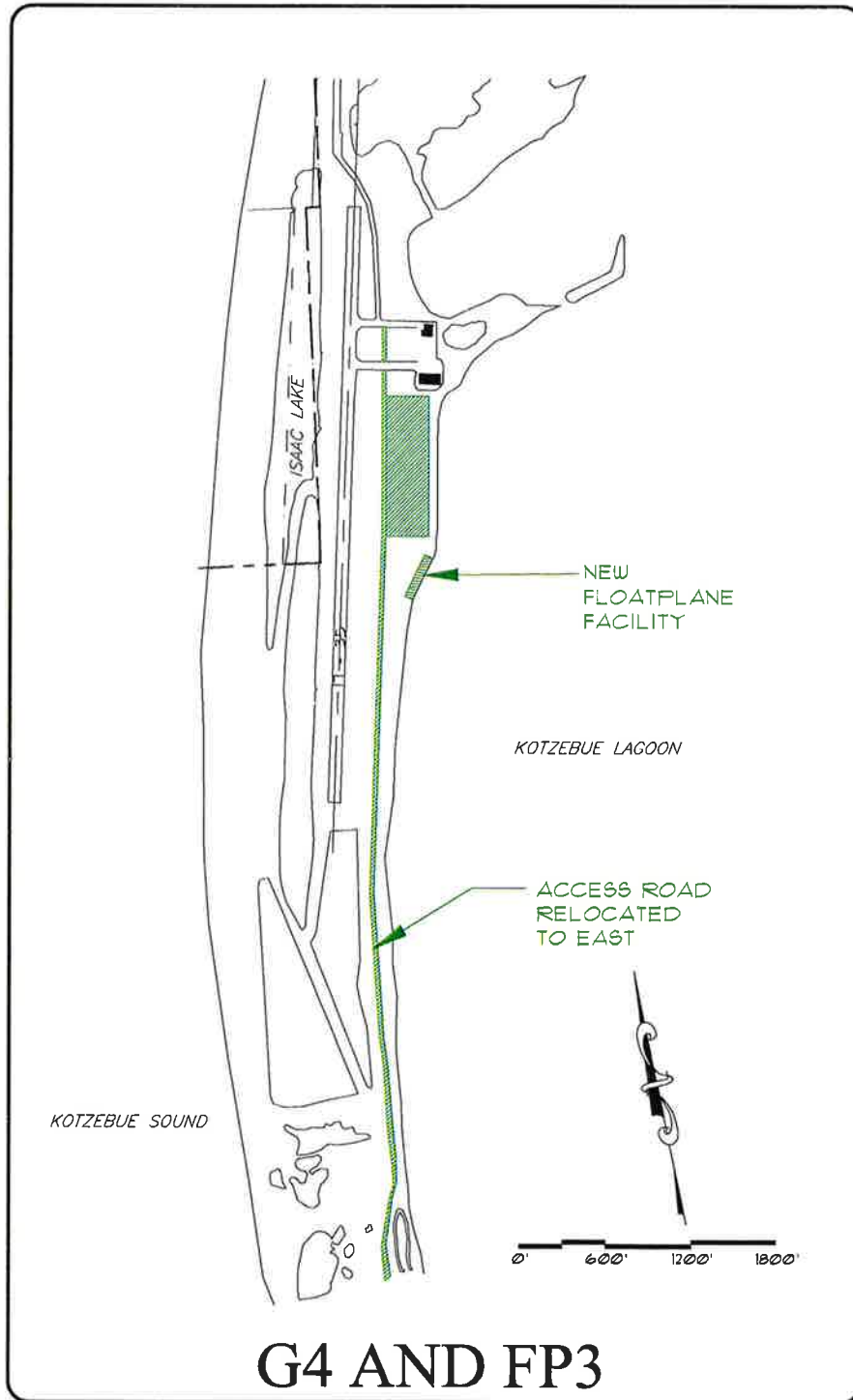
**EXHIBIT 5-7A: GA AND FLOAT POND ALTERNATIVES (G2/FP3)**



**G2 AND FP3**

**GENERAL AVIATION AND FLOAT POND**

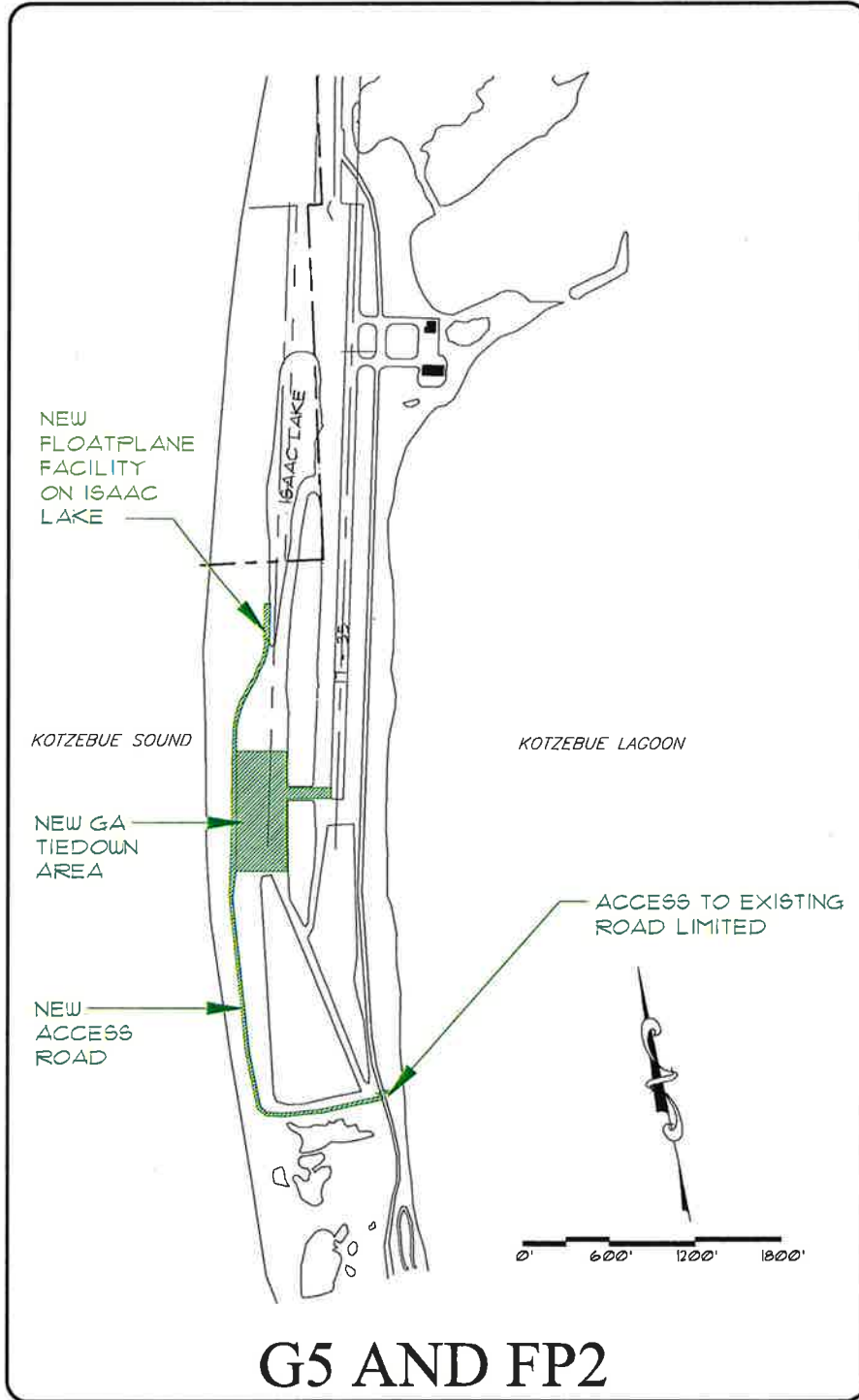
**EXHIBIT 5-7B: GA AND FLOAT POND ALTERNATIVES (G4/FP3)**



**G4 AND FP3**  
GENERAL AVIATION AND FLOAT POND

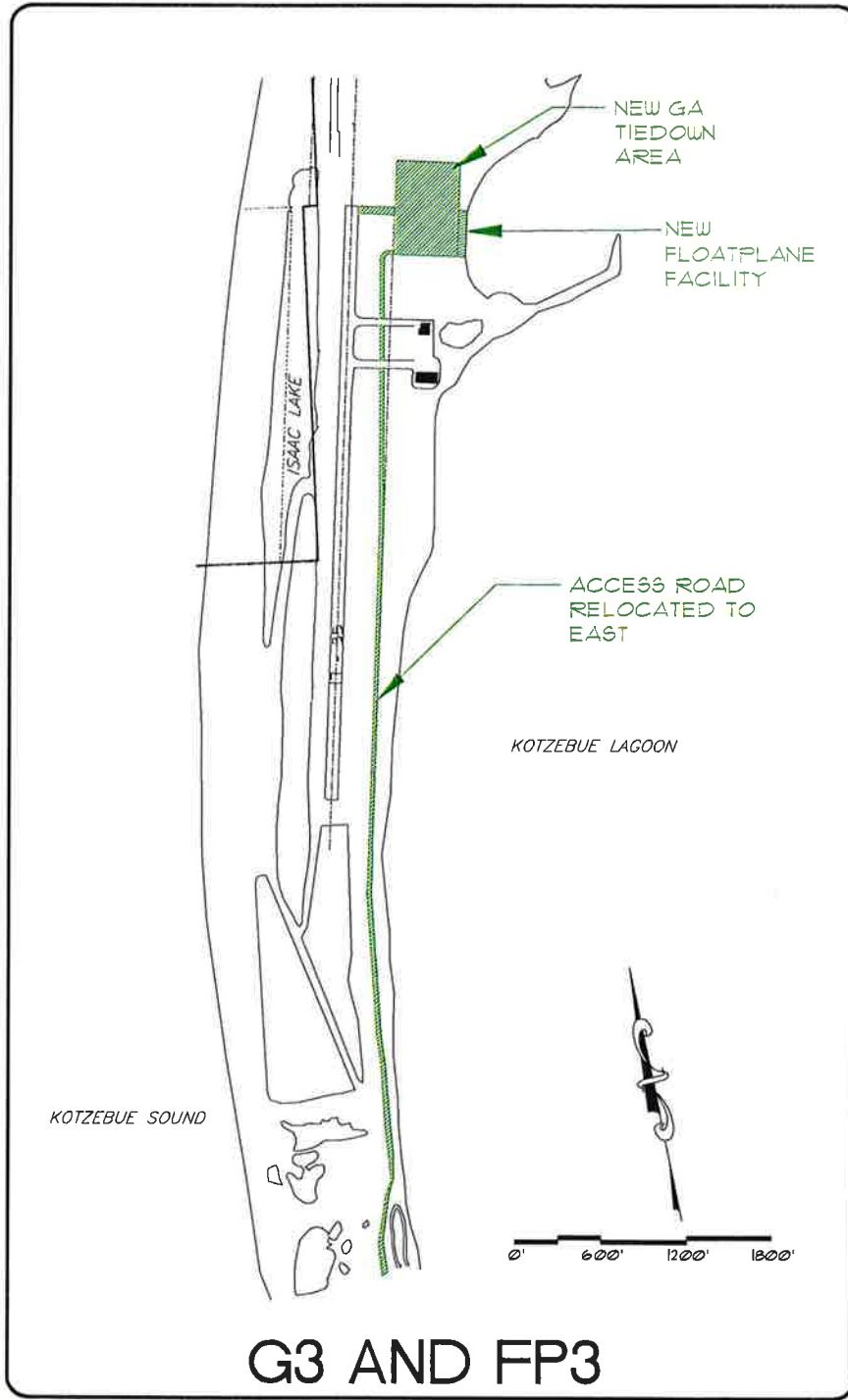


**EXHIBIT 5-7C: GA AND FLOAT POND ALTERNATIVES (G5/FP2)**



**G5 AND FP2**  
GENERAL AVIATION AND FLOAT POND

**EXHIBIT 5-7D: GA AND FLOAT POND ALTERNATIVES (G3/FP3)**



**G3 AND FP3**  
GENERAL AVIATION AND FLOAT POND

### 5.3.2 LANDSIDE ALTERNATIVES

The key determinant of terminal area alternatives for Kotzebue Airport is terminal facility consolidation. Each carrier at Kotzebue Airport conducts all its operations within its own facilities on its own lease lot (or adjacent lots). Constrained area for expanding individual lease holds or developing lots for new carriers and passenger/cargo processing convenience are just two reasons for considering a different approach to terminal facilities. The last master plan update reserved land northeast of the existing terminal area for a future multi-use terminal. The advantages and disadvantages of a multi-use terminal are as follows:

#### Advantages of Multi-use Terminal:

- Transfer Passenger Convenience
- More Efficient Building, Apron, and Vehicle Parking Use
- Food Service More Feasible
- Community Gateway Image
- Flexibility and Ease of Expansion
- Lower Maintenance and Operations Cost

#### Disadvantages of Multi-use Terminal:

- Carriers' Operations Divided
- Loss of Carriers' Capital Investments
- Varied Lease Expiration Dates
- High Initial Cost
- Difficult Financing
- Terminal Operator Needed
- Loss of Carrier Identity
- If Airport Relocated, Multi-Use Terminal Investment Harder to Recover

Terminal area alternatives identified for Kotzebue Airport address the landside facility requirements discussed in the last chapter, as well as different levels of terminal consolidation. The terminal area alternatives outlined here are illustrated by Exhibits 5-8a, 5-8b, 5-8c, and 5-8d.

**Alternative Description**

T1 No Action. The 15 existing lease holds totaling 8.5 acres and the 14 existing GA tiedown spaces would remain. Existing apron congestion would not be alleviated and airspace penetrations would not be removed.

T2 Multi-use Terminal. This alternative proposes a consolidated passenger and cargo terminal of approximately 39,000 square feet. The terminal could be developed and operated by one entity or it could be developed condominium-style, with individual operators responsible for their own facilities which would abut common use public spaces, corridors, and building support. The terminal location northeast of the existing apron would relieve apron congestion and prevent parked jet aircraft from obstructing airspace. As was planned in the last master plan update, the apron would be expanded eastward into the lagoon to provide ample aircraft maneuvering room and capacity for growth beyond the 20-year demand. Additional relief of apron congestion would be provided by relocating the fueling facility to the west end of the apron and by extending the apron approximately 90 feet southward, which still allows the minimum 400 foot separation from the runway.

The west half of the terminal would remain divided into individual lease lots to accommodate carriers' non-terminal activities, such as aircraft maintenance and parking. Existing lease holds would be reduced from 15 to 12, totaling 6.1 acres. The existing Alaska Airlines facility would be converted to the DOT&PF SRE building and the upper floor could be used by the relocated FSS. A new ARFF would be located near the middle of the apron and the existing DOT&PF building, near the relocated fueling facility, could be leased to the fueling operator. The NWS could have a facility at the northeast corner of the terminal area. Existing GA tiedowns would remain in their existing location in the terminal area, and additional tiedowns would be established on the apron, so that the terminal area would contain 28 GA tiedowns.

**Alternative    Description**

- T3**            **Lease Lot Expansion with Large Aircraft Parking.** Like T2, this alternative would remedy the apron congestion and airspace obstruction problems by moving large aircraft parking northeast to new lease lots, relocating the fueling facility, and expanding the apron southward. GA tiedowns would move out of the terminal area to provide for lease lot expansion. T3 would have 17 leaseholds totaling 10.8 acres. The new lease lots would include three lots set aside for large jet passenger/cargo airlines. Individual unit terminals could be grouped around shared public parking for passenger convenience. The third new lease lot fronting the large jet aircraft apron area would be an excellent site for a multi-use cargo terminal. Separate new SRE and ARFF buildings would be built and located to preserve apron frontage for air carriers. Until demand for new lease lots occurs, the area can be used for GA tiedowns, allowing postponement of the construction of new GA tiedowns east of Runway 17-35.
- T4**            **Lease Lot Expansion.** This alternative assumes that lease lot expansion would be accomplished without relocating current leaseholders, or moving large aircraft parking. The airspace obstruction problem would remain. However, apron congestion would be improved through the same relocation of the fueling facility and the southward apron expansion included in Alternatives T2 and T3. T4 would have 21 leaseholds totaling 12.7 acres. T4's expansion would not include shared automobile parking. A new combined SRE and ARFF building would be built. The existing GA tiedowns would move out of the terminal area to provide for lease lot expansion.

EXHIBIT 5-8A: T1 - NO ACTION ALTERNATIVE

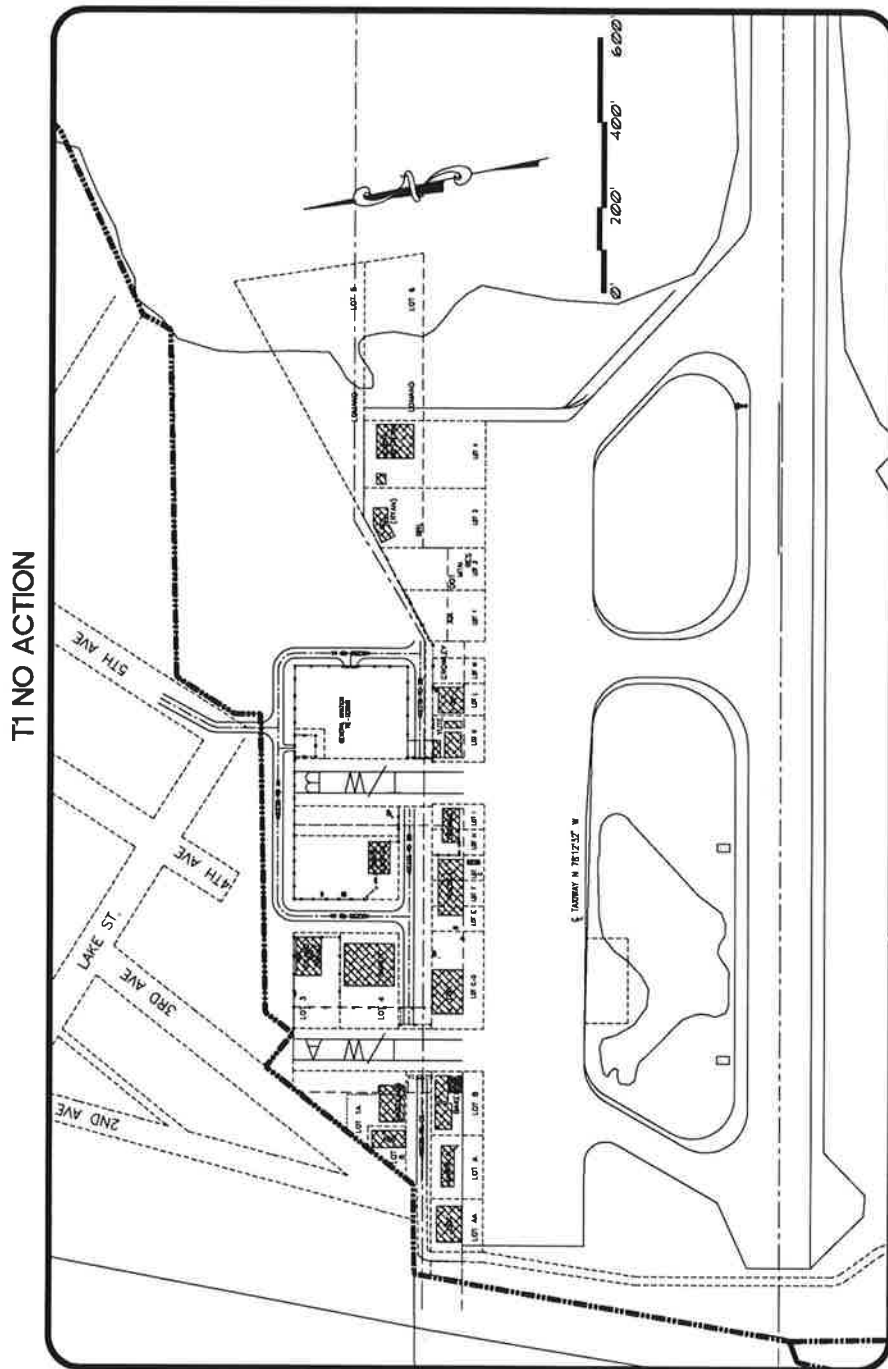
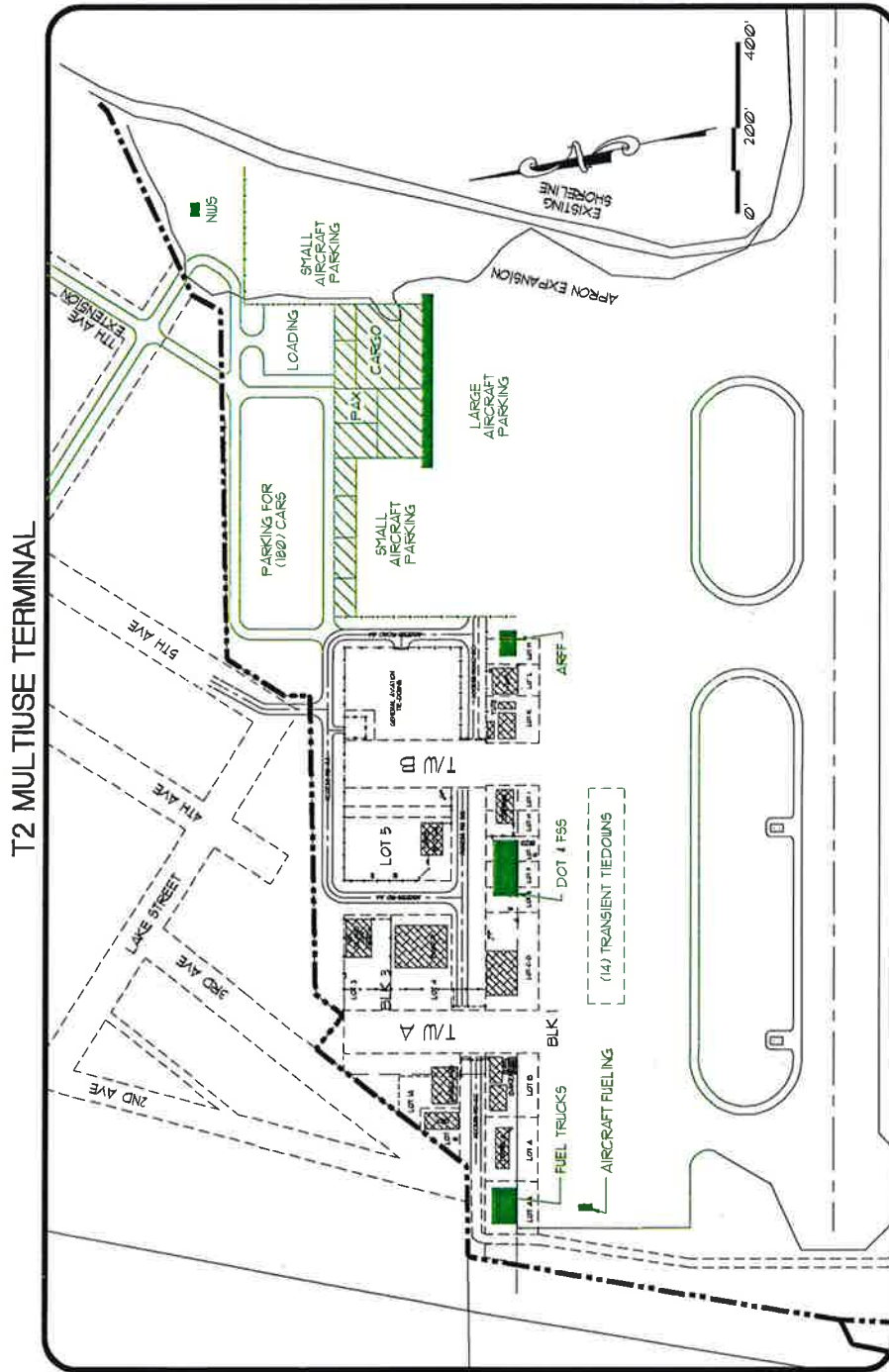




EXHIBIT 5-8B: T2 - MULTI-USE TERMINAL



T2 MULTIUSE TERMINAL

EXHIBIT 5-8C: T3 - LEASE LOT EXPANSION WITH LARGE AIRCRAFT PARKING



EXHIBIT 5-8D: T4 - LEASE LOT EXPANSION



## 5.4 ALTERNATIVES EVALUATION

Following the alternatives identification process, the general airport alternatives as well as the airport component (airside and landside) alternatives were evaluated. Evaluation criteria were established with consideration for the airport goals and objectives. Four basic criteria were used to evaluate the alternatives:

- **Operational Feasibility.** Operational feasibility refers to characteristics such as ability to serve forecast demand, to meet FAA and FAR standards, and to support safe and efficient airport and aviation operations.
- **Environmental Implications.** Although an environmental overview will address the impact of the selected development alternative(s), it is wise to consider environmental implications before deciding among alternatives.
- **Financial/Technical Feasibility.** Almost anything is technically feasible, but the cost of the technical solution may make the development action financially infeasible. The scarce availability and high cost of fill materials impacts the feasibility of most development projects at Kotzebue Airport.
- **Public/User Acceptance.** The public is not of a single mind, nor does public opinion necessarily match the opinions of airport users. Public/user acceptance is primarily determined through the airport master plan's public involvement process.

### 5.4.1 GENERAL AIRPORT ALTERNATIVES EVALUATION

The evaluation of the general airport alternatives started with operational feasibility, specifically the comparison of the various airfield capacity scenarios. Exhibit 5-9 presents a comparison of the estimated hourly capacities (VFR and IFR) and the annual service volume (estimated annual operations capacity under a generic scenario) for the different airfield configurations under Alternatives A1, A2, A3, and A4.

Exhibit 5-10 summarizes the findings of the overall alternatives evaluation for the four general airport alternatives.

**EXHIBIT 5-9****GENERAL AIRPORT ALTERNATIVES - CAPACITY EVALUATION FOR OPERATIONAL FEASIBILITY**

<b>A1 - Existing Airfield</b>	
	VFR Hourly Capacity = <b>98</b> operations IFR Hourly Capacity = <b>50</b> operations Annual Service Volume = <b>218,000</b> operations
<b>A2 - Improve Existing Airport</b>	
	VFR Hourly Capacity = <b>111</b> operations IFR Hourly Capacity = <b>55</b> operations Annual Service Volume = <b>247,000</b> operations
<b>A3 - Relocate Airport</b>	
	VFR Hourly Capacity = <b>98</b> operations IFR Hourly Capacity = <b>59</b> operations Annual Service Volume = <b>230,000</b> operations
<b>A4 - Relocated Air Carrier Runway</b>	
	VFR Hourly Capacity = <b>130</b> operations IFR Hourly Capacity = <b>&lt; 50</b> operations (without taxiway) Annual Service Volume = <b>355,000</b> operations

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



**EXHIBIT 5-10  
GENERAL AIRPORT ALTERNATIVES EVALUATION**

<b>AIRPORT COMPONENT</b>	<b>Operational Feasibility</b>	<b>Environmental Implications</b>	<b>Financial/Technical Feasibility*</b>	<b>Public/User Acceptance</b>
<b>General Airport</b>				
A1 - No action	does not meet demand nor comply w/ design standards	no change	no capital cost	generally unacceptable
A2 - Improve existing airport comparable to a relocated airport facility	meets demand & complies w/ standards; little capacity for additional runway length or expansion beyond 2018 demand	considerable impact; see individual component alternative evaluations	very high capital cost; \$98 - 251 million	generally acceptable
A3 - Relocate Airport	meets demand & complies w/ standards; more flexibility and expandability beyond 2018 forecast demand	considerable impact - would require Environmental Impact Statement (EIS), but might have less impact on sensitive coastal areas than improvements at existing airport	very high capital cost; \$128 million (excluding land acquisition)	generally acceptable; existing airport site available for community expansion, but new airport much farther from community than existing airport
A4 - Relocated air carrier runway/taxiway	meets demand & complies w/ standards; relocated runway distant from support facilities/requires shuttling passengers & cargo; switchback taxiway required to meet 1.5% maximum grade; parallel runways greatly increase capacity	considerable impact - would require Environmental Impact Statement (EIS), but might have less impact on sensitive coastal areas than improvements at existing airport	very high capital cost; land acquisition required	generally acceptable, but requires BIA road relocation and implies community growth limitations on hillside; Runway 17-35 possibly available for other community use

\* The scarce availability and high cost of fill materials impacts most development projects.

#### 5.4.2 AIRPORT COMPONENT ALTERNATIVES EVALUATION

Exhibit 5-11 summarizes the evaluation findings for the runway, taxiway, GA, and floatplane facilities development alternatives.



## Exhibit 5-11

## AIRPORT COMPONENT ALTERNATIVES EVALUATION

AIRPORT COMPONENT	Operational Feasibility	Environmental Implications	Financial/Technical Feasibility*	Public/User Acceptance
<b>Runway</b>				
R1 - No action	not in compliance w/ FAA design stds; compliance would reduce runway length	no change	no capital cost	generally acceptable
R2 - Runway 8 end safety area extension	complies with FAA design stds; increases takeoff distance	considerable impact including possible disruption to salmon migration & coastal navigation	very high construction cost; high maintenance cost to mitigate erosion by storm surges; \$23-75 million	likely unacceptable due to disruption to fishing & boating patterns
R3 - Runway 26 end safety area extension	complies with FAA design stds; increases takeoff distance	considerable impact including filling in wetlands	high construction cost; must maintain channel between north & south lagoons; \$23 - 54 million	little disruption to fishing & boating patterns
<b>Taxiway</b>				
TW1 - No action	delays during peak hour	no change	no capital cost	undesirable aircraft delay
TW2 - Full-length parallel taxiway to Runway 8-26	improves capacity 13%; enhances safety by allowing holding or taxiing aircraft to be outside runway safety area & object free area	considerable impact including filling in wetlands; if paired with R2 or R3, see associated implications	very high construction cost in Kotzebue Lagoon; if paired with R2 or R3, see associated issues: \$15 million (w/o R2 or R3 extension)	highly desired by airport users to reduce delay

\* The scarce availability and high cost of fill materials impacts most development projects.

## EXHIBIT 5-11 (CONT'D)

AIRPORT COMPONENT	Operational Feasibility	Environmental Implications	Financial/Technical Feasibility*	Public/User Acceptance
<b>General Aviation</b>				
G1 - No action	not in compliance w/ FAA design stds; aircraft parking now restricts aircraft size on R17-35 and obstructs airspace	no change	no capital cost	generally acceptable
G2 - NW tiedown area	complies with design stds & airspace protection; allows Group II aircraft on R17-35; convenient to FSS reasonably close to terminal area	considerable impact including disturbing archaeological resources & filling wetlands	high cost; requires land acquisition; \$3 million	there were concerns about salt spray and this eliminates future use of Isaac Lake as float pond
G3 - NE tiedown area	complies with design stds & airspace protection; allows Group II aircraft on R17-35; reasonably close to terminal area; close to existing facilities adjacent to 17-35	considerable impact including filling wetlands & disturbing habitat	high cost; \$2 million	generally acceptable
G4 - E tiedown area	complies with design stds & airspace protection; allows Group II aircraft on R17-35; close to existing facilities adjacent to 17-35	moderate impact including filling openwater wetlands	high cost; \$2 million	generally acceptable
G5 - SW tiedown area	complies with design stds & airspace protection; allows Group II aircraft on Runway 17-35; farthest from terminal area facilities	considerable impact including disturbing archaeological resources & rare plant species	moderate cost; requires taxiway across sewage lagoon; \$1 million	there were concerns about salt spray

**EXHIBIT 5-11 (CONT'D)**

<b>AIRPORT COMPONENT</b>	<b>Operational Feasibility</b>	<b>Environmental Implications</b>	<b>Financial/Technical Feasibility*</b>	<b>Public/User Acceptance</b>
<b>Float Pond Facilities</b>				
FP1 - No action	no change; all operations in Lagoon; Isaac Lake no longer available	no change	no capital cost	unacceptable to floatplane operators
FP2 - Isaac Lake	fresh water; no tidal action, but strong crosswinds at times; traffic pattern parallel to 17-35; heavy loads would still have to operate from the lagoon	minimal impact	requires land acquisition, use agreement, or easement; \$94,000**	generally acceptable
FP3 - Kotzebue Lagoon	saltwater, tidal action; flexibility in crosswinds, but increased airspace conflict potential	minimal impact	dock needed to account for tide action; \$590,000	generally acceptable
<b>Terminal Area</b>				
T1 - No action	fuel and large aircraft parking penetrate protected airspace/object free area; does not meet future demand, apron congestion will worsen	no change	no capital cost	acceptable to no-growth advocates; but lost opportunities for community's economic development; inconvenience of overcrowded facilities

\* The scarce availability and high cost of fill materials impacts most development projects.

\*\* Initial estimate only; will require appraisal and negotiation.

## EXHIBIT 5-11 (CONT'D)

AIRPORT COMPONENT	Operational Feasibility	Environmental Implications	Financial/Technical Feasibility*	Public/User Acceptance
<b>Terminal Area (cont'd)</b>				
T2 - Multi-use terminal	complies w/ airspace protection & object free area; incorporates GA transients; land use & ops efficiency from consolidated terminal functions/fewer lease lots, but individual carrier activities split between terminal & lease lot; flexible & expandable	apron expansion fills wetlands; disturbs fishing area	high capital cost; requires terminal sponsorship; financing difficulty; loss of carrier investment; \$14 million	high passenger convenience acceptance; low airport operator acceptance; gateway image w/ improved access
T3 - Lease lot expansion & large aircraft parking	complies w/ airspace protection & object free area; provides shared vehicle parking for passengers; potential for consolidated cargo terminal	low impact	moderate cost; \$2 million	generally acceptable
T4 - Lease lot expansion	object free area cleared, but large parked aircraft penetrate airspace; minimal disruption of existing leases & facilities; no reduction of apron congestion	low impact	moderate cost; \$2 million	generally acceptable

## 5.5 SELECTION OF PREFERRED DEVELOPMENT PLAN

The results of the alternatives evaluation served as a basis for selection of a preferred development plan for the Kotzebue Airport (Exhibit 5-12).

The following airport and airport component alternatives for the future development of Kotzebue's airport have been selected. The selections resulted from comments made during the public meeting held September 16, 1997 in Kotzebue and from DOT&PF, FAA, City, Borough, and air carrier comments. Alternative selections were also influenced by the constraint of an assumed budget of about \$30 million (1998 dollars) over the 20-year planning period.

*General Airport: A4 - Airport Relocation (more than 20 years in the future)*

The existing airport property has sufficient capacity for the projected 2018 aviation demand. However, improving the existing airport so that it complies with FAA design standards would approximate the cost of a new airport. With these costly improvements, the existing airport would still not provide the long-range future expansion capability that a different, less constrained airport site would. Moreover, a new airport site would allow development of a multi-use terminal and tee hangars, better separation of large and small aircraft, and better navigational aids. Land south of the Air Force radar facility is the best site within the city limits for an airport with a primary runway up to 10,000 feet long. This land should be reserved for construction of a new airport when it becomes economically feasible.

Airport relocation may not be economically feasible for many years. Meanwhile, the existing airport must be maintained and improved to adequately serve the community. The following development alternatives for the existing airport are those that will provide the most benefit for their cost, considering the eventual airport relocation.

*Primary Runway: R1 - No Action*

The expense of complying with FAA design standards for runway safety areas at Kotzebue Airport is prohibitive. An FAA deviation allows current operation within the existing runway safety areas.

*Taxiway: TW2 - Full Length Parallel Taxiway for Runway 8-26 (in two phases in the long-term future)*

Runway usage currently exceeds the FAA's recommended threshold of 20,000 annual operations for a parallel taxiway, and aircraft operations are projected to increase more than 50% in the next 20 years. However, due to the expense (\$15 million), this improvement will not likely be affordable within 20 years. Also, before such a large investment in the existing airport is made, the feasibility and timing of airport relocation should also be reevaluated. A parallel taxiway should remain on the Airport Layout Plan, justifying it for Airport Improvement Program funding in case its priority should rise or funding become available. To improve its financial feasibility, the parallel taxiway should be programmed in two phases. Most operators on Runway 8-26 do not need the full 5,900-foot runway length. The first phase of parallel taxiway extension could serve 4,000 feet of the runway at about half the cost of serving the full runway length. In addition, the connecting taxiway between runway 17/35 and runway 8/26 would be relocated out of the runway 17/35 RPZ.

*General Aviation: G3 Modified - Tiedowns in Northeast Area (in two phases)*

The existing tiedown area west of Runway 17-35 should be relocated outside the runway object free area (OFA) for Group II. The preferred alternative locates GA south of the existing National Guard Hangar to maintain required line-of-sight between the runways.



Due to the high cost, the access road parallel to and east of Runway 17-35 will not be relocated and will continue to penetrate the runway OFA and Part 77 surface. However, road usage will be more limited, once the BIA hillside road provides the public an alternate route to areas south of the airport.

Other revisions to Alternative G3 will reduce the financial impact by reconfiguring the tiedown area so that it takes less land fill to construct and by dividing tiedown construction into two phases. The tiedown area will be narrower and longer, to minimize fill in the lagoon. The USF&WS and National Guard leases will be ended, and facilities removed, by the time of lease expiration to accommodate line-of-sight requirements.

Note that the new tiedown area is to the east of Runway 17-35, while the current tiedown facilities are along the west side of Runway 17-35.

*Float Pond: FP2 - Isaac Lake and FP3 - Lagoon (modified)*

The user preference is Isaac Lake, after completion of KIC's dewatering and gravel extraction. For strong crosswinds or when a plane's load requires more takeoff distance than available in Isaac Lake, the lagoon should still be accessible to floatplanes. This might be best accomplished by a ramp in the vicinity of the new GA tiedown area. Mooring/parking of floatplanes should be along the shores of Isaac Lake, rather than at an expensive floatplane dock on the lagoon.

*Terminal Area: T3 Modified - Lease Lot Expansion with Large Aircraft Parking*

Eventual relocation of large jet aircraft to the east end of the terminal apron will reduce apron congestion and eliminate Part 77 airspace penetrations by large jet aircraft parked at the Alaska Airlines and FBX facilities. Buildings on existing lease lots in Block 1 (Lots K, L, M) and Block 2 (Lots 1, 2, 3, and 4) must be demolished or moved to realize the ultimate terminal plan. However, demolition or relocation may not occur until the existing leases expire (2000 in Block 1 and 2015 in Block 2) and demand for additional lease lots warrants the action. The terminal lease lot expansion will be programmed in two phases; the north, undeveloped half will be the first phase and the south half will be programmed as existing leases become available. Existing leaseholders operating or serving large jets on the west end of the apron need not be pressured to relocate. The three proposed lease lots fronting the apron should be reserved for large jet operators, new or relocated. Until demand for the new lease lots occurs, the area can be used for GA tiedowns, allowing postponement of the costly construction of new GA tiedowns on fill in the lagoon.

It is envisioned that a joint-use cargo terminal would occupy the eastern large jet lease lot. (One cargo handler, FBX, serves more than one all-cargo carrier now, suggesting the feasibility of a future joint-use cargo terminal.) DOT&PF should encourage private development and operation of a cargo terminal.



Unlike T3, the Aircraft Rescue and Firefighting Facility (ARFF) should be combined with the Snow Removal Equipment (SRE) building. This DOT&PF ARFF/SRE building should be sited at the east end of the apron area where it has immediate access to the airfield. The existing DOT&PF location would serve well for housing fuel trucks, which now occupy a building that will be demolished or moved.

As in T3 the terminal apron will be expanded southward and the fueling facility relocated to the west end of the apron.

If, or when, FAA decides to rebuild their FSS in Kotzebue, they should choose a location that can best serve aviation in general, and GA in particular. Locating the FSS in an upper floor of the DOT&PF building is an option that has merit for several reasons, and the new DOT&PF building location would provide a clear view of all parts of the airfield from the FSS.

The National Weather Service (NWS) prefers to continue to be located with the FSS. Care should be taken to ensure that any new location for the NWS provides adequate open area for the release of weather balloons.

The details of the preferred development plan will be refined and illustrated in a set of drawings referred to as an airport layout plan (ALP) set. The ALP set will show the existing conditions as well as the proposed development for the Airport. An overview of possible environmental impacts will also be prepared. The last task in the airport master planning process is the implementation plan which outlines the phased development for the preferred development plan and associated cost estimates.

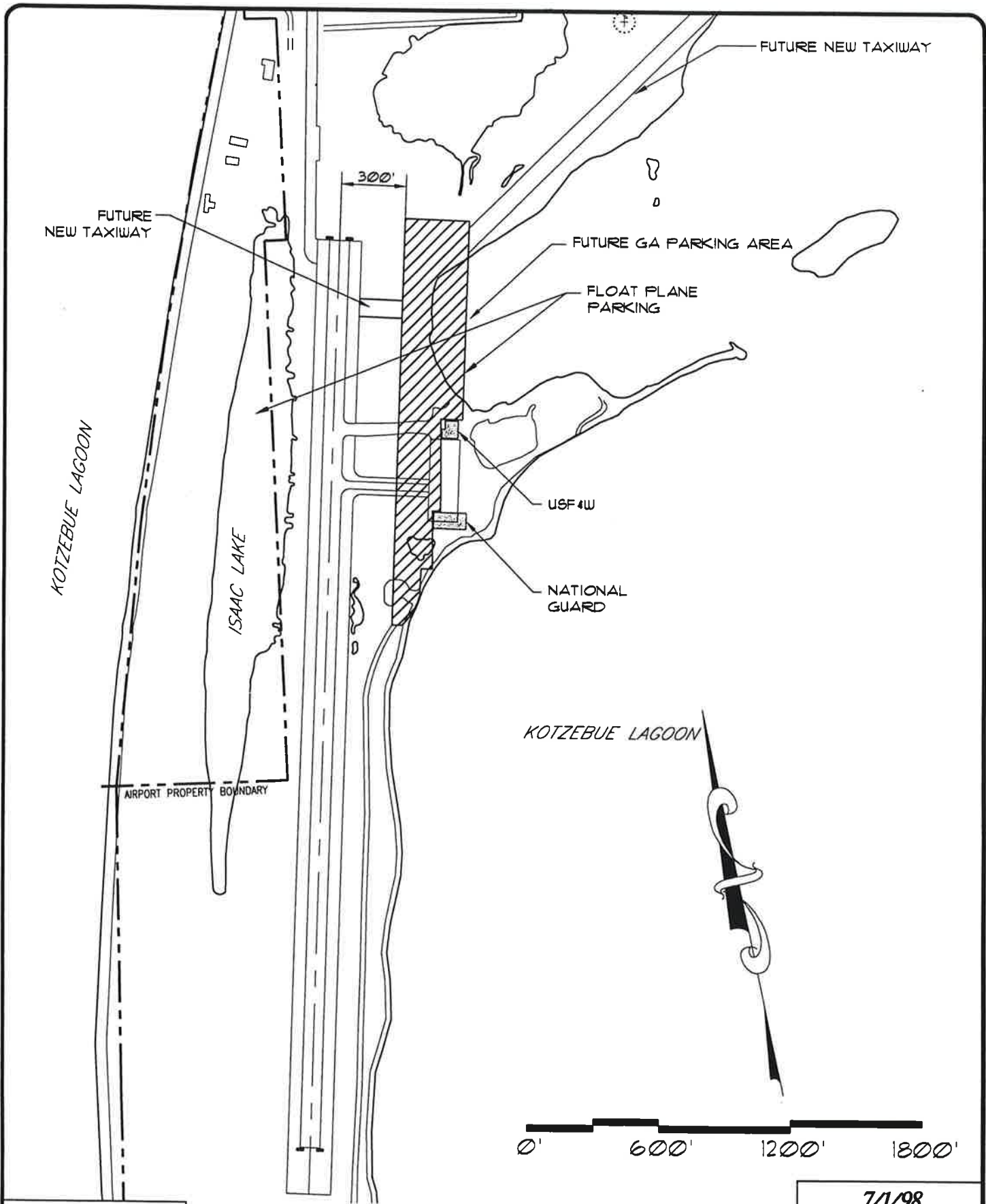


EXHIBIT 5-12

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**RALPH WIEN MEMORIAL AIRPORT**  
 KOTZEBUE, ALASKA  
**GENERAL AVIATION DEVELOPMENT PLAN**

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STATE OF ALASKA  
 DEPARTMENT OF TRANSPORTATION AND PUBLIC FACILITIES

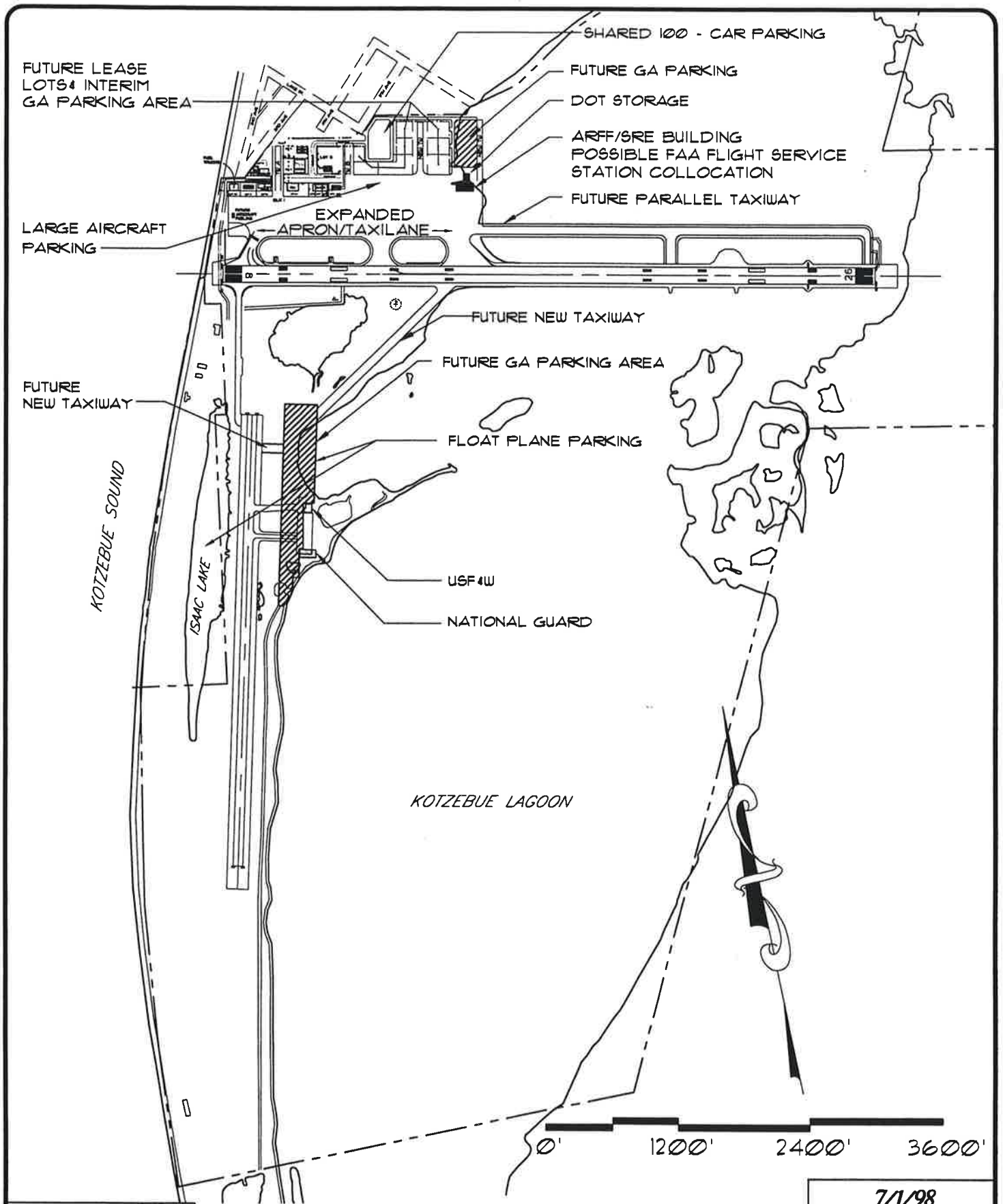


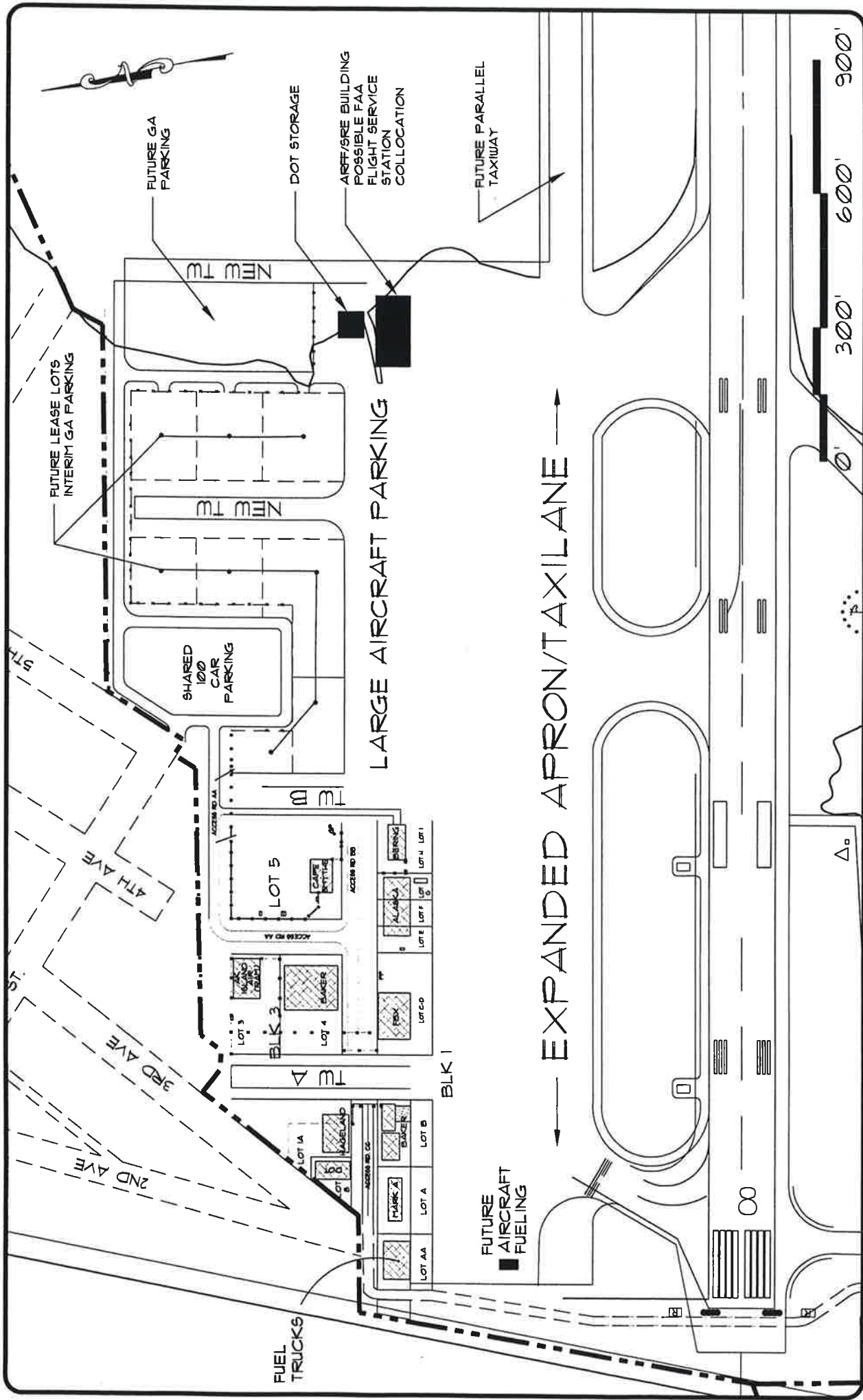
EXHIBIT 5-13

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**RALPH WIEN MEMORIAL AIRPORT**  
KOTZEBUE, ALASKA  
**PREFERRED DEVELOPMENT PLAN**

STATE OF ALASKA  
DEPARTMENT OF TRANSPORTATION AND PUBLIC FACILITIES



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**RALPH WIEN MEMORIAL AIRPORT**  
KOTZEBUE, ALASKA  
**TERMINAL AREA DEVELOPMENT PLAN**

STATE OF ALASKA  
DEPARTMENT OF TRANSPORTATION AND PUBLIC FACILITIES

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EXHIBIT 5-14



## 6.1 INTRODUCTION

The purposes of this chapter are: 1) to evaluate existing environmental conditions at Kotzebue Airport and vicinity in Kotzebue, Alaska, 2) to describe the potential impacts the proposed changes at the airport would have on the environment, and 3) consider what role environmental conditions may have on future airport development. Potential impacts identified for the No Action and preferred alternatives are found within this section; a discussion of the potential impacts for all component alternatives is on file with the ADOT&PF.

The preferred alternative is consistent with the community's expressed needs which comprise several components and are described in Chapter 5. The component alternatives which comprise the airport preferred alternative are: Runway 8-26 as it currently exists, a full length taxiway parallel to Runway 8-26 (long-term), a new general aviation tie down area (medium-term), development of a floatplane facility at Isaac Lake (short-term) and continued use of Kotzebue Lagoon, expansion of terminal area apron and lease lots (short/long-term), and removal of two islands in Kotzebue Lagoon.

Accomplishment of the preferred alternative components will require permits from federal, state, and local agencies. The following is a preliminary list of permits that this alternative may require:

- Corps of Engineers, Section 404 permit
- Alaska Department of Environmental Conservation, Section 401 Water Quality Certification
- Environmental Protection Agency, National Pollution Discharge Elimination System permit
- State of Alaska and Northwest Arctic Borough Coastal Zone Consistency Determination
- City of Kotzebue building permits and other authorizations
- Northwest Arctic Borough local planning authority approval
- Alaska Department of Fish and Game Title 16 permit

A State of Alaska Coastal Project questionnaire will be completed for each phase of development. Review of the questionnaire will identify permits required for each project. In addition, it is likely that construction of components of the preferred alternative may require a hazardous materials site assessment, a determination of archeological importance by the State Historic Preservation Officer, and a determination as to whether the projects fall within the purview of Department of Transportation, Section 4(f).

The preferred alternative is expected to be developed in phases over 20 years (contingent on available funding). This environmental overview represents a preliminary analysis of environmental sensitivities and constraints which could affect airport improvement. It is intended to lay the foundation for environmental work which may be required in connection with the components of the preferred alternative and other future projects. Some proposed airport improvements may require NEPA documentation, either environmental assessments (EA) or environmental impact statements (EIS). According to FAA guidelines, all proposed actions which are not categorically excluded require an environmental assessment. The EA is used to determine whether potential impacts appear to be significant. If the potential impacts are significant, an EIS is required.

Generally, actions such as issuance of grants, retirement of bonds, repair work, acquisition of private parcels within airport boundaries, landscaping, and acquisition of snow removal equipment, etc. are not subject to preparation of an EA. Following the FAA guidelines, it appears that most of the activities associated with accomplishment of the preferred alternative would require an EA. This would include anything that would involve wetland fills such as expansion of the terminal, the new general aviation (GA) tiedown area, and construction of the parallel taxiway. Acquisition of Isaac Lake, equipment purchase, and construction of some facilities which do not involve wetland fills may not require an EA. It is expected that some activities, which are outside the scope of this document, such as hill obstruction removal for an extension of Runway 8-26 and airport relocation, would require at least an EA and possibly an EIS.

## **6.2 NOISE**

While aircraft noise contours were not plotted for current 1995 activity (60,000 annual operations), contours were prepared during the original master planning effort using 1985 activity (45,700 annual aircraft operations). The result showed the 65 Ldn well within the airport property. The 55 and 60 Ldn were actually plotted on a drawing of the airport area. Additional discussion of noise and a geographical depiction of the 1985 noise contours is included in Section 8.4.2 of Chapter 8, Land Use. The updated forecasts indicate there is no need for a new noise study.

Existing noise conditions at the airport would change without development due to increasing aviation demand.

The No Action alternative is similar to the preferred alternative as discussed below, but the No Action would not reactivate floatplane operations on Isaac Lake (which make up a small percentage of total GA operations). Float planes would continue to operate off the lagoon; effects on adjacent noise levels is expected to be negligible.

The preferred alternative does not propose to alter the runway system configuration nor utilization patterns with the exception of reactivating Isaac Lake floatplane operations. Therefore, the projected increase in aircraft operations will continue to generally follow the current flight patterns.

## **6.3 CLIMATIC CONDITIONS**

Kotzebue's climate is influenced by its proximity to the Chukchi Sea. The area experiences frequent storms between October and April and cool summers. Less than 20 inches of precipitation falls annually, including 50 to 60 inches of snow. Surface winds are strong and persistent, averaging 10 to 15 knots throughout the year. Calm conditions occur less than 15 percent of the time. Freeze up generally occurs between early October and early November; breakup occurs usually in mid-May, although it may occur as late as early June. During mid-winter, there are two to three hours of daylight; in the summer, it is light for 24 hours per day.



## 6.4 LAND USE AND OWNERSHIP

The Kotzebue Airport is owned and maintained by the ADOT&PF. Airport lands encompass 1,805 acres south of the City of Kotzebue. The boundary of the property includes shoreline of Kotzebue Sound to the west, a large part of Kotzebue Lagoon to the east, and part of Isaac Lake. Within airport boundaries, there are parcels owned by Kikiktagruk Inupiat Corporation (west side including part of Isaac Lake) and FAA (west side, north of KIC property).

Lands within the airport boundary are occupied by Runway 8-26 and crosswind Runway 17-35 as well as taxiways, aprons, lease lots, the City sewage lagoon, National Guard facility, ADOT&PF facilities, and roads. The beach area to the west of the airport is used by local residents as an access route to the south and as a boat launch area. Tent camps have been established here for many years, particularly for subsistence setnetting for chum salmon. Dog teams have also been staked out in the area. In the past, fish buying stations had been established at the west end of Runway 8-26, but recently the area has been closed to fish buyers. Isaac Lake, which was formerly used for floatplane operations, has been partially drained and is currently being used as a gravel source.

Present conditions at the airport would be retained under the No Action alternative.

The current runway is constructed on a wetland fill within a coastal zone; an action which is not considered a compatible coastal zone land use and, as such, requires a review and permitting process. The airport forms a barrier to development of the City to the south. The preferred alternative would require fill into Kotzebue Lagoon in order to construct a taxiway parallel to Runway 8-26. The new GA tiedown area and use of Isaac Lake for floatplanes would result in wetland fills, as would expansion of the terminal area apron and lease lots. Filling wetlands is generally not considered to be a compatible land use according to FAA guidelines and would require an EA. Other compatibility issues are discussed in Chapter 8.

It would not be necessary to move persons from their residences to accomplish the preferred alternative. However, some changes in land ownership are anticipated. Chapter 8 states that acquisition of Isaac Lake or a use permit from Kikiktagruk Inupiat Corporation would be necessary to return the lake to float pond use after gravel mining is completed.

## 6.5 SOCIOECONOMIC CONDITIONS

The City of Kotzebue is located 26 miles north of the Arctic Circle on the northwest shore of the Baldwin Peninsula on Kotzebue Sound. The City occupies a small spit of land between the Sound and Kotzebue Lagoon. Kotzebue, which is within the Northwest Arctic Borough (NAB), is the regional hub of commerce and transportation. The population of the City was approximately 2,800 in 1996. Major sources of employment in Kotzebue are government agencies, Red Dog Mine, commercial fishing, and tourism. Further information on the socioeconomic environment may be found in chapters 2 and 3 of the Master Plan Update.

Retaining the airport as it is currently configured could have some adverse effect on socioeconomic conditions in Kotzebue. No Action would result in an inability to accommodate future growth of the community and could have a dampening effect on the economy.

The preferred alternative would result in an improvement of the existing airport and would, therefore, be expected to affect the economy positively. Positive economic impacts would be expected as a result of the jobs and expenditures that would occur during airport construction and during airport operation. Direct economic impacts would occur as a result of activities at the airport itself while indirect impacts would be the result of off-site activities such as hotels, restaurants, etc. In addition, induced economic impacts would be expected to occur. These are impacts related to the circulation of money from direct and indirect sources in the economy. Economic impacts of airport improvement would be greatest at the local level, although some effects may be felt at the state level as well. The airport would continue to meet the needs of the community.

No shifts of population or unmanageable increases in demands for public services are expected to result from development of the preferred alternative or from the No Action alternative.

## **6.6 AIR QUALITY**

Kotzebue is considered to be a Class II attainment area. There are no industrial sources contributing to degradation of air quality; air quality in the Kotzebue area is considered good.

The No Action alternative would result in no change over current conditions.

All of the preferred alternative components involving construction would cause a temporary degradation in air quality during construction due to aerial suspension of particulates. Dust abatement methods would be expected to minimize degradation. Increased dust from construction would cease following completion of the project.

## **6.7 WATER QUALITY**

Sewage generated at the Kotzebue Airport is pumped to the City-owned sewage lagoon located south of Runway 17-35 within the airport boundaries. Drinking water is obtained from Devil's Lake. Most surface water runoff flows to safety areas, nearby wetlands, and Kotzebue Lagoon. Some catch basins direct the flow to the safety area between the ramp and Runway 8-26. Water from the safety area eventually reaches Kotzebue Sound. Runoff and drainage are not treated and most likely contain petroleum, petroleum products, and other hazardous materials. The Kotzebue Airport formerly used urea as a de-icer during the winter months, but switched to a product with a potassium acetate base in 1994. The new product has a lower biological oxygen demand than urea. The effects of these substances on Kotzebue Lagoon have not been quantified; effects may be localized and subject to distribution in lagoon waters.

The No Action alternative would maintain conditions as they currently exist at the airport. Runway 8-26 extends into Kotzebue Lagoon. It is likely that petroleum products and other pollutants are washed off the runway into the lagoon. There is no information regarding the amount of material which may be entering the lagoon in this manner and it is likely that the substances would be considerably diluted by the waters of the lagoon. It should be noted that empty 55-gallon barrels and other containers are present in wetlands along the shore of Kotzebue Lagoon east of the east end of Runway 8-26 within the airport's boundaries. It is not known what the barrels contained or how long

they have been in the wetlands. Neither is it known what impact the presence of the barrels and their contents may have had on the wetlands or adjacent lagoon waters. Testing may be required to determine if clean up is warranted.

The full-length parallel taxiway would involve fill within the lagoon. Placement of fill could increase siltation, sedimentation, and suspended solids. After the fill has been placed and stabilizes, this effect would diminish. However, removal of the silts and sediments would most likely be slow, as the water movement within the lagoon is not very active. Constructing the taxiway in the lagoon would provide more opportunities for pollutants to wash off into lagoon waters, although the increase over current conditions likely would be negligible. The parallel taxiway could create an area of stagnant water between the runway and taxiway fills unless provisions are made to move water in and out of the enclosure. This ponded area would also be the recipient of runoff from the runway and the taxiway and could be a collection point for pollutants.

The new GA area involves wetland fills along the shore of Kotzebue Lagoon with resultant potential for pollutants to enter the lagoon. In addition, this component of the preferred alternative involves road construction along the east side of Runway 17-35 along and through wetlands. Pollutants from the road could run off into the wetlands.

Use of Isaac Lake, as a floatplane pond would result in introduction of petroleum products and other substances into the lake from float planes. Some usage of Kotzebue Lagoon by float planes is likely to remain even if Isaac Lake is altered to accommodate them, with resultant continuing pollution of the lagoon. Dilution of the pollutants should protect the lagoon as a whole, but local effects could be expected. Because Isaac Lake is a much smaller water body than the lagoon, the dilution factor would be much smaller and the concentration of pollutants would be greater with this component alternative. However, the net effect could still be minor. More detailed studies would be required for future environmental evaluations.

Expansion of the terminal area apron and lease lots would have less potential for water quality degradation because only minor fill is anticipated into Kotzebue Lagoon. However, since terminal area expansion involves large aircraft parking on the east side of the airport, there is some possibility of substances from the aircraft washing into the adjacent lake. Fill into wetlands would be required for terminal area expansion with the resultant potential for pollution of remaining wetlands.

Construction of the preferred alternative components carry the potential for increased siltation and sedimentation. Development of the preferred alternative would result in increased impervious area at the airport which in turn would increase water pollution potential due to collection and treatment and/or other mitigative measures. The amount of existing water quality degradation and additional degradation which would be expected as a result of the development of the preferred alternative should be studied in more detail in future environmental evaluations.

## **6.8 DEPARTMENT OF TRANSPORTATION ACT, SECTION 4(F)**

Section 4(f) lands include public parks, recreation areas, wildlife or waterfowl refuges, and, if determined by officials having jurisdiction, areas of historical and/or archeological importance. The

City of Kotzebue contains a park/playground and cemetery a few blocks north of the airport. In addition, most of the area occupied by the City of Kotzebue and environs is designated as the Kotzebue Archeological District in view of its archeological resources.

There are no state parks, wildlife refuges, sanctuaries, or designated critical habitat area near Kotzebue. The next nearest land which falls under the purview of Section 4(f) is the Cape Krusenstern National Monument, the southern boundary of which lies approximately 10 miles to the northwest of Kotzebue. Other Section 4(f) lands in the Northwest Arctic Borough include the Noatak Preserve, Gates of the Arctic National Park and Preserve, the Bering Land Bridge National Preserve, and the Selawik National Wildlife Refuge.

The No Action alternative would result in no change over current conditions.

The preferred alternative would have no effects on parks, wildlife or waterfowl refuges or designated recreation areas. However, most of the area occupied by the City of Kotzebue and environs is designated as the Kotzebue Archeological District in view of its important archeological resources. A determination of significance and inclusion under Section 4(f) would be needed before construction of any of the preferred development plan could be accomplished.

## **6.9 HISTORIC, ARCHITECTURAL, ARCHEOLOGICAL, AND CULTURAL RESOURCES**

The Kotzebue Airport lies entirely within the Kotzebue Archeological District which was determined eligible in 1986 for inclusion in the National Register of Historic Places. Kotzebue Spit contains several identified archeological sites; one site is located on airport property near the FAA Flight Service Station. The exact location of archeological sites is not released in order to protect the resources; however, the entire beach area along Kotzebue Sound is considered to have high potential for archeological resources.

No development would occur at the Kotzebue Airport under the No Action alternative. Therefore, no further impacts would be expected to historic, architectural, archeological, or cultural resources.

The Kotzebue Archeological District covers most of the area occupied by the City of Kotzebue and the airport. Before components of the preferred alternative could be built, it would be necessary to determine the potential effect on archeological resources. The components of the preferred alternative, with the exception of the runway, could have some potential for affecting archeological resources. A cultural survey would be required before construction.

## **6.10 BIOTIC COMMUNITIES**

### **6.10.1 VEGETATION AND TERRESTRIAL HABITATS**

The airport is located on a low, sandy-gravelly spit which runs north-south between Kotzebue Lagoon and Kotzebue Sound. The coastline to the west of the airport is a beach area; further south, the coastline is characterized by bluffs. Kotzebue Lagoon lies between the spit where the airport is located and the 80 to 100 ft bluffs to the east on the Baldwin Peninsula.



The area encompassed by the Kotzebue Airport is characterized by willow heath communities and unvegetated areas. Much of the area has been disturbed by construction and operation of the airport and ancillary facilities, roads, solid waste disposal, sewage lagoon, and gravel mining activities. Plant species found in the area include Oxytropis arctica var. barnebyana (a candidate for threatened or endangered status) which has been the object of continuing research to determine the health and extent of its population (Section 6.10).

The area to the west of Runway 17-35 is an old beach ridge which is sparsely vegetated with low willows. The oxytrope is found in this habitat. Moving away from the beach to the east, areas not occupied by gravel pads are characterized by low willows, crowberry, cranberry, and labrador tea. Along the margins of Kotzebue Lagoon and the small ponds and lakes near 17-35, where the habitat is more moist, vegetation such as grasses, forbs, and sedges are found along with willows.

Soils in the area consist of sands, silts, gravels, and organic materials. Near Isaac Lake, soils are organic material and silt in the upper six inches and sandy gravel to seven to 10 feet. Below this layer are fine sand and silt to about 14 feet. At the east end of Runway 8-26, test holes showed silts with traces of sand and organic materials to 14 feet. Permafrost in the Kotzebue area is continuous.

Erosion occurs on the beaches west of the airport mainly due to ice action and storm-generated waves. In the past, a number of erosion control projects have attempted to minimize erosion near the city. These have been successful to varying degrees.

The No Action alternative would result in no change to current conditions.

The runway component involves no new construction and would, therefore, have no effect beyond existing conditions on vegetation and terrestrial habitats. Components involving new construction would affect upland habitats; however, all construction would occur in areas which, to varying extents, have been affected by previous disturbance. The parallel taxiway would have little if any effect on terrestrial habitats. The new GA tiedown area and connecting taxiway would affect upland habitats and vegetation, i.e., removal of grasses, forbs, and sedges along Kotzebue Lagoon. The terminal area expansion would affect upland vegetation, also, but this component is located in an area of previous disturbance. The disposal site for material dredged during this land removal has not been determined; some amount of upland habitat could be affected. This concern should be addressed when more detailed design information becomes available.

### **6.10.2 FISH AND AQUATIC AND MARINE HABITATS**

The Kotzebue Airport is bounded on the east by Kotzebue Lagoon, a large brackish water body and on the west by Kotzebue Sound. Within the confines of the airport are several ponds and Isaac Lake. Isaac Lake has been partially dewatered in the past few years due to a gravel mining operation. There is one stream drainage within ADOT&PF airport lands. This stream enters the lagoon immediately east of the end of Runway 8-26. There are no reports of fish inhabiting the stream. Kotzebue Lagoon is connected to Kotzebue Sound to the north. In addition, storm events periodically cause the low-lying areas to the south of the airport to be breached and ocean waters flow into the lagoon.

Marine waters of Kotzebue Sound along the City and airport are relatively shallow; e.g., large vessels

must anchor 15 miles from shore and lighter their cargo to the City. Shallow draft barges used in river transport can anchor at the Crowley docks.

Kotzebue Lagoon contains whitefish, arctic char, and, seasonally, herring, smelt, and chum salmon. The lagoon, which is normally brackish, can be nearly fresh during summers of high precipitation. Conversely, salt water from Kotzebue Sound can enter during some storm events. Offshore, commercial setnet fishermen catch chum salmon which pass Kotzebue on their way to the Kobuk and Noatak rivers. Subsistence nets are found along the beach to the west of the airport runways. Herring are found throughout Kotzebue Sound during spring and summer. Especially in early spring, herring may be present offshore of airport property in ocean waters. Local fishermen take tom cod in the lagoon by jigging through the ice in winter.

The No Action alternative would result in no change to existing conditions.

The runway component would result in no change to existing conditions. The runway is built on a fill across Kotzebue Lagoon, bisecting the lagoon except for a small area at the east end where water is allowed to move freely between the north and south portions of the lagoon. It is not known what effect this causeway has had on fish use of the lagoon. This component would maintain the existing causeway; the parallel taxiway would result in construction of another fill to the north of the existing runway.

In addition to the fill for the parallel taxiway, fill for the lease lot expansion would be required on the west shore of the lagoon to the north of the present runway. Local fishermen fish from the shore and offshore in this area. Fishing and access to fishing would be affected to some extent by the fills. Fish habitat and open water would be lost under the footprint of the fills and fish would be excluded from the area between the taxiway and existing runway. Regardless of how the airport may be improved in the future, fishermen may be excluded from some shoreline fishing areas due to security concerns. Fish habitat may also be affected by sedimentation from placement of fills into the water and by pollutants draining into the water. The extent of these impacts needs to be studied in detail in future environmental analyses.

The preferred alternative includes removal by dredging of two islands to the south of the existing runway to eliminate bird habitat in order to reduce the hazard of bird strikes. Dredging would involve operation of equipment in the waters of the lagoon and disposal of the dredged material. There is no information at this time regarding the amount of material to be dredged or its ultimate disposal. The dredging operation itself could produce silt and sediment in the lagoon and, depending upon the timing of the operation, could disrupt use of the lagoon by fish and fishermen. Once the islands have been removed, the result would be an additional 9.5 acres of underwater habitat.

The new GA tiedown area and terminal area expansion requires fill into Kotzebue Lagoon (less than 2% of total lagoon area), and some fish habitat would be lost due to these fills. The boundaries of the GA tiedown area fill could be adjusted to avoid adverse impacts to both the pond itself and its outlet. Effects of the proposed fills on fish and fish habitats could be studied in more detail in future environment evaluations. In addition to the impacts of the fill, pollutants could affect local use of waters near the dock and ramp area. Use of Isaac Lake as a floatpond would not be expected to affect fish as the lake is not categorized as fish habitat.



### 6.10.3 WETLANDS

Wetlands within or adjacent to the Kotzebue Airport consist primarily of open water areas and saltwater marshes along the margins of Kotzebue Lagoon and the ponds to the west of the lagoon. These marshes are characterized by brackish ponds with emergent vegetation. Sedges, including cottongrass and pendent grass, are found along the shores.

The National Wetlands Inventory maps prepared by the U.S. Fish and Wildlife Service (USFWS) designate Isaac Lake as "Lacustrine Limnetic-Unconsolidated Bottom, Permanently Flooded and Excavated" (i.e., fresh, open water wetlands). Kotzebue Lagoon is considered to be "Estuarine Subtidal-Unconsolidated Bottom" (i.e., brackish lagoon). This designation is also given to the pond near the west end of Runway 8-26 north of 17-35 and the wetlands on the east side of the lagoon east of Runway 17-35. The islands proposed for removal are considered to be estuarine wetlands of a slightly different type: irregularly flooded wetlands with persistent emergent vegetation. This designation recognizes that they are slightly higher (but still low-lying) lands within an estuarine wetland and, although usually fairly dry, are subject to flooding often enough to be considered wetlands themselves. Most of the other wetlands along the margin of the lagoon in the vicinity of the airport are designated "Palustrine-Emergent, Shrub-Scrub, Persistent, Saturated" (i.e., swamp).

Activities at the Kotzebue Airport have had effects on wetlands in the past. The No Action alternative would result in no change to existing conditions.

With the exception of the existing runway, all of the components of the preferred alternative would require fills into wetlands. The parallel taxiway requires a fill of approximately 13 acres into Kotzebue Lagoon, an estuarine wetland. The new GA tiedown area would require approximately 11 acres of fill into palustrine wetlands and into Kotzebue Lagoon. Use of Isaac Lake for float planes would most likely involve some reconfiguration of the lake; some fill may be required, but the net result would be an increase in the size of the lake. Terminal area expansion would require approximately nine acres of fill into estuarine wetlands.

A more detailed study of the effects of these fills on local wetland systems should be undertaken in future environmental evaluations. This study would be included in any Corps of Engineers permitting process. The same would apply to the dredging of the two islands. Mitigation strategies can be created when more detailed designs of the preferred alternative components has occurred.

### 6.10.4 WILDLIFE

The area included in the Kotzebue Airport is inhabited by various small mammals such as red-backed and meadow voles and arctic ground squirrels. In the winter, red foxes and, occasionally, arctic foxes may be seen in the area. Although large mammals are not usually found on airport property, occasionally solitary caribou wander into the area. Rarely, individual muskoxen have been seen at the Kotzebue Airport. These animals are always bulls and have been seen in the area only during the fall.

Kotzebue Sound is within the range of a number of marine mammal species. The most common marine mammals seen near the City and airport are spotted seals and beluga whales. Spotted seals

are year-round residents and are harvested by local residents, whereas beluga whales migrate through Kotzebue Sound on their way to northern waters in the spring and to the south in the fall. Spotted seals have occasionally hauled out on the airport ramp according to airport employees. There have been reports of gray whales moving into Kotzebue Sound near Kotzebue, but this species is usually found further to the west in the waters of the Chukchi Sea.

Kotzebue Lagoon is an important spring and fall staging area for ducks and shorebirds migrating through the area. Although concentrations of birds are greatest in the spring and fall during migration, large numbers of birds nest in the lagoon area. Ducks found in the lagoon include scaup, northern pintail, northern shoveler, teal, mallard, widgeon, and, occasionally, canvasback. Tundra swans and geese migrate through the area, but do not regularly use Kotzebue Lagoon.

Willow ptarmigan are abundant in tundra areas near Kotzebue. Pomarine, long-tailed, and parasitic jaegers are present along the beach. Shorebirds observed in the area include semipalmated plover, snipe, golden plover, western sandpiper, semipalmated sandpiper, dunlin, and northern phalarope.

Glaucous gulls, glaucous-winged gulls, black-legged kittiwakes, and ravens are the most common residents at the airport and present a constant control problem for airport personnel. Gulls nest regularly on the islands south of the existing runway. Arctic terns are also present in the area. Short-eared owls are seen, especially in the winter, hunting for voles. There are also large numbers of passerine species that summer in the Kotzebue area including robin, gray-cheeked thrush, yellow wagtail, yellow warbler, hoary redpoll, savannah sparrow, white-crowned sparrow, lapland longspur, and bluethroat, the latter species being relatively uncommon on the mainland of Alaska. USFWS and National Park Service personnel are involved in passerine studies in the Kotzebue area.

The No Action Alternative would maintain existing conditions at the Kotzebue Airport.

None of the components would result in significant adverse effects on terrestrial mammals or their habitats. Some small mammals such as arctic ground squirrels and voles may be disturbed or displaced during construction, but are expected to re-colonize during operations. Most of the development associated with the various components would take place on or near previously disturbed areas which are not considered prime wildlife habitat. The preferred alternative does not call for construction in areas occupied by marine mammals.

Construction of the new GA tiedown area and terminal area expansion could result in disruption and displacement of birds in the immediate vicinity; however, construction of these components all take place in areas which have been previously disturbed to varying degrees and which do not represent critical bird habitat. Once construction is complete, it is expected that displaced individuals would return. Timing activities to avoid the nesting season could minimize any local impacts from construction. Developing Isaac Lake to accommodate floatplane traffic could also encourage use of the lake by waterfowl. Waterfowl are currently common in the wetlands, ponds, and lakes surrounding Isaac Lake.

Dredging the islands south of the airport would remove heavily-used gull nesting habitat within Kotzebue Lagoon. The effect on the gull population in the Kotzebue area should be considered in more detail in future environmental evaluations. None of the other components is expected to have

significant effects on birds which occupy the Kotzebue area.

### 6.11 ENDANGERED AND THREATENED SPECIES

There are no endangered species of mammals or birds which inhabit the area of the Kotzebue Airport. The plant species Oxytropis arctica var. barnebyana has been a candidate species and is the subject of ongoing research. The oxytrope is found along the beach ridge to the west of Runway 17-35 from approximately Isaac Lake to south of the sewage lagoon. The plant prefers open habitats with sandy-gravelly substrates. It is also found in other parts of the Kotzebue area including on gravel pads which were formerly occupied by Air Force facilities south of the airport. However, the largest portion of the population is located on ADOT&PF lands at the airport. A survey in 1995 by Bureau of Land Management (BLM) and USFWS personnel found approximately 8,700 plants in the Kotzebue area; 5,300 of which were on ADOT&PF property. Studies were carried out in the summer of 1997 to determine whether a population of the plant at the Squirrel River is genetically related to those found in Kotzebue, but the results of this study are not yet known.

The No Action alternative would maintain existing conditions.

No endangered or threatened species of flora or fauna would be affected by any of the components. None of the components as currently proposed are expected to have a significant effect on the candidate plant species, Oxytropis arctica var. barnebyana.

### 6.12 FLOODPLAINS

The elevation of the Kotzebue Airport is approximately 11 feet; Runway 8-26 varies between 7.1 and 10.7 feet above mean sea level. The 100-year flood elevation is 10.0 feet. Local residents report that the "elephant ear" at the eastern end of Runway 8-26, which is on a fill within Kotzebue Lagoon, is flooded during high-water events about every two to three years. A flood event in 1990 inundated parts of the City of Kotzebue as well as a good portion of Runway 8-26. There are no reports of other airport facilities being flooded. It is likely that most of the airport would be considered to be within "the area subject to a one percent or greater chance of flooding in any given year" (Executive Order 11988). Floodplain mapping by the Federal Emergency Management Agency in 1983 excludes portions of the airport from the 100-year floodplain; however, Army Corps of Engineers personnel suggest that flood events in recent years indicate that these maps may need to be updated.

The No Action alternative would maintain existing conditions. It is likely that portions of the airport lie within the 100-year flood zone; the No Action alternative would not change this.

It is likely that the components of the preferred alternative proposed for the airport would fall within the 100-year flood zone. This may be particularly true for the parallel taxiway and the new GA tiedown area since both components involve fills into Kotzebue Lagoon. Executive Order 11988 directs federal agencies to reduce risk of flood loss and minimize impacts on human health and safety by avoiding placement of facilities in flood plains and by instituting flood control measures for facilities which are located in floodplains. Detailed designs of proposed projects should consider the potential impact of fills on the floodplain and institute measures to mitigate any effect.

### **6.13 COASTAL ZONE MANAGEMENT PROGRAM**

A revision of the Northwest Arctic Borough Revised Coastal Management Plan (NAB CMP) was approved for distribution in 1997. As stated in the plan, the goals are to preserve subsistence values, protect the right to self-determination, allow appropriate economic development, preserve cultural and social traditions, and preserve environmental quality. The overall plan goal is to "protect and preserve the current high quality state of NAB coastal area resources in support of subsistence use thereof by the residents of the NAB." To this end, the NAB CMP has established a number of policies.

The policies of the NAB CMP apply to lands within the coastal district with the exception of federally-owned lands. These policies are in addition to CMP standards of the State of Alaska (6 AAC 80). The Ralph Wien Memorial Airport is within the designated coastal zone. Policies apply to the following factors:

- 6.3.2 Subsistence Use
- 6.3.4 Habitat and Biological Resource Protection
- 6.3.5 Historic, Prehistoric, and Archeological Resources
- 6.3.6 Air, Land, and Water Quality
- 6.3.7 Solid Waste Disposal
- 6.3.8 Geophysical Hazards
- 6.3.9 Coastal Development
- 6.3.11 Transportation and Utilities
- 6.3.13 Mining and Mineral Processing

The No Action alternative would maintain existing conditions.

All of the components of the preferred alternative would involve development within the coastal management boundary. All design and construction would be consistent with the requirements of the NAB Coastal Management Program to be permissible. Initial evaluation of the components of the preferred development plan indicates that they are permissible.

### **6.14 COASTAL BARRIERS**

The Kotzebue Airport does not fall within an area designated as a coastal barrier under the Coastal Barriers Resources Act of 1982 (PL 97-348). However, the site is considered a coastal barrier and lagoon system under the NAB CMP. See Section 6.12 for CMP policies applying to coastal barriers.



The No Action alternative would maintain existing conditions.

No federally-designated coastal barriers would be affected by any of the components of the preferred alternative. However, as a coastal barrier/lagoon system under the NAB CMP, this area is subject to coastal policies regarding barriers and lagoons, e.g., policy 6.3.4.

#### **6.15 WILD AND SCENIC RIVERS**

There are no rivers within or adjacent to the Ralph Wien Memorial Airport.

Neither the No Action nor the preferred alternative would have any effect on wild or scenic rivers.

#### **6.16 FARMLAND**

There is no farmland or potential farmland within or adjacent to the Ralph Wien Memorial Airport.

Neither the No Action nor the preferred alternative would have any effect on farmlands.

#### **6.17 LIGHT EMISSIONS**

Existing Kotzebue Airport light emissions include high intensity runway lighting (HIRL) on the primary runway, medium intensity runway lighting (MIRL) on the crosswind, and medium intensity taxiway lighting (MITL) on five of the seven existing taxiways. The aesthetic and visual impacts of the existing light emissions is minimal to the residences in the area and to vehicular traffic on surrounding roads.

Present conditions at the airport would be retained under the No Action alternative.

Additional airfield lighting proposed during the planning period (through 2018) is MITL on the partial parallel taxiway proposed for Runway 8-26. This presents an insignificant increase in light emissions. No other major changes are proposed in airfield lighting.

#### **6.18 SOLID WASTES AND HAZARDOUS MATERIALS**

The City's former solid waste site occupies six acres south of Runway 17-35. A new landfill has been developed further to the south. The old site is in the process of being closed. The airport generates only a small portion of the materials disposed of at the solid waste facility.

The only active fuel vendor at the airport is Crowley Marine Services which maintains a truck-based fueling operation.

De-icing chemicals are stored outdoors at the east end of the terminal area apron in containers which are supposedly impervious to weather.

The No Action alternative would retain existing conditions.

It is not anticipated that the preferred alternative would result in adverse impacts to solid waste and hazardous materials conditions. Construction and operation of the airport is not expected to produce significantly increased quantities of solid waste or hazardous materials. This alternative may result in positive impacts to hazardous materials with improved storage locations and facilities for fuels and other hazardous materials. It is recommended, however, that a hazardous materials site assessment be conducted prior to construction of any facilities for the preferred alternative.

The proposed quantity and type of solid waste generated by the completed airport preferred alternative is not expected to be appreciably different from current conditions. Nor would the method of collection or disposal be expected to be different.

### **6.19 CONSTRUCTION IMPACTS**

It is expected that dust and increased equipment noise would be generated by construction of the components of the preferred alternative. Dust and noise from the terminal and lease lot expansion would likely have the most impact on the community, as the location of this component is closer to the residential and business districts than are the other components. With dust abatement methods, the air quality effects should be minimized. Local bird populations may also experience noise and activity disturbance. Timing construction to avoid sensitive periods such as nesting and pre-migration congregations could reduce this expected impact. Fills into Kotzebue Lagoon should be timed to avoid seasonal fisheries use and disruption of bird populations. Erosion control methods should be employed for all fills into wetlands and the lagoon. Construction of the facilities may require transportation of materials from the Kotzebue dock through the City. Traffic is not normally a problem in Kotzebue and it is not expected that the increase due to airport construction would be significant. Some routes may experience closures or detour during construction, especially in the vicinities of the terminal and lease lot expansions and the new GA tiedown area.

During construction, the environs of the airport would be subjected to increased noise from heavy equipment. Any adverse effects would cease with completion of construction. Adverse effects during construction could be reduced by timing activities so that sleeping hours and other quiet times are not disturbed.

None of the likely impacts are expected to be significant and all will cease or be greatly reduced when construction is complete.



## REFERENCES

- Alaska Department of Community and Regional Affairs.* 1997. Kotzebue community profile. Juneau, AK.
- Alaska Department of Fish and Game.* 1986. Distribution of Freshwater Fish, Marine Fish, and Shellfish, Western and Interior Region, Vol. III. Div. of Habitat. Juneau, AK.
- Alaska Department of Fish and Game.* 1991. State of Alaska refuges, critical habitat areas, and sanctuaries. ADF&G, Habitat Division, Juneau, AK.
- Hudson, G.E.* 1957. Birds observed in the Kotzebue Sound area of Alaska during the summer of 1956. *Murrelet* 38(3): 26-29.
- Lipkin, R.* 1985. Status Report on *Oxytropis arctica* R.Br. var. *barnebyana* Welsh. Herbarium, Univ. of Alaska Museum, Fairbanks, AK.
- Murray, D.F. and R. Lipkin.* 1987. Candidate Threatened and Endangered Plants of Alaska. Univ. of Alaska Museum, Fairbanks, AK.
- Northwest Arctic Borough Planning Department and Copeland, Landye, Bennett, and Wolf, LLP.* 1997. Northwest Arctic Borough Revised Coastal Management Plan, Concept Approved Draft. April 1997. Kotzebue, AK.
- R&M Consultants, Inc.* 1993. Ralph Wien Memorial Airport runway resurfacing final design study report, AIP No. 3-02-0160-05/State Project No. 64498, Kotzebue Alaska. Prepared for ADOT/PF, Western District. Nome, AK.
- Resource Analysts, Falls Creek Environmental, and LZH Associates.* 1983. Biological Resources of the NANA Coastal Resource Service Area. Prepared for Maniilaq Association. Kotzebue, AK.
- TRA/Farr.* 1989. Ralph Wien Memorial Airport, Kotzebue, Alaska, Airport Master Plan. Prepared for ADOT/PF.
- US Fish and Wildlife Service.* 1994. National Wetlands Inventory, Kotzebue, Alaska quadrangle map, 1:100,000. Anchorage, AK.



## 7.1 INTRODUCTION

The preferred airport development alternative presented in Chapter 5 identified proposed improvements for the various airport components for the next twenty years with emphasis on the first five years. A set of airport layout plans, referred to as the ALP set, were prepared to graphically depict these proposed improvements in addition to airspace, land use, and property ownership. In order to be eligible for federal funding assistance under the Airport Improvement Program (AIP), future airport development must be shown on an approved ALP.

The completed ALP set is a separate document from this report.

Drawings developed in the ALP set for Kotzebue Airport include the following:

- Airport Layout Plan
- Terminal Area Plan
- Airspace Plan/Part 77
- Approach Surface Plan and Profiles

A brief description of the purpose of each drawing is provided on the following pages.

## 7.2 AIRPORT LAYOUT PLAN

The Kotzebue Airport ALP sheets reflect all projects recommended in the master plan through the year 2018. Proposed development presented in Chapter 5 includes terminal area expansion, a full-length parallel taxiway to Runway 8-26, a new GA aircraft parking area, and renewed use of Isaac lake for float plane operations. Chapter 9, Implementation, presents the proposed phasing of these capital improvements.

In addition to the ALP's graphic illustration of the existing and future conditions of Kotzebue Airport, pertinent data is provided on the ALP. This data is presented in the airport data table, runway data table, all-weather wind rose, deviations from standards table, and the legend. Much of this data is already illustrated directly on the drawing, but the tables, legend and wind rose present data in an orderly fashion for reference by subject. This data is also given for the existing and ultimate conditions.

The airport data table includes the following information for Kotzebue Airport: airport elevation, airport reference point (ARP) coordinates, mean maximum temperature, airport and terminal nav aids, airport reference code (ARC), airport lighting, and taxiway lighting & marking.

The ARC for Kotzebue Airport (as described earlier in Chapter 4) is C-III which indicates that the design aircraft expected to use Kotzebue Airport are in Approach Category C, and Airplane Design Group III. Due to physical constraints, two areas of the airport are designed to serve less demanding aircraft (B-II)

which are actually using those specific areas. These include crosswind Runway 17-35 and the perpendicular taxiways north of the terminal apron.

The runway data table presents the following information for both runways at Kotzebue Airport: runway end elevations and coordinates, effective runway gradient, percent wind coverage, approach category and design group, runway dimensions, runway surface, pavement strength, runway instrumentation, runway lighting, runway marking, approach aids, approach surfaces (with visibility minimums), and runway safety area (RSA) and object free area (OFA) dimensions.

The all-weather wind rose, also shown on the ALP sheet, covers wind conditions under all weather conditions. The all-weather wind rose indicates by compass sector the frequency at which winds in a given velocity range occur. Runway orientation is superimposed on the wind rose and the percentage of wind coverage for the all-weather condition is provided.

The non-standard conditions table shown on the ALP includes those airport dimensions and surfaces which are not in compliance with FAA guidelines and regulations. These conditions, also addressed in Chapter 4, include non-standard Runway 8-26 object free and safety area dimensions (width and length) and obstructions to airspace surfaces (i.e. access road, parked aircraft, fueling facility).

The ALP sheet also reflects recommended land uses for protection of the airport. Due to the importance of compatible land use development, land uses proposed for Kotzebue Airport are described in detail in Chapter 8.

### 7.3 TERMINAL AREA PLAN

The terminal area plan is an enlarged and refined plan view of the selected development configuration shown on the ALP sheet. The ultimate terminal area development will include lease lot expansion with the eventual relocation of large aircraft parking to the east end of the terminal to reduce terminal apron congestion and eliminate the existing Part 77 airspace problems associated with the tail heights of the large aircraft parked too close to the runway. As shown, certain buildings will need to be removed to accommodate the terminal area plan. Also shown is the combined location of the aircraft rescue and firefighting (ARFF) and snow removal equipment (SRE) facilities with an adjacent storage facility for deicing fluid, the relocation of the fueling facility to the west end of the apron, and a proposed area for a joint-use cargo terminal. The terminal area plan also includes development of a 100-car parking lot, which includes adequate parking for the long-term future.

### 7.4 AIRSPACE PLAN/PART 77

The Airspace Plan depicts the ultimate airspace for Kotzebue as defined by Federal Aviation Regulations (FAR) Part 77, *Objects Affecting Navigable Airspace*. The intent of these regulations is to protect the airspace and approaches to each runway from hazards that could affect the safe and efficient operation of the airport. Protection of these areas is outlined by a set of "imaginary surfaces" shown on the Airspace

**Plan.** Any penetration of these imaginary surfaces is defined as an obstruction affecting navigable airspace. Design criteria for these surfaces are determined by airport category and runway approach instrumentation. The ultimate airspace surfaces shown on the plan are the same for the existing condition as no changes to the Kotzebue runway lengths, airport category or instrumentation are planned through 2018.

The principal imaginary surfaces shown in the airspace plan include:

- Primary Surface
- Approach Surface
- Horizontal Surface
- Transitional Surface
- Conical Surface

#### **7.4.1 PRIMARY SURFACE**

The primary surface is a surface longitudinally centered on a runway. When the runway has a prepared hard surface, the primary surface extends 200 feet beyond each end of the runway. Existing and future Runway 8-26 is an instrument runway serving large aircraft with a primary surface width of 1,000 feet. Existing and future Runway 17-35 is a utility runway with visual approaches and a primary surface width of 250 feet.

#### **7.4.2 APPROACH SURFACE**

The approach surface is a surface longitudinally centered on the extended runway centerline which extends outward and upward from each end of the primary surface. Approach slope and dimensions are determined for each runway end based on the type of approach.

Runway 8's precision instrument approach dictates an approach surface horizontal length of 50,000 feet. The inner 10,000 feet is at a 50:1 slope with the remaining 40,000 feet at a 40:1 slope. The width of the approach is 1,000 feet where it meets the primary surface. The width extends to a total of 16,000 feet at the extent of the approach (50,000 feet out).

Runway 26's nonprecision instrument approach dictates an approach surface horizontal length of 10,000 feet at a 34:1 slope. The width of the approach is 1,000 feet where it meets the primary surface, and it expands uniformly to a width of 3,500 feet. Existing terrain provides only a clear 15.9:1 approach slope to runway 26.

Runway 17-35, categorized as a visual runway, requires a 20:1 approach slope out a horizontal length of 5,000 feet. The approach surface measures 250 feet at the inner edge, where it matches the primary surface for this runway, and expands uniformly to a width of 1,250 feet at its outermost point (5,000 feet out).

### **7.4.3 HORIZONTAL SURFACE**

The horizontal surface is a horizontal plane 150 feet above the established airport elevation. At Kotzebue Airport, the elevation is approximately 12 feet MSL so the horizontal surface is at an elevation of 162 feet. The plan dimensions of the horizontal surface are set forth by arcs of specified dimensions from the end of the primary surface for each runway. A tangent line connects the arcs. These arcs correspond with the approach surface length described in section 7.5.2.

### **7.4.4 TRANSITIONAL SURFACE**

The transitional surface is an imaginary surface used to join two surfaces together. This surface is an inclined plane with a slope of 7:1 extending upward and outward from the primary and approach surfaces. The transitional surface ends at its intersection with the horizontal surface or other more critical surface preceding it.

### **7.4.5 CONICAL SURFACE**

The conical surface is an inclined plane extending upward and outward from the outer boundary of the horizontal surface at a slope of 20:1 for a horizontal distance of 4,000 feet. The top of the conical surface is at a height of 350 feet above the airport elevation which is 362 feet for Kotzebue.

## **7.5 APPROACH SURFACE PLAN AND PROFILES**

The Approach Plan and Profiles Drawing provides a detailed look at the physical features near each runway's extended centerline including topography, roads, obstructions and incompatible objects in these critical areas.

A table on each runway's plan and profile drawing summarizes the existing obstructions to Kotzebue airspace and their disposition.



## 8.1 INTRODUCTION

The purpose of this land use analysis is to document the anticipated impacts of airport improvements on the land within the airport boundary, on adjacent properties, and on the community as a whole. The Land Use Plan for Ralph Wien Memorial Airport (Exhibit 8-1) adopts general FAA criteria for the use of airport property (FAA Advisory Circular 150/5070-6A, *Airport Master Plans*):

- Adherence to standards in support of safe aircraft operations.
- Non-interference with line of sight or other restrictions for navigation aids and weather equipment.
- Use of existing facilities, insofar as possible and depending on their location, condition, and obligations with respect to their use.
- Attention to factors that may affect construction cost, such as available utilities and topography.
- Flexibility in being able to accommodate changes in demand and expansion, both vertically and horizontally.
- Efficiency in ground access to the community.
- Priority accorded aeronautical activities where available land is limited.
- Encouragement of revenue producing land uses which support an aviation-oriented infrastructure.
- Flexibility of non-aeronautical uses so as to permit expansion of aeronautical facilities.

## 8.2 ON-AIRPORT LAND USE

Existing on-airport land use changes since the last master plan update include:

- Two taxiways were constructed to allow northward expansion of the terminal lease lot area.
- Isaac Lake was dewatered, ending its use for floatplane operations.
- The 3<sup>rd</sup> Battalion Army National Guard vacated its hangar.

The proposed on-airport land uses in Exhibit 8-1 are generally consistent with the recommendations of the last master plan update, although the area east of Runway 17-35 was designated for “Public Agency Use”, rather than “Noncommercial Aviation Support”. Usage of this area for general aviation is an appropriate land use and is consistent with the preferred development plan.

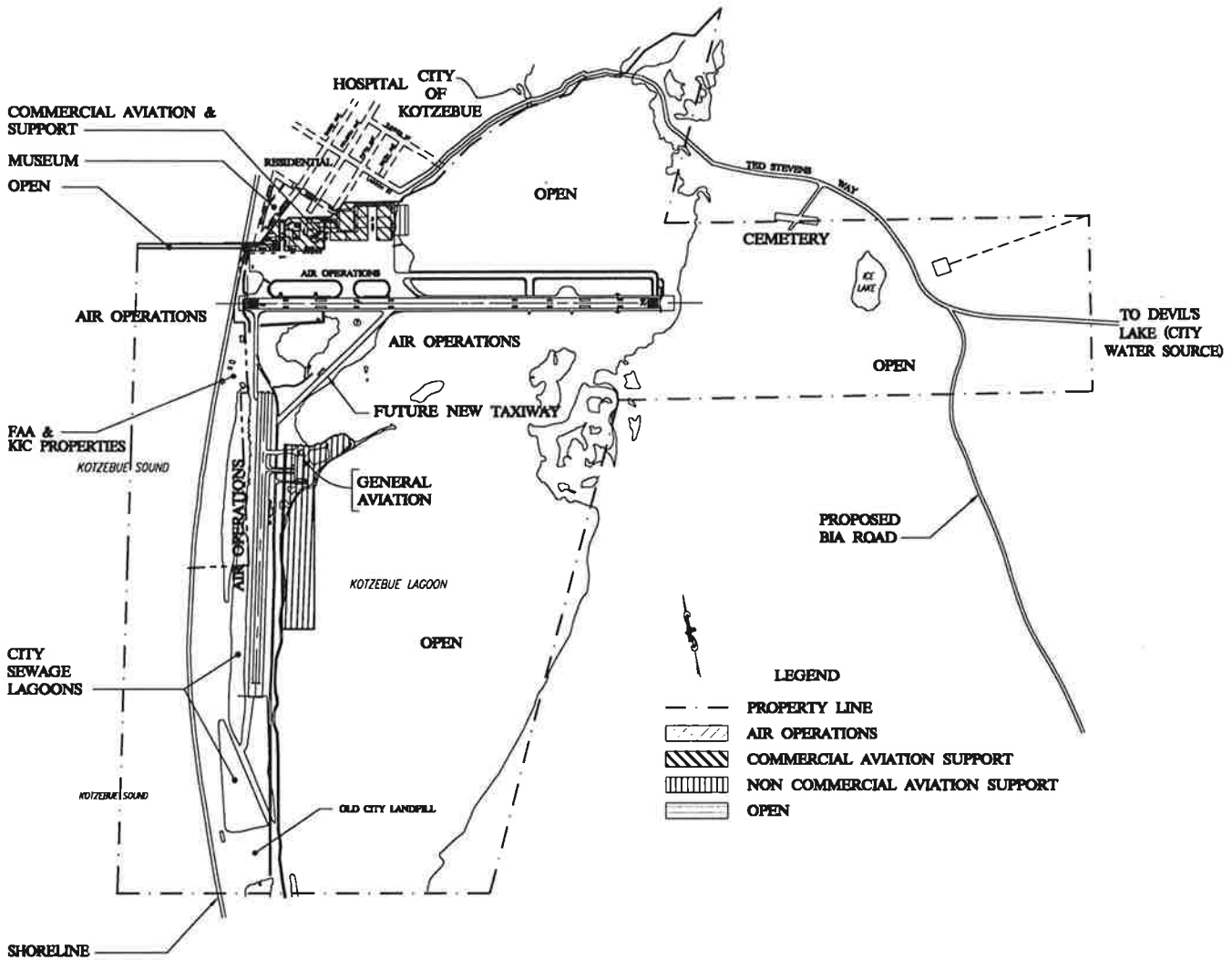


EXHIBIT 8-1

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**RALPH WIEN MEMORIAL AIRPORT  
KOTZEBUE, ALASKA  
LAND USE PLAN**

STATE OF ALASKA  
DEPARTMENT OF TRANSPORTATION AND PUBLIC FACILITIES

The categories of land use shown on Exhibit 8-1, air operations, aviation support and open, are described in the following paragraphs.

### **8.2.1 AIR OPERATIONS**

The highest priority use for airport land is present and future air operations. This category includes runways, taxiways, aprons, navigation aids, and their associated clearances. The boundary of the air operations land use is equivalent to the Building Restriction Line (BRL).

The BRL is defined by:

- 1,500 foot-wide area centered on Runway 8-26, protecting a 1,000 foot-wide primary surface and a 7:1 slope transitional surface to a height of 35 feet
- 600 foot-wide areas centered on Runways 17-35 and on the future float pond takeoff and landing surface, protecting 250 foot-wide primary surfaces and 7:1 slope transitional surfaces to a height of 25 feet
- Taxiway and taxilane object free areas
- Runway protection zones (RPZ), with appropriate dimensions for the following criteria:
  - Runway 8: approach visibility minimums lower than  $\frac{3}{4}$  mile (ultimate)
  - Runway 26: approach visibility minimums not lower than  $\frac{3}{4}$  mile (due to hillside obstruction)
  - Runways 17, 35, and float pond: visual approaches for small aircraft only

The air operations land use boundary at the east end of the terminal apron jogs northward to allow for parking large jets (e.g. B737) so that they will not penetrate the transitional airspace surface. Navigational aids may be located within the air operations land use, but FAA buildings south of Runway 8-26 that fall within the air operations area should be removed eventually.

The trapezoidal RPZ at the end of a runway should not contain buildings. However, some ancillary land uses other than air operations are permitted within the RPZ, provided they do not attract wildlife, are outside the runway object free area, and do not interfere with navigational aids. Automobile parking is discouraged, but permitted. Fuel storage, residences, and places of public assembly should not be located in the RPZ. The RPZ at the approach end of Runway 35 contains a sewage lagoon, which does not conflict with air operations.

### **8.2.2 AVIATION SUPPORT**

Aviation support is the second highest priority for airport land. This category includes terminals, hangars, general aviation facilities, aircraft fueling, airport operations and maintenance facilities, and the automobile parking and access drives associated with these facilities.

At Kotzebue, there are two major aviation support areas. The terminal area north of Runway 8-26 is the commercial aviation support land use, and the developed area south of Runway 8-26 and east of Runway 17-35 is the general aviation support land use. Since commercial aviation activities include the transfer of passengers or cargo between air carriers, it is advantageous for them to be near each other. A major criterion for deciding whether an aviation-related activity should be located in the commercial area is the amount of public vehicular traffic associated with the activity. The commercial area will be easily accessible by road from town. The general aviation area will be less accessible, either by the circuitous BIA road or by the limited access road next to the Runway 8 threshold. Another criterion is airplane size. The general aviation area should be limited to smaller airplanes (under 12,500 pounds and less than 79-foot wingspan). This master plan recommends that in the commercial area, airplanes be segregated by size. Large airplane activity would be relocated to the east end of the terminal apron.

It is not necessary that activities in the two aviation support areas be strictly commercial or general aviation. For example, the commercial area contains activities, such as aircraft fueling and airport maintenance, which support both commercial and general aviation. Also, commercial floatplane charters are more compatible with the general aviation area than with the commercial area.

### **8.2.3 OPEN LAND**

Undeveloped land provides an airport with flexibility to meet unforeseen needs and with expansion capability beyond the 20-year planning period. With the exception of the hillside and the lagoon, the only significant open land use at Kotzebue is the beach at the south end of the property. The site was considered for GA aircraft tiedowns, but rejected because (1) aircraft owners objected to salt spray from the adjacent ocean, (2) it is a more remote location than the selected site, and (3) the area is inhabited by a plant under consideration as a threatened species. If aircraft parking needs grow more than projected for the planning period, this beach site could be re-examined for aircraft parking. Temporary seasonal housing now occupies this land.

Activities in the open land use should not emit smoke, produce glare, produce electromagnetic interference that could affect radio navigation and approach aids, or attract wildlife. Refer to the discussion of off-airport land use for more detailed restrictions on land use to ensure compatibility with the airport.

#### **8.2.4 LAND ACQUISITION AND CONTROL**

The Kotzebue Airport is constrained from expanding due to the proximity of the community, Kotzebue Sound, and the Kotzebue Lagoon. This is one reason for recommending airport relocation in the long-range future. At its current location, however, Kotzebue Airport has the following land acquisition/control issues:

##### **KIC Property South of Runway 8-26 and West of Runway 17-35**

Acquisition or a use agreement should be obtained from the Kikitagrük Inupiat Corporation (KIC) to return Isaac Lake to float pond use after gravel extraction is complete. Air operations will affect not only the lake itself, but also the land under floatplane approaches and transitional surfaces. The KIC property is considered a part of the air operations land use; measures may be needed to ensure that the future use of the KIC property does not interfere with air operations.

##### **Hillside East of Runway 8-26**

The FAA recommends the airport owner control the RPZ, preferably through the acquisition of sufficient property interest. DOT&PF has the necessary property interest to protect the hillside RPZ.

#### **8.4 OFF-AIRPORT LAND USE**

Most of the developed City of Kotzebue is on a narrow spit of land, constrained by water on three sides and constrained by the airport on the fourth side. Kotzebue has continued to grow since the 1989 plan. Significant recent development includes the hospital at Fifth Avenue and Mission Street and the new sanitary landfill two miles south of the airport.

Existing land uses adjacent to the airport's north boundary include the NANA museum, Kotzebue Electric Association's bulk fuel storage tanks, and a mixture of residential, commercial, and light industrial uses. Water is immediately west and east of the airport, but beyond Kotzebue Lagoon to the east are a cemetery, the City's water supply lake, and mostly undeveloped land. The City's old landfill, adjacent to the airport on the south, has been covered and is in the process of being closed. Having been a sanitary landfill, it will be unsuitable for buildings, but may be used as open land.

The City of Kotzebue has a planning commission, but no land use plan. Currently, BIA has plans to build a road around the east side of the lagoon. This road will open the potential for community expansion to the hillside. In the past, KIC has proposed to develop housing on the hillside east of Kotzebue Lagoon, and the construction of the BIA road will increase the feasibility of such a development. The City of Kotzebue is encouraged to ensure that development in the vicinity of the airport, particularly new development on the hillside east of Runway 8-26, is compatible with aviation. The major concerns for land use compatibility with airports are described in the following paragraphs.



### **8.4.1 AIRSPACE**

The airspace drawing in the Airport Layout Plan drawing set indicates the sloped imaginary approach, departure, and transitional surfaces that define the airspace that should remain unobstructed by structures, vegetation, or terrain.

### **8.4.2 NOISE**

Exhibit 8-2 indicates the noise contours modeled for 1985 aviation activity in the 1989 Master Plan. Noise is expressed as the Day-Night Average Sound Level, or Ldn. Ldn is the national standard accepted by the FAA for describing cumulative noise exposure and identifying noise/land use compatibility issues. Ldn is the average noise level in decibels (dB) over a full 24-hour period. Ldn contours do not represent actual noise conditions present on any specific day or absolute boundaries of acceptability in personal response to noise.

FAA guidance (Advisory Circular 150/5020-1) states that all land uses are compatible with Ldn levels below 65 dB. Residential areas, schools, hospitals, churches, and auditoriums are the most noise sensitive land uses, and are generally incompatible with noise levels between 65 dB Ldn and 75 dB Ldn unless sound insulated.

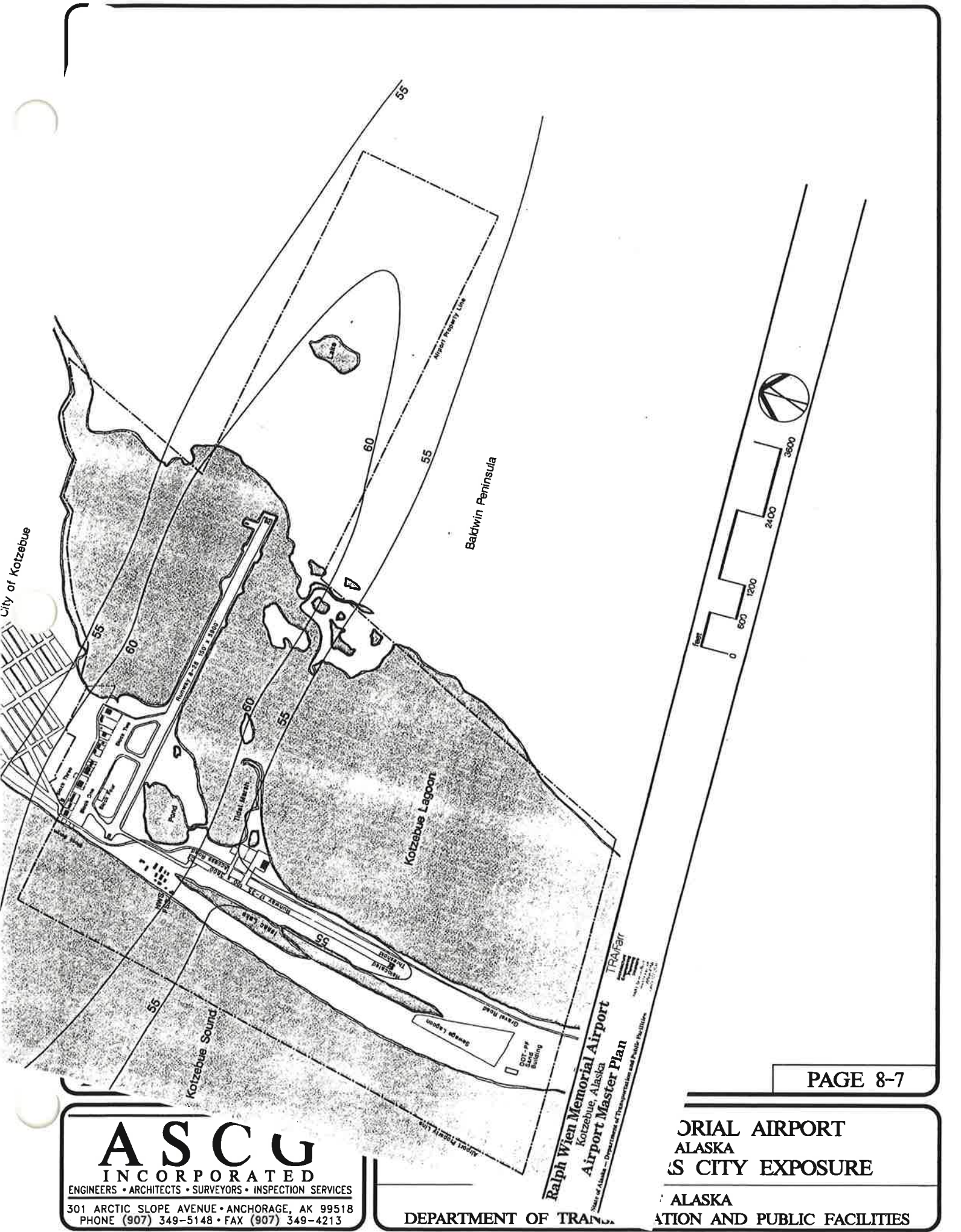
For 1985 aviation activity (45,700 annual aircraft operations), the 65 dB contour fell well within airport property. The 1989 Master Plan also projected noise contours for 1995 aviation activity. The 65 dB contour for 1995 activity remained within airport property, except for 2.1 acres of land just outside the northwest corner of the airport. The projected 1995 annual aircraft operations (96,900) slightly exceeds the 94,505 annual operations forecast for 2018 in this master plan update. Therefore, noise contours for 2018 should approximate those previously projected for 1995. A new noise study is not required for this master plan update.

Noise should not create a significant land use incompatibility problem, as defined by FAA guidance.

Since the 1989 Master Plan, the Airport Noise and Capacity Act of 1990 was passed by Congress, requiring airlines to convert from Stage 2 to Stage 3 (quieter) aircraft fleets by December 31, 1999. Although the State of Alaska was exempt from this Act, it has benefited from Alaska Airlines' fleet conversion from noisier B-727 to quieter B-737 aircraft. Intrastate all-cargo jet operations, however, will not be converted to quieter aircraft. Stage 2 all-cargo aircraft flying at night, when sensitivity to noise is heightened, could offset the impact of the quieter Alaska Airlines fleet.

Hillside development under the flight path of Runway 8-26 could be subjected to fairly high noise levels. Therefore, aircraft noise should be a consideration in planning the hillside development.



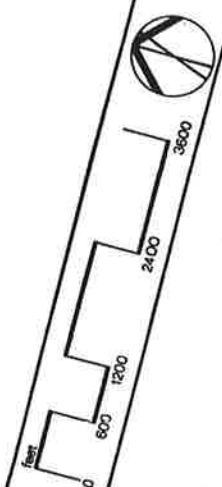


City of Kotzebue

Baldwin Peninsula

Kotzebue Lagoon

Kotzebue Sound



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DEPARTMENT OF TRANSPORTATION AND PUBLIC FACILITIES

Ralph Wien Memorial Airport  
 Kotzebue, Alaska  
 Airport Master Plan  
 State of Alaska - Department of Transportation and Public Facilities

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ORIAL AIRPORT  
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### **8.4.3 OTHER COMPATIBILITY ISSUES**

So that they do not interfere with aviation, future activities near the airport should not emit smoke, produce glare, produce electromagnetic interference that could affect radio navigation and approach aids, or attract wildlife.

### **8.4.4 LAND OCCUPANCY**

Land occupancy is listed in Exhibit 8-3. Current land occupancy drawings are maintained at the ADOT&PF Northern Region offices in Fairbanks.

## Exhibit 8-3: Land Occupancy

Block	Lot	Lessee	Use	Size (sf)	Lease Period
1	AA	DOT&PF	Maintenance	15625	Indefinite
1	AA	MarkAir	*	18750	To 7/1/2007
1	B	Baker Aviation	Air Taxi Operator	18750	To 7/1/2005
1	C	MarkAir	**	30015	To 7/1/2007
1	D	MarkAir	**		
1	E	Alaska Airlines	Commercial Airline	22500	To 6/20/2010
1	F	Alaska Airlines	Passenger/Cargo		
1	G	Alaska Airlines	Terminal		
1	H	Bering Air	Air Taxi Operator	7500	To 7/1/1999
1	I	Bering Air			To 7/1/1999
1	K	Walker Air Service			
1	L	Civil Air Patrol	Search & Resue	9375	To 4/15/2000
1	M	Crowley Marine Services	Fueling Services	7500	To 7/1/1997
2	1	DOT&PF (formely Mike Spisak, dba Ram Aviation)	Maintenance Reserve	19939	Indefinite
2	2	DOT&PF	Maintenance Reserve	22165	Indefinite
2	3	Ryan Air dba Arctic Transporation Services	Air Taxi Operator	39540	To 1/1/2013
2	4	Northwestern Aviation	Air Taxi Operator	46778	To 1/1/2015
2	5	Ben Lomond	Aircraft/Dock Area	46248	To 2/15/1996
2	6	Ben Lomond		30000	

<b>Block</b>	<b>Lot</b>	<b>Lessee</b>	<b>Use</b>	<b>Size (sf)</b>	<b>Lease Period</b>
3	1A	Hageland Aviation Services	Air Taxi Operator	31095	To 4/1/2004
3	1B	DOT&PF	Maintenance Reserve	8115	Indefinite
3	3	RAM Aviation dba Alaska Island Air	Air Taxi Operator	24750	To 6/15/1998
3	4	Baker Aviation	Air Taxi Operator	31500	To 1/1/2015
3	5	Cape Smythe Air Service	Air Taxi Operator	54750	To 8/1/2009
4	1	Crowley Marine Services	Fueling Services	21205	To 7/1/1997
5	1	Arctic Air Guides Flying Service	Guide Service	24000	To 9/1/1998
5	2	Arctic Air Guides Flying Service		70995	
5	3	Unassigned	Public Float Plane Access	10000	
6	1	US Fish & Wildlife Service	Wildlife Management	15750	To 7/3/2017
6	2	US Fish & Wildlife Service	Field Studies	22500	
6	3	AK Depart of Military Affairs	Army National Guard Hangar		To 3/15/2012
6	4	Unassigned		22500	
6	5	Unassigned			
6	6	US Fish & Wildlife Service		44907	To 7/3/2017
7	1	Unassigned	Load/Unload Fish	3750	Seasonal
7	2	Unassigned	Load/Unload Fish	3750	Seasonal
7	3	Unassigned	Load/Unload Fish	3750	Seasonal
7	4	Unassigned	Load/Unload Fish	3750	Seasonal

Block	Lot	Lessee	Use	Size (sf)	Lease Period
Parcel		FAA	VORTAC	43560	
Parcel		FAA			To 9/30/1996
Parcel		National Weather Service	Balloon Launch Area	111514	To 9/16/2023
Parcel		City of Kotzebue	Sewage Lagoon		To 7/5/2031
Parcel		FAA	Glide Slope Antenna		To 6/30/1994
Parcel		FAA	RVR		To 9/30/1999

\* Mark Air discontinued service  
in 1995.

\*\* Occupied by FBX, Inc.





## **9.1 INTRODUCTION**

The objective of this chapter is to examine the financial implementation of proposed improvements at the Kotzebue Airport.

## **9.2 FUNDING SOURCES**

The primary source of airport funding for proposed capital improvements is the Federal Airport Improvement Program (AIP). The Airport and Airway Trust Fund supports the AIP. The Trust Fund provides a stable funding source whereby users pay for the services they receive. The Trust Fund is built on user fees/taxes derived from airline tickets, freight waybills, international departure fees, and fuel.

Kotzebue Airport receives AIP funding as a Primary Airport (a commercial service airport which enplanes more than 10,000 passengers annually). A Primary Airport is eligible for funding from several sources within the AIP. In Alaska, the standard AIP share is 93.75 percent of the project cost. Projects that are eligible for grants include airport planning, airport capacity enhancement/preservation projects, noise compatibility programs, and some airport development projects. Eligible development projects include facilities or equipment associated with the construction, improvement, or repair (excluding routine maintenance) of an airport. With certain restrictions, buildings that house Aircraft Rescue and Firefighting (ARFF), security, and snow removal equipment, as well as terminal buildings, are eligible for federal funding. Hangars, auto parking areas, most airport buildings, art objects, and decorative landscaping are ineligible.

Capital funding for Kotzebue has historically been Federal AIP and State General Funds. Potential sources include local government, private entities, and passenger facility charges (PFCs).

## **9.3 CAPITAL IMPROVEMENT PROGRAM**

Exhibit 9-1 summarizes the capital improvement program for Kotzebue Airport. These projects are derived from the preferred development plan selected and documented earlier in Chapter 4.

Projects have been scheduled according to anticipated demand and allocated to one of three phases during the twenty-year planning period. Phase I projects are outlined on an annual basis during the first five-year period. Phase II projects are grouped during the second five-year increment, with projects for the remaining ten years listed in Phase III. In addition, projects beyond the 20-year planning period have also been identified. These include airport relocation and portions of the preferred airport development option which are not financially feasible within the planning period.

Rough order-of-magnitude cost estimates, in 1998 dollars, have been prepared for each project, as well as identification of the project's eligibility for federal participation by funding amount. Cost estimates were prepared by quantifying the magnitude of each project and applying standard unit cost data to determine total project costs. The costs include an allowance for engineering and construction management. Refer to Appendix 9 for the detailed costs.

**EXHIBIT 9-1**  
**CAPITAL IMPROVEMENT PROGRAM**

Project	Cost	Federal Funding <sup>1</sup>	State Match <sup>1</sup>
<b>PHASE I (1999-2003)</b>			
Apron/Taxilane Extension & Connecting Taxiway	\$ 2,879,300	\$2,465,000	\$ 164,300
Reconstruct Existing Terminal Apron & Vehicle Parking Lot	\$ 2,580,129	\$2,128,000	\$ 141,900
DOT&PF ARFF/SRE Building	\$4,908,800	\$4,602,000	\$306,800
SRE Equipment Purchase	\$585,000	\$548,400	\$36,600
Interim GA Parking Area	\$2,398,700	\$2,248,800	\$149,900
Lagoon Island Obstruction Removal	\$936,000	\$877,500	\$58,500
Isaac Lake Acquisition for Float Pond	\$94,400	\$88,500	\$5,900
Subtotal	\$14,382,329	\$12,958,200	\$863,900
<b>PHASE II (2004-2008)</b>			
DOT&PF Material Storage Building	\$1,168,200	\$1,095,200	\$73,000
SRE Equipment Purchase	\$560,000	\$525,000	\$35,000
GA Parking Expansion Phase I	\$3,703,100	\$3,471,700	\$231,400
Master Plan Update	\$300,000	\$281,200	\$18,800
Rehabilitation of Runway 17-35 & Connecting Taxiway	\$1,127,000		
Subtotal	\$6,858,300		
<b>PHASE III (2009-2018)</b>			
Reconstruct Existing Runway	\$4,784,300	\$4,485,300	\$299,000
Lease Lot & Taxiway Construction Phase II	\$3,096,900	\$2,903,300	\$193,600
GA Parking Expansion Phase II	\$2,233,200	\$2,093,600	\$139,600
Parallel Taxiway Phase I	\$4,550,300	\$4,265,900	\$284,400
Subtotal	\$14,664,700	\$13,748,100	\$916,600
<b>Total 20-Year CIP</b>	<b>\$34,218,100</b>	<b>\$32,079,400</b>	<b>\$2,138,700</b>
<b>BEYOND III (2019 OR LATER) - NOT IN 20-YEAR CIP</b>			
Hill Obstruction Removal (Runway 8-26)	\$16,624,800	\$15,585,700	\$1,039,100
Parallel Taxiway Phase II	\$5,140,300	\$4,819,000	\$321,300
Airport Relocation <sup>2</sup>	\$61,761,200	\$57,901,100	\$3,860,100
Subtotal	\$83,526,300	\$78,305,800	\$5,220,500

<sup>1</sup> Based on maximum eligibility percentage for Federal Airport Improvement Program Grant funding

<sup>2</sup> Excludes cost of land acquisition

Note: Figures are rounded. Costs are in 1998 dollars.

### 9.3.1 PHASE I DEVELOPMENT (1999-2003)

Following is a detailed description of each project in the Phase I (1999-2003) development period. The year each project is proposed for development is also included in this Phase.

***Apron/Taxilane Extension & Connecting Taxiway*** **\$2,879,300**

To provide additional relief of apron congestion, the existing terminal area apron is proposed to be moved southward by approximately 90 feet. The apron taxiway will also be relocated 90 feet south to the minimum 400-foot separation from the runway centerline. This will provide approximately 20,000 additional square yards of ramp area and would also include relocation of the connecting taxiway between runway 17/35 and runway 8/26. In addition, the fueling facility will be relocated to the west end of the apron (current ARFF/SRE site).

***Reconstruct Existing Terminal Apron & Vehicle Parking Lot*** **\$2,580,129**

This project consists of reconstructing 67,220 square yards of existing asphalt concrete (AC) apron in the terminal area adding 8,350 square yards of asphalt for the vehicle parking lot, and the installation of terminal area fencing for security. The apron has been in service for over 15 years, continuing maintenance is impractical due to foundation subsidence.

***ADOT&PF ARFF/SRE Building (with possible FAA FSS collocation)*** **\$4,908,800**

The combined Aircraft Rescue and Firefighting Facility (ARFF) and Snow Removal Equipment (SRE) building will be approximately 12,800 square feet in area (160 feet by 80 feet). It will include two bays for ARFF equipment and four bays for SRE. Each bay will accommodate two pieces of equipment. The building should be placed at the east end of the apron where it has immediate access to the airfield and can be easily served by utilities. To allow building setback for building codes and airside area for SRE, an area of 200 feet by 120 feet should be provided.

***SRE Equipment Purchase Phase I*** **\$585,000**

This project consists of the acquisition of one plow truck with sander, one motor grader, and one D-6 class dozer for snow removal. The acquisition will replace obsolete equipment which has been in service in excess of 15 years.

***Interim GA Parking Area*** **\$2,398,700**

The master plan calls for redeveloping the east end of the terminal area, and extending lease lots to the north property line. Because of existing leases in the south part of this area, the project will be phased. The first phase will be to develop the vacant property north of Block 2. Initial construction will consist of filling and grading an area approximately 800 feet by 400 feet and using it temporarily for GA aircraft tiedowns. Temporary taxiway access will be through the vacant ADOT&PF Maintenance Reserve, Lot 2 in Block 2. As demand for new lease lots develops, the area will take on its ultimate configuration, with four lease lots, a perimeter road, taxiway, and shared 100-car parking lot at the west end. The southwestern lease lot should not be leased until the building on Lot

3 of Block 2 (now Ryan Air) can be removed, allowing direct connection of the new taxiway to the apron. Temporarily, the southwestern lease lot will provide the taxiway connection from the ADOT&PF Maintenance Reserve Lot to the three new lease lots.

***Lagoon Islands Obstruction Removal*** **\$936,000**

As a stand-alone project, the removal of the two lagoon bird hazard islands is a significant project. The west island is approximately 500 feet by 200 feet, and the east island is approximately 900 feet by 350 feet. The islands would be excavated to a depth of at least two feet. It is believed that the excavation to this depth could be completed with conventional equipment working off the ice in late winter. If the material proves to be sands and gravels suitable for embankment rather than waste, the island removal could be combined with one of the terminal area fill projects, which would likely represent a considerable overall cost savings. If sands and gravels are present, it may also be cost effective to mobilize a dredge and excavate to a greater depth.

***Isaac Lake Acquisition for Float Pond*** **\$94,400**

This project consists of acquiring Isaac Lake after completion of KIC's gravel extraction and dewatering. The ultimate cost will depend on the conclusion of appraisal and negotiations. Mooring/parking of floatplanes will be along the shores of Isaac Lake. Kotzebue Lagoon will be used during strong crosswinds or when a plane's load requires more takeoff distance than available in Isaac Lake.

**9.3.2 PHASE II DEVELOPMENT (2004-2008)**

Following is a detailed description of each project in the Phase II (2004-2008) development period.

***ADOT&PF Material Storage Building*** **\$1,168,200**

This 60-foot by 60-foot building is needed to store deicing material in a protected area. The material is currently stored at the DOT Maintenance Reserve. Loss of product occurs from weather deterioration of the containers.

***SRE Equipment Purchase Phase II*** **\$560,000**

This project consists of the acquisition of a blower/sweeper and a 966 class loader, to replace existing equipment in service for over 20 years.

***GA Parking Expansion Phase I*** **\$3,703,100**

The existing GA tiedown area west of Runway 17-35 is inside the runway object free area and requires relocation. The ultimate GA tiedown area will be constructed in two phases. Phase I of the new GA tiedown area development will be located south of the National Guard Hangar, and will include space for approximately 46 GA aircraft tiedowns, with electricity for engine heaters. The

schedule for this project will be determined by the need to relocate GA parking out of its interim location on the north side of the expanded lease lot area.

***Master Plan Update***

***\$300,000***

The Ralph Wien Memorial Airport Master Plan will likely require an update in Phase II of the planning period. The update should include a review of the existing conditions, aviation demand forecasts, and development alternatives (related to any changes in demand). Necessary adjustments to the future capital development program should also be determined. The alternative of airport relocation should be reevaluated.

***Rehabilitation of Runway 17-35***

***\$1,127,000***

This project consists of new lighting, six inches of new runway surfacing and drainage for Runway 17-35.

**9.3.3 PHASE III DEVELOPMENT (2009-2018)**

Following is a detailed description of each project in the Phase III (2009-2018) development period.

***Reconstruct Existing Runway***

***\$4,784,300***

This project consists of the reconstruction of primary Runway 8-26 (5,900 feet by 150 feet), which was previously reconstructed in 1994. Due to thermal fatigue, paved runways in the Arctic fail sooner than the desirable 20-year design life. The reconstruction will include the removal of existing pavement and the construction of new AC pavement and crushed aggregate base, including runway striping and markings.

***Lease Lot and Taxiway Construction Phase II***

***\$3,096,900***

This project completes the redevelopment and expansion of the east side of the terminal area. Ultimately, the paved apron will be extended about 150 feet northward, providing parking area for transient large jet airplanes. Three new lease lots will border the apron. A new taxiway, designed for Group II aircraft, will provide airside access to the four lease lots developed in Phase I of this project. By 2000, leases for Lots K, L, and M of Block 1 will have expired, so that the buildings on them (now occupied by Yute, Civil Air Patrol, and Crowley Marine) can be removed. Until lots are leased, they may be temporarily used for GA aircraft tiedowns. Lots 1, 2, 5, and 6 in Block 2 have short-term leases and are undeveloped. In Block 2, Lots 3 and 4 (Ryan Air and Northwestern Aviation) contain buildings and the leases do not expire until 2013 and 2015, respectively. These long-term leases may dictate the schedule for final completion of the terminal area eastside redevelopment.



***GA Parking Expansion II***

***\$2,233,200***

This project will be the second of two phases of the new GA tiedown area and will provide approximately 42 GA aircraft tiedowns, and will expand the Phase I GA tiedown area south of the National Guard Hangar.

***Parallel Taxiway Phase I***

***\$4,550,300***

This project will be the first of two phases to construct a full-length parallel taxiway to Runway 8-26. This first phase will consist of a partial parallel taxiway extending from the east end of the terminal area apron west by approximately 2000 feet in length and 50 feet wide with a 118-foot wide safety area to meet FAA design criteria for Airplane Design Group III aircraft. This project also includes the construction of a connecting taxiway, marking, lighting, and signage.

**9.4 FINANCIAL ANALYSIS**

The overall financial ability of Kotzebue Airport was reviewed relative to future capital expenditures required for the proposed projects. In addition to the earlier identification of capital outlays, airport revenues and expenses were projected through the end of the planning period. These projections were based on the current (1996) revenue and expense figures provided by DOT&PF.

**9.4.1 REVENUES**

Local operating revenues for Kotzebue Airport include airport leases, tie-down rentals, and user fees. The majority of airport revenues are from airport leases. Forecast revenues assume a three percent annual increase for moderate growth and proposed lease lot expansion through the planning period (2018), using 1996 as a base year.

**9.4.2 EXPENSES**

Airport operating expenses include equipment, maintenance, personnel, travel, and contracts. Operating expenses are projected to stabilize and remain at 1996 levels through the planning period based on more efficient airport operations.

**9.4.3 CASH FLOW**

Exhibit 9-3 outlines the estimated annual negative cash flow at Kotzebue Airport through the planning period.



**EXHIBIT 9-2**  
**CASH FLOW SUMMARY**

Fiscal Year	Total Revenues	Total Expenses	Net Cash Flow
1994	\$ 88,678	\$ 741,900	(\$ 653,222)
1995	\$ 84,208	\$ 752,400	(\$ 668,192)
1996	\$ 81,917	\$ 745,200	(\$ 663,283)
Phase I - 2003	\$ 100,700	\$ 745,200	(\$ 644,500)
Phase II - 2008	\$ 116,800	\$ 745,200	(\$ 628,400)
Phase III - 2018	\$ 157,000	\$ 745,200	(\$ 588,200)

Source: Historical figures provided by AK DOT&PF.

Note: Revenue and Expense projections through 2018 are in 1998 dollars.

### 9.5 Other Future Development Recommendations

Some recommendations that are beyond the 20-year time frame of this master plan are nevertheless considered important enough to be noted now. These include three major capital improvement projects: removal of the hill obstruction for Runway 8-26; completion of the parallel taxiway; and, ultimately, relocation of the entire airport.

The FAA should be encouraged to consider Navaid improvements that would permit lower minimums for the ILS approach to Runway 8. As the community and air traffic grows, the number of scheduled passenger flights unable to land at Kotzebue during inclement weather conditions will increase, as will the negative economic impact of weather diversions. One option, according to the FAA, is to install approach lights, which would improve the visibility minimums.

Upon completion of the proposed BIA hillside road, restriction of public access across the Runway 8-26 safety area may be considered. This would be intended to enhance the security and integrity of airport operational areas.



# Kotzebue Airport Master Plan Update

## ISSUES

Please circle one rating that expresses your opinion of the issue.

	Very Important	Important	Not Important
Improvement of aircraft access to Alaska Airlines terminal building			<input checked="" type="radio"/>
Accommodation of future lease lot demand			<input checked="" type="radio"/>
Condition of fire station		<input checked="" type="radio"/>	
Condition of maintenance equipment building		<input checked="" type="radio"/>	
Expansion of automobile parking			<input checked="" type="radio"/>
Multi-user passenger terminal building			<input checked="" type="radio"/>
Improvement of Runway 8-26 safety area			<input checked="" type="radio"/>
Runway security compromised by road at west end			<input checked="" type="radio"/>
Aircraft fueling facilities' penetration of airspace			<input checked="" type="radio"/>
Adequacy of itinerant/GA aircraft parking		<input checked="" type="radio"/>	
Accommodation of float planes from Isaac Lake	<input checked="" type="radio"/>		
Leaseholder tie-down areas within taxiway safety area		<input checked="" type="radio"/>	
Scarcity of gravel resources		<input checked="" type="radio"/>	
Access to beach recreation west of the runway after Lagoon Road construction		<input checked="" type="radio"/>	
Pavement maintenance		<input checked="" type="radio"/>	
Community involvement in airport development and operation			<input checked="" type="radio"/>
Funding for airport development		<input checked="" type="radio"/>	
Local difficulties with national security requirements			<input checked="" type="radio"/>

OTHER ISSUES?

SKI AIRCRAFT CONSIDERATION

Very Important

Important

Not Important

\_\_\_\_\_

Very Important

Important

Not Important

\_\_\_\_\_

Very Important

Important

Not Important

REMARKS

Any concerns or ideas about immediate and long-range future airport development and operation?

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OPTIONAL:

Your name, phone number, address:

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\_\_\_\_\_  
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NORTHWESTERN AVIATION

P.O. BOX 741  
KOTZEBUE, ALASKA 99752

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Your association with the airport (passenger, airport tenant, private pilot, etc):

AIRPORT TENANT

Would you like to be on the mailing list for Airport Master Plan Update newsletters?

Yes No

If you would like to return this survey later or discuss the airport plan, please contact:

Jonathan Widdis

Phone: 267-6301

ASCG, Inc.

Fax: 267-6470

301 Arctic Slope Avenue

Anchorage, AK 99518

# Baker Aviation, Inc.

P.O. BOX 708 • KOTZEBUE, AK 99752  
(907) 442-3108 • FAX (907) 442-3018

## Kotzebue Airport Master Plan Update

### ISSUES

Please circle one rating that expresses your opinion of the issue.

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Pavement maintenance	Very Important	Important	Not Important
Community involvement in airport development and operation	Very Important	Important	Not Important
Funding for airport development	Very Important	Important	Not Important
Local difficulties with national security requirements	Very Important	Important	Not Important

CAP KOTZEBUE  
P.O. Box 1011

KOTZEBUE AC  
98752-1001

### Kotzebue Airport Master Plan Update

#### ISSUES

Please circle one rating that expresses your opinion of the issue.

Issue	Very Important	Important	Not Important
Improvement of aircraft access to Alaska Airlines terminal building			<input checked="" type="radio"/>
Accommodation of future lease lot demand		<input checked="" type="radio"/>	<input type="radio"/>
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Pavement maintenance		<input checked="" type="radio"/>	<input type="radio"/>
Community involvement in airport development and operation		<input checked="" type="radio"/>	<input type="radio"/>
Funding for airport development		<input checked="" type="radio"/>	<input type="radio"/>
Local difficulties with national security requirements			<input checked="" type="radio"/>



OTHER ISSUES?

Rwy 08 WITH ILS

APCH LIGHTING SYSTEM	Very Important	Important	Not Important
_____	Very Important	Important	Not Important
_____	Very Important	Important	Not Important

REMARKS

Any concerns or Ideas about immediate and long-range future airport development and operation?

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OPTIONAL:

Your name, phone number, address:

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CIVIL AIR PATROL  
 KOTZEBUE SR. SQUADRON  
 P O BOX 1011  
 KOTZEBUE, AK 99752

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Your association with the airport (passenger, airport tenant, private pilot, etc):

CAP

Would you like to be on the mailing list for Airport Master Plan Update newsletters?

Yes  No

If you would like to return this survey later or discuss the airport plan, please contact:

Jonathan Widdis Phone: 267-6301  
 ASCG, Inc. Fax: 267-6470  
 301 Arctic Slope Avenue  
 Anchorage, AK 99518

# Kotzebue Airport Master Plan Update

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OTHER ISSUES?

	Very Important	Important	Not Important
_____			
_____			
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REMARKS

Any concerns or ideas about immediate and long-range future airport development and operation?

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OPTIONAL:

Your name, phone number, address: DELANO BARR  
Box 775  
KOTLEBUK, AK 99757      442-3731

Your association with the airport (passenger, airport tenant, private pilot, etc):  
AVIATION PRESERVATIONS NORTH WEATHER SVC

Would you like to be on the mailing list for Airport Master Plan Update newsletters?      Yes    No

If you would like to return this survey later or discuss the airport plan, please contact:

Jonathan Widdis      Phone: 267-6301  
 ASCG, Inc.      Fax: 267-6470

301 Arctic Slope Avenue  
 Anchorage, AK 99518

OR GIVE TO John Evans  
Airport Manager

# Kotzebue Airport Master Plan Update

## ISSUES

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Funding for airport development	Very Important	Important	Not Important
Local difficulties with national security requirements	Very Important	Important	Not Important

OTHER ISSUES?

Local Advisory Group

Very Important

Important

Not Important

would be useful to

Very Important

Important

Not Important

Review update plan

Very Important

Important

Not Important

REMARKS

Any concerns or ideas about immediate and long-range future airport development and operation?

Airport - new construction on ~~west~~ east side  
of town

OPTIONAL:

Your name, phone number, address:

M. Scott

PO Box 46

Kotzebue 99752

442-3401

Your association with the airport (passenger, airport tenant, private pilot, etc):

Would you like to be on the mailing list for Airport Master Plan Update newsletters?

Yes

No

If you would like to return this survey later or discuss the airport plan, please contact:

Jonathan Widdis

Phone:

267-6301

ASCG, Inc.

Fax:

267-6470

301 Arctic Slope Avenue

Anchorage, AK 99518

OR GIVE TO

John Evans

Airport Manager



3-17-97

# Kotzebue Airport Master Plan Update

## ISSUES

Please circle one rating that expresses your opinion of the issue.

Improvement of aircraft access to Alaska Airlines terminal building	Very Important	Important	Not Important
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Funding for airport development	Very Important	Important	Not Important
Local difficulties with national security requirements	Very Important	Important	Not Important



MAR-03-97 17:40 From/ASCG INCORPORATED

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OTHER ISSUES?

	Very Important	Important	Not Important
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REMARKS

Any concerns or ideas about immediate and long-range future airport development and operation?

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OPTIONAL:

Your name, phone number, address:

DAN HROGOS

P.O. Box 261

Kat... 907-442-2410

Your association with the airport (passenger, airport tenant, private pilot, etc):

Would you like to be on the mailing list for Airport Master Plan Update newsletters? Yes No

If you would like to return this survey later or discuss the airport plan, please contact:

Jonathan Widdis  
 ASCG, Inc.  
 301 Arctic Slope Avenue  
 Anchorage, AK 99518

Phone: 267-6301  
 Fax: 267-6470

# Kotzebue Airport Master Plan Update

... CENTER

## ISSUES

Please circle one rating that expresses your opinion of the issue.

ISSUES	Very Important	Important	Not Important
Improvement of aircraft access to Alaska Airlines terminal building			<input checked="" type="radio"/>
Accommodation of future lease lot demand	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>
Condition of fire station	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>
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Funding for airport development	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>
Local difficulties with national security requirements	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>

OTHER ISSUES?

	Very Important	Important	Not Important
<u>Being a Yute Blocking Taxiway Bravo</u>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>
<u>Show Removal</u>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>
_____	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

REMARKS

Any concerns or ideas about immediate and long-range future airport development and operation?

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OPTIONAL:

Your name, phone number, address:

John Shergalis                      907 442-2673  
Box 59K  
Kotzebue, AK 99752

Your association with the airport (passenger, airport tenant, private pilot, etc):

Cape Smythe Pilot

Would you like to be on the mailing list for Airport Master Plan Update newsletters?

Yes     No

If you would like to return this survey later or discuss the airport plan, please contact:

Jonathan Widdis                      Phone:    267-6301  
ASCG, Inc.                              Fax:        267-6470  
301 Arctic Slope Avenue  
Anchorage, AK 99518

# Kotzebue Airport Master Plan Update

## ISSUES

Please circle one rating that expresses your opinion of the issue.

Issue	Very Important	Important	Not Important
Improvement of aircraft access to Alaska Airlines terminal building			<input checked="" type="radio"/>
Accommodation of future lease lot demand	<input checked="" type="radio"/>		
Condition of fire station		<input checked="" type="radio"/>	
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Funding for airport development		<input checked="" type="radio"/>	
Local difficulties with national security requirements			<input checked="" type="radio"/>



OTHER ISSUES?

ACCESS to ski operation areas  
from GA parking.

Very Important

Important

Not Important

Aircraft Access to 17-35 from East side  
of runway (more specific than general)

Very Important

Important

Not Important

Very Important

Important

Not Important

REMARKS

Any concerns or ideas about immediate and long-range future airport development and operation?

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\_\_\_\_\_  
\_\_\_\_\_

OPTIONAL:

Your name, phone number, address:

GENE PELTOLA JR P.O. Box 270 WOTZ, AK 99752  
(907) 442-3799 PN  
442-3124 FAX

Your association with the airport (passenger, airport tenant, private pilot, etc):

FWS - comm. pilot

Would you like to be on the mailing list for Airport Master Plan Update newsletters?

Yes  No

If you would like to return this survey later or discuss the airport plan, please contact:

Jonathan Widdis  
ASCG, Inc.  
301 Arctic Slope Avenue  
Anchorage, AK 99518

Phone: 267-6301  
Fax: 267-6470

OR GIVE TO JOHN EVANS,  
AIRPORT MANAGER.

# Kotzebue Airport Master Plan Update

## ISSUES

Please circle one rating that expresses your opinion of the issue.

ISSUES	Very Important	Important	Not Important
Improvement of aircraft access to Alaska Airlines terminal building			<input checked="" type="radio"/>
Accommodation of future lease lot demand	<input checked="" type="radio"/>		<input checked="" type="radio"/>
Condition of fire station	<input checked="" type="radio"/>	<input checked="" type="radio"/>	
Condition of maintenance equipment building	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>
Expansion of automobile parking	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>
Multi-user passenger terminal building	<input checked="" type="radio"/>	<input checked="" type="radio"/>	
Improvement of Runway 8-26 safety area	<input checked="" type="radio"/>	<input checked="" type="radio"/>	
Runway security compromised by road at west end	<input checked="" type="radio"/>	<input checked="" type="radio"/>	
Aircraft fueling facilities' penetration of airspace	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>
Adequacy of itinerant/GA aircraft parking	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>
Accommodation of float planes from Isaac Lake	<input checked="" type="radio"/>	<input checked="" type="radio"/>	
Leaseholder tie-down areas within taxiway safety area	<input checked="" type="radio"/>	<input checked="" type="radio"/>	
Scarcity of gravel resources	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>
Access to beach recreation west of the runway after Lagoon Road construction	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>
Pavement maintenance	<input checked="" type="radio"/>	<input checked="" type="radio"/>	
Community involvement in airport development and operation	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>
Funding for airport development	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>
Local difficulties with national security requirements	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>



OTHER ISSUES?

	Very Important	Important	Not Important
RAMP AREA'S PAVED	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>
	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

REMARKS

Any concerns or ideas about immediate and long-range future airport development and operation?

W/TH TAXIWAY ACCESS TO ONE SINGLE AIR SERVICE GA RAMP  
 AIRCRAFT <sup>INCURSION</sup> TRUCKS, MAIL, OTHER HAVE RESTRICTED THE  
 TAXIWAY.  
 HAVE BEEN IMPRESSED WITH THE STATES PROFESSIONALISM IN THE WAY  
 THAT THEY WORK WITH US TO KEEP US FUNCTIONING, I.E. SNOW REMOVAL  
 THANK YOU!

OPTIONAL:

Your name, phone number, address:

TOM HOLDEN (907) 442-3037  
 P.O. Box 583  
 KOTZEBUE AIC 99752

Your association with the airport (passenger, airport tenant, private pilot, etc):

COMMERCIAL PILOT @ SAS

Would you like to be on the mailing list for Airport Master Plan Update newsletters?

Yes  No

If you would like to return this survey later or discuss the airport plan, please contact:

Jonathan Widdis Phone: 267-6301  
 ASCG, Inc. Fax: 267-6470  
 301 Arctic Slope Avenue  
 Anchorage, AK 99518

# Kotzebue Airport Master Plan Update

## ISSUES

Please circle one rating that expresses your opinion of the issue.

Improvement of aircraft access to Alaska Airlines terminal building	Very Important	Important	Not Important
Accommodation of future lease lot demand	Very Important	Important	Not Important
Condition of fire station	Very Important	Important	Not Important
Condition of maintenance equipment building	Very Important	Important	Not Important
Expansion of automobile parking	Very Important	Important	Not Important
Multi-user passenger terminal building	Very Important	Important	Not Important
Improvement of Runway 8-26 safety area	Very Important	Important	Not Important
Runway security compromised by road at west end	Very Important	Important	Not Important
Aircraft fueling facilities' penetration of airspace	Very Important	Important	Not Important
Adequacy of itinerant/GA aircraft parking	Very Important	Important	Not Important
Accommodation of float planes from Isaac Lake	Very Important	Important	Not Important
Leaseholder tie-down areas within taxiway safety area	Very Important	Important	Not Important
Scarcity of gravel resources	Very Important	Important	Not Important
Access to beach recreation west of the runway after Lagoon Road construction	Very Important	Important	Not Important
Pavement maintenance	Very Important	Important	Not Important
Community involvement in airport development and operation	Very Important	Important	Not Important
Funding for airport development	Very Important	Important	Not Important
Local difficulties with national security requirements	Very Important	Important	Not Important

OTHER ISSUES?

	Very Important	Important	Not Important
_____			
_____			
_____			

REMARKS

Any concerns or ideas about immediate and long-range future airport development and operation?

\_\_\_\_\_

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\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

OPTIONAL:

Your name, phone number, address: Hageland Aviation Services, Inc  
Box 222610  
Anchorage, AK 99522

Your association with the airport (passenger, airport tenant, private pilot, etc):  
Airport Tenant

Would you like to be on the mailing list for Airport Master Plan Update newsletters?  Yes  No

If you would like to return this survey later or discuss the airport plan, please contact:

Jonathan Widdis Phone: 267-6301  
 ASCG, Inc. Fax: 267-6470  
 301 Arctic Slope Avenue  
 Anchorage, AK 99518



# United States Department of the Interior

FISH AND WILDLIFE SERVICE

1011 E. Tudor Rd.  
Anchorage, Alaska 99503-6199

Division of Realty

# FAX

DATE: 3/3/97

TO: Leslie Herr

ORGANIZATION: Selawik NWL

TELEPHONE: \_\_\_\_\_

FAX NUMBER: 442-3124

FROM: Jim Stewart, Realty

TELEPHONE: (907) 786-3490

FAX NUMBER: (907) 786-3901

NUMBER OF PAGES (incl. cover) 4

CONTENTS: Leslie

We received this fax today.

Please respond to it.

Thank you

Jim Stewart

**BLACK & VEATCH**

11401 Corner Overland Park, KS 66211, (913) 458-8000

**F A X**

DATE: March 3, 1997

PROJECT NO: 30370.0001  
PROJECT: Kotzebue Airport Master Plan

TO: Bob Rice  
FIRM: US Fish & Wildlife  
FAX NO: 907-786-3625

TELEPHONE: 907-786-3372

FROM: Sara Funk

TELEPHONE: 913-458-8006

TRANSMITTAL CONSISTS OF 3

FAX NO: 913-458-8254  
PAGES INCLUDING THIS PAGE.

Under subcontract to ASCG Inc. of Anchorage, I am beginning work on an airport master plan update for Kotzebue. Norm Plispanen in Fairbanks (451-2385) is the DOT/PF project manager for the work.

Could you help us to identify the most important needs at the airport by completing this questionnaire? Your viewpoint will be very much appreciated.

I will be calling you soon with more specific questions about your operations at Kotzebue. Your answers to the questions will help us forecast future aviation activity and identify future facility requirements.



# Kotzebue Airport Master Plan Update

## ISSUES

Please circle one rating that expresses your opinion of the issue.

Issue	Very Important	Important	Not Important
Improvement of aircraft access to Alaska Airlines terminal building			<input checked="" type="radio"/>
Accommodation of future lease lot demand	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>
Condition of fire station	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>
Condition of maintenance equipment building	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>
Expansion of automobile parking	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>
Multi-user passenger terminal building	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>
Improvement of Runway 8-26 safety area	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>
Runway security compromised by road at west end	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>
Aircraft fueling facilities' penetration of airspace	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>
Adequacy of itinerant/GA aircraft parking	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>
Accommodation of float planes from Isaac Lake	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>
Leaseholder tie-down areas within taxiway safety area	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>
Scarcity of gravel resources	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>
Access to beach recreation west of the runway after Lagoon Road construction	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>
Pavement maintenance	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>
Community involvement in airport development and operation	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>
Funding for airport development	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>
Local difficulties with national security requirements	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>



**OTHER ISSUES?**

_____	<b>Very Important</b>	<b>Important</b>	<b>Not Important</b>
_____	<b>Very Important</b>	<b>Important</b>	<b>Not Important</b>
_____	<b>Very Important</b>	<b>Important</b>	<b>Not Important</b>

**REMARKS**

Any concerns or ideas about immediate and long-range future airport development and operation?

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

**OPTIONAL:**

Your name, phone number, address:

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

Your association with the airport (passenger, airport tenant, private pilot, etc):

\_\_\_\_\_

Would you like to be on the mailing list for Airport Master Plan Update newsletters?

Yes No

If you would like to return this survey later or discuss the airport plan, please contact:

Jonathan Widdis

Phone: 267-6301

ASCG, Inc.

Fax: 267-6470

301 Arctic Slope Avenue

Anchorage, AK 99518

# Kotzebue Airport Master Plan Update

## ISSUES

Please circle one rating that expresses your opinion of the issue.

	Very Important	Important	Not Important
Improvement of aircraft access to Alaska Airlines terminal building			
Accommodation of future lease lot demand			<input checked="" type="radio"/>
Condition of fire station			<input checked="" type="radio"/>
Condition of maintenance equipment building			<input checked="" type="radio"/>
Expansion of automobile parking	<input checked="" type="radio"/>		
Multi-user passenger terminal building			<input checked="" type="radio"/>
Improvement of Runway 8-26 safety area	<input checked="" type="radio"/>		
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Aircraft fueling facilities' penetration of airspace			<input checked="" type="radio"/>
Adequacy of itinerant/GA aircraft parking		<input checked="" type="radio"/>	
Accommodation of float planes from Isaac Lake			<input checked="" type="radio"/>
Leaseholder tie-down areas within taxiway safety area	<input checked="" type="radio"/>		
Scarcity of gravel resources		<input checked="" type="radio"/>	
Access to beach recreation west of the runway after Lagoon Road construction			<input checked="" type="radio"/>
Pavement maintenance	<input checked="" type="radio"/>		
Community involvement in airport development and operation		<input checked="" type="radio"/>	
Funding for airport development		<input checked="" type="radio"/>	
Local difficulties with national security requirements			<input checked="" type="radio"/>

OTHER ISSUES?

<u>Paved parking by Air carriers</u>	<u>Very Important</u>	Important	Not Important
_____	Very Important	Important	Not Important
_____	Very Important	Important	Not Important

REMARKS

Any concerns or ideas about immediate and long-range future airport development and operation?

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OPTIONAL:

Your name, phone number, address:

Len Slope, Customer Service Mgr., Alaska Airlines, PO Box 726, Kotzebue AK 99752

Your association with the airport (passenger, airport tenant, private pilot, etc):

Airport tenant

Would you like to be on the mailing list for Airport Master Plan Update newsletters?

Yes  No

If you would like to return this survey later or discuss the airport plan, please contact:

Jonathan Widdis Phone: 267-6301  
 ASCG, Inc. Fax: 267-6470  
 301 Arctic Slope Avenue  
 Anchorage, AK 99518

OR GIVE TO John Evans  
Airport Manager

To: J. Widdis

# Kotzebue Airport Master Plan Update

## ISSUES

Please circle one rating that expresses your opinion of the issue.

Issue	Very Important	Important	Not Important
Improvement of aircraft access to Alaska Airlines terminal building			<input checked="" type="radio"/>
Accommodation of future lease lot demand	<input checked="" type="radio"/>		
Condition of fire station	<input checked="" type="radio"/>		
Condition of maintenance equipment building	<input checked="" type="radio"/>		
Expansion of automobile parking		<input checked="" type="radio"/>	
Multi-user passenger terminal building	<input checked="" type="radio"/>		
Improvement of Runway 8-26 safety area	<input checked="" type="radio"/>		
Runway security compromised by road at west end	<input checked="" type="radio"/>		
Aircraft fueling facilities' penetration of airspace	<input checked="" type="radio"/>		
Adequacy of itinerant/GA aircraft parking	<input checked="" type="radio"/>		
Accommodation of float planes from Isaac Lake			<input checked="" type="radio"/>
Leaseholder tie-down areas within taxiway safety area	<input checked="" type="radio"/>		
Scarcity of gravel resources	<input checked="" type="radio"/>		
Access to beach recreation west of the runway after Lagoon Road construction			<input checked="" type="radio"/>
Pavement maintenance	<input checked="" type="radio"/>		
Community involvement in airport development and operation		<input checked="" type="radio"/>	
Funding for airport development	<input checked="" type="radio"/>		
Local difficulties with national security requirements	<input checked="" type="radio"/>		

OTHER ISSUES?

<u>Fencing</u>	<u>Very Important</u>	Important	Not Important
_____	Very Important	Important	Not Important
_____	Very Important	Important	Not Important

REMARKS

Any concerns or ideas about immediate and long-range future airport development and operation?

Approach to A6 should be lowered by removing hill. State property should be fenced off along beach. Its dump road should be moved.

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

OPTIONAL:

Your name, phone number, address: John Evans

Box 55

OTZ, AK

Your association with the airport (passenger, airport tenant, private pilot, etc):

\_\_\_\_\_

Would you like to be on the mailing list for Airport Master Plan Update newsletters? Yes No

If you would like to return this survey later or discuss the airport plan, please contact:

Jonathan Widdis	Phone:	267-6301
ASCG, Inc.	Fax:	267-6470
301 Arctic Slope Avenue		
Anchorage, AK 99518		



FROM: ARCTIC TRANS SERVICE

FAX NO.: 563 8177

To	SARA FUNK	From	TEB LAMB
Co.	BLACK & VEATCH	Co.	ARCTIC TRANSPORTATION
Dept	PROJECT # 30370	Phone #	907-562-2227
Fax #	913-458-8254	Fax #	907-563-8177

# Kotzebue Airport Master Plan Update

## ISSUES

Please circle one rating that expresses your opinion of the issue.

	Very Important	Important	Not Important
Improvement of aircraft access to Alaska Airlines terminal building			<input checked="" type="radio"/>
Accommodation of future lease lot demand	<input checked="" type="radio"/>		
Condition of fire station	<input checked="" type="radio"/>		
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Multi-user passenger terminal building			<input checked="" type="radio"/>
Improvement of Runway 8-26 safety area		<input checked="" type="radio"/>	
Runway security compromised by road at west end	<input checked="" type="radio"/>		
Aircraft fueling facilities' penetration of airspace		<input checked="" type="radio"/>	
Adequacy of itinerant/GA aircraft parking	<input checked="" type="radio"/>		
Accommodation of float planes from Isaac Lake			<input checked="" type="radio"/>
Leaseholder tie-down areas within taxiway safety area	<input checked="" type="radio"/>		
Scarcity of gravel resources	<input checked="" type="radio"/>		
Access to beach recreation west of the runway after Lagoon Road construction		<input checked="" type="radio"/>	
Pavement maintenance	<input checked="" type="radio"/>		
Community involvement in airport development and operation		<input checked="" type="radio"/>	
Funding for airport development	<input checked="" type="radio"/>		
Local difficulties with national security requirements	<input checked="" type="radio"/>		



**Air Carrier/Air Taxi Questionnaire**  
**Kotzebue Airport Master Plan Update**

Name \_\_\_\_\_  
 Organization \_\_\_\_\_  
 Telephone \_\_\_\_\_  
 Fax \_\_\_\_\_  
 Date \_\_\_\_\_

Services Provided (list FAR Part for operations) \_\_\_\_\_

Arrivals/Departure Schedule (typ. for each season) \_\_\_\_\_

Routes (with stage lengths) \_\_\_\_\_

No. Employees at Airport \_\_\_\_\_

Inventory of Facilities (locate on map) \_\_\_\_\_

		FORECAST		
Base Year	5-Year	10-Year	20-Year	
1996	2003	2008	2018	

A. Forecast of Passenger Enplanements

Annual \_\_\_\_\_

Average Day - Peak Month \_\_\_\_\_

Peak Hour (average day - peak month) \_\_\_\_\_

Peak Month in 1996: \_\_\_\_\_

Time of day for peak enplanements:  
 deplanements: \_\_\_\_\_

B. Forecast of Aircraft Departures

Average Day - Peak Month (by type of aircraft, incl different landing gear) \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

Total:

Peak Hour (average day - peak month) \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

Total:

---

		FORECAST		
	Base Year 1996	5-Year 2003	10-Year 2008	20-Year 2018
C. Forecast of Deplaned Cargo (pounds or tons)				
Annual				
Average Day - Peak Month				
Peak Hour (average day - peak month)				
Peak Month in 1996:				
Time of day for peak deplanements:				
% Mail:      %Freight:      Method of unloading:				

D. Forecast of Enplaned Cargo (pounds or tons)				
Annual				
Average Day - Peak Month				
Peak Hour (average day - peak month)				
Peak Month in 1996:				
Time of day for peak deplanements:				
% Mail:      %Freight:      Method of unloading:				

E. Forecast of Aircraft Parking Positions	
With loading bridges to terminal	
With at-grade terminal access	
Overnight	
Other	
Parking Method (power out, power back, or push back):	

F. Forecast of Support Facilities	
Building Area Requirements (square feet)	
Passenger Processing	
Cargo Processing	
Administrative	
Other (describe)	
Total	
Hangar/Maintenance Shop Requirements (area, dimensions, height, no. aircraft)	
Automobile Parking (no. of spaces)	

---

---

Outdoor Area (type and size)

G. Remarks

Describe Passenger/Baggage Processing (security screening required? baggage claim device? any change anticipated?)

---

---

Location of Building/Hangar

---

---

Runways, Taxiways, Aprons

---

---

Nav aids

---

---

Fueling & Utilities

---

---

Roads and Parking.

---

---

Other

---

---

2410 4/29/97

RECEIVED

APR 25 1997

Air Carrier/Air Taxi Questionnaire  
Kotzebue Airport Master Plan Update

Name Mike Hajdukovich  
 Organization Frontier Flying Service  
 Telephone 907-474-0014  
 Fax 907-474-0774  
 Date 4-22-97

Services Provided (list FAR Part for operations) 121

Arrivals/Departure Schedule (typ. for each season) 9:30 A.M. / 9:40 A.M. 5:00 P.M. / 5:10 P.M.

Routes (with stage lengths) FAI-OTZ-64L-ANC-64L-OTZ-FAI Mon-Sat

No. Employees at Airport 0

Inventory of Facilities (locate on map) L

	Base Year 1996	FORECAST		
		5-Year 2003	10-Year 2008	20-Year 2018
A Forecast of Passenger Enplanements				
Annual				
Average Day - Peak Month	<u>3000</u>	<u>4500</u>	<u>-</u>	<u>-</u>
Peak Hour (average day - peak month)	<u>7</u>			
Peak Month in 1996:				
Time of day for peak enplanements: deplanements:				

B. Forecast of Aircraft Departures

Average Day - Peak Month (by type of aircraft, incl different landing gear)

Buch 200 2x per day per year Mon-Sat year Round

Total:

Peak Hour (average day - peak month)

12:00 P.M. & 5:00 P.M.

Total:

	Base Year 1996	FORECAST		
		5-Year 2003	10-Year 2008	20-Year 2018
C. Forecast of Deplaned Cargo (pounds or tons)				
Annual	17500	17500	17500	
Average Day - Peak Month				
Peak Hour (average day - peak month)				
Peak Month in 1996:				
Time of day for peak deplanements:				
% Mail: 95 % Freight: 5				
Method of unloading: Cape Smythe				

D. Forecast of Enplaned Cargo (pounds or tons)				
Annual	1000			
Average Day - Peak Month	3000			
Peak Hour (average day - peak month)	1200 p.m.			
Peak Month in 1996:				
Time of day for peak deplanements:				
% Mail: 0 % Freight: 100				
Method of unloading:				

E. Forecast of Aircraft Parking Positions	
With loading bridges to terminal	0
With at-grade terminal access	1
Overnight	0
Other	0
Parking Method (power out, power back, or push back):	

F. Forecast of Support Facilities	
Building Area Requirements (square feet)	
Passenger Processing	Cape Smythe
Cargo Processing	
Administrative	
Other (describe)	
Total	
Hangar/Maintenance Shop Requirements (area, dimensions, height, no. aircraft)	
Automobile Parking (no. of spaces)	



**Air Carrier/Air Taxi Questionnaire  
 Kotzebue Airport Master Plan Update**

1

Name BILL  
 Organization FRONTIER  
 Telephone 907/474-0014  
 Fax - 0774  
 Date \_\_\_\_\_

Services Provided (list FAR Part for operations)

FAR 121 & 135

Arrivals/Departure Schedule (typ. for each season)

ARRIVE OTZ 9:30 AM and 4:00 PM / DEPART 9:40 AM and 5:00 PM

Routes (with stage lengths)

FAI-OTZ (388 NM) OTZ-GAL (197 NM) OTZ-OME (160 NM)

No. Employees at Airport \_\_\_\_\_

Inventory of Facilities (locate on map) \_\_\_\_\_

	Base Year 1996	5-Year 2003	FORECAST	
			10-Year 2008	20-Year 2018
A. Forecast of Passenger Enplanements				
Annual				
Average Day - Peak Month	<u>1700</u>	<u>2500</u>	<u>2500</u>	<u>2500</u>
Peak Hour (average day - peak month)	<u>5</u>	<u>10</u>	<u>10</u>	<u>10</u>
Peak Month in 1996:				
Time of day for peak enplanements:	<u>0940</u>	<u>1700</u>		
deplanements:	<u>0940</u>	<u>1630</u>		

**B. Forecast of Aircraft Departures**

Average Day - Peak Month (by type of aircraft, incl different landing gear)

2 per Day using Beech King Air (BE200) Mon-Sat.  
No scheduled flights on Sundays

Total: \_\_\_\_\_

Peak Hour (average day - peak month) \_\_\_\_\_



**Air Carrier/Air Taxi Questionnaire**  
**Kotzebue Airport Master Plan Update**  
 2

	Base Year 1996	FORECAST		
		5-Year 2003	10-Year 2008	20-Year 2018
<b>C. Forecast of Deplaned Cargo (pounds or tons)</b>				
Annual	1500			
Average Day - Peak Month	10			
Peak Hour (average day - peak month)	150			
Peak Month in 1996:				
Time of day for peak deplanements:				
% Mail: 2    % Freight: 5    Method of unloading:				

<b>D. Forecast of Enplaned Cargo (pounds or tons)</b>				
Annual	1500			
Average Day - Peak Month	10			
Peak Hour (average day - peak month)				
Peak Month in 1996:				
Time of day for peak deplanements: SEE FRONT				
% Mail: <del>2</del> % Freight: 5    Method of unloading: CARS				

**E. Forecast of Aircraft Parking Positions**

With loading bridges to terminal \_\_\_\_\_

With at-grade terminal access \_\_\_\_\_

Overnight \_\_\_\_\_

Other CAPE SMITH \_\_\_\_\_

Parking Method (power out, power back, or push back): \_\_\_\_\_

**F. Forecast of Support Facilities**

Building Area Requirements (square feet)

Passenger Processing \_\_\_\_\_

Cargo Processing \_\_\_\_\_

Administrative \_\_\_\_\_

Other (describe) \_\_\_\_\_

Total \_\_\_\_\_

Hangar/Maintenance Shop Requirements (area, dimensions, height, no. aircraft) \_\_\_\_\_

Automobile Parking (no. of spaces) \_\_\_\_\_

Outdoor Area (type and size) \_\_\_\_\_

Fueling & Utilities

CROWLEY MARINE

Roads and Parking.

Other

04/27/97 11:16 907 522 3403

R&M CONSULTANTS

002/006

Air Carrier/Air Taxi Questionnaire  
Kotzebue Airport Master Plan Update

1

Name ROBERT W. EVERTS  
 Organization TATONDUK OUTFITTERS LTD. DBA AIR CARGO EXPRESS  
 Telephone 907 474-4699  
 Fax 907 474-3002  
 Date 4-29-97

Services Provided (list FAR Part for operations) FAR PART 121 AIR CARRIER  
SCHEDULED ALL-CARGO

Arrivals/Departure Schedule (typ. for each season)  
ARRIVE 2130 TUESDAY-SATURDAY, DEPART 2215 TUESDAY-SATURDAY

Routes (with stage lengths) ANCHORAGE - Nome - KOTZEBUE - ANCHORAGE

No. Employees at Airport CONTRACT AGENT SERVICES WITH FBX IN KOTZEBUE,  
 Inventory of Facilities (locate on map)

	Base Year 1996	FORECAST		
		5-Year 2003	10-Year 2008	20-Year 2018
A. Forecast of Passenger Enplanements				
Annual	0	0	0	0
Average Day - Peak Month				
Peak Hour (average day - peak month)				
Peak Month in 1996:				
Time of day for peak enplanements: deplanements:				

AIR CARGO EXPRESS DOES NOT ANTICIPATE PASSENGER OPERATIONS IN OTZ

B. Forecast of Aircraft Departures  
 Average Day - Peak Month (by type of aircraft, incl different landing gear)  
AVERAGE PER DAY - 1 LANDING - DC-6  
AVERAGE PER MONTH - 22 LANDINGS - DC-6

Total: 22-30/mo.

Peak Hour (average day - peak month)  
SCHEDULES ARRIVE-DEPART TIME  
2130 - 2215

04/27/97 11:46 907 522 3403

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003/006

Air Carrier/Air Taxi Questionnaire  
Kotzebue Airport Master Plan Update  
2

Total:

	Base Year 1996	FORECAST		
		5-Year 2003	10-Year 2008	20-Year 2018
C. Forecast of Deplaned Cargo (pounds or tons)				
Annual - POUNDS	3,628,664	5,000,000 +		
Average Day - Peak Month	27500 lbs	JULY		
Peak Hour (average day - peak month)	1900 - 2100 HOURS	JULY		
Peak Month in 1996:	JULY			
Time of day for peak deplanements:	1900 - 2100 HOURS			
% Mail: 75 % Freight: 25				
Method of unloading:	FORKLIFT			

D. Forecast of Enplaned Cargo (pounds or tons)				
Annual - POUNDS	182,085	1,800,000 +		
Average Day - Peak Month	580 lbs	JULY		
Peak Hour (average day - peak month)	1900 - 2100 HOURS	JULY		
Peak Month in 1996:	JULY			
Time of day for peak deplanements:	1900 - 2100 HRS			
% Mail: 15 % Freight: 85				
Method of unloading:	FORKLIFT			

E. Forecast of Aircraft Parking Positions

- With loading bridges to terminal
- With at-grade terminal access AT GRADE CARGO RAMP VIA ABB
- Overnight - OCCASIONAL
- Other
- Parking Method (power out, power back, or push back):

F. Forecast of Support Facilities

- Building Area Requirements (square feet)
  - Passenger Processing PER AGENT
  - Cargo Processing
  - Administrative
  - Other (describe)
  - Total
- Hangar/Maintenance Shop Requirements (area, dimensions, height, no. aircraft) NO MAINTENANCE PERFORMED IN KOTZEBUE
- Automobile Parking (no. of spaces)



04/27/87

11:47

907 522 3403

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004/006

Air Carrier/Air Taxi Questionnaire  
Kotzebue Airport Master Plan Update

3

Outdoor Area (type and size)

G. Remarks

Describe Passenger/Baggage Processing (security screening required? baggage claim device? any change anticipated?)

AIR CARGO EXPRESS CONDUCTS NO PASSENGER  
OPERATIONS.

Location of Building/Hangar

AIR AGENT

Runways, Taxiways, Aprons

~~AIR AGENT~~ - RAMP AREA COULD  
BE WIDER - LARGE AIRCRAFT HAVE  
Nav aids  
DIFFICULTY CLEARING EACH OTHER

Fueling & Utilities

Roads and Parking.

Other (Desired Improvements)

MORE RAMP SPACE - ABOVE

# Alaska Airlines

April 29, 1997.

R&M Consultants, Inc.  
9101 Vanguard Dr.  
Anchorage, AK 99507

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R&M CONSULTANTS, INC.

Per your request, enclosed please find information re Kotzebue Master Plan 1996-2018.

Please contact Richard Smith for any further information you may require. You can reach him at (907) 747-5775.

*PER 5/12/97 DICK CONVERSATION SMITH / AK AIRLINES / SITKA 907-747-5775 CONTACT FOR M.P.*

Sincerely,



Korbey G. Hunt  
Director - Properties

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MAY 3 1997

PF/Fin...



Air Carrier/Air Taxi Questionnaire  
Kotzebue Airport Master Plan Update

Name \_\_\_\_\_

Organization \_\_\_\_\_

Telephone \_\_\_\_\_

Fax \_\_\_\_\_

Date \_\_\_\_\_

Services Provided (list FAR Part for operations) Scheduled Combination and All-Cargo service  
operated under FAR Part 119 and 121.

Arrivals/Departure Schedule (typ. for each season) See attached.

Routes (with stage lengths) OTZ-ANC 549 sm, OTZ-OME 183 sm.

No. Employees at Airport 19

Inventory of Facilities (locate on map) \_\_\_\_\_

	Base Year 1996	FORECAST		
		5-Year 2003	10-Year 2008	20-Year 2018
A. Forecast of Passenger Enplanements 1/ Annual	29,254	31,169	32,858	36,303
Average Day - Peak Month	148	158	166	184
Peak Hour (average day - peak month)	65	69	73	81
Peak Month in 1996: July				
Time of day for peak enplanements:	1100-1200			
deplanements:	1700-1800			
B. Forecast of Aircraft Departures	917	1,002	1,053	1,164
Average Day - Peak Month (by type of aircraft, incl different landing gear)				
B737-200	1.8	2.0	2.1	2.3
B737-400	2.0	2.2	2.3	2.5
Total:	3.8	4.2	4.4	4.8
Peak Hour (average day - peak month)	1.0	1.0	1.0	1.0

1/ Passenger enplanements includes non-revenue passengers. Departures excludes minimal charter operations

Total:

	Base Year 1996	FORECAST		
		5-Year 2003	10-Year 2008	20-Year 2018
C. Forecast of Deplaned Cargo (pounds or tons)1/ Annual	6,623,500	7,868,900	8,398,500	9,431,600
Average Day - Peak Month	23,160	27,510	29,370	32,980
Peak Hour (average day - peak month)	7,930	9,420	10,060	11,290
Peak Month in 1996: August				
Time of day for peak deplanements: 1900-2000				
% Mail: 85 % Freight: 15 Method of unloading:				

D. Forecast of Enplaned Cargo (pounds or tons)1/ Annual	821,100	1,022,100	1,129,700	1,254,800
Average Day - Peak Month	3,550	4,420	4,880	5,430
Peak Hour (average day - peak month)	2,140	2,660	2,940	3,270
Peak Month in 1996: September				
Time of day for peak deplanements: 1800-1900				
% Mail: 43 % Freight: 57 Method of unloading:				

- E. Forecast of Aircraft Parking Positions
- With loading bridges to terminal
  - With at-grade terminal access
  - Overnight
  - Other
- Parking Method (power out, power back, or push back):

F. Forecast of Support Facilities	5/12/97	DICK SMITH / AK AIRLINES
Building Area Requirements (square feet)		907-747-5775 SITKA
Passenger Processing		
Cargo Processing	TERMINAL AREA IS ADEQUATE	
Administrative	MAY REMODEL TO MAKE SPACE	
Other (describe)	MORE EFFICIENT	
Total		

Hangar/Maintenance Shop Requirements (area, dimensions, height, no. aircraft)  
 - AK AIRLINES - WOULD LIKE PAVED

Automobile Parking (no. of spaces)  
 PARKING TO CUT DOWN ON DUST. ADD'L SECURITY FENCING.

1/ Includes freight, small package and mail

Table 1

Alaska Airlines,  
 Kotzebue Station Activity, Scheduled Service  
 Revenue Departures and Traffic Enplaned  
 1985 - 2018

Year	Combination						All Cargo						Total Scheduled										
	Days	Pax Revenue	NonRev	Freight Pounds	Goldstreak Pounds	Mail Pounds	Days	Freight Pounds	Goldstreak Pounds	Mail Pounds	Days	Pax Revenue	NonRev	Freight Pounds	Goldstreak Pounds	Mail Pounds	Days	Pax Revenue	NonRev	Freight Pounds	Goldstreak Pounds	Mail Pounds	
1985	998	24,897	1,228	1,205,906		294,438	59	975,763		856	1,057	24,897	1,228	2,181,669		295,294							
1986	999	23,834	1,333	689,922		291,506	20	376,675		1,050	1,019	23,834	1,333	1,066,597		292,556							
1987	960	24,108	1,517	509,496		341,856	11	5,690		800	971	24,108	1,517	515,186		342,656							
1988	962	25,145	1,330	909,284		376,356	39	514,300		4,980	1,001	25,145	1,330	1,483,584		381,336							
1989	934	27,879	1,349	541,615		399,084	44	84,019		37,767	978	27,879	1,349	625,634		436,851							
1990	940	25,872	1,344	462,653		476,948	37	165,660		24,747	977	25,872	1,344	628,313		501,695							
1991	947	25,968	1,491	583,248		406,430	29	219,318		4,821	976	25,968	1,491	802,566		411,251							
1992	1,028	25,890	1,377	668,723		493,702	47	208,023		609	1,075	25,890	1,377	876,746		494,311							
1993	1,033	24,346	1,633	377,787		340,306	44	40,869		278	1,077	24,346	1,633	418,656		340,584							
1994	993	27,532	1,973	417,340		442,756	49	102,788		29,623	1,042	27,532	1,973	520,128		472,379							
1995	996	28,169	1,968	457,694		466,609	66	114,494		95	1,062	28,169	1,968	572,188		492,037							
1996	906	27,122	2,132	314,569		421,286	11	5,297		24,354	917	27,122	2,132	319,866		445,640							
1997	906	27,180	2,174	317,100		421,290	38	49,818		16,416	944	27,180	2,174	366,918		437,706							
2003	962	28,860	2,309	432,900		452,140	40	52,440		17,280	1,002	28,860	2,309	485,340		469,420							
2008	1,011	30,330	2,528	505,500		480,225	42	55,062		18,144	1,053	30,330	2,528	560,562		498,369							
2018	1,117	33,510	2,793	558,500		536,160	47	61,617		20,304	1,164	33,510	2,793	620,117		556,464							
Average Annual Growth																							
1985-96	(.88)	(.28)	3.63	(13.50)		1.83																	
1996-97		.21	1.99	.80	(82.07)	.00																	
1997-03	1.00	1.21	1.21	6.42	2.72	1.42																	
2003-08	1.00	1.00	1.83	3.15	1.00	1.21																	
2008-18	1.00	1.00	1.00	1.00	1.00	1.11																	
1996-18	.96	.97	1.23	2.64	.96	1.10																	

Note: Source 1985-1996 STATR662. Goldstreak not available prior to 1991.

Table II

Alaska Airlines, Inc.  
 Kozev Station Activity, Scheduled Service  
 Revenue Departures and Traffic Explained Per Departure  
 1985 - 2018

Year	Drops	Combination				All Cargo				Total Scheduled			
		Pax Revenue	Pax NonRev	Freight Pounds	Mail Pounds	Drops	Freight Pounds	Goldstreak Pounds	Mail Pounds	Revenue	Pax NonRev	Freight Pounds	Goldstreak Pounds
1985	998	24.9	1.2	1,208	295	59	16,530	15	23.6	1.2	2,064		279
1986	999	23.9	1.3	691	292	20	18,034	53	23.4	1.3	1,047		287
1987	960	25.1	1.6	531	356	11	517	73	24.8	1.6	531		353
1988	962	26.1	1.4	1,008	391	39	13,187	128	25.1	1.3	1,482		381
1989	934	29.8	1.4	580	427	44	1,910	858	28.5	1.4	640		447
1990	940	27.5	1.4	492	507	37	4,477	669	26.5	1.4	643		514
1991	947	27.4	1.6	616	429	29	7,563	166	26.6	1.5	822	42	421
1992	1,028	25.2	1.3	651	480	47	4,426	13	24.1	1.3	816	50	460
1993	1,033	23.6	1.6	366	329	44	929	6	22.6	1.5	389	57	316
1994	993	27.7	2.0	420	446	49	2,098	605	26.4	1.9	499	70	453
1995	996	28.3	2.0	460	468	66	1,735	1	26.5	1.9	539	66	463
1996	906	29.9	2.4	347	465	11	482	2,214	29.6	2.3	349	61	486
1997	906	30.0	2.4	350	465	38	1,311	432	28.8	2.3	389	62	464
2003	962	30.0	2.4	450	470	40	1,311	432	28.8	2.3	484	67	468
2008	1,011	30.0	2.5	500	475	42	1,311	432	28.8	2.4	532	67	473
2018	1,117	30.0	2.5	500	480	47	1,311	432	28.8	2.4	533	67	478

Alaska Airlines,  
 Kotzebue Station Activity, Scheduled Service  
 Revenue Arrivals and Traffic Deplanned  
 1985 - 2018

Year	Combination					All Cargo					Total Scheduled					
	Days	Pax Revenue	Pax NonFly	Freight Pounds	Goldstreak Pounds	Mail Pounds	Days	Freight Pounds	Goldstreak Pounds	Mail Pounds	Days	Pax Revenue	Pax NonFly	Freight Pounds	Goldstreak Pounds	Mail Pounds
1985	997	24,428	1,301	1,654,877	4,670,008	4,670,008	60	339,729	760,647	760,647	1,057	24,428	1,301	1,994,606	5,430,655	5,430,655
1986	999	23,830	1,342	1,413,877	4,367,069	4,367,069	20	128,635	182,217	182,217	1,019	23,830	1,342	1,542,512	4,549,286	4,549,286
1987	962	23,724	1,619	1,491,802	3,975,090	3,975,090	11	71,265	212,556	212,556	973	23,724	1,619	1,563,067	4,187,646	4,187,646
1988	962	24,780	1,326	1,364,615	4,264,435	4,264,435	40	226,120	508,779	508,779	1,002	24,780	1,326	1,590,735	4,773,214	4,773,214
1989	935	27,601	1,357	1,249,933	4,256,199	4,256,199	46	172,900	1,047,418	1,047,418	981	27,601	1,357	1,422,803	5,303,617	5,303,617
1990	940	25,161	1,361	1,485,886	4,709,034	4,709,034	37	178,822	760,374	760,374	977	25,161	1,361	1,664,708	5,469,408	5,469,408
1991	947	25,584	1,501	1,384,597	4,381,737	4,381,737	29	179,734	461,549	461,549	976	25,584	1,581	1,564,331	4,843,286	4,843,286
1992	1,000	24,568	1,375	1,340,769	4,446,186	4,446,186	48	313,027	826,487	826,487	1,078	24,568	1,375	1,653,796	5,272,673	5,272,673
1993	1,033	23,819	1,720	1,284,843	4,825,877	4,825,877	44	274,592	174,871,288	174,871,288	1,077	23,819	1,720	1,559,435	104,490	5,697,165
1994	993	27,604	1,989	1,247,082	5,124,225	5,124,225	58	326,158	486,153,155	486,153,155	1,051	27,604	1,989	1,573,240	135,178	6,277,380
1995	996	28,750	1,950	1,082,296	5,850,548	5,850,548	73	299,749	447,161,602	447,161,602	1,069	28,750	1,950	1,382,045	182,587	7,462,150
1996	907	27,321	2,153	845,947	5,341,923	5,341,923	11	26,481	483,206,185	483,206,185	918	27,321	2,153	872,428	202,949	5,548,108
1997	906	27,180	2,174	860,700	5,327,280	5,327,280	38	95,000	570,714,400	570,714,400	944	27,180	2,174	955,700	208,950	6,041,680
2003	962	28,860	2,309	1,058,200	5,656,560	5,656,560	40	108,000	600,805,000	600,805,000	1,002	28,860	2,309	1,166,200	241,100	6,461,560
2008	1,011	30,330	2,528	1,213,200	5,944,680	5,944,680	42	121,800	630,845,250	630,845,250	1,053	30,330	2,528	1,335,000	273,600	6,789,930
2018	1,117	33,510	2,793	1,452,100	6,567,960	6,567,960	47	141,000	705,945,875	705,945,875	1,164	33,510	2,793	1,593,100	324,635	7,513,835

Average Annual Growth

1985-96	(.86)	(.32)	3.55	(3.11)	.41											
1996-97	(.11)	(.52)	.99	1.74	(.27)	2.92										.19
1997-03	1.00	1.21	1.21	4.22	1.21	2.91										8.90
2003-08	1.00	1.00	1.83	2.77	1.00	2.57										1.13
2008-18	1.00	1.00	1.00	1.81	1.00	1.73										1.00
1996-18	.95	.93	1.19	2.49	.94	2.16										1.02
																1.39

Note: Source 1985-1996 STATR662. Goldstreak not available prior to 1991.



Table IV

Alaska Airlines, Inc.  
 Kotzebue Station Activity, Scheduled Service  
 Revenue Arrivals and Traffic Deployed Per Arrival  
 1985 - 2018

Year	Combination					All Cargo					Total Scheduled				
	Deos	Pax Revenue	Pax NonRev	Freight Pounds	Goldstreak Pounds	Mail Pounds	Deos	Freight Pounds	Goldstreak Pounds	Mail Pounds	Deos	Pax Revenue	Pax NonRev	Freight Pounds	Goldstreak Pounds
1985	997	24.5	1.3	1,660	4,684	60	5,662	12,677	1,057	23.1	1.2	1,887	5,138		
1986	999	23.9	1.3	1,415	4,371	20	6,432	9,111	1,019	23.4	1.3	1,514	4,464		
1987	962	24.7	1.7	1,551	4,132	11	6,479	19,323	973	24.4	1.7	1,606	4,304		
1988	962	25.8	1.4	1,419	4,433	40	5,653	12,719	1,002	24.7	1.3	1,588	4,764		
1989	935	29.5	1.5	1,337	4,552	46	3,759	22,770	981	28.1	1.4	1,450	5,406		
1990	940	26.8	1.4	1,581	5,010	37	4,803	20,551	977	25.8	1.4	1,704	5,598		
1991	947	27.0	1.7	1,462	4,627	29	6,198	15,915	976	26.2	1.6	1,603	4,962		
1992	1,030	23.9	1.3	1,302	4,317	48	6,521	17,218	1,078	22.8	1.3	1,534	4,891		
1993	1,033	23.1	1.7	1,244	4,672	44	6,241	19,802	1,077	22.1	1.6	1,448	5,290		
1994	993	27.8	2.0	1,256	5,160	58	5,623	19,882	1,051	26.3	1.9	1,497	5,973		
1995	996	28.9	2.0	1,087	5,874	73	4,106	22,077	1,069	26.9	1.8	1,293	6,980		
1996	907	30.1	2.4	933	5,890	11	2,407	18,744	918	29.8	2.3	950	6,044		
1997	906	30.0	2.4	950	5,880	38	2,500	18,800	944	28.8	2.3	1,012	6,400		
2003	962	30.0	2.4	1,100	5,880	40	2,700	20,125	1,002	28.8	2.3	1,164	6,449		
2008	1,011	30.0	2.5	1,200	5,880	42	2,900	20,125	1,053	28.8	2.4	1,268	6,448		
2018	1,117	30.0	2.5	1,300	5,880	47	3,000	20,125	1,164	28.8	2.4	1,369	6,455		



Alaska Airlines Inc.  
Kotzebue Summer/Spring Schedules  
1996-1997

<u>Freq</u>	<u>Org</u>	<u>Dest</u>	<u>Depart</u>	<u>Arrive</u>	<u>Flight</u>	<u>Aircraft</u>
July 1996						
135	ANC/OME	OTZ	838	916	53	73M
2467	ANC	OTZ	750	916	51	73M
Dly	ANC	OTZ	915	1040	152	734
Dly	ANC	OTZ	1631	1756	153	734
X1	ANC	OTZ	1810	1934	57	73M
March 1997						
135	OTZ	ANC	954	1116	53	73M
2467	OTZ	ANC	954	1116	52	73M
Dly	OTZ	OME/ANC	1122	1205	152	734
Dly	OTZ	OME/ANC	1837	1919	153	734
X13	OTZ	ANC	2012	2132	56	73M
3	OTZ	OME/ANC	2012	2054	57	73M
March 1997						
1567	ANC/OME	OTZ	825	904	52	73M
234	ANC	OTZ	727	904	51	73M
5	ANC	OTZ	1554	1721	57	73M
X5	ANC	OTZ	1622	1749	57	73M
Dly	OTZ	ANC	939	1108	52	73M
5	OTZ	ANC	1755	1921	56	73M
X15	OTZ	ANC	1823	1949	56	73M
*124	OTZ	OME/ANC	1824	1909	57	73M

\*Selective cancellations

Source: Official Airline Guide

APR-09-97 WED 06:37

807 522 3403

R&M CONSULTANTS

002/008

DIVISION OF REALTY

FAX NO. 9077863901

P. 03

Rec'd  
from  
12/11/97  
S/P

RECEIVED

MAY 01 1997

R&M CONSULTANTS, INC

Air Carrier/Air Taxi Questionnaire  
Kotzebue Airport Master Plan Update

Name SELAWIK NATIONAL WILDLIFE REFUGE  
 Organization U.S. FISH & WILDLIFE SERVICE  
 Telephone (907) 442-3799  
 Fax 442-3124  
 Date 4/17/97

Services Provided (list FAR Part for operations) NONE

Arrivals/Departure Schedule (typ. for each season) NONE

Routes (with stage lengths) NONE

No. Employees at Airport NONE

Inventory of Facilities (locate on map) Hanger lot 1, Float pond lot 6, Ramp lot 2

A. Forecast of Passenger Enplanements Annual	Base Year 1996	FORECAST		
		5-Year 2003	10-Year 2008	20-Year 2018
Average Day - Peak Month	0	40	50	60
Peak Hour (average day - peak month)	0	2	3	4
Peak Month in 1996:	0	2	3	4
Time of day for peak enplanements: deplanements:	0 0			

B. Forecast of Aircraft Departures

Average Day - Peak Month (by type of aircraft, incl different landing gear)	Total:
Piper PA-18 wheel sk: floats	1

Peak Hour (average day - peak month)	Total:
Piper PA-18 wheel sk	1

Air Carrier/Air Taxi Questionnaire  
 Kotzebue Airport Master Plan Update

2

Total:

C. Forecast of Deplaned Cargo (pounds or tons)	Base Year 1996	FORECAST		
		5-Year 2003	10-Year 2008	20-Year 2018
Annual				
Average Day - Peak Month	<input type="radio"/>	2,000	3,000	4,000
Peak Hour (average day - peak month)	<input type="radio"/>	50	60	70
Peak Month in 1996:	<input type="radio"/>	50	60	70
Time of day for peak deplanements:	<input type="radio"/>			
<input type="radio"/> % Mail: 100 % Freight:				
Method of unloading: Hand				

D. Forecast of Enplaned Cargo (pounds or tons)				
Annual				
Average Day - Peak Month	<input type="radio"/>	6,000	8,000	10,000
Peak Hour (average day - peak month)	<input type="radio"/>	50	60	70
Peak Month in 1996:	<input type="radio"/>	50	60	70
Time of day for peak deplanements:	<input type="radio"/>			
<input type="radio"/> % Mail: 100 % Freight:				
Method of unloading: Hand				

E. Forecast of Aircraft Parking Positions	
With loading bridges to terminal	N/A
With at-grade terminal access	N/A
Overnight	Occasional Apron Parking lot 2
Other	in Hanger lot 1
Parking Method (power out, power back, or push back)	

F. Forecast of Support Facilities	
Building Area Requirements (square feet)	no additional space required
Passenger Processing	<input type="radio"/>
Cargo Processing	<input type="radio"/>
Administrative	<input type="radio"/>
Other (describe)	<input type="radio"/>
Total	<input type="radio"/>
Hangar/Maintenance Shop Requirements (area, dimensions, height, no. aircraft)	<input type="radio"/>
Automobile Parking (no. of spaces)	3

Air Carrier/Air Taxi Questionnaire  
Kotzebuc Airport Master Plan Update  
3

Outdoor Area (type and size)

G. Remarks

Describe Passenger/Baggage Processing (security screening required? baggage claim device? any change anticipated?)  
N/A

Location of Building/Hangar

Lot 1

Runways, Taxiways, Aprons

^ apron lot 2, Float Road lot 6, Taxiway not shown on map crosses Road  
and projected to be removed taking gravel making runway not accessible. lot access  
to runway doesn't exist (see map)  
Nav aids

N/A

Fueling & Utilities

Lot 2 2,000 gal Av. tank, electricity, water holding tank - city  
hauls water & removes sewage for fee.

Roads and Parking.

1 Road to lot 1 park on Apron

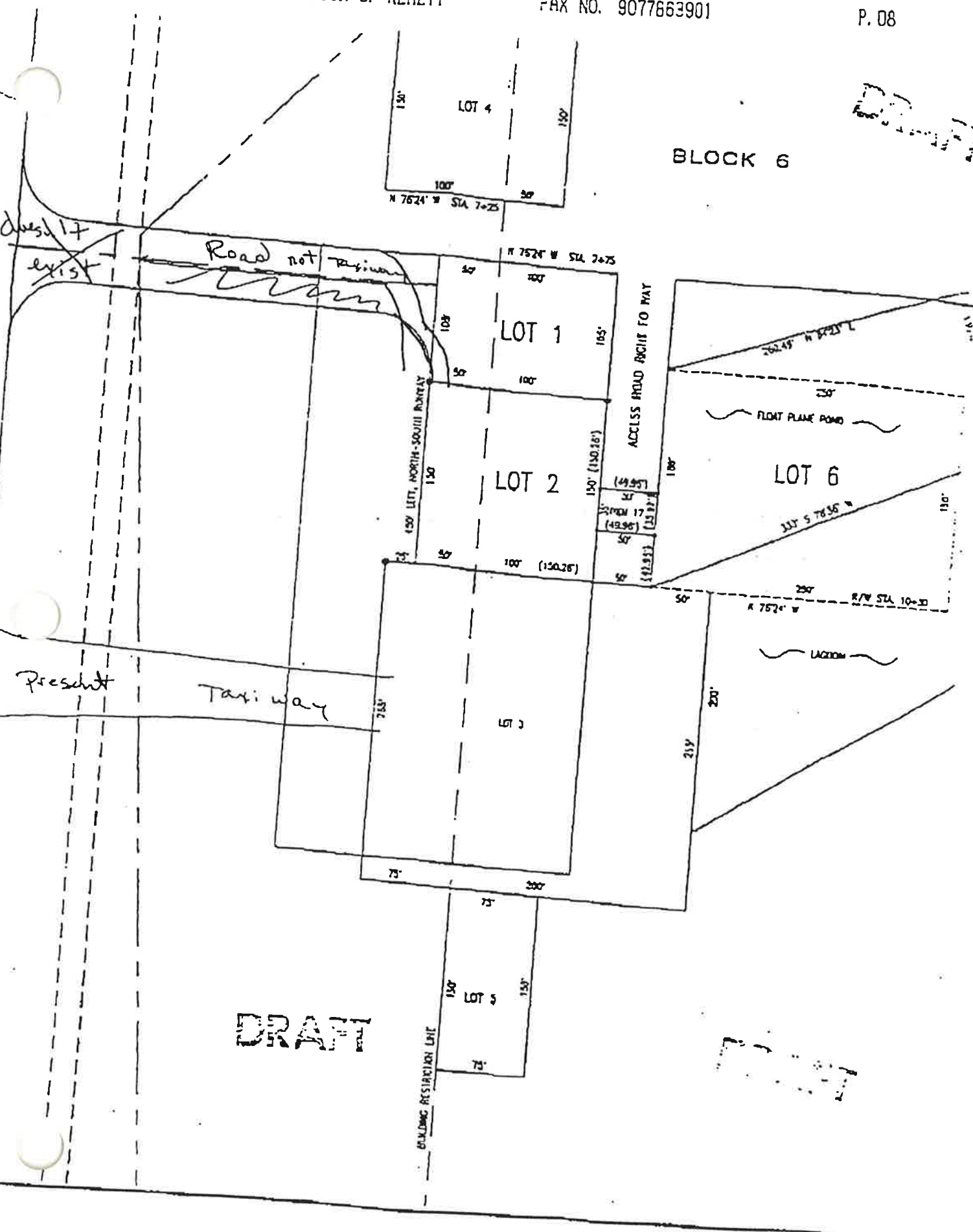
Other (Desired Improvements)

Road goes through Taxiway. Road set to be removed will no plan to  
fill hole after gravel is removed from Road. This will make Taxi way  
less. Map not correct; shows non-existent taxiway.



DRAFT

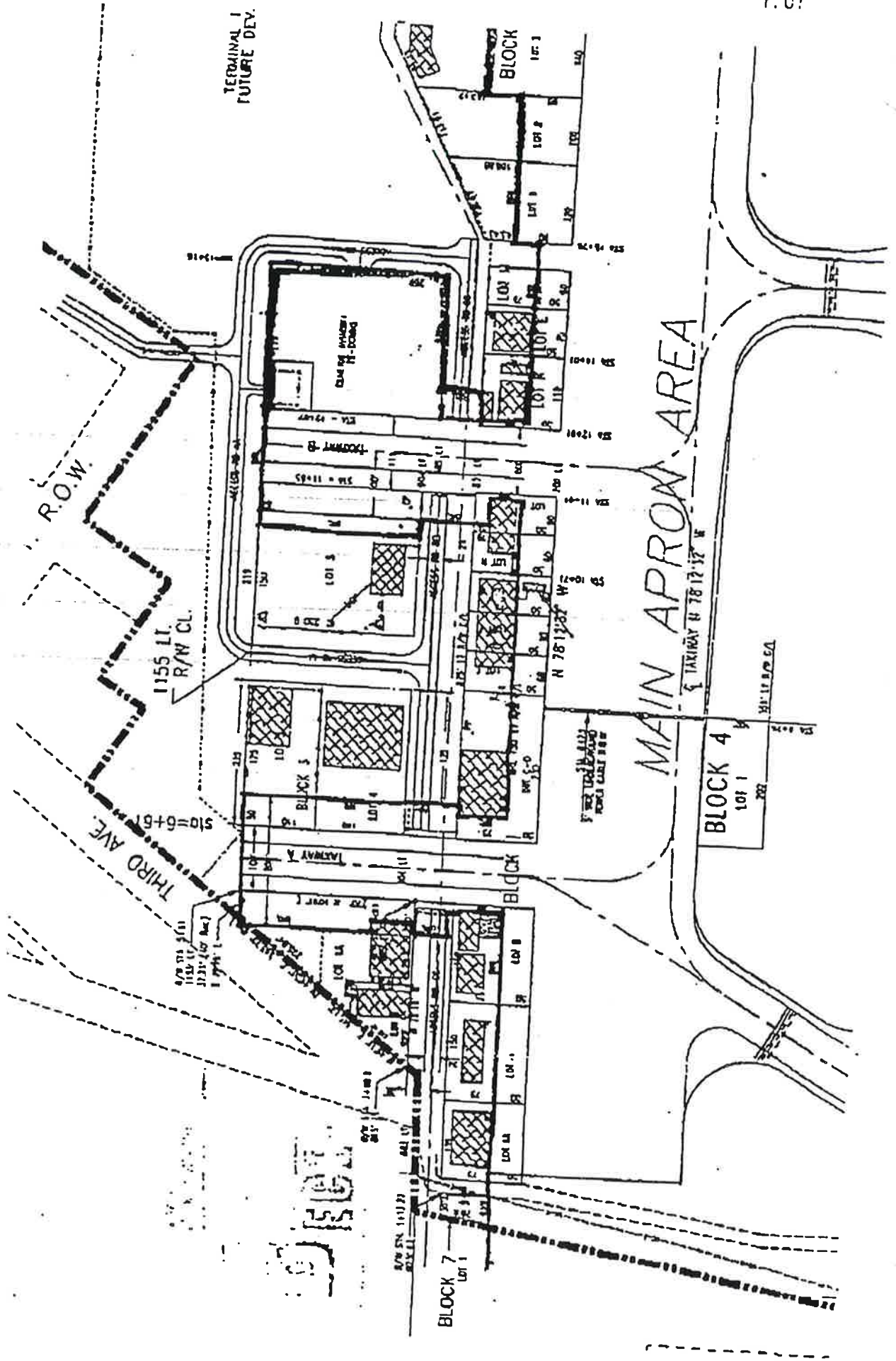
BLOCK 6



DRAFT

DRAFT

BRL



BRL



K- 1000000

Air Carrier/Air Taxi Questionnaire  
Kotzebue Airport Master Plan Update

Name DAN HODGES  
 Organization CROWLEY MARINE SERVICES, INC.  
 Telephone 907 - 442 - 7211  
 Fax 907 - 442 - 3627  
 Date 4/22/97

Services Provided (list FAR Part for operations) FULL AIRCRAFT ONLY - DO NOT  
operate any aircraft  
 Arrivals/Departure Schedule (typ. for each season)

Routes (with stage lengths)

No. Employees at Airport 1

Inventory of Facilities (locate on map) Lot 1 Block 4, Lot M Block 1

	Base Year 1996	FORECAST		
		5-Year 2003	10-Year 2008	20-Year 2018
A. Forecast of Passenger Enplanements				
Annual				
Average Day - Peak Month				
Peak Hour (average day - peak month)				
Peak Month in 1996:				
Time of day for peak enplanements:				
deplanements:				

B. Forecast of Aircraft Departures

Average Day - Peak Month (by type of aircraft, incl different landing gear)

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

Total:

\_\_\_\_\_

Peak Hour (average day - peak month)

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

Air Carrier/Air Taxi Questionnaire  
Kotzebue Airport Master Plan Update

Name JAMES ROOD  
 Organization NORTHWESTERN AVIATION  
 Telephone 907-442-2525  
 Fax 907-442-2145  
 Date 5-19-97

Services Provided (list FAR Part for operations) PT 35

Arrivals/Departure Schedule (typ. for each season) ON DEMAND

Routes (with stage lengths) ON DEMAND

No. Employees at Airport 1 FULL TIME, 1 PART TIME

Inventory of Facilities (~~locate on map~~)  
 (general location/type)

FORECAST

	Base Year 1996	5-Year 2003	10-Year 2008	20-Year 2018
A. Forecast of Passenger Enplanements				
Annual	2500	2500	2500	2500
Average Day - Peak Month	500	500	500	500
Peak Hour (average day - peak month)	2	2	2	2
Peak Month in 1996:				
Time of day for peak enplanements:	9 am	9 am	9 am	1 pm
deplanements:	4 pm	4 pm	4 pm	2 pm

B. Forecast of Aircraft Departures

Average Day - Peak Month (by type of aircraft, incl. different landing gear)

10 single engine - wheels  
 10 single engine - floats  
 5 single engine - ski  
 Total: 25

Peak Hour (average day - peak month)

2 single engine wheels  
 3 single engine floats  
 1 single engine ski

air Carrier/Air Taxi Questionnaire  
 Kotelchue Airport Master Plan Update

C. Forecast of Deplaned Cargo (pounds or tons)

	Base Year 1996	5-Year 2003	10-Year 2008	20-Year 2018
Annual	500,000 lbs			750,000 lbs
Average Day - Peak Month	6,200	6,000	6,000	6,200
Peak Hour (average day - peak month)	1,200	1,200	1,200	1,200
Peak Month in 1996:				
Time of day for peak deplanements:				
% Mail: <input checked="" type="checkbox"/> % Freight: 20% Method of unloading: by hand				

D. Forecast of Enplaned Cargo (pounds or tons)

	Base Year 1996	5-Year 2003	10-Year 2008	20-Year 2018
Annual	500,000 lbs			750,000 lbs
Average Day - Peak Month	6,200	6,000	6,000	6,200
Peak Hour (average day - peak month)	1,200	1,200	1,200	1,200
Peak Month in 1996:				
Time of day for peak deplanements:				
% Mail: <input checked="" type="checkbox"/> % Freight: 40% Method of unloading: by hand				

E. Forecast of Aircraft Parking Positions

With loading bridges to terminal	N/A			
With at-grade terminal access	7	7	7	7
Overnight	7	7	7	7
Other				
Parking Method (power out, power back, or push back):	push back (?)			

F. Forecast of Support Facilities

Building Area Requirements (square feet)	Base Year 1996	5-Year 2003	10-Year 2008	20-Year 2018
Passenger Processing	6,000 sq ft	6,000	6,000	6,000
Cargo Processing	7,200	7,200	7,200	7,200
Administrative	600 sq ft	600 sq ft	600 sq ft	600 sq ft
Other (describe) storage	500 sq ft	500 sq ft	500 sq ft	500 sq ft
Total	8,900	8,900	8,900	8,900
Hangar/Maintenance Shop Requirements (area, dimensions, height, no. aircraft)	7,200 - 6 aircraft			
Automobile Parking (no. of spaces)	4			
Outdoor Area (type and size)	N/A Lot: 100 x 300 ft			



Air Carrier/Air Taxi Questionnaire  
Kotzebue Airport Master Plan Update

G. Remarks

Describe Passenger/Baggage Processing (security screening required? baggage claim device? any change anticipated?)

Passenger waiting area - no changes

Location of Building/Hangar:

North-east corner of lot

Runways, Taxiways, Aprons:

located near taxiway "E" Echo

Nav aids

none

Fueling & Utilities

N/A (electric, w/s, no fuel)

Roads and Parking.

N/A

Other

Need the use of a float pond. Current facilities are not acceptable.

Also a ski strip should be maintained during the winter/spring months.

Why was the float pond destroyed!

Air Carrier/Air Taxi Questionnaire  
 Kotzebue Airport Master Plan Update

1

Name BAKER AVIATION  
 Organization P.O. Box 708  
 Telephone Kotzebue, AK 99752  
 Fax 907-442-2088  
 Date 5-18-97

Services Provided (list FAR Part for operations) PART 135

Arrivals/Departure Schedule (typ. for each season)

Routes (with stage lengths)

No. Employees at Airport 32 OTZ

Inventory of Facilities (locate on map) LOT 4, BL 3 OTZ

A. Forecast of Passenger Enplanements	Base Year 1996	5-Year 2003	FORECAST	
			10-Year 2008	20-Year 2018
Annual				
Average Day - Peak Month	15686	16000	16,850	17,500
Peak Hour (average day - peak month)	10:00 AM			
Peak Month in 1996:	AUG			
Time of day for peak enplanements:	10:00 AM			
deplanements:	6:00 PM			

B. Forecast of Aircraft Departures

Average Day - Peak Month (by type of aircraft, incl different landing gear)

AUG	C 207	521
	C 402	408
	C 208	537
	BE-90	175
	Total:	1641 DEPARTURES MO.

Peak Hour (average day - peak month)  
AUG 10:00 AM

**Air Carrier/Air Taxi Questionnaire**  
**Kotzebue Airport Master Plan Update**

Total:

C. Forecast of Deplaned Cargo (pounds or tons)	Base Year 1996	FORECAST		
		5-Year 2003	10-Year 2008	20-Year 2018
Annual				
Average Day - Peak Month	2,799,453	2,804,453	2,810,450	2,900,000
Peak Hour (average day - peak month)	20,000	30,000	40,000	50,000
Peak Month in 1996:	AUG			
Time of day for peak deplanements:	11:00 AM			
% Mail: 92 % Freight: 8				
Method of unloading:	CART, Fork LIFT, Rampmen.			

D. Forecast of Enplaned Cargo (pounds or tons)				
Annual				
Average Day - Peak Month	2,799,453	2,899,453		
Peak Hour (average day - peak month)	20,000	30,000	40,000	50,000
Peak Month in 1996:	AUG			
Time of day for peak deplanements:	11:00 AM			
% Mail: % Freight:				
Method of unloading:	SAME AS ABOVE			

E. Forecast of Aircraft Parking Positions				
With loading bridges to terminal	N/A			
With at-grade terminal access				
Overnight	7	9	12	15
Other	7	9	12	15
Parking Method (power out, power back, or push back):	ALL			

F. Forecast of Support Facilities	
Building Area Requirements (square feet)	
Passenger Processing	2800 SQ FT
Cargo Processing	2400 ..
Administrative	2400 ..
Other (describe)	
Total	
Hangar/Maintenance Shop Requirements (area, dimensions, height, no. aircraft)	7200 ..
Automobile Parking (no. of spaces)	10



Air Carrier/Air Taxi Questionnaire  
Kotzebue Airport Master Plan Update  
3

Outdoor Area (type and size)

G. Remarks

Describe Passenger/Baggage Processing (security screening required? baggage claim device? any change anticipated?)

COMPANY FACILITY INCLUDES LOBBY + TICKET COUNTER AREA  
(NO SCREENING required)

Location of Building/Hangar

KOTZEBUE AIRPORT, BL 3, LOT 4

Runways, Taxiways, Aprons

TAXIWAY A

Nav aids

N/A

Fueling & Utilities

COMPANY FUEL SYS.

Roads and Parking.

PARKING + CUSTOMER ENTRANCE AREA NEEDS GRAVEL.

Other (Desired Improvements)

Air Carrier/Air Taxi Questionnaire  
Kotzebue Airport Master Plan Update

Name John Walker  
 Organization Inuit Air  
 Telephone 907-442-2798  
 Fax none  
 Date 4-30-97

Services Provided (list FAR Part for operations)  
135

Arrivals/Departure Schedule (typ. for each season)  
NOW SCHEDULED

Routes (with stage lengths)  
NOW SCHEDULED

No. Employees at Airport 2

Inventory of Facilities (locate on map) none

	Base Year 1997	FORECAST		
		5-Year 2003	10-Year 2008	20-Year 2018
A. Forecast of Passenger Enplanements				
Annual	250			
Average Day - Peak Month	5			
Peak Hour (average day - peak month)	1			
Peak Month in 1997:				
Time of day for peak enplanements:	10: AM			
deplanements:	2 PM			

B. Forecast of Aircraft Departures

Average Day - Peak Month (by type of aircraft, incl different landing gear)

<u>Piper Supercub</u>	<u>3/4 - DAY</u>	<u>X 30</u>	<u>FOL</u>	<u>MO.</u>
<u>Wanat Cessna 185</u>	<u>1</u>	<u>X 30</u>	<u>FOL</u>	<u>MO.</u>

Total:

Peak Hour (average day - peak month)

Air Carrier/Air Taxi Questionnaire  
Kotzebue Airport Master Plan Update

Total:

	Base Year 1996	FORECAST		
		5-Year 2003	10-Year 2008	20-Year 2018
C. Forecast of Deplaned Cargo (pounds or tons)				
Annual	200 #			
Average Day - Peak Month	200 #			
Peak Hour (average day - peak month)	?			
Peak Month in 1996:				
Time of day for peak deplanements:				
% Mail:      %Freight:      Method of unloading:				HAND

D. Forecast of Enplaned Cargo (pounds or tons)				
Annual				
Average Day - Peak Month				
Peak Hour (average day - peak month)				
Peak Month in 1996:				
Time of day for peak deplanements:				
% Mail:      %Freight:      Method of unloading:				

E. Forecast of Aircraft Parking Positions	
With loading bridges to terminal	
With at-grade terminal access	
Overnight	
Other	
Parking Method (power out, power back, or push back):	

F. Forecast of Support Facilities	
Building Area Requirements (square feet)	
Passenger Processing	
Cargo Processing	
Administrative	
Other (describe)	
Total	
Hangar/Maintenance Shop Requirements (area, dimensions, height, no. aircraft)	
Automobile Parking (no. of spaces)	

Air Carrier/Air Taxi Questionnaire  
Kotzebue Airport Master Plan Update

Outdoor Area (type and size)

G. Remarks

Describe Passenger/Baggage Processing (security screening required? baggage claim device? any change anticipated?)

Location of Building/Hangar

Runways, Taxiways, Aprons

Nav aids

Fueling & Utilities

Roads and Parking.

Other (Desired Improvements)

I WOULD LIKE TO HAVE A AIRPORT LEASE LOT FOR A  
2 SMALL AIRCRAFT OPERATION WITH NO HANGAR, ONLY A SMALL BUILDING  
(20' x 20'). THIS IS A AREA SERVED BY SMALL BUSH PLANES, AND NOT  
AN INTERNATIONAL AIRPORT!, PLEASE MAKE MORE SMALL LEASE LOTS AVAILABLE.



*Excerpts from the previous 1989 Master Plan are included throughout this appendix*

### **Appendix II.a - Regional Data**

Kotzebue was incorporated in 1958 and has a city manager form of government with an unsalaried, seven-member city council. The council elects one of its members to serve as mayor, and retains a salaried city manager.

The City of Kotzebue is located within the Northwest Arctic Borough which was organized in June 1986. The Borough covers an area of 43,298 square miles, with its boundaries being consistent with the boundaries of the NANA Regional Corporation, also known as the Kobuk region. NANA Regional Corporation was certified under the Alaska Native Claims Settlement Act to receive land and monetary benefits on behalf of the Native Alaskans originating from that particular area of the state.

The Northwest Arctic Borough has an elected mayor and an eleven-member assembly. Each member serves for a period of three years. The mayor has no voting rights but may veto any measure presented by the assembly. A seven-member planning commission has been appointed to serve the Borough. As of this writing, services to be provided by the Borough have not been fully defined.

### ***Population***

The first major economic impetus to this growth occurred in 1897, with the location of a commercial reindeer herd at Kotzebue. Following World War II, the federal government's commitment to improvements in health care, education, and the quality of life for Alaska Natives brought social services and economic activity to the town. Kotzebue was selected as the location for these developments due to its established position as a transfer point for both marine and air transportation, and the fact that it was the largest existing village in the area.

Much of the widely distributed population of the region has migrated to Kotzebue to take advantage of the increased commerce and availability of services and employment. The population of Kotzebue is currently approximately one-half of the entire Kobuk region **population**.

### ***Physical Environment***

Kotzebue Sound is shallow, with considerable sedimentation. There are no natural harbors on the Sound.

Permafrost is extensive, except near the major rivers. There are no glaciers in the region.



Three major rivers are located in the region: the Noatak, the Kobuk, and the Selawik. Broad flood plains and lake-dotted lowlands characterize the deltas where these rivers enter Kotzebue Sound. Principal mountain ranges of the region are the Waring Mountains to the east (rounded hills less than 2,000 feet high), the Baird Mountains to the northeast (moderately rugged mountains 2,500 to 3,000 feet high), and the Maiyumerak Mountains to the north of Kotzebue.

### **Appendix II.b - Airport History**

Aviation in Kotzebue began during the late 1930's and early 1940's at a site developed by the Village of Kotzebue, approximately three-fourths of a mile from the current State-owned facility. As the volume of air traffic increased, the field became inadequate and, in 1950, the Territory of Alaska constructed the Ralph Wien Memorial Airport.

Establishment of a 3,750-foot by 150-foot east-west landing strip, and improvement of an existing 3,525-foot by 150-foot north-south strip known as the Civil Aeronautics Authority strip occurred in 1950. Encouraged by establishment of a military communications site during the 1950s and an increase in tourism, the airport continued to grow.

Between 1950 and 1985, thirteen separate federal aid grants totaling over \$10 million have contributed to the development of the airport. In 1950 a federal grant agreement of \$170,887 provided for site preparation for a 3,750-foot east/west landing strip (Runway 8-26) and apron area construction. Improvement of the existing north/south landing strip (Runway 17-35) was also included. These projects were financially completed in 1953.

In 1957 a federal grant agreement of \$59,371 provided for construction of a taxiway, apron, and access road. Reconstruction of Runway 8-26 and erosion control were also provided for. Construction of these projects was completed in 1959, with financial completion in 1966.

In 1961 a federal grant agreement of \$151,050 provided for reconstruction, extending lighting systems, enlargement of apron area, and erosion control. Construction was completed in 1965, with financial completion in 1967.

In 1963 a federal grant agreement of \$801,883 provided for the following: land acquisition; extension of Runway 8-26 by 1,300 feet at the east end; obstruction removal/lighting; a snow equipment building; security fencing; permanent installation of a field lighting electrical vault; and extension of apron area, taxiways, and service road. Completion of these projects was accomplished in 1967, with financial completion in 1969.

In 1968 a federal grant agreement of \$276,914 provided for site preparation and construction of an additional 1,000-foot extension of Runway 8-26 to the east. Construction began in 1968 and was completed later that year. These projects were financially completed in 1970.

In 1969 a federal grant agreement of \$1,119,395 provided for placement of insulation board under the runway to limit subsurface deformation, and paving of Runway 8-26 (6,000 by 150 feet), entrance road, and taxiways; relocation and extension of the MIRL; marking of the runways and taxiways; and other related work. Construction began in 1969 and was completed in 1970. These projects were financially completed in 1973.

In 1973 a federal grant agreement of \$712,448 provided for land acquisition-development; obstruction removal; relocation of the VASI; and installation of a segmented circle and lighted wind cone. Land acquisition and construction began in 1973, with completion in 1977. These projects were financially completed in 1978.

In 1974 a federal grant agreement of \$125,451 was provided for the acquisition of an aircraft rescue and firefighting (ARFF) truck. This project got under way in 1974, was completed in 1975, and was financially completed in 1978.

In 1975 a federal grant agreement of \$350,625 provided for the conversion of the existing SRE building into an aircraft rescue and firefighting (ARFF) building; and construction of an SRE building. This project was under way in 1975 and completed in 1976. The project was financially completed in 1977.

In 1977 a federal grant agreement of \$1,245,440 provided for reconstruction of a section of Runway 8-26 including additional placement of board insulation to limit subsurface deformation (212 by 450 feet); expansion of the gravel apron (16,650 square yards); and extension of the access road (820 by 20 feet) These projects were under way in 1978 and completed in 1979. Financial completion occurred in 1984.

In 1979 a federal grant agreement of \$435,604 provided for installation of HIRLS on Runway 8-26; installation of MIRLs on Runway 17-35; and lighting on taxiways and apron area. These projects were under way in 1979 and completed later that year. They were financially complete in 1985.

In 1982 a federal grant agreement of \$900,000 provided for acquisition of 9.4 acres of land north of the existing terminal area.

In 1983 a federal grant agreement of \$3,700,000 provided for construction and paving of apron area (40,809 square yards), a parallel taxiway (8,946 square yards), an east diagonal taxiway (7,079 square yards), and a right-angle taxiway (5,677 square yards); installation of TL; reconstruction of a portion of Runway 8-26 (8,255 square yards); and friction sealing and marking of Runway 8/26 (5,900 by 150 feet) and the north-south taxiway (6,667 square yards).

In 1986 a federal grant agreement of \$246,563 provided for the acquisition of an aircraft rescue and firefighting vehicle. This project was initiated in 1986. Further information with regard to this acquisition can be found in the following paragraph.

Over the period 1984-1985, several of the aforementioned improvement and development projects were completed. The entire main apron area was resurfaced in this period. Additionally, a new diagonal taxiway 120 feet wide was added at the east end of the main apron. This taxiway connects Runway 8-26 with the main apron area. The center taxiway was widened to 120 feet in this time period as well. Culverts were also provided under these taxiways to allow for drainage of apron runoff into the lagoon which borders the airport to the east. A paved taxiway was also constructed to the Alaska Army National Guard facility which is located in lease Block 6 east of Runway 17-35. This taxiway is located on the lot's north end. Planning for a new airport-based ARFF vehicle was initiated in 1986. The new vehicle was obtained in the spring of 1987. Also in 1986, the threshold to Runway 35 was permanently relocated by 550 feet to provide adequate safety areas, reducing Runway 17-35's usable length to 3,800 feet.

In 1987 a federal grant agreement of \$2,395,000 provided for construction of taxiways, taxiway lighting and signage, additional lease lot area, general aviation tie-down area, security fencing, terminal area access roads and utilities for the lease lot areas. The work was completed in the fall of 1988, and lease lots were ready for disposal. The area developed is designated as Block 3 on the current land occupancy drawings, and the taxiways are designated as "A" and "B" on the current airport layout plans.

In 1993 a federal grant of \$4,325,000 provided for reconstruction of Runway 8-26, installation of distance remaining and guidance signage, paving of Taxiways "A" and "B" security fencing, and purchase of new snow removal equipment. The work was completed in the fall of 1994.

### **Appendix II.c - Airport Facilities**

#### ***Leaseholders***

Included in this appendix is a list of lease commitments on the airport, with the exception of utility leases.

Each operator at the airport occupies a lot, portions of a lot, or a sublet section of a lot with his individual facilities. The existing lots are not uniform size. Most of the currently occupied lots enjoy apron frontage. A taxiway reserve provides connection to the access road and terminal area land behind the developed strip of land.

APPENDIX II - INVENTORY CHAPTER SUPPLEMENT  
RALPH WIEN MEMORIAL AIRPORT MASTER PLAN UPDATE

Block	Lot	Lessee	Use	Size (sf)	Lease Period
1	AA	DOT&PF	Maintenance	15625	Indefinite
1	AA	MarkAir	*	18750	To 7/1/2007
1	B	Baker Aviation	Air Taxi Operator	18750	To 7/1/2005
1	C	MarkAir	**	30015	To 7/1/2007
1	D	MarkAir	**		
1	E	Alaska Airlines	Commercial Airline	22500	To 6/20/2010
1	F	Alaska Airlines	Passenger/Cargo		
1	G	Alaska Airlines	Terminal		
1	H	Bering Air	Air Taxi Operator	7500	To 7/1/1999
1	I	Bering Air			To 7/1/1999
1	K	Walker Air Service			
1	L	Civil Air Patrol	Search & Rescue	9375	To 4/15/2000
1	M	Crowley Marine Services	Fueling Services	7500	To 7/1/1997
2	1	DOT&PF (formerly Mike Spisak, dba Ram Aviation)	Maintenance Reserve	19939	Indefinite
2	2	DOT&PF	Maintenance Reserve	22165	Indefinite
2	3	Ryan Air dba Arctic Transportation Services	Air Taxi Operator	39540	To 1/1/2013
2	4	Northwestern Aviation	Air Taxi Operator	46778	To 1/1/2015
2	5	Ben Lomond	Aircraft/Dock Area	46248	To 2/15/1996
2	6	Ben Lomond		30000	

APPENDIX II - INVENTORY CHAPTER SUPPLEMENT  
RALPH WIEN MEMORIAL AIRPORT MASTER PLAN UPDATE

<b>Block</b>	<b>Lot</b>	<b>Lessee</b>	<b>Use</b>	<b>Size (sf)</b>	<b>Lease Period</b>
3	1A	Hageland Aviation Services	Air Taxi Operator	31095	To 4/1/2004
3	1B	DOT&PF	Maintenance Reserve	8115	Indefinite
3	3	RAM Aviation dba Alaska Island Air	Air Taxi Operator	24750	To 6/15/1998
3	4	Baker Aviation	Air Taxi Operator	31500	To 1/1/2015
3	5	Cape Smythe Air Service	Air Taxi Operator	54750	To 8/1/2009
4	1	Crowley Marine Services	Fueling Services	21205	To 7/1/1997
5	1	Arctic Air Guides Flying Service	Guide Service	24000	To 9/1/1998
5	2	Arctic Air Guides Flying Service		70995	
5	3	Unassigned	Public Float Plane Access	10000	
6	1	US Fish & Wildlife Service	Wildlife Management	15750	To 7/3/2017
6	2	US Fish & Wildlife Service	Field Studies	22500	
6	3	AK Depart of Military Affairs	Air National Guard Hangar		To 3/15/2012
6	4	Unassigned		22500	
6	5	Unassigned			
6	6	US Fish & Wildlife Service		44907	To 7/3/2017
7	1	Unassigned	Load/Unload Fish	3750	Seasonal
7	2	Unassigned	Load/Unload Fish	3750	Seasonal



Block	Lot	Lessee	Use	Size (sf)	Lease Period
7	3	Unassigned	Load/Unload Fish	3750	Seasonal
7	4	Unassigned	Load/Unload Fish	3750	Seasonal
Parcel		FAA	VORTAC	43560	
Parcel		FAA			To 9/30/1996
Parcel		National Weather Service	Balloon Launch Area	111514	To 9/16/2023
Parcel		City of Kotzebue	Sewage Lagoon		To 7/5/2031
Parcel		FAA	Glide Slope Antenna		To 6/30/1994
Parcel		FAA	RVR		To 9/30/1999

\* Mark discontinued service in 1995.

\*\* Occupied by FBX, Inc.

***ARFF***

The ARFF at Kotzebue is supported by the City of Kotzebue Fire Station, located approximately one mile north of the Airport.

ARFF available equipment includes:

Engine #1 -- Nodwell-Flextrac has a 1,500-gallon water tank and a separate rear pump capable of pumping 750 GPM.

Engine #2 -- International 4x4 truck has a 360-gallon water tank and a power take-off pump from the drive engine capable of pumping 250 GPM.

Engine #6 -- Ford 700, two-wheel-drive, with 750-gallon water tank PTO-driven 750 GPM pump, Bean Hi-pressure with two reels and AFFF by induction.

Engine #AI -- Piereville, 75-foot serial truck, 2,000 gallons of water, 1,500 GPM single stage pump, 1,000 GTM nozzle with all other appropriate equipment (air packs, ladders, etc.)

Engine #1 carries AFFF additive for fuel and aircraft fires. The AFFF agent is discharged between the truck pump and nozzles or by dumping the AFFF agent in the water tank.

***Fueling***

The following presents all available information on the existing fuel storage capacities of the individual operators.

**EXISTING FUEL STORAGE CAPACITY**

<i>Operator</i>		<i>Storage Capacity</i>
Former MarkAir, Inc. Facilities	(Above ground)	8,500 gallons A-50 (2)860 gallons gasoline 1,500 gallons stove oil 500 gallons stove oil
	(Buried)	10,000 gallons to be Jet A 2,000 gallons Jet A 2,000 gallons empty 1,000 gallons gasoline 1,000 gallons stove oil
Crowley Marine Services	(Truck)	3,500 gallons A-50 3,500 gallons 100/130
	(Buried)	12,000 gallons Jet A 12,000 gallons 100/130 2,000 gallons 80 octane
Baker Aviation, Inc.	(Buried)	1,000 gallons 100/130 500 gallons stove oil
Bering Air, Inc.	(Above ground)	(3)500 gallons 100/130 (2)500 gallons stove oil
	(Truck)	1,250 gallons 100/130 750 gallons stove oil
Walker Flying Service	(Above ground)	1,000 gallons 100/130 1,000 gallons stove oil
Civil Air Patrol	(Above ground)	500 gallons 80 octane
	(Buried)	500 gallons stove oil
Ryan Air Service, Inc.	(Truck)	1,200 gallons 100/130 1,000 gallons 100/130
Alaska Airlines, Inc.		10,000 gallons Jet A 500 gallons gasoline 500 gallons gasoline 500 gallons gasoline

Source: ADOT & PF

**Appendix II.d - Airport Operators**

***Terminal Area Operators***

MarkAir, Inc., a scheduled carrier, discontinued operations in 1995. The former MarkAir facility is a single-story, wood-frame passenger terminal building, 35 feet by 95 feet, located on Lot A, Block 1. This building was originally constructed by Alaska Airlines in 1965. Wien Airlines bought these facilities from Alaska Airlines. MarkAir subsequently bought the facility from Wien in 1984. MarkAir ceased their scheduled passenger services in January 1995. This building is unoccupied. The building formerly housed ticketing, baggage claim, security, and departure lounge facilities, as well as administrative offices and a cargo sorting area.

Functional Former MarkAir facilities include a hangar building located on Lots C and D of block 1. This building is an 80-foot by 107-foot insulated steel-frame structure with a concrete floor. The building is currently occupied by Mark Fairbanks Inc. (FBX). FBX provides freight handling and expediting services for Air Cargo Express, Lynden Air Freight, and Northern Air Cargo. The air cargo carriers utilize the apron area which fronts the building located on Lot A, Block 1 and 4,000-square-foot area located north of Lot C-D. (Lot A of Block 3) contains buried fuel storage tanks, formerly used by MarkAir.

Baker Aviation, Inc., located on Lot B, Block 1, and Lot 4, block 3, is a scheduled air carrier and air taxi/charter services. The hangar on Lot B is an insulated steel-frame structure, 40 feet by 60 feet, and accommodates one aircraft. The hangar was constructed in 1977. The adjacent office building is a two-story, insulated steel-frame structure, 30 feet by 60 feet, and was constructed in 1978. In 1985, Baker Aviation expanded their facility to include a 20-foot by 30-foot mail storage area. In 1991 Baker Aviation constructed an 80 foot by 120 foot pre-engineered metal building, with a concrete floor slab on Lot 4, Block 3. This building contains office area, hangar area for up to 3 small aircraft and a small passenger waiting area.

Alaska Airlines, Inc., offers scheduled carrier passenger service on a daily basis. In June 1985, Alaska Airlines completed construction of a new 60-foot by 120-foot two-story terminal building. The structure is located on Lots E, J, and G, Block 1. The passenger area contains the following functions: Sterile area, lobby, ticket counters, operations offices, baggage claim, rest rooms, and warehouse facilities.

In November of 1987 Shellabarger Flying Service relinquished their operating certificate and sold the business to Bering Air, Inc. Shellabarger previously occupied Lots H and I of Block 1. Bering Air is now located here, and occupies a hangar/office building previously owned by Shellabarger. The building is 40 feet by 80 feet, and is of insulated steel-frame construction with a concrete floor. It was constructed in 1978. About 10 percent of the building is devoted to passenger and office space. Bering Air is a scheduled air taxi service.

Bering Air also subleases administrative and passenger handling facilities from Alaska Airlines terminal facilities.

Walker Air Service, located on Lot K1, Block 1 is an air taxi service. They have a 40-foot by 60-foot insulated steel-frame hangar building and a smaller office/garage building.

The Civil Air Patrol, located on Lot L, Block 1, has a 60-foot by 60-foot insulated steel-frame hangar building with mezzanine office space, constructed in 1980-81. The facility has been used jointly with NANA Search and Rescue.

Ryan Air Service, Inc. dba. Arctic Transportation Services, has a 2,350-square-foot, two-story wood-frame structure located on Lot 3, Block 2. Arctic Transportation Services is a scheduled carrier offering passenger, cargo, and mail service.

Northwestern Aviation operates out of a 60-foot by 60-foot metal insulated hangar. Northwestern offers charter and cargo services and also provides transport of some hazardous materials and petroleum products such as stove oil.

Hageland Aviation Services, located on Lot 1, Block 3, has a 60 foot by 80 foot pre-engineered metal building on a concrete floor slab. The building is used for hangar area, office space and passenger waiting.

Alaska Island Air (Formerly RAM Aviation), located on Lot 3, Block 3, has a 40 foot by 60 foot pre-engineered metal building on a concrete floor slab. The building is used for hangar area, office space and passenger waiting.

Cape Smythe Air Service, located on lot 5, Block 3, has a 60 foot by 80 foot pre-engineered metal building on a concrete floor slab. The building is used for hangar area, office space and passenger waiting.



**Appendix II.e - Aviation Activity Data**

The following represents the preliminary list of leaseholders' based aircraft.

<i>Operator</i>	<i>No. Of Based Aircraft</i>	<i>Type of Aircraft</i>
Alaska Island Air	5	(2) Cessna 185 (1) Cessna 206 (1) King Air (1) DC-3
Baker Aviation	5	(1) Piper 402 (1) Cessna 207 (1) Cessna 208 (1) Cessna 185 (1) PA-18
Bering Air, Inc.	8	(2) Piper Navajo (1) DHC Otter Single (1) Cessna 206 (3) Cessna 207 (1) Cessna 185 (Floats)
Cape Smythe Air Service, Inc.	4	(1) Cessna 207 (1) Cessna 208 (1) Piper Navajo (1) DHC Otter Twin
Civil Air Patrol	1	(1) DHC-2 Beaver
Northwestern Aviation	6	(2) Cessna Agrtruck (1) Cessna 206 (1) Cessna 185 (1) Piper PA-18 (1) Short Bros. Skyvan
Arctic Transportation Services	4	(1) Cessna 172 (1) Cessna 207 (2) Cessna 402
Walker Air Service	1	(1) Piper PA-18
U.S. Fish and Wildlife Service	1	(1) Piper PA-18

**Appendix II.f - Survey Questionnaires**

Survey questionnaires were distributed to the following Kotzebue Airport operators. Some operators listed are no longer in business. Surveys completed and returned are also included.

**Kotzebue Airport Operators**

- Northwestem Aviation
- RAM Aviation
- Arctic Transportation Services
- US Fish & Wildlife Service
- FM Flight Service
- Walker Air Service
- Lynden Air Cargo
- Northern Air Cargo
- Alaska Airlines
- Baker Aviation
- Arctic Air Guides
- AK Dept of Military Affairs
- Bering Air
- Cape Smythe
- Crowley Marine
- Hageland Air Service
- Frontier Flying Service
- Airships Alaska
- Barrow Air
- Alaska Wing Civil Air Patrol
- Air Cargo Express
- Yute Air



Kotzebue  
Operations

	Itinerant Operations				Itinerant Operations				Itinerant Operations				Itinerant Operations			
	Air Carrier Operations		Air Taxi & Commuter/Carrier Operations		Air Taxi & Commuter/Carrier Operations		Air Taxi & Commuter/Carrier Operations		GA		GA		GA			
	Previous Master Plan Update	Recent Alaska System Plan	Current Terminal Area Forecast	Previous Master Plan Update	Recent Alaska System Plan	Current Terminal Area Forecast	Previous Master Plan Update	Recent Alaska System Plan	Current Terminal Area Forecast	Previous Master Plan Update	Recent Alaska System Plan	Current Terminal Area Forecast	Previous Master Plan Update	Recent Alaska System Plan	Current Terminal Area Forecast	
1986			10,000	1986			20,000			1986			10,000			
1987			3,000	1987			32,000			1987			10,000			
1988			3,111	1988			32,000			1988			10,000			
1989			2,000	1989			20,000			1989			30,000			
1990	8,900		2,000	1990	42,782		20,000			1990	13,838		30,000			
1991			2,000	1991			20,000			1991			30,000			
1992		20,000	3,534	1992		2,000	20,000			1992		30,000	30,000			
1993			3,534	1993			20,000			1993			30,000			
1994			2,000	1994			20,000			1994			30,000			
1995	7,600	20,000	2,000	1995	66,572	2,000	20,000			1995	17,020	30,000	30,000			
1996			2,000	1996			20,520			1996			30,000			
1997			2,000	1997			20,625			1997			30,000			
1998			2,000	1998			20,721			1998			30,000			
1999			2,000	1999			20,807			1999			30,000			
2000	7,000	22,900	2,000	2000	51,886	2,200	20,884			2000	14,292	34,140	30,000			
2001			2,000	2001			20,951			2001			30,000			
2002			2,000	2002			21,011			2002			30,000			
2003			2,000	2003			21,062			2003			30,000			
2004			2,000	2004			21,105			2004			30,000			
2005	6,800	25,800	2,000	2005	46,013	2,300	21,141			2005	13,097	36,240	30,000			
2006			2,000	2006			21,170			2006			30,000			
2007			2,000	2007			21,384			2007			30,000			
2008			2,000	2008			21,592			2008			30,000			
2009			2,000	2009			21,794			2009			30,000			
2010			2,000	2010			21,990			2010			30,000			
2011				2011						2011						
2012				2012						2012						
2013				2013						2013						
2014				2014						2014						
2015				2015						2015						
2016				2016						2016						
2017				2017						2017						
2018				2018						2018						

*Italics indicate forecast or estimate*

Kotzebue  
Operations

	Itinerant Operations				Itinerant Operations				Local Operations			
	Military	Recent Alaska System Plan Update	Current Terminal Area Forecast	Total	Previous Master Plan Update	Recent Alaska System Plan	Current Terminal Area Forecast	GA	Previous Master Plan Update	Recent Alaska System Plan	Current Terminal Area Forecast	
1986			1,000		1986		41,000		1986		5,000	
1987			1,000		1987		46,000		1987		4,000	
1988			1,000		1988		46,111		1988		4,000	
1989			1,000		1989		53,000		1989		7,000	
1990	888		1,000	66,408	1990		53,000		1990	3,480	7,000	
1991			1,000		1991		53,000		1991		7,000	
1992		1,000	1,000		1992		54,534		1992		7,000	
1993			1,000		1993		54,534		1993		7,000	
1994			1,000		1994		53,000		1994		7,000	
1995	888	1,000	1,000	92,080	1995	53,000	53,000		1995	4,708	7,000	
1996			1,000		1996		53,520		1996		7,000	
1997			1,000		1997		53,625		1997		7,000	
1998			1,000		1998		53,721		1998		7,000	
1999			1,000		1999		53,807		1999		7,000	
2000	888	1,000	1,000	74,066	2000	60,240	53,884		2000	3,922	7,960	
2001			1,000		2001		53,951		2001		7,000	
2002			1,000		2002		54,011		2002		7,000	
2003			1,000		2003		54,062		2003		7,000	
2004			1,000		2004		54,105		2004		7,000	
2005	888	1,000	1,000	66,798	2005	65,340	54,141		2005	3,590	7,000	
2006			1,000		2006		54,170		2006		7,000	
2007			1,000		2007		54,384		2007		7,000	
2008			1,000		2008		54,592		2008		7,000	
2009			1,000		2009		54,794		2009		7,000	
2010		1,000	1,000		2010	69,450	54,990		2010	8,950	7,000	
2011					2011				2011			
2012					2012				2012			
2013					2013				2013			
2014					2014				2014			
2015					2015				2015			
2016					2016				2016			
2017					2017				2017			
2018					2018				2018			







## Cargo

Growth Scenarios - freight (est split of enpl/depl=35%/65%)									
	Low 1.1%			Medium 2.2%			High 4.4%		
	Enpl	Depl	Total	Enpl	Depl	Total	Enpl	Depl	Total
1995	4,846	9,000	13,846	4,846	9,000	13,846	4,846	9,000	13,846
1996	4,899	9,099	13,998	4,953	9,198	14,151	5,059	9,396	14,455
1997	4,953	9,199	14,152	5,062	9,400	14,462	5,282	9,809	15,091
1998	5,008	9,300	14,308	5,173	9,607	14,780	5,514	10,241	15,755
1999	5,063	9,402	14,465	5,287	9,818	15,105	5,757	10,692	16,449
2000	5,119	9,506	14,624	5,403	10,034	15,438	6,010	11,162	17,172
2001	5,175	9,610	14,785	5,522	10,255	15,777	6,275	11,653	17,928
2002	5,232	9,716	14,948	5,644	10,481	16,124	6,551	12,166	18,717
<b>2003</b>	<b>5,289</b>	<b>9,823</b>	<b>15,112</b>	<b>5,768</b>	<b>10,711</b>	<b>16,479</b>	<b>6,839</b>	<b>12,701</b>	<b>19,540</b>
2004	5,348	9,931	15,279	5,895	10,947	16,842	7,140	13,260	20,400
2005	5,406	10,040	15,447	6,024	11,188	17,212	7,454	13,843	21,298
2006	5,466	10,151	15,617	6,157	11,434	17,591	7,782	14,453	22,235
2007	5,526	10,262	15,788	6,292	11,686	17,978	8,125	15,088	23,213
<b>2008</b>	<b>5,587</b>	<b>10,375</b>	<b>15,962</b>	<b>6,431</b>	<b>11,943</b>	<b>18,373</b>	<b>8,482</b>	<b>15,752</b>	<b>24,234</b>
2009	5,648	10,489	16,138	6,572	12,205	18,777	8,855	16,445	25,301
2010	5,710	10,605	16,315	6,717	12,474	19,191	9,245	17,169	26,414
2011	5,773	10,722	16,495	6,864	12,748	19,613	9,652	17,924	27,576
2012	5,837	10,839	16,676	7,015	13,029	20,044	10,076	18,713	28,789
2013	5,901	10,959	16,860	7,170	13,315	20,485	10,520	19,536	30,056
2014	5,966	11,079	17,045	7,328	13,608	20,936	10,983	20,396	31,379
2015	6,031	11,201	17,232	7,489	13,908	21,396	11,466	21,294	32,759
2016	6,098	11,324	17,422	7,654	14,214	21,867	11,970	22,230	34,201
2017	6,165	11,449	17,614	7,822	14,526	22,348	12,497	23,209	35,706
<b>2018</b>	<b>6,233</b>	<b>11,575</b>	<b>17,807</b>	<b>7,994</b>	<b>14,846</b>	<b>22,840</b>	<b>13,047</b>	<b>24,230</b>	<b>37,277</b>

Cargo

TOTAL CARGO BY GROWTH SCENARIO											
	Low				Medium				High		
	Freight & Mail				Freight & Mail				Freight & Mail		
	Enpl	Depl	Total	Enpl	Depl	Total	Enpl	Depl	Total		
1995	5,472	16,201	21,673	5,472	16,201	21,673	5,472	16,201	21,673		
1996	5,535	16,408	21,943	5,598	16,615	22,212	5,723	17,029	22,752		
1997	5,598	16,617	22,216	5,726	17,040	22,766	5,985	17,900	23,886		
1998	5,663	16,830	22,492	5,857	17,476	23,333	6,260	18,817	25,077		
1999	5,727	17,045	22,773	5,992	17,923	23,915	6,547	19,782	26,330		
2000	5,793	17,263	23,056	6,129	18,382	24,511	6,848	20,798	27,647		
2001	5,860	17,484	23,344	6,270	18,853	25,123	7,163	21,868	29,031		
2002	5,927	17,708	23,635	6,414	19,337	25,751	7,492	22,993	30,486		
<b>2003</b>	<b>5,995</b>	<b>17,935</b>	<b>23,929</b>	<b>6,561</b>	<b>19,833</b>	<b>26,394</b>	<b>7,837</b>	<b>24,178</b>	<b>32,015</b>		
2004	6,063	18,164	24,228	6,712	20,342	27,054	8,198	25,426	33,623		
2005	6,133	18,397	24,530	6,866	20,865	27,731	8,575	26,739	35,314		
2006	6,203	18,633	24,836	7,024	21,402	28,425	8,971	28,122	37,093		
2007	6,275	18,872	25,147	7,185	21,952	29,137	9,384	29,578	38,962		
<b>2008</b>	<b>6,347</b>	<b>19,114</b>	<b>25,461</b>	<b>7,350</b>	<b>22,517</b>	<b>29,867</b>	<b>9,818</b>	<b>31,111</b>	<b>40,929</b>		
2009	6,419	19,359	25,779	7,519	23,097	30,617	10,271	32,726	42,997		
2010	6,493	19,608	26,101	7,692	23,693	31,385	10,745	34,426	45,172		
2011	6,568	19,859	26,427	7,869	24,304	32,173	11,242	36,217	47,459		
2012	6,643	20,114	26,757	8,050	24,931	32,981	11,762	38,103	49,866		
2013	6,719	20,373	27,092	8,236	25,574	33,810	12,307	40,090	52,397		
2014	6,797	20,634	27,431	8,426	26,235	34,661	12,877	42,183	55,060		
2015	6,875	20,900	27,774	8,620	26,913	35,533	13,474	44,388	57,862		
2016	6,954	21,168	28,122	8,818	27,609	36,428	14,099	46,710	60,809		
2017	7,034	21,441	28,474	9,022	28,324	37,346	14,753	49,157	63,910		
<b>2018</b>	<b>7,114</b>	<b>21,716</b>	<b>28,831</b>	<b>9,230</b>	<b>29,057</b>	<b>38,287</b>	<b>15,439</b>	<b>51,735</b>	<b>67,174</b>		

Cargo

Growth Scenarios - mail (est split of enpl/depl=8%/92%)									
	Low 1.5%			Medium 3.0%			High 6.0%		
	Enpl	Depl	Total	Enpl	Depl	Total	Enpl	Depl	Total
1995	626	7,201	7,827	626	7,201	7,827	626	7,201	7,827
1996	636	7,309	7,944	645	7,417	8,062	664	7,633	8,297
1997	645	7,418	8,064	664	7,639	8,304	704	8,091	8,794
1998	655	7,530	8,185	684	7,869	8,553	746	8,576	9,322
1999	665	7,643	8,307	705	8,105	8,809	791	9,091	9,881
2000	675	7,757	8,432	726	8,348	9,074	838	9,636	10,474
2001	685	7,874	8,558	748	8,598	9,346	888	10,215	11,103
2002	695	7,992	8,687	770	8,856	9,626	942	10,827	11,769
<b>2003</b>	<b>705</b>	<b>8,112</b>	<b>8,817</b>	<b>793</b>	<b>9,122</b>	<b>9,915</b>	<b>998</b>	<b>11,477</b>	<b>12,475</b>
2004	716	8,233	8,949	817	9,395	10,212	1,058	12,166	13,224
2005	727	8,357	9,084	842	9,677	10,519	1,121	12,896	14,017
2006	738	8,482	9,220	867	9,968	10,834	1,189	13,669	14,858
2007	749	8,609	9,358	893	10,267	11,159	1,260	14,490	15,749
<b>2008</b>	<b>760</b>	<b>8,739</b>	<b>9,498</b>	<b>920</b>	<b>10,575</b>	<b>11,494</b>	<b>1,336</b>	<b>15,359</b>	<b>16,694</b>
2009	771	8,870	9,641	947	10,892	11,839	1,416	16,280	17,696
2010	783	9,003	9,786	976	11,219	12,194	1,501	17,257	18,758
2011	795	9,138	9,932	1,005	11,555	12,560	1,591	18,293	19,883
2012	807	9,275	10,081	1,035	11,902	12,937	1,686	19,390	21,076
2013	819	9,414	10,233	1,066	12,259	13,325	1,787	20,554	22,341
2014	831	9,555	10,386	1,098	12,627	13,725	1,895	21,787	23,681
2015	843	9,698	10,542	1,131	13,006	14,136	2,008	23,094	25,102
2016	856	9,844	10,700	1,165	13,396	14,561	2,129	24,480	26,608
2017	869	9,992	10,860	1,200	13,798	14,997	2,256	25,948	28,205
<b>2018</b>	<b>882</b>	<b>10,141</b>	<b>11,023</b>	<b>1,236</b>	<b>14,211</b>	<b>15,447</b>	<b>2,392</b>	<b>27,505</b>	<b>29,897</b>



Cargo

<b>Percent Split of freight/mail</b>		
	<b>freight</b>	<b>mail</b>
1995	64%	36%
1996	64%	36%
1997	64%	36%
1998	64%	36%
1999	64%	36%
2000	63%	37%
2001	63%	37%
2002	63%	37%
2003	63%	37%
2004	63%	37%
2005	63%	37%
2006	63%	37%
2007	63%	37%
2008	63%	37%
2009	63%	37%
2010	63%	37%
2011	62%	38%
2012	62%	38%
2013	62%	38%
2014	62%	38%
2015	62%	38%
2016	62%	38%
2017	62%	38%
2018	62%	38%

Socioecon and Enpl

	Enplanements		Population		Employment	
1985	43,511	-	2,633	0	1,822	0
1986	45,957	5.62%	2,657	0.90%	1,823	0.05%
1987	51,851	12.83%	2,681	0.90%	1,732	-4.99%
1988	52,955	2.13%	2,705	0.90%	1,785	3.06%
1989	57,846	9.24%	2,729	0.90%	1,991	11.54%
1990	53,695	-7.18%	2,751	0.80%	2,220	11.50%
1991	48,415	-9.83%	2,777	0.95%	2,190	-1.35%
1992	57,861	19.51%	2,804	0.95%	2,227	1.69%
1993	50,341	-13.00%	2,830	0.95%	2,298	3.19%
1994	55,117	9.49%	2,857	0.95%	2,465	7.27%
1995	55,904	1.43%	2,888	1.08%	2,509	1.78%

Pax-per-Operation

Current Master Plan - Passengers per Operation									
	Ops			Pax			Passengers per Operation		
	Air Carrier	Air Taxi/ Commuter	Total	Air Carrier	Air Taxi/ Commuter	Total	Air Carrier Pax/Op	Air Taxi & Commuter Pax/Op	TOTAL Pax/Op
1986	10,000	20,000	30,000	23,957	22,000	45,957	2.40	1.10	1.53
1987	3,000	32,000	35,000	23,851	28,000	51,851	7.95	0.88	1.48
1988	3,111	32,000	35,111	25,546	27,409	52,955	8.21	0.86	1.51
1989	2,000	20,000	22,000	27,967	29,879	57,846	13.98	1.49	2.63
1990	2,000	20,000	22,000	25,942	27,753	53,695	12.97	1.39	2.44
1991	2,000	20,000	22,000	26,007	22,408	48,415	13.00	1.12	2.20
1992	3,534	20,000	23,534	30,947	26,914	57,861	8.76	1.35	2.48
1993	3,534	20,000	23,534	28,793	21,548	50,341	8.15	1.08	2.14
1994	2,000	20,000	22,000	30,759	24,358	55,117	15.38	1.22	2.51
1995	2,000	20,000	22,000	30,728	25,176	55,904	15.36	1.26	2.54
1996	2,009	20,858	22,867	30,852	26,282	57,134	15.36	1.26	2.50
1997	2,032	21,232	23,264	31,216	27,175	58,391	15.36	1.28	2.51
1998	2,056	21,607	23,663	31,583	28,092	59,675	15.36	1.30	2.52
1999	2,080	21,983	24,064	31,956	29,033	60,988	15.36	1.32	2.53
2000	2,105	22,361	24,466	32,332	29,998	62,330	15.36	1.34	2.55
2001	2,130	22,740	24,870	32,713	30,988	63,701	15.36	1.36	2.56
2002	2,155	23,120	25,275	33,098	32,005	65,103	15.36	1.38	2.58
2003	2,166	23,659	25,825	33,267	33,267	66,535	15.36	1.41	2.58
2004	2,191	24,041	26,233	33,659	34,339	67,999	15.36	1.43	2.59
2005	2,217	24,425	26,642	34,056	35,439	69,495	15.36	1.45	2.61
2006	2,243	24,810	27,054	34,457	36,567	71,024	15.36	1.47	2.63
2007	2,270	25,197	27,467	34,863	37,723	72,586	15.36	1.50	2.64
2008	2,270	25,853	28,123	34,866	39,317	74,183	15.36	1.52	2.64
2009	2,308	26,126	28,434	35,455	40,360	75,815	15.36	1.54	2.67
2010	2,347	26,401	28,748	36,054	41,429	77,483	15.36	1.57	2.70
2011	2,387	26,678	29,065	36,663	42,525	79,188	15.36	1.59	2.72
2012	2,427	26,956	29,384	37,282	43,648	80,930	15.36	1.62	2.75
2013	2,468	27,237	29,705	37,912	44,799	82,710	15.36	1.64	2.78
2014	2,510	27,519	30,029	38,552	45,978	84,530	15.36	1.67	2.81
2015	2,552	27,803	30,355	39,203	47,186	86,389	15.36	1.70	2.85
2016	2,595	28,089	30,684	39,865	48,425	88,290	15.36	1.72	2.88
2017	2,639	28,377	31,016	40,539	49,694	90,232	15.36	1.75	2.91
2018	2,684	28,666	31,350	41,223	50,994	92,218	15.36	1.78	2.94

**Based Aircraft Fleet Mix Forecast**

Year	Single Engine	Multi Engine	Helicopter	Total
1995	68	10	1	79
1996	70	11	1	81
1997	72	11	1	84
1998	74	11	1	86
1999	76	12	1	89
2000	78	12	1	91
2001	80	12	1	93
2002	81	13	1	95
2003	83	13	1	97
2004	85	13	1	99
2005	87	13	1	102
2006	89	14	1	104
2007	90	14	1	106
2008	92	14	1	108
2009	94	14	1	110
2010	95	15	1	112
2011	97	15	1	114
2012	99	15	2	116
2013	101	16	2	118
2014	103	16	2	120
2015	105	16	2	123
2016	107	16	2	125
2017	109	17	2	127
2018	111	17	2	130

*Italics indicate forecast or estimate*





### **Appendix IV.a - Introduction**

The Ralph Wien Memorial Airport Master Plan Update has identified alternatives for the various components of the airport. An alternative for each component will be combined into the preferred alternative. These alternatives are described in detail in Chapter 5 of the Master Plan Update. An overview of the environmental consequences which would be associated with the component alternatives is presented in this section. Information regarding the No Action and preferred alternatives has been excerpted and appears in Chapter 6 of the Master Plan Update.

The alternatives are as follows:

#### **Airport Alternatives**

- A1 No Action
- A2 Improve Comparable to Relocation
- A3 Relocate Airport
- A4 Relocate Air Carrier Runway with Taxiway

#### **Primary Runway Alternatives**

- R1 No Action
- R2 Improve Safety Area - 1,000 ft westward runway extension
- R3 Improve Safety Area - 1,000 ft eastward runway extension

#### **Taxiway Alternatives**

- TW1 No Action
- TW2 Full Length Parallel to Runway 8-26

#### **General Aviation Alternatives**

- G1 No Action
- G2 B-II - tie down in NW area, road on west side
- G3 B-II - tie down in NE area, build out road on east side
- G4 B-II - tie down in E area, build out road on east side
- G5 B-II - tie down in SW area, road on west side

#### **Float Pond Alternatives**

- FP1 No Action
- FP2 Acquire Isaac Lake
- FP3 Develop Float Pond Facility on Kotzebue Lagoon

### Terminal Area Alternatives

- T1 No Action
- T2 Multiuse Terminal
- T3 Lease Lot Expansion with Large Aircraft Parking
- T4 Lease Lot Expansion

The Airport Alternatives treat the airport as a whole, whereas the remaining alternatives on the list are component alternatives. A1 is No Action, i.e., all components would remain as they currently exist. A2 takes the preferred alternative for each component and combines them into a comprehensive airport alternative. This appendix does not discuss the Airport Alternatives (A1, A2, A3, A4); it discusses only the individual components.

Airport alternatives A3 and A4 involve moving the entire airport to a new location. Although this may be the ultimate solution to many of the existing airport's problems, it lies outside the scope of the environmental analysis associated with this Master Plan update. An airport relocation would most likely require, at a minimum, an Environmental Assessment for compliance with the National Environmental Policy Act (NEPA). Alternatives A3 and A4 will not be discussed in this analysis.

All component alternatives are reviewed in this brief environmental analysis. However, the preferred component alternatives should be noted. These are: R1 (No Action), TW2 (full length taxiway parallel to Runway 8-26), G3 modified (tiedown in NE area), FP2 (develop floatplane facility at Isaac Lake and continue to use Kotzebue Lagoon), and T3 (expand lease lots with large aircraft parking).

### Appendix IV.b - Noise

While aircraft noise contours were not plotted for current 1995 activity (60,000 annual operations), contours were prepared during the last master plan update using 1985 activity (45,700 annual aircraft operations). The result showed the 65 Ldn well within the airport property. The 55 and 60 Ldn were actually plotted on a drawing of the airport area. Additional discussion of noise and a geographical depiction of the 1985 noise contours is included in Chapter 8, Section 8.4.2, Land Use.

Existing noise conditions at the airport would change without development due to increasing aviation demand.

The No Action alternative is similar to the preferred alternative as discussed below, but the No Action would not reactivate floatplane operations on Isaac Lake (which make up a small percentage of total GA operations).

The preferred alternative does not propose to alter the runway system configuration nor utilization patterns with the exception of reactivating Isaac Lake floatplane operations. Therefore, the projected increase in aircraft operations will continue to generally follow the current flight patterns. Additional discussion of projected noise contours of 96,900 annual operations (just over this master plan's projection of 94,500 operations in 2018) is included in Chapter 8, Section 8.4.2, Land Use.

#### Appendix IV.c - Compatible Land Use

R1 (No Action) would have no effect on compatible land use over what currently exists. Runway 8-26 is already constructed on wetland fill within a coastal zone; actions which are not considered compatible land use. Currently, OTZ forms a barrier for development of the City to the southwest.

R2, which involves a 1000 ft extension to the west from the end of Runway 8-26, would require a fill which crosses the beach and extends into Kotzebue Sound. R3 would extend Runway 8-26 to the east 1000 ft. This alternative would require completely bisecting Kotzebue Lagoon with further fill in open water and in vegetated wetlands. These are also not compatible land use actions. Both R2 and R3 would perpetuate the barrier to city expansion to the south.

TW1 would not require any further wetland fills or work in a coastal zone. TW2 would require a fill into Kotzebue Lagoon in order to construct a taxiway parallel to Runway 8-26. G1 (No Action) would result in no change over current conditions. G2, G3, G4, and G5 would result in additional wetland fills. FP1 would not result in any change over existing conditions. Both FP2 and FP3 would result in wetland fills.

T1 would not result in any change over existing conditions. T2, T3, and T4 would all require wetland fills. Filling wetlands is not considered a compatible land use.

#### Appendix IV.d - Social Impacts

None of the components and their alternatives would require relocation of residential areas and most would not require relocation or disruption of local businesses. Only T2, T3, and T4 may impact local businesses which are currently located at the airport. The effect would generally be positive; i.e., cargo facilities, parking and fueling would be improved with all of these alternatives.

Some disruption of current uses of the beach to the west of Isaac Lake would result from alternatives G2 and G5 since these alternatives would require construction of a road along the beach in an area used by local persons for fishing, camping, and other activities.

#### Appendix IV.e - Induced Socioeconomic Impacts

The No Action alternatives would not result in any changes over current conditions. This inability to accommodate future growth of the community and airport use could have a dampening effect on the local economy. All of the action alternatives would result in varying degrees of improvement to the airport and would, therefore, be expected to have a positive effect on local businesses. No shifts of population or increased public service demands are expected to accrue from the component alternatives.

#### Appendix IV.f - Air Quality

None of the No Action alternatives would result in conditions other than those currently existing at the airport. All of the action alternatives would cause temporary degradation of air quality during construction due to aerial suspension of particulates. Dust abatement methods would be expected to minimize degradation. Increased dust from construction would cease following completion of the project.

#### Appendix IV.g - Water Quality

R1, the no action alternative for the primary runway, would maintain current conditions. Runway 8-26 extends into Kotzebue Lagoon. It is likely that petroleum products and other pollutants would be washed off the runway into the lagoon. There is no information regarding the amount of material which may be entering the lagoon in this manner and it is likely that the substances would be considerably diluted by the waters of the lagoon. It should be noted that empty 55-gallon barrels and other containers are present in wetlands along the shore of Kotzebue Lagoon to the east of end of Runway 8-26. It is not known what the barrels contained or how long they have been in the wetlands. Neither is it known what impact the presence of the barrels and their contents may have had on the wetlands or adjacent lagoon waters.

R2 would extend Runway 8-26 into Kotzebue Sound. The extension would be built on fill, essentially a causeway, in the marine environment. Local siltation, sedimentation, and increase in suspended solids could occur from placement of the fill. It is likely that these effects would diminish after the fill has been placed and stabilizes. However, the effect of the causeway on coastal processes such as beach erosion, is not known. If erosion is accelerated, local sedimentation and siltation from the fill could persist. The runway extension would present the potential for introduction of petroleum products and other substances into waters of the Sound. It is likely, however, that considerable dilution of substances would take place. Although there would be potential for local water quality effects, the effect on the Sound would be negligible.

R3 involves extending the primary runway to the east, bisecting Kotzebue Lagoon. As described above, during construction, placement of fill could increase siltation, sedimentation, and suspended solids. After the fill has been placed and stabilizes, this effect will diminish. However, removal of local sediments and silts would be slower than for the offshore fill as the water movement within the lagoon is likely not as active as the offshore currents. The presence of the extension would result in an increase in the amount of substances washed off the runway into the lagoon; this increase may be negligible. In addition, provisions would need to be made for water percolation through the runway between the north and south portion of the lagoon. Otherwise, there could be a change in salinity and other water quality parameters between the two halves of the lagoon. A change in water quality would create a change in the habitat offered by the lagoon and would affect plants, fish, and other aquatic organisms inhabiting the lagoon. Construction of the runway fill would probably result in the removal of the drums and other materials from the wetlands.

TW1 would maintain conditions as they are. The full-length taxiway parallel to Runway 8-26 (TW2) would involve fill within the lagoon resulting in similar effects as described above for fill placement for R3. The parallel taxiway could create an area of stagnant water between the runway and taxiway fills unless provisions are made to move water in and out of the enclosure. This ponded area would also be the recipient of runoff from the runway and the taxiway and could be a collection point for pollutants.

The general aviation alternatives all involve fills in wetlands with resultant potential for pollutants to enter remaining wetlands and ponds. The potential is greatest for G3 and G4 which involve fills along the shore of Kotzebue Lagoon. In addition, these alternatives involve road construction east of Runway 17-35 along and through wetlands. G2, which involves construction of an access road to the west and around the south end of Isaac Lake, would affect wetlands at its intersection with the existing access road. Pollutants from the road could run off into the wetlands.

FP2, which involves development of a floatplane facility at Isaac Lake, would result in introduction of petroleum products and other substances into the lake from float planes. Some usage of Kotzebue Lagoon by float planes is likely to remain even if Isaac Lake is altered to accommodate them. FP3 includes development of a floatplane dock on Kotzebue Lagoon which would be a concentration point for pollutants from planes. Both action alternatives would result in introduction of pollutants into Kotzebue Lagoon; however, FP3 would result in greater amounts. Dilution of the pollutants should protect the lagoon as a whole, but local effects could be expected. Because Isaac Lake is a much smaller waterbody than the lagoon, the dilution factor would be much smaller and the concentration of pollutants would be greater with FP2. FP1 continues current usage in Kotzebue Lagoon: some pollutants are likely entering the lagoon from airplanes and is diluted by lagoon waters.

The action alternatives for the terminal involve development of lease lots and relocation of some facilities. T1 would retain the present configuration. T2 would involve wetland fill, including fill into Kotzebue Lagoon, for development of a multi-use terminal, vehicle parking, cargo space, and small aircraft parking on the east side of the airport. This alternative would present the largest possibility of water quality degradation, both from construction and operation. During construction, fines and fluids from heavy equipment could enter Kotzebue Lagoon. During operation, runoff from the aircraft and vehicle parking areas could introduce petroleum products and other pollutants into the lagoon. T3 and T4 would have less potential for water quality degradation since fills into the lagoon are not required. T3 includes large aircraft parking on the east side of the airport and, thus, could have a slightly higher possibility of pollutants from aircraft entering the lagoon than T4. Both T3 and T4 involve fill into wetlands.

#### Appendix IV.h - Department of Transportation Act, Section 4(f)

None of the component action alternatives would have an effect on Department of Transportation Act, Section 4(f) lands such as parks, wildlife or waterfowl refuges or designated recreation areas. However, most of the area occupied by the City of Kotzebue and environs is designated as the Kotzebue Archeological District in view of its important archeological resources. This is particularly



true of the beach ridges to the west of the airport. Component alternatives R2, G2, and G5 involve development along the beach. FAA Order 5050.4a states that Section 4(f) lands include "land of an historic site of national, state or local significance as determined by the officials having jurisdiction." A determination would be needed before construction of these alternatives could be accomplished.

#### Appendix IV.i - Historic, Architectural, Archeological, and Cultural Resources

The Kotzebue Archeological District covers most of the area occupied by the City of Kotzebue and the airport. Before any of the action alternatives are built, it would be necessary to determine the potential effect on archeological resources. The alternatives presenting the most concern would be R2, G2, and G5 due to the fact that these alternatives involve construction along the beach where there is a high likelihood of encountering archeological resources. The No Action alternatives would maintain current conditions.

#### Appendix IV.j - Biotic Communities

##### *Fish and Aquatic Resources*

Both runway action alternatives (R2 and R3) would have effects on fish and aquatic resources. R2 extends Runway 8-26 into the marine waters of Kotzebue Sound. In this area, salmon migrate along the shore and around the City of Kotzebue on their way to the Noatak and Kobuk rivers. The fish often move within 50 ft of the shore. The extension would create an obstruction to migration which salmon would have to circumnavigate. In addition, the causeway could have effects on offshore currents and water circulation which could affect water velocity and areas of shoreline deposition. This potential habitat shift could locally affect marine species which inhabit the nearshore waters. This obstruction could also disrupt coastal transportation in the Kotzebue area since local boaters tend to move close to the shore because the waters are deeper there.

R3 would bisect Kotzebue Lagoon. Without maintaining the amount of water communication between the north and south portions of the lagoon, shifts in salinity and other water quality parameters could occur resulting in effects on resident and migratory fish populations. Herring and salmon which enter the lagoon seasonally would be blocked from the southern portion of the lagoon. Whitefish, Dolly Varden, and arctic char also are present in the lagoon; populations could be adversely affected by water quality changes (especially salinity) and inaccessibility of habitat. Some fish habitat would be lost under the footprint of the fill. R3 would also require moving or obliterating the stream that enters Kotzebue Lagoon to the east of the end of Runway 8-26. While this stream is not reported to contain fish, it is a fresh water source for the lagoon. Rerouting the stream away from the lagoon would decrease the amount of fresh water entering the lagoon and could increase the possibility of salinity changes.



The action alternative for the taxiway, TW2, would require fill into the waters of Kotzebue Lagoon, including fill along the shore to the east of the airport facilities. Some fish habitat would be lost under the footprint of the taxiway and a larger area may be adversely affected by sedimentation from the placement of fill materials into the water. In addition, pollutants introduced to the water may affect local usage of habitat by fish and other organisms.

The general aviation alternatives, G2 and G5, are not expected to have any effects on fish or their habitats. Construction of a floatplane facility in Kotzebue Lagoon could have local effects on fish habitat due to fills, in-water construction and introduction of pollutants. G3 and G4 require fills into Kotzebue Lagoon for relocation of the access road to the east; some fish habitat would be lost due to these fills. Pollutants could affect local use of waters near the dock and ramp area. Security considerations may preclude use of shoreline areas by fishermen.

T2 is the only terminal alternative that is expected to have any effect on fish and their habitats. This alternative requires filling into Kotzebue Lagoon in an area used by fish and fishermen. Fish habitat would be lost under the footprint of the fill and sedimentation from placement of fill into water may adversely affect surrounding areas. It is not known whether fish would use the areas offshore of the fill as they do the natural shoreline.

### ***Vegetation and Terrestrial Habitats***

The No Action alternatives for all components would result in no change to current conditions. Vegetation and terrestrial habitats of OTZ and its environs have been subjected to clearing and disturbance in the past.

R2 would remove some upland beach habitat to the west of Runway 8-26. This is primarily unvegetated or sparsely vegetated land. R3 would involve a fill which crosses Kotzebue Lagoon and extends into a drainage and uplands to the east. In addition to the vegetation (upland and wetland) which would be lost due to the fill required for construction of the runway, a hill would have to be removed to accommodate aircraft using the runway. It is likely that the recontoured area where the hill would be leveled would revegetate; mitigation measures for this alternative should include revegetation for stability and re-establishment of upland habitats.

TW2 would have little if any effect on terrestrial habitats. The action alternatives for the general aviation component would all affect upland habitats and vegetation to varying degrees. The greatest adverse effects would result from G2 and G5 which involve construction along the beach ridges west of Runway 17-35. These alternatives would have the greatest potential to affect populations of the plant *Oxytropis arctica* var. *barnebyana* which grows among the willows on these beach ridges. G3 and G4 would result in removal of some grasses, forbs, and sedges found along Kotzebue Lagoon.

The terminal alternatives would affect some upland vegetation, but primarily would be developed in areas of previous disturbance.

### *Wildlife*

None of the component alternatives would have significant adverse effects on terrestrial mammals or their habitats. Some small mammals such as parka ground squirrels and voles may be disturbed or displaced during construction, but are expected to recolonize during operations. Most of the development associated with the various components would take place on or near previously disturbed areas which are not considered to be prime wildlife habitat.

With the exception of R2, none of the alternatives involve construction in areas occupied by marine mammals. Although R2 would involve a runway extension into the marine waters of Kotzebue Sound, very little impact to marine mammals is expected. Some disturbance could be expected due to noise and activity associated with construction. It is not expected that the extension would affect the migration routes of beluga whales or habitat used by spotted seals, the two species of marine mammal most common in the waters immediately offshore of Kotzebue. Beluga whales generally follow migrating salmon and would, therefore, move around the obstruction if the salmon move around it. Spotted seal habitat is not limited in the Kotzebue area and the small amount of beach and marine zone removed by this alternative would be negligible. The amount and type of noise experienced by marine mammals is not expected to be significantly different from that which occurs presently.

None of the component alternatives are expected to have significant adverse effects on the birds that occupy the Kotzebue area. Some upland passerine species may be disturbed and displaced due to construction of the runway extension onto the uplands in alternative R3, but the type of habitat which would be affected is not limited in the area. Construction of the various general aviation alternatives and associated access roads and the terminal alternatives could result in disruption and displacement of birds in the immediate vicinity; however, construction of these alternatives all take place in areas that have been previously disturbed to varying degrees and which do not represent critical bird habitat. Once construction is complete, it is expected that displaced individuals would return. Timing construction to avoid the nesting season could minimize local impacts.

Developing Isaac Lake to accommodate floatplane traffic (FP2) could also encourage use by waterfowl. This could be a problem. Waterfowl are currently common in the wetlands, ponds and lakes surrounding Isaac Lake.

The No Action alternatives for all components would maintain existing conditions.

### Appendix IV.k - Endangered and Threatened Species of Flora and Fauna

No endangered or threatened species of flora and fauna would be affected by any of the alternatives. However, the candidate species of plant, *Oxytropis arctica* var. *barnebyana* could be affected by G2 and G5 due to development on the beach ridges to the west of Isaac Lake. Depending on the footprint of the fill associated with R2, some oxytrope habitat could be affected by this alternative as well.

The threatened arctic peregrine falcon nests in the tundra cliff areas of northwest Alaska and migrates through the Kotzebue area. There are no known nest sites within 15 miles of the airport. The Spectacled eider has been placed on the endangered species list, and the Stellar's eider is a Category 1 candidate for the endangered species list. Both types of eider may migrate through the Kotzebue area, but neither species is known to breed near Kotzebue.

#### Appendix IV.1 - Wetlands

All of the action alternatives proposed for the various components involve wetland fills. The No Action alternatives would maintain conditions as they are. Existing development at the airport has affected wetlands; fills, draining, and, ostensibly, introduction of pollutants have occurred at the airport.

R2 requires fill in a marine environment; R3 and TW2 require fills into Kotzebue Lagoon, an estuarine wetland. The amount of wetland filled with R3 may be greater than with R2 as the latter fill crosses an upland before reaching marine waters.

The westside access road in G2 and G5 and the general aviation facility for G5 involve fill into palustrine wetlands. It is possible that final alignment of the access road could avoid most wetland impacts with the exception of the portion which would tie the road into the existing access road along Kotzebue Lagoon. G3 and G4 would require fill into palustrine wetlands for construction of the general aviation facility and part of the access road and fills into Kotzebue Lagoon for relocation of the access road.

FP2 and FP3 would involve fill into Isaac Lake, a lacustrine wetland, and Kotzebue Lagoon, respectively. FP2 involves reconfiguration of Isaac Lake as a floatplane facility; some fill may be required, but the net result would be an increase in lacustrine wetland. FP3 may require some fill into the margin of Kotzebue Lagoon for construction of docking facilities and a ramp.

The terminal alternatives also would require wetland fills. T2 would result in the greatest impact to wetlands as it would require both fill into palustrine wetlands and into Kotzebue Lagoon. T3 and T4 would involve fill into palustrine wetlands.

#### Appendix IV.m - Floodplains

It is likely that most of the action alternatives proposed for the airport components fall within the 100-year flood zone. Updated flood maps are not available, but recent flood events suggest that much of the extension in R3 could be affected by floods. This may be true particularly for TW2 and the portions of T2, G3, and G4 which extend into the lagoon. It is likely that the general aviation alternatives would be outside the flood zone, although the storm surge zone should be delineated to determine possible effects on the westside access road proposed in G2 and G5.

Appendix IV.n - Coastal Zone Management Program

All of the action alternatives proposed would involve development within the coastal management boundary. The applicable policies can be found in Section X.12. The most likely policies affecting each proposed action alternative would be as follows:

R2	6.3.2, 6.3.4, 6.3.5, 6.3.6, 6.3.7, 6.3.8, 6.3.9, 6.3.11, 6.3.13
R3	6.3.4, 6.3.5, 6.3.6, 6.3.7, 6.3.9, 6.3.11, 6.3.13
TW2	6.3.2, 6.3.4, 6.3.6, 6.3.7, 6.3.9, 6.3.11, 6.3.13
G2, G5	6.3.2, 6.3.4, 6.3.5, 6.3.6, 6.3.7, 6.3.8, 6.3.9, 6.3.11, 6.3.13
G3, G4	6.3.4, 6.3.6, 6.3.7, 6.3.9, 6.3.11, 6.3.13
FP2	6.3.4, 6.3.5, 6.3.6, 6.3.7, 6.3.8, 6.3.9, 6.3.11, 6.3.13
FP3	6.3.4, 6.3.6, 6.3.7, 6.3.9, 6.3.11, 6.3.13
T2, T3, T4	6.3.4, 6.3.6, 6.3.7, 6.3.9, 6.3.11, 6.3.13

Appendix IV.o - Coastal Barriers

None of the action alternatives nor the No Action alternatives would result in any impacts to coastal barriers as defined by the Coastal Barriers Resources Act of 1982. However, as a coastal barrier/lagoon system under the NAB CMP, this area is subject to coastal policies regarding barriers and lagoons, e.g., 6.3.4.

Appendix IV.p - Wild and Scenic Rivers

None of the action alternatives nor the No Action alternative would have effects on Wild and Scenic Rivers (X.14).

Appendix IV.q - Farmland

None of the action alternatives nor the No Action alternative would have effects on farmland (X.15).

#### Appendix IV.r - Energy Supply and Natural Resources

Construction of the action alternatives would require gravel and other materials for fill and petroleum products to fuel construction equipment. The source of gravel and other materials is not known at this time; however, it is likely that at least some material could be obtained from local sources such as the pit at Isaac Lake. Materials delivered by barge would require petroleum products to fuel the vessel. Current use of the airport by vendors and operators requires a certain expenditure of electricity generated from petroleum as well as use of petroleum for motor vehicles and airplanes. Any increased capacity created by the action alternatives would increase use of both electricity and fuels. In addition, gravel and other materials are used regularly for maintenance and would continue to be used under both the No Action and action alternatives. None of these effects would be considered significant.

#### Appendix IV.s - Light Emissions

Existing Kotzebue Airport light emissions include high intensity runway lighting (HIRL) on the primary runway, medium intensity runway lighting (MIRL) on the crosswind, and medium intensity taxiway lighting (MITL) on five of the seven existing taxiways. The aesthetic and visual impacts of the existing light emissions is minimal to the residences in the area and to vehicular traffic on surrounding roads.

Present conditions at the airport would be retained under the No Action alternative.

Additional airfield lighting proposed during the planning period (through 2018) is MITL on the partial parallel taxiway proposed for Runway 8-26. This presents an insignificant increase in light emissions. No other major changes are proposed in airfield lighting.

#### Appendix IV.t - Solid Waste Impact

The projected quantity and type of solid waste generated by the terminal action alternatives is not expected to be appreciably different from current conditions. Nor would the method of collection or disposal be expected to be different.

#### Appendix IV.u - Construction Impacts

It is expected that dust and increased equipment noise would be generated by construction the action alternatives. Dust and noise from the terminal alternatives and R2 would likely have the most impact on the community as the location of these alternatives is closer to the residential and business districts than are the other components/alternatives. With dust abatement methods, the air quality effects should be minimized. The adverse effects of noise on the community can be reduced by timing activities so that sleeping hours and other quiet times are not disturbed. Local bird populations may also experience noise and activity disturbance. Timing construction to avoid sensitive periods such as nesting and pre-migration congregations should reduce this expected impact.

It is not expected that materials would need to be transported through city streets for most alternatives. However, it is possible that armoring and other specialized materials may need to be imported to Kotzebue for construction of R2. These materials would need to be brought from the port to the construction site through the city unless they could be lightered directly from barges anchored offshore to the fill location.

Construction of the westside access roads in G2 and G5 could be disruptive to subsistence and recreational use of the beach areas. Timing of construction activities to avoid the high use parts of the year could reduce these impacts. Fills into both Kotzebue Sound (R2) and into Kotzebue Lagoon (R3, TW2, G3, G4, and T2) should be timed to avoid marine mammal and seasonal fisheries use and disruption of bird populations.

None of the likely impacts are expected to be significant and all will cease or be greatly reduced when construction is complete.