

FINAL REPORT

INDEPENDENCE STATE AIRPORT Airport Layout Plan Report

Prepared for

Oregon Department of Transportation - Aeronautics

October 1997

Prepared by

Aron Faegre & Associates

520 SW Yamhill, Roof Garden 1

Portland, Oregon 97204

(503) 222-2546

In association with

David Miller & Associates - Airport Consultant

Gazeley & Associates

Devco Engineering, Inc.

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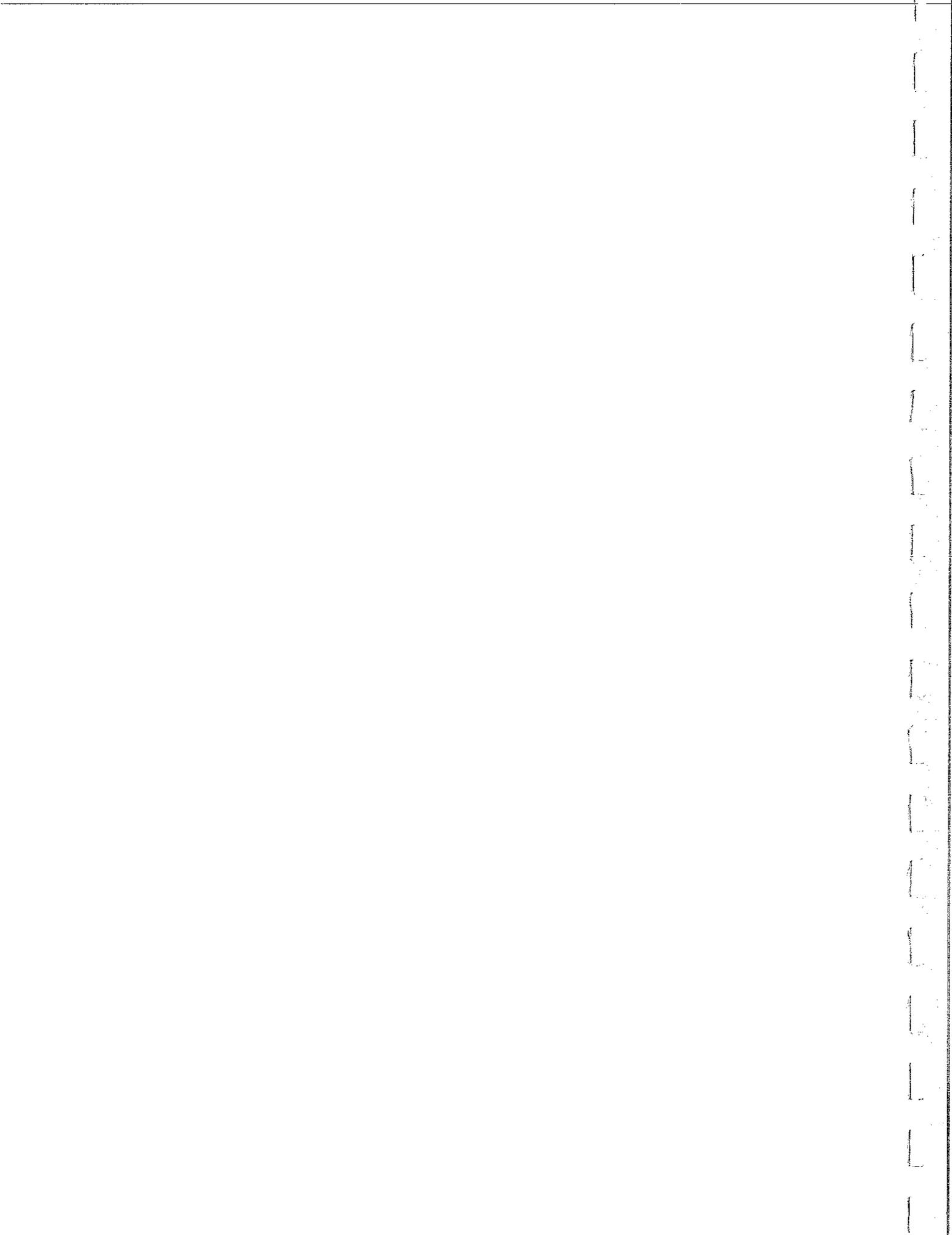
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Chapter One
**INTRODUCTION
STUDY OVERVIEW
CONCLUSIONS AND RECOMMENDATIONS**

The preparation of the Independence State Airport Layout Plan Report and supporting documentation has been undertaken by the State of Oregon Department of Transportation - Aeronautics to examine the existing configuration of the airport and to address current and long-term airport needs. Previous airport planning documents for Independence include the Airport Master Plan and Airport Layout Plan drawings prepared by Century West Engineering in 1985. This 1996-97 study examines prior recommendations and evaluates the changes which may affect demand for aviation facilities at Independence. The adoption of this plan will supersede previous planning documents for the airport.

Through existing community comprehensive planning, the City of Independence and Polk County have recognized the significant role of the airport in the overall transportation system and economic base of the local community and throughout the county. In its role as a general aviation airport, Independence State Airport serves a wide range of users, including local Independence and Monmouth residents and visitors, business and government.

The primary objective of the Airport Layout Plan Report is to identify current, short-term, and long-term facility needs and improvements necessary to maintain a safe, efficient, economical, and environmentally acceptable air transportation facility for the area. This requires an evaluation of the airport and surrounding land uses, and a determination of what steps should be taken in the future to maintain an adequate, safe, and reliable airport facility.

The 1996-1997 Airport Layout Plan Report.

- *Examines the recommended improvements depicted on the 1985 Airport Layout Plan and contained in the 1985 Airport Master Plan;*
- *Determines current and future aviation activity and facility requirements;*
- *Examines previous recommendations and develops alternatives which are appropriate to meet the current and projected airport facility needs;*
- *Updates the airport layout plan, airspace plan, and land-use plan for the airport and its surrounding areas; and*
- *Schedules priorities of improvements and estimates development costs.*

The review and approval of the Airport Layout Plan drawing by the Federal Aviation Administration (FAA) will enable the Airport Sponsor to apply for federal Airport Improvement Program (AIP) grants for eligible projects. Although competition for AIP dollars is substantial, AIP funds are an essential source of funding airport improvement projects at community general aviation airports. The updated Airport Layout Plan was funded with a 90 percent grant from the Federal Aviation Administration, with the remaining 10 percent participation provided by Oregon DOT-Aeronautics.

The preparation of this document was financed in part by a planning grant from the Federal Aviation Administration (FAA) as provided under Section 505 of the Airport and Airway Improvement Act of 1988. The contents do not necessarily reflect the official views or policy of the FAA. Acceptance of this report by the FAA does not in any way constitute a commitment on the part of the United States to participate in any development depicted therein nor does it indicate that the proposed development is environmentally acceptable in accordance with appropriate public laws.

PUBLIC INVOLVEMENT

The public involvement element of the planning process provided opportunities for all interested individuals, organizations, and groups to participate in the project. A Joint Planning Conference (JPC) was held on September 17, 1996 in which all parties with specific interest in the project were invited to attend. Advertisements were also placed inviting the general public's participation. The purpose of the JPC was to identify any concerns or issues which needed to be addressed as part of this planning effort. The response to the JPC was excellent at all levels. The September 17th meeting attracted nearly thirty people from the local area in addition to Aeronautics staff and the Consultants.

Both individual citizens and several organizations were represented at the meeting. Among the organizations in attendance were the City of Independence (Mayor, three City Council members, and Community Development Department staff), Polk County (two County Commissioners and Community Development Department staff); and ODOT Region 2 Planning Staff. Other participants included the local fixed base operator, numerous airpark residents; and other airport users, including representatives of the Oregon Pilots Association and the Experimental Aircraft Association. The JPC was successful in its goal of identifying the major issues currently affecting the airport, and those issues which need to be addressed in the airport layout plan update. Local airpark residents and airport users formed an advisory group which provided substantial input on all airport facility and land use planning issues.

During the study, draft working papers including an Introductory Summary and Airport Alternatives were prepared. The Introductory Summary provided an update on the findings associated with the inventory and forecasts. The Alternatives working paper included the facility requirements analysis and preliminary development alternatives. A public meeting was held to present the findings of the preliminary working papers and specific facility development alternatives. Following a review period, a preferred alternative was selected, with engineering cost estimates, updated airport layout plan drawings, and noise contours provided. A Draft Report contained the entire work effort. Following a review period, public and agency comments were integrated into the Final Report and ALP drawing set.

PREVIOUS MASTER PLANNING RECOMMENDATIONS:

The recommendations contained in the previous (1985) Airport Master Plan are summarized in **Table 1-1**. Projects which have been completed are marked in the left column; projects yet to be completed are also noted.

**Table 1-1
Previous Master Plan Recommendations**

Project	Completed (Yes)	No	1996-97 ALP *
Land Acquisition - Rwy 34 RPZ		X	Y
Install Nondirectional Beacon (NDB)		X	N
Land Acquisition - North End of Runway & RPZ		X	Y**
Ingress-Egress ROW Acquisition (for North Taxiway to Airpark)	X		n/a

Runway Extension (700 feet @ north end)		X	Y**
Install PAPI system - Rwy 34		X	Y**
Install MIRL system		X	Y
Construct Paved Apron (10,000 sq.yd)		X	Y**
Obstruction Lighting (3)		X	Y
Reconstruct Paved Apron		X	Y
Reconstruct T-Hangar Access Taxiway (no. 2 north of apron)		X	Y
Mark Interim Helicopter Parking		X	N
Relocated Segmented Circle		X	Y
Install Supplemental Wind Cone (Rwy 34 end)		X	Y
Runway Sealcoat		X	Y
Construct Paved Auto Parking and Access (North Hangar Area)		X	Y
Parallel Taxiway Extension (700 feet @ north end) and reflectors		X	Y**
Construct AG Sprayer Apron, Building, and Auto Parking		X	Y**
Install Periphery and Chain Link Fencing		X	Y
Overlay all Pavement Surfaces (55,000 sq.yds.)		X	Y
Pave T-Hangar Access Taxiways (2); Construct T-Hangars	X		Y**
Helicopter Paved Parking		X	Y**
FBO Maintenance Building and Apron		X	N
Construct Paved Auto Parking (south of apron)		X	N
Construct Paved Tiedown Apron (southeast corner)		X	N
T-Hangar Access Taxiway (north end)		X	N
Runway Sealcoat		X	Y
Construct Paved Auto Parking and Access (north end)		X	N
FBO Expansion Area, Auto Parking, and Apron (north end)		X	N

* Projects Recommended in 1996-97 Airport Layout Plan Report - Yes/No

** Modified Project Recommendation Based on Current Design Standards, etc.

1996-97 AIRPORT LAYOUT PLAN REPORT CONCLUSIONS

1. Independence State Airport is owned, operated and maintained by the State of Oregon Department of Transportation - Aeronautics to serve Independence, Monmouth, and many smaller communities in the surrounding area.
2. Independence State Airport is a Basic Utility II category airport, accommodating general aviation and business aviation users.
3. Independence State Airport has a single paved runway (3,070 feet by 60 feet) with a full-length parallel taxiway, an aircraft parking apron and an aircraft hangar area. All pavements are designed to accommodate light single- and multi-engine aircraft weighing 12,500 pounds or less. The airport facilities are designed to meet FAA Airport Design Group I standards
4. Privately-owned airpark developments are located along the eastern edge of the airport. Access-Egress agreements between ODOT Aeronautics and the Independence Airpark Association have been established to provide off-airport access to the airfield facilities.
5. The critical aircraft type previously identified for the airport was Basic Utility II, which includes most light twin-engine aircraft weighing less than 12,500 pounds. BU-II aircraft are usually included in Airplane Design Group I and Approach Category A.
6. Independence State Airport had approximately 124 based aircraft with approximately 32,773 operations in the twelve months leading to October 1996. Based on the most previous acoustical counting records (1993), air traffic at Independence State Airport has increased by more than 30 percent in the last four years. Included among the total number of based aircraft are approximately 84 aircraft which are located in the airpark.
7. The majority of aircraft hangars are located north of the main apron and in the adjacent airport airpark, which is located off airport property. All airport development is located on the east side of the runway-taxiway system. Existing developed hangar areas on the airport are nearly full.
8. Independence State Airport does not currently have instrument approach capabilities. The airport operates under visual flight rules (VFR) conditions (day or night) only.
9. Overhead power lines located southwest of the runway appear to penetrate the runway transitional surface. Overhead electrical lines located northwest of the runway may penetrate the future Runway 16 approach surface and transitional surface.

10. The Independence Airpark is considered to be a successful, high quality airpark development. Independence State Airport has attained national recognition, in large part due to the airpark's reputation throughout the aviation community.
11. The airpark currently has more than 90 homes with hangars currently occupied. New home/hangar construction in the airpark is also underway and additional airpark development is planned at both the north and south ends of the existing airpark. The total number of airpark residences located on the east side of the runway may eventually exceed 200.
12. The remaining undeveloped airport land southeast of the runway is relatively limited and should be preserved for aviation-related development. Long-term aviation land reserves should be identified to accommodate potential needs beyond the current twenty-year planning period.

1996-97 AIRPORT LAYOUT PLAN REPORT RECOMMENDATIONS

The recommendations of previous planning efforts were examined to revalidate or eliminate recommendations as appropriate, based on current considerations and design standards.

1. Conduct pavement maintenance (crack filling, sealcoat, and drainage repair) on Runway 16-34 immediately in order to maintain safe conditions and maximize useful life. Implement a regular maintenance program on all pavements which are being rehabilitated or reconstructed.
2. Extend Runway 16-34 to 3,610 feet. The 540-foot extension and safety area should be added on the north (Runway 16) end. Runway edge lighting should be upgraded to medium intensity (MIRL) for the entire runway. The parallel taxiway should also be extended with an aircraft turnaround provided adjacent to the threshold. Additional property beyond the northern airport boundary will be required to accommodate the extended runway safety area and approach surface.
3. A pavement weight bearing capacity of 12,500 pounds (single wheel) is adequate to accommodate the design aircraft and most aircraft which operate at the airport.
4. Reconstruct, reconfigure, and expand the Main Apron to accommodate expanded fuel facilities and additional aircraft parking. A second access taxiway should be incorporated into the apron design in order to improve aircraft flow through the parking, fueling, and passenger loading/unloading areas.
5. Modify the existing taxiway connection to the airpark to separate aircraft taxiing in and out of the airpark.

1996-97 AIRPORT LAYOUT PLAN REPORT RECOMMENDATIONS (Continued)

6. Install taxiway reflective edge markers on the parallel taxiway and major access taxiways to improve aircraft taxiing safety during nighttime ground operations. Medium-intensity taxiway edge lighting (MITL), although a low funding priority for the FAA, are identified as a long-term improvement.
7. An area of approximately 41 acres (540 feet wide) located along the west side of Runway 16-34 should be acquired and reserved for future general aviation parking and hangar development.
8. Construct a 400-foot taxiway extension from the south end of the parallel taxiway to serve the South Hangar area. Up to three individual hangar taxilanes would be constructed to provide access to the hangar lease areas.
9. Expand the aircraft apron to accommodate aircraft parking requirements and to serve conventional hangar development.
10. Provide airport security fencing around all active airfield areas. If added in phases, the highest priority would be to fence along the east and south sides of the airport along public roadways.
11. Establish a GPS approach at the airport, provide automated weather observation equipment to accommodate commercial and business aviation users, medevac flights, etc.
12. The City of Independence and Polk County should maintain airport overlay zoning which coincides with the future approach surfaces and FAR Part 77 surfaces. The airport overlay zoning should conform with guidelines provided by the Oregon Department of Transportation - Aeronautics Section, regarding airport land use compatibility planning.
13. Safeguard the Runway Protection Zones by acquiring property or avigation easements for portions of the existing and future RPZs located outside airport property, not presently controlled.
14. Replace visual approach indicator unit on Runway 34 with a precision approach path indicator (PAPI). A PAPI should also be installed on Runway 16.
15. Add runway end identifier lights (REIL) on Runways 16 and 34 when a GPS approach is approved for the airport.

1996-97 AIRPORT LAYOUT PLAN REPORT RECOMMENDATIONS (Continued)

16. The Sponsor should adopt the Airport Layout Plan document and drawings in a timely manner. The Airport Layout Plan Report should be submitted by the Sponsor to the City of Independence and Polk County for incorporation in the respective comprehensive plans. The Sponsor should also coordinate proposed changes in existing airport overlay zoning with the city and county.
17. Runway 34 should be designated and use as the calm wind runway in order to minimize noise exposure on nearby residential areas south of the airport. In addition to designating a calm wind runway, a review of airport operating procedures should be conducted to ensure that appropriate noise abatement procedures and standard traffic pattern elevations and locations are being utilized at the airport.
18. An updated obstruction survey should be conducted to verify location and heights of potential penetrations to FAR Part 77 surfaces.
19. Request funding assistance under FAA and other federal, state or local funding programs for all eligible capital improvements.
20. Initiate the development of the recommended improvements in a timely manner.



Chapter Two **INVENTORY AND FORECASTS**

INTRODUCTION

This section of the report describes the existing conditions and activity at the airport and will evaluate projections of future aviation activity. Historical data from a variety of sources are used in this evaluation, including forecasts contained in Oregon Aviation System Plan (OASP) documents and regional socioeconomic data. The existing airfield facilities have been evaluated through recent on-site inspections.

AIRPORT LOCATION

LOCALE

Independence is located in Polk County, approximately 8 statute miles southeast of the county seat, Dallas, and approximately 10 miles west-southwest of Salem, which is located in Marion County. The communities of Independence and Monmouth are located adjacent to each other near Highways 99W and 51, which are the primary north-south transportation routes through the western side of the Willamette Valley. Highway 22, located north of Independence, is primary east-west corridor which connects the Oregon Coast, Dallas, Salem, Interstate 5, the Cascade Range, and points east.

Independence State Airport is located on approximately 69 acres and is owned and operated by the State of Oregon Department of Transportation - Aeronautics. Airport elevation is recorded at 176 feet above mean sea level (MSL). The Airport Reference Point coordinates are Latitude 44° 52.01'N, and Longitude 123° 11'90"W. Vehicle access to the airport is provided by a paved roadway which connects to Hoffman Road and Highways 51 and 99W. The airport is located at the northern edge of the Independence city limits, on County Road 846, commonly known as Hoffman Road. Hoffman Road is also used as a primary route between Highways 99W and 51.

AREA TOPOGRAPHY

Independence is located in the central Willamette Valley, about ten miles east of the foothills of the Coast Range. The airport is located on main valley floor; the Willamette River runs along the eastern edge of Independence. The soils in the area consist of bottom lands which include somewhat poorly drained silt loams, with a seasonally high water table and flooding potential. The terrain surrounding the airport rises to over 2,000 feet within ten miles. Among the most prominent topographical features is the Black Rock formation, located 15 to 25 nautical miles northwest. The highest point is 3,420 feet mean sea level, located 25 miles from the airport. Another peak, which is unnamed on the sectional chart, is located 15 miles southwest of the airport, with an elevation of 3,232 feet.

CLIMATE

The climate of the Willamette Valley can be characterized by wet, mild winters and dry, moderately warm summers. Independence averages approximately 45 inches of precipitation annually, with less than 10 inches of snow. The winter season (November through February) sees an increase in moisture and accounts for the majority of annual precipitation. The mean maximum temperature in July is listed at 83.2°F, and the mean minimum temperature in January is 33.0°F.

AIRPORT HISTORY

This history comes largely from "*How a Covered Wagon Trek Promoted the Birth of an Airport*" by John Pfaff, 1987, and "*History of Independence State Airport*" by Independence State Airport Support Group History Committee, December 14, 1996.

The Independence Airport originally was developed from a request by the news media to have a place to land aircraft and report on the arrival of the "On to Oregon Cavalcade" from Independence, Missouri to Independence, Oregon in 1959.

In commemoration of the Centennial anniversary of the statehood of Oregon, the Oregon Junior Chamber of Commerce came forth with an idea to sponsor a Covered Wagon Train from Independence, Missouri to Oregon during the year 1959. The route was to cover as closely as possible to the Old Oregon Trail. The. It was decided that the trek should end at Independence, Oregon. This became one of the most significant promotions of the Centennial year.

The Independence JC's, with the help of the community, raised the money and Ben Griffith, a local farmer, volunteered to drive the team that pulled the Independence Wagon. This lead wagon also carried the mail that was postmarked in Independence, Missouri and also stamped in Independence, Oregon. Six other communities also sponsored wagons.

It was on April 20, 1959 that President Harry Truman started the seven wagons with 27 wagon travelers out for Oregon. As the wagons moved west over the Oregon Trail, crowds became greater, made up of school children who would be driven several miles to watch the wagons go by, to adults of all ages and dignitaries from each State. The wagons reached Independence, Oregon on schedule, August 15, 1959.

A mammoth celebration had been planned for the three days in Independence with a parade of over 100 entries. It was estimated that over 125,000 people attended the three day celebration. The Independence covered wagon is housed in a special building and on display in Independence. It is still used for parades and special occasions.

One of the arrangements for the celebrations was to provide a landing strip for small planes coming in from Independence, Missouri and Kansas City. Under the leadership of John Pfaff, Chair for the arrival celebration committee, and Realtor Al Noble, it was arranged that aircraft would be allowed to land in one of the grass seed fields of local farmer Edwin Totten. The next year, merchants and business people in Independence, with the assistance of Polk County, purchased 66 acres of land from Edwin Totten for \$200 per acre.

The city decided developing, operating, and managing the airport would be better served by donating the airport to the State of Oregon Aeronautics Division. After initial engineering and construction, the airport was dedicated as the Independence State Airport on August 14, 1964. Within two years, the turfed aggregate runway was opened and general aviation use began. The primary users of the turf runway were local pilots and agricultural applicators. A two story fixed base operator's (FBO) building was added in the late 1960's.

In 1969 the first of 12 annual "Palms to Pines" women's air races terminated at the Independence State Airport. This women's air race was from Santa Monica, California to Independence Airport. Because of poor weather on the 13th race in 1893, the race was terminated in Klamath Falls and

has since ended each year in Bend.

In 1970 drainage was improved and apron facilities were constructed. The turf runway was widened to 30 feet and resurfaced with oiled gravel in 1972. By 1975 the Independence Airport received an FAA grant to construct a paved 60 foot wide by 3,070 long runway. A low intensity runway and lighting system was installed shortly after.

A spin-off that came from the airport location was the development of an adjacent residential airpark and the locating of several commercial businesses adjacent to the runway. The Independence Airpark (Phases 1, 2, and 3) received an ingress and egress permit from Oregon Aeronautics Division and FAA on June 14, 1974. This agreement was made for a 30 year period. The permit was granted on agreement of the airpark developers, James E. Preuit and Thomas W. Combest, to pave the main parallel taxiway of the airport in lieu of annual permit fees.

Two additional airparks were then developed. The North Airpark Annex was added in 1992 and the North Park Annex was added in 1994. Separate access permits were given the new additions for a 10 year period with renewal options. When the access permit for the original airpark expires in 2004 and new permits are granted, it is anticipated that all airpark lot owners will be paying a uniform user fee.

In recent years improvements have been limited primarily to landside facilities. Construction has continued for residential house and hangars in the airparks and hangar leasing areas of the airport. The FBO building has been remodeled to include a restaurant by Don and Annie Thomson. The FBO rental hangars have also been remodeled and upgraded.

After commemorative flights in 1989, 1990, 1991, and 1993 over the Old Oregon Trail from Independence, Missouri to Independence, Oregon, the Independence State Airport was rededicated as the "End of the Oregon Trail Airport" on August 14, 1993. This sesquicentennial celebration included participation of 40 aircraft and 90 persons who flew the trail. Included were representatives of the City of Independence, Polk county, the Oregon Trail Coordinating Council, Evergreen AirVentures Museum, the Polk County Historical Society, and the Oregon Aeronautics Division.

SOCIOECONOMIC CONDITIONS

Population

According to data provided by Portland State University (PSU), population within the City of Independence boundaries totaled 4,620 in 1994, up 4.4 percent from 1990. Polk County's population in 1994 was estimated at 54,400, up approximately 9.8 percent since the 1990 census. Population growth within Polk County during the 1980-1990 period was 9.6 percent. Current PSU population forecasts indicate that Polk County's population is expected to increase by 45 percent, to 71,604, by 2010. Historically, Independence has accounted for 7 to 10 percent of county population; if this past trend continues, Independence would grow to between 5,000 and 7,100 by 2010.

Economy

According to the Oregon State Extension Service, Polk County is one of Oregon's leading agricultural producers with more than \$86 million in farm sales in 1994. The agriculture and food processing industries are major employers in the area. Government agencies, health care organizations, higher education, lumber and wood products manufacturing, and tourism also continue to be leading employers in the region. A large percentage of Polk County residents work in Marion and Yamhill counties. For purposes of evaluating economic data, state economists often combine Polk County with Marion and Yamhill counties into a single "region." In recent years unemployment in the region has ranged from 4.5 to 7 percent. During the height of the recession in the early 1980's, unemployment within the region ranged from 10 to 12 percent, with some months between 12 and 14 percent. State economists indicate that the region's increasingly diversified economy has succeeded in posting lower jobless rates nearly every year since 1982, with current levels at 4.5 to 5 percent.

Independence State Airport is the only publicly-owned airport in Polk County. The airport has, and will continue to be an important component in the local and regional transportation system and economy. Local and transient aircraft users contribute to the local economy through the use of services (i.e. fuel, maintenance, food, lodging, etc.), and support of other non-aviation businesses. On both a local and county-wide basis, Independence State Airport provides business and industry with an efficient transportation option. Access to an airport is often a primary consideration in selecting a location to develop or relocate a business. The airport's ability to continue serving general aviation and business aviation users is considered to be an important element in the local and regional economy. In addition, the successful development of the airpark has resulted in a significant increase in the construction of high-value new homes and aircraft hangars, which benefit the local tax base and overall economy.

EXISTING FACILITIES

Airfield facilities which directly relate to the arrival or departure of aircraft are termed "airside." Airside facilities include runways, taxiways, airfield lighting, and navigational aids. "Landside" facilities are those interfacing with or supporting airfield functions, including aircraft parking areas, helicopter parking, aircraft hangars and storage areas, airport administrative and maintenance buildings, airport roadways and vehicle parking areas. **Table 2-1** provides a summary of existing facilities **Figure 2-1** depicts existing conditions at the airport.

AIRFIELD FACILITIES

Independence State Airport has a single paved runway designated as 16-34. Runway 16-34 is 3,070 feet long and 60 feet wide with an asphalt surface and basic visual marking. The runway is generally in fair condition, although some sections appear to require repair. The effective gradient of Runway 16-34 is 0.037 percent. The runway has low-intensity runway edge lighting (LIRL) and threshold lighting. The airport has a lighted wind cone and segmented circle located west of the runway. Runway 16-34 is served with a full-length parallel taxiway (30 feet wide) with four connecting taxiways and an aircraft pull-out area located at the Runway 34 threshold. The taxiway does not have reflective edge markers or lighting.

A paved aircraft parking apron is located near the southern third of the runway on its east side. The aircraft apron is connected to the parallel taxiway by one 50-foot wide access taxiway located at the north end of the apron.

The most recent FAA 5010 Airport Record Form lists pavement strength at 12,500 pounds for aircraft with single-wheel (SW) landing gear. A pavement condition index (PCI) evaluation was conducted at Independence State Airport in May 1995.

The **runway** pavement was rated "**fair**" at 55 PCI (PCI 40-55 = "Fair").

The **parallel taxiway** was rated "**fair**" with a PCI rating of 55, although some portions of the taxiway are rated "very good" and "excellent." (PCI 70-85 = "Very Good" PCI 85-100 = "Excellent")

The **hangar taxiway** pavements range from "**poor**" to "**very good**." (PCI 25-40 = "Poor")

The **aircraft parking apron** was rated "**good**" with a PCI of 66. (PCI 55-70 = "Good")

Recent visual inspections indicate that the airfield pavements are generally in fair condition, although limited areas of severe cracking and settling are visible on the runway. Patching has been attempted on most of the settled areas, although some of the failed areas will need to be repaired before surface

**Table 2-1
Independence State Airport
Existing Facilities**

Owner:	State of Oregon Department of Transportation - Aeronautics
Communities:	Independence, Monmouth, and outlying areas in Polk County
Runways:	Runway 16-34: 3,070 by 60 feet; Asphalt Surface
Taxiways:	Full-Length Parallel Taxiway (3,070 by 30 feet); Four Exit Taxiways Nine Hangar Taxilane/Taxiways to on/off airport hangars
Apron:	Aircraft Parking Apron - by 380 by 200 feet (8,440 square yards) 25 Aircraft Tiedowns and Fueling Area
Lighting:	Low Intensity Runway Edge Lighting (LJRL); Threshold Lights; Tri-Color Visual Approach Slope Indicator (TRCV) - Runway 34 Airport Beacon; Lighted Wind Cone, Segmented Circle. No taxiway lighting or reflectors.
Nav aids:	None
Fuel Storage:	2 Underground Storage Tanks - 12,000 gallons 100LL; 12,000 gallon 80/87 AVGAS
Airport Buildings:	Airport FBO/Restaurant, fueling building; conventional and T-hangars (north area); conventional hangars (south area); 90+ residences/hangars located in adjacent airport (off-airport)
Activity:	124 Based Aircraft (Estimated 40 aircraft located on-airport, 84 aircraft located off-airport. Nearly all single-engine; 2-3 light twin-engine aircraft) 32,773 Aircraft Operations (1995-96) (Operations to Based Aircraft Ratio: Approximately 265:1)

treatments area applied. In addition, the outer edges of some surfaces, including the runway are showing substantial cracking and deterioration. Most pavements are currently in need of crackfilling and a sealcoat, or an overlay. The apron and taxiways have the same weight-bearing capacity as the runway.

LANDSIDE FACILITIES

The aircraft parking apron is 380 feet by 200 feet; the paved area is approximately 8,440 square yards and accommodates 21 aircraft tie-downs, with additional tiedowns located on an adjacent turf area. The tiedowns are configured in three north-south rows with a single east-west row located at the north end of the apron. The western and eastern tiedown rows are configured with tail-in positions facing the toward the apron; the center row has a tail-to-tail configuration, and the northern row has tail-in tiedown positions.

Taxiing aircraft enter/exit the apron at the north end on a connecting taxiway to parallel taxiway. Aircraft loading and unloading is accommodated directly in front of the fixed base operator (FBO) building at the northeast corner of the apron. The aircraft fueling area is located south of the FBO/restaurant, immediately south of the vehicle access gate for the apron.

The airport has approximately 25 T-hangar and conventional hangars located in the area north of the main apron. There are a total of eight taxiway or taxilane connections located north of the main apron. Five of the taxiways connect airpark residences to the runway/taxiway system; three of the taxiways do not extend into the airpark. Additional taxiways beyond the airport boundary are anticipated as the airpark expansion continues at the north and south ends of the development. Future airpark taxiways are expected to connect with existing airpark taxiways and utilize existing access taxiways into the airport.

At the north end of the apron is a conventional hangar and an 8-unit T-hangar. Other hangars in the apron area include a maintenance hangar located at the southeast corner of the apron; and a small single-unit shade hangar located on the apron, adjacent to the fueling area. Two large conventional hangars are located near the south end of the airport, adjacent to the end of Runway 34. Aircraft access to these hangars is provided by a single taxiway which connects to the parallel taxiway. In addition to the FBO, two maintenance shops are located at Independence State Airport. The local Experimental Aircraft Association (EAA) chapter is currently planning to construct a multi-unit hangar and office complex on the airport.

AIRPORT SUPPORT FACILITIES

The airport's fixed base operator (FBO) sells aviation fuel. The airport currently has two underground storage tanks with a capacity of 12,000 gallons of 100LL and 12,000 gallons of 80/87 aviation gasoline (AVGAS). The tanks are owned and maintained by Oregon DOT - Aeronautics. Oregon Aeronautics staff and the airport's fixed base operator are currently discussing options (i.e. installation of a monitoring/leak detection system, etc.) for continued use of the underground tanks. It appears that the existing underground tanks can continue in use as long as they are in compliance with federal and state environmental regulations. As with all facilities, airport management will need to consider factors such as the age of the tanks, the costs of maintenance and upgrades, and replacement options to determine the best course of action.

A paved automobile parking area is located adjacent to the FBO and main apron; additional parking is available adjacent to the hangars located north of the apron. The airport FBO building is located adjacent to the main apron with approximately 1,000 square feet. The two-floor building has a restaurant, restrooms, office space and passenger waiting areas. A public telephone is also available. Water, sewer and electrical service is available in the vicinity of the airport. The City of Independence provides water and sewer service; Pacific Power & Light provides electrical service. Natural gas service is also available through Northwest Natural Gas. Telephone service is provided by U.S. West.

The airport has limited fencing along its east side; gates are located at the end of the airport access road and at the apron. There is no fencing in the North Hangar Area or between the airport and airpark.

AIRPORT LIGHTING

The airport is equipped with low-intensity runway edge lighting (LIRL), threshold lights, an airport beacon, and a lighted wind cone. Runway 34 is equipped with a tri-color visual approach slope indicator (TRCV), which, according to local users, is not adequate. The airport beacon is located on the east side of the runway, mounted south of the FBO building. Local pilots indicate that the existing runway edge lighting and visual approach aid do not provide adequate output to assist in nighttime operations. The systems reportedly produce very low illumination and are in poor condition.

AIRSPACE AND NAVIGATIONAL AIDS

Independence State Airport operates under visual flight rules (VFR) conditions and is not equipped with electronic navigational aids. The airspace surrounding the airport is relatively uncomplicated and no significant obstructions are identified on the current Seattle Sectional Chart. The airport uses a standard left traffic pattern for both runways with an altitude of 1,000 feet above ground level (AGL) (1,170 feet mean sea level).

Two low altitude instrument airways pass within 2.5 miles east and west of the airport. Victor 287, located immediately west of the airport, connects the Newport and Newberg VORTACs. Victor 495, located immediately east of the airport, connects the Corvallis VOR/DME and the Newberg VORTAC. The airways do not create any conflicts with local terminal airspace due to the minimum enroute or obstruction altitudes (MEA or MOA) of 4,000 and 3,400 feet. Independence State Airport is located 30.7 nautical miles from Newberg VORTAC on the 177 degree radial (117.4 MHz)

The nearest public-use airports are Salem-McNary Field, located 9 nautical miles to the east-northeast, Albany Municipal Airport, located 16 nautical miles to the southeast; McMinnville Municipal, located 19 nautical miles north; and Corvallis Municipal Airport, located 23 miles south-southwest

A global positioning system (GPS) nonprecision instrument approach is currently being developed for Independence State Airport by the FAA. It is anticipated that the approach will be designed with minimum visibility requirements of one statute mile or greater. This will provide circle-to-land approach minima with a visual final approach segment to either runway. Based on the "utility" airport classification under FAR Part 77, this type of approach is compatible with existing approach surfaces and other FAR Part 77 Imaginary Surfaces. The airport will be able to accommodate an instrument approach without on-site weather observation, however its use will be limited to general aviation users (non commercial, charter, etc.). Options for providing an automated system such as AAI-SMI's NEXWOS system may be considered, depending on local need and the cost of acquisition, operation and maintenance. These automated systems are fully compliant to FAA standards for weather observation, typically providing wind speed and direction, visibility, cloud height, and barometric pressure.

LAND-USE PLANNING AND ZONING

The bulk of the Independence State Airport property is located in Polk County's jurisdiction. This area is zoned Polk County Public Amusement and Recreation (PA), with an Airport Development District Overlay. A portion of the airport, east of the runway, is located within the City of Independence, and as such is subject to that City's planning jurisdiction. The primary zoning of this

portion of the site is Single-family Residential (RS), and it is overlain with the Airport Development (AD) District (which prohibits residential uses). According to telephone communication with the City Planner, the City's AD District is identical to that of the County, so the planning criteria are the same for both portions of the airport property, and no additional criteria apply to the area within the City Limits. FAR Part 77 imaginary surfaces are protected through zoning provisions in both the City and County planning documents.

Existing uses and activities on the airport property, with the exception of a restaurant, are entirely aviation-related. Currently, those activities and uses include: two maintenance facilities; one hangar which is owned by Oregon Aeronautics and leased to a helicopter tree service (this lease is planned to have terminated, and the tree service removed from this site, by the time of publication of this report); one Fixed Base Operator; a full service breakfast and lunch restaurant; and hangar rentals. Uses and Zoning surrounding the airport are listed in the table below:

**Table 2-2
Area Land Use & Zoning**

Area	Land Use	Zone
North	Agriculture	Polk Co Exclusive Farm Use (EFU)
South	Hoffman Road, Agriculture	City Light Industrial (LI)
East	Residential "Airpark"	City Single-family Residential (RS)
West	Agriculture	Polk Co. EFU

Other uses in the vicinity include a Boise Cascade log pond, and manufacturing types of uses, southeast of the airfield in the Heavy Industrial (HI) Zone; a Medium Density Residential development to the southwest; and a proposed 22 acre residential development in the RS Zone near the site's southwest corner, between Airport and Striker Roads.

Chapter 170 of the Polk County Zoning Ordinance, PA Zone, provides that an airport is an outright permitted use in the PA Zone. Sections 170.090-170.130 provide property development standards for the PA Zone as follows:

- Building Height: ≤ 6 Stories
- Front Yard: ≥ 20 Feet
- Side Yard: ≥ 5 Feet, plus additional width for buildings over 30 Feet in height;
 ≥ 20 Feet for any side yard adjacent to a street

Rear Yard: ≥ 20 Feet, plus 4 Feet for each story above the first

The Airport Development District is an Overlay Zone which is placed over top the County PA Zoning at this location. Section 180.030 of the Polk County Zoning Ordinance (PCZO) provides that aviation-related structures, uses and activities are permitted outright in the Airport Development District, subject to the Limitations of 180.045 and Chapter 181, Airport Zone Height Limitations. However, Section 180.045 provides that **"height or other limitations and restrictions here imposed shall not apply to such structures or uses customarily employed for aeronautical purposes."**

Variance to the standards of Chapters 180 and 181 for structures or uses not normally allowed under the provisions of those sections, if necessary to facilitate the Master Plan, may be permitted if **"it is duly found that a literal application or enforcement of the regulations will result in unnecessary hardship, and relief granted, will not be contrary to the public interest, and will not create a hazard to air navigation, will do substantial justice, and will be in accordance with the spirit of this Ordinance."**(Section 180.060; 181.025)

Conditional Uses in the Airport Development District may include structures or buildings accessory to a permitted use; a single-family dwelling; and buildings and uses of a public works, public service or public utility nature (Section 180.035). Conditional Uses are subject to the criteria and procedures set forth in Chapter 119 of the PCZO.

The portion of the airport which is located within the Independence City Limits is subject to the property development standards of the underlying RS Zone, which provides the following property development standards:

Building Height: ≤ 30 feet, except that church or public service building may be up to 45 feet in height
Front Yard: ≥ 15 feet
Side Yard: ≥ 5 feet if not adjoining a street; ≥ 10 feet if adjoining a street
Rear Yard: ≥ 15 feet
Lot Area: $\geq 5,000$ square feet
Lot Frontage/Width: ≥ 25 feet frontage; ≥ 50 feet width at front building line

AIRPORT SERVICE AREA

The airport service area, or airport trade area, as it is commonly known, refers to the area surrounding an airport which is directly affected by activities at that airport. As noted earlier, Independence State Airport is the only public-use airport located in Polk County. Air trade areas are determined primarily

by the facilities provided at a particular airport and the number of airports in a particular area. Typically, a 30-minute surface travel time is used to approximate the boundaries of an air trade area. However, the presence (or absence) of other airports in a large area can directly affect airport use. The Independence State Airport service area extends beyond Independence and Monmouth to include communities such as Dallas and Buena Vista, and the overall rural areas located on the highway system. A major part of the user base at Independence is related to the adjacent airpark, which is primarily responsible for the growth in based aircraft and users. In addition to serving local residents, the airpark's reputation within the national aviation community has grown in recent years, attracting pilots from around the country who have an interest in the facility¹.

FORECASTS OF AVIATION ACTIVITY

Based Aircraft

As noted in the initial draft of the Inventory/Forecast Chapter, the Oregon Aviation System Plan (OASP) forecasts generated in 1996, were originally selected for use in this project. However, as the project proceeded, it became apparent that the current OASP estimates of based aircraft (92) did not fully reflect recent growth of the airpark. With the assistance of the airpark association, updated estimates of airpark-based aircraft were made. The total number of lots currently developed and remaining to be developed within the airpark was also determined. An estimate of airport-based aircraft was also updated. Based on the updated estimates, airpark- and airport-based aircraft totaled 124 in December 1996. A breakdown of the totals is presented in **Table 2-3**. The estimates for current aircraft operations are considered to be accurate due to the acoustical counting program used in 1995-96.

With new base year data available, updating the forecasts of based aircraft became necessary. The methodology selected was to retain the 1996 OASP forecast growth rate for on-airport based aircraft, and estimate airpark-based aircraft in relation to the development potential of the existing and future airpark expansion. Two projections were developed to reflect two scenarios which have different chances of occurrence. The first projection, referred to as the "baseline" projection, reflects continued development of the existing airpark lots within a relatively short period. This assumption is based largely on the rate of growth which occurred between 1985 and 1996, when airpark residences and based aircraft more than doubled. In 1985, airpark-based aircraft accounted for approximately 55 percent of total based aircraft at Independence State Airport. In 1996, the percentage increased to approximately 68 percent. According to airpark sources, all lots have been sold and the majority are expected to be developed within the next few years. In either forecast projection, airpark-based

¹ Personal comment made by local resident at Public Meeting.

aircraft are expected to account for 75 to 77 percent of total based aircraft at the airport by the end of the twenty-year planning period.

The "Baseline Projection" is based on the following assumptions:

1. The existing airpark (including northern end expansion) has a total of 160 lots, of which an estimated 94 are currently developed or under construction.
2. The 94 residences have an estimated 84 based aircraft, resulting in a based-aircraft-to-residence ratio of 0.9 to 1.
3. It is assumed that of the currently undeveloped lots (66), 80 percent will be developed within 5 years; and 100 percent will be developed within 10 years. The based aircraft/residence ratio of 0.9 is maintained.
4. On-airport based aircraft are currently estimated to total 40 aircraft. The OASP growth rate (1.09 % annual average growth rate (AAR) is applied through the 20-year planning period.

The "High Projection" is based on the following assumptions:

1. The assumptions from the "Baseline Projection" are maintained
2. The southern 22-acre land area will be developed as an airpark with approximately 46 lots.
3. It is assumed that of the currently undeveloped lots (46) in the 22-acre airpark site, 20 percent will be developed within 5 years; 40 percent will be developed within 10 years; 50 percent will be developed within 15 years; and 80 percent will be developed within 20 years. The existing airpark based aircraft/residence ratio of 0.9 is maintained.
4. The totals from the "Baseline Projection" are added to the aircraft from the 22-acre site.

For planning purposes, it is important to consider the potential effect airpark expansion may have on airport activity. The existing airpark development has demonstrated a steady rate of growth over the last ten to fifteen years. However, unlike the existing airpark, which is actively expanding, the future rate of development within the southern 22-acre parcel is unknown at this time. As a result, it is recommended that the "High Projection" be used for reference purposes to determine development reserves and identify any additional incremental constraints which may result from the higher activity levels. The "Baseline Projection" should be selected as the preferred projection for based aircraft.

Further expansion of airpark development on the west side of the airport is also possible. However, based on the availability of east-side lots and the status of the land located west of the airport, it is not anticipated that this development would occur until well into the current twenty-year planning period. The 1985 Airport Master Plan (Century West Engineering) forecast of based aircraft was 115 in 1995, and 153 in 2005. The 1985 master plan projections of based aircraft are within 10 percent of actual levels at the mid-point of the twenty year planning period.

Aircraft Operations

As noted earlier, the most recent estimates of air traffic at Independence State Airport were based on recently-updated acoustical activity counts. The on-site counts included quarterly samples from October 1995 to September 1996. When the 1996 activity counts were compared with the 1993 counts, it appeared that the ratio of aircraft operations to based aircraft had increased considerably (from approximately 280 to 360). However, applying the recently-updated based aircraft inventory totals to the activity counts, results in a ratio of 260 operations per based aircraft, which is very similar to the 1993 ratio. The 260 operations per based aircraft are intended to represent total traffic in relation to based aircraft, including local and itinerant activity

**Table 2-3
Based Aircraft Forecasts**

Baseline Projection	Existing		Forecast			
	1985	1996	2001	2006	2011	2016
<i>Airpark Residences</i>	34	94	147	160	160	160
Airpark-Based Aircraft	33	84	132	144	144	144
Airport-Based Aircraft	27	40	42	45	47	50
Total Based Aircraft	40	124	174	189	191	194

High Projection	Existing		Forecast			
	1985	1996	2001	2006	2011	2016
<i>Airpark Residences</i>	34	94	156	178	183	188
Airpark-Based Aircraft	33	84	140	161	165	169
Airport-Based Aircraft	27	40	42	45	47	50
Total Based Aircraft	40	124	182	206	212	219

By applying the ratio of 260 operations-per-based aircraft to the Baseline and High Projections of based aircraft, estimates of future operations can be made. Updated operations projections are presented for the Baseline and High Projection in **Table 2-4**. Over twenty years, the Baseline and High Projections of aircraft activity reflect an annual average rate (AAR) of 2.2 and 2.8 percent, respectively. Although this level of growth exceeds both regional and national averages for activity at most general aviation airports, the success of the airpark makes the profile of activity at this airport unique.

**Table 2-4
Aircraft Operations Forecasts**

Baseline Projection	Existing	2001	2006	2011	2016
Based Aircraft	124	174	189	191	194
<i>Avg. Ops. Per Based A/C</i>	<i>264</i>	<i>260</i>	<i>260</i>	<i>260</i>	<i>260</i>
Aircraft Operations	32,773	45,200	49,100	49,700	50,400
Local Operations	10,815	13,500	14,700	14,900	15,100
Itinerant Operations	21,958	31,700	34,400	34,800	35,300
Total Operations	32,773	45,200	49,100	49,700	50,400

High Projection	Existing	2001	2006	2011	2016
Based Aircraft	124	182	206	212	219
<i>Avg. Ops. Per Based A/C</i>	<i>264</i>	<i>260</i>	<i>260</i>	<i>260</i>	<i>260</i>
Aircraft Operations	32,773	47,300	53,600	55,100	56,900
Local Operations	10,815	14,200	16,100	16,500	17,100
Itinerant Operations	21,958	33,100	37,500	38,600	39,800
Total Operations	32,773	47,300	53,600	55,100	56,900

As noted with the based aircraft projections, it is recommended that the Baseline Projection be selected as the preferred forecast. The High Projection may be used as an indicator of potential activity which would result from an increased development scenario. The difference in aircraft operations between the Baseline and High Projections is less than 13 percent at the end of the current planning period, which would not significantly affect the airport's ability to accommodate activity.

From a facility planning perspective, it is noted that most of new based aircraft will be located in the airpark. The need for on-airport aircraft parking and hangar space would reflect the through-the-fence activity at the airport.

Airfield Capacity

Estimates of airfield capacity were originally determined based on the activity forecasts first generated. Based on the revised forecasts, updated capacity estimates were also required. Based on the revised activity levels, the annual service volume of Runway 16-34 is currently estimated at approximately 92,700 operations. Peak month activity is estimated at 15 percent of annual traffic. This is based on VFR-only operations with a full-length parallel taxiway, no ILS or control tower, and a non radar environment. Annual capacity could be expected to increase slightly (to 97,000 - 98,000 operations) with the addition of a nonprecision instrument approach and all other conditions are unchanged. Airfield capacity methodology used in this analysis is outlined in FAA Advisory Circular 150/5060-5, **Airport Capacity and Delay**. Updated capacity information is presented in **Table 2-5**.

Table 2-5
Airfield Capacity

	Existing	2001	2006	2011	2016
Aircraft Operations	32,773	45,200	49,100	49,700	50,400
Peak Month (15%)	4,916	6,780	7,365	7,455	7,560
Design Day (Avg Day/Peak Mo.)	164	226	246	249	252
Peak Hour (15% of Peak Day)	25	34	37	37	38
Hourly Capacity - VFR	100	100	100	100	100
Hourly Capacity - IFR	0	20	20	20	20
Annual Service Volume	92,700	98,500	97,000	97,000	97,000
Peak Hour Demand % of Capacity	25%	34%	37%	37%	38%
Annual Demand % of ASV	35%	46%	51%	51%	52%

Figure 2-2
Forecast Based Aircraft

Historical & Forecast Based Aircraft

Independence State Airport

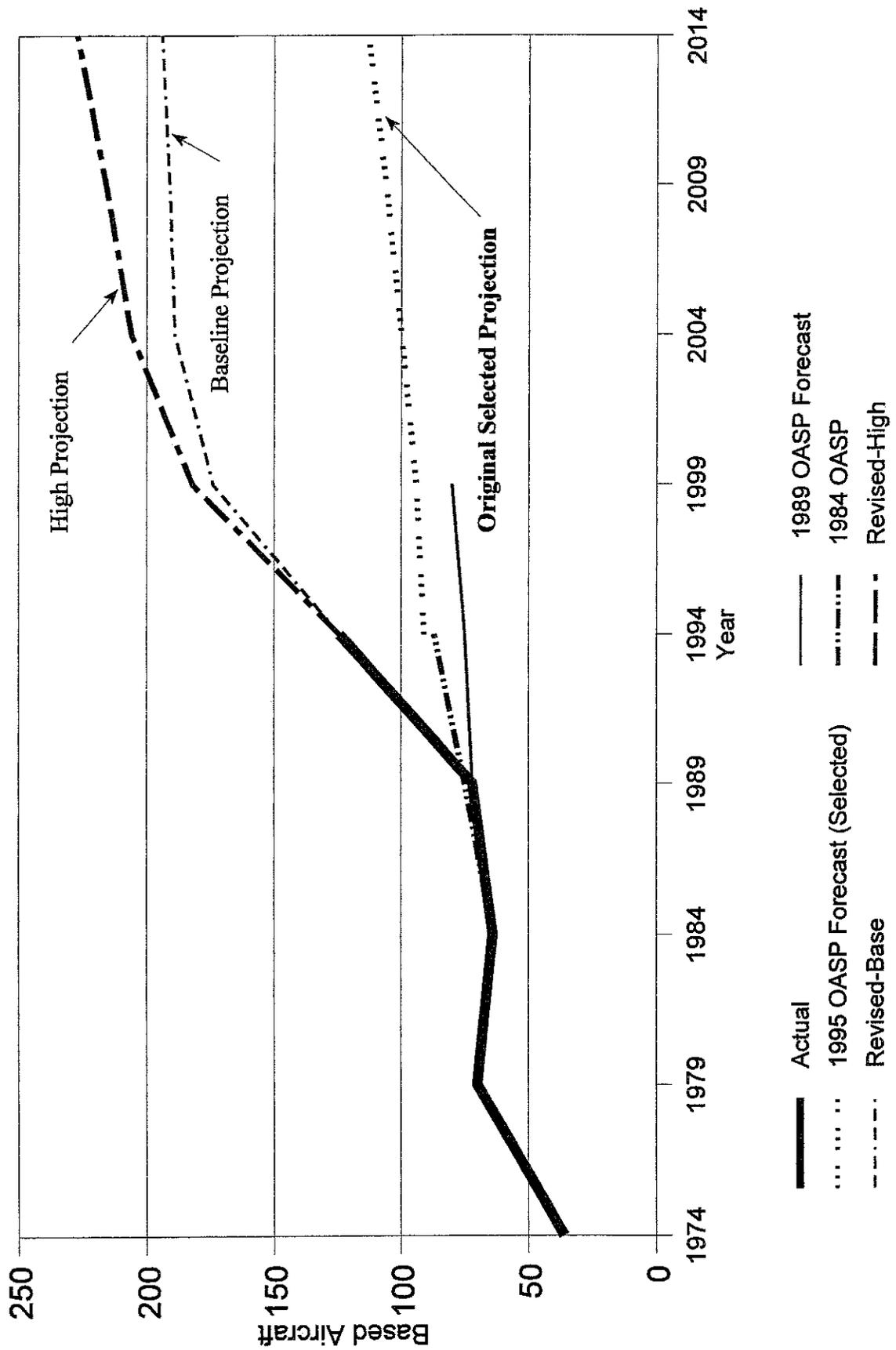
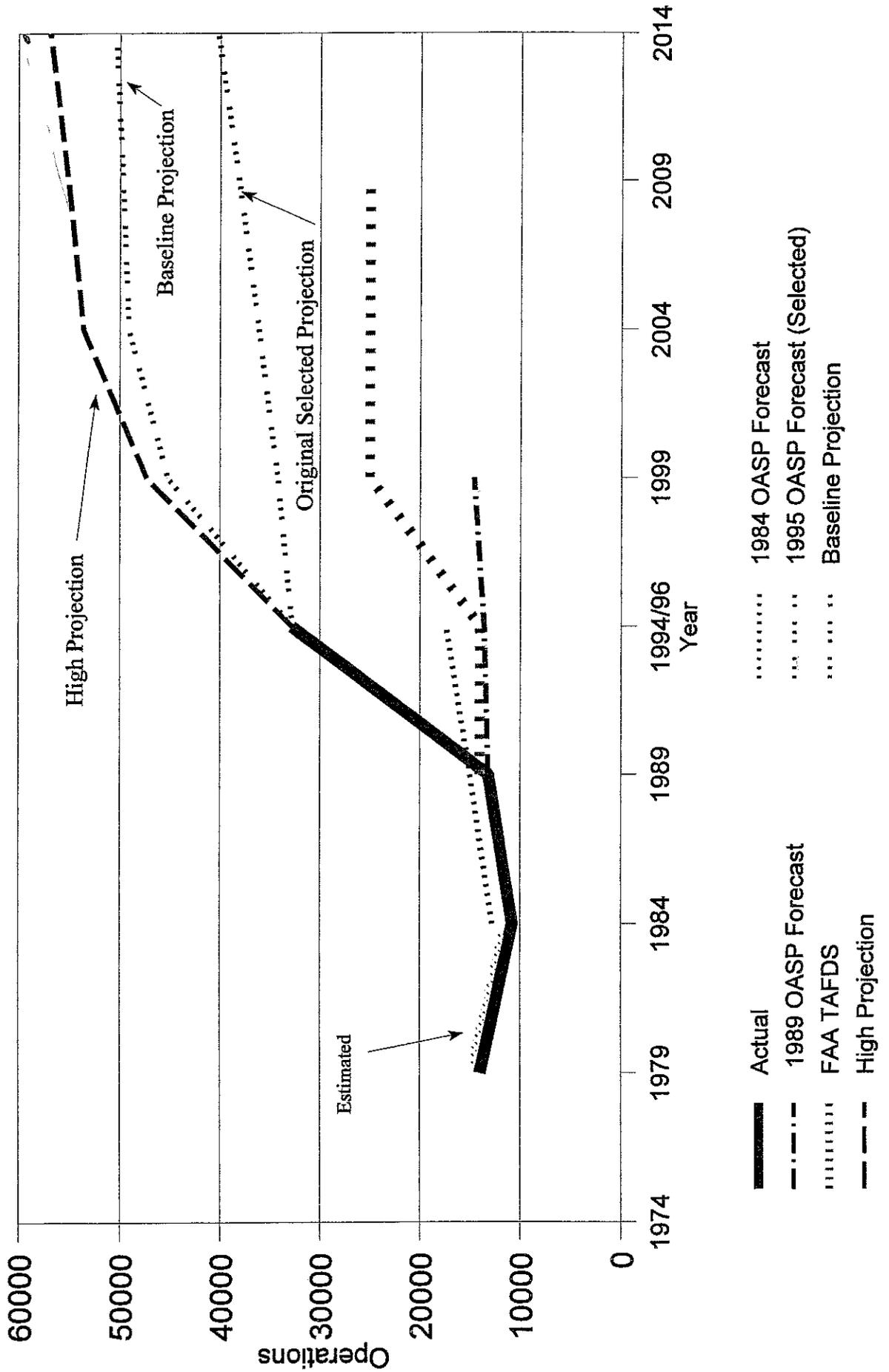
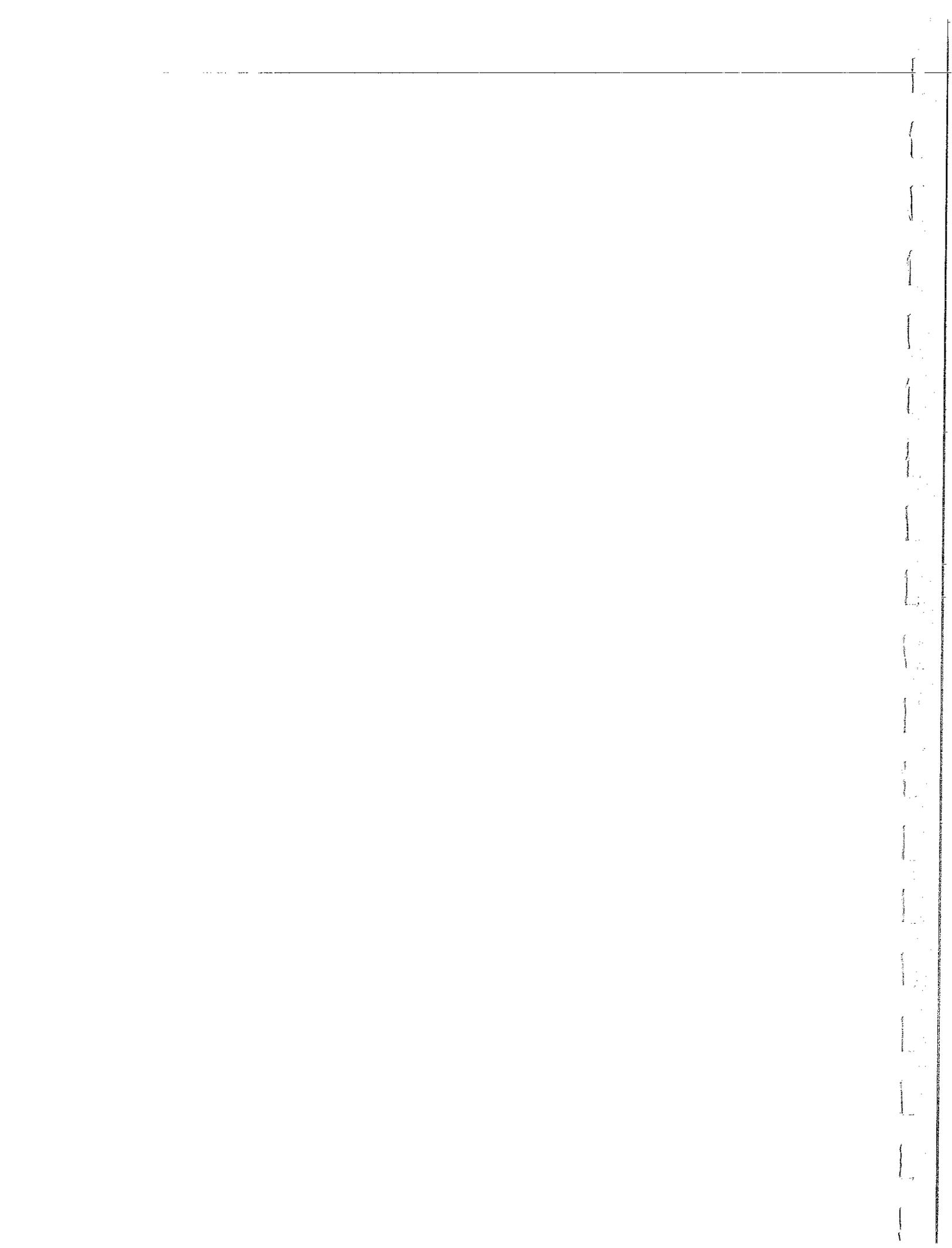


Figure 2-3
Forecast Operations

Historical & Forecast Aircraft Operations

Independence State Airport





Chapter Three

FACILITY REQUIREMENTS

INTRODUCTION

To properly plan for the future of Independence State Airport, it is necessary to translate forecast aviation demand--including type and volume--into specified types and quantities of facilities that can adequately serve this identified demand. This chapter uses the results of the forecast and demand capacity analyses conducted in **Chapter Two**, and established planning criteria, to determine the airside (i.e., runway, taxiways, navigational aids, marking, and lighting) and landside (i.e., hangars, fixed base operator (FBO) facilities, aircraft parking apron, fueling, automobile parking, and access) facility requirements.

The objective of this effort is to identify in general terms, the adequacy or inadequacy of the existing airport facilities and outline what new facilities may be needed to accommodate forecast demands. Having established facility requirements, alternatives for providing these facilities will be evaluated in **Chapter Four** to determine the most cost effective and efficient means for implementation.

Future Airpark Expansion Potential

The airpark at Independence State Airport has a significant effect on aviation activity and airfield facility requirements. As described below, growth in based aircraft within the airpark has accounted

for the largest portion of new based aircraft at the airport in recent years. This trend is expected to continue well into the planning period.

The existing Independence Airpark includes two phases of development, in addition to a newer northern section. These areas combine for approximately 160 lots, of which, approximately 94 are currently developed. The 22-acre site located immediately south of Airpark Phase II is currently being planned for up to 46 airpark lots. **Table 3-1** provides data on airpark residences, airpark-based aircraft, and airport based aircraft for the current year and in 1985, when the previous master plan was developed; totals for potential residential development with a full build-out are also provided. Airpark representatives indicate that all lots have been sold, although some turnover may be expected. It is estimated that there are approximately 84 aircraft located in the airpark, which results in a ratio of 0.9 based aircraft per residence in the airpark.

Based on airport management records, it is estimated that approximately 40 aircraft are currently stored in hangars or use tie-downs on the airport. The combined total of 124 airpark and airport based aircraft is substantially higher than the 92 based aircraft identified in the most recent state system plan forecasts.

As noted in the forecast section contained in Chapter Two, baseline and high projections of based aircraft and aircraft operations were developed. The projections were based largely on assumptions related to the timing and scale of airpark residential development. For planning purposes, the baseline projection was determined to be the most reasonable forecast, the high projection, which reflects development of the 22-acre parcel, should be used to determine additional development reserves, as appropriate. Summaries of the selected forecast are provided in **Tables 3-2 and 3-3**.

**Table 3-1
Independence State Airport
Based Aircraft/Airpark Development (100% Build-Out Potential)**

	1985	1997	Future(a)	Future (b)
Airpark Residences	34	94	160	206
Airpark Based Aircraft	33 (55%)	84 (68%)	144 (76%)	185 (79%)
Airport-Based Aircraft	27 (45%)	40 (32%)	45 (24%)	49 (21%)
Total Based Aircraft	60	124	189	234

Future (a) assumes full development of existing airpark lots from northern edge to Bonanza Taxiway.

Future (b) assumes airpark additional development of 22-acre site.

**Table 3-2
Based Aircraft Forecasts
Independence State Airport**

Baseline Projection	Existing		Forecast			
	1985	1996	2001	2006	2011	2016
<i>Airpark Residences</i>	34	94	147	160	160	160
Airpark-Based Aircraft	33	84	132	144	144	144
Airport-Based Aircraft	27	40	42	45	47	50
Total Based Aircraft	60	124	174	189	191	194

**Table 3-3
Aircraft Operations Forecasts
Independence State Airport**

Baseline Projection	Existing	2001	2006	2011	2016
Based Aircraft	124	174	189	191	194
<i>Avg. Ops. Per Based A/C</i>	264	260	260	260	260
Aircraft Operations	32,773	45,200	49,100	49,700	50,400
Local Operations	10,815	13,500	14,700	14,900	15,100
Itinerant Operations	21,958	31,700	34,400	34,800	35,300
Total Operations	32,773	45,200	49,100	49,700	50,400

AIRPORT DESIGN STANDARDS

The selection of the appropriate design standards for the development of airfield facilities is based primarily upon the characteristics of the aircraft which are expected to use the airport. The most critical characteristics are the approach speed and wingspan of the critical design aircraft anticipated for the airport. Planning for future aircraft use is particularly important because design standards are used to determine separation distances between facilities that could be very costly to relocate later.

Federal Aviation Administration (FAA) **Advisory Circular (AC) 150/5300-13, Airport Design**, serves as the primary reference in planning airfield facilities. **FAR Part 77, Objects Affecting Navigable Airspace**, defines airport imaginary surfaces which are established to protect the airspace immediately surrounding a runway. The imaginary surfaces will be fully described in the Airport Plans section of this report. Airport imaginary surfaces should be clear of obstructions (i.e. structures, parked aircraft, trees, etc.) to the greatest extent possible.

FAA **Advisory Circular 150/5300-13** groups aircraft into five categories based upon their approach speed. Categories A and B include small propeller aircraft and certain smaller business jet aircraft which have approach speeds of less than 121 knots. Categories C, D, and E consist of the remaining business jets as well as larger jet and propeller aircraft generally associated with commercial and military use, these aircraft have approach speeds of 121 knots or more. Most aircraft currently utilizing Independence State Airport are included in Categories A and B.

The advisory circular also establishes six aircraft design groups, based on the physical size (wingspan) of the aircraft. The categories range from Airplane Design Group (ADG) I, for aircraft with wingspans of less than 49 feet, to ADG VI for the largest commercial and military aircraft. Most aircraft operating at Independence are included in Airplane Design Group I. A summary of typical general aviation and business-related aircraft and their respective design categories is presented in **Table 3-4**.

Design Aircraft

Aircraft activity at Independence State Airport is predominantly general aviation single and twin-engine piston aircraft. The airport also accommodates a limited amount of turbine-aircraft activity, which is associated with itinerant operations. Transient turboprop traffic is estimated at less than 150 annual operations, with most of these operations associated with two Boise Cascade King Air aircraft. Two or three light twin-engine aircraft (Piper Seneca, Twin Comanche, and Beechcraft Baron) are typically based at the airport, in addition to similar itinerant aircraft which are attracted to the restaurant, airpark, maintenance services on the airport, or other local businesses. These aircraft are predominantly included in Airplane Design Group I (ADG I) with a maximum gross takeoff weight of 12,500 pounds or less. Several of these aircraft are included in Approach Category B, therefore, B-I (small aircraft exclusively) standards are appropriate for Runway 16-34.

Design Aircraft Summary:

Based on overall requirements and existing conditions, **Aircraft Approach Category B and Airplane Design Group (ADG) I (small aircraft) standards would be appropriate for use on Runway 16-34. Accordingly, Airport Reference Code (ARC) B-I would be appropriate for existing and future activity on Runway 16-34.** A variety of light twin-engine piston aircraft similar to those based at the

airport, represent the design aircraft type. Airfield design standards outlined in Table 3-5 are presented for ADG I (small aircraft) and ADG I.

**Table 3-4
Typical Aircraft & Design Categories**

Aircraft	Design Group	Approach Category	Maximum Gross Takeoff Weight (lbs)
Beechcraft Bonanza A36	A	I	3,650
Beechcraft Baron 55	A	I	5,300
Piper Aerostar 602P	B	I	6,000
Cessna 402	B	I	6,300
Cessna 421	B	I	7,450
Beech King Air B200	B	II	12,500
Cessna Citation I	B	I	11,850

Source: AC 150/5300-13, Change 4

Airspace

The airport is located in a relatively flat terrain with rising terrain located several miles to the west. The 1985 Approach and Clear Zone Plan depicts no terrain penetrations to any of the FAR Part 77 surfaces. The approach surfaces depicted for the runway ends are based on 20:1 visual or nonprecision approach slopes. Airspace planning was based on a future nonprecision approach to Runway 16-34 and maintaining the FAR Part 77 "Utility" runway designation.

As noted earlier, the selected design aircraft is a light twin-engine aircraft, represented by Airport Reference Code (ARC) B-I. Some design standards are further defined by visibility minimums and type of approach. Generally, providing either 1 mile or 3/4-mile visibility minimums is the point where standards change, requiring significantly larger clear areas, facility setbacks, etc. As noted earlier, it is anticipated that future instrument approaches at Independence will have visibility minimums not lower than 1 mile.

Instrument Approach Capabilities

The FAA is currently in the process of developing a GPS instrument approach for Independence State

Airport. It is expected that the approach will be nonprecision with a visual final approach segment and visibility minimums of one mile or greater. This type of approach minima are compatible with existing airport geometry (i.e. runway-taxiway clearances, building restriction lines, etc.).

On-Field Weather Data

If future instrument approaches are going to be used by any FAR Part 135 or 121 commercial operators (i.e. charter flights, etc.), on-field weather reporting is required, including local weather and altimeter data. On-field weather data is not required for general aviation use, under FAR Part 91. FAA funding may be available for an automated weather observation system (AWOS) system through the Facilities & Equipment (F&E) program. Alternatively, funding a system through an AIP grant is possible, although annual operation and maintenance would be a local sponsor expense. Automated weather systems (ASOS) are also available through the National Weather System. Automated systems such as AAI-SMI's NEXWOS are fully compliant to FAA standards for weather observation, typically providing wind speed and direction, visibility, cloud height, and barometric pressure.

FAR PART 77 SURFACES

The 1985 Airport Layout Plan and Approach and Clear Zone Plan (Century West Engineering) reflected visual or nonprecision instrument approach capabilities with a Utility runway designation.

The airport currently operates under visual flight rules (VFR). Runway 16-34 is designated as Utility. Utility runways are designed for aircraft weighing 12,500 pounds or less, which is the pavement weight bearing capacity listed for Runway 16-34.

Approach Surfaces

The existing approach surfaces for Runway 16-34 has slopes of 20:1 and extend outward for 5,000 feet. The FAR Part 77 standard for runway with nonprecision instrument approaches is a 20:1 approach slope which extends outward 5,000 feet. The inner width of the nonprecision instrument approach slope is 250 feet, the outer width is 1,250 feet, which is the standard for visual approaches on utility runway. Nonprecision instrument approaches with visual final approach segments on Utility runways also have the same approach surface dimensions and slope.

Hoffman Road, which is located along the southern edge of the airport, traverses the approach for Runway 34. The roadway is located approximately 415 feet from the Runway 34 threshold at its nearest point. Hoffman Road has an elevation of 178.56 feet, located 415 feet from the runway threshold (174.6 feet). Based on the standard 20:1 visual approach surface, vehicles (15 feet standard) traveling on the roadway penetrate the approach by 8.25 feet.

The existing approach surface for Runway 16 appears to be free of any obstructions, although a powerline located approximately 1,900 feet north of the runway end may affect any future runway extensions and approaches.

Primary Surface

The existing primary surface for Runway 16-34 is 250 feet wide, centered on the runway. This width meets the standard for utility runway with visual approaches. The primary surface is a rectangular plane of airspace which rests on the runway (at centerline elevation) and extends 200 feet beyond the runway end, the width depends on the runway category and type of approach (i.e. visual, nonprecision, precision). The primary surface should be free of any penetrations, except items with locations fixed by function (i.e. PAPI, edge lights, etc.). The primary surface end connects to the inner portion of the runway approach surface. The existing primary surface appears to be free of penetrations.

The introduction of an instrument approach at Independence State Airport is expected to be a nonprecision GPS with visibility minimums of one mile. This type of approach utilizes a visual final approach segment. Therefore, maintaining Utility runway standards with visual approaches is consistent with the potential approach capabilities. In the event that a nonprecision instrument approach was designed to a specific runway end, with visibility minimums less than one mile, an upgrade of FAR Part 77 surfaces would be required. The primary surface standard would increase to 500 feet wide.

Transitional Surface

The transitional surface is located at the outer edge of the primary surface, represented by a plane of airspace which rises perpendicularly at a slope of 7 to 1, until reaching an elevation 150 feet above runway elevation. Based on FAR Part 77 standards, this surface should be free of obstructions (i.e. parked aircraft, structures, trees, etc.).

Hangars and residences constructed east of the parallel taxiway are located as close as 100 feet to taxiway centerline (250 feet from runway centerline). The closest potential aircraft parking areas are also 250 feet from the runway centerline and 100 feet from the parallel taxiway centerline.

With a 250-foot wide primary surface, the transitional surface slope begins at a point 125 feet from the runway centerline. At a slope of 7:1, the transitional surface would be approximately 17.9 feet above the runway elevation at the BRL. If any hangars or residences located immediately beyond the existing BRL have a height of 18 feet or higher, they may penetrate the transitional surface. Any new construction on the remaining lots which are immediately adjacent to the BRL should have appropriate height limitations based on the transitional surface clearance standards.

The overhead powerlines located southwest and northwest of the airport appear to penetrate the runway transitional surface. These obstructions should be lighted and marked if relocation is not possible.

As noted earlier, an upgrade in runway instrument approach capabilities with reduced visibility minimums would require a 500-foot wide primary surface. The transitional surface would begin 250 feet from runway centerline. On the east-side of the runway, the building restriction line (BRL) is located 250 feet from the runway centerline. Establishing a transitional surface at this point would result in every structure (house or hangar) located within 100 to 150 feet of the BRL penetrating the transitional surface. Based on this criteria, it appears that a nonprecision instrument approach with visual final approach segments can be accommodated without any conflicts with FAR Part 77 imaginary surfaces.

Horizontal Surface

The existing horizontal surface will not change with the addition of a nonprecision instrument approach, since visual and nonprecision instrument approaches for utility runway have approach surfaces extending to 5,000 feet, which is the radius used to define the horizontal surface. No penetrations are known to exist within the existing horizontal surface.

Conical Surface

The existing (4,000-foot, 20:1 slope) conical surface will not change with the addition of nonprecision instrument approach capabilities. No penetrations are known to exist within the existing conical surface.

AIRPORT DESIGN STANDARDS

As noted earlier, based on existing and projected facility activity, Aircraft Approach Category B and Airplane Design Group I (small aircraft exclusively) design standards should be applied to Runway 16-34. In addition, standards for visibility minimums of not lower than one mile should be used based on the potential GPS instrument approach.

Runway Safety Area

The standard for ADGI runway is 120 feet for width and 240 feet for length beyond the runway end. Runway 16-34 meets both the width and length standard.

**Table 3-5
FAA RUNWAY DIMENSIONAL STANDARDS
AIRPLANE DESIGN GROUP I (small aircraft exclusively)/I**

Standard	ADG I (s)	ADG I
Runway Length (in feet)	3,040/3,610(a)	3,040/3,610
Runway Width	60	60
Runway Shoulder Width	10	10
Runway Safety Area Width	120	120
Runway Safety Area Length (Beyond Rwy End)	240	240
Obstacle-Free Zone	250	400
Object Free Area Width	250	400
Object Free Area Length (Beyond Rwy End)	240	240
Primary Surface Width	250*	500
Primary Surface Length (Beyond Rwy End)	200*	200
Runway Protection Zone Length	1,000*	1000
Runway Protection Zone Inner Width	250*	500
Runway Protection Zone Outer Width	450	700
Runway Centerline to:		
Parallel Taxiway Centerline	150	225
Aircraft Parking Area	125	200
Building Restriction Line	194.5(b)	269.5(b)
Taxiway Width	25	25
Taxiway Shoulder Width	10	10
Taxiway Safety Area Width	49	49
Taxiway Object Free Area Width	89	89
Taxiway Centerline to Fixed/Movable Object	44.5	44.5

(a) Runway length required to accommodate 95 and 100 percent of General Aviation Fleet 12,500 pounds or less. The existing runway will accommodate 95% of the GA fleet under most operating conditions. (b) This distance will protect the existing Runway 16-34 parallel taxiway object free area, based on ADG I(s) & I. * Visual and Nonprecision Utility/Other Runway (Per FAR Part 77); all other dimensions reflect visual runway or runway with not lower than 3/4-statute mile approach visibility minimums (per AC 150/5300-13, Change 4) within the respective design group. RPZ dimensions based on visual and not lower than 1-mile approach visibility minimums. **

Runway Object Free Area

The standard for ADG I runway is 250 feet for width, centered on the runway and 240 feet for length (beyond the runway end). The existing Runway 16-34 OFA meets this standard

Runway Obstacle Free Zone

The standard obstacle free zone (OFZ) for Runway 16-34, which is used exclusively by small aircraft, is 250 feet. The Runway 16-34 OFZ meets the standard.

Taxiway Safety Area

The standard for ADG I is 49 feet for width. The Runway 16-34 parallel taxiway safety area meets the ADG I standard.

Taxiway Object Free Area

The standard for ADG I is 89 feet for width, centered on the taxiway. The Runway 16-34 parallel taxiway meets the ADG I standard

Building Restriction Line

The existing BRL is located 250 feet east of the Runway 16-34 centerline. The parallel taxiway is located 150 feet from runway, on its east side. This provides a 100-foot separation between the BRL and the taxiway centerline. The 250-foot BRL is located 125 feet from the beginning of the runway transitional surface slope (7:1), which would provide a vertical clearance of 17.8 feet at the BRL. The location of building restriction lines (BRL) are dependent on, and should encompass the runway protection zones (RPZ), runway object-free area (OFA), and should provide adequate separation for existing or planned parallel taxiways. The existing 250-foot BRL accommodates these clearances.

Runway Protection Zones

The standard for runway protection zone dimensions for Runway 16-34 is based on use by small airplanes exclusively with visual approaches. Runway 16-34 RPZs would be 250 feet at the inner width, 450 feet at the outer width, with a length of 1,000 feet. This dimension would be used for existing visual approaches and may also be used for nonprecision instrument approaches with visual final approach segments with visibility not lower than 1 mile.

As noted in the description of Part 77 surfaces, the 20:1 approach to Runway 34 is penetrated by

vehicles traveling on Hoffman Road. Appendix 2 of FAA Advisory Circular 150/5300-13, Change 4, indicates that establishing a surface which extends from the runway threshold provides an acceptable alternative to displacing a runway threshold or removing the obstruction. For Runway 16-34, the 20:1 surface extending from the runway threshold provides obstruction clearance for vehicles traveling on Hoffman Road.

Aircraft Parking Line

For ADG I (small aircraft exclusively), the standard aircraft parking area setback is 125 feet for runways with not lower than 3/4-statute mile approach visibility minimums. This setback provides the required clearance for the runway object free area, obstacle free area, and primary surface, but does not reflect clearance requirements from a parallel taxiway. The existing aircraft parking area coincides with the building restriction line (BRL), which is 250 feet east of runway centerline.

All aircraft parking on the airport is currently located on the east side of the runway, where the critical separation becomes the parallel taxiway object free area, which is 89 feet wide (44.5 feet from taxiway centerline) for ADG I. This would place the aircraft parking line at a minimum of 194.5 feet from runway centerline, based on the existing parallel taxiway-runway separation of 150 feet. This aircraft parking line exceeds ADG I standards and also protects the taxiway object free area (with 55.5 feet of additional clearance).

Runway-Parallel Taxiway Separation

For ADG I (small airplanes exclusively), the standard runway-parallel taxiway separation is 150 feet for runway with not lower than 3/4-statute mile approach visibility minimums.

AIRSIDE FACILITY REQUIREMENTS

Airside facilities are those directly related to the arrival and departure and movement of aircraft:

- **Runway**
- **Taxiways**
- **Airfield Marking and Lighting**
- **Navigational Aids**

Runway

The adequacy of the existing runway system at Independence State Airport was analyzed from a number of perspectives including runway orientation, airfield capacity, runway length, and pavement strength. From this information, the runway requirements for the airport were determined.

Runway Orientation

The orientation of runway for takeoff and landing operations is primarily a function of wind velocity and direction, combined with the ability of aircraft to operate under adverse wind conditions. Runway 16-34 at Independence State Airport is oriented in a north-south direction. As a general rule, the primary runway at an airport is oriented as closely as practical in the direction of prevailing winds. When landing and taking off, aircraft are able to maneuver on a runway as long as the wind component perpendicular to the aircraft's direction of travel (defined as crosswind) is not excessive.

The 1985 Airport Layout Plan depicts the Salem-McNary Field wind rose with the Independence Runway 16-34 alignment providing an estimated 99.1 percent wind coverage at 12 miles per hour. Wind rose data for Independence is not available, although it appears that the existing alignment is adequate. FAA planning standards indicate that an airport should be planned with the capability to operate under allowable wind conditions at least 95 percent of the time.

Runway Length

Runway 16-34 has a length of 3,070 feet. The determination of the recommended runway length is based primarily upon airport elevation, mean maximum daily temperature of the hottest month, runway gradient, and the critical aircraft type expected to use the runway.

Based on local conditions and the methodology outlined in AC 150/5325-4A, a runway length of 3,610 feet would be required to accommodate 100 percent of small aircraft (12,500 pounds or less maximum gross takeoff weight; less than 10 seats) in the general aviation fleet. For small aircraft with 10 or more seats, a length of 4,180 feet is recommended.

At a length of 3,070 feet, Runway 16-34 is capable of accommodating approximately 95 percent of the general aviation fleet under most conditions. A summary of the recommended runway lengths from the FAA computer model is presented below:

FAA Runway Lengths Recommended For Airport Design (From FAA Computer Model):

Airport Elevation: 176 feet MSL

Mean Max Temperature in Hottest Month: 83.2F

Maximum Difference in runway centerline elevation: 1 Foot

Current Runway Length: 3,070 feet (16-34)

Small Airplanes with less than 10 seats

75 percent of these airplanes 2,490 feet

95 percent of these airplanes 3,040 feet

100 percent of these airplanes 3,610 feet

Small airplanes with 10 or more seats 4,180 feet

Based on existing and forecast activity, an extension of 540 feet would increase Runway 16-34's ability to accommodate the majority of aircraft in the general aviation fleet. The existing width of 60 feet meets the recommended width for runway included in Airplane Design Group (ADG) I

Airfield Pavement

The 1985 Airport Layout Plan lists pavement strength for Runway 16-34 at 12,500 pounds (unspecified aircraft type). The surface of the runway is in good condition. The current Airport/Facility Directory, published by NOAA, lists the following pavement strength: **Runway 16-34: 12,500 lbs. (single wheel)**. The most recent pavement evaluation at Independence conducted in May 1995 yielded ratings which ranged from "poor" to "excellent." PCI ratings included:

55 (good) - Runway 16-34,

52/84/93 (fair to excellent) - Runway 16-34 Parallel Taxiway and exit taxiways;

64 (good) - Connecting taxiway to main apron,

66 (good) - main apron;

27/66/71/80 (poor to very good) taxiways to hangars.

Several areas of settling on the runway, parallel taxiway, apron were identified during a recent site inspection. These areas will require permanent repair as part of the next pavement project. The PCI's on the taxiways, runway and apron indicate that overlays will be required during the current 20-year planning period. Some of the surfaces with "good" or "very good" ratings can be maintained with periodic sealcoats and maintenance, as required, until later in the planning period. However, an evaluation of these pavements should be conducted as part of the next major pavement design project in order to determine the costs and/or benefits of deferring rehabilitation for several years.

The weights of the typical design aircraft operating at Independence State Airport are at or below 12,500 pounds. Based on the design aircraft, future pavement designs should also be based on 12,500 pound single wheel loading. As noted in the Inventory Chapter, the runway requires a program of vegetation control and crackfilling in order to extend the useful life of the pavement.

Airfield Capacity

As noted in the Inventory/Forecast Chapter, hourly and annual runway capacity at Independence is considered to be adequate through the planning period. The addition of an instrument approach procedure for the airport would increase capacity, although because the airport does not experience any significant capacity problems on an annual basis, the primary benefits would be associated with relieving congestion during peak activity periods and during poor weather conditions.

Theoretical hourly capacity is approximately 95 to 106 operations during visual flight rules (VFR). The annual service volume (ASV) for the airport is currently estimated at 92,700 operations, compared to 20-year forecasts of approximately 50,000 operations. The airport is currently operating at approximately 35 percent of its ASV. **FAA Order 5090.3B, Field Formulation of the National Airport Systems**, indicates that improvements should be considered when operations reach 60 percent of annual capacity. Based on forecast operations, the runway will continue to operate well below capacity during the twenty-year planning period. The addition of an instrument approach is expected to provide a minor increase in annual capacity, but would significantly improve capacity during IFR weather conditions, when the airport is currently closed.

Taxiways

Taxiways are constructed primarily to facilitate aircraft movements to and from the runway system. Some taxiways are necessary simply to provide access between apron and runway, while other taxiways become necessary as activity increases and safer and more efficient use of the airfield is needed. Runway 16-34 is served by a full-length parallel taxiway. The existing taxiway width of 30 feet exceeds the Airplane Design Group (ADG) I standard of 25 feet. The existing runway-parallel taxiway separation of 150 feet meets ADG I standards.

Taxiway access on the airfield is good. As the number of based aircraft in the airpark continues to increase, some taxiway improvements and upgrades may be necessary to maintain an efficient flow of aircraft movement in the runway-taxiway system, in addition to airpark taxiways. Establishing dual direction taxiways at points of congestion may be an effective way to improve flow and capacity.

The main apron currently has a single access taxiway located at the north end of the apron. Adding a second access taxiway in conjunction with an apron reconfiguration and/or expansion would

improve the flow of aircraft taxiing and reduce potential congestion during busy periods.

The hangar access taxiway located immediately north of the main apron has been identified as being too narrow and also having deep ditches located along the edges. Consideration should be given to widening the taxiway, or possibly connecting the taxiway to the north edge of the main apron to create a continuous paved surface. Reflective taxiway edge markers should also be considered.

Airfield Instrumentation and Lighting

Runway 16-34 has low-intensity runway edge lighting (LIRL). Medium-intensity runway edge lighting (MIRL) is standard for general aviation runway. Runway 34 is equipped with a tri-color approach slope indicator. Local pilots indicate that the system does not provide adequate visual guidance during nighttime or reduced visibility periods.

Runway end identifier lights (REILs) should be considered for runways without approach lights. REILs consist of two sequenced strobes which provide rapid and positive identification of the approach end of the runway. The addition of REILS and a visual guidance indicator (VGI) system would improve utilization of the runway. The Precision Approach Path Indicator (PAPI) is the standard visual guidance system approved by the FAA.

None of the taxiways on the airport are lighted. Reflective edge markers provide an economical alternative to installing edge lighting. As a longer-term option, medium-intensity taxiway edge lighting (MITL) on the parallel taxiway may be considered. Local pilots have indicated that deep ditches located adjacent to taxiways create a safety hazard during nighttime conditions. Adding reflectors or edge lighting would address this problem.

The aircraft apron and hangar areas have limited flood lighting. Flood lighting is recommended for all operations areas for improved utilization and security. Local pilots indicate a need to provide glare shielding for all airport lighting. Local pilots also indicate a need to provide obstruction/position lighting on power lines located north and west of the runway.

Navigational Aids

As noted earlier, the airport does not currently have any electronic navigational aids, although work is currently underway to design a global positioning system (GPS) instrument approach at the airport.

LANDSIDE FACILITIES

The purpose of this section is to determine the space requirements during the planning period for the following types of facilities normally associated with general aviation operations areas:

- Hangars
- Local and Itinerant Apron

Hangars

Currently, the majority of based aircraft at Independence State Airport are stored in hangars both on the airport or in the adjacent airpark. According to the most recent estimates, there are approximately 40 general aviation based aircraft at the airport and 84 aircraft located on the airpark. It is estimated that approximately 80 percent of airport-based aircraft are stored in hangars. This level of hangar utilization is expected to continue.

The number of aircraft hangars located on the airport has increased from 7 in 1985 to 29 today. Aside from the hangars which are used for aircraft maintenance or other commercial activities, it is estimated that the hangar storage capacity on the airport has increased from approximately 20 aircraft in 1985, to 45 to 50 aircraft today.

A planning standard of 1,000 square feet per based aircraft stored in hangars was used; 1,200 square feet was used as a planning standard for multi-engine aircraft. These figures were then applied to the aircraft to be hangared to determine the area to be devoted to hangar facility requirements through the planning period. The hangar needs for Independence presented in **Table 3-6** indicate that additional hangar space will be required during the planning period.

As noted earlier, the majority of the increase in based aircraft is expected to occur within the airpark. The primary facility-related improvements associated with continued airpark development will be enhancements to existing taxiways when circulation and flow are affected. The aircraft fueling area on the main apron should also be capable of accommodating increased activity.

The forecasts of on-airport based aircraft are projected to increase at a relatively low level. The growth rates for based aircraft contained in the 1996 Oregon Aviation System Plan have been retained for on-airport based aircraft. However, in order to be prepared for unexpected changes in demand, it is recommended that adequate hangar development reserves be identified for on-airport activity. Currently, several airpark residents with hangar-home combinations also use additional hangar space on the airport. If this trend continued, the anticipated increase in airpark development could also stimulate additional demand for hangar facilities on the airport. Ample reserve areas for

hangars should be identified to accommodate both current forecast increases and additional capacity to accommodate potential changes in demand.

Local and Itinerant Apron

An aircraft parking apron with adequate area should be provided for locally based aircraft which are not stored in hangars and for transient aircraft visiting the airport. Currently, the majority of locally based aircraft at Independence are stored in hangars. Independence State Airport has a paved main apron which accommodates local and itinerant aircraft. The total apron area is approximately 8,400 square yards with 18 light aircraft tiedowns. This area also accommodates itinerant parking, aircraft tiedowns, and fueling. An additional 19 tiedowns are located on a turf-surfaced area located immediately south of the apron with approximately 5,500 square yards of parking.

FAA Advisory Circular 150/5300-13 suggests a methodology by which itinerant parking requirements can be determined from knowledge of busy-day operations. At Independence State Airport, the number of itinerant spaces was determined to be approximately 30 percent of busy day itinerant operations. The FAA planning criterion of 360 square yards per itinerant aircraft was applied to the number itinerant spaces to determine future itinerant ramp requirements. Based aircraft tiedowns were planned at 300 square yards per aircraft, per FAA standards.

At Independence, parking requirements associated with based aircraft, transient aircraft, and seasonally based aircraft are considered. For the short-term, it appears that 29 tiedowns, in addition to space for corporate itinerant aircraft and itinerant rotorcraft parking would be required with approximately 14,600 square yards of apron. Long term parking requirements include 30 light aircraft tiedown positions, with corporate and rotorcraft parking, and approximately 16,200 square yards of apron. The aircraft parking area requirements are summarized in **Table 3-7**. Based on forecast demand, expansion of aircraft apron area to accommodate additional tie-downs would be required early, and again later, in the planning period. As noted with regard to hangar space, it is recommended that adequate reserve areas be identified to accommodate potential shifts in demand, which could exceed current projections.

In addition to area required for based and itinerant aircraft tiedowns, the operational areas of the apron will need to be capable of accommodating an increase in aircraft activity. The aircraft fueling area and the passenger loading/unloading area adjacent to the FBO are likely to become increasingly congested as the number of based aircraft continue to increase. As part of the alternatives analysis, a reconfiguration of the apron to allow for incremental expansion of these functional areas should be considered. Due to the configuration of the apron and the tiedowns, it may be beneficial to provide additional width for aircraft taxiing between the center double tiedown row and the back of the apron.

The potential volume of aircraft fueling activity could increase significantly in relation to the recent and projected increase in based aircraft. With congestion on the apron already existing, providing a wider taxi area would significantly improve aircraft flow and movement on the apron

SURFACE ACCESS REQUIREMENTS

The capacity of the primary airport access roadways appears to be adequate for the planning period. Vehicle access to the aircraft apron and hangar area is provided by Airport Road, which connects to Hoffman Road. Vehicle parking in the terminal area appears to be adequate; new hangar construction north of the main apron also includes limited vehicle parking.

SUPPORT FACILITIES

AVIATION FUEL STORAGE

Aviation gasoline (AVGAS) is available at Independence State Airport. The airport utilizes two underground tanks with a capacity of 12,000 gallons each of 100LL and 80/87 aviation gasoline (AVGAS). The tanks are owned by Oregon DOT-Aeronautics and will require upgrading (leak detection, monitoring) or removal to meet 1998 DEQ regulations. This issue is currently being evaluated by airport management and the fixed base operator (FBO).

The FBO indicates that annual fuel sales have averaged approximately 32,000 gallons in recent years. Based on current activity, this would average approximately 1.0 gallon of fuel sold per aircraft operation. This level of fueling activity is low, but may reflect several factors such as a higher frequency of local flight activity, fuel being purchased at other nearby airports, short distance itinerant flights or possibly private fueling of locally-based aircraft. Examples of fuel sales/aircraft operations ratios at other area airports include Salem-McNary Field: 5.2 gallons per operation; Florence Municipal Airport: 3.3 gallons per operation; and Madras City-County Airport: 8.7 gallons per operation. Grants Pass Airport 2.5 gallons per operation; and Ashland Municipal 2.9 gallons per operation.

Although these numbers vary greatly, the general indication is that the level of fueling activity at Independence is low. There appear to be no specific facility requirements constraining fuel sales at Independence.

**Table 3-6
Independence State Airport Facility Requirements**

Forecast Summary

	1996	1999	2004	2009	2014
Airport-Based Aircraft	40	42	45	47	50
Airpark-Based Aircraft	84	132	144	144	144
Total	124	174	189	191	194
Annual Operations	32773	45200	49100	49700	50400
Peak Month	4916	6780	7365	7455	7560
Design Day	164	226	246	249	252
Peak Day	222	306	333	337	341
Peak Hour	44	61	67	67	68
Design Hour	25	34	37	37	38

Facility Requirements

Aircraft to be Hangared (on airport)	32	34	36	38	40
Based Aircraft Tiedowns	8	8	9	9	10
GA Transient Aircraft Tiedowns	10	18	20	20	20
Corporate Itinerant Parking	0	1	1	2	2
Total Fixed Wing Parking	18	28	30	32	32
Itinerant Rotorcraft Parking	0	1	1	2	2
Based Aircraft Tiedown @ 300 sy ea.	2,400	2,520	2,700	2,820	3,000
GA Itinerant Aircraft Tiedown @ 360 sy ea.	3,600	6,612	7,182	7,270	7,372
Corporate Itinerant Parking @ 500 sy ea.	0	500	500	1,000	1,000
Itinerant Rotor Parking @ 550 sy ea.	0	550	550	1,100	1,100
Passenger Loading/Unloading/Fueling	1,100	2,400	2,400	2,400	2,400
Circulation	1,300	1,300	1,300	1,300	1,300
Total Parking Area**	8,400	13,882	14,632	15,890	16,172

*(**Existing Apron is approximately 8,400 square yards in area, although not all useable parking space)*

Additional Hangar Spaces	2	4	6	8
Additional Hangar Area (sf) On Airport	2,000	4,200	6,200	8,400

For the purposes of projecting fuel storage requirements, an average of 1.0 gallons of AVGAS for each aircraft operation was used. Storage requirements can be calculated based on peak month activity. In 1994, the peak month was estimated at 4,900 operations. The 1.0-gallon-per-operation average would indicate a need for the storage of approximately 4,900 gallons of fuel during the month.

In 2014, the peak month operations would be approximately 7,500 operations creating a need for approximately (7,500) gallons of fuel storage for a one-month supply period, although this total could increase substantially with higher utilization. With multiple deliveries scheduled during peak months, the existing capacity will be adequate well into the planning period. Adding additional storage capacity will be primarily dictated by market conditions. The area located adjacent to the existing tanks should be reserved for future fuel storage requirements.

The existing 24,000 gallon storage capacity is expected to be adequate well into the planning period. The efficient utilization of the existing capacity is partly due to the supplier of aviation fuel being located in Salem. The close proximity allows for frequent restocking with a timely response. In the event that fuel sales were to increase to a level more comparable to other general aviation airports, the capacity requirements would continue to be based on market conditions and the ability to be restocked.

For long-term planning purposes, the forecast volume of traffic suggests that providing a reserve for expanded fuel storage would be appropriate. A second 10,000 to 12,000 gallon AVGAS tank may be justified at a point when volume of aircraft operations and fuel sales increase. The decision to provide additional capacity is a function of the market, and specifically, the economics of more frequent restocking versus the expense of adding increased storage.

Adequate above-ground reserve areas should also be maintained in the event that the existing underground storage tanks are removed and new above ground tanks are required.

No jet fuel storage exists or appears to be required at Independence at this time.

AIRPORT UTILITIES

The airport has electrical service provided by Pacific Power & Light. Water and sewer service at the airport is provided by the City of Independence. For most hangars, electrical and water service is adequate. Sewer service may be desirable for larger users, although demand at airports is generally low due to the cost of extending service.

SECURITY

The airport has limited chain-link fencing between the main apron and airport access roadway. Upgraded airport perimeter fencing should be considered to protect all active airport areas including runway, taxiways, and aircraft tie-down and hangar areas. Additional flood lighting should be provided (with glare protection) around the aircraft parking apron and hangar areas to maintain adequate security.

OTHER FACILITIES

The lack of public restrooms at the airport has been identified as a primary facility requirement. The FBO/airport restaurant has restrooms available for customers. Options for funding and maintaining restrooms or self-contained portable toilets, should be explored by airport management, local user groups, and community leaders.

A public pay telephone is located near the main apron. This is considered adequate for current and projected use.

FACILITY REQUIREMENTS SUMMARY

A number of facilities requirements for Independence State Airport have been identified for the current twenty-year planning period. Overall facility requirements have been summarized in **Table 3-7**. Some facilities will be capable of accommodating forecast demands through the planning period; other facilities will require upgrading during the planning period. The next step in the planning process is to analyze alternatives that can accommodate these requirements. The next chapter will provide this analysis and recommend specific development alternatives for which are capable of accommodating projected demands through the twenty-year planning period and beyond.

The anticipated growth within the airpark has been identified as a source of increased aircraft-related activity. This activity, combined with on-airport activity, will place additional demands on the runway-taxiway system, and support improvements in runway lighting, taxiway marking, and pavement management. Other facilities such as fuel dispensing may require expansion as peak period activity increases. Taxiway improvements, including aircraft holding areas and by-pass taxiways may also be required as demands increase.

Land acquisition to preserve long-term aviation use of the airport and adjacent areas should be considered. As noted earlier, the remaining undeveloped land located on the east side of the runway

is relatively limited. This land area is expected to be developed within the current planning period, or shortly thereafter. For this reason, it would be prudent to acquire property as soon as possible in order to provide the greatest amount of flexibility possible in accommodating future development. An area of approximately 41 acres bordering the west side of the airport would provide a development area comparable (in depth) to the east side hangar and apron area. This land is currently zoned exclusive farm use (EFU) and is located outside the city limits and urban growth boundary. Acquiring this property to preserve potential airport development options will help the airport to address long-term needs which extend well beyond the current planning period. Land acquisition would also be needed to accommodate a future runway/parallel taxiway extension, runway safety area extension, and relocated runway protection zone.

Table 3-7
FACILITY REQUIREMENTS SUMMARY
Independence State Airport

	<u>SHORT-TERM</u>	<u>LONG-TERM</u>
LAND	Acquire Property for Rwy Extension and RPZ	West Side Development Reserve
RUNWAY	540-foot Extension Sealcoat or Overlay	Pavement Maintenance Program
TAXIWAYS	540-foot Extension Overlay or Sealcoat P.Txy 2nd Access Txy to Main Apron	Pavement Maintenance Program Hangar Access Txy
	South Hangar Access Txy. Airpark Txy Connector	
APRONS	Expand Main Apron; Main Apron Overlay or Sealcoat	Pavement Maintenance Program
HANGARS	T-Hangar and Conventional Hangar Lease Area	T-Hangar and Conventional Hangar Lease Area Reserves
NAVAIDS	GPS Nonprecision Approach ASOS/AWOS	None
LIGHTING	MIRL; Taxiway Edge Reflectors PAPI, REIL (Rwy 16 & 34) Lighted Wind Cones, Reloc. Beacon	MITL - Parallel Txy
ROADWAYS	None	West Side Ag Area
FUEL STORAGE	Upgrade or Replace Existing UST	Fuel Storage Reserve
SECURITY	Security Fencing	Apron Flood Lighting
BUILDINGS	Public Restrooms	None
UTILITIES	Extend Water & Electrical connection to new hangars	Same



Chapter Four

AIRPORT DEVELOPMENT ALTERNATIVES AND AIRPORT LAYOUT PLAN

The following descriptions provide an overview of development options and issues addressed in the Independence State Airport Layout Plan Study. The initial development concepts were general in nature, with the emphasis being placed on identifying overall facility needs at the airport. The options can accommodate forecast facility needs at the airport during the current twenty year planning period.

Overview

The evaluation phase of the Airport Layout Plan Update project began with preliminary development concepts (Figure 1) being presented at a public meeting in Independence. The process of identifying and evaluating airport needs provided an opportunity for the local community to be directly involved with planning of airport improvements. Airport users, the general public, the City of Independence and Oregon Department of Transportation - Aeronautics each provided input regarding the development concepts, which allowed for the refinement of alternatives. Based on the facility requirements analyses, several facility needs were identified. Included among the highest priorities was the 540-foot extension of the airport's runway (Runway 16-34), expansion of the aircraft apron; resurfacing existing runway, taxiway, and apron pavements, establishment of a global positioning (GPS) system instrument approach; and upgrading runway lighting and visual approach aids.

Airpark-Airport Development

The relationship between the airport and the privately-owned airpark development has grown in recent years. Airpark residential-hangar developments are projected to account for the majority of new based aircraft at Independence during the current twenty-year planning period. The existing east-side airpark is expected to be fully developed within the current 20-year planning period. Additional expansion of airpark lots has also occurred on the north end of the development and the 22-acre parcel located south of the airpark is also being planned for airpark development. This type of development is compatible with the available airport facilities

Some improvements in the airport-airpark interface will be required during the current planning period. One such improvement will be the addition of a second taxiway connector into the airpark. This connection will allow directional taxiing of aircraft on separate taxiways. As the number of based aircraft in the airpark increases, the potential for congestion will also increase; adding a bypass taxiway and aircraft pull out areas can help to promote efficient aircraft flow.

Runway-Taxiway System

As noted in the Facility Requirements analyses, a 540-foot extension of Runway 16-34, would be needed to accommodate 100 percent of the small airplane general aviation fleet. This increase in runway length would not enable the airport to accommodate significantly larger aircraft, but would provide an added margin of safety for the type of aircraft currently operating at the airport.

The 1985 Airport Layout Plan depicted a 700-foot extension on the north end of the runway. The recommendation for a north-end extension has been reviewed and found to be the best option available; however, a 700-foot extension exceeds projected aircraft requirements.

The existing parallel taxiway would also be extended, with an aircraft holding area added, in conjunction with the 540-foot runway extension. The runway safety area (120 feet wide) would need to be extended 240 feet beyond the runway end to meet the ADG I standard. Additional property will be required to accommodate the extended safety area. The airport should also acquire property or an aviation easement as soon as possible to protect the future runway protection zone.

As noted in the facility requirements analysis, the existing low-intensity runway edge lights and tricolor visual approach indicator, would be upgraded to meet the current standard (medium intensity lighting and precision approach path indicators [PAPI])

Independence State Airport
Proposed Improvement Projects

3-4-97

Key to Accompany 11 x 17 drawing

1. Runway/Taxiway Extension.
2. Property Acquisition for Runway/Taxiway and RPZ to 15' height.
3. Avigation Easement for RPZ beyond that already held.
4. Future Residential Airpark in planning stage.
5. Create one-way circular access to airpark to improve aircraft circulation.
6. Auto parking expansion.
7. Public Restroom.
8. Fuel tank and service area expansion.
9. Apron/Tiedown Expansion.
10. Helicopter parking.
11. Hangar development sites.
12. Hangar development sites.
13. Agricultural Aviation loading/use area.
14. Property acquisition and zone change from EFU to Airport Related for future FBO/Tiedowns/Hangars.
15. Potential zone change from EFU to Residential Airpark. *
16. Potential future privately constructed taxiway to be deeded to state. *
17. Potential future privately constructed road to be deeded to city. *
18. Potential future 2450' x 200' un-marked turf landing area for antique aircraft. *

Notes: (1) See also Table 3-7 which lists other airport improvement items.
(2) Items with asterisk (*) requested by airport user group long range planning committee.

Other Improvements

A primary focus of the airport alternatives at Independence State Airport is providing areas for aircraft parking apron and hangar expansion. Despite the division of based aircraft between the airpark and the airport, the main apron is used by most aircraft. The existing aircraft apron can experience congestion during busy periods. It is anticipated that as the number of overall based aircraft increase, activity on the apron, particularly aircraft fueling, will also increase. A reconfiguration of the apron, with an expanded aircraft fueling area and an increase in light aircraft tiedowns, has been identified as a primary terminal need.

The existing apron would be extended to the south, and west, toward the parallel taxiway. The existing aircraft parking line coincides with the building restriction line (250 feet from runway centerline). Based on Design Group I standards for small aircraft, the aircraft parking line can be located approximately 194.5 feet east of the runway centerline. This distance will provide the required 44.5 feet of clearance from the parallel taxiway centerline and a fixed/moveable object (parked aircraft). The additional apron depth will allow an outer single row of tiedowns and an interior double row of tiedowns; the rear section of the apron would be available for FBO use, aircraft fueling, and existing/future aircraft hangars located behind the apron. A second access taxiway would be added at the south end of the apron to improve aircraft circulation. Additional apron flood lighting (with glare protection) should be provided on the expanded apron.

As noted earlier, a larger clear area for aircraft fueling should be protected on the apron. The existing location of the fuel tanks and dispensing equipment is adequate. The existing underground fuel storage tanks have adequate capacity to accommodate existing and projected demand. The ability to have frequent restocking from fuel suppliers in Salem significantly reduces the need to construct additional capacity. The reconfiguration/expansion of the fueling area should be coordinated with other recommended terminal area improvements, including public restrooms, expanded vehicle parking, itinerant aircraft parking, and passenger loading/unloading areas for the FBO.

Itinerant helicopter parking areas have been identified for the area near the south end of the main apron. This location will provide adequate separation between helicopters and fixed-wing aircraft parking, and can also access other landside facilities on the east side of the airport.

The alternative shows additional space for conventional hangars at the southeast corner of the airport. This area can accommodate the demand for hangar space that is currently forecast. However, because this area represents the last remaining part of the airport that can accommodate significant aviation expansion, it is important that this area be preserved for aviation-related use. Additional hangar space is also identified along the east side of the expanded main apron.

A grass-surfaced area located along the west side of the runway has been identified for potential use by antique aircraft. This area could be accommodated without displacing any other airfield facilities.

An agricultural aircraft operating area has been identified near the southwest corner of the airport. This potential use was also identified on the 1985 Airport Layout Plan. These facilities could tie into a potential west-side airpark development, should that occur.

Several items have been noted regarding the potential west side airpark. For example, if west side development is proposed in the future, a west side parallel taxiway reserve should also be established. Additional taxiway connections and access roads would be required to accommodate west-side development. If airpark development occurred on the west side of the runway, a second fixed base operator/fueling site should be reserved. Expansion of airport property would be required to accommodate the airside/landside facilities, particularly on-airport tiedowns and hangars.

The preferred alternative is depicted on the Airport Layout Plan (ALP) drawing, described below. The improvements identified on the ALP reflect the facility requirements previously identified, input provided by airport users, and the options selected by the airport sponsor, Oregon DOT-Aeronautics.

AIRPORT LAYOUT PLAN DRAWINGS

In the Alternatives section, options were evaluated for the long-term development of Independence State Airport. This effort resulted in the selection of the Preferred Alternative. The purpose of this section is to describe in narrative and graphic form, the recommended development through the 20-year planning period. A set of plans, referred to in the aggregate as the **Airport Layout Plans**, has been prepared to graphically depict recommendations for airfield layout, land use, and the identification and possible disposition of obstructions in the runway protection zones (RPZs) or approach surfaces. This set of plans, prepared pursuant to guidelines established by the Federal Aviation Administration (FAA), includes:

- *Airport Layout Plan*
- *Part 77 Airspace Plan*
- *Land-Use Plan with 20-year Noise Contours*

AIRPORT LAYOUT PLAN

The Airport Layout Plan (ALP) presents the existing and ultimate airport layout and depicts the recommended improvements which will enable the airport to meet forecast aviation demand. Detailed

airport and runway data are provided on the ALP to facilitate the interpretation of the planning recommendations. Runway and Airport Data tables provide additional information on existing conditions and dimensions. The McNary Field wind rose was added to illustrate the approximate wind conditions in relation to the runway alignment at Independence. The 160-340 degree runway alignment provides wind coverage in excess of 95 percent at 10.5 knots/12 miles per hour.

The ALP shows a number of improvements for both the airside and landside areas of the airport. It should be noted that the improvements depicted on the ALP, reflect all major airfield developments recommended during the current 20-year planning period. Decisions made by the airport sponsor, regarding the actual scheduling of projects will be based on specific demand and the availability of funding.

The ALP depicts an ultimate runway 3,610 by 60 feet, with dimensional standards based on ADG I standards. The runway/parallel taxiway extension will be located at the north end of the runway. The northern airport property line is located approximately 200 feet beyond the runway end; additional property will be required to accommodate the full length (540 feet) extension and the extended runway safety area (240 feet). Total property acquisition at the north end of the airport is estimated at 18.7 acres, including the physical development area and 8.035 acres within the runway protection zone (RPZ).

The ALP also identifies recommended upgrades in runway edge lighting, taxiway reflectors, taxiway lighting, visual guidance indicators, and GPS instrument approach.

Expansion of the aircraft apron will provide additional light aircraft tiedowns, itinerant corporate aircraft parking, and an expansion of the aircraft fueling area. The apron will include a single row of tail-in tiedowns located at the outer edge, with a row of tail-to-tail tiedowns in the center of the apron. The taxilane located between the center row of tiedowns and the back of the apron will be widened to approximately 100 feet in order to provide improved aircraft taxiing through the tiedown and fueling areas. A second access taxiway connecting to the parallel taxiway is located near the south end of the expanded apron. Designated helicopter parking areas are identified near the south end of the expanded apron.

Improvements in hangar taxiway access include an extension of a second taxiway into the airpark. This will permit simultaneous aircraft taxiing between the airpark and the airport. A new hangar area is identified for the southeast corner of the airport; a 400-foot taxiway extension will be required to access this area. Individual 350-foot hangar taxilanes can be added as demand occurs. The west-side agricultural operations area is identified for the southwest corner of the airport. This development is intended to accommodate aerial applicator operations including equipment storage, aircraft parking and the storage, mixing and loading of chemicals. The area will require taxiway access to the runway

and a new vehicle access road from Hoffman Road. A small aircraft apron would also be developed to support ground operations. All operations areas will need to meet DEQ and EPA standards for site containment, spill prevention, etc.

A 41 acre aviation development reserve is identified on the west side of the airport. Acquisition of this area is intended to protect the long-term viability of the airport by providing additional expansion on-airport opportunities. With the remaining east-side development space expected to be used during the current twenty-year planning period, this west side development reserve is the best option available to preserve continued aviation use of the site while limiting future "through-the-fence" activities to airpark-type residential development. Failing to protect this land in the near term could result in it being developed in residential use, which has occurred other nearby areas (immediately south of Hoffman Road, within 900 feet of the runway).

Beyond the extension and resurfacing of Runway 16-34 and the parallel taxiway, the primary airside improvements include precision approach path indicators (PAPI) and runway end identifier lighting (REIL). The existing low intensity runway lighting (LIRL) and the visual guidance indicator on Runway 34 will be replaced/upgraded.

The main apron is identified for reconfiguration and expansion, with the aircraft fueling area being expanded to accommodate multiple aircraft without creating bottlenecks in the tiedown areas. A second connecting taxiway will be added to the main apron to improve aircraft movement and flow. The expanded apron area is capable of accommodating aircraft parking requirements for the current planning period and beyond. Expansion reserves are identified for the areas not required to accommodate the 20-year projections.

An aviation development reserve (approximately 41 acres) has been identified for the area located along the west side of Runway 16-34. Surface access to this area would be required as part of the initial development.

PART 77 AIRSPACE PLAN

The Part 77 Airspace Plan for Independence State Airport, depicted in **Drawing 2**, was developed based on Federal Aviation Regulations (FARs) **Part 77, Objects Affecting Navigable Airspace**. The plan provides the plan view of the ultimate imaginary surfaces for the airport and identifies the airspace and approaches to each runway end to protect them from encroachment by obstructions which would affect safe airport operations. By comparing the elevations of the imaginary surfaces with the surrounding terrain, obstructions to navigable airspace were identified. The surface heights, angles, and radii are determined by the runway type and instrumentation. The Airspace Plan reflects **Part 77**

critical surfaces for the recommended airfield development and identifies those obstructions which penetrate the surfaces.

None of the runway approaches (existing or future) at Independence State Airport are affected by terrain penetrations. The standard approach surface for Runway 34 is penetrated by vehicles traveling on Hoffman Road. Based on standard FAR Part 77 analyses, there is an 8.3-foot penetration to the 20:1 approach surface. The road elevation of 178.6 feet is slightly higher than the Runway 34 threshold (174.6 feet) and is located as near as 415 feet from the runway end. However, by utilizing the methodology contained in FAA Advisory Circular 150/5300-13, Change 4, an alternative approach slope location based on the threshold of the runway can meet the 20:1 standard.

Overhead powerlines located on the west side of the runway are listed as obstructions to the existing Runway 34 end transitional surface and the future Runway 16 approach and transitional surface.

LAND-USE PLAN

The Airport Land-Use and Zoning Plan, **Drawing 3**, for Independence State Airport depicts existing zoning in the immediate vicinity of the airport, which is under the jurisdiction of the City of Independence and Polk County. The bulk of the Independence State Airport property is located in Polk County's jurisdiction. This area is zoned Polk County Public Amusement and Recreation (PA), with an Airport Development District Overlay. A portion of the airport, east of the runway, is located within the City of Independence, and as such is subject to that City's planning jurisdiction. The primary zoning of this portion of the site is Single-family Residential (RS), and it is overlain with the Airport Development (AD) District. FAR Part 77 imaginary surfaces are protected through zoning provisions in both the City and County planning documents.

Other uses in the vicinity include a Boise Cascade log pond, and manufacturing types of uses, southeast of the airfield in the Heavy Industrial (HI) Zone; a Medium Density Residential development to the southwest; and a proposed 22 acre residential development in the RS Zone near the site's southwest corner, between Airport and Striker Roads

The Airport Development District is an Overlay Zone which is placed over top the County PA Zoning at this location. The Polk County Zoning Ordinance (PCZO) provides that aviation-related structures, uses and activities are permitted outright in the Airport Development District, subject to the specific limitations of the section.

The portion of the airport which is located within the Independence City Limits is subject to the property development standards of the underlying RS Zone.

Noise Contours

The current noise contours are depicted on the Land Use Plan to provide a general indication of existing noise exposure. The 65 DNL contours contained almost entirely within airport property boundaries, with small portion extending along the airport's edges. A portion of the 65 DNL extends into the airpark.

A portion of the current 60 DNL contour extends beyond airport property north and south of the airport, and beyond the east and west edges of the airport. A larger portion of the airpark is located within the 60 DNL contour. The current 55 DNL contour extends 3,000 to 3,500 feet beyond airport property to north and south; and 400 to 500 feet beyond the eastern and western airport boundaries. A portion of the residential area (near Luke Street) located immediately southwest of the airport is contained within the 55 DNL contour.

Each of these noise contours is projected to increase in size during the current planning period based on the forecast increase in aircraft takeoffs and landings. Effective land use planning measures should be taken to prevent incompatible land uses (i.e., residential) from moving closer to the airport.

Based on FAA noise compatibility planning standards and existing zoning, no conflicts exist between airport noise and existing land use. All land uses are compatible with noise levels of 65 DNL and lower. In addition to federal guidelines, the State of Oregon DEQ has corresponding guidelines for noise compatibility and requires that an "Airport Noise Impact Boundary" be provided, with contours down to 55 DNL. While 55 DNL establishes the parameters of the study area, noise-sensitive land uses located in areas with impacts below 65 DNL are considered compatible with aviation activity. Like the FAA, DEQ recommends noise mitigation measures for land uses lying in areas with impacts exceeding 65 DNL.



Chapter Five **CAPITAL IMPROVEMENT PROGRAM**

The previous chapters in the Airport Layout Plan Report have established the facility needs and recommended plans for Independence State Airport through the twenty-year planning period. The purpose of this chapter is to provide an implementation program by which the recommendations can be realized in an effective and economical manner. The following sections present development schedules and construction cost summaries for the development projects and financing options for capital improvements.

The cost of providing needed facilities at the airport will not be borne solely by the Oregon DOT Aeronautics. Several sources for development funding exist, including the Federal Aviation Administration (FAA), the local community (i.e. City of Independence, Polk County, local Airpark Association), and airport users. Historically, Independence State Airport has benefitted from an active user base, particularly with the local airpark association.

As proposed, ODOT Aeronautics and the local community would each be responsible for providing approximately 5 percent of the total development cost during the planning period, with the balance of project costs being eligible for federal funding. Hangar development on the airport has historically been privately funded; this is expected to continue.

The primary source for airport development funding is aviation users, both locally and nationally. Typically, FAA grants fund 90 percent of eligible projects at airports such as Independence State Airport. These grant funds are derived from user fees deposited in the National Aviation Trust Fund. Since 1982, the federal **Airport Improvement Program (AIP)** has been the legislation authorizing

the dissemination and use of these funds. The funds are collected through excise taxes on airline tickets, aviation fuel, accessories, aircraft registrations, and other aviation uses. AIP funding levels have been cut for several consecutive years by Congress, while demand for funds continues to increase. The result has been that many airport improvement projects have been deferred, particularly at smaller airports. For ODOT Aeronautics, with more than 30 airports to operate and improve, recent funding levels have permitted only one major development project per year.

The current method of funding general aviation airport projects is to consolidate several smaller projects into a single, larger grant. This approach has been used successfully by ODOT Aeronautics at Joseph, John Day and Cottage Grove. This type of approach is anticipated for Independence. This consolidation of projects results in significant facility upgrades for an airport, although it also normally indicates that there will be no other large project funding for several years.

AIRPORT DEVELOPMENT SCHEDULES AND COST SUMMARIES

Prior to formulation of the development schedules, the cost of each proposed improvement has been estimated. The figures used for all development items throughout the planning period are expressed in 1997 dollars and include 30 percent overhead for administration, engineering, and contingencies. For future implementation of this plan, airport management can convert the 1997-based figures by adjusting for subsequent inflation. The interim change in the **United States Consumer Price Index (USCPI)** can be used to estimate future costs by using the following formula to yield a multiplier ratio:

$$\frac{X}{160.1} = Y$$

Where:

X	=	USCPI in any given future year
160.1	=	USCPI in May 1997 (1982-84 = 100)
Y	=	Conversion factor

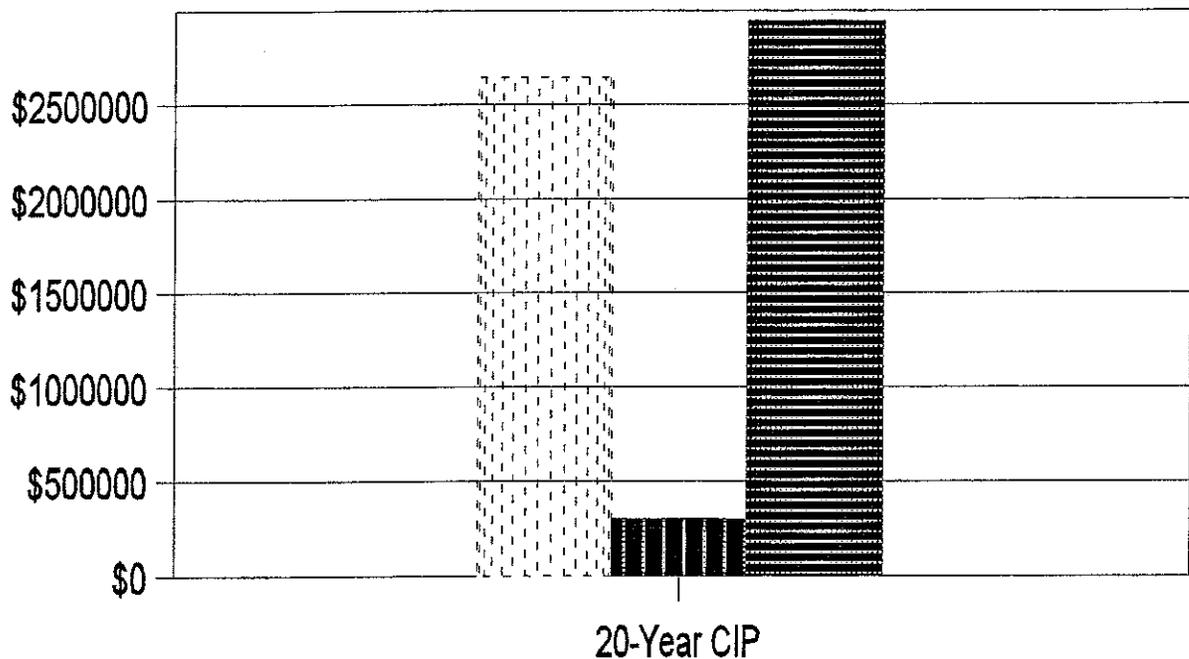
Dividing the future **CPI** by the 1997 **CPI** provides a conversion factor (Y) which, in turn, is multiplied by the 1997-based cost estimates to provide appropriate amounts in any future re-evaluation. Only national **CPI** data should be used, as local or regional indices may vary. Consumer Price Index information may be obtained from the U.S. Bureau of Labor Statistics and the economic research units of most commercial banks and councils of governments.

The following sections outline the recommended development program and detailed funding distribution assumptions. The scheduling has been prepared in accordance with facility requirements determined earlier, as well as with economic feasibility. It should be remembered that, in addition to

funding considerations, airport development should take place in response to demonstrated demands or actual activity, rather than according to a fixed time frame corresponding to forecasts of future activity. Therefore, should significant variations from forecast trends occur, facility development scheduling may have to be adjusted in the future.

The prioritized schedules have been divided into two stages--Short Term and Long Term--covering the entire planning period. **Table 5-1** shows that the total cost of developing Independence State Airport to meet forecast needs will total approximately \$2,945,000 by the year 2016.

20-Year CIP Independence State Airport



FAA	\$2642850
State/Local	\$300410
Total	\$2943260

The short-term projects are generally associated with improvements to the runway-taxiway system and aircraft parking apron. Property acquisition is identified for the runway extension, approximately 7.15 acres in the existing Runway 34 protection zone (RPZ), and also preservation of the undeveloped property west of the airport. Preservation of the west-side property is considered to be very important

to the future of the airport. The majority of existing on-airport undeveloped property will be used by the end of the planning period. Acquiring the property would provide both short- and long-term benefits: protection from the encroachment of incompatible land uses on the airport's western border, and providing for the very long-term development needs of the airport.

Long-term projects address several incremental improvements to facilities, a number of pavement management projects, and development of an agricultural operator area on the west side of the runway. Other projects include expanded auto parking and fencing.

Table 5-1 - Independence State Airport

20-Year Capital Improvement Program			
Short Term Projects	Project Cost	FAA Eligible	State/Local
PROPERTY ACQUISITION-NORTH (18 acres @ \$5,000/ac.)	\$90,000	\$81,000	\$9,000
ENVIRONMENTAL ASSESSMENT (Rwy Extension)	\$35,000	\$31,500	\$3,500
PROPERTY ACQUISITION - Runway 34 Protection Zone (7 15 acres @ \$20,000/ac.)	\$143,000	\$128,700	\$14,300
PROPERTY ACQUISITION-WEST (41 acres @ \$5,000/ac.)	\$205,000	\$184,500	\$20,500
RUNWAY/PARALLEL TAXIWAY EXTENSION (540 feet)	\$202,800	\$182,520	\$20,280
MAIN APRON EXPANSION (16,000sy)	\$539,500	\$485,550	\$53,950
SOUTH HANGAR TAXIWAY	\$111,800	\$100,620	\$11,180
AIRPARK TAXIWAY CONNECTION	\$6,760	\$0	\$6,760
RUNWAY OVERLAY (3,060x60')	\$149,500	\$134,550	\$14,950
PARALLEL TAXIWAY OVERLAY (3,060x30)	\$96,200	\$86,580	\$9,620
MAIN APRON OVERLAY (380x210)	\$67,600	\$60,840	\$6,760
MIRL (3,610') & ELECTRICAL BLDG	\$137,800	\$124,020	\$13,780
PAPI (Rwy 16&34)	\$39,000	\$35,100	\$3,900
RELOCATE AIRPORT BEACON	\$11,700	\$10,530	\$1,170
PARALLEL TAXIWAY REFLECTORS (3,610 LF)	\$9,100	\$8,190	\$910
AUTOMATED WEATHER STATION	\$65,000	\$58,500	\$6,500
TOTAL SHORT TERM	\$1,909,760	\$1,712,700	\$197,060

Long Term Projects	Project Cost	FAA Eligible	State/Local
AIRPORT FENCING (3,000 lf)	\$58,500	\$52,650	\$5,850
SOUTH HANGAR SITE PREP/AUTO PKG	\$132,600	\$119,340	\$13,260
NORTH HANGAR TAXILANES OVERLAY	\$31,200	\$28,080	\$3,120
REILS (Rwy 16&34)	\$36,400	\$32,760	\$3,640
RUNWAY SEALCOAT (3,610X60)	\$40,300	\$36,270	\$4,030
PARALLEL TAXIWAY SEALCOAT (3,610X30)	\$19,500	\$17,550	\$1,950
APRON SEALCOAT	\$44,200	\$39,780	\$4,420
HELIPADS	\$29,250	\$26,325	\$2,925
NORTH HANGAR AREA SEALCOAT	\$6,500	\$5,850	\$650
AUTO PARKING EXPANSION	\$46,800	\$42,120	\$4,680
AG. AREA PHASE I	\$149,500	\$134,550	\$14,950
RUNWAY SEALCOAT (3,610X60)	\$40,300	\$36,270	\$4,030
PARALLEL TAXIWAY SEALCOAT (3,610X30)	\$19,500	\$17,550	\$1,950
APRON SEALCOAT	\$44,200	\$39,780	\$4,420
AIRPORT FENCING (4,000 lf)	\$78,000	\$70,200	\$7,800
AG AREA PHASE II	\$87,800	\$79,020	\$8,780
SOUTH HANGAR TAXIWAY SEALCOAT	\$5,200	\$4,680	\$520
MITL (3,610 feet)	\$59,750	\$53,775	\$5,975
RUNWAY SEALCOAT (3,610X60)	\$40,300	\$36,270	\$4,030
PARALLEL TAXIWAY SEALCOAT (3,610X30)	\$19,500	\$17,550	\$1,950
APRON SEALCOAT	\$44,200	\$39,780	\$4,420
TOTAL LONG TERM PROJECTS	\$1,033,500	\$930,150	\$103,350

TOTAL SHORT TERM & LONG TERM PROJECTS \$2,943,260 \$2,642,850 \$300,410

AIRPORT CAPITAL IMPROVEMENTS FINANCING

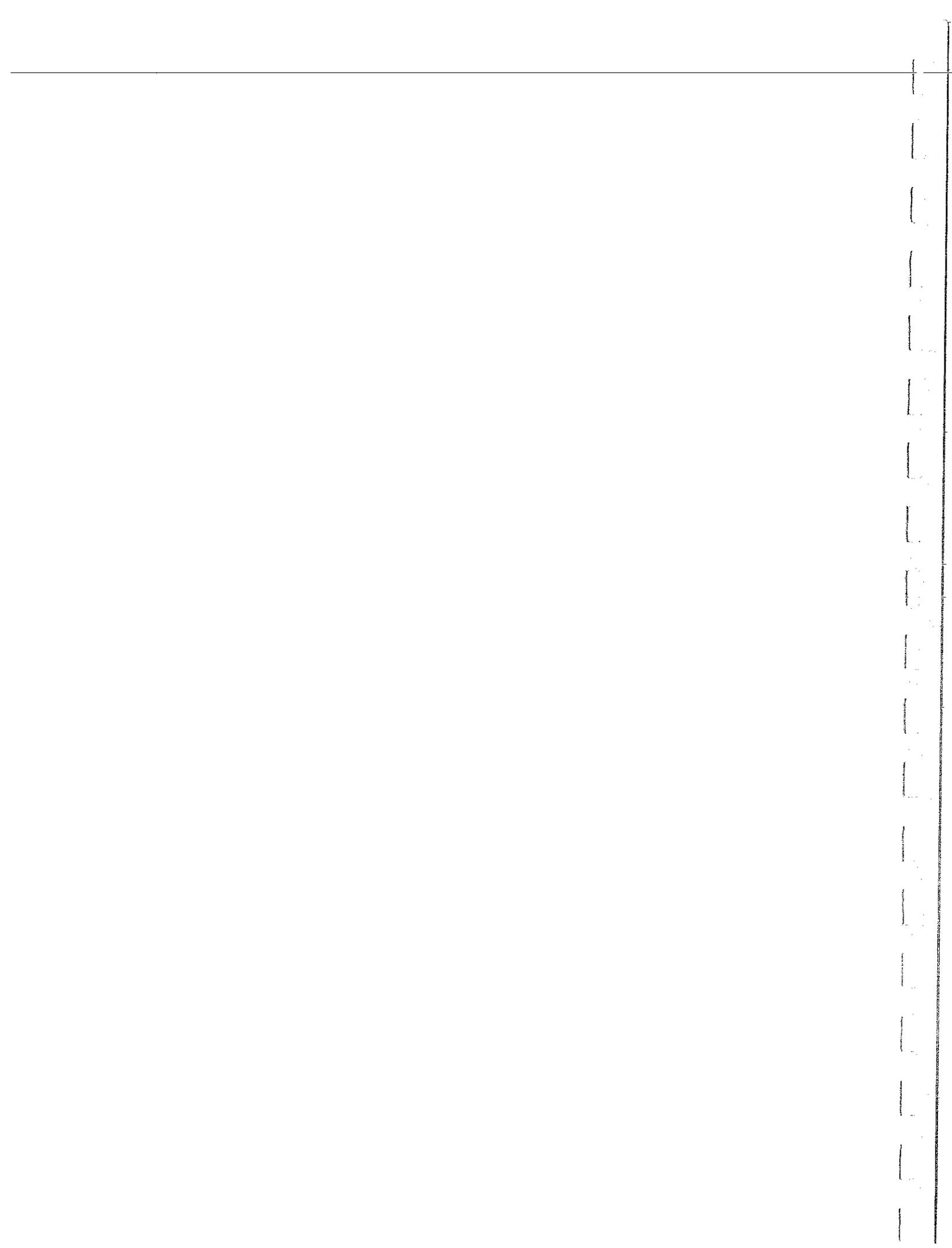
While the primary responsibility for financing capital facility development rests with the sponsor, there are a number of sources from which airport development funds can be derived. Money for capital improvements may come from a number of sources and may be used singly or in combination to accomplish airport development. Sources for financing airport facilities include the FAA's Airport Improvement Program (AIP), state economic development funds, private donations, lease-backs, direct revenue loans, and certificates of participation. Local participation, donations of equipment, labor, and materials can also contribute to the implementation of the capital program.

As a state owned airport, the capital improvement program for Independence is managed by the Oregon Department of Transportation Aeronautics. Improvements at Independence State, along with the needs of more than 30 other state owned community airports are balanced as funds are available. Demand for facility improvements far exceeds annual funding; the result is that many facility needs are deferred over extended periods until funding can be obtained. The state also looks to local communities for support in funding capital improvements.

FAA funds for airport development, which are derived from user fees, are available for land acquisition, construction, alteration, fire fighting, and crash rescue vehicles and facilities, as well as for establishing and improving air navigation facilities. Publicly-owned airports are eligible for such aid provided the proposed project is included in the National Plan. The federal share of these projects in Oregon is 90 percent of eligible costs as outlined above.

THIRD-PARTY SUPPORT

ODOT Aeronautics, the City of Independence and Polk County have a strong interest in continued private support and development of Independence State Airport. The airport has also received support from the Airpark Association in past years in exchange for airfield access. As business and industry benefit from the use of the airport, they should also be encouraged to invest in additional improvements, including hangars on leased land parcels. This type of support lowers the sponsor's overall cost of providing facilities needed for the airport, while providing opportunities for private investment. In addition to improving the financial outlook for development and operation, it also stimulates civic participation and pride in the airport. As the only publicly-owned airport in Polk County, Independence State Airport plays an important role in the economic health of the region.



GAZELEY & ASSOCIATES

10880 SW Matzen Drive • Wilsonville, OR 97070 • (503) 682-8799 • FAX (503) 685-9433

July 21, 1997

Gary Viehdorfer
Oregon Aeronautics
3040 25th St., SE
Salem, OR 97310

Gary,

We have completed a review of environmental conditions, incorporating the National Environmental Policy Act (NEPA) environmental impact elements, in the immediate vicinity of Independence State Airport. This information is to be incorporated into the current Airport Layout Plan which is being performed by Aron Faegre & Associates, by whom we have been commissioned on a subcontract basis for this environmental review.

No significant environmental impediments have been identified in our review as affecting the planned improvements to the airfield. The airstrip is surrounded by predominantly agricultural, industrial and residential land uses, and is in an area which has been largely developed and manipulated by human activity. While potential noise impacts were not a part of our scope of review, we note that existing and pending residential development in the vicinity of the airport may be affected by increased aviation activities. City Planning Staff voiced concern regarding the present number and frequency of overflights over the City of Independence. Mike Danko, City Planner, stated that he understands the airport to be at about 25 percent capacity for numbers of aircraft currently facilitated. He speculated that citizens may, at some point, become active in seeking a decrease in overflights over the city, as usage of the airstrip increases.

Please note that letters have been sent to the Oregon Department of Environmental Quality, Water Quality Division, and U.S. Department of Interior's Fish and Wildlife Service regarding this project, but responses from those agencies have not been received. The consultant recommends considering and incorporating, as appropriate, any input from those agencies into the airport improvement efforts. From research and personal communications with various agencies and planning officials, we have gathered the following environmental data of record which are worthy of note while proceeding with airport improvements: The area is in attainment for air quality. Water quality concerns, if any are raised in future correspondence from DEQ, should be addressed by the sponsor (none were raised in personal communication with appropriate DEQ Staff). At a minimum, DEQ generally requires that airport improvements provide appropriate consideration for: A) The handling of runoff from pesticide and agriculture-related spray down areas; B) The handling of de-icing agents and other potentially hazardous substances; and C) Stormwater runoff, including the requirement for a National Pollutant Discharge Elimination Systems (NPDES) Permit for projects affecting an area of five (5) acres or greater.

Gary Viehdorfer
Re: Independence S.A.
July 21, 1997
Page 2

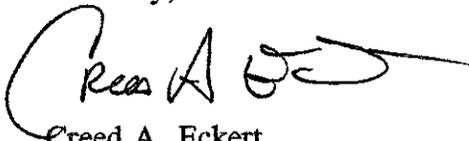
The Oregon State Historic Preservation Office (SHPO) has identified cultural resource sites of record along Ash Creek in the City of Independence and in Polk County; however, no sites have been identified which would be affected by the planned airport improvements.

A representative of the Oregon Department of Fish and Wildlife (ODFW) stated that no biological survey of the airport property is known to exist. This representative stated to the consultant that it is unlikely that any significant species of wildlife are located on or very near the airfield; however, ODFW generally recommends that a biological survey be completed prior to construction taking place. ODFW has provided a list of species of fauna (animals) which are listed as "Sensitive", "Threatened" or "Endangered" in the State of Oregon. Information regarding whether these or other State-protected species of flora or fauna are known to inhabit the vicinity of the airport property may be obtained from the Oregon Natural Heritage Program for a reasonable cost. The USFWS is forwarding information regarding any Federally-listed Threatened or Endangered Species which may have been recorded in the area.

No jurisdictional wetlands appear to lie on the airport property, by the consultant's interpretation of the National Wetlands Inventory, although soils on the site are listed as hydric soils and wetlands may be possible on the property. No further study is required, though the sponsor may consider having a professional wetlands determination performed. In the event that wetlands are identified on the agricultural lands north of the airfield, where the runway extension is planned, this area would likely be exempt from any wetlands regulation due to its historic agricultural use.

No environmental factors identified in this review would appear to represent an obvious significant impediment to the implementation of the Preferred Alternative at Independence State Airport. This evaluation does not include potential noise impacts or significant analysis beyond the scope of our contract. Thank you for the opportunity to investigate these matters.

Sincerely,



Creed A. Eckert,
Environmental Planner

c: Aron Faegre & Associates

attachment

List of Contacts, Independence State Airport
ALP - Environmental Review Element

<u>Agency, Contact {if avail}</u>	<u>Phone Conversation(s)</u>	<u>Letter Sent</u>
City of Independence, Mike Danko	X	
DEQ, Air Quality, Howard Harris, Annette Liebe	X	
DEQ, Water Quality, Raghu Namburi	X	X
SHPO, Dr. Leland R. Gilson		X
ODFW, {Various}	X	
USFWS, Josh Millman Angie Gordon	X	X
Nat'l Resources Conservation Service {Formerly SCS}, {N.A.}	X	

Some of the above information sources forwarded written materials and/or maps to the consultant to facilitate our review.

AIRPORT AND RUNWAY DATA

Airport elevation	176 feet
Mean daily maximum temperature of the hottest month	83.20 F.
Maximum difference in runway centerline elevation	1 feet
Length of haul for airplanes of more than 60,000 pounds	500 miles
Dry runways	

RUNWAY LENGTHS RECOMMENDED FOR AIRPORT DESIGN

Small airplanes with approach speeds of less than 30 knots	310 feet
Small airplanes with approach speeds of less than 50 knots	810 feet
Small airplanes with less than 10 passenger seats	
75 percent of these small airplanes	2490 feet
95 percent of these small airplanes	3040 feet
100 percent of these small airplanes	3610 feet
Small airplanes with 10 or more passenger seats	4180 feet
Large airplanes of 60,000 pounds or less	
75 percent of these large airplanes at 60 percent useful load	4640 feet
75 percent of these large airplanes at 90 percent useful load	6250 feet
100 percent of these large airplanes at 60 percent useful load	5190 feet
100 percent of these large airplanes at 90 percent useful load	7770 feet
Airplanes of more than 60,000 pounds	Approximately 5070 feet

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

AIRPORT DESIGN AIRPLANE AND AIRPORT DATA

Aircraft Approach Category B

Airplane Design Group I

Airplane wingspan	45.80 feet
Primary runway end approach visibility minimums are visual exclusively	
Other runway end approach visibility minimums are visual exclusively	
Airplane undercarriage width (1.15 x main gear track)	14.95 feet
Airport elevation	175 feet

RUNWAY AND TAXIWAY WIDTH AND CLEARANCE STANDARD DIMENSIONS

Airplane Group/ARC

Runway centerline to parallel runway centerline simultaneous operations
when wake turbulence is not treated as a factor:

VFR operations with no intervening taxiway	700 feet
VFR operations with one intervening taxiway	700 feet
VFR operations with two intervening taxiways	700 feet
IFR approach and departure with approach to near threshold	2500 feet less 100 ft for each 500 ft of threshold stagger to a minimum of 1000 feet.

Runway centerline to parallel runway centerline simultaneous operations
when wake turbulence is treated as a factor:

VFR operations	2500 feet
IFR departures	2500 feet
IFR approach and departure with approach to near threshold	2500 feet
IFR approach and departure with approach to far threshold	2500 feet plus 100 feet for each 500 feet of threshold stagger.
IFR approaches	3400 feet

Runway centerline to parallel taxiway/taxilane centerline	222.9	225 feet
Runway centerline to edge of aircraft parking	200.0	200 feet
Runway width		60 feet
Runway shoulder width		10 feet
Runway blast pad width		80 feet
Runway blast pad length		100 feet
Runway safety area width		120 feet
Runway safety area length beyond each runway end or stopway end, whichever is greater		240 feet
Runway object free area width		400 feet
Runway object free area length beyond each runway end or stopway end, whichever is greater		240 feet
Clearway width		500 feet
Stopway width		60 feet

Obstacle free zone (OFZ):

Runway OFZ width	400 feet
Runway OFZ length beyond each runway end	200 feet
Inner-approach OFZ width	400 feet
Inner-approach OFZ length beyond approach light system	200 feet
Inner-approach OFZ slope from 200 feet beyond threshold	50:1
Inner-transitional OFZ slope	0:1

Runway protection zone at the primary runway end:

Width 200 feet from runway end	500 feet
Width 1200 feet from runway end	700 feet
Length	1000 feet

Runway protection zone at other runway end:

Width 200 feet from runway end	500 feet
Width 1200 feet from runway end	700 feet
Length	1000 feet

Departure runway protection zone:

Width 200 feet from the far end of TORA	500 feet
Width 1200 feet from the far end of TORA	700 feet
Length	1000 feet

Threshold surface at primary runway end:

Distance out from threshold to start of surface	0 feet
Width of surface at start of trapezoidal section	400 feet
Width of surface at end of trapezoidal section	1000 feet
Length of trapezoidal section	1500 feet
Length of rectangular section	8500 feet
Slope of surface	20:1

Threshold surface at other runway end:

Distance out from threshold to start of surface	0 feet
Width of surface at start of trapezoidal section	400 feet
Width of surface at end of trapezoidal section	1000 feet
Length of trapezoidal section	1500 feet
Length of rectangular section	8500 feet
Slope of surface	20:1

Taxiway centerline to parallel taxiway/taxilane centerline	65.0	69 feet
Taxiway centerline to fixed or movable object	42.1	44.5 feet
Taxilane centerline to parallel taxilane centerline	60.4	64 feet
Taxilane centerline to fixed or movable object	37.5	39.5 feet
Taxiway width	25.0	25 feet
Taxiway shoulder width		10 feet
Taxiway safety area width	45.8	49 feet
Taxiway object free area width	84.2	89 feet
Taxilane object free area width	75.0	79 feet
Taxiway edge safety margin		5 feet
Taxiway wingtip clearance	19.2	20 feet
Taxilane wingtip clearance	14.6	15 feet

REFERENCE: AC 150/5300-13, Airport Design, including Changes 1 through 4.