

DESERT AIRE AIRPORT

AIRPORT LAYOUT PLAN AND NARRATIVE REPORT

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Chapter 1: Introduction

This airport layout plan and narrative report (ALP) for Desert Aire Airport is sponsored by Grant County Airport District 1 (GCAD #1). It examines existing conditions at Desert Aire Airport, forecasts future aviation activity over a 20-year time period, recommends improvements to ensure that the airport can serve projected demand and identifies sources of funds to pay for those improvements.

This report focuses on:

- The size and layout as well as the existing and planned uses of Desert Aire Airport.
- The extent to which the airport conforms to Federal Aviation Administration (FAA) design recommendations and, where such recommendations are not met, whether they can be met considering site constraints.
- Projected facility development and whether that development can be accomplished in conformance with FAA design recommendations.
- Enhancements at Desert Aire Airport that will increase the airport's value to the community and the surrounding area.

In preparing this ALP, Airside has reviewed the following:

- Airport development plan prepared by Airside, 1996.
- Pavement condition report sponsored by WSDOT/AD, 2000.

- Desert Aire Airport Development Issues Study by Airside, 2002.
- The Washington State Aviation System Plan.
- The Grant County Unified Development Code (3rd Printing), 2003.
- The Grant County Comprehensive Plan, 1999.

Primary funding for this report has been provided by the Washington State Department of Transportation's Aviation Division (WSDOT/AD). It has been prepared by Airside with assistance from a volunteer steering committee seated by GCAD #1. Review of the interim report, as well as ongoing technical assistance, has been provided by WSDOT/AD.

Table 1: Desert Aire Airport ALP steering committee

MEMBER	REPRESENTING
Dave Bevers	Desert Aire Owners Association
Mike Conley	Port of Mattawa
Ralph Herth	GCAD #1 and Desert Aire Owners Association board member
Bob Kibler	Local citizen (former chair of GCAD #1)
Richard Leitz	Port of Mattawa
Mike Mulcahy	Local citizen
Cliff Naser	GCAP #1
Wayne Sahli	Port of Mattawa
David Strand	Local citizen
Billie Sumrall	Grant County Planning Dept.
Tom Truax	Ross Davidson Properties
Marjorie Wells	Local citizen
Ray Wells	Chair, GCAD #1

This ALP has been prepared according to WSDOT/AD guidelines contained in Appendix E of the aviation division's Grant Procedures Manual.

In writing this report we have followed the guidelines of the *Chicago Manual of Style* and the *AP Stylebook*, the two most widely used stylebooks in American publishing. These stylebooks call for different practices than are sometimes used in these kinds of plans, particularly with respect to capitalization of cities, as well as government agencies and offices.

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Chapter 2: Inventory and Current Activity

2.1 GENERAL

Desert Aire

The community of Desert Aire is situated adjacent to the Columbia River in south-central Washington State. Desert Aire is in southwest Grant County, approximately 55 miles northwest of the tri-cities of Pasco, Kennewick and Richland. The community is located 40 miles southwest of Moses Lake and 130 miles southeast of Seattle. Desert Aire is a planned unit development (PUD), organized according to Grant County statute. It has a number of amenities, including an adjacent 8,000-acre lake, formed on the Columbia River by the Priest Rapids Dam, and an 18-hole golf course. Desert Aire is adjacent to Washington State Highway 243.

Grant County

Grant County is in central Washington. The county consists of 2,675 square miles of land. It is the fourth-largest county in Washington. The county is bordered on the west by Douglas and Kittitas counties, on the southwest by Yakima County, on the south by Benton and Franklin counties, on the east by Adams and Lincoln counties and on the north by Okanogan County. Grant County is generally rural. Approximately 65 percent of the county is productive farmland. County topography ranges in elevation from 380 feet above sea level along the Columbia River to 2,882 feet above sea level at the crest of a hill near Quincy in the west part of the county.

The Port of Mattawa

The Port of Mattawa (Grant County District 3), located in Mattawa a few miles north of Desert Aire, plays a major role in industrial and commercial development in the region surrounding

Desert Aire Airport. The port has an industrial area, including a multi-purpose building used as a business incubator. The port serves as a catalyst in many development efforts, including one to create additional wine growing in the region.

Desert Aire Airport

Desert Aire Airport is located east of the Columbia River immediately north of the Priest Rapids Dam. The airport is sited approximately in the center of the Desert Aire community and consists of 49.93 acres. Topography in the region surrounding the airport consists of rolling hills to the west across the Columbia River and slight rises in terrain to the east, which transition onto flat farmland.

The airport is bounded on the west by the Columbia River, on the east by Washington State Highway 243, on the south by private residences and on the north by property that is platted for private residences.

Desert Aire Airport is unique among Washington's public-use airports in that it was originally developed as a primary feature of the Desert Aire PUD and was a privately owned, private-use airport for 22 years before becoming publicly managed by District 1, which was organized in August 1994. District 1 operates the airport according to a 20-year lease agreement with the Desert Aire Owners Association (DAOA), which owns the property on which the airport is located. This lease agreement currently extends through August 2014. A copy of the lease agreement is included in the appendix to this document.

Climate

The climate in the Desert Aire area is the same as in most of Grant County. It is in Washington's

Central Basin climatological region, which is semi-arid. Winters are cold. Summers are hot. The average annual temperature is 52 degrees Fahrenheit. The mean maximum temperature is 89 degrees Fahrenheit. Average annual rainfall in Grant County is 8.42 inches.

plan include zoning districts titled Rural Village Residential, Rural Village Open Space Conservation, Rural Village Residential, Rural Village Commercial and Rural Village Industrial. Grant County is the responsible agency for development and approval of the Grant County Comprehensive Plan and development regulations.

2.2 SOCIOECONOMIC DATA

Population

In 1910, one year after becoming a county, Grant County's population was 8,698. Over the next 20 years the population was at times as low as 5,666. From 1930 to 1962 the county experienced rapid growth to over 54,000. During the 1960s, Washington State followed a nationwide rural-to-urban migration pattern. Population growth in Grant County slowed during this period. Population growth was erratic during the 1970s and 1980s. During the 1990s, county population increased considerably. Population in 2000 was 74,698.

Economy

Between 1969 and 1996, total employment in Grant County grew by 97 percent. Agriculture, including production, distribution and processing, is and has been for many years the anchor of Grant County's economy, employing about 5,000 people. The only sectors employing larger numbers of people are services (6,272) and local government (5,533).

2.3 LAND-USE AND PLANNING

Desert Aire is located within the unincorporated area of Grant County. It continues to be developed according to the Desert Aire Rural Village major development plan authorized by the county in December 2000. Elements of the master

Table 2: Industry sectors

Industry sector	Establishments	Employees
Agriculture, forestry, fishing and hunting	635	4,856
Mining	*	*
Utilities	*	*
Construction	226	753
Manufacturing	71	3,778
Wholesale trade	88	943
Retail trade	235	2,816
Transportation and warehousing	95	719
Information	16	176
Finance and insurance	58	417
Real estate, rental and leasing	63	217
Services	1,277	6,272
Federal government	12	615
State government	21	741
Local government	67	5,533
Not elsewhere classified	10	119

Source: Washington State Employment Security Department.

Grant County Comprehensive plan, development regulations and existing land uses

Grant County has made a consistent effort to protect public-use airports within the county through the adoption of comprehensive plan policies and development regulations. Policies and regulations have been codified to protect its airports from adjacent incompatible development and to ensure that airports were protected as essential public facilities.

Map 1: Desert Aire regional location

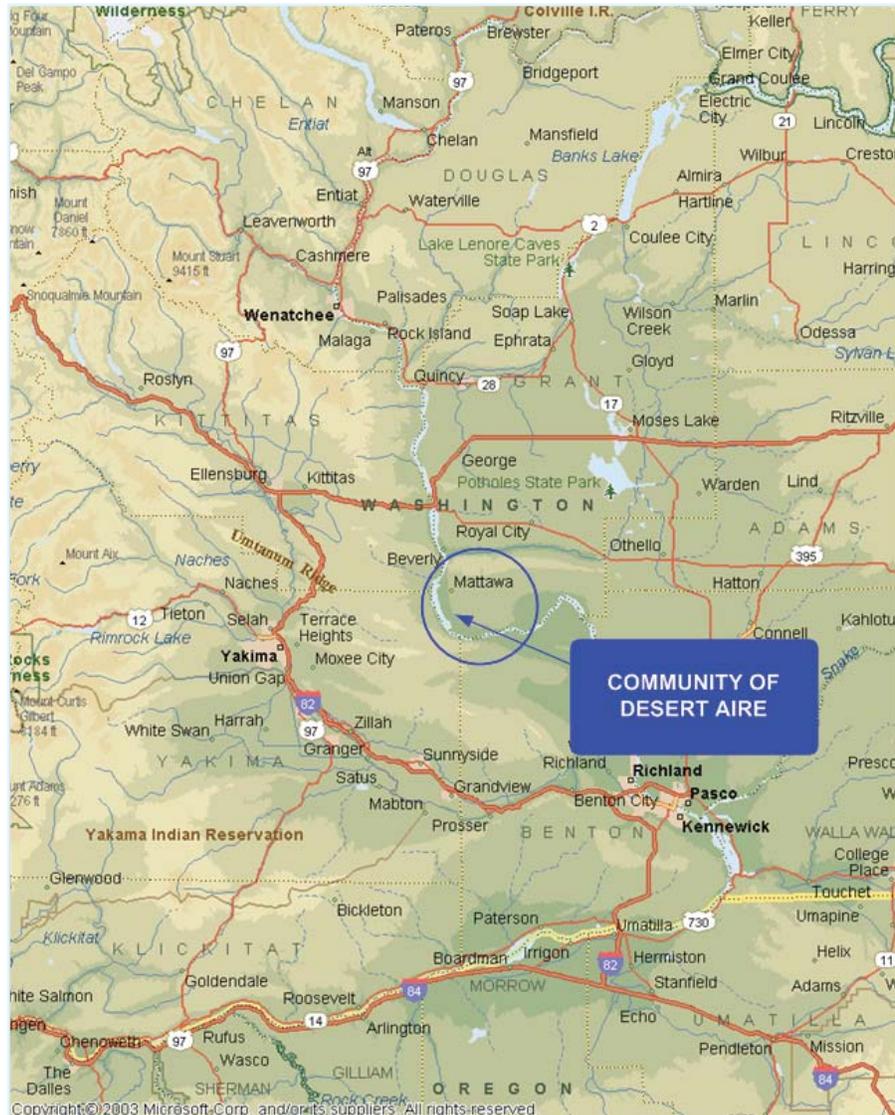
Following is a brief description of the applicable comprehensive plan policies and development regulations currently in effect. Complete texts of each of these documents may be found in the appendix to this narrative report. (See Appendix: Land-use and Zoning Documents.)

Comprehensive plan policies

The Grant County Comprehensive Plan describes public use airports and their importance in general terms. The inventory section of the plan incorrectly lists Desert Aire Airport as privately owned and operated.

Development regulations

Grant County has two ordinances that protect public use airports within the County. These regulations apply to Desert Aire Airport.



Chapter 23.04.645 “Airport Safety Overlay (ASO)”

The purposes of the ASO are to protect critical airspace around public use airports from airspace obstructions and hazards, and to discourage incompatible land uses. This chapter recognizes Federal Air Regulation Part 77 “Objects Affecting Navigable Airspace.”

Chapter 23.08.030 “Performance and Use Standards”

The performance and use standards chapter provides for future airport expansion and protects

airport facilities by establishing development standards. This chapter addresses such issues as setbacks, heights of structures, lot coverage, airport hazards, rights-of-way and parking.

Washington Growth Management Act

State legislation requires that all towns, cities and counties in which there is located a public use general aviation airport discourage incompatible development through comprehensive plan policies and consistent development regulations. This legislation is set forth in the Revised

Code of Washington (RCW 35.63.250, 35A.63.250, 36.70.547, and 36.70A.510). This legislation is applicable to all GMA and non-GMA jurisdictions in the state.

Depending on airport characteristics, location and the amount of usable open space adjacent to a general aviation airport, incompatible land uses may include public assembly/large concentrations of people, residential density, intensity of nonresidential development, structure height, hazardous/explosive material, wildlife hazards, light/glare, air quality and electronic signals.

Grant County is planning under GMA RCW 36.70A.510. Code sections implemented by Grant County are in general conformance with the growth management act.

Recommendations relative to zoning and land use are contained in Chapter 4 of this report.

2.4 AIRPORT SITE – GENERAL

Desert Aire Airport is located on a slight rise east of the Columbia River, south of the community of Mattawa.

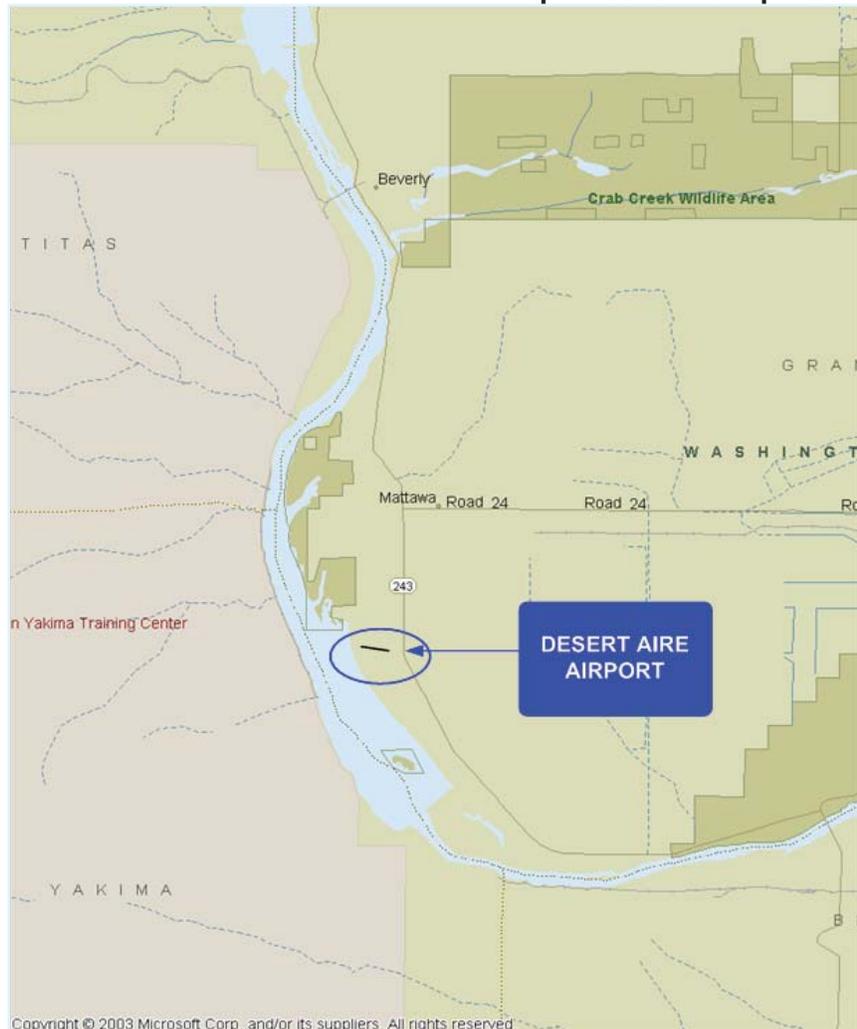
2.5 RECENT AIRPORT REVITALIZATION

During the last five years, work that has been accomplished on paved surfaces includes application of a seal coat to the parking apron, widening of the taxiway and crack sealing of paved surfaces. Crack sealing of all paved surfaces is done routinely.

2.6 UNIQUE CHALLENGES AND OPPORTUNITIES

To provide for a better understanding of information contained in following sections of this narrative it will be helpful at this juncture to discuss

Map 2: Desert Aire Airport site



additional details about unique conditions at Desert Aire Airport.

Eighteen property owners south of and adjacent to the airport's property boundary have developed taxilanes that connect to the airport's parallel taxiway from their privately owned hangars.

These taxilanes, though privately constructed, are on airport property. Additional properties on the south side of the airport have the potential for direct airport access. (For a visual depiction of the airport’s property boundary and the location of these taxiways please refer to Figure 1 at the end of this chapter.)

Since lots at Desert Aire were initially offered to the public in the early 1970s, 1,561 have been sold. It is estimated by the developer’s sales office that 700 residences exist today. Recently, Desert Aire’s Division 9, Phases 5 and 6 - the so-called northside lots - have been offered for sale. These remaining 89 lots, including 27 that are adjacent to the airport’s north property line, are the last that will be offered to the public.

Desert Aire Airport has very little property available for commercial development and for construction of hangars and other attributes that would help GCAD #1 fund improvements and meet financial match obligations for grants received from WSDOT/AD. However, the lots on the south side of the runway that have access to the airport’s taxiway or that potentially have such access, and the 27 lots in Division 9 north of the runway represent an opportunity to provide consistent income to the airport district if each of those lot owners are assessed modest annual fees for access to the airport. This is a reasonable and appropriate funding mechanism since the property owners adjacent to the airport are gaining the advantage of direct access to a publicly funded facility.

Both the Federal Aviation Administration (FAA) and, more pertinent to Desert Aire, WSDOT/AD have longstanding policies that discourage access to publicly funded airports from private property. Reasons for these policies are somewhat complex. They include considerations related to insurance, liability, fees and fairness. In some cases, concerns of the FAA and WSDOT/AD have been mitigated by fee assessments, hold-

harmless agreements and other actions related to such access.

In June of this year, the GCAD #1 commissioners voted to impose access fees to owners of residential lots that are adjacent to the airport. Mechanisms for their collection are currently being discussed. Such a fee structure would distribute airport financial support among a large number of property owners who directly benefit from airport access. The resulting steady and predictable income from access fees will, if implemented, assist District 1 with its airport management responsibilities.

2.7 AIRPORT CLASSIFICATION – THE ARC SYSTEM

Both the FAA and WSDOT/AD use what is termed the “airport reference code,” or ARC system, to categorize airports. The ARC system provides a method for applying dimensional safety and protection standards to airports according to the aircraft those airports generally serve. Dimensional standards include such items as runway-to-taxiway separation distances, sizes of runway safety areas (RSAs) and sizes of runway object-free areas (ROFAs). The ARC system uses the concept of a

Table 3: The ARC system

Category	AIRCRAFT APPROACH CATEGORY APPROACH SPEED		AIRPLANE DESIGN GROUP WINGSPAN		
	At or more than	Less than	Wing-span	At or more than	Less than
A		91 kts	I		49'
B	91 kts	121 kts	II	49'	79'
C	121 kts	141 kts	III	79'	118'
D	141 kts	166 kts	IV	118'	171'
E	166 kts		V	171'	214'
			VI	214'	262'

Source: FAA Advisory Circular 150/5300-13

critical aircraft, described as an aircraft that controls one or more airport design features based on the aircraft's approach speed and wingspan. Five hundred annual itinerant operations are required for an aircraft to be considered the critical aircraft for an airport.

Letter designations from A to E represent five aircraft approach speed categories ranging from less than 91 nautical miles per hour (knots) to 166 knots or more. Roman numeral designations from I to VI represent aircraft wingspans of from less than 49 feet to 261 feet. There is a special designation, used in ARC categories A and B, for airports that serve aircraft weighing less than 12,500 pounds. This designation attaches the term "small" to the ARC letter/numeral combination.

The Washington State Continuous Airport System Plan (WSCASP) database shows Desert Aire as having an ARC classification of A-I (small). This category includes aircraft with approach speeds of 91 knots per hour or less, wingspans of less than 49 feet and weights under 12,500 pounds.

Photo 1: Cessna 182



A review of Desert Aire Airport's operations conducted for this plan confirms that it does generally serve aircraft in the A-I ARC category that weigh less than 12,500 pounds and that it primarily accommodates recreational flying.

A clear representative of this ARC category is the Cessna 182. The Cessna 182 has been in production for a number of years and has gone through

Table 4: Airport data

Name	Desert Aire Airport
Location number	M94
FAA Designation	26290.9.A
Owner Lessee	Desert Aire Owners Association Grant County Airport District #1
Range, township, county, city and state	22 E.W.M., 14N, Grant, Desert Aire, WA
Acreage	49.93 acres
Service level (on the NPIAS system)	General aviation (GA)
Reference code existing	A-I (Small)
Design aircraft	Cessna 182
Elevation	570'
Reference point (location) NAD83 NAVD88	Latitude: N 48 deg. 41' 14.1040" Longitude: W119 deg. 55' 11.0140"
Mean maximum temperature	89 degrees
Approach category	Visual
Navigation aids	Wind indicator/rotating beacon/ tetrahedron
Approach guidance	PAPI - Runway 28
Wind coverage	n/a

several attribute changes. Its latest version has a wingspan of 36 feet, a maximum certified takeoff weight of 3,100 pounds and an approach speed of less than 91 knots. The Cessna 182 is designated in this plan as Desert Aire's critical aircraft.

NPIAS

Desert Aire Airport is not listed on the National Plan of Integrated Airport Systems (NPIAS) and is therefore ineligible to apply for federal grant funds through the Federal Aviation Administration. The Washington State Department of Transportation's Aviation Division is Desert Aire Airport's primary source of grant funds.

Wind Coverage

Information regarding prevailing wind is not available from the National Oceanic and Atmospheric Administration (NOAA) for Desert Aire Airport. Due to the absence of wind data a windrose is not provided in this plan. Local observers note

that prevailing winds are from the west/north-west and that, as with many areas of Washington, strong south winds are sometimes experienced. Since the runway is oriented almost directly east/west and prevailing winds are generally from the west/northwest pilots using Runway 28 experience varying degrees of right-side quartering cross winds.

2.8 EXISTING AIRSIDE FACILITIES

Paved surfaces

Runway and taxiway

Desert Aire Airport has a single runway oriented on magnetic headings 010 and 280 degrees (Runway 10/28). It is 3,665 feet long and 36 feet wide. The runway is constructed of asphalt and has a gross weight-bearing capacity of 6,000 pounds for aircraft with single-wheel main landing gear, according to a report published by Pavement Consultants Inc. in 2000. A 28-foot-wide full-length taxiway is located south of the runway. The runway-centerline-to-taxiway centerline distance is 194 feet.

The runway, taxiway and apron areas were rated as being in excellent condition in the 2000 pavement condition report and, although their conditions have degraded slightly, they are still rated as excellent in the draft of a report that will be published in early 2006.

Aircraft apron

An aircraft parking apron approximately 210 feet by 192 feet in size is located south of the taxiway at the west end of the airport. It is connected to both the end of Runway 10 and to the full-length taxiway. There are 16 aircraft parking spaces on this paved apron.

The aircraft apron has an information kiosk and telephone for the convenience of visiting pilots.

Pavement graphics

Pavement graphics include runway numerals, a white dashed centerline and hold lines at the three locations where the taxiway connects with

Runway lights

The runway is equipped with 33 medium-intensity runway edge lights (MIRLs) and 12 split red/green threshold lights. All lights are mounted on in-ground base cans. The base cans are exposed above grade to varying degrees. An extra light at the mid-field taxiway connector causes the number of runway edge lights to be uneven.

Photo 2: Runway 10 painted graphic -- west view



Taxiway reflectors

Blue taxiway reflectors are located throughout the taxiway system.

Wind tetrahedron

A wind tetrahedron is located east of mid-field just north of the runway. The edge of the tetrahedron that is nearest to the runway is 56 feet from the runway's centerline.

Precision approach path indicator (PAPI)

A PAPI system that provides guidance during approach and landing is located near the east end of the airport for use by pilots landing on Runway 28.

Wind indication

Desert Aire Airport has one lighted wind indicator. It is located north of the runway, east of mid-field at a distance of 55 feet from the runway's centerline.

Airport rotating beacon/pilot controlled lighting

A rotating beacon is located south of the runway, east of mid-field. It is co-located with equipment that facilitates pilot control of runway lighting (PCL).

Signage

Desert Aire Airport has retroreflective hold-line signs at each of the three connecting taxiways. Information signs are posted adjacent to the aircraft parking apron.

Photo 3: PAPI system at Runway 28



2.9 EXISTING LANDSIDE FACILITIES

Structures

There are no structures within the property boundary of Desert Aire Airport.

Aircraft fuel

There is no fueling system at Desert Aire Airport.

Access road and vehicle parking

Access to the airport's public apron is provided by Airport Way, which connects to Desert Aire Drive and ultimately to Washington State Highway 243.

Utilities

Electrical power connects to the airport at the PCL unit and at the parking apron at the west end of the airport.

Water/Sewage

There is no water delivery system and no public or self-contained sewage system within the property boundary of Desert Aire Airport.

Airport maintenance equipment

No major vehicles or large items of equipment are dedicated for use at the airport.

Fencing

No fencing is installed at Desert Aire Airport.

Airport maintenance

Desert Aire Airport is primarily maintained by volunteer efforts organized by the Desert Aire Airport Commission.

Table 5: Airport facility data

Airport feature		Information
Runway		
Dimensions		3,665' x 36'
Gradient		1.1%
Surface		Asphalt
Pavement strength		6,000 lbs per wheel
Marking		End numerals -- center dashed lines
Lighting		Edge (33)/threshold (6 per end)
Taxiway		
Dimensions		3,524' x 28'
Surface		Asphalt
Marking		Hold lines
Lighting/reflectors		Reflectors
Aircraft parking apron		
Dimensions		210' x 192'
Surface		Asphalt
Marking		Tie-downs painted
Lighting/reflectors		None
Tie-downs		16
Fuel system		
None		

2.10 COMPARISON OF EXISTING CONDITIONS TO FAA STANDARDS

An important aspect of this planning program is a comparison of FAA-recommended standards to existing conditions of Desert Aire Airport. Dimensional standards published by the FAA are intended to provide an acceptable level of airport safety. This section defines specific FAA standards and relates them to existing conditions.

Definitions relating to FAA standards has been obtained from FAA Advisory Circular (AC) 150/5300-13. Airport information is from the WSDOT/AD database and from on-site measurements and observations.

Standards definitions

Runway width – A runway width considered adequate to provide for safe aircraft operations.

Runway Safety Area (RSA) – A defined rectangular surface centered on a runway prepared or suitable for reducing the risk of damage to airplanes in the event of an undershoot, overshoot or excursion from the runway.

Runway safety areas shall be: (1) cleared and graded and have no potentially hazardous ruts, humps, depressions or other surface variations; (2) drained by grading or storm sewers to prevent water accumulation; (3) capable, under dry conditions, of supporting snow removal equipment, aircraft rescue and firefighting equipment, and the occasional passage of aircraft without causing structural damage to the aircraft; and (4) free of objects, except for objects that need to be located in the RSA because of their function. Objects higher than 3 inches above grade should be constructed, to the extent practicable, on low-impact resistant supports (frangible mounted structures) of the lowest practical height with the frangible point no higher than 3 inches above grade. Other objects, such as manholes, should

be constructed at grade. In no case should their height exceed 3 inches above grade.

Runway safety areas, including their conditions and their protection, are one of the highest priorities of both the FAA and WSDOT/AD.

Runway Object-Free Area (ROFA) – An area on the ground centered on a runway provided to enhance the safety of aircraft operations by being free of objects, except for objects that need to be located within the ROFA for air navigation or aircraft ground maneuvering purposes.

Shoulder – An area adjacent to the edge of runways, taxiways or aprons providing a transition between pavement and the adjacent surface, support of aircraft running off the pavement, enhanced drainage and blast protection.

Taxiway Safety Area (TSA) – A defined rectangular surface centered on a taxiway prepared or suitable for reducing the risk of damage to airplanes unintentionally departing from a taxiway.

Taxiway Object-Free Area (TOFA) – An area on the ground centered on a taxiway provided to enhance the safety of aircraft operations by being free of objects, except for objects that need to be located within the TOFA for air navigation or aircraft ground maneuvering purposes.

Runway-to-taxiway separation – A distance between a runway centerline and an adjacent taxiway centerline considered adequate to protect operating aircraft.

Runway centerline-to-holding-position marking – A distance considered adequate to provide protection between aircraft using an active runway and aircraft waiting for takeoff from that runway.

Runway Protection Zone (RPZ) – RPZs enhance the protection of people and property on the

ground. This is achieved through airport owner control over RPZs. Owner control includes clearing of RPZ areas of incompatible objects and activities. Control is preferably exercised through the acquisition of sufficient property interest in the RPZ.

Runway centerline-to-aircraft-parking area – A distance considered sufficient to protect operating aircraft, parked aircraft and activities occurring around parked aircraft.

2.11 ASSESSMENT OF EXISTING CONDITIONS RELATIVE TO FAA DESIGN STANDARDS

Runway length

Desert Aire’s runway, according to FAA data, is able to accommodate approximately 95 percent of the aircraft fleet having maximum certified takeoff weights of less than 12,500 pounds. Information from the FAA’s computer model related to runway length versus aircraft that may be accommodated is contained in the appendix to this narrative.

Runway width

At 36 feet, the width of the airport’s runway is 24 feet less than the FAA standard.

Runway safety area

The runway safety area is not in conformance with the FAA standard due to rough terrain and locations of the lighted wind indicator and wind

Table 6: Comparison of FAA standards

Comparison of FAA standards for A-1 (Small) airport to existing conditions		
FAA standard	Dimension relative to Desert Aire Airport	Existing condition at Desert Aire Airport
Runway length*	2,800' (75%) 3,300' (95%) 3,900' (100%)	3,665'
Runway width	60'	36'
Runway safety area	120'x4,145'	120'x4,000' District 1 does not have control over all the property encompassed by the RSA. Grading and compacting are required. The lighted wind indicator and elements of the wind tetrahedron are within the RSA.
Runway object-free area	250'x4,145'	250'x4,000' District 1 does not have control over all the property encompassed by the ROFA. The lighted wind indicator and elements of the wind tetrahedron are within the ROFA.
Shoulder	10'	10'
Taxiway width	25'	28'
Taxiway safety area width	49'	49'
Taxiway object-free area width	89'	89'
Runway to taxiway separation	150'	194'
Runway centerline-to holding position marking	125'	61'
Runway protection zone	250'x1,000'x450'	Portions of the RPZ are not under control of GCAD #1.
Runway centerline-to-aircraft parking area	125'	202'

* Length of runway to accommodate 75 percent, 95 percent and 100 percent of a group of aircraft weighing fewer than 12,500 pounds. Source, AC 150/5325-4A.

tetrahedron. Portions of the RSA that are at each end of the runway are outside the airport’s property boundary.

Runway object-free area

The area encompassing the runway object-free area is in general conformance with the FAA standard. The lighted wind indicator and tetrahedron are, however, within the ROFA. Portions of the ROFA that are at each end of the runway are outside the airport's property boundary.

Runway centerline-to-taxiway centerline

The FAA standard for A-1 (small) airports is 150 feet from runway centerline-to-taxiway centerline. This distance at Desert Aire Airport is 194 feet. This standard is exceeded by 44 feet.

Runway shoulder

The runway shoulder area of 10 feet is in general conformance with the relevant standard. Additional grading and compaction are required to fully meet this standard.

Taxiway hold-line standards

The FAA standard from runway centerline to hold line is 125 feet. The existing distance is 61 feet, considerably less than this standard.

Taxiway safety area

The airport controls all of the property that encompasses the taxiway safety area. This area should be graded and compacted in order to conform to the taxiway safety area standard.

Taxiway object-free area

Desert Aire Airport is in compliance with the taxiway object-free area standard.

Runway Protection Zone (RPZ)

The Runway 28 RPZ is in conformance with the FAA standard in terms of property use. Uses to which the RPZs are put should not generate large gatherings of people. The east end of the RPZ extends over Washington State Highway 243. The Runway 10 RPZ is also in general conformance with the standard. Approximately one-half of this

RPZ encompasses a portion of the Desert Aire Golf Course. Large portions of both RPZs are not under GCAD #1 control.

Runway centerline to aircraft parking

The north edge of the existing aircraft parking area is 202 feet from the runway centerline. The relevant standard is 125 feet. This standard is exceeded.

Figure 1: Existing conditions autocad diagram



2.12 INFORMATION SOURCES

Sources of information provided in this chapter include:

- Washington State Department of Transportation/Aviation Division airport database.
- Federal Aviation Administration (FAA) Form 5010.
- 1996 airport development plan by Airside.
- Pavement Consultants Inc. pavement report dated June 2000
- Interviews with airport manager

Chapter 3:

Forecast

3.1 INTRODUCTION

This chapter forecasts numbers of based aircraft and annual aircraft operations at Desert Aire Airport in five-year intervals over a 20-year planning period. A future airport reference code (ARC) based on forecast data is identified.

The forecasting process is an important one for a number of reasons. Forecasts will help District 1, in consideration of the requirements of the Port of Mattawa and Grant County, plan the airport's future. Understanding future demand that may result from factors both within and outside of local influences will help these entities make better decisions about capital improvements.

Forecasts are also vital to the funding of those improvements. As stated, Washington State Aviation is Desert Aire Airport's primary source of grant funds for the airport's operational areas. Though the Aviation Division has made considerable progress over the last few years with respect to the grant process and to the amount of funds available, it continues to have less money than is needed to meet project demands. Consequently, the division must carefully prioritize grants. Forecasts assist WSDOT/AD with these funding decisions.

Capital projects that are necessary to correct conditions that negatively impact safety and projects that maintain investment in infrastructure, especially paved surfaces, should be funded as money is available regardless of forecasts. However, major development that enhances airport operational capability will be made only after careful evaluation of necessity based on logically quantified future need.

Forecasts are also important to organizations interested in financing features of airports that

are not generally funded by WSDOT/AD. Both the Washington State Department of Community Trade and Development (CTED) and the U.S. Department of Commerce's Economic Development Administration are financial resources for projects, such as utility infrastructure and road construction, that are necessary to support development of airport-related and airport-compatible businesses on and adjacent to airport property. These entities, as well as the Port of Mattawa, are interested in funding projects that create jobs and that improve incomes.

It is a primary recommendation of this plan that, after it is published, District 1 update and communicate its activity-level forecast as conditions indicate it is appropriate to do so. For instance, if a new manufacturing business that operates one or more aircraft moves to the area, the resulting increase in based aircraft and annual operations should be added to the forecast and communicated to WSDOT/AD. This will help Desert Aire Airport maintain its appropriate place in the Aviation Division's priority list. Also, this information will be useful during the next update to this airport layout plan. Forecasting by professionals has become a highly refined art but it is still, at best, guessing. Tracking and noting actual conditions that alter forecasts help refine this process.

3.2 TERMINOLOGY

Terms used in this section that require definition are:

Aircraft operation: A takeoff or a landing.

Local aircraft operation: Aircraft operating in an airport's traffic pattern or aircraft known to be departing to or arriving from local practice areas.

Itinerant aircraft operation: All other operations.

3.3 FORECASTING METHODS

To determine the most accurate forecast of future airport operations, this plan begins with quantifying existing conditions, including the numbers and types of based aircraft, estimating local and itinerant flight operations, and determining county and local population and other pertinent data. Next, factors that are likely to influence future demand are identified. These factors include population projections for Grant County over the planning period as well as projections made by state agencies about economic development in the region served by Desert Aire Airport. Forecast information produced by WSDOT/AD and the FAA is also considered.

Other issues that may impact changes in airport activity are then evaluated. These include (1) development specific to the Mattawa/Desert Aire area, (2) Desert Aire Airport's airport-based residential growth, (3) changes in pilot rules recently promulgated by the FAA and (4) the impacts of airport development.

For purposes of this narrative report, the term "based aircraft" refers to aircraft that are tied down on the airport's existing apron or stored on private property adjacent to the airport and that have direct access to the airport's taxiway.

3.4 EXISTING DATA

Existing data about based aircraft and annual flight operations are available from three sources: the FAA's Airport Master Record, also called Form 5010, last updated in April 2003; the WSDOT/Aviation Division database, last updated in 2002; and

Table 7: FAA Form 5010

Fleet Mix Based aircraft 2003		Operations 2003	
Single-engine	7	GA local	100
Multi-engine	0	GA itinerant	1,000
Turboprop	0	Air carrier	0
Glider	0	Air taxi	0
Ultralight	0	Commuter	0
Rotorcraft	0	Military	0
Total	7	Total	1,100

Source: FAA Form 5010.

data provided by the airport layout plan steering committee.

Information from these sources is shown in tables 7-9.

Table 8: WSDOT/AD database

Fleet Mix			Annual Operations		
Based A/C	Existing 2002	Projected 2005		Existing 2002	Projected 2005
Single-engine	7	10	GA local	100	150
Multi-engine	0	0	GA itinerant	1,000	1,500
Turboprop	0	0	Air carrier	0	0
Glider	0	0	Air taxi	0	60
Ultralight	0	0	Commuter	0	0
Rotorcraft	0	0	Military	0	60
Total	7	10	Total	1,100	1,650

Source: Washington State Department of Transportation/Aviation Division WSCASP database.

Determination of based aircraft baseline

Information provided by the airport manager, as shown in Table 9, will be used as the based aircraft baseline for this document. Eleven operational aircraft are based at Desert Aire Airport.

Determination of flight operations activity baseline

The WSDOT/AD database estimated a total of 1,100 annual operations in 2003. Of those opera-

tions, 100 were estimated to have been flown by locally based aircraft. The database projected 1,650 annual operations in 2005. Of those, 150 were projected to be operated by based aircraft.

The FAA does not provide estimates of flight activity levels at Desert Aire Airport. However, the FAA publishes general guidelines that are intended to be used in airport planning. One of these guidelines is that one should assume 250 operations per year per based aircraft at rural airports. This multiplier, if applied to currently active aircraft at Desert Aire Airport would result in annual flight operations of 2,750.

Flight operations activity levels at small, general-aviation airports are difficult to determine without direct inquiry of local pilots. For this report, Desert Aire Airport’s manager queried owners of based aircraft. As shown in Table 10, owners of aircraft based at the airport estimate their flight operations to be approximately 1,500 annually.

Table 9: Based operational aircraft

Aircraft	ARC category	General use
Beechcraft Baron twin engine	B-1 (small)	Personal/business
Cessna 182	A-1 (small)	Personal/business
Cessna 177	A-1 (small)	Personal
Beechcraft T-34	A-1 (small)	Personal
Beechcraft Bonanza	A-1 (small)	Personal
Piper 180	A-1 (small)	Personal
Beechcraft Bonanza	A-1 (small)	Personal
Cessna 172	A-1 (small)	Personal/business
RV-7	A-1 (small)	Personal
Pitts	A-1 (small)	Personal
Cessna 150	A-1 (small)	Instruction
Total	11	

Source: Interview with airport manager.

Absent a more reliable system, itinerant operations are considered to be the average of those estimated by WSDOT/AD (1,500) and the FAA (1,000) or 1,250.

Total annual flight operations at Desert Aire Airport are therefore estimated to be 2,750.

Table 10: Based aircraft annual operations

Aircraft	Annual Operations (takeoff or landing)
Beechcraft Baron twin engine	120
Cessna 182	300
Cessna 177	50
Beechcraft T-34	100
Beechcraft Bonanza	50
Piper 180	50
Beechcraft Bonanza	150
Cessna 182	60
RV-7	160
Pitts	60
Cessna 150	400
Total	1,490 (rounded to 1,500)

Source: Interview with airport manager.

3.5 FORECASTS

WSDOT/AD

In 2002 WSDOT/AD published a document that extensively analyzed and forecast Washington aviation activity through the year 2020. This document is part of the Washington State Continuous Airport System Plan, or WSCASP. The plan concluded that numbers of based aircraft and flight operations activity for all airports in Grant County would change very little through the year 2020. The study estimates that 225 aircraft were based in the county in the year 2000 and that based aircraft would increase at an even pace to 229, a net increase of just four aircraft throughout the planning period. Based aircraft at Desert Aire Airport were projected to remain static throughout the planning period.

Federal Aviation Administration

As stated, the FAA does not project future numbers of based aircraft or flight activity levels at

Desert Aire Airport. The FAA does, however, publish other useful forecasting information.

According to the FAA, the number of U.S.-based active general-aviation aircraft is expected to increase at an average annual growth rate of 0.5 percent through the year 2025. Most of this growth is attributed to business-type aircraft. Single-engine piston aircraft, those most applicable to Desert Aire Airport, are expected to increase in numbers at a rate of 0.2 percent. Flight hours are expected to increase at a faster rate than the aircraft fleet, 1.5 percent annually through 2014 and then 1.2 percent annually through 2025. These modest numbers, when applied to Grant County and to Desert Aire Airport, seem to parallel estimates by WSDOT/AD.

Conclusions based on WSDOT/AD, FAA and actual data

Projections by WSDOT/AD and the FAA indicate very limited growth in based aircraft and flight operations over the planning period.

Population and income projections

Grant County has experienced slow and at times erratic growth in population over the past decade. Washington State analysts project that the county's population will continue to grow and do so more steadily into the foreseeable future. With a current population of 87,238 the county has 32,440 (59 percent) more people than it did in 1990. State analysts project that the county will gain another 23,791 people to over 111,000 by the year 2020.

Grant County has also experienced steady growth in household income. In current dollars, median household income has risen from \$24,217 in 1990 to \$36,083 in 2004. (Washington State Office of Financial Management, "Median Household Income Estimates by County: 1989 to 2003 and Projection for 2004"). Per capita personal income in the county has risen from \$19,408 in 1999 to \$21,756 in 2003, according to the U.S. Depart-

ment of Commerce's Bureau of Economic Analysis. (<http://www.bea.doc.gov/bea/regional/reis/drill.cfm>) While the average annual growth rate in personal income has been 7.7 percent since 1990, the rate has slowed in recent years, and managed only 3.4 percent in 2002-2003.

Table 11: Grant County population

Year	Population
1990	54,798
2000	74,698
2003	77,100
2005	87,238 (projected)
2010	96,502 (projected)
2015	104,523 (projected)
2020	111,029 (projected)

Source: Office of Financial Management, 2003.

Though Grant County's personal income growth rate has recently slowed, it is important to note that during the period from 1990 to 2003 it grew, in current dollars from \$14,621 to \$21,756. Average income is less in Grant County than it is in more populated areas of Washington state but there is evidence of relatively consistent improvement.

If, as expected, Grant County's population and income continue to grow they will almost certainly entail greater demands for airport services.

Additional factors

Airport forecasts should take into account specific local conditions and other factors to the extent that the information used is logical, reasonable and credible. The factors included in this section are considered to meet this test. These local conditions and factors relate to:

- Growth in the Mattawa/Desert Aire area
- Desert Aire's development
- Alterations to FAA rules regarding pilots
- Airport improvements

Growth in the Mattawa/Desert Aire area

The Port of Mattawa and other organizations are pursuing development of areas adjacent to Desert Aire and Mattawa. Much of this development is based on agriculture; some on light-industrial and high-technology industries.

The Port of Mattawa was formed in 1958. It acquired 53 acres west of Mattawa in the mid-1970s for future development. In 2000, on the 53-acre site, 6,800 square feet of incubator space was constructed to support new businesses. During the 2001-2003 time period two additional buildings of 6,000 square feet each were built and are now fully occupied. Sewer, water and road construction projects valued at almost \$400,000 that are necessary to support future development in the 53 acre site have been installed.

In the mid-1990s, 100 acres near Mattawa were acquired and developed by the port as an industrial park to support controlled atmosphere storage for the local fruit industry. Those 100 acres have been sold to private firms.

Over 5,000 acres of land have recently been dedicated to growing wine grapes. This development is representative of a trend to increasingly position the Mattawa/Desert Aire area as a premier wine growing region. Currently a new winery is being constructed in the port's industrial park. It is anticipated that this wine growing region will have its own wine-region identity, a so-called appellation.

Additionally, the port is currently engaged in leasing 53 acres of space south of Mattawa for light industrial uses.

EnCana, an energy development firm based in Calgary, Alberta is drilling a natural gas test well seven miles east of Mattawa. If this well justifies activation of this potential gas field, up to 50 wells could be established over the next five-year period. If this area becomes a productive source

of natural gas, EnCana will ship the gas by pipeline or truck, construct a combustion turbine generator for electrical production or accomplish some combination of both. This project is in its speculative stage. EnCana has drilling rights over 800,000 acres of property in several Washington counties within which it is investigating natural gas sources.

Anticipated impact on forecast

Business development activities in the Mattawa/Desert Aire area are not likely to result in dramatic increases in airport activity. Agricultural and agricultural product storage facilities are not the kinds of businesses that have direct aviation connections except for spray activities and those, if they develop, will likely be based at private airfields. EnCana management stated during a recent interview that even if the Mattawa-area gas wells are developed it is unlikely that their activation will result in routine usage of Desert Aire Airport based on their experience in other areas.

Nevertheless, both general development activities and the EnCana project are representative of increasing levels of attention by business interests in the Mattawa/Desert Aire area. Growth and business development specifically oriented to the area around Desert Aire Airport is expected to have a minor but steady influence on based aircraft as well as local and itinerant flight operations over the planning period.

This plan projects one additional locally based aircraft and an additional 100 local and 50 itinerant operations per year throughout the planning period that will be attributed to business development in the Mattawa/Desert Aire area.

Desert Aire's development

Approximately 700 residences exist in the Desert Aire community. The population is estimated at 1,100. A number of lots that have been purchased have not yet been developed. Division 9, Phases 5 and 6, located north of the runway have been

platted for an additional 89 residences. Twenty-seven of the Division 9 residential lots will have direct access to the runway via a taxiway that the developer of Desert Aire has decided to fund. It is logical to assume that many of Desert Aire's projected ultimate population of 4,500 to 5,000 will be focused on golf, aviation or both since the community's golf course and airport are such predominant features of the planned unit development (PUD).

At the northeast corner of Desert Aire Airport is a six-acre, commercially zoned parcel that is owned by the Desert Aire Owners Association (DAOA). Consideration has been given to dedicating this area to airport use. Potential uses for this property, as more thoroughly explained in Chapter 4, would be aircraft tie-downs, storage hangars and airport-compatible commercial enterprises.

Anticipated impact on forecast

Growth in the community of Desert Aire will have a direct, moderate and steady impact on both based aircraft and flight operations over the planning period. The airpark-like setting of Desert Aire Airport allows for a more predictable link between population growth and airport activity levels than is experienced at most general aviation airports.

An additional two aircraft per year and an additional 300 local flight operations per year are predicted by this plan between the years 2005 to 2010. For the remainder of the planning period, one aircraft per year and 150 additional flight operations are forecast.

Alterations to FAA rules regarding pilots

Rules recently promulgated by the FAA allow owners of several categories of ultralight aircraft to register those aircraft in a new category called "light sport." Light-sport aircraft are expected to substantially add to the numbers of based aircraft and flight operations at U.S. airports. It is logical to assume that pilots in this category will, in

general, prefer to operate from airports such as Desert Aire that have low-activity levels, are non-towered and that have an abundance of adjacent, uncontrolled airspace. The light-sport category of aircraft seems to be particularly well suited to airports such as Desert Aire with its private access to a taxiway/runway system.

Anticipated impact on forecast

The sport-pilot category is expected to increase the based aircraft census by eight aircraft between 2005 and 2025. Annual operations are expected to increase at a rate of 150 per based aircraft. Itinerant operations are expected to increase at a rate of 100 per five-year cycle.

Airport Improvements

Though typical planning procedures call for airport improvements, especially those that increase airport capacity, to be justified by demand, it is logical to assume that improvements might have some impact on actually generating demand. The community of Desert Aire is attractive to those who enjoy relaxed lifestyles in sunny climates. It is also attractive to those who enjoy airpark-style living. It is logical to assume that capital improvements that cause Desert Aire Airport to be increasingly attractive, efficient and functional will create additional demand on airports facilities and services.

It is, therefore, a conclusion of this narrative that alterations to the airport's layout, operating features and operational capability are likely to have a general, supportive impact on the aircraft census as well as based and itinerant activity levels.

Basic layout improvements would include the full-length, northside taxiway mentioned earlier, a widened runway, additional tie-downs, hangars and a fuel system. Operating features would include a precision approach path indicator (PAPI) system to serve Runway 10. These improvements are more fully explained in Chapter 4.

It is possible that Desert Aire Airport would increase its share of all aircraft based in Grant County if it were to improve the airport as described. Market share is not considered a major factor, however, because drive distances between Desert Aire Airport and other county airports are too extensive to assume that improvements will draw aircraft based elsewhere.

As indicated in Table 11, Grant County’s population in 1990 was 54,798. In 2005 it is estimated to be 87,238. It is expected to grow to 111,029 by the year 2020. This amounts to an average of approximately 1,874 additional people per year over the 30-year period. If this rate were projected to the year 2025, the last year of the time period addressed in this plan, the county will have a population of more than 120,000. Almost 33,000 residents, 38 percent, will have been added to Grant County between 2005 and 2025.

This raises a question about where this increased population will reside. Moses Lake is the largest city in the county, with 15,730 residents. The next largest city, Ephrata, has only 6,855 residents. The remainder of the county’s population is widely dispersed. Due to the county’s expected continuing focus on agricultural products and facilities to support them it is likely that the county’s population will continue to grow in a dispersed manner and that the Mattawa/Desert Aire region, external

of Desert Aire itself, will grow at least proportionately with the county as a whole. Airport improvements, though generally supportive of airport operations, are not considered by this forecast to impact numbers of based aircraft or flight operations.

Forecast of based aircraft and operations

Based aircraft

Eleven aircraft are currently based at Desert Aire Airport. Forecasts by WSDOT/AD and the FAA expect no growth. If this were the extent of our forecast we would assume that throughout the 20-year planning period Desert Aire Airport will continue to be home to about 12 to 15 aircraft. This plan, however, assumes that the factors identified earlier in this section will have an impact on the based aircraft census. The impacts of each of these factors on based aircraft over the planning period are shown in Table 12. Table 13 shows these impacts cumulatively.

Annual operations

As explained earlier in this section, current annual flight operations resulting from both based and itinerant activity are assumed to be 2,750. Table 12 indicates the impacts each of the factors identified in this section are expected to amount to. Tables 13 and 14 apply these additions to flight operations over the planning period.

Table 12: Additions to based aircraft and annual flight operations over the planning period

Factor	2005-2010			2010-2015			2015-2020			2020-2025		
	Based aircraft	Local Ops	Itinerant Ops	Based aircraft	Local ops	Itinerant ops	Based aircraft	Local ops	Itinerant ops	Based aircraft	Local ops	Itinerant ops
Local growth	5	500	250	5	500	250	5	500	250	5	500	250
DA development	10	1,500	0	5	750	0	5	300	0	5	750	100
Sport pilot	2	300	100	2	300	100	2	300	100	2	300	100
Totals	17	2,300	350	12	1,550	350	12	1,550	350	12	1,550	350

Table 13: Forecast based aircraft 2005-2025

Based aircraft by type	2005 (1)	2010	2015	2020	2025
Single-engine	10	26	37	49	61
Multi-engine	1	2	3	3	3
Helicopter	0	0	0	0	0
Total based aircraft	11	28	40	52	64
Average annual percentage increase		31	9	6	5

*(1) Actual current***Table 14: Forecast annual flight operations 2005-2025**

Operations	2005 (1)	2010	2015	2020	2025
Single-engine	2,630	5,150	6,925	8,825	10,725
Multi-engine	120	250	375	375	375
Helicopter	0	0	0	0	0
Total operations	2,750	5,400	7,300	9,200	11,100
Average annual percentage increase in total operations		19	7	5	4
Local operations	1,500	3,800	5,350	6,900	8,450
Average annual percentage increase in local operations		31	8	6	4
Itinerant operations	1,250	1,600	1,950	2,300	2,650
Average annual percentage increase in itinerant operations		6	4	4	3

(1) Estimated current

The above tables and graphs indicate moderate growth of based aircraft and flight operations over the planning period. These forecasts are based on anticipated development activities by the Port of Mattawa, expected continuing population increases, expected advances in median household income, continuing development of lots with direct access to Desert Aire’s runway and changes in FAA rules regarding the light-sport category of aircraft. Growth in numbers of based aircraft and based aircraft flight operations is weighted in favor of the 2005 to 2010 time period due to the activation of Division 9 – the northside lots – and construction of the northside taxiway.

Airport fleet mix

The fleet mix at Desert Aire Airport is forecast to continue to be dominated by single-engine aircraft due to the airpark setting. Additions to the fleet mix will be light-sport aircraft.

Airport reference code

Forecast aircraft continue to support an ARC category of A-I (small). Technological advances and sport pilot rules are not likely to change this designation.

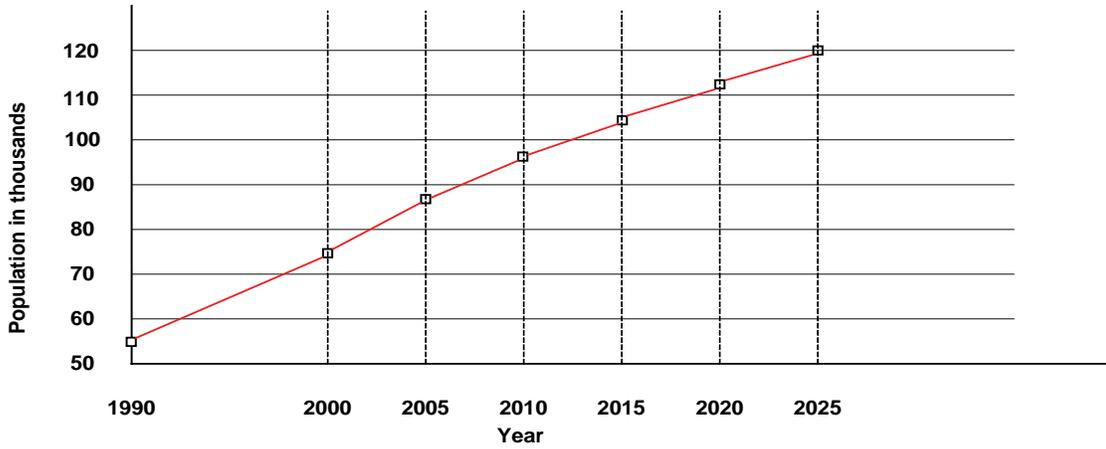


Figure 2: Grant County Population Growth Estimated by the Washington State Office of Financial Management in 2003

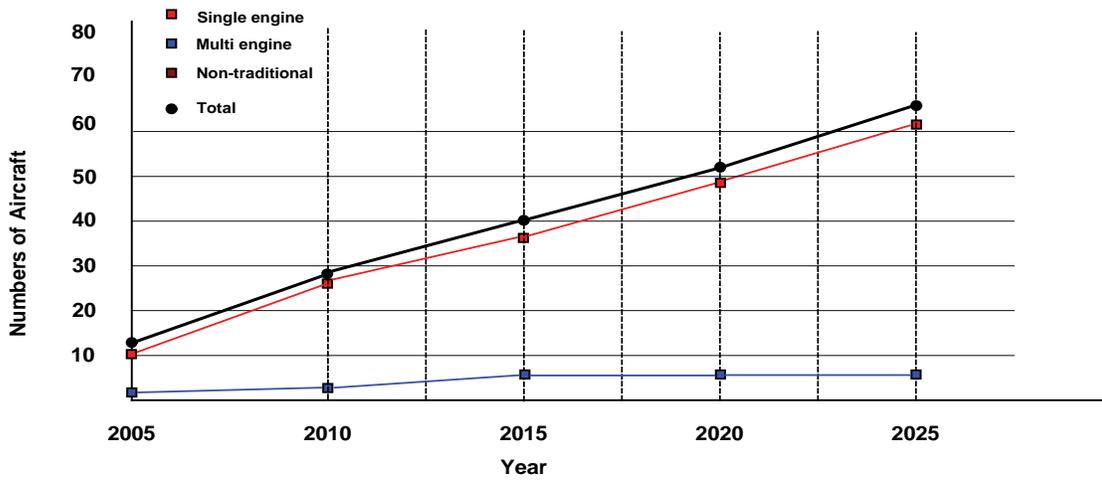


Figure 3: Forecast of Based Aircraft at Desert Aire Airport

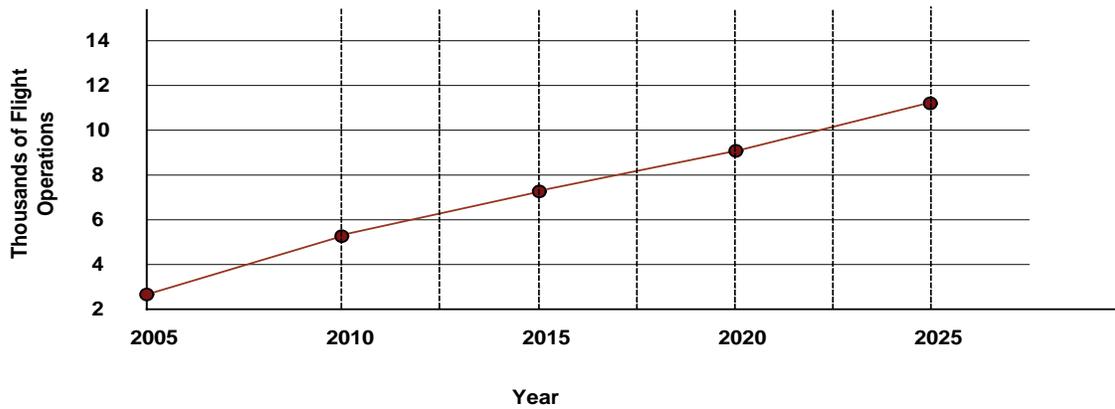


Figure 4: Forecast of Annual Flight Operations at Desert Aire Airport

Chapter 4:

Facility requirements and development alternatives

4.1 INTRODUCTION

This chapter uses information from Chapters 2 and 3, data gathered during site visits, and suggestions from the ALP steering committee to develop a list of recommended improvements at Desert Aire Airport over the planning period. Projects listed are intended to increase safety, accommodate forecast demand and provide a transportation facility that is aesthetically pleasing and accommodating to local citizens and visitors. Information about the timing of projects is at the end of the chapter. Estimated expenses associated with recommendations are contained in Chapter 5.

As stated in Chapter 3, the Cessna 182 and the A-1 (small) group of aircraft it represents is identified as the design aircraft throughout the planning period. Additional kinds of aircraft that may use Desert Aire Airport are light sport aircraft and variations of aircraft based on advancing technologies.

FAA recommendations related to design standards that are contained in Advisory Circular 150/5300-13 have been applied.

4.2 AIRPORT LAYOUT

Runway length/width

The existing runway at Desert Aire Airport is 3,665 feet long and 36 feet wide. For small, single-engine aircraft this runway length is generally adequate. According to the FAA's computer model, the airport is able to accommodate over 95 percent of the general aviation fleet weighing less than 12,500 pounds. Runway width - at 36 feet - is 24 feet less than the FAA's runway width design standard of 60 feet.

To put the "95 percent of the fleet" comment in context, the A-1 (small) fleet includes aircraft that weigh up to 12,500 pounds. Though it is an unusual inclusion, aircraft such as the Mitsubishi MU-2P, high-performance multi-engine turbo-prop are considered A-1 small aircraft. Most of the aircraft using the airport now and that are expected to use the airport in the future weigh considerably less and require less runway length than those few airplanes that are at the upper end of this category. Consequently, it is logical to assume that Desert Aire's runway is long enough to accommodate nearly all of the A-1 (small) aircraft fleet under most temperature and aircraft loading conditions.

Northside taxiway

The developer of Desert Aire stated in November 2005 that all 27 of the so-called northside lots are "spoken for." He explained that he is holding deposits on each lot but cannot legally sell them until permission is provided by GCAD #1 for access to the runway. When asked what percentage of the anticipated lot owners will have aircraft he stated "most of them." Airside and the developer determined that it is appropriately conservative to state in this plan that at least a majority of the lot owners plan to have or do have aircraft.

Development of a northside taxiway is, therefore, logical considering forecast increases of based aircraft, Desert Aire's airpark-style layout, and the absence of airport property on which to construct tie-downs and hangars. A northside taxiway - which would be constructed primarily with the developer's funds - would continue to facilitate Desert Aire's storage of active aircraft on private property. Such storage and access are reasonable, considering the planned access fees mentioned in Chapter 3.

To provide a safety margin, the northside taxiway will be constructed so that its taxiway object-free area (TOFA) is approximately 3 feet south of the property boundaries of adjacent Division 9 lots. The distance between the northside taxiway centerline and the existing runway centerline will therefore be 134 feet, 16 feet less than the FAA recommended standard. This reduction in centerline-to-centerline distance is not considered to be a safety hazard and is anticipated to be temporary as is explained further in this chapter.

4.3 ALTERNATIVES DEVELOPMENT

The overall conformation of Desert Aire Airport has been reviewed and discussions with the ALP steering committee regarding the existing and future airport layout have resulted in consideration of three development alternatives. Considering the layout and site constraints at Desert Air Airport, there are few development options available to GCAD #1. The following might be better characterized as variations on development themes that would be determined by available funding. The alternatives are:

- *Alternative 1:* Construct the northside taxiway.
- *Alternative 2:* Accomplish Alternative 1 and reconstruct the southside taxiway.
- *Alternative 3:* Accomplish Alternatives 1 and 2. Move and widen the runway.

Serious consideration was not given to a “do-nothing” alternative. Choosing this alternative would leave Desert Aire Airport in its current configuration including the absence of a northside taxiway. Future capital improvements would be focused on potential development of the six-acre parcel northeast of the airport for aircraft tie-downs and commercial uses. The six-acre parcel has not been legally transferred to GCAD #1 at this time and, though it is addressed in general in this plan, it is premature to assume that it will be fully under the control of GCAD #1 in the near

future. Consequently, doing nothing would mean that the Division 9 lots that are adjacent to the runway would not have runway access and would not have places to park aircraft except for the limited space available on the existing aircraft parking apron.

Leaving Desert Air in its present configuration would have identifiable advantages and disadvantages. Doing nothing would cost less than any of the three alternatives and it would reduce future aircraft noise levels because it would probably have the effect of inhibiting increases in activity. However, limiting Desert Aire Airport’s ability to meet anticipated demand is contrary to the intent of this plan. Also, failure to take action to meet demand will inhibit the ability of the airport to achieve a level of activity - a level of importance - that will help ensure its future.

It is important to note that this chapter not only recognizes Desert Aire’s airpark-style layout but works to accommodate its continuance. In this instance, one only has to look at the existing conformation of the airport and its surroundings to understand that Desert Aire Airport is bounded by roads on all four sides, and that residences have co-existed with the airport for many years to determine that the only logical course of action is to support this airport’s development and help it meet demands that will be placed on it.

Further, maintaining the viability of small, general aviation airports both in terms of finances and community compatibility is often a challenge. The recent proposal to apply access fees to adjacent properties at Desert Aire both recognizes that public funds are involved and has the potential to create a consistent level of income that many traditionally funded general aviation airports would welcome.

In the final analysis, Desert Aire is positioned to serve general aviation interests in southwest Grant County even if its layout and operations are non-traditional as compared to most of Washington’s publicly funded airports.

Following, therefore, are descriptions of specific alternatives intended to improve Desert Aire Airport, help it accommodate projected demand and ensure its future viability. Although called alternatives, these development options are more accurately progressive improvements that may be taken based on the amount of capital improvement funds that may be available.

Alternative 1 – Construct northside taxiway

With this alternative, a northside taxiway would be constructed. Its centerline would be 134 feet from the centerline of the existing runway. This would provide access for all 27 northside residential lots and for the six-acre commercial property, if developed. As stated, the northside taxiway would be constructed with private funds. This plan, however, recommends involvement by District 1 in the form of signs and reflectors.

Assessment of this alternative

Advantages

- Improved access to and use of Desert Aire Airport.
- Increased ability of the airport to meet projected demand.
- Limited cost to GCAP #1 and WSDOT/AD

Disadvantages

- Inability to fully meet the taxiway-to-runway separation distance on the north side of the runway.
- The runway would continue to be 24 feet less than the FAA recommended 60 foot width standard.

Alternative 2 – Construct the northside taxiway and reconstruct the southside taxiway

This alternative provides for construction of the northside taxiway as described in Alternative 1

and reconstruction of the southside taxiway. The south taxiway would be extended further west than its current end – at least to the west edge of the aircraft parking apron – allowing for a holding area to be used by aircraft waiting to depart Runway 10. The south taxiway would also be extended east to create a more efficient connection to the end of Runway 28.

Assessment of this alternative

Advantages

- Improved access to and use of Desert Aire Airport
- Increased ability to meet projected demand.
- Extensions, pullouts and holding areas would improve flow and efficiency.

Disadvantages

- Inability to meet FAA recommendations related to runway width and runway-taxiway separation distance.
- This alternative is more costly than Alternative 1.

Alternative 3 – Accomplish alternative 2, move and widen the runway

This alternative would encompass all taxiway construction described in alternatives 1 and 2. It would also move the runway centerline 16 feet south and reconstruct the runway to the FAA standard 60-foot width.

Assessment of this alternative

Advantages

- Provision of a fully functional, good quality, efficient runway/taxiway system that, if cared for, would probably last the term addressed in this plan.

- Ability to meet FAA recommendations related to runway width and runway-taxiway separation distance between the north taxiway and the realigned runway.
- Reconstruction of the runway would allow the west end to be elevated by approximately 3 feet – enough to eliminate the pump house as the controlling obstruction for Runway 10.

Disadvantages

- This is the most costly alternative.

Summary assessment

Alternative 1, construction of only a northside taxiway, is a functional concept. It would, however, create a non-standard runway/taxiway separation distance between the existing runway and taxiway over the long term. It would also result in continued operation of a runway that is less than the FAA standard width.

Alternative 2, construction/reconstruction of both taxiways, would provide for efficient aircraft maneuvering throughout the taxiway system. It would also provide holding areas and turnouts to facilitate safe aircraft movements and reduce bottlenecks that would probably occur as additional access locations to the airport's taxiway system are developed. Further, this alternative solves the problem of uneven, rough surfaces on the south taxiway that are the result of attempts to correct width problems created when the south taxiway was first constructed.

This alternative is favored over Alternative 1.

Alternative 3, construction/reconstruction of both taxiways and reconstruction and relocation of the main runway bring the airport into full compliance with FAA airport design recommendations and provides a fully functional airport for the duration of the planning period.

Alternative 3 is chosen as the best long-term solution for the Desert Aire runway/taxiway system.

Runway layout considerations

Alternative 3 indicates different separation distances from the center of the relocated runway to the north and south taxiways. This alternative indicates the runway centerline as being moved far enough south to conform to the FAA separation standard between it and the planned north side taxiway. Project engineering may result in moving the runway centerline further south.

Pullouts

Taxiway depictions contained in this plan show what are termed "pullouts," or holding areas. These exist along both taxiways and at the ends of the taxiways. These will need further study during final engineering of this project. The intent of these paved areas is to provide opportunities for taxiing aircraft to allow other aircraft traveling in the opposite direction to pass. These features will be necessary considering the number of access locations that will connect to the taxiways as growth occurs. These pullouts would not be necessary if the taxiways were wide enough for two-way aircraft traffic but the cost of taxiways wide enough to accommodate opposing traffic is not justified.

Slope

The depiction of the runway in alternative 3 as well as on the airport layout plan show the east end being elevated 1 foot above its current elevation and the west end being elevated 3 feet above its current elevation. These runway end elevation adjustments will result in a runway gradient of 1 percent – similar to the existing gradient. Final engineering may reduce this slope somewhat by raising the west end further. To determine ultimate slope, impacts to a number of airport elements including the apron at the west end must be considered. For every foot the west end of the runway is raised, it will be 1 foot further above the elevation of the aircraft parking apron and adjacent taxiway locations. There will be a point at which raising the west end of the runway further will cause taxiway slopes connect-

ing the runway to other paved surfaces to be too steep for safe and efficient aircraft movement.

The 3-foot elevation change of the west end of the runway as depicted herein is enough to allow removal of the pump house west of the runway as a controlling obstruction to the Runway 10 approach surface. Runway approach surfaces are components of so-called imaginary surfaces.

These surfaces are detailed in Federal Air Regulation (FAR) Part 77 "Objects Affecting Navigable Airspace." A full explanation of FAR 77 is included in the appendix.

Table 15 reviews alternatives 1, 2 and 3 with respect to compliance with FAA design standards.

Table 15: Comparison of alternatives with FAA standards

FAA standard	Alternative 1	Alternative 2	Alternative 3
Runway length 3,655'	3,655'	3,655'	3,655'
Runway width standard 60'	36"	36'	60'
Taxiway width Standard 25'	25' North taxiway 28' South taxiway	25' Both taxiways	25' Both taxiways
Runway Safety Area (RSA) 120' wide centered on the runway. Extends 240' beyond each runway end.	Neither the RSA nor the ROFA would be impacted by choices made between these alternatives. Both the RSA and the ROFA are out of compliance due to several issues unrelated to this decision. These issues include location of the wind tetrahedron, location of the hold-line signs, surface preparation and grading, and a lack of control over the surface area included in these standards.		
Runway Object-Free Area (ROFA) 250' wide centered on the runway. Extends 240' beyond each runway end.			
Taxiway safety area (TSA) 49' wide centered on the taxiway.	In compliance, provided grading and compacting are accomplished.	In compliance, provided grading and compacting are accomplished.	In compliance, provided grading and compacting are accomplished.
Taxiway Object-Free Area (TOFA) 89' wide centered on the taxiway.	In compliance.	In compliance, provided alterations to the existing aircraft parking apron are made.	In compliance, provided alterations to the existing aircraft parking apron are made.
Runway/taxiway separation 150'	134' (Not in compliance.)	134' (Not in compliance.)	150' (In compliance.)
Runway protection zone (RPZ) under owner control Length 1,000' Width inner 250' Width outer 450'	As with the RSA and ROFA, the RPZ is not affected by this decision.		
FAR Part 77 approach surface 20:1 slope beginning 200' from the ends of the paved runway surface.	No change. Slope still not obtained at Runway 10. Slope to be gained at Runway 28 by actions unrelated to this alternative.	No change. Slope still not obtained at Runway 10. Slope to be gained at Runway 28 by actions unrelated to this alternative.	Slope obtained at Runway 10. Slope to be gained at Runway 28 by actions unrelated to this alternative.
FAR Part 77 Transitional Surface 7:1 slope beginning at the edge of FAR 77 Primary surface	Not affected.	Not affected	Movement of the runway 16' south will increase the height of the transitional surface slope at the northside property lines by about 2.5 feet. None of the existing structures south of the runway will penetrate the FAR Part 77 transitional surface.

RECOMMENDATIONS RELATED TO THE RUNWAY/TAXIWAY SYSTEM

1. The runway/taxiway configuration identified in Alternative 3 is recommended for implementation. This configuration will provide complete access to the airport's runway system, will ensure that major construction is done according to recommended standards and will provide good quality taxiways at an airport that is expected to have more than generally experienced taxiway use due to the airpark-style layout.
2. All future taxilanes constructed by private parties on airport property that provide for access from private aircraft parking areas or hangars should be constructed to a development standard that includes right-angle approaches, width, corner radii, pavement type and striping. This will contribute to orderly development, safety and improved aesthetics at Desert Aire Airport.
3. During final planning careful consideration should be given to the ultimate runway slope, runway end elevations and the location and design of so-called pullouts and holding areas.
4. Regardless of when future airport layout alterations are accomplished, steps should be taken to adjust the airport's property boundaries to ensure that GCAD #1 has control over the runway safety area, runway object-free area and, to the extent possible, both runway protection zones.
5. Runway hold lines and hold-line signs should be moved to locations 125 feet from the runway centerline. All hold lines should be painted to the 1 foot-width FAA standard.
6. The north taxiway should be constructed to the same design standard anticipated for the planned reconstruction of the south taxiway.

PHASING

Current state regulations do not allow WSDOT/AD to provide grants in excess of \$250,000. Design, engineering and construction of a new taxiway/runway system as described in Alternative 3 will exceed that amount. Unless state regulations regarding maximum grant amounts are changed before implementation of this option, Alternative 3 should be accomplished in three grants as indicated below. The northside taxiway is not included in this phasing plan since it is assumed that it will be constructed with private funds prior to other taxiway/runway construction.

Phasing plan

1. Design, engineering, specifications and contract documents for the runway/south taxiway system including grading, drainage, lighting, signage and other features.
2. Construction of the relocated runway including stub connections to connect to the north taxiway. This phase would include striping and installation of all runway equipment.
3. Construction of full-length south taxiway, striping and installation of all taxiway features.

Alt 1 drawing

Alternative 2 drawing

Alternative 3 drawing

4.4 PROJECTS AND IMPROVEMENTS

PROJECTS 2006

Following is a list of prioritized projects recommended for completion during 2006.

A1. Expansion of property boundary

As indicated in this report the existing property boundary impacts GCAD #1's control over critical airport operational areas. Expansion of the property boundary to include these areas is important to operational safety and future airport development. (Refer to drawing C.1, the airport layout plan.) During this process, determine whether the airport's existing property boundary is consistent with the aircraft parking apron, especially at its south edge.

A2. Hold line improvement

Eradicate all existing hold lines. Paint new hold lines at a distance of 125 feet from centerline of the runway. Reinstall existing retroreflective hold-line signs on frangible mountings adjacent to and left of the hold lines while facing the runway. Ensure that the signs are mounted such that the non-frangible pipe supports extend no more than 2 inches above grade. Hold-line graphics should be yellow and in 1-foot widths rather than the existing 6-inch widths.

A3. Runway safety area, runway object-free area and FAR Part 77 primary surface enhancements

Efforts to improve the RSA and Part 77 primary surface should be accomplished to the degree possible. These areas should be graded and compacted to conform to relevant FAA standards. The RSA is 120 feet wide, centered on the runway and extends 240 beyond each end. The FAR Part 77 primary surface extends 200 feet beyond the runway and is 250 wide centered on the runway. The runway object-free area is the same width as the primary surface but, as with the RSA, it extends 40 feet farther from the runway at both ends. Particular attention should be given to the area north of the end of Runway 28 where there is a rise in terrain.

Dismantle and relocate or remove the wind tetrahedron. A portion of this feature is within the RSA. The entire feature is within the ROFA.

During this process install and chemically stabilize compacted top-course rock along edges of the runway to provide a transition from the runway edge to the runway safety area.

A4. Seal runway cracks

A5. Northside (Taxiway B) taxiway access standards

Produce written and graphical standards for all future taxiways that will connect to the northside parallel taxiway. These include width, radii, pavement specification, construction quality assurance, painted graphics and locations.

PROJECTS 2007-2010

Following is a list of projects recommended for the 2007-2011 time period. Table 16, which lists recommended projects throughout the 20-year planning period, depicts them in this five-year time period in individual years.

2007

B1. Design and construct the northside taxiway

Though this is planned to be accomplished with private funds, close interaction with the airport commission will be required. Ensure that the taxiway is planned and constructed to relevant standards, that it is located properly, that appropriate pullouts and holding areas are included, that it is painted properly and that hold-line signage and reflectors are installed.

GCAD #1 and WSDOT/AD should consider providing taxiway reflectors and hold-line signs through a grant since this taxiway will probably be used to provide access to the runway from the commercial area at the northeast corner of the airport.

Particular attention should be given to safety at any time that any construction activity is accomplished within the runway object-free area. Notices to airmen (NOTAMS) should be filed.

B2. Order taxiway reflectors and hold-line signs for the northside taxiway

B3. Install equipment and paint northside taxiway

This includes installation of the taxiway reflectors and hold line signs. Reflector locations should consider potential taxiway access locations. Install reflectors 5 feet from the taxiway's edge.

B4. Off-airport signs

Signs should be installed at the entrance to Desert Aire from Washington State Highway 243 and the junction of Desert Aire Drive and Airport Way providing directions to the aircraft parking apron.

B5. Pursue transfer of the six-acre commercial site to GCAD #1.

B6. Plan, specify and develop bid and contract documents for Alternative 3

Planning for Alternative 3 development should be accomplished in time to have this project advertised by the spring of 2008.

2008

C1. Remove three aircraft parking spaces

When the south taxiway is extended to the west in order to connect it more completely with the runway's south end, three aircraft parking spaces will be within the taxiway object-free area (TOFA). Abandon these spaces. They will be replaced after this time period.

C2. Reconstruct and lengthen the southside taxiway (Taxiway A)

This project should extend the taxiway to the ends of the runway. The three taxiway connectors should not be included in this project since widening and moving the runway as indicated

during the following year would result in waste of pavement.

C3. Install Taxiway A reflectors

Install reflectors throughout the south taxiway system 5 feet from the taxiway's edge.

C4. Paint Taxiway A centerline and hold lines, install hold-line signs

Ensure that the hold lines are 12 inches wide and that they and the hold-line signs are located 125 feet from the ultimate runway centerline as determined by detailed planning referred to in project B6.

2009

D1. Construct new runway

Reconstruct, move and widen the runway. Construct runway to Taxiway A connectors.

D2. Reinstall medium-intensity (MIRL) runway edge and threshold lights in existing base cans

Clean lenses, replacing as necessary, inspect wiring and ensure that the tops of the base cans are level and even with grade when reinstalled. Install all runway edge lights 10 feet from the runway's edge.

D3. Paint runway and taxiway graphics, reinstall hold-line signs

These actions are necessary due to movement of the runway's centerline.

D4. Relocate runway 28 PAPI

Reinstall the PAPI system to specification. Concrete supports should be no more than 3 inches above grade.

D5. Install runway 10 PAPI

Install a PAPI system to serve the approach to Runway 10.

D6. Install supplemental wind indicator

As shown on the ALP, this indicator should be on an 8-foot support pole.

2010

E1. Six-acre site

If the six-acre site northeast of the airport is under GCAD #1 control, plan it to incorporate aircraft tie-downs, aircraft hangars, a fuel system, and commercial development. Work closely with the Port of Mattawa in this process. Phase development and consider non-aviation funding sources to supplement funds from WSDOT/AD.

2011

F1. Pave portion of six-acre site

Prepare aircraft tie-down portion of this site.

F2. Develop vehicle access and parking at the six-acre site

F3. Construct tie-downs

F4. Paved surface maintenance

Crack seal and provide high-quality seal coat – not a fog seal nor a slurry surface – to all paved surfaces. Repaint all runway and taxiway graphics.

PROJECTS 2012–2016

G1. Expand existing south side aircraft parking

As of this period there will be 13 aircraft tie-downs installed on the 192-foot-by-210-foot parking apron. This apron may be expanded as demand requires. The existing apron accommodates 16 aircraft in 4,480 square yards. This amounts to about 280 square yards per aircraft, close to the FAA recommended 300 square yards per aircraft. Extension possibilities exist to the east, west and south as noted on the airport layout plan. This plan assumes an additional 5,770 square yards for aircraft tie-downs, which will accommodate a total of 26 aircraft. Approximately

12 vehicle parking spaces can be constructed on this site. (See drawing C.2.)

G2. Install additional tie-downs and hangars on six-acre site as required

G3. Install fuel system

G4. Construct multi-purpose terminal/welcome center

This building will be used as a visitor center where those flying to the Desert Aire area can be accommodated in clean, comfortable and functional surroundings. This building will provide increased opportunities for the community of Desert Aire, the Port of Mattawa, local business interests and Grant County to display information about their individual and mutual economic development and tourism efforts. This new structure would serve as the focal point for the airport.

G5. Install infrastructure as required

G6. Conduct paved surface maintenance as indicated in F4 at the end of this period

PROJECTS 2017–2021

H1. Additional fuel tank

Turbine aircraft in development even today will be able to use runways of about 3,000 feet long. A fuel system that is able to dispense Jet A fuel or new types of fuel that these aircraft will use should be installed as demand is identified.

H2. Additional hangars, if demand exists

H3. Paved surface maintenance

As noted in F4 and G6.

PROJECTS 2022 – 2026

I1. Reconstruct all paved surfaces, if necessary

12. Refine use of six-acre site

Improve this commercial area as necessary.

4.5 HANGAR/TIE-DOWN DEVELOPMENT

This section correlates development of hangars that are not on private property with anticipated hangar and tie-down demand.

Chapter 2 indicates that 11 aircraft are currently based at Desert Aire Airport. Chapter 3 predicts that at the end of the planning period, the year 2025, 64 aircraft will be based at the airport. Based aircraft are expected to reach the following levels by the following indicated years: 28 in 2010, 40 in 2015, 52 in 2020, and 64 in 2025.

Most of the aircraft that will be added to the Desert Aire based aircraft census will be accommodated on private property. Division 9, the northside development, has 27 lots that have potential for direct access to the north side taxiway. As with the southside development, some of the north side lots will be combined – two lots into one. It is assumed that a total of 20 northside lots will be able to house aircraft on private property at full development.

It is further assumed that with additional southside development of hangars a total of 30 aircraft will ultimately be accommodated. This amounts to a total of 50 aircraft that are estimated to be stored in private hangars at the end of the planning period. This leaves District 1 in a position to plan for tie-down and hangars to store the remaining 14 based aircraft. The existence of the southside properties which do not yet have aircraft stored on them and the existing parking apron which has considerable unused capacity mean that accommodating the 14 aircraft is a mid-term rather than a near-term issue.

The existing aircraft parking apron's 16 positions will be reduced to 13 when the southside taxiway (Taxiway A) is reconstructed during the 2007–

2011 time period. However this parking apron is scheduled to be expanded in the 2012–2016 time period to accommodate a total of 26 aircraft. This meets projected demand. It is likely, though, that individuals living north of the runway or those not living in Desert Aire who own aircraft will wish to have use of aircraft tie-downs and hangars in the northeast commercial area. The northeast commercial area is also the most logical place for transient aircraft to park due to the planned fuel system and proximity to SR 243. Though projected demand, in terms of numbers of aircraft, will be met by private storage and by the existing west side parking apron there is justification for development of the parking apron in the east commercial area. It is assumed that demand will exist for these northside tie-downs and hangars by the 2012–2016 time period.

4.6 BUILDING RESTRICTION LINES (BRLS)

Building restriction lines (BRLs) are lines parallel to runways that are established to identify permissible locations for structures. Generally BRLs are located so that FAR Part 77 transitional surfaces will not be penetrated by planned structures. Structure heights are typically considered to be 15 feet for planning purposes.

Transitional surfaces rise at a ratio of 7 to 1 (horizontal to vertical) perpendicular to an airport's runway. Outward and upward slopes begin at another FAR 77 surface called the "primary surface" which, at Desert Aire Airport is 125 feet from centerline on both sides of the runway. Primary surfaces rise and decrease in elevation with the nearest point of the runway so differences in runway elevations relative to adjacent proposed building sites must be taken into consideration.

It should be noted that FAR 77 is not a legal restriction of structure heights. It is instead a federal regulation that identifies a method for determining existing and proposed penetrations of airspace and their dispensation. Penetrations

are considered by the FAA to be obstructions to navigable airspace unless a study by the FAA determines otherwise. FAA studies may result in one of three conclusions: (1) no objection to the penetration, (2) objection unless mitigation, such as lighting, is accomplished and (3) objection. FAA airspace determinations are not binding on local jurisdictions since the FAA does not have authority over local zoning. Nevertheless, it is a good idea, and WSDOT/AD policy, to avoid FAR

Part 77 penetrations, thus the logic behind showing BRLs on airport plans.

BRLs related to both existing and ultimate runway conditions are depicted on the airport layout plan.

Table 16 provides a detailed list of recommended projects and when their accomplishment is projected.

Table 16: Recommended improvements

Projects and timing	
2006	
A1.	Pursue expansion of the airport property boundary.
A2.	Alter hold line locations.
A3.	Enhance runway safety area, runway object-free area and FAR Part 77 primary surface.
A4.	Seal runway cracks.
A5.	Establish standards for northside access taxiways.
2007	
B1.	Design and construct northside taxiway.
B2.	Order hold-line signs and taxiway reflectors for the northside taxiway.
B3.	Install taxiway reflectors, hold-line signs, paint taxiway graphics.
B4.	Install off-airport signs.
B5.	Pursue transfer of the six-acre commercial site to District 1.
B6.	Plan, specify and develop documents for Alternative 3.
2008	
C1.	Remove three aircraft parking spaces as noted on ALP.
C2.	Reconstruct and lengthen parallel portion of southside taxiway (Taxiway A).
C3.	Install reflectors throughout parallel portion of Taxiway A.
C4.	Paint centerline, paint hold lines and install hold-line signs, Taxiway A.
2009	
D1.	Reconstruct, move, widen runway, including perpendicular portions of Taxiway A.
D2.	Inspect, fix as necessary and reinstall runway edge and threshold lights.
D3.	Paint runway, Taxiway A connector and Taxiway A hold-line graphics.
D4.	Relocate PAPI, Runway 28.
D5.	Install PAPI, Runway 10.
D6.	Install supplemental wind indicator at Runway 10.

Table 16: Recommended improvements (continued)

Projects and timing	
2010	
E1.	Accomplish detailed planning of the six-acre commercial site, if under District 1 control.
2011	
F1.	Pave portion of commercial site to be used for aircraft tie-downs.
F2.	Provide access and parking for vehicles at northside-based aircraft tie-downs.
F3.	Construct northside-based aircraft tie-downs.
F4.	Seal coat and repaint all taxiway, runway and apron surfaces.
2012-2016	
G1.	Expand existing aircraft parking.
G2.	Install tie-downs and T-hangars, north side.
G3.	Install fuel system.
G4.	Construct new multi-purpose terminal/welcome center.
G5.	Install infrastructure.
G6.	Conduct paved surface maintenance.
2017-2021	
H1.	Add additional fuel tank and dispensing system, as necessary.
H2.	Install additional hangars.
H3.	Conduct paved surface maintenance.
2022-2026	
I1.	Reconstruct all paved surfaces.
I2.	Refine six-acre site.

4.7 ZONING AND LAND USE

It is recommended that this section be read while referring to drawings C 1.6, titled “Zoning and Land Use,” and C 1.7, titled “Exhibit A.”

Existing zoning

The property encompassing Desert Aire Airport consists of 49.93 acres. It is zoned “village industrial.” The six-acre site northeast of the airport — which has potential for airport-dependent, airport-related and airport-compatible development — is currently zoned “rural village commercial,” as are areas east and southeast of the airport, including areas that encompass portions of the

airport’s runway protection zone (RPZ), runway safety area (RSA), runway object-free area (ROFA) and FAR Part 77 Primary Surface. A portion of the commercially zoned area is used for the Desert Aire Senior Center. Large areas south and north of the airport’s boundary are zoned “rural village residential.” To the west of the airport, both east and west of Airport Way, is an area zoned “rural village open space.”

Existing land Use

Land northeast, east and southeast of the airport is currently categorized as “open space – undeveloped.” East of the pathway used as a utility easement and west of highway 243 is an area

designated “agriculture.” South of the airport the land use designation is “residential.” North of the airport, the residentially zoned area is undeveloped at this time and for purposes of this plan is termed “platted residential.” West of the airport, both east and west of Airport Way, the land use designation is “open space – undeveloped.”

Zoning and land-use recommendations

Addressing specific issues related to zoning and land use on Desert Aire Airport and the areas adjacent to it will increase safety and foster airport/community compatibility. Doing so soon after publication of this plan is particularly important since Grant County (according to a telephone conversation with an official of the Grant County Planning Department in November 2005) is currently updating its comprehensive plan and development regulations. This airport layout plan recommends that during this process Grant County, GCAD #1 and WSDOT/AD work closely to ensure that the following actions are taken.

- Alter applicable sections of the comprehensive plan to accurately state the airport’s publicly operated, open-to-the-public status.
- Alter the zoning designation of the airport from “industrial” to “airport.” Develop this specific zoning classification to provide for permitted, conditional and prohibited uses within the zone. Permitted uses should include those features and structures normally associated with a general aviation airport such as aircraft hangars, fuel systems, navigational aides, signs and terminal buildings. Include in this zoning classification specific areas west and east of the airport that are important to the safety of aircraft operations. Areas to the west should encompass property up to Airport Way. This zoning action will provide additional controls over the RSA, ROFA, RPZ and FAR Part 77 Primary Surface.

- Zone the six-acre commercial parcel northeast of the airport as “airport commercial.” This area has the potential of being supportive of airport operations and a contributor to the airport’s economic well-being. Features such as retail establishments and public services such as restaurants should be shown as “permitted uses.”
- Initiate a process that informs purchasers of property within Desert Aire Rural Village that (1) their property is located adjacent to or within close proximity to Desert Aire Airport and that their property may be impacted by a variety of aviation activities. Note that such activities may include but are not limited to noise, vibration, chemical, odors, hours of operation, low overhead flights and other associated activities and (2) that the Federal Aviation Administration (FAA) establishes standards and notification requirements for potential height hazards that may be caused by structures, building, trees and other objects affecting navigable air space through 14 CFR Federal Aviation Regulations (FAR) Part 77 Civil Aviation Imaginary Surfaces. Any questions relating to structures, height hazards or obstructions should be directed to the Grant County Planning Department or the FAA. (See the WSDOT/AD disclosure notice in the appendix to this plan)
- Include in the transportation and policy elements of comprehensive plan a general overview of Desert Aire Airport. Reference should be made to the Desert Aire Airport Layout Plan and other applicable documents. The updated comprehensive plan should include supporting maps and drawings including those that explain Federal Air Regulation Part 77 (FAR 77).
- Ensure that supporting comprehensive plan policies included in the transportation, recreation, and economic development

sections discourage incompatible development in the vicinity of the airport (with the exception at Desert Aire of existing and planned residences), and designate Desert Aire Airport as an essential public facility in a manner consistent with applicable state regulations.

Utility easement

As indicated in Chapter 2, and as noted on the airport layout plan diagram, an emergency access and utility easement is east of the runway and within the east RPZ. This plan assumes that there is no intention to develop this easement as a roadway. If that were done there would be a necessity to displace the landing threshold for Runway 28 by approximately 130 feet.

Chapter 5:

Financial

Chapter 4 contained information about airport improvements that are intended to meet forecast demand and increase safety, utility and efficiency at Desert Aire Airport. This chapter identifies the cost of those improvements and establishes a plan for paying for them. Also included in this chapter is data related to current and projected airport income and expenses.

5.1 GENERAL FINANCIAL INFORMATION

Cost estimates

Project cost estimates are in 2006 dollars. A 30 percent contingency has been incorporated into projects where applicable to cover engineering, administration and unforeseen circumstances. As this portion of this plan is updated, GCAP #1 will need to adjust the 2005-based dollar amounts as they are affected by inflation. These estimates are for planning purposes only and should not be used as construction cost estimates.

The paving estimate for the northside taxiway (taxiway A) was provided by Forsgren Associates Inc. It is included in the appendix.

The following formulas were applied to estimates for other paved surfaces.

Base course and top course rock

Area to be paved times the depth of compacted rock @ .167 for 2-inch depth and .25 for 3-inch depth.

Class A/B asphalt (ACP)

A yield of 8.25 square yards per ton of asphalt is estimated for a 2-inch mat depth.

Organization

This CIP has been organized by identifying specific projects that should be completed in 2006.

They include not only capital projects but administrative actions, such as adjustment of Desert Aire Airport's property boundary and establishment of specifications for Taxiway B access locations, that will help the airport develop.

Projects recommended for the years 2007 through 2011 are listed in the individual years during which it is anticipated that they will be accomplished. Projects for the remaining time periods are listed in five-year increments.

This CIP is intended to provide scheduling of projects as they are envisioned at this time. Projects recommended for the 2006-2011 time period are easier to plan than projects identified for implementation 15 or 20 years from now. It is important to review and adjust this CIP on at least an annual basis.

Funding sources

This capital improvement program makes assumptions that some funding sources other than the Desert Aire Owners Association, the Port of Mattawa and WSDOT/AD will be available, especially for structure and infrastructure projects. Actual availability of funds as identified herein will depend on a number of factors, including the level of funds available to WSDOT/AD and to other agencies to distribute and the needs of other airports as compared to the needs of Desert Aire.

Planning ahead

A factor that plays a material role in the successful receipt of grant funds from WSDOT/AD and other sources, such as the Washington State Department of Community Trade and Development, is communication. Granting agencies are more like-

ly to respond positively to grant requests when they are given plenty of advance notice about intentions to apply for funds. This helps granting agencies to do their own advance planning. Informing grant sources of plans three to four years in advance, and each year thereafter until funds are requested, is an effective strategy.

Third-party financing

Airports often use third-party financing for development of facilities that are to be used primarily by private businesses or organizations. Projects of this kind include hangars and industrial structures. Some portions of this CIP identify no cost to GCAD #1 because of assumed third-party financing.

Rates and charges

It is very important at Desert Aire Airport, as with all airport facilities, that careful attention be paid to determinations of rates and charges. Small airports have limited abilities to collect revenue. It is often the case that fees that sponsors of small airports charge for based aircraft tie-downs, land leases, overnight tie-downs, fuel and other services are lower than what might be considered market value.

In some cases, fees – with the exception of those associated with fuel – are not charged at all. Clearly, sponsors of most small airports do not have the ability to collect revenue that is sufficient to pay for major capital improvements. It is important that airport sponsors do their best to maximize revenue while being cognizant of the ability of those engaged in general aviation to pay. In this way, airport sponsors can show that they are doing their best to contribute to the needs of their airports.

Establishment of rates and charges should consider the potential of volunteerism. Efforts by individuals who volunteer their time - by GCAD #1 commissioners, as an example - are very

important to Desert Aire Airport. It is important though to strike a fiscally sound balance between recognizing volunteer efforts and charging rates that help airports remain financially viable.

It is particularly important for airports such as Desert Aire to carefully consider the value of its property as it looks forward to growth and major capital improvements. A periodic review of airport-related property lease fees is recommended. Fees should be adjusted to reflect real market conditions.

Financing of this development program

WSDOT/AD

The Washington State Department of Transportation's Aviation Division is Desert Aire Airport's primary source of grant funds for airside improvements. Airside improvements are those that relate to the runway/taxiway system, the aircraft parking apron and navigational aids, including signage. Planning and engineering for projects that are eligible for WSDOT/AD construction grants are also eligible for grant funds.

For additional information about eligibility of projects for WSDOT/AD grants, as well as the division's project priority system and application process, see their website <http://www.wsdot.wa.gov/aviation/grants/default.htm>. Under the Grant Program tab see the Grant Procedures Manual.

During a review of the final draft of this narrative report WSDOT/AD made it clear that future grants from the aviation division would be considered only after (1) a new lease agreement between DAOA and GCAD#1 which extends the lease period to 20 years is implemented, (2) the Washington State Attorney General has reviewed the lease and finds that it is legal for Washington state to provide airport aid grant funds to GCAD#1, (3) property necessary to bring Desert Aire Airport's

runway safety area and runway object-free area under the control of GCAD#1 are implemented (See Exhibit A – C1.7), and (4) a program that provides for the payment of access fees by property owners who have direct access to the airport's taxiway system is implemented.

Further, any potential financial involvement by the aviation division in construction of, or provision of equipment for, the north side taxiway (Taxiway B) would be conditioned on GCAD#1 control of Area 3 as depicted in Exhibit A and use of that property for airport-related purposes as shown in the building area plan. (See drawing C1.2)

CTED and EDA

Sources of grant funds for landside-related projects such as roads and utilities are the Washington State Department of Community Trade and Development (CTED) and the United States Department of Commerce/Economic Development Administration (DOC/EDA).

CTED's contact information is:

Washington State Department of Community
Trade and Economic Development
RAAD Building
MS: 42525
128 – 10th Avenue
PO box 42525
Olympia, WA 98504
Business and Project Development Office
(360) 725-4100

EDA's contact information is:

United States Department of Commerce
Economic Development Administration
Jackson Federal Building, Room 1856
915 Second Avenue
Seattle, WA 98174
(206) 220-7682

The Port of Mattawa

A continued close working relationship between the Port of Mattawa and GCAD #1 will be beneficial to both. Desert Aire Airport represents a portal to the local area that will be increasingly important to business interests and, therefore, to the port's mission. The port staff has extensive experience working with funding agencies on capital projects. Regular planning sessions intended to more fully develop policies, procedures, areas of interest and goals will help maximize this relationship.

The 6-acre commercial site

This plan assumes that GCAD #1 will actively seek control over the 6-acre commercial site northeast of the airport. This site, if properly planned, could serve the interests of GCAD #1 and the Port of Mattawa.

The safety area grant program

WSDOT/AD has a grant program specifically designed to address runway safety-area improvements; especially those improvements that reduce the likelihood of inadvertent runway incursions. Information about this program is included in the appendix to this plan. Projects such as hold-line repainting and hold-line sign installation noted in Chapter 4 would qualify for funding under this specific program. This is an excellent program that targets a high-priority safety issue.

5.2 EXISTING REVENUE AND EXPENSES

Desert Aire Airport does not have revenue from sources such as fuel sales, hangar rent and land leases. Support funds are derived from the Desert Aire Owners Association and the Port of Mattawa. These are indicated in Table 17. Expenses are indicated in Table 18.

Revenue/expense summary

During the period 2002-2004, expenses exceeded revenue by an average of \$2,308 per year. Tables

17 and 18 include grant funds from WSDOT/AD and expenses associated with projects related to those funds.

County revenue of \$10,000 listed in Table 17 and the professional services expense for the same amount listed in table 18 are related to a planning program which was conducted by GCAP #1 and was funded by Grant County.

Table 17: Revenue 2002-2004

Revenue source	2002	2003	2004	Three-year total	Three-year average
Desert Aire Owners Assoc.	\$2,500	\$2,500	\$2,500	\$7,500	\$2,500
WSDOT/AD	\$1,083	0	\$3,288	\$4,371	\$1,457
Port of Matawa	\$500	\$2,500	\$500	\$3,500	\$1,167
Fly-in break-fast	\$866	\$446	\$554	\$1,886	\$629
Grant County	\$10,000	0	0	\$10,000	\$3,333

Source: CDAD #1.

Table 18: Expenses 2002-2004 and net financial

Expense category	2002	2003	2004	Three-year total	Three-year average
Airport supplies	\$1,311	\$356	\$513	\$2,180	\$727
Weed control	\$448	\$747	\$592	\$1,787	\$596
Professional services	\$10,000	0	0	\$10,000	\$3,333
Community Airport Assoc.	\$115	\$95	\$285	\$495	\$165
Maintenance and improvements	\$513	\$3,862	\$8,518	\$12,893	\$4,298
Liability insurance	\$1,650	\$1,650	\$1,850	\$5,150	\$1,717
Election costs	\$233	\$239	0	\$472	\$157
Utilities	\$228	\$255	\$259	\$742	\$247
Telephone	\$129	0	\$335	\$464	\$155
Total expenses	\$14,627	\$7,204	\$12,352	\$34,183	\$11,395
Total revenue	\$14,969	\$5,446	\$6,842	\$27,257	\$9,086
Net income (loss)	\$343	(\$1,758)	(\$5,510)	(\$6,925)	(\$2,308)

Source: GCAD #1.

5.3 RECOMMENDED PROJECTS

This section estimates costs of projects included in Table 16, Chapter 4.

Minor maintenance expenses are not specifically identified.

Table 19 indicates all projects over the 20-year planning period and identifies planned sources of funds. Table 20 provides details about how project costs were calculated. Table 21 shows funds required by each source according to specific time periods.

Table 19: 20-year capital improvement program

Item	Project	Total Cost	WSDOT/ AD	Port of Mattawa	Private or other grant agency	Volunteer labor, materials and equip- ment	DAOA and/ or GCAP #1
	2006						
A1	Expand airport property boundary	\$5,000	0	0	0	0	\$5,000
A2	Alter hold line locations	\$600	\$500	0	0	\$50	\$50
A3	Enhance runway safety area, runway object-free area and FAR Part 77 primary surface	\$16,144	\$15,337	0	0	\$250	\$557
A4	Seal runway cracks	\$750	\$700	0	0	0	\$50
A5	Establish standards for northside access taxiways	\$5,000	0	0	\$4,000	0	\$1,000
	Subtotals	\$27,494	\$16,537	0	\$4,000	\$300	\$6,657
	2007						
B1	Design and construct taxiway B	\$230,900	\$20,000	\$6,135	\$203,765	0	\$1,000
B2	Order hold-line signs and taxiway reflectors for the northside taxiway (Taxiway B)	\$3,510	\$3,100	0	0	0	\$410
B3	Install taxiway reflectors, hold-line signs, paint taxiway B graphics	\$5,300	\$4,750	0	0	0	\$550
B4	Install off-airport signs	\$432	0	0	0	0	\$432
B5	Transfer control of the six-acre commercial site to GCAP #1	\$3,000	0	0	0	0	\$3,000
B6	Plan, specify and develop documents for Alternative 3	\$70,000	\$66,500	\$2,000	0	0	\$1,500
	Subtotals	\$313,142	\$94,350	\$8,135	\$203,765	0	\$6,892
	2008						
C1	Remove three aircraft parking spaces as noted on ALP	\$100	0	0	0	0	\$100
C2	Reconstruct and lengthen parallel portion of southside taxiway (Taxiway A)	\$160,556	\$152,000	\$4,000	0	0	\$4,556
C3	Install reflectors throughout parallel portion of Taxiway A	\$2,890	\$2,746	0	0	0	\$144
C4	Paint center line, paint hold lines and install hold-line signs, Taxiway A	\$4,000	\$3,800	0	0	0	\$200
	Subtotals	\$167,546	\$158,546	\$4,000	0	0	\$5,000

Table 19: 20-year capital improvement program (continued)

Item	Project	Total cost	WSDOT/AD	Port of Mat-tawa	Private or other grant agency	Volunteer labor, materials and equipment	DAOA and/or GCAP #1
2009							
D1	Reconstruct, move, widen runway, including perpendicular portions of Taxiway A	\$321,615	\$250,000	\$61,615	0	0	\$10,000
D2	Inspect, fix as necessary and re-install runway edge and threshold lights	\$10,000	\$9,500	0	0	0	\$500
D3	Paint runway, Taxiway A connector and Taxiway A hold-line graphics	\$5,000	\$4,750	0	0	0	\$250
D4	Relocate PAPI, Runway 28	\$2,000	\$1,900	0	0	\$100	0
D5	Install PAPI, Runway 10	\$12,000	\$11,400	0	0	0	\$600
D6	Install supplemental wind indicator, Runway 10	\$2,000	\$1,900	0	0	0	\$100
	Subtotals	\$352,615	\$279,450	\$61,615	0	\$100	11,450
2010							
E1	Accomplish detailed planning of the six-acre commercial site if under GCAP #1 control	\$5,000	0	\$3,000	0	0	\$2,000
	Subtotals	\$5,000	0	\$3,000	0	0	\$2,000
2011							
F1	Pave portion of commercial site to be used for aircraft tie-downs	\$40,000	\$38,000	\$1,000	0	0	\$1,000
F2	Provide access and parking for vehicles at northside based aircraft tie-downs (east end)	\$30,000	0	\$25,000	0	0	\$5,000
F3	Construct northside based aircraft tie-downs (east end)	\$20,000	\$19,000	\$500	0	0	\$500
F4	Seal coat and repaint all taxiway/runway and apron surfaces	\$10,000	\$9,500	0	0	0	\$500
	Subtotals	\$100,000	\$66,500	\$26,500	0	0	\$7,000
2012-2016							
G1	Expand existing aircraft parking	\$60,000	\$57,000	\$1,000	0	0	\$2,000
G2	Install tie-downs and T-hangers, north side	\$240,000	\$50,000	\$13,000	\$175,000	0	\$2,000

Table 19: 20-year capital improvement program (continued)

Item	Project	Total cost	WSDOT/AD	Port of Mat-tawa	Private or other grant agency	Volunteer labor, materials and equipment	DAOA and/or GCAP #1
G3	Install fuel system	\$70,000	\$40,000	\$20,000	0	0	\$10,000
G4	Construct new, multi-purpose terminal/welcome center	\$240,000	0	\$100,000	\$100,000	0	\$40,000
G5	Install infrastructure	\$50,000	\$20,000	\$25,000	0	0	\$5,000
G6	Conduct paved surface maintenance	\$12,000	\$11,400	0	0	0	\$600
	Subtotals	\$672,000	\$178,400	\$159,000	\$275,000	0	\$59,600
	2017-2021						
H1	Add additional fuel tank and dispensing system as necessary	\$70,000	\$40,000	\$20,000	0	0	\$10,000
H2	Install additional hangars	\$200,000	0	\$10,000	\$180,000	0	\$10,000
H3	Conduct paved surface maintenance	\$12,000	\$11,400	0	0	0	\$600
	Subtotals	\$282,000	\$51,400	\$30,000	\$180,000	0	\$20,600
	2022-2026						
I1	Overlay runway, Taxiway A, Taxiway B and westside aircraft paking apron	\$398,800	\$358,920	\$20,000	0	0	\$19,880
I2	Refine six-acre site	\$100,000	0	\$70,000	\$20,000	0	\$10,000
	Subtotals	\$498,800	\$358,920	\$90,000	\$20,000	0	\$29,880

Funding totals in this table are for planning purposes only. No agency or department, including WSDOT/AD, has committed to providing these funds.

Table 20: CIP details

Item	Project	Detail cost
A1	Expand airport property boundary	
	Estimated legal and recording fees	\$5,000
A2	Alter hold line locations	
	Remove and relocate existing hold lines — three locations	\$300
	Eradicate existing hold lines — three locations	\$50
	Paint hold lines — three locations	\$250
	Subtotal	\$600

Table 20: CIP details (continued)

Item	Project	Detail cost
A3	Enhance RSA, ROFA and primary surface	
	Grade and compact runway safety area and primary surface off ends of runway	\$5,000
	Dismantle and remove tetrahedron	\$500
	Apply stabilized top course rock (2,470 lineal yards, 6 lineal yards per cubic yard of material = 411 cubic yards or 616 tons of rock at \$16.00 per ton = \$9,856	\$9,856
	Sales tax on \$9,856	\$788
	Subtotal	\$16,144
A4	Crack seal paved surfaces	
	Seal cracks	\$750
A5	Standards for Taxiway B access taxiways	
	Planning	\$5,000
	Total for Section A	\$27,494
B1	Pave Taxiway B (12,251 square yards)	
	Design	\$21,764
	Survey	\$20,000
	Materials testing	\$10,000
	Cut and fill (4,500 cubic yards @ \$4.50)	\$20,250
	Cut and waste (3,750 cubic yards @ \$3.00)	\$11,250
	Base course rock (1,900 tons @ \$16.00)	\$30,400
	Top course rock (1,300 tons @ \$16.00)	\$20,800
	Asphalt, Class A/B (1,425 tons @ \$60.00)	\$85,500
	Sales tax on materials of \$136,700	\$10,936
	Subtotal	\$230,900
B2	Purchase Taxiway B equipment	
	Three hold-line signs @ \$500	\$1,500
	50 reflectors @ \$35	\$1,750
	Sales tax on \$3,250	\$260
	Subtotal	\$3,510
B3	Taxiway B equipment and painting	
	Install three hold-line signs	\$300
	Install reflectors	\$1,000
	Paint centerline and hold lines	\$4,000
	Subtotal	\$5,300

Table 20: CIP details (continued)

Item	Project	Detail cost
B4	Purchase/install off-airport signs	
	Two signs @ \$200 each	\$400
	Sales tax	\$32
	Subtotal	\$432
B5	Transfer control of six-acre property	
	Estimated legal and recording fees	\$3,000
B6	Planning for Alternative 3	
	Design, survey, engineering for pavement, lights, graphics and equipment	\$70,000
	Total for Section B	\$313,142
C1	Remove three aircraft parking aprons	
	Labor	\$100
C2	Reconstruct and lengthen parallel portion of Taxiway A (11,000 square yards, including pull-outs)	
	Bid document review and adjustment (depends upon timing of project relative to accomplishment of B6 above)	\$5,000
	Survey	\$10,000
	Materials testing	\$3,000
	Pulverize and stabilize existing base to use as base for taxiway (10,963 square yards @ .75)	\$8,222
	Cut and fill (500 cubic yards @ \$4.50)	\$2,250
	Base course rock (1,000 tons @ \$16.00)	\$16,000
	Top course rock (1,300 tons @ \$16.00)	\$20,800
	Asphalt, Class A/B (1,425 tons @ \$60.00)	\$85,500
	Sales tax on materials of \$122,300	\$9,784
	Subtotal	\$160,556
C3	Install new reflectors Taxiway A	
	Reflectors (50 @ \$35)	\$1,750
	Installation	\$1,000
	Sales tax on reflectors	\$140
	Subtotal	\$2,890
C4	Paint Taxiway A	
	Centerline and hold lines	\$4,000
	Total	\$4,000
	Total for Section C	\$167,546

Table 20: CIP details (continued)

Item	Project	Detail cost
D1	Reconstruct runway and Taxiway A connectors (27,400 square yards)	
	Bid document review and adjustment (depends on timing of project relative to accomplishment of B6 above)	\$5,000
	Survey	\$5,000
	Materials testing	\$5,000
	Pulverize and stabilize existing base to use for runway (16,660 square yards @ .75)	\$12,495
	Cut and fill (2,000 cubic yards @ \$4.50)	\$9,000
	Base course rock (2,600 tons @ \$16.00) (amount reduced by pulverized existing asphalt)	\$41,600
	Top course rock (2,900 tons @ \$16.00)	\$46,400
	Asphalt Class A/B (3,200 tons @ \$55.00)	\$176,000
	Sales tax on materials of \$264,000	\$21,120
	Subtotal	\$321,615
D2	Runway edge and threshold lights	
	Remove, inspect, replace as necessary and reinstall lights	\$10,000
D3	Paint runway and Taxiway A	
	Centerlines, hold lines, runway end numerals and runway fog lines	\$5,000
D4	Relocate Runway 28 PAPI	
	Concrete, power and installation	\$2,000
D5	PAPI Runway 10	
	Purchase and install	\$12,000
D6	Wind indicator Runway 10	
	Purchase and install unlighted wind indicator on 8' pods	\$2,000
	Total for Section D	\$352,615
E1	Plan six-acre site	
	Planning and design	\$5,000
	Total Section E	\$5,000
F1	Pave northside tie-downs	
	Two taxilanes at 230'x20' plus individual hangar taxilanes = 2,000 square yards of class A/B asphalt	\$40,000

Table 20: CIP details (continued)

Item	Project	Detail cost
F2	Vehicle parking, north side	
	Prepare, pave, light and landscape vehicle parking area	\$30,000
F3	Northside based aircraft tie-downs	
	Eight spaces, including paving	\$20,000
F4	Paved surface maintenance	
	Seal coat and repaint taxiways, runway and westside aircraft parking apron	\$10,000
	Total for Section F	\$100,000
G1	Expand existing aircraft parking	
	Increase existing 4,480 square yards to 10,250 square yards	\$60,000
G2	Install additional tie-downs and T-hangars, north side	\$240,000
G3	Install fuel system	
	6,000 gallon tank with cardlock system	\$70,000
G4	Construct multi-purpose terminal/welcome center	
	1,200-square-foot structure with vehicle parking, landscaping and lighting	\$240,000
G5	Install infrastructure at six-acre site	
	Water, sewage disposal, power, aircraft tie-downs and security fence	\$50,000
G6	Pave surface maintenance	
	Seal coat and repaint taxiways, runway and aircraft parking aprons	\$12,000
	Total for Section G	\$672,000
H1	Additional fuel tank	
	Add second system with Jet A or specialized fuel as justified	\$70,000
H2	Install hangars	\$200,000
H3	Paved surface maintenance	
	Seal coat and repaint taxiways, runway and aircraft parking area	\$12,000
	Total for Section H	\$282,000

Table 20: CIP details (continued)

Item	Project	Detail cost
I1	Overlay runway, Taxiway A and Taxiway B	
	50,651 square yards @ 8.5 tons per square yard = 6,000 tons of asphalt @ \$60.00)	\$360,000
	Repaint	\$10,000
	Sales tax on pavement	\$28,800
	Subtotal	\$398,800
I2	Refine six-acre site	
	Complete build-out	\$100,000
	Total for Section I	\$498,800

Table 21: Capital expenditure by phase

Phase	CIP total cost	WSDOT/AD	Port of Mattawa	Private or other grant agency	Volunteer labor	DAOA and/or GCAP #1
2006	\$27,494	\$16,537	0	\$4,000	\$300	\$6,657
2007	\$313,142	\$94,350	\$8,135	\$203,765	0	\$6,892
2008	\$167,546	\$158,546	\$4,000	0	0	\$5,000
2009	\$352,615	\$279,450	\$61,615	0	\$100	\$11,450
2010	\$5,000	0	\$3,000	0	0	\$2,000
2011	\$100,000	\$66,500	\$26,500	0	0	\$7,000
2012-2016	\$672,000	\$178,400	\$159,000	\$275,000	0	\$59,600
2017-2021	\$282,000	\$51,400	\$30,000	\$180,000	0	\$20,600
2022-2026	\$498,800	\$358,920	\$90,000	\$20,000	0	\$29,880
Totals	\$2,418,597	\$1,204,103	\$382,250	\$682,765	\$400	\$149,079

Funding totals in this table are for planning purposes only. No agency or department, including WSDOT/AD, has committed to providing these funds.