SHOW LOW

REGIONAL AIRPORT

AIRPORT MASTER PLAN

SHOW LOW REGIONAL AIRPORT
Show Low, Arizona

AIRPORT MASTER PLAN
FINAL TECHNICAL REPORT

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Approved by the City of Show Low Council
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SHOW LOW Municipal Airport

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Show Low, Arizona

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INTRODUCTION

INTRODUCTION

The Show Low Regional Airport master plan study has been undertaken to evaluate the airport's capabilities and role, to forecast future aviation demand, and to plan for the timely development of new or expanded facilities that may be required to meet that demand. The ultimate goal of the master plan is to provide systematic guidelines for the airport's overall maintenance, development, and operation.

The master plan is intended to be a proactive document which identifies, and then plans for, future facility needs well in advance of the actual need for the facilities. This is done to ensure that the City of Show Low can coordinate project approvals, design, financing, and construction in a timely manner prior to experiencing the detrimental effects of inadequate facilities.

An important result of the master plan is reserving sufficient areas for future facility needs. This protects development areas and ensures they will be readily available when required to meet future needs. The intended result is a detailed land use concept which outlines specific uses for all areas of airport property.

The preparation of this master plan is evidence that the City of Show Low recognizes the importance of air transportation to the community and the associated challenges inherent in providing for its unique operating and improvement needs. The cost of maintaining an airport is an investment, which yields impressive benefits to the community. With a sound and realistic master plan, the Show Low Regional Airport can maintain its role as an important link to the national air transportation system for the

community and maintain the existing public and private investments in its facilities.

MASTER PLAN OBJECTIVES

The primary objective of the Show Low Regional Airport Master Plan is to develop and maintain a financially feasible long-term development program which will satisfy aviation demand and be compatible with community development, other transportation modes, and the environment. The accomplishment of this objective requires the evaluation of the existing airport and a determination of what actions should be taken to maintain an adequate, safe, and reliable airport facility to meet the air transportation needs of the area. The completed Master Plan will provide an outline of the necessary development and give responsible officials advance notice of future needs to aid in planning, scheduling, and budgeting.

Specific objectives of the Show Low Regional Airport Master Plan are:

- To preserve and protect the public and private investments in existing airport facilities;
- To enhance the safety of aircraft operations;
- To be reflective of community goals, needs, and plans;
- To ensure that future development is environmentally compatible;
- To establish a schedule of development priorities and a program to meet the needs of the proposed improvements in the Master Plan;
- To develop a plan that is responsive to air transportation demands;
- To develop an orderly plan for the use of the airport;
- To coordinate this Master Plan with local, regional, state, and federal agencies;
- To develop active and productive public involvement throughout the planning process;
- Re-evaluate the need for a new crosswind runway;
- Evaluate long term commercial air service market and needs; and
- Determine compliance with runway safety area standards.

The Master Plan will accomplish these objectives by carrying out the following:

- Determining projected needs of airport users through the year 2025;

- Identifying existing and future facility needs;
- Evaluating future airport facility development alternatives which will optimize airport capacity and aircraft safety;
- Developing a realistic, common-sense plan for the use and/or expansion of the airport;
- Developing land use strategies for the use of airport property;
- Establishing a schedule of development priorities and a program for improvements, and;
- Analyzing the airport's financial requirements for capital improvement needs and grant options.

MASTER PLAN ELEMENTS AND PROCESS

The Show Low Regional Airport Master Plan is being prepared in a systematic fashion following Federal Aviation Administration (FAA) guidelines and industry-accepted principles and practices. The Master Plan for Show Low Regional Airport has six general elements which are intended to assist in the discovery of future facility needs and provide the supporting rationale for their implementation. **Exhibit IA** provides a graphical depiction of the Show Low Regional Airport Master Plan process and elements.

Element One encompasses the inventory efforts. The inventory efforts are focused on collecting and assembling relevant data pertaining to the airport and the area the airport serves. The inventory effort collects information on existing airport facilities, operations, and control. Local economic and demographic data is collected to define the local growth trends. Planning studies which may have relevance to the Master Plan are also collected. Information collected during the inventory efforts is summarized in Chapter One, Inventory.

Element Two examines the potential aviation demand for commercial air service and general aviation activity at the airport. This analysis utilizes local socioeconomic information, as well as national air transportation trends to quantify the levels of aviation activity which can reasonably be expected to occur at Show Low Regional Airport through the year 2025. The results of this effort are used to determine the types and sizes of facilities which will be required to meet the projected aviation demands for Show Low Regional Airport over the next twenty years. The results of this analysis are presented in Chapter Two, Aviation Demand Forecasts.

Element Three comprises the facility requirements analysis. The intent of this analysis is to compare the existing facility capacities to forecast aviation demand and determine where deficiencies in capacities (as well as excess capacities) may exist. Where deficiencies are identified, the size and

type of new facilities to accommodate the demand are identified. The airfield analysis focuses on improvements needed to serve the type of aircraft expected to operate at the airport and navigational aids to increase the safety and efficiency of operations. This element also includes a determination of passenger terminal building and general aviation facility needs. The findings of this analysis will be presented in Chapter Three, Facility Needs Evaluation.

Element Four considers a series of reasonable solutions to accommodate the projected facility needs. This element proposes various facility and site plan configurations which meet the projected facility needs. A thorough analysis is completed to analyze the strengths and weaknesses of each proposed development alternative with the intention of determining a single direction for development. Chapter Four, Airport Development Alternatives, comprises the results of the work efforts given to completing this element.

Element Five includes two independent, yet interrelated, work efforts: a capital implementation program and airport plans. This element will comprise Chapters Five and Six of the Master Plan. Chapter Five provides both a graphic and narrative description of the recommended plan for the use, development, and operation of the airport. Specifics on environmental concerns and compatible land use strategies are also provided. Appendix C to the Master Plan includes the official Airport Layout Plan and detailed technical drawings depicting related airspace, land use, and property data. These drawings are used by the FAA in determining grant eligibility and funding. Chapter Six focuses on the capital needs program which defines the schedules, costs, and funding sources for the recommended development projects.

COORDINATION

The Show Low Regional Airport Master Plan is of interest to many within the local community. This includes local citizens, community organizations, airport users, airport tenants, area-wide planning agencies and aviation organizations. As an important component of the regional, state, and national aviation systems, the Show Low Regional Airport Master Plan is of importance to both state and federal agencies responsible for overseeing air transportation.

To assist in the development of the Show Low Regional Airport Master Plan, the City of Show Low identified a cross-section of community members and interested persons to act in an advisory role in the development of the Master Plan. As members of the Planning Advisory Committee (PAC), the committee members reviewed phase reports and provided comments throughout the study to help ensure that a realistic, viable plan was developed.

To assist in the review process, draft phase reports were prepared at three milestones in the planning process as shown previously on **Exhibit IA**. The

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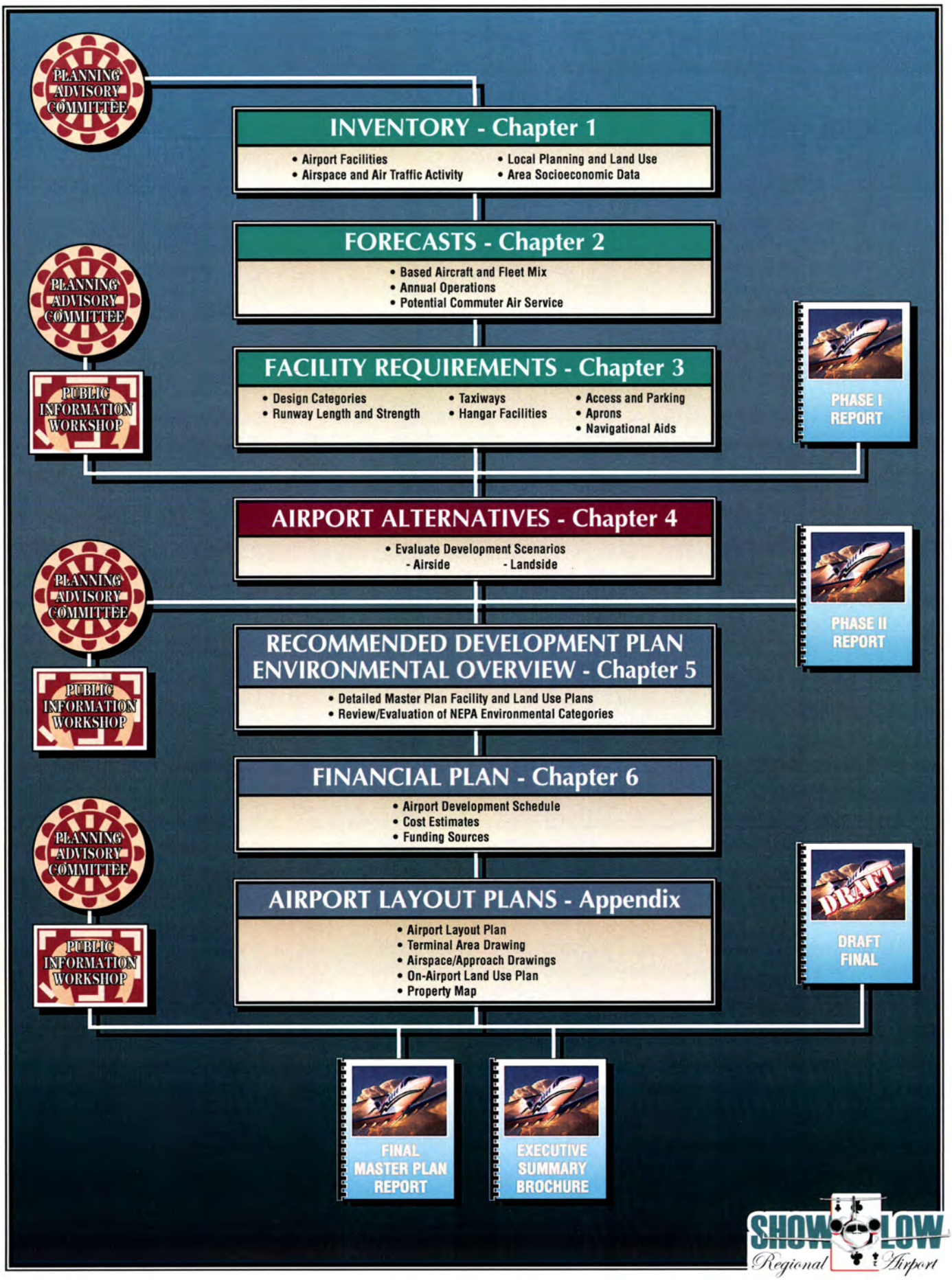

SHOW LOW Regional Airport

Exhibit IA
MASTER PLAN PROCESS

draft phase report process allowed for input and review during each step within the Master Plan process to ensure that all Master Plan issues were fully addressed as the recommended program was developed.

Three public information workshops were also included as part of the plan coordination. The public information workshops allowed the public to provide input and learn about general information concerning the Master Plan.

Chapter One
INVENTORY

INVENTORY

The initial step in the preparation of the airport master plan for Show Low Regional Airport is the collection of information that will provide a basis for the analysis to be completed in subsequent chapters. For the master plan, information is gathered regarding not only the airport but also the region it serves. This chapter will begin with an overview of the existing conditions at Show Low Regional Airport consisting of descriptions of the airport facilities, airspace, and the airport's role in regional, state, and national aviation systems. This will be followed by background information regarding the City of Show Low and the regional area, including information regarding surface transportation and the socioeconomic profile.

Information provided in this chapter was obtained through on-site inspections of the airport, interviews with airport management, airport tenants, and various governmental agencies. Various documents were provided by the Federal Aviation Administration (FAA), Arizona Department of Transportation (ADOT), White Mountain Regional Development Council, City of Show Low, and Navajo County.

BACKGROUND

Show Low Regional Airport is located on a 340-acre site in the eastern portion of the City of Show Low. As shown on **Exhibit 1A**, an on-going land transfer between the City of Show Low and U.S. Forest Service will increase Show Low Regional Airport by 351 acres. This will include property to allow for the development of Runway 18-36 as proposed in the last master plan.

Show Low Regional Airport is positioned to serve all segments of the civil air transportation industry as it currently has facilities to accommodate commercial airline users, air cargo users, and general aviation users. The commercial airline segment of the air transportation industry includes all air carriers providing scheduled air service. Arizona Express presently provides scheduled and on-demand air service from Show Low to Phoenix. Arizona Express uses a Beechcraft 1900 aircraft configured for nine passengers.

Show Low Regional Airport is included in the Essential Air Service (EAS) program. The EAS program is administered by the U.S. Department of Transportation to ensure smaller communities retain access to the national air transportation system. Under the EAS program, the air carrier providing scheduled service to a community is provided a monthly subsidy in return for providing a minimum level of service to a hub airport.

Arizona Express was selected in May 2002 to provide subsidized scheduled air service for Show Low. Under the contract, Arizona Express is to provide 14 nonstop round trips between Phoenix and Show Low weekly. The subsidy extends for a one-year period after Arizona Express has F.A.R. Part 135 air carrier authority.

The air cargo segment of the air transportation industry includes the activities of air mail and air freight/air express. Air cargo activities at Show Low Regional Airport include cargo carried by United Parcel Service (UPS), DHC, and Airborne Express. These cargo operators do not maintain facilities at Show Low Regional Airport; rather, Shundiin Services Company, located within the old terminal building along the central apron, provides local handling and delivery services. Cargo is off-loaded from the aircraft directly to delivery vehicles located outside the fenced apron.

General aviation is the largest and most diverse segment of the air transportation industry. General aviation aircraft constitute 97 percent of all civil aircraft in the United States today. Use of these aircraft cover a broad spectrum of activities from personal and recreational flying to air ambulance to business and commercial uses such as aerial applicators, aerial surveyors and photographers, and the non-scheduled transport of company staff from one location to another. General aviation aircraft range from one and two seat piston-powered aircraft to long-range business jet aircraft capable of flying non-stop to international destinations. In 2002, there were 57 aircraft based at Show Low Regional Airport.

An Arizona Army National Guard Armory is located on the airport. Accessed from U.S. Highway 60, this facility does not require airfield access.

HISTORICAL PERSPECTIVE

Show Low Regional Airport began operations in 1946 with a dirt runway and a small terminal. The airport was

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LEGEND

Existing Property Line

Ultimate Property Line
(Forest Service Land Transfer)

NDB - Nondirectional Beacon
REIL - Runway End Identifier Light
PAPI - Precision Approach Path Indicator
GPS - Global Positioning System

0 1000 2000
SCALE IN FEET

NORTH

NDB or GPS-A Approach

Long Lake (Dry Lake Bed)

Power Line

Highway 77

Forest Service Land

700' Displaced Threshold

PAPI

NDB

Segmented Circle with Lighted Windcone and Wind Tee

REIL

750' Displaced Threshold

GPS Approach

Runway 6-24 7,200 x 100'

50' A1

REIL

75' A2

50'

42' A4

400'

PAPI

35'

50' A5

Taxiway A

58'

52'

Holding Apron

ARFF Facility/ Snow Removal Equipment

Taxiway A4

42'

Runway 3-24 3,937 x 60'

181'

Holding Apron

35'

Taxiway B

35'

35'

35'

Arizona Public Service Substation

Airport Rd

Corporate Way

Forest Service Land

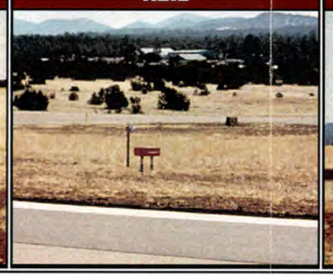
U.S. Highway 60

Beacon

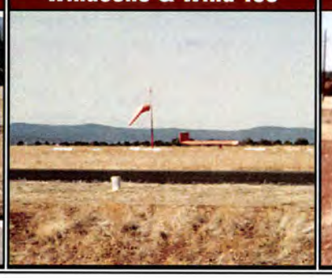
NDB

PAPI

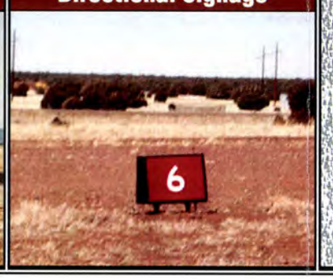
REIL



Windcone & Wind Tee



Directional Signage



SHOW LOW Regional Airport

Exhibit 1A
EXISTING AIRFIELD FACILITIES

sponsored by Navajo County and funded by private interests. A special-use permit from the U.S. Forest Service was required as the airport was constructed on land managed by this federal agency. When the property was transferred to the city from the U.S. Forest Service, the entire airport property was designated for aviation uses except for a small parcel of land located south of Runway 6-24 and between Airport Road and the western property line. This small parcel of land, which is currently undeveloped, was designated for non-aviation uses.

The previous airport Master Plan was completed for Show Low Regional Airport in 1991. The principal recommendations of this plan included the following:

- Extending Runway 6-24 to 7,200 feet;
- Widening Runway 6-24 to 100 feet;
- Constructing Taxiway A;
- Closing Runway 3-21;
- Acquiring land for the construction of a new runway;
- Constructing the new crosswind runway (Runway 18-36);
- Constructing a new terminal building; and
- Constructing an ARFF facility.

Since the completion of the Master Plan, Runway 6-24 has been extended and widened. Taxiway A was constructed. The new terminal building and auto parking was also completed.

AIRPORT ADMINISTRATION

Show Low Regional Airport is owned and operated by the City of Show Low. The city provides aircraft fueling and line services in addition to maintaining the airport. City personnel staff the airport from 5:30 a.m. to 7:30 p.m. during which time they also provide weather observations and airport advisory radio services. The airport is staffed with five individuals from the Department of Public Works. The Airport Manager reports to the Director of Public Works. There are five members of the airport staff.

AIRPORT FACILITIES

This section presents a description of the existing facilities at Show Low Regional Airport. These facilities can be divided into two distinct categories: airside facilities and landside facilities. Airside facilities include those directly associated with aircraft operation. Landside facilities include those necessary to provide a safe transition from surface to air transportation and support aircraft servicing, storage, maintenance, and operational safety.

AIRSIDE FACILITIES

Airside facilities, previously depicted on **Exhibit 1A**, are those facilities directly associated with the safe and efficient movement of aircraft on the airport. Airside facilities include runways, taxiways, airport lighting, and navigational aids. Airside facility data is discussed in detail below and is summarized in **Table 1A**.

TABLE 1A
Airside Facility Data
Show Low Regional Airport

RUNWAY INFORMATION		
	Runway 6-24	**Runway 3-21**
Runway Length (feet) Runway Width (feet)	7,200 100	3,937 60
Runway Surface Material Condition	Asphalt Good	Asphalt Good
Pavement Markings	Nonprecision	Basic
Runway Load Bearing Strength (pounds)	35,000 SWL 60,000 DWL	12,500 SWL
Lighting	MIRL MITL PAPI-2 REIL	Retro-reflective markers
AIRPORT INFORMATION		
Instrument Approach Procedure	NDB or GPS-A	
Airfield Lighting	Rotating beacon Lighted Runway Direction signs (Also Taxiway A signs) Pilot-controlled lighting (Runway 6-24 MIRL only)	
Weather and Communication Aids	Segmented circle Wind Tee Lighted wind cone	
Navigational Aids	NDB, Loran-C, GPS, VOR	

DWL - dual wheel loading, SWL - single wheel loading, MIRL - medium intensity runway lighting, MITL - medium intensity taxiway lighting, PAPI - precision approach path indicator, REIL - runway end identification lighting, NDB - nondirectional beacon, GPS - global positioning satellite VOR - very high frequency omnidirectional range facility

Source: Airport Facility Directory; Southwest U.S. (February 2002)

Runways

Show Low Regional Airport is equipped with two intersecting asphalt runways: Runway 6-24 and Runway 3-21. The runways intersect within the displaced threshold of Runway 24.

- RUNWAY 6-24

Runway 6-24, the primary runway, is 7,200 feet long, 100 feet wide, and oriented in an east-west manner. The runway has been improved in recent years. In 1998, the runway was extended 1,500 feet and overlaid. The runway was widened to 100 feet in 2001. The runway surface is composed of an asphalt overlay on asphalt cement concrete.

Runway 6-24 has a pavement strength of 35,000 pounds single wheel loading (SWL) and 60,000 pounds dual wheel loading (DWL). SWL refers to the design of certain aircraft landing gear that have a single wheel on each main landing gear strut. DWL refers to certain aircraft landing gear which have two wheels on each main landing gear strut.

Both ends of Runway 6-24 have displaced landing thresholds to avoid obstructions and provide for runway safety area (RSA) standards. The Runway 6 landing threshold is displaced 700 feet in order to avoid electrical lines which parallel the west side of Highway 77. A project to place these lines below ground level is planned for 2004. The Runway 24 threshold is displaced 750 feet to meet RSA standards.

- RUNWAY 3-21

The crosswind runway, Runway 3-21, is 3,937 feet long and 60 feet wide and has a rated pavement strength of 12,500 pounds SWL. The runway has an asphalt cement concrete surface. The runway received a 1 ½-inch overlay in 2001.

Taxiways

The taxiway system at Show Low Regional Airport includes a full length parallel taxiway, a partial parallel taxiway, and nine connecting taxiways. Taxiway A is a full length parallel taxiway that provides access to both ends of Runway 6-24. This taxiway is 50 feet wide and is located 400 feet from the Runway 6-24 centerline. Taxiway A was constructed in 1993 and widened to 50 feet in 1995.

Four connecting taxiways, referred to as Taxiways A1, A2, A4, and A5, provide access from Runway 6-24 to the parallel taxiway. Taxiway A1 is 50 feet wide, Taxiway A2 is 75 feet wide, Taxiway A4 is 42 feet wide, and Taxiway A5 is 50 feet wide. Taxiway A4 also provides access from Runway 6-24 to the terminal facilities, Runway 3-21, and the north, center, and south apron areas.

Taxiway B extends between the Runway 21 end and Taxiway A4.

Taxiway B is 35 feet wide and is located 181 feet from the Runway 3-21 centerline. Three 35-foot wide connecting taxiways provide access from Taxiway B to Runway 3-21. Two of these taxiways also provide access to the south parking apron and hangar facilities. A 35-foot wide taxiway provides access from Runway 3-21 to the central apron area.

Pavement Condition

In July 2000, a pavement evaluation report was completed by Applied Pavement Technology, Inc. in association with Kleinfelder, Inc. The purpose of this report was to assess pavement conditions at the airport with the use of the pavement condition index (PCI) procedure.

The results of the pavement assessment indicate that overall pavement at the airport, including runways, taxiways, and parking areas, is in very good condition. The Runway 6-24 PCI index rating was 100; Taxiway A was 100; Taxiway A4 ranged between 47 and 93; Taxiway B was 70; the north apron was 99; the center apron was 76; while the south apron was 70. The majority of the pavement is in need of only preventative maintenance actions such as crack sealing and surface treatments. A portion of Taxiway A4 between Runway 3-21 and the central apron is in need of major rehabilitation, such as an overlay.

Airfield Lighting

Airfield lighting systems extend an airport's usefulness into periods of darkness and/or poor visibility. A variety of lighting systems are installed at Show Low Regional Airport for this purpose. These lighting systems, categorized by function, are summarized as follows.

- IDENTIFICATION LIGHTING

The location of an airport at night is universally indicated by a rotating beacon which projects two beams of light, one white and one green, 180 degrees apart. The rotating beacon at Show Low Regional Airport is located atop a metal tower adjacent to the center apron.

- RUNWAY AND TAXIWAY LIGHTING

Runway and taxiway lighting utilizes light fixtures placed near the pavement edge to define the lateral limits of the pavement. This lighting is essential for maintaining safe operations at night and/or during times of poor visibility in order to maintain safe and efficient access from the runway and aircraft parking areas.

Runway 6-24 is equipped with medium intensity runway lighting (MIRL). Medium intensity taxiway lighting (MITL) has been installed on Taxiway A, Taxiway A1, Taxiway A2, Taxiway A4, and Taxiway A5.

The Runway 6 and 24 ends are equipped with threshold lighting to identify the landing threshold. Threshold lighting consists of specially designed light fixtures that are red on one-half of the lens and green on the other half of the lens. The red portion of the lights are turned towards the approach surface and intended to be seen from landing aircraft, while the green portion is visible to aircraft on the runway surface.

Runway 3-21 does not have runway or taxiway lighting. Retro-reflective markers have been placed along the runway to aid pilots in determining the runway edges.

- VISUAL APPROACH LIGHTING

A two-box precision approach path indicator (PAPI-2) system has been installed at the Runway 6 and Runway 24 ends. The Runway 6 PAPI-2 is located on the north side of the runway approximately 700 feet past the displaced landing threshold. The Runway 24 PAPI-2 is located on the south side of the runway near the end of the displaced threshold. The PAPI consists of a series of lights that when interpreted by the pilot they give him or her an indication of being above, below, or on the designed descent path to the runway. A PAPI system has a range of five miles during the day and up to nearly 20 miles at night.

- RUNWAY END IDENTIFICATION LIGHTING

Runway end identification lights (REILs) provide rapid and positive identification of the approach ends of a runway. A REIL system has been installed at each end of Runway 6-24. A REIL consists of two synchronized flashing lights, located laterally on each side of the runway threshold, facing the approaching aircraft.

- AIRFIELD SIGNS

Airfield identification signs assist pilots in identifying their location on the airfield and direct them to their desired location. Lighted airfield signs at Show Low Regional Airport are associated with Runway 6-24 and Taxiway A and located at aircraft hold positions, taxiway intersections, and at the intersection of the connecting taxiways and runways.

- PILOT-CONTROLLED LIGHTING

The MIRL system on Runway 6-24 and Taxiway A MITL system are equipped with a pilot-controlled lighting system (PCL). This system allows pilots to turn on and/or increase the intensity of the lighting system from the aircraft with the use of the aircraft's radio transmitter.

Pavement Markings

Pavement markings aid in the movement of aircraft along airport surfaces and identifies closed or hazardous areas on the airport. The basic markings on Runway 3-21 identify the runway centerline and designation. The nonprecision markings on Runway 6-24 identify the runway designations, centerline, touchdown point, and aircraft holding positions. Markings at the ends of Runway 6-24 identify the displaced thresholds, which are not available for landings. Taxiway and apron centerline markings are provided to assist pilots in maintaining proper clearance from pavement edges and objects near the taxiway/taxilane edges. Pavement markings also identify aircraft tiedown positions and aircraft holding positions.

Other Facilities

The airport also has a lighted wind cone, segmented circle, and wind tee. A lighted wind cone provides information to pilots regarding wind conditions. The segmented circle consists of a system of visual indicators designed to provide traffic pattern information to pilots. The wind tee is a device that is used as a landing direction indicator. The small end of the wind tee points in the direction of landing. Three additional wind cones located near the Runway 6, Runway 3, and Runway 24 ends supplement the primary, lighted wind cone.

Navigational Aids

Navigational aids are electronic devices that transmit radio frequencies which pilots of properly equipped aircraft translate into point-to-point guidance and position information. The types of electronic navigational aids available for aircraft flying to or from Show Low Regional Airport include the nondirectional beacon (NDB), the very high frequency omnidirectional range (VOR) facility, Loran-C, and the global positioning system (GPS).

The NDB transmits nondirectional signals whereby the pilot of an aircraft, equipped with direction-finding equipment, can determine their bearing to and from the radio beacon in order to track to the beacon station. The NDB at Show Low Regional Airport is located approximately 350 feet north of the midpoint of Runway 6-24.

The VOR, in general, provides azimuth readings to pilots of properly equipped aircraft by transmitting a radio signal at every degree to provide 360 individual navigational courses. Frequently, distance measuring equipment (DME) is combined with a VOR facility (VOR-DME) to provide distance as well as direction information to the pilot. Military tactical air navigation aids (TACANs) and civil VORs are commonly combined to form a VORTAC. A VORTAC provides distance and direction information to civil and military pilots. The St. Johns VORTAC, located

approximately 44 nautical miles west of the airport, can be utilized by pilots flying to or from the airport and is shown on **Exhibit 1B.**

GPS was initially developed by the United States Department of Defense for military navigation around the world and is currently being utilized more and more in civilian aircraft. GPS varies from an NDB or VOR in that pilots are not required to navigate using a specific facility. GPS uses satellites placed in orbit around the earth to transmit electronic signals, which properly equipped aircraft use to determine altitude, speed, and navigational information. With GPS, pilots can directly navigate to any airport in the country and are not required to navigate using a specific navigational facility. The FAA is proceeding with a program to gradually replace all traditional enroute navigational aids with GPS over the next 20 years.

Loran-C is a ground-based enroute navigational aid which utilizes a system of transmitters located in various locations across the continental United States. Loran-C is similar to GPS as pilots are not required to navigate using a specific facility. With a properly equipped aircraft, pilots can navigate to any airport in the United States using Loran-C.

Instrument Approach Procedures

Instrument approach procedures are a series of predetermined maneuvers, established by the FAA, which utilize electronic navigational aids (such as those discussed in the previous section) to assist pilots in locating and landing at an airport during low visibility and cloud ceiling conditions. The capability of an instrument approach is defined by the visibility and cloud ceiling minimums associated with the approach. Visibility minimums define the horizontal distance that the pilot must be able to see to complete the approach. Cloud ceilings define the lowest level a cloud layer (defined in feet above the ground) can be situated for a pilot to complete the approach. If the observed visibility or cloud ceilings are below the minimums prescribed for the approach, the pilot cannot complete the instrument approach.

Only one instrument approach has been prepared for Show Low Regional Airport. This approach, referred to as the NDB or GPS-A approach, is a circling non-precision approach. In contrast to a precision approach, which provides both course guidance and vertical descent information to pilots, a non-precision approach provides only course guidance information to a pilot. A circling approach allows pilots to land on any active runway at the airport. While providing flexibility for the pilot to land on the runway most closely aligned with the prevailing wind at that time, a circling approach will have higher visibility and cloud ceiling minimums than other instrument approaches which are aligned with a particular runway end. This is done to provide pilots with sufficient visibility and ground clearance to navigate visually from the approach to the desired runway end for landing.

The NDB or GPS-A approach at Show Low Regional Airport allows pilots to land when cloud ceilings are a minimum of 1,248 feet above the ground and visibility is restricted to one and one-quarter miles for aircraft with approach speeds less than 90 knots. For aircraft with approach speeds between 91 and 120 knots, the cloud ceiling minimums remain unchanged while the visibility requirements increase to one and one-half miles. For aircraft with approach speeds between 121 and 140 knots, the visibility minimums increase to three miles while the cloud ceiling minimums remain unchanged. This procedure is not authorized for aircraft with approach speeds higher than 140 knots. Furthermore, this approach does not allow circling southeast of Runways 3 and 24 due to the presence of an obstacle in that area. When the Show Low altimeter cannot be obtained, this approach is not authorized.

Local Operating Procedures

Show Low Regional Airport is situated at 6,412 feet above mean sea level (MSL). The traffic pattern altitude for all aircraft at the airport is 800 feet above the airfield elevation (7,212 feet MSL). Runway 21 and Runway 6 utilize a left-hand traffic pattern while Runways 3 and 24 utilize a right-hand traffic pattern. By utilizing a left-hand traffic pattern for one runway end and a right-hand traffic pattern for the opposite end, all aircraft operations are maintained on one side of each runway. Therefore, for Runway 6-24, the traffic pattern is maintained north of the runway. For Runway 3-21, the traffic pattern is maintained southeast of the runway. To avoid overflights of residential areas, aircraft departing Runway 24 are requested to turn to a heading of 280 degrees after takeoff.

Vicinity Airspace

To ensure a safe and efficient airspace environment for all aspects of aviation, the FAA has established an airspace structure that regulates and establishes procedures for aircraft using the national airspace system. The U.S. airspace structure provides for two basic categories of airspace, controlled and uncontrolled, and identifies them as Classes A, B, C, D, E, and G as described below.

- Class A airspace is controlled airspace and includes all airspace from 18,000 feet MSL to Flight Level 600 (approximately 60,000 feet MSL).

- Class B airspace is controlled airspace surrounding high capacity commercial service airports (i.e. Phoenix Sky Harbor International Airport, Los Angeles International Airport).

- Class C airspace is controlled airspace surrounding lower activity commercial service (i.e. Tucson International Airport) and some military airports.

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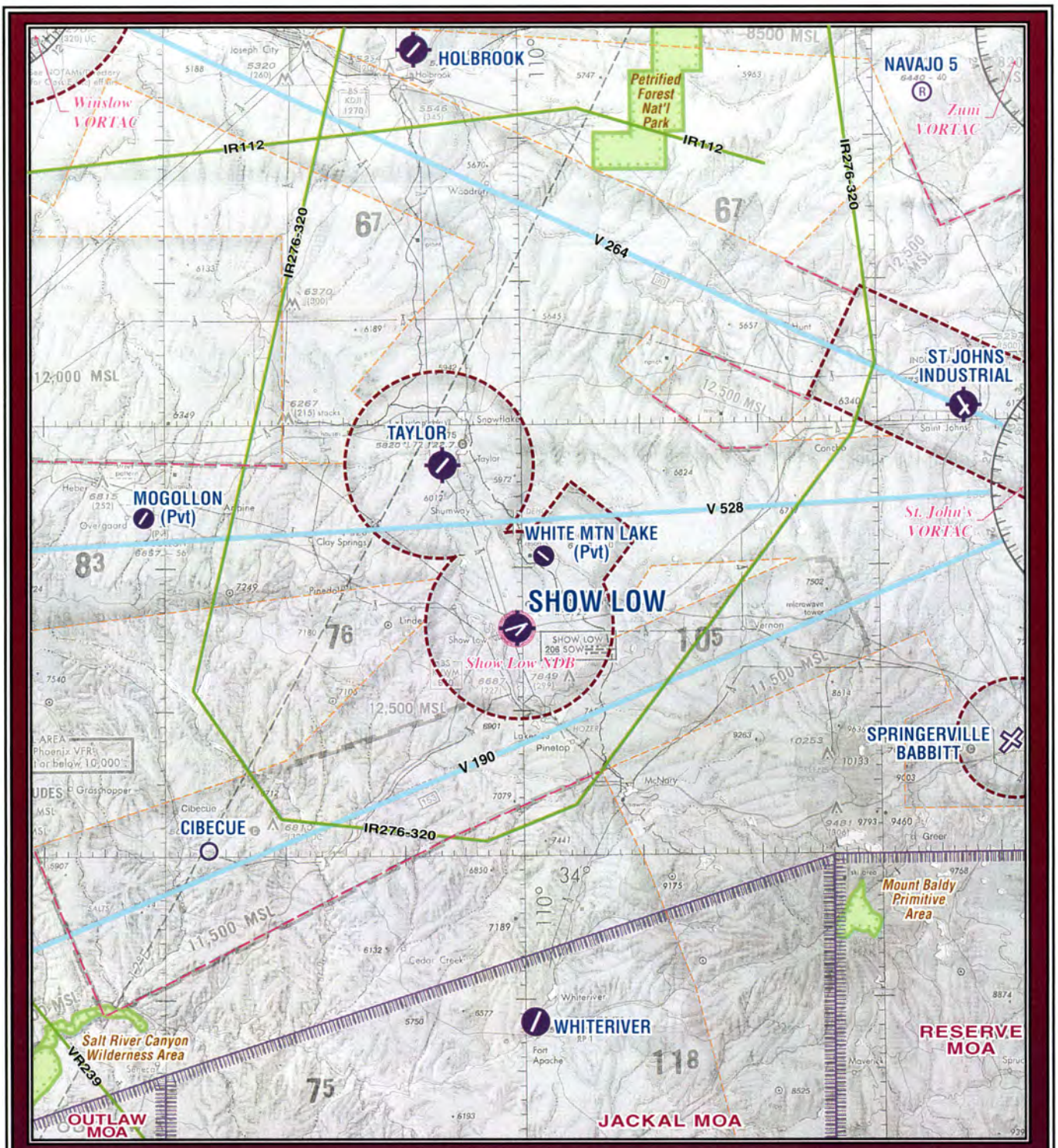

LEGEND:

- Hard-surfaced runways greater than 8069 ft. or some multiple runways less than 8069 ft.
- Hard-surfaced runways 1500 ft. to 8069 ft.
- Other than hard-surfaced runways
- Services/Fuel Available
- Private (Pvt)
- Non-Directional Radiobeacon (NDB)
- Compass Rose
- Victor Airways
- Military Training Routes
- Prohibited, Restricted, Warning and Alert Areas
- Class E Airspace with floor 700' above surface
- Class E Airspace with floor other than 700' above surface
- Class E Airspace with floor 1200' above surface

NORTH

0 12

SCALE IN MILES

SHOW LOW Regional Airport

Exhibit 1B
VICINITY AIRSPACE

- Class D airspace is controlled airspace surrounding airports with an airport traffic control tower (ATCT).

All aircraft operating within Classes A, B, C, and D airspace must be in contact with the air traffic control facility responsible for that particular airspace.

- Class E is controlled airspace that encompasses all instrument approach procedures and low altitude federal airways. Only aircraft conducting instrument flights are required to be in contact with air traffic control when operating within Class E airspace. While aircraft conducting visual flights in Class E airspace are not required to be in radio communications with air traffic control facilities, visual flight can only be conducted if minimum visibility and cloud ceilings exist.

- Class G airspace is uncontrolled airspace that does not require contact with an air traffic control facility.

Airspace within the vicinity of Show Low Regional Airport is depicted on **Exhibit 1B**. The airspace for a seven nautical mile radius around the airport is Class E airspace with a floor 700 feet above ground level (AGL) and extending to 18,000 feet MSL. A five mile long by six mile wide extension of the Class E airspace to the northeast provides for the instrument approach procedure described earlier.

The airspace outside the immediate Class E airspace surrounding Show Low Regional Airport is Class E airspace with a floor 1,200 feet above the ground. It should be noted that, due to high terrain in the vicinity of the airport, some areas of Class E airspace have higher floors.

A number of Victor Airways are present near Show Low Regional Airport. Victor Airways are corridors of airspace eight miles wide that extend upward from 1,200 feet AGL to 18,000 feet MSL, and extend between VOR navigational facilities. The Victor airways in the vicinity of the airport emanate from the St. Johns VOR.

There are three military operation areas (MOAs) south of Show Low Regional Airport. MOAs define airspace where a high level of military activity is conducted and are intended to segregate military and civilian aircraft. While civilian aircraft operations are not restricted in the MOA, civilian aircraft are cautioned to be alert for military aircraft during the periods the MOA is active and at the specified altitudes. These MOAs include the Outlaw, Jackal, and Reserve MOAs.

The IR 276-320 and IR 112 military training routes are located near Show Low Regional Airport. The routes are used by military aircraft for training activity and commonly operate at speeds in excess of 250 knots and at altitudes above 10,000 feet MSL. While civilian aircraft are not restricted in the

vicinity of these routes, civilian aircraft are cautioned to remain alert for high speed military jet aircraft.

While not considered part of the U.S. airspace structure, the boundaries of the National Park Service areas, U.S. Wildlife Service areas, and U.S. Forest Wilderness and Primitive areas are noted on aeronautical charts. While aircraft operations are not specifically restricted over these areas, aircraft are requested to maintain a minimum altitude of 2,000 feet AGL. As shown on **Exhibit 1B**, the Salt River Canyon Wilderness Area, Mount Baldy Primitive Area, and Petrified Forest National Park are found near the airport.

Air Traffic Control

Show Low Regional Airport does not have an operational ATCT; therefore, no formal terminal air traffic control services are available at the airport. Aircraft operating in the vicinity of the airport are not required to file any type of flight plan or to contact any air traffic control facility unless they are entering airspace where contact is mandatory. Air traffic advisories and certain weather information can be obtained using the airport unicom when airport personnel are available. Enroute air traffic control services are provided through the Albuquerque Air Route Traffic Control Facility (ARTCC), which controls aircraft in a large multi-state area.

LANDSIDE FACILITIES

Landside facilities are the ground-based facilities that support the aircraft and pilot/passenger handling functions. These facilities typically include the passenger terminal building, aircraft storage/maintenance hangars, aircraft parking apron and support facilities, such as fuel storage, automobile parking, and roadway access. Landside facilities at Show Low Regional Airport are identified on **Exhibit 1C**.

Terminal Building

Commercial airline and general aviation terminal functions are provided in a single terminal located between the two runways, south of the midpoint of Runway 6-24. The newly constructed terminal building was opened in August 1999. This building replaced the terminal that is located just east of the new terminal location along the central apron.

The terminal building floor plan and areas are depicted on **Exhibit 1D**. The terminal building encompasses approximately 6,323 square feet and includes space for commercial airline ticketing and operations, baggage claim, and a departure holdroom. Space for rental car companies is also provided. For general aviation activities, the terminal includes general office space, a conference room, airport administration line services, and vending.

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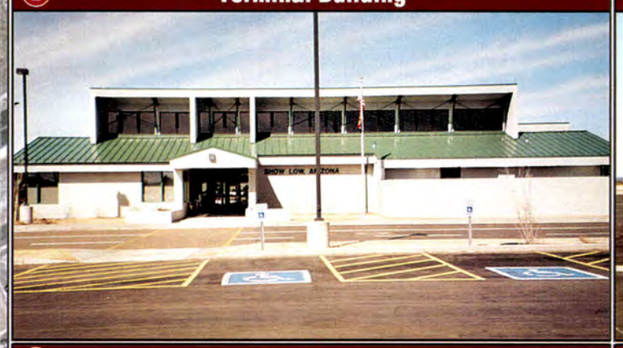
1 **Electrical Building**

5 **Conventional Hangars**

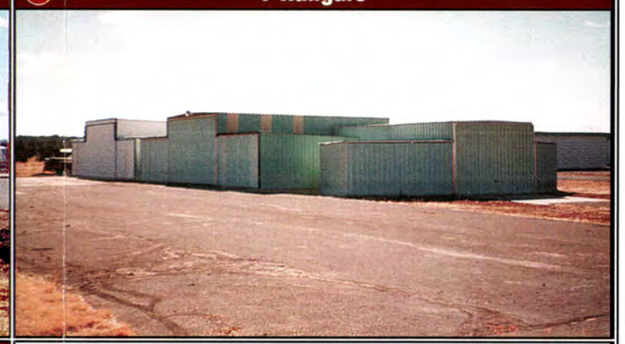
2 **Terminal Building**



6 **Box Hangars**

3 **Shundiin Services Co.**

7 **T-Hangars**



4 **Medical Express**

SHOW LOW Regional Airport

Exhibit 1C
EXISTING LANDSIDE FACILITIES

02MP01-1D-10/21/03

LEGEND	
AREA	SQUARE FOOTAGE
Baggage Claim	125
Airline Operations/Ticketing	435
Circulation/Public Lobby	2,304
Departure Area	927
Airport Administration	999
Maintenance/Mechanical	177
Office Space	544
Restrooms	288
Airline Support Offices	304
Concessions	220
	Total: 6,323

0 15 30
SCALE IN FEET

NORTH

Hold Room
Airline Office
Baggage Makeup
Ticketing Counter
Fixed Bag Shelf
Manager's Office
Closet
Admin./ Unicom
Potential Baggage Screening Device
Lobby
Conference Room
Pilot Briefing Room
Patio
Line Equipment Storage
Planter
Planter
Planter
Men's Restroom
Car Rental
Office
Office
Office
Mech. & Janitor
Vending
Women's Restroom
Mech.
Mech.

SHOW LOW Regional Airport

Exhibit 1D
TERMINAL BUILDING FLOORPLAN

Aircraft Parking Aprons

Four aircraft apron areas are provided at Show Low Regional Airport. As depicted on **Exhibit 1C** and described below, these apron areas are referred to as the air carrier, north, central, and south apron areas.

The air carrier apron, located adjacent to the terminal building, includes approximately 8,300 square yards of space for aircraft parking and circulation taxilanes. Located adjacent to the air carrier apron, the north apron provides approximately 9,700 square yards of space for aircraft tiedowns and parking, and circulation. There are a total of 12 business aircraft-sized parking spaces on the north apron.

The center apron is located north of Runway 3-21, south of the terminal building. This apron encompasses approximately 37,100 square yards and provides 123 tiedown spaces.

The south apron provides taxilane access for the series of aircraft storage hangars located in this area. This apron encompasses approximately 10,800 square yards and provides six designated tiedown locations.

All of the apron areas discussed above have asphalt surfaces. During the pavement evaluation conducted in July 2000, it was determined that all of these apron areas are in very good condition.

Aircraft Hangar Facilities

There are 22 separate hangar facilities located at the airport totaling approximately 57,800 square feet. Hangar space is comprised of conventional hangars, box-type T-hangars, and individual T-hangars. Conventional hangars provide a large enclosed space, typically accommodating more than one aircraft. The box-type T-hangars provide four individual hangar locations, one on each side of the building. T-hangars provide for separate, single aircraft storage areas. All hangars at the airport are privately-owned with the exception of one 9,000 square-foot hangar owned by the City.

Conventional hangar space at the airport totals approximately 57,500 square feet in 13 separate hangars. One of these hangars is owned by Medical Express and the other is owned by the City. Both are located on the center apron. The remaining nine hangars are privately-owned and are located on or adjacent to the south apron.

Four box-type T-hangars and 11 individual T-hangars are also located on the south apron. The box-type T-hangars total approximately 15,900 square feet and the T-hangars total approximately 8,200 square feet.

Fuel Facilities

The City of Show Low owns and operates all fuel storage and dispensing

facilities at the airport. Jet fuel storage facilities are located 220 feet east of Taxiway A4. Fuel storage at this location totals 10,000 gallons in one underground Jet A tank. The 100LL fuel storage facilities are located underground along Corporate Way, south of the south apron area. Fuel storage at this location totals 10,000 gallons. Jet-A fuel is dispensed by a 2,200-gallon mobile fuel truck while 100LL is dispensed with a 1,500-gallon mobile fuel truck. All fuel storage is in compliance with Arizona Department of Environmental Quality (ADEQ) regulations.

Aircraft Rescue and Firefighting

There is no designated airport rescue and firefighting (ARFF) facility at Show Low Regional Airport; however, the airport is equipped with a vehicle which carries 250 pounds of aqueous film forming foam (AFFF). The nearest fire station is located within the City of Show Low and has a 10-minute response time to the airport in case of emergency.

An airport rescue and firefighting (ARFF) facility will be located west of the terminal building. Both firefighter quarters and equipment storage would be provided in this facility. This facility would also be combined with an airport snow removal equipment storage building. The location and configuration of this building is shown on **Exhibit 1C**.

Airport Snow Removal Equipment

Airport snow removal equipment includes a powered snow blower and trucks equipped with snow plows. The snow blower was built in 1963 and has a 600-ton per hour capacity. Two additional trucks with twelve-foot snow removal blades and one truck with an eight-foot blade are used in snow removal activities.

Automobile Parking

Automobile parking at Show Low Regional Airport totals approximately 171 spaces. The public parking for the terminal building is located south of the terminal between the Airport Road loop and totals 62 spaces. Eleven parking spaces, located west of the terminal, are designated for employee parking. East of the terminal is a long term parking area providing an additional 92 parking spaces. These spaces are used by airport tenants and users who wish to leave a vehicle at the airport for extended periods of time. Six parking spaces are located in front of the old terminal building. Public parking at the terminal is free of charge. A fee is charged for vehicles left in the long term parking area.

Utilities

Water, sanitary sewer, and electrical utilities are available at the airport. Water and sanitary sewer services are

provided by the City of Show Low. Arizona Public Service Company provides electrical service at the airport. Propane is used for heating.

The airport's primary electrical vault is located west of the terminal building. The airport is equipped with an emergency generator that powers the Runway 6-24 and associated taxiway lighting during primary power interruptions.

A utility inventory and infrastructure plan was prepared under a separate contract. This study located all primary utility services at the airport. The recommendations of this Master Plan were coordinated with this study to ensure all required utility services can be efficiently provided to future development areas.

Fencing

Portions of the airport perimeter are equipped with a system of fencing designed to restrict inadvertent access to the aircraft operational areas by wildlife. The fencing system consists of a double and single-line electrical fence located eight feet on either side of a four-strand barbed-wire fence. Chain-link fencing is located along the south side of the air carrier apron and north apron, and along the north side of the central apron.

General Aviation Services

The City of Show Low provides all fueling and line services at the airport. These services include aircraft fueling, aircraft tiedowns, aircraft pre-heating, ground power, aircraft towing and jump starts, and a pilot's briefing room. Medical Express is one of several air ambulance services, providing medical transport services for the region.

COMMUNITY PROFILE

The purpose of this section is to summarize various studies and data to provide an understanding of the characteristics of the local area. Within this section is a description of ground access systems near the airport, a description of existing and future land use around the airport, local climate data, and a historical summary of the local economy and demographics.

REGIONAL SETTING, ACCESS, AND TRANSPORTATION

The City of Show Low is located in the southeastern portion of Navajo County at the intersection of U.S. Highway 60 and State Highway 77. The city is surrounded by the Apache Sitgreaves National Forest and White Mountain Apache Reservation. Show Low Regional Airport is located at the intersections of U.S. Highway 60 and State Highway 77 on the eastern side of Show Low, approximately two miles from downtown Show Low. Airport Road, which provides access to the airport, is accessed via U.S. Highway 60.

As depicted on **Exhibit 1E**, Highway 77 connects Show Low with Interstate 40,

the Town of Snowflake, and the City of Holbrook to the north. To the south, Highway 260 provides access to the towns of Pinetop-Lakeside and Hon Dah. U.S. Highway 60 connects with Springerville and Eager, to the east, and Carrizo and Globe to the southwest.

The City of Show Low was founded in 1870 by a partnership between two ranchers. In 1876, the two ranchers decided to dissolve the partnership by playing the card game commonly known as Seven Up. Allegedly, during the last hand of the game, one of the partners said "Show low and you win." The partner cut a deuce of clubs thereby winning the ranch and naming the town Show Low. In 1902, the ranch was sold to William Jordan Flake for the Church of Jesus Christ of Latter-day Saints. The city was not incorporated until 1953.

From a regional perspective, the City of Show Low is considered part of the White Mountains Region which consists of the cities of Show Low, Pinetop-Lakeside, Snowflake, and Taylor. This region has become a popular tourist destination due to its natural beauty, cool climate, and outdoor activities. The region is located three and one-half hours from Phoenix and Tucson, two hours from Flagstaff, four hours from Albuquerque, seven hours from Las Vegas, and eight hours from El Paso.

Public transportation, serving the City of Show Low and the Town of Pinetop-Lakeside, is provided, via bus, by the Four Seasons Connection. There is no passenger rail service to the area.

Regional Airports

A review of public-use airports within a 30-nautical mile (NM) radius of Show Low Regional Airport was made to identify and distinguish the types of air service provided in the region. These airports were previously identified on **Exhibit 1B**. Information pertaining to each airport was obtained from FAA Form 5010-1, *Airport Master Record.*

Taylor Airport is located 12.5 NM northwest of Show Low Regional Airport and is owned and operated by the Town of Taylor. The airport has a single 7,200-foot asphalt runway (Runway 3-21) available for use. Fuel services are available at the airport. There are 18 based aircraft. The airport averages approximately 92 operations per week and has a GPS approach to Runway 21.

Cibecue Airport is located 29.6 NM southwest of Show Low Regional Airport. This airport has a 4,200-foot gravel runway. This airport is unattended and no services are available.

Whiteriver Airport is located 27.2 NM south of Show Low Regional Airport. This airport is owned and operated by the White Mountain Apache Tribe and has a 6,288-foot asphalt runway. No services are available at the airport. An average of 82 operations per week occur at this airport.

01MP07-1E-10/21/03

Exhibit 1E
LOCATION MAP

AREA LAND USE AND CONTROL

Land uses surrounding Show Low Regional Airport are varied and include a mix of open space and industrial development. As depicted on **Exhibit 1F**, the airport is bounded by U.S. Forest Service land to the north, west, and east. Land south of the airport is either undeveloped or industrial in nature. To the southwest, areas of industrial and commercial development provide a buffer between the airport and residential land uses.

The nearest school to the airport is the Renaissance Academy. This school is a charter school serving kindergarten through eighth grade. The school is located approximately one mile southwest of the airport. A newly constructed church is located south of Highway 60 near the airport.

Land Use Plans

With the exception of land to the north of the airport and east of Long Lake, land use surrounding the airport is the responsibility of the City of Show Low. To guide development in the area, the city has prepared and adopted the *City of Show Low General Plan*. As part of the general plan, a future land use map, depicted on **Exhibit 1G**, was prepared. As illustrated, future land uses in the vicinity of the airport are planned to be compatible with the airport. An airport/industrial complex will surround the airport to the north, south, east, and west and commercial development is planned to the southwest. Residential areas and master-planned communities are planned past the aviation/ industrial complex to the west and south of the airport.

Height and Hazard Zoning

Height and hazard zoning in the vicinity of the airport is regulated by Article 16-2, *Airport Zoning*, of the Show Low City Code. Specific zones, based on the F.A.R. Part 77 airspace plan, have been established in order to regulate the height of objects in the vicinity of the airport.

Section 16-2-5 sets forth the following use restrictions:

- Electrical interference with navigational signals or radio communications between the airport and aircraft;
- Difficulties for pilots attempting to distinguish between airport lights and other lighting;
- A glare in the eyes of pilots using the airport;
- Impairing visibility in the vicinity of the airport; or
- Create a hazard or endanger the landing, takeoff, or maneuvering of aircraft using Show Low Regional Airport.

Section 15-1-691, Wireless Tele-communications Towers and Antennas, establishes guidelines for the siting of commercial towers and antennas. This ordinance accounts for the airport zones

established for the airport in Section 16-2-2 of the code.

PUBLIC AIRPORT DISCLOSURE MAP

In accordance with Arizona Revised Statute 28-8486, the City of Show Low has established a public airport disclosure map. The map is intended to assist property owners and prospective property owners in identifying the operational areas of the airport and how they may relate to their property. The boundaries of the public disclosure map are illustrated on **Exhibits 1F** and **1G**. The existing public disclosure map for Show Low Regional Airport extends for one mile from the end of each runway (including proposed Runway 18-36) and one mile laterally each side of the runway.

THE AIRPORT'S SYSTEM ROLE

Airport planning exists on many levels: local, state, and national. Each level has a different emphasis and purpose. Locally, this Master Plan is the primary airport planning document.

At the state level, the airport is included in the Arizona State Aviation System Plan (SASP). The purpose of the SASP is to ensure that the state has an adequate and efficient system of airports to serve its aviation needs well into the 21st century. The SASP defines the specific role of each airport in the state's aviation system and establishes funding needs. Through the state's *Continuous Aviation System Planning Process* (CASPP), the SASP is updated every five years. The most recent update to the SASP is the draft 2000 *Arizona State Aviation Needs Study* (SANS). The purpose of the SANS is to provide policy guidelines that promote and maintain a safe aviation system in the state, assess the state's airports' capital improvement needs, and identify resources and strategies to implement the plan.

Show Low Regional Airport is one of 112 airports within the state's aviation system plan. The 2000 SANS includes all public and private airports and heliports in Arizona which are open to the public, including American Indian and recreational airports.

At the national level, the airport is included in the *National Plan of Integrated Airport Systems* (NPIAS). The NPIAS includes a total of 3,660 airports (both existing and proposed) which are important to national air transportation. Show Low Regional Airport is classified as a non-primary commercial service airport within the NPIAS.

CLIMATE

Weather conditions are important to the planning and development of an airport. Temperature is an important factor in determining runway length requirements, while wind direction and speed are used to determine optimum runway orientation. The need for navigational aids and lighting is determined by the percentage of time that visibility is

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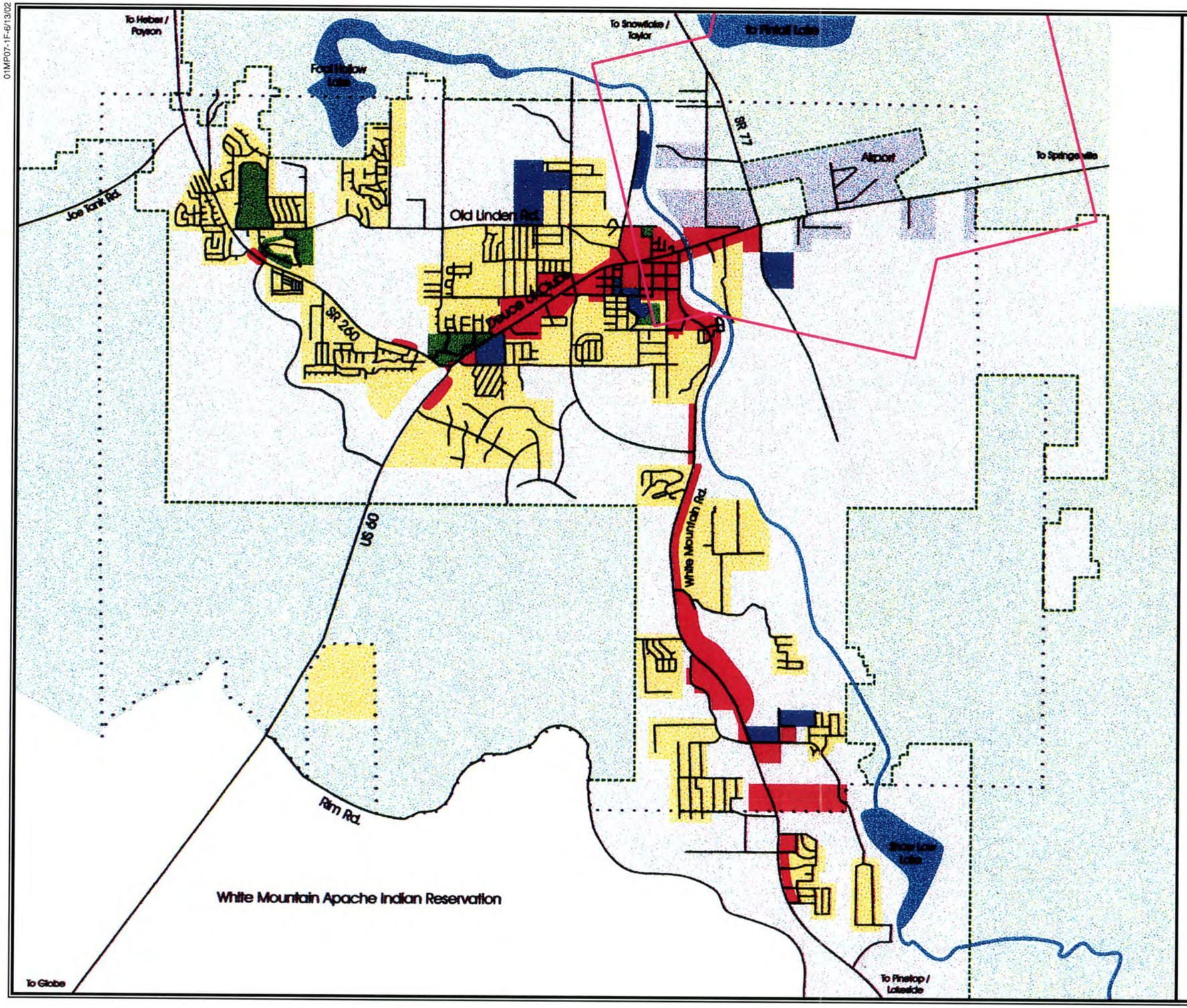


LEGEND

- Public Airport Disclosure Map Limits
- Streets
- City Boundary
- Forest Service Boundary
- U.S. Forest Service
- Park/Golf Course
- Show Low Creek and Lakes
- Undeveloped
- Residential
- Retail/Employment
- Airport/Industrial
- Public/Institutional

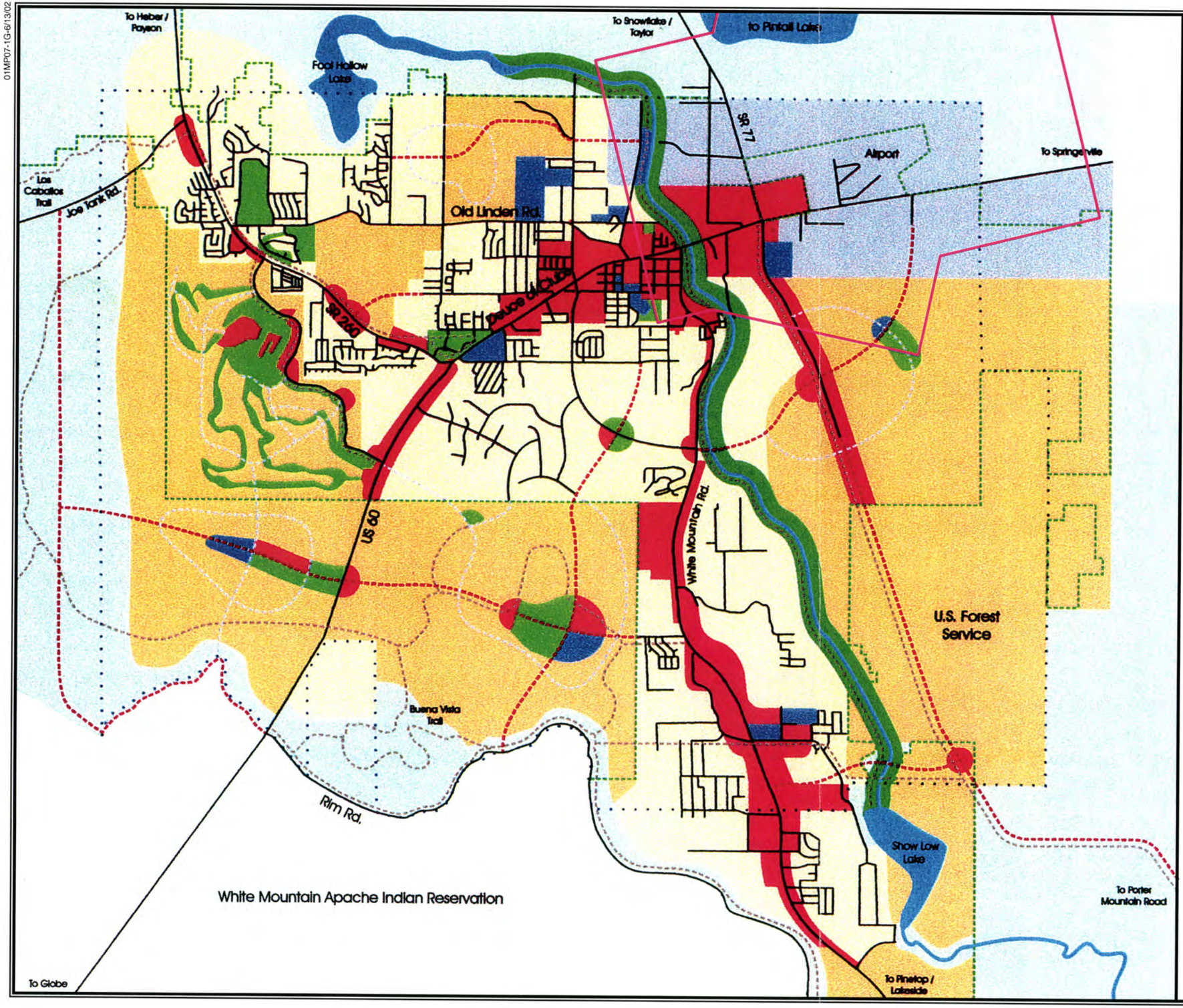
NORTH

Source: Show Low Existing Land Use
Community Sciences Corporation

SHOW LOW Regional Airport

Exhibit 1F
EXISTING LAND USE

01MP07-1G-6/13/02



LEGEND

- Public Airport Disclosure Map Limits
- Streets
- City Boundary
- Forest Service Boundary
- Open Space
- Show Low Creek Corridor
- Park/Golf Course
- Show Low Creek and Lakes
- Residential Areas
- Master Planned Communities
- Retail/Employment Centers
- Airport/Industrial Complex
- Public/Institutional
- New Connection Routes
- Master Plan Circulation
- Trail System

NORTH

Source: Show Low Development Plan
Community Sciences Corporation

SHOW LOW Regional Airport

Exhibit 1G
FUTURE LAND USE

impaired due to cloud coverage or other conditions.

The Show Low region experiences a moderate winter followed by a cool spring and summer. July is the hottest month with an average daily maximum temperature of 85.8 degrees Fahrenheit (F), and January is the coldest month with an average daily minimum temperature of 44.2 degrees F. The average precipitation in Show Low is 17.8 inches per year. Average temperature and precipitation totals by month are summarized in **Table 1B**.

TABLE 1B
Weather Summary
Show Low, Arizona

Month	Daily Minimum (degrees F)	Daily Maximum (degrees F)	Average Total Precipitation (inches)	Average Total Snowfall (Inches)
January	20.0	45.3	1.22	5.8
February	23.8	50.5	1.28	5.2
March	28.6	56.0	1.39	6.0
April	33.7	64.1	0.65	1.8
May	41.6	73.3	0.70	0.0
June	50.3	83.5	0.45	0.0
July	57.2	85.8	2.26	0.0
August	55.8	82.8	3.20	0.0
September	49.5	77.9	1.74	0.0
October	37.8	67.4	1.66	0.5
November	27.6	55.4	1.38	2.5
December	21.0	46.3	1.87	6.0
Yearly Average	**37.2**	**65.7**	**17.80**	**27.8**

Source: Western Regional Climatic Center

SOCIOECONOMIC CHARACTERISTICS

A variety of historical and forecast socioeconomic data, related to the regional area, has been collected for use in various elements of this Master Plan. This information provides essential background for use in determining aviation service level requirements. Aviation forecasts are often related to the population base, economic strength of a region, and the ability of a region to sustain a strong economic base over an extended period of time.

Population

Population is one of the most important elements to consider when planning for future needs of the airport. Historical population data for the City of Show Low, Navajo County, and the State of Arizona are presented in **Table 1C**. As shown in the table, the population of

Show Low, with an average annual growth rate of 3.0 percent, has grown in a similar manner to that of the State of Arizona, with an average annual growth rate of 3.1 percent. Navajo County as a whole has experienced a much slower rate of growth with an average annual growth rate of only 1.8 percent.

TABLE 1C
Historical Population

	1980	1990	2000	Average Annual Growth Rate
City of Show Low	4,298	5,019	7,695	3.0%
Navajo County	67,629	77,658	97,470	1.8%
State of Arizona	2,716,546	3,665,228	5,130,632	3.1%

Source: Arizona Department of Economic Security

A further review of regional growth patterns indicates that the southern portions of Navajo County have grown at a faster pace than the northern portions of the county. The cities and towns within a twenty-mile radius of Show Low have experienced faster-paced growth than the cities and towns in northern Navajo County, primarily due to the ever-increasing seasonal population and increasing tourism to the White Mountains area. For example, from 1980 to 2000, the City of Holbrook in northern Navajo County has experienced a negative average annual growth rate of -0.8 percent while the Town of Pinetop-Lakeside, located nine miles south of Show Low in Navajo County, has experienced a positive annual growth rate of 2.2 percent.

Employment

Analysis of a community's employment base can be valuable in determining the overall well-being of that community. In most cases, the community's make-up and health is significantly determined by the availability of jobs, the variety of employment opportunities, and the types of wages provided by local employers. The largest employers in the City of Show Low, including the number of employees, are shown in **Table 1D**.

TABLE 1D
Major Employers
City of Show Low

Company Name	Number of Employees
Navajo County Navapache Regional Medical Center	643
Abitibi Consolidated Northland Pioneer College	450
Wal-Mart	373
Snow Flake/Taylor School District	300

Source: White Mountains of Arizona Regional Development Corporation

Table 1E summarizes labor force data and growth indicators for the City of Show Low. As shown in the table, while the number of unemployed has increased along with the labor force, the unemployment rate has steadily decreased since 1990. Growth indicators show a strong economy as the number of new building permits increased from 104 in 1990 to 357 in 2000, and taxable sales almost tripled.

TABLE 1E
Labor Force Data and Economic Indicators
City of Show Low

	1990	1998	2000
Labor Force Data			
Civilian Labor Force	2,130	2,414	2.490
Unemployment	111	121	120
Unemployment Rate	5.2%	5.0%	4.8%
Growth Indicators			
New Building Permits	104	401	357
Taxable Sales ($)	94,853,850	230,088,100	271,946,950

Source: Arizona Department of Commerce

SUMMARY

The information discussed in this chapter provides a foundation upon which the remaining elements of the planning process will be constructed. This information will provide guidance, along with additional analysis and data collection, for the development of forecasts of aviation demand and facility requirements.

Chapter Two
AVIATION DEMAND FORECASTS

Chapter Two

AVIATION DEMAND FORECASTS

The purpose of this chapter is to examine the existing and potential aviation demand for scheduled air carrier and general aviation activity at Show Low Regional Airport. The proper planning of a facility of any type must begin with a definition of the demand that may occur over a specified period of time. Projections of scheduled airline enplanements and operations, general aviation operations, air taxi operations, and based aircraft will be used to determine the types and sizes of facilities required to meet the aviation demands of Show Low Regional Airport through 2025.

Air transportation is a unique industry that has experienced wide fluctuations in growth and recession. For this reason, it is important that from time-to-time an airport evaluate its current position and examine future demand trends and potential. This holds especially true today given limited public funding mechanisms.

The primary objective of this planning effort is to define the magnitude of change that can be expected over time. Because of the cyclical nature of the economy, it is virtually impossible to predict, with certainty, year-to-year fluctuations in activity when looking as far as 20 years into the future. However, a trend can be established which delineates long term growth potential. While a single line is often used to express the anticipated growth, it is important to remember that actual growth may fluctuate above and below this line. The point to remember about forecasts is that they serve only as guidelines, and planning must remain flexible to respond to unforeseen facility needs. This is because aviation activity

is affected by many external influences, as well as by the types of aircraft used and the nature of available facilities.

Recognizing this, it is intended to develop a Master Plan for Show Low Regional Airport that will be demand-based rather than time-based. As a result, the reasonable levels of activity potential that are derived from this forecasting effort will be related to the planning horizon levels rather than dates in time. These planning horizons will be established as levels of activity that will call for consideration of the implementation of the next step in the Master Plan program. This will be further described in subsequent chapters of this Master Plan.

Although publically-owned and operated, an airport is, in many ways, very similar to the private business environment. Airports provide much needed services to the community and have to recognize their position and establish well-planned goals in order to better serve the community. Marketing efforts and facility development are matched to goals so that the airport can best serve the community.

In order to fully assess current and future aviation demand for Show Low Regional Airport, an examination of several key factors is needed. These include: national and regional aviation trends, historical and forecast socioeconomic and demographic information of the area, competing transportation modes, and facilities. Consideration and analysis of these factors will ensure a comprehensive outlook for future aviation demand at Show Low Regional Airport.

These forecasts have been prepared following the events of September 11, 2001, when four commercial airliners were hijacked. Immediately following the events of September 11th, the national airspace system was closed and all commercial flights were grounded. Following the resumption of flights, commercial airline traffic was down, which led to schedule reductions and layoffs by many of the commercial airlines. The federal government provided billions of dollars in financial assistance to the commercial airlines, along with loan guarantees. No similar assistance was provided for the general aviation industry. The total impacts September 11th will have on commercial and general aviation can only be determined over time.

The demand-based manner in which this Master Plan is being prepared is intended to accommodate variations in demand at the airport. Demand-based planning relates capital improvements to demand factors, such as based aircraft or passengers, instead of points in time. This allows the airport to address capital improvement needs according to actual demand occurring at the airport. Therefore, should growth in passengers, aircraft operations, or based aircraft slow or decline, it may not be necessary to implement some improvement projects. However, should the airport experience accelerated growth, the plan will have accounted for that growth and will be flexible enough to respond accordingly.

LOCAL SOCIOECONOMIC FEATURES

The local socioeconomic conditions provide an important baseline consideration for preparing aviation demand forecasts. Local demographic and economic growth provide important indicators for understanding the dynamics of the community and future growth potential.

POPULATION

Table 2A summarizes population projections for the communities in the White Mountain region: Show Low, Snowflake, Pinetop-Lakeside, and Taylor. As shown in the table, the population in the White Mountain region is expected to grow at an average annual rate of 0.9 percent through 2025. Show Low and Taylor are expected to grow at 1.0 percent annually through 2025, while Snowflake and Pinetop-Lakeside are projected to grow at a slightly slower rate.

TABLE 2A
Forecast Population

	2001	2005	2010	2015	2020	2025	Avg. Annual Growth Rate
Show Low	8,085	8,350	8,823	9,257	9,742	10,255	1.0%
Pinetop-Lakeside	3,680	3,966	4,090	4,112	4,193	4,338	0.7%
Snowflake	4,580	4,730	4,888	4,999	5,143	5,319	0.6%
Taylor	3,385	3,166	3,431	3,723	4,019	4,301	1.0%
Total	19,730	20,212	21,232	22,091	23,097	24,213	0.9%

Source: Arizona Department of Economic Security

The population of the White Mountain region is actually greater than shown in the table. The White Mountain region is considered to include those areas within 50 miles of Show Low. This encompasses large unincorporated portions of Navajo and Apache counties. This is expected to increase the population by as much as 40,000. During the summer season, the population is expected to increase by an additional 28,000.

SALES

Table 2B summarizes total sales, total retail sales, and local sales tax revenues for Show Low, Pinetop-Lakeside, Taylor, and Snowflake. With few exceptions, these categories have increased for the region over the past four fiscal years. Total sales tax revenues and total sales have grown at an average annual rate of 1.1 percent, while retail sales have grown at an average annual rate of 1.0 percent.

TABLE 2B
White Mountain Region Total Sales, Retail Sales, Sales Tax Revenues

Total Sales Tax Revenues[1]	**FY 97-98**	**FY 98-99**	**FY 99-00**	**FY 00-01**
City of Show Low	$4,601,762	$5,438,939	$6,213,466	$6,445,786
Town of Pinetop-Lakeside	$2,059,153	$2,179,473	$2,209,317	$2,280,217
Town of Taylor	$393,732	$412,491	$417,649	$452,008
Town of Snowflake	$581,461	$706,453	$682,522	$793,262
Total	**$7,636,108**	**$8,737,356**	**$9,522,954**	**$9,971,273**
Projected Total Sales[2]	**FY 97-98**	**FY 98-99**	**FY 99-00**	**FY 00-01**
City of Show Low	$230,088,100	$271,946,950	$310,673,300	$322,289,300
Town of Pinetop-Lakeside	$82,366,120	$87,178,920	$88,372,680	$91,208,680
Town of Taylor	$19,686,600	$20,624,550	$20,882,450	$22,600,400
Town of Snowflake	$29,073,050	$35,322,650	$34,126,100	$39,663,100
Total	**$361,213,870**	**$415,073,070**	**$454,054,530**	**$475,761,480**
Total Retail Sales	**FY 97-98**	**FY 98-99**	**FY 99-00**	**FY 00-01**
City of Show Low	$165,043,241	$183,828,413	$210,019,150	$216,280,400
Town of Pinetop-Lakeside	$36,870,828	$40,090,000	$41,219,116	$41,105,240
Town of Taylor	$12,825,957	$13,623,114	$13,033,150	$14,061,500
Town of Snowflake	$15,974,550	$21,729,052	$20,688,979	$20,676,700
Total	**$230,714,576**	**$259,270,579**	**$284,960,395**	**$292,123,840**

Source: White Mountains of Arizona Regional Development Corporation.

FORECASTING APPROACH

The development of aviation forecasts proceeds through both analytical and judgmental processes. A series of mathematical relationships are tested to establish statistical logic and rationale for projected growth. However, the judgement of the forecast analyst, based upon professional experience, knowledge of the aviation industry, and assessment of the local situation, is important in the final determination of the preferred forecast.

The most reliable approach to estimating aviation demand is through the utilization of more than one analytical technique. Methodologies frequently considered include trend line projections, correlation/regression analysis, and market share analysis.

Trend line projections are probably the simplest and most familiar of the

forecasting techniques. By fitting growth curves to historical demand data, then extending them into the future, a basic trend line projection is produced. A basic assumption of this technique is that outside factors will continue to affect aviation demand in much the same manner as in the past. As broad as this assumption may be, the trend line projection does serve as a reliable benchmark for comparing other projections.

Correlation analysis provides a measure of direct relationship between two separate sets of historic data. Should there be a reasonable correlation between the data sets, further evaluation using regression analysis may be employed.

In regression analysis, values for the aviation demand in question (i.e. based aircraft), the dependent variable, are projected on the basis of one or more other indicators, the independent variable. Historical values for all variables are analyzed to determine the relationship between the independent and dependent variables. These relationships may then be used, with projected values of the independent variable, to project corresponding values of the dependent variable.

Market share analysis involves a historical review of the airport activity as a percentage, or share, of a larger regional, state, or national aviation market. A historical market share trend is determined providing an expected market share for the future. These shares are then multiplied by the forecasts of the larger geographical area to produce a market share projection. This method has the same limitations as trend line projections, but can provide a useful check on the validity of other forecasting techniques.

It is important to note that one should not assume a high level of confidence in forecasts that extend beyond five years. Facility and financial planning usually require at least a 10-year preview, since it often takes more than five years to complete a major facility development program. However, it is important to use forecasts which do not overestimate revenue-generating capabilities or understate demand for facilities needed to meet public (user) needs.

A wide range of factors are known to influence the aviation industry and can have significant impacts on the extent and nature of air service provided in both the local and national markets. Technological advances in aviation have historically altered, and will continue to change, the growth rates in aviation demand over time. The most obvious example is the impact of jet aircraft on the aviation industry, which resulted in a growth rate that far exceeded expectations. Such changes are difficult, if not impossible, to predict, and there is simply no mathematical way to estimate their impacts. Using a broad spectrum of local, regional, and national socioeconomic and aviation information, and analyzing the most current aviation trends, forecasts are presented in the following sections.

The following forecast analysis examines each of the aviation demand categories expected at Show Low

Regional Airport through 2025. Each segment will be examined individually, and then collectively, to provide an understanding of the overall aviation activity at Show Low Regional Airport through 2025.

AIRPORT SERVICE AREA

The service area of an airport is defined by its proximity to other airports providing similar services. Phoenix Sky Harbor International Airport offers the greatest competition to Show Low Regional Airport. Located approximately 170 miles southwest, Phoenix Sky Harbor International Airport is served by all the major airlines and many regional air carriers.

From a commercial service perspective, the decision to fly out of Show Low Regional Airport is affected by numerous factors, including the drive times to other airports offering commercial service, availability of flights and equipment, airfares, and the type of traveler (business vs. pleasure). Phoenix Sky Harbor International Airport offers the greatest competition for service in terms of the availability of flights, aircraft, and air fares.

The primary attraction for air service at Show Low is the ground distance from Phoenix Sky Harbor International Airport, the difficulty of the drive (especially in winter), and the time savings that can be achieved through flying to Show Low Regional Airport. Due to the limited size of the potential passenger market in Show Low, it is unlikely that Show Low Regional Airport could offer similar availability of flights, aircraft, or air fares for air travelers to Show Low as Phoenix Sky Harbor International Airport.

For general aviation, the service area is more closely defined around the airport, since other general aviation airports in the area provide similar services to smaller aircraft. However, this factor is influenced by the need for many general aviation operators to have the level of service provided at Show Low Regional Airport, including a longer runway and instrument capability, and proximity to Show Low, which serves as the economic center for the White Mountain Region.

COMMERCIAL AIRLINE ACTIVITY

NATIONAL TRENDS

Each year, the Federal Aviation Administration (FAA) publishes its national aviation forecast. Included in this publication are forecasts for air carriers, regional/commuters, general aviation, and FAA workload measures. The forecasts are prepared to meet budget and planning needs of the constituent units of the FAA and to provide information that can be used by state and local authorities, the aviation industry, and by the general public. The current edition when this chapter was prepared was FAA *Aerospace Forecasts-Fiscal Years 2002-2013*, published in March 2002. The forecasts use the economic performance of the United States as an indicator of future aviation industry growth. Similar

economic analyses are applied to the outlook for aviation growth in international markets.

In 2002, the overall demand for aviation services is expected to decline. Positive growth is not expected to be achieved until 2003, and even then the level of enplanements may not return to, or surpass, those of 2001 until 2004. While the majority of this decline is forecast to occur with the large air carriers, the regional airline industry is expected to achieve small levels of growth in 2002, possibly returning to its long-term historical growth trend in 2003. Air cargo traffic is expected to grow at rates similar to those predicted for passenger traffic. After 2004, general aviation is expected to achieve low to moderate increases in the active fleet and hours flown, with most of the growth occurring in business/corporate flying. Combined aviation activity at FAA and contract facilities is expected to increase at significantly higher rates than those predicted for general aviation.

The forecasts prepared by the FAA assume that aviation demand will follow a similar path to recovery, as with previous terrorist or war-related incidents (i.e., Pan American Flight 103 in December 1988 and Iraq's invasion of Kuwait in August 1990). In each instance, traffic and revenue growth resumed within a year. However, the events of September 11th, 2001 had a much more significant effect on the aviation industry, and therefore, must be taken into consideration in the following forecasts. The successful prosecution of the war on terrorism and no further incidences of terrorist activity will set the tone for early recovery in 2002.

Commercial Aviation

The events of September 11th, 2001 had a profound effect on U.S. airlines, both domestically and internationally. While domestic capacity was up 0.9 percent for the entire year, it was down 19.0 percent in September, wiping out most of the gains recorded in the previous 11 months. Prior to this event, the commercial aviation industry recorded its seventh consecutive year of strong traffic growth in 2000. Domestic passenger enplanements declined 1.8 percent in 2001, while domestic load factors averaged 69.7 percent, down 1.2 percent from the previous year.

The year 2001 would also prove to have a disastrous effect on airline profits, with U.S. air carriers reporting operating losses of $4.3 billion ($3.2 billion occurred in the July-September quarter). This is down $12.2 billion from the previous year. This is a dramatic turnaround from the previous seven years (1994-2000), when U.S. air carriers reported operating profits totaling $47.6 billion. However, losses in 2001 would have been significantly higher if the federal government had not approved a $5.0 billion emergency aid package for U.S. airlines. This aid package is included in most air carriers' financial statements for the July-September quarter.

Following the events of September 11th, many of the larger air carriers grounded

a number of their older, less efficient aircraft, and deferred aircraft that were scheduled for delivery in 2002 and 2003. Orders for commercial jet aircraft totaled 851 in the first three quarters of 2001. This is a decrease of 40.6 percent from the same period in 2000. Regional jet orders were down 50.1 percent from the 659 aircraft ordered during the first nine months of 2000. However, the 2,301 orders over the past 19 quarters show that the regional jets will continue to be the fastest growing segment of the aviation industry over the next several years. The number of large passenger jets (more than 70 seats) is forecast to decline by 0.3 percent (13 aircraft) in 2002. Over the 12-year forecast period, the number of large passenger jet aircraft is expected to increase from 4,069 in 2001 to 5,606 in 2013. This represents an annual average increase of 2.7 percent, or 128 aircraft per year. The demand for narrow body aircraft will continue to outpace the demand for the wide body fleet. The narrow body fleet is forecast to grow by 107 aircraft annually, and the wide body fleet by 21 aircraft a year.

The FAA's projection for domestic and international commercial service passenger enplanements indicate relatively strong growth. However, air carrier operations are not expected to return to pre-September 11th activity levels until 2005. Domestic enplanements are projected to grow at an annual average rate of 3.1 percent over the 12-year forecast period, while international enplanements are projected to grow at an annual average rate of 4.7 percent.

Regional/Commuter Airlines

The regional/commuter airline industry, defined as air carriers providing regularly scheduled passenger service and fleets composed primarily of aircraft having 60 seats or less, continues to be the strongest growth sector of the commercial air carrier industry. Dramatic growth in code-sharing agreements with the major carriers, followed by a wave of air carrier acquisitions and purchases of equity interests, has resulted in the transfer of large numbers of short-haul jet routes to their regional partners, fueling the industry's growth.

Despite the events of September 11th, many regional/commuter airlines were able to maintain their previous flight schedules. Many have even increased their flight schedules in response to the transfer of additional routes from their larger code-sharing partners. Regional/commuter capacity and traffic continued to grow in 2001, enplaning 79.37 million passengers in the fiscal year. This is an increase of 0.8 percent over 2000. The regional/commuter airlines achieved a load factor of 58.6 percent in 2001, an increase of 0.3 percent over the previous year.

Industry growth is expected to outpace that of the larger commercial air carriers. The introduction of new state-of-the-art aircraft, especially high-speed turboprops and regional jets with ranges of up to 1,000 miles, is expected to open up new opportunities for growth in non-traditional markets. The regional airline industry will also

benefit from continued integration with the larger air carriers. The further need for larger commercial air carriers to reduce costs and fleet size will insure that these carriers continue to transfer smaller, marginally profitable routes to the regional air carriers.

Likewise, the increased use of regional jets is expected to lead to another round of route rationalization by the larger commercial carriers, particularly on low-density routes in the 500-mile range. Regional jet aircraft can serve these markets with the speed and comfort of a large jet, while at the same time providing greater service frequency that is not economically feasible with the speed and comfort of a large jet. This is expected to contribute to strong growth during the early portion of the planning period, although this phenomenon is expected to diminish during the mid-to-latter portion of the planning period.

Passenger enplanements are expected to increase at an average annual rate of 5.5 percent during the FAA's 12-year forecast period, from 79.7 million in 2001 to 151.5 million in 2013. In 2013, regional/commuter airlines are expected to transport 16.6 percent of all passengers in scheduled domestic air service. This is an increase of 12.7 percent from 2001. This greater use of regional jets results in the average seating capacity of the regional fleet increasing from 39.9 seats in 2001 to 48.4 seats in 2013. **Exhibit 2A** depicts passenger enplanements and fleet mix forecasts for the U.S. regional/ commuter market.

SHOW LOW REGIONAL AIRPORT AIR SERVICE

Air service at Show Low Regional Airport has varied in recent years. Since 1992, five separate airlines have provided air service at Show Low Regional Airport. Arizona Pacific provided service in 1992, 1993, and a portion of 1994. Scenic Airlines provided service from 1994 to 1996. Great Lakes Airlines served Show Low in 1996 and 1997. Sunrise Airlines served the airport from 1998 through 2001. Arizona Express began service in late 2001 and is currently providing service.

Show Low Regional Airport is included in the Essential Air Service (EAS) program. The EAS program is administered by the U.S. Department of Transportation to ensure smaller communities retain access to the national air transportation system. Under the EAS program, the air carrier providing scheduled service to a community is provided a monthly subsidy in return for providing a minimum level of service to a hub airport.

Arizona Express was selected in May 2002 to provide subsidized scheduled air service to Show Low for one year. Under the contract, Arizona Express is to provide 14 nonstop round trips between Phoenix and Show Low weekly. Arizona Express provides the subsidized service with a Beechcraft 1900 aircraft configured with nine seats.

As shown in **Table 2C**, annual enplanement levels have varied each year. Annual enplanements peaked at 4,059 in 2000. The previous peak level for enplaned passengers was in 1996 when there were 3,525 enplaned passengers.

TABLE 2C
Ratio Of Enplanements Per Resident

Year	Show Low Enplanements	City of Show Low Population	Enplanements per Resident
1992	2,857	5,280	0.54
1993	2,831	5,390	0.53
1994	3,294	5,605	0.59
1995	3,131	5,830	0.54
1996	3,525	7,230	0.49
1997	1,300	7,480	0.17
1998	1,618	7,875	0.21
1999	3,746	8,245	0.45
2000	4,059	8,575	0.47
2001	1,267	8,085	0.16
Constant Ratio of Enplanements Per Resident			
2005	4,200	8,350	0.50
2010	4,400	8,823	0.50
2015	4,600	9,257	0.50
2020	4,900	9,742	0.50
2025	5,100	10,255	0.50
Increasing Ratio of Enplanements Per Resident			
2005	4,300	8,350	0.52
2010	4,800	8,823	0.54
2015	5,200	9,257	0.56
2020	5,700	9,742	0.58
2025	6,200	10,255	0.60

Source for historical Show Low enplanements: City of Show Low
Source for historical and forecast population: Arizona Department of Economic Security

Show Low was only served by scheduled air service January through April in 2001 and part of December 2001. This led to the decline in enplanements in 2001.

Between 1992 and 2000, enplanements grew by 29 percent. The most recent of period of growth (1998-2000) can be attributed to a consistent schedule and continuous service at Show Low.

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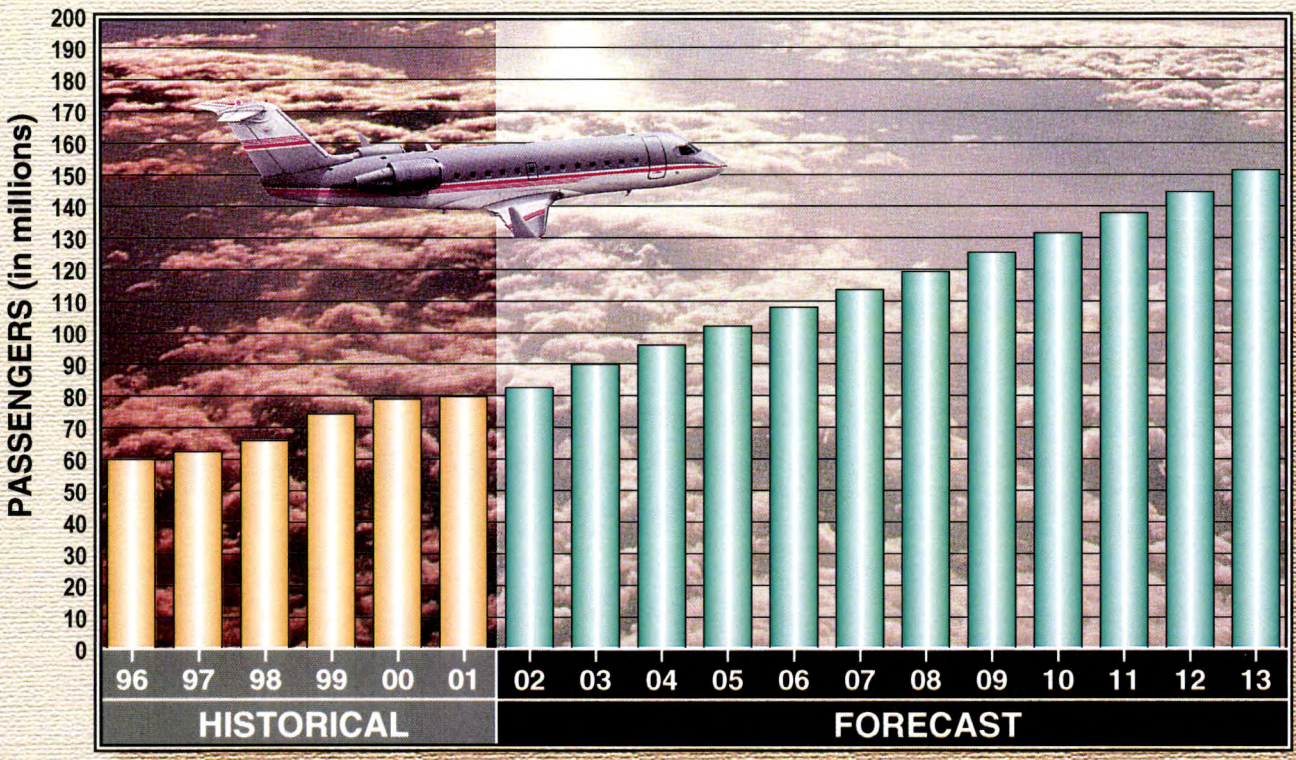
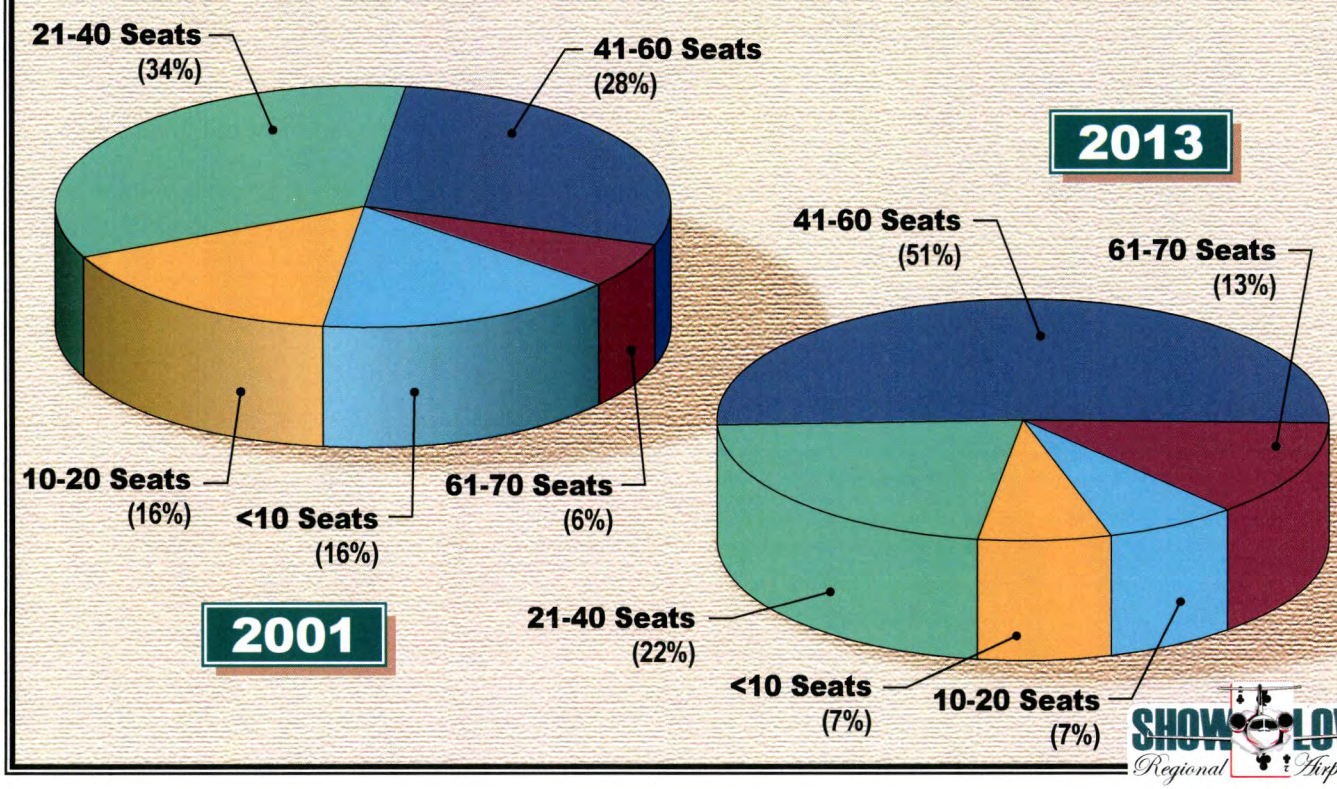
U.S. REGIONAL/COMMUTER SCHEDULED PASSENGER ENPLANEMENTS



Source: FAA Aerospace Forecasts, FY 2002-2013

PERCENT BY AIRCRAFT SEAT SIZE



SHOW LOW Regional Airport

Exhibit 2A
U.S. REGIONAL/COMMUTER FORECASTS

Between 1998 and 2000, enplanements grew by more than 60 percent. During this period, the airport had continual service from Sunrise Airlines. These companies operated under an EAS contract using a Beechcraft King Air leased from the City of Show Low. The growth through this period suggests that there is a strong air service market in Show Low as long as that service can be shown to be reliable.

COMMERCIAL AIRLINE FORECASTS

To determine the types and sizes of facilities necessary to accommodate airline activity at Show Low Regional Airport, three basic elements of this activity must be forecast. These forecast elements include:

- Annual Enplaned Passengers
- Fleet Mix
- Annual Aircraft Operations

Annual Enplaned Passenger Forecasts

As in any case where there are differences in levels of service, Show Low Regional Airport must compete with the air service available at Phoenix Sky Harbor International Airport. While 170 miles from Show Low, Phoenix provides regular jet service. As a result, many passengers choose to use Phoenix Sky Harbor International Airport rather than fly directly to the more convenient Show Low Regional Airport.

The number of potential enplanements that Show Low Regional Airport may realize depends upon the role of Show Low Regional Airport. The full potential for Show Low Regional Airport would only be realized if Show Low Regional Airport provided services and air fares similar to Phoenix Sky Harbor International Airport. This is not likely, considering the ability of Phoenix Sky Harbor International Airport to accommodate large transport jets and provide better scheduling and air fares.

The first step in developing forecasts of total annual enplaned passengers involved the use of time-series and regression analyses. Time-series analysis pertains to projecting future activity based on previous trends. Regression analyses measure the statistical relationship between dependent and independent variables, and provide a "correlation coefficient." Due to the fluctuations in enplanement levels since 1992, the time-series and regression analyses yielded correlation coefficients too low to have any predictive reliability. Therefore, none of the time-series or regression analyses were carried forward for the study.

Table 2C compares annual enplanements to the total population in Show Low. As shown in **Table 2C**, the 2000 ratio of enplanements to population of 0.47 was down from a high of 0.59 in 1994.

Two forecasts, based on the ratio of enplanements to population, have been prepared. A constant ratio of enplane-

ments per resident has been developed to yield an enplanement projection growing at the same rate as the Show Low population.

As shown in **Table 2C**, applying a constant ratio of 0.50 enplanements to residents yields 5,100 annual enplanements by the end of the planning period. A second forecast increases the ratio of enplanements to population through the planning period, reaching a level similar to the 1994 high of 0.59 enplanements per resident by the end of the planning period. This yields 6,200 annual enplanements in 2025.

A market share analysis of total U.S. regional airline enplanements was developed to prepare an alternate forecast. **Table 2D** delineates Show Low Regional Airport's market share since 1992.

TABLE 2D
Market Share Analysis

Year	U.S. Regional Enplanements	Show Low Enplanements	% of U.S. Regional Airline Enplanements
HISTORICAL			
1992	41,100,000	2,857	0.007%
1993	45,100,000	2,831	0.006%
1994	51,500,000	3,294	0.006%
1995	55,800,000	3,131	0.006%
1996	60,000,000	3,525	0.006%
1997	62,300,000	1,300	0.002%
1998	65,900,000	1,618	0.002%
1999	74,300,000	3,746	0.005%
2000	79,600,000	4,059	0.005%
2001	79,700,000	1,267	0.002%
Constant Share of U.S. Regional Airline Enplanements			
2005	102,100,000	5,200	0.005%
2010	131,500,000	6,700	0.005%
2015	179,300,000	9,100	0.005%
2020	221,200,000	11,300	0.005%
2025	263,100,000	13,400	0.005%
Increasing Share of U.S. Regional Airline Enplanements			
2005	107,200,000	6,700	0.006%
2010	139,800,000	9,700	0.007%
2015	179,300,000	14,300	0.008%
2020	221,200,000	19,900	0.009%
2025	263,100,000	26,300	0.010%

Source for historical and forecast U.S. Regional Enplanements: FAA
Source for historical Show Low enplanements: City of Show Low

As shown in the table, Show Low Regional Airport's share of the U.S. market for regional airline annual enplanements has varied since 1990 from a low of 0.002 percent to a high of 0.007 percent.

To gain an understanding of future airline enplanements at Show Low Regional Airport based upon the growth projected for U.S. regional airline enplanements, a constant share of U.S. regional airline enplanements forecast has been prepared. This forecast takes the 2000 market share of 0.005 percent and applies it to forecast U.S. regional airline enplanements prepared by the FAA. This method projects annual enplanements growing at the same rate as U.S. regional airline enplanements and yields 13,400 enplanements by the end of the planning period. A second forecast projects Show Low Regional Airport gaining market share through the planning period. This projection yields 26,300 enplanements by the end of the planning period.

The FAA and the Arizona Department of Transportation - Aeronautics Division (ADOT) forecasts have been considered for comparative purposes. The FAA *Terminal Area Forecasts 2001-2015* (TAF) presents enplanement projections for all commercial service airports in the United States. The TAF for Show Low Regional Airport was developed using historical data through the year 2000 and projects annual enplanements declining through 2015 to 3,961. Forecasts prepared for the *2000 State Aviation Needs Study* (SANS) projected enplanements growing to 4,415 by 2020.

Based on historical growth trends, both of these forecasts likely underestimate the growth potential in the market. Historically, enplanement levels have grown at the airport. The FAA TAF is contrary to this historical trend.

Table 2E summarizes all the forecasts prepared for this analysis. As shown on **Exhibit 2B**, the combination of the forecasts represents a "forecast envelope." The "forecast envelope" represents the area in which future enplanements should be found.

The constant ratio of enplanements per resident forecast represents the low end of the forecast envelope, while the increasing share of U.S. regional airline enplanements forecast forms the upper end of the forecast envelope. The FAA TAF and ADOT forecasts lie below the forecast envelope.

In examining the forecasts, it would appear that the increasing share of U.S. regional airline enplanements is too aggressive for the airport. This forecast yields a strong annual growth rate that more than likely could not be sustained over the planning period.

The constant ratio of enplanements per resident and increasing ratio of enplanements per resident appear to understate growth potential. As shown previously, enplanements grew nearly 60 percent in a three-year period marked by continual, reliable air service. If this type of service could be achieved again, enplanement growth could quickly outpace these forecast levels.

TABLE 2E
Enplanement Forecast Summary

	2000	2005	2010	2015	2020	2025	Avg. Annual Growth
Constant Ratio of Enplanements Per Resident		4,200	4,400	4,600	4,900	5,100	0.9%
Increasing Ratio of Enplanements Per Resident		4,300	4,800	5,200	5,700	6,200	1.7%
Constant Share of U.S. Regional Airline Enplanements		5,200	6,700	9,100	11,300	13,400	4.9%
Increasing Share of U.S. Regional Airline Enplanements		6,700	9,700	14,300	19,900	26,300	7.8%
COMPARABLE FORECASTS							
FAA *Terminal Area Forecast* (TAF)		4,108	4,034	3,961			-0.2%
2000 SANS		2,365	2,759	3,995	4,415		0.4%
Planning Forecast	4,059	4,100	6,700	9,000	11,000	13,000	4.8%

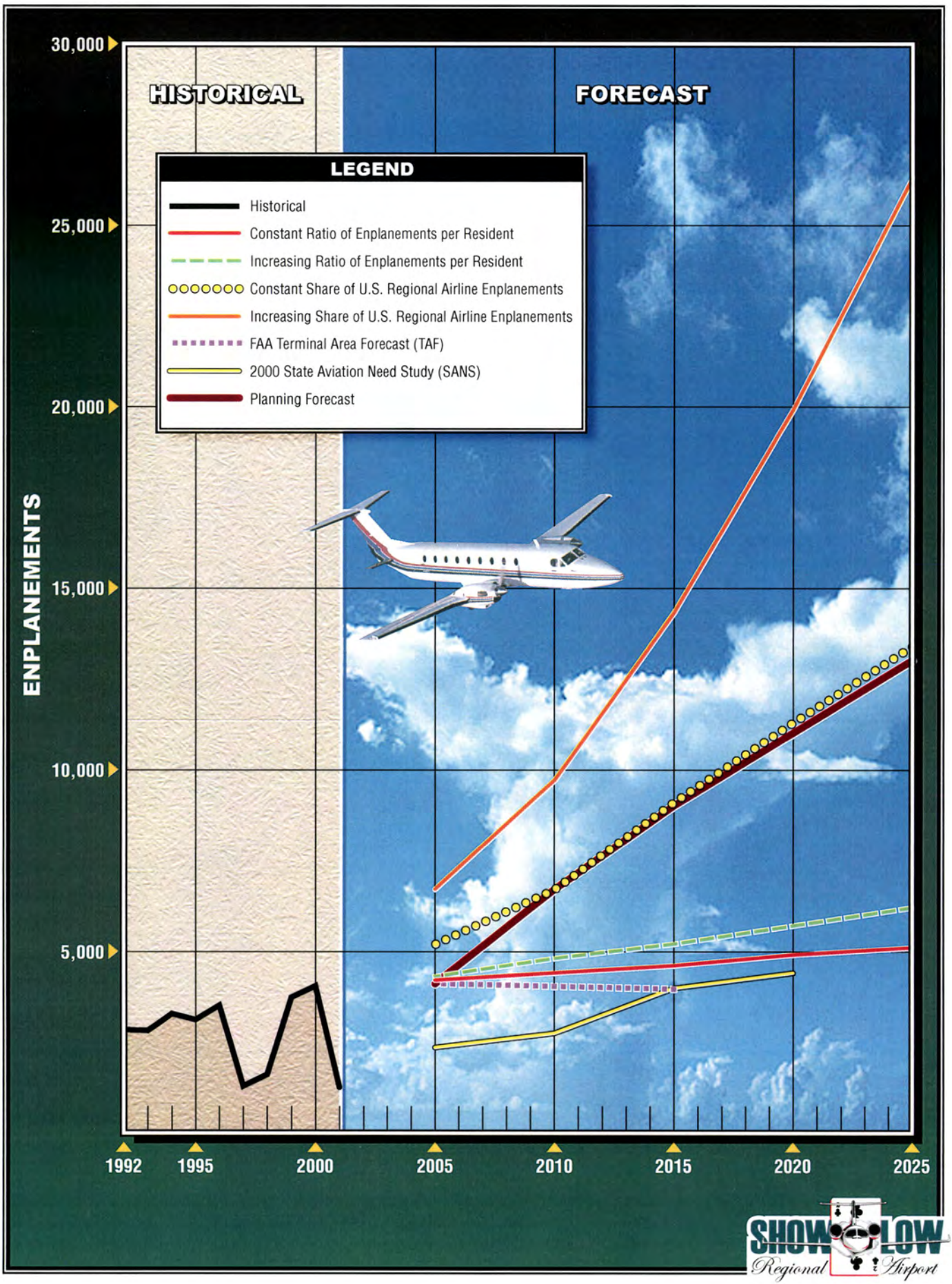
An assurance of continual service is provided by the EAS program. This is an advantage that Show Low has over many air service markets. This subsidy greatly enhances the ability of an air carrier to build a market by providing operating incomes during the period the market is growing.

There is potential for growth in the Show Low market. The local population and economy is growing as evidenced previously. The airport serves the White Mountain region, which by some estimates serves over 114,000 people. The local "second home" is growing as well. Finally, the proximity of Show Low Regional Airport to the Phoenix area has significant advantages in attracting air travelers who wish to shorten their travel times. This is important to business travelers, some visitors, and persons with second homes.

The selected forecast for Show Low Regional Airport closely follows the constant share of U.S. regional airline enplanements. This forecast allows for growth in the market without overstating the potential. This forecast projects Show Low growing to its 2000 level of nearly 4,100 annual enplanements by 2005. The selected forecast equates to a 4.8 percent annual growth rate through 2025.

Airline Fleet Mix and Operations

The type of aircraft in the commercial airline fleet serving the airport is an important component of airport



SHOW LOW Regional Airport

Exhibit 2B
ENPLANEMENT FORECASTS

planning. Not only will the make-up of the commercial airline fleet mix serving the airport be helpful in determining the number of commercial airline operations at the airport, but it is also helpful in defining many of the key parameters used in airport planning. Namely, the critical aircraft serving the airport (used for pavement design, ramp geometry, and terminal complex layout).

It is expected that air service in the future at Show Low Regional Airport will continue to be provided by regional/ commuter airlines As noted, the structure of the regional airline fleet is changing such that a wide range of aircraft are expected to be available to meet market demands. The introduction of the new regional/ commuter aircraft has expanded system capacity, providing for the ability to build new markets.

The airline fleet mix projection is summarized in **Table 2F**. Airline service at Show Low Regional Airport has recently been provided with nine-seat aircraft. Arizona Express has indicated that they will serve the market with nine-seat aircraft. Service with nine-seat aircraft is expected to continue only for a short period. As the market grows, it is expected that use of aircraft with up to 19 seats would be necessary to serve peak periods. Additionally, the typical 19-seat regional airline aircraft is more widely accepted by the traveling public due to their design and wide use by other regional carriers. The payload and speed of a typical regional airline turboprop aircraft should also offer operating advantages for air carriers at Show Low. The critical design aircraft in this scenario would be an aircraft similar to the Beechcraft 1900.

TABLE 2F
Commercial Fleet Mix and Operations Forecast

		FORECASTS				
Seating Range (Representative Aircraft)	**2000**	**2005**	**2010**	**2015**	**2020**	**2025**
0-9 (Beechcraft King Air)	100.0%	50.0%	0.0%	0.0%	0.0%	0.0%
10-20 (Beechcraft 1900)	0.0%	50.0%	100.0%	100.0%	100.0%	100.0%
Seats Per Departure	9	14	19	19	19	19
Boarding Load Factor	41%	35%	36%	37%	38%	40%
Enplanements Per Departure	4	5	7	7	7	8
Annual Enplanements	3,257	4,100	6,700	9,000	11,000	13,000
Annual Departures	875	800	1,000	1,300	1,500	1,700
ANNUAL OPERATIONS	**1,750**	**1,600**	**2,000**	**2,600**	**3,000**	**3,400**

A boarding load factor (BLF) of 41 percent was achieved in 2000. The BLF is projected to decline slightly as 19-seat aircraft are introduced into the market. However, consistent with national trends, the BLF is expected to grow

through the planning period as enplanement levels grow and capacity remains constant.

Annual operations are calculated by dividing the projected annual enplanements by the enplanements per departure (enplanements per departure were calculated by applying the BLF to the projected seats per departure). An increase in operations is projected through the planning period. This will be needed to serve the projected demand and accounts for schedule and frequency enhancements.

GENERAL AVIATION

General aviation is defined as the portion of civil aviation which encompasses all facets of aviation except commercial and military operations. To determine the types and sizes of facilities that should be planned to accommodate general aviation activity, certain elements of this activity must be forecast. These indicators of general aviation demand include:

- Based Aircraft
- Based Aircraft Fleet Mix
- Annual Operations

NATIONAL TRENDS

Following more than a decade of decline, the general aviation industry was revitalized with the passage of the General Aviation Revitalization Act in 1994, which limits the liability on general aviation aircraft to 18 years from the date of manufacture. This legislation sparked an interest to renew the manufacturing of general aviation aircraft, due to the reduction in product liability, as well as renewed optimism for the industry. The high cost of product liability insurance was a major factor in the decision by many American aircraft manufacturers to slow or discontinue the production of general aviation aircraft.

However, this continued growth in the general aviation industry appears to have slowed considerably in 2001, negatively impacted by the events of September 11th. Thousands of general aviation aircraft were grounded for weeks, due to "no-fly zone" restrictions imposed on operations of aircraft in security-sensitive areas. Some U.S. airports in and around Washington, D.C. and New York City remained closed to visual flight rules (VFR) traffic for an extended period.

According to a report released by the General Aviation Manufacturers Association (GAMA), aircraft shipments were down 13.4 percent for the third quarter, and 6.2 percent year-to-date. The Aerospace Industries Association of America (AIAA) expects general aviation shipments to decline for the first time since 1994, down 8.8 percent, to 2,556 aircraft. The number of general aviation hours flown is projected to decline by 2.2 percent in 2002, and increase by only 0.4 percent the following year.

At the end of 2001, the total pilot population, including student, private, commercial, and airline transport, was

estimated at 649,957. This is an increase of 3.9 percent, or 24,000 pilots, from 2000. Student pilots were the only group to experience a decrease in 2001, down 6.6 percent from 2000. The number of student pilots is projected to decline by 4.5 percent in 2002, and an additional 1.2 percent the following year. After 2004, the number of student pilots is expected to increase at an average annual rate of 1.0 percent, totaling 90,000 in 2013, which is less than the number recorded in 2000 (93,064). It should be noted that this FAA forecast is disputed by industry organizations. Independent studies suggest that the FAA historical student pilot records are not correct and student pilot starts actual increased in 2000. In contrast, the industry organizations project student pilot starts to increase through the planning period.

However, the events of September 11th have not had the same negative impact on the business/corporate side of general aviation. The increased security measures placed on commercial flights has increased interest in fractional and corporate aircraft ownership, as well as on-demand charter flights. This is reflected in the forecast of active general aviation pilots, excluding air transport pilots, to increase by 54,000 (0.8 percent annually) over the forecast period.

The most notable trend in general aviation is the continued strong use of general aviation aircraft for business and corporate uses. According to the FAA, general aviation operations and general aviation aircraft handled at enroute traffic control centers increased for the ninth consecutive year, signifying the continued growth in the use of more sophisticated general aviation aircraft. The forecast for general aviation aircraft assumes that business use of general aviation aircraft will expand much more rapidly than personal/sport use, due largely to the expected growth in fractional ownership.

In 2000, there were an estimated 217,533 active general aviation aircraft, representing a decrease of 0.9 percent from the previous year, and the first decline in five years. **Exhibit 2C** depicts the FAA forecast for active general aviation aircraft in the United States. The FAA forecasts general aviation aircraft to increase at an average annual rate of 0.3 percent over the 13-year forecast period. Single-engine piston aircraft are expected to decrease from 149,422 in the short-term, and then begin a period of slow growth after 2004, reaching 152,000 in 2013. Multi-engine piston aircraft are expected to remain relatively flat throughout the forecast period. Turbine-powered aircraft are expected to grow at an average annual rate of 2.1 percent over the forecast period, faster than all other segments of the national fleet. Turbojet aircraft are expected to provide the largest portion of this growth, with an annual average growth rate of 3.4 percent. This strong growth projected for the turbojet aircraft can be attributed to the growth in the fractional ownership industry, new product offerings (which include new entry level aircraft and long-range global jets), and a shift from commercial travel by many travelers and

corporations. Turboprop aircraft, on the other hand, are projected to grow at an average annual rate of only 0.2 percent over the forecast period.

Manufacturer and industry programs and initiatives continue to revitalize the general aviation industry with a variety of programs. For example, Piper Aircraft Company has created Piper Financial Services (PFS) to offer competitive interest rates and/or leasing of Piper aircraft. Manufacturer and industry programs include the "No Plane, No Gain" program promoted jointly by the General Aviation Manufacturers Association (GAMA) and the National Business Aircraft Association (NBAA). This program was designed to promote the use of general aviation aircraft as an essential, cost-effective tool for businesses. Other programs are intended to promote growth in new pilot starts and to introduce people to general aviation. These include, "Project Pilot," sponsored by the Aircraft Owners and Pilots Association (AOPA), "Flying Start", sponsored by the Experimental Aircraft Association (EAA), "Be a Pilot," jointly sponsored and supported by more than 100 industry organizations, and "Av Kids," sponsored by the NBAA. Over the years, programs such as these have played an important role in the success of general aviation, and will continue to be vital to its growth in the future.

BASED AIRCRAFT

The number of based aircraft is the most basic indicator of general aviation demand. By first developing a forecast of based aircraft, the growth of the other indicators can be projected based upon this growth and other factors characteristic to Show Low Regional Airport and the area it serves. The rationale for forecasting general aviation activity is presented below.

Table 2G summarizes historical based aircraft for selected years. As shown in the table, the airport has experienced sustained annual growth in the number of based aircraft. Based aircraft have grown from 18 in 1995 to 57 in 2001.

With only a limited sample of historical based aircraft, reliable time-series or regression analyses could not be made. Therefore, future based aircraft levels have been examined using a market share analysis.

Table 2G compares Show Low Regional Airport based aircraft to Navajo County registered aircraft. As shown in the table, Show Low has increased its share of registered aircraft in Navajo County, growing from 23 percent in 1995 to 73 percent in 2001. In that six-year period, Show Low based aircraft have grown to represent the majority of aircraft in the county.

To gain an understanding of future based aircraft at Show Low Regional Airport based upon the growth projected for registered aircraft in Navajo County, a constant share of Navajo County registered aircraft forecast has been prepared. This forecast takes the 2001 market share of 73.4 percent and applies it to forecast registered aircraft in Navajo County prepared by ADOT and summarized in the 2000 SANS.

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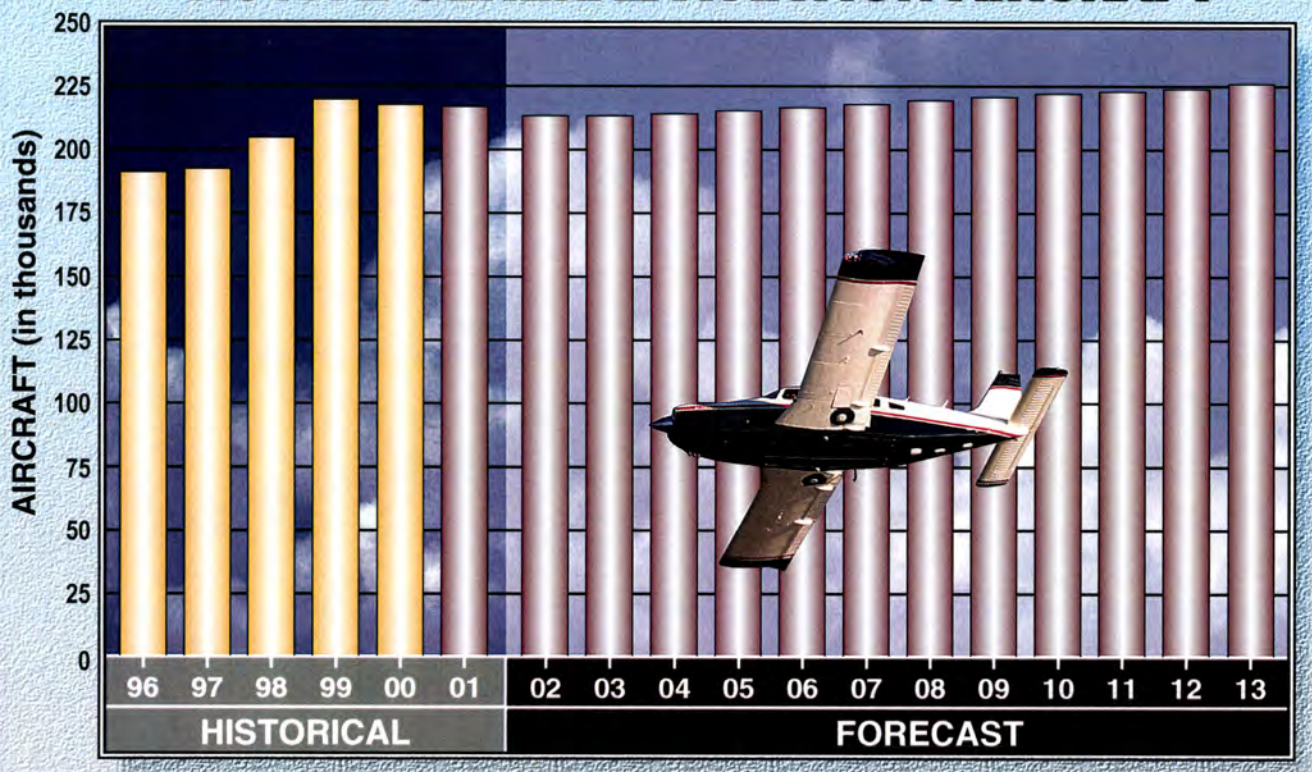
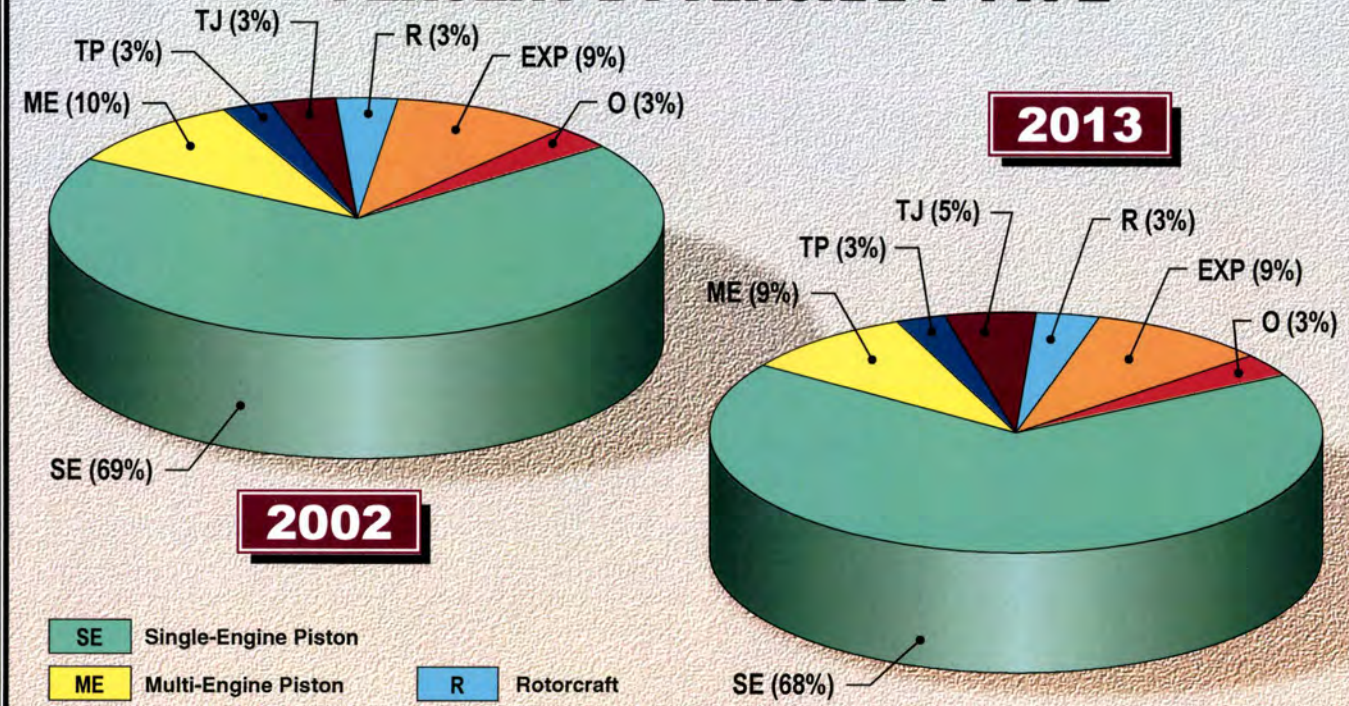
ACTIVE GENERAL AVIATION AIRCRAFT



Source: FAA Aerospace Forecasts, FY 2002-2013

PERCENT BY AIRCRAFT TYPE



SHOW LOW Regional Airport

Exhibit 2C
U.S. ACTIVE GENERAL AVIATION AIRCRAFT FORECASTS

This projection yields 109 based aircraft by the end of the planning period. A second forecast projects Show Low Regional Airport gaining market share through the planning period. This projection yields124 based aircraft by the end of the planning period.

TABLE 2G
Share of Navajo County Registered Aircraft

Year	Navajo County Registered Aircraft	Show Low Based Aircraft	% of Registered Aircraft
1995	77	18	23.4%
1998	74	47	63.5%
2001	78	57	73.1%
Constant Share of Navajo County Registered Aircraft			
2005	111	81	73.1%
2010	121	88	73.1%
2015	129	94	73.1%
2020	139	102	73.1%
2025*	149	109	73.1%
Increasing Share of Navajo County Registered Aircraft			
2005	111	83	75.0%
2010	121	93	77.0%
2015	129	102	79.0%
2020	139	113	81.0%
2025*	149	124	83.0%

* Extrapolated by Coffman Associates.

Source for historical information: ADOT, Airport Records
Source for forecast registered aircraft: Draft Element 5, *2000 State Aviation Needs Study*

A comparative forecast has been prepared by examining based aircraft as a ratio of Show Low residents and is summarized in **Table 2H**. Two forecasts have been prepared. The first examines based aircraft potential by applying the 2001 ratio of 7.1 based aircraft per 1,000 residents to forecast Show Low population. The constant ratio of based aircraft to 1,000 residents projection results in based aircraft growing at the same rate as the local population and 72 based aircraft by 2025.

With the expanding population base and economic growth in the area, the potential exists for based aircraft growth at the airport to exceed the projected population growth. This has

been the trend in the past, as the ratio of based aircraft to population has been increasing annually. An increasing ratio yields 92 based aircraft in 2025.

The FAA TAF and ADOT forecasts are considered for comparative purposes. The FAA TAF uses a base year total of 74 aircraft and projects no growth in based aircraft. Having established that actual based aircraft levels are only 57 currently, the FAA TAF overstates based aircraft. The ADOT forecast provides for only 14 new based aircraft by 2020. Thirty-nine based aircraft have been added at the airport since 1995. Therefore, the ADOT forecast appears to be too conservative based upon historical trends.

TABLE 2H
Ratio of Based Aircraft to Population

Year	Show Low Based Aircraft	City of Show Low Population	Based Aircraft Per 1,000 Residents
1995	18	5,830	3.1
1998	47	7,875	6.0
2001	57	8,085	7.1
Constant Ratio of Based Aircraft per 1,000 Residents			
2005	59	8,350	7.1
2010	62	8,823	7.1
2015	65	9,257	7.1
2020	69	9,742	7.1
2025	72	10,255	7.1
Increasing Ratio of Based Aircraft per 1,000 Residents			
2005	61	8,350	7.3
2010	66	8,823	7.5
2015	74	9,257	8.0
2020	83	9,742	8.5
2025	92	10,255	9.0

Source for historical and forecast population: Arizona Department of Economic Security

Table 2J provides a summary of all based aircraft forecasts. The planning forecast closely follows the constant share of Navajo County registered aircraft. As shown on **Exhibit 2D**, this forecast lies approximately mid-range in the forecast envelope. This forecast fully accounts for the historical growth trend at the airport. The increasing share of Navajo County registered aircraft forecast appears to be too aggressive, while the constant ratio of based aircraft to 1,000 residents and increasing ratio of based aircraft to 1,000 residents are too conservative considering historical growth trends. The planning forecast projects based aircraft growing at an average annual rate of 2.8 percent.

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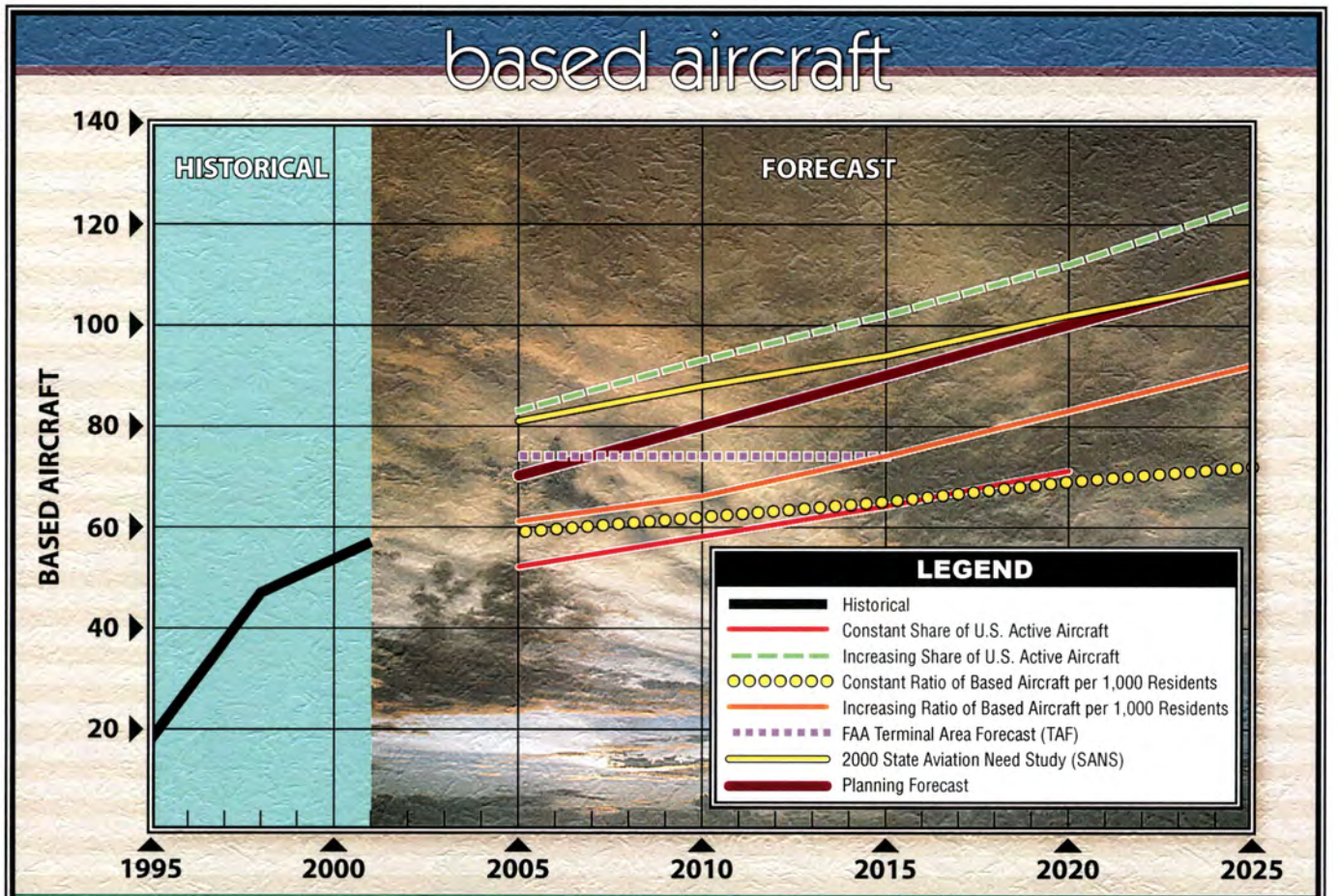
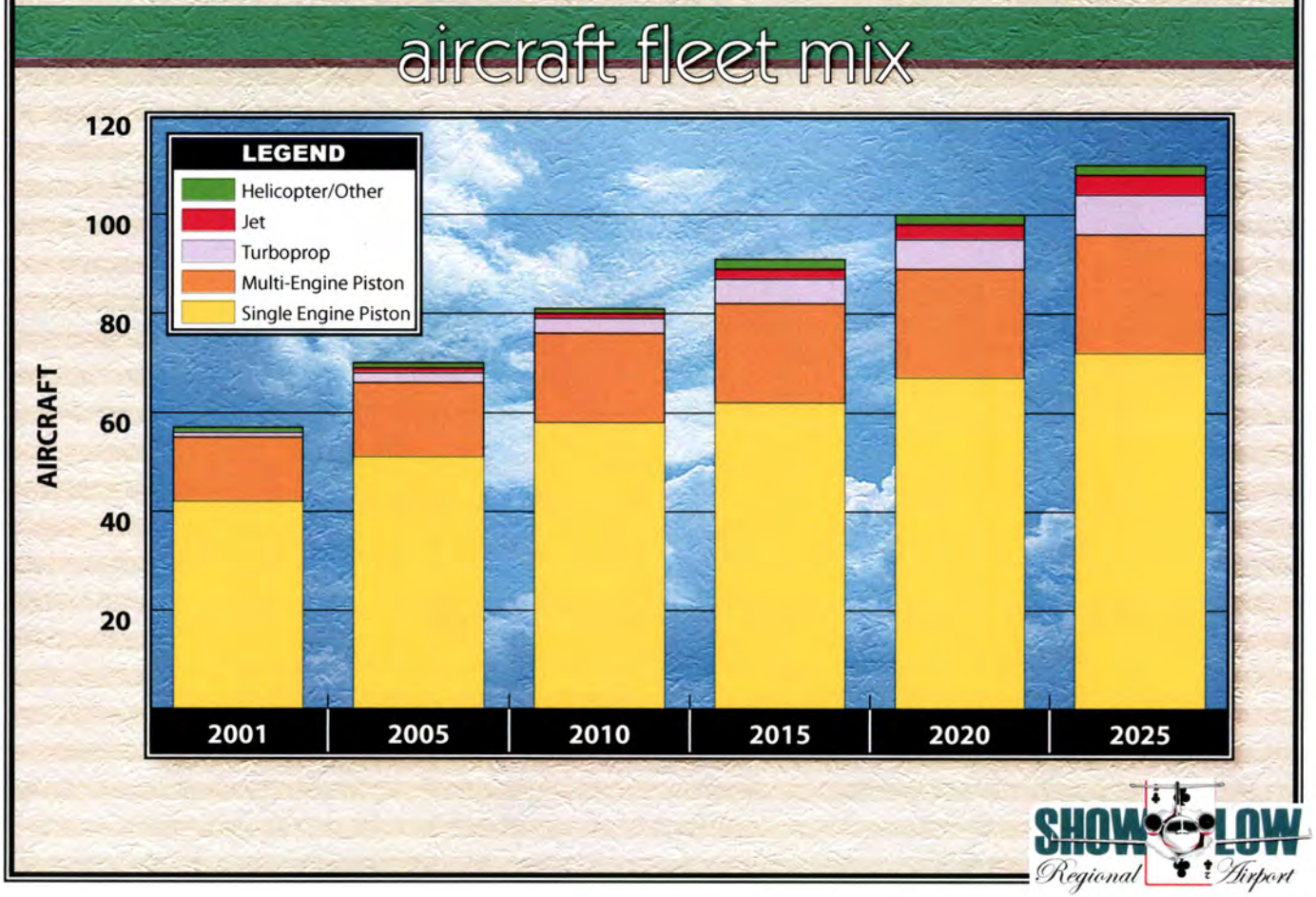




SHOW LOW Regional Airport

Exhibit 2D
BASED AIRCRAFT FORECASTS

TABLE 2J
Based Aircraft Forecast Summary

	2001	2005	2010	2015	2020	2025
Constant Share of Navajo County Registered Aircraft		81	88	94	102	109
Increasing Share of Navajo County Registered Aircraft		83	93	102	113	124
Constant Ratio of Based Aircraft per 1,000 Residents		59	62	65	69	72
Increasing Ratio of Based Aircraft per 1,000 Residents		61	66	74	83	92
COMPARABLE FORECASTS						
FAA Terminal Area Forecast		74	74	74		
2000 SANS		52	58	64	71	
Planning Forecast	57	70	80	90	100	110

BASED AIRCRAFT FLEET MIX PROJECTION

Knowing the mix of aircraft expected to be based at the airport is necessary to properly plan facilities that will best serve the level of activity and the type of activities occurring at the airport. The based aircraft fleet mix in 2001 was primarily comprised of single and multi-engine piston-powered aircraft. However, there was one turboprop and one ultralight aircraft. As detailed previously, the national trend is toward a larger percentage of sophisticated turbine aircraft in the national fleet. Growth within each based aircraft category at the airport has been determined by comparison with national projections (which reflect current aircraft production) and consideration of local economic conditions. The projected trend of based aircraft at Show Low Regional Airport includes a growing number of single and multi-engine aircraft and turboprop aircraft. However, strong growth in business turbojet aircraft is projected for the airport through the planning period, consistent with national trends. The based aircraft fleet mix projection for Show Low Regional Airport is summarized in **Table 2K** and depicted on **Exhibit 2D**.

ANNUAL OPERATIONS

Typically, there are two types of operations at an airport: local and itinerant. A local operation is a takeoff or landing performed by an aircraft that operates within sight of the airport, or which executes simulated approaches or touch-and-go operations at the airport. Itinerant operations are those performed by aircraft with a specific origin or destination away from the airport. Generally, local operations are characterized by training operations. Typically, itinerant operations increase with business and commercial use since business aircraft are used primarily to carry people from one location to

another. Without a flight training school at Show Low Regional Airport, touch-and-go operations are limited; therefore, most operations at the airport are itinerant.

TABLE 2K
Based Aircraft Fleet Mix

Year	Total	Single Engine Piston	Multi-Engine Piston	Turboprop	Jet	Helicopter/ Other
HISTORICAL						
2001	57	42	13	1	0	1
FORECAST						
2005	70	51	15	2	1	1
2010	80	57	18	3	1	1
2015	90	62	20	5	2	2
2020	100	67	22	6	3	2
2025	110	72	24	8	4	2

Due to the absence of an airport traffic control tower (ATCT), actual operational counts are not available for Show Low Regional Airport. Instead, only general estimates of historical aircraft operations are available based on operational counts completed at the airport from 5:30 a.m. to 7:30 p.m. These counts indicate approximately 15,300 operations in 2000 and 2001. These counts suggested approximately 11,400 general aviation operations in 2000 and 9,800 in 2001.

Typically, operations per based aircraft range between 200 and 500 at airports without significant levels of aircraft flight training (or local operations). Since there is not a dedicated flight school at the airport, touch-and-go training operations are limited; therefore, the airport falls within the lower portion of this range. As shown in **Table 2L**, there were 172 operations per based aircraft in 2001.

Two projections of annual operations have been developed by considering varying numbers of operations per based aircraft through the planning period. The first is a constant or static forecast which applies 175 operations per based aircraft to forecast based aircraft. This yields general aviation operations growing to 19,300 by the end of the planning period. An alternate forecast has been prepared using an increasing number of operations per based aircraft. This accounts for national projections that indicate increased use of general aviation aircraft. This forecast yields 25,600 annual operations by the end of the planning period.

TABLE 2L
General Aviation Operations

Year	General Aviation Operations	Based Aircraft	Operations Per Based Aircraft
2001	9,800	57	172
Constant Ratio of Operations Per Based Aircraft			
2005	12,300	70	175
2010	14,000	80	175
2015	15,800	90	175
2020	17,500	100	175
2025	19,300	110	175
Increasing Ratio of Operations Per Based Aircraft			
2005	13,000	70	185
2010	15,600	80	195
2015	18,500	90	205
2020	21,800	100	218
2025	25,600	110	233

The FAA TAF projects annual operations at a static level of 35,000 annual operations. Similar to based aircraft levels, the TAF overstates actual activity at the airport. The 2000 SANS projects annual operations growing from 29,000 in 1998 to 43,700 by the end of the planning period. Based on actual operational counts, it is likely that this forecast also overstates actual levels at the airport.

While it is likely that operational levels will grow, it is not likely that the operations per based aircraft will remain constant. It should be assumed that flight training activities might increase at some time through the planning period. The planning forecast accounts for this by allowing for an increase in the number of operations per based aircraft. The increasing ratio of operations per based aircraft has been selected as the preferred planning forecast. This forecast projects annual operations growing at an average annual rate of 4.1 percent.

AIR TAXI OPERATIONS

The airport records air charter and air cargo operations in a single category. Records are not maintained separately for air cargo operations; therefore, this level of operations cannot be segregated. Operations within this category totaled 5,300 in 2001. Operations within this category are projected to grow at 1.2 percent annually, consistent with national projections for aircraft use. Projected air taxi operations are summarized in **Table 2M**.

TABLE 2M Air Taxi Operations	
2000	5,300
2005	5,600
2010	6,000
2015	6,300
2020	6,700
2025	7,100
Source: Airport Records	

PEAKING CHARACTERISTICS

Many airport facility needs are related to the levels of activity during peak periods. The periods used in developing facility requirements for this study are as follows:

- **Peak Month** - The calendar month when peak passenger enplanements or aircraft operations occur.
- **Design Day** - The average day in the peak month. This indicator is easily derived by dividing the peak month operations or passenger enplanements by the number of days in the month.
- **Busy Day** - The busy day of a typical week in the peak month.
- **Design Hour** - The peak hour within the design day.

AIRLINE PEAKING CHARACTERISTICS

Airline peaking characteristics have been determined by examining historical records of enplanements and operations. The peak month for passenger enplanements in 2000 was 10.4 percent of total enplanements. Future peak month levels were estimated using this percentage. The design hour enplanements were estimated based on the size of the largest aircraft anticipated during the peak hour.

The peak month for operations was projected at 9.5 percent of total annual operations, consistent with the peak month experienced in 2000. Based upon scheduling at the airport, the peak hour represents a single aircraft landing and departing within the same hour. Peak hour operations are expected to increase through the planning period as frequency is anticipated to be added to the schedule to accommodate demand and expanded air service. Airline peaking characteristics are summarized in **Table 2N**.

GENERAL AVIATION PEAKING CHARACTERISTICS

General aviation peaking characteristics are summarized in **Table 2P**. Examining 2001 operational logs maintained by the airport, it was determined that the peak month operations were 12.2 percent of total annual operations, while the busy day represented 7.6 percent of the peak month. These percentages were used to project future peak months and busy days. Design hour operations were estimated at 15 percent of design day operations.

TABLE 2N
Forecasts of Air Carrier Peak Activity

	2000	2005	2010	2015	2020	2025
ENPLANEMENTS						
Annual	4,059	4,100	6,700	9,000	11,000	13,000
Peak Month	423	427	698	938	1,146	1,355
Design Day	14	14	23	31	38	45
Design Hour	9	9	15	20	24	29
OPERATIONS						
Annual	1,656	1,600	2,000	2,600	3,000	3,400
Peak Month	156	150	190	250	290	320
Design Day	5	5	6	8	10	11
Design Hour	2	2	2	5	5	6

Source: Airport Records.

TABLE 2P
Forecasts of General Aviation Peak Activity

	2001	2005	2010	2015	2020	2025
ITINERANT OPERATIONS						
Annual	9,800	13,000	15,600	18,500	21,800	25,600
Peak Month	1,200	1,600	1,900	2,300	2,700	3,100
Busy Day	92	123	146	176	207	238
Design Day	40	53	63	77	90	103
Design Hour	6	8	9	11	13	15

Source: Airport Records.

ANNUAL INSTRUMENT APPROACHES

An instrument approach as defined by the FAA is "an approach to an airport with the intent to land by an aircraft in accordance with an Instrument Flight Rule (IFR) flight plan, when visibility is less than three miles and/or when the ceiling is at or below the minimum initial approach altitude." To qualify as an instrument approach at Show Low Regional Airport, aircraft must land at the airport after following the published instrument approach procedure.

Due to the limited capability of the existing instrument approach, the number of actual instrument approaches completed at the airport is low. The last recorded year for instrument approach operations was 1997 when there were nine. For Show Low Regional Airport, it is expected that annual instrument approaches (AIAs) would represent one percent of

total itinerant operations. Improved instrument approach capability is anticipated in the future as navigational systems improve to include global positioning system (GPS) technology. Applying the percentage to forecast itinerant operations yields 190 instrument approaches in 2005, 215 in 2010, 240 in 2015, 260 in 2020, and 280 in 2025.

SUMMARY

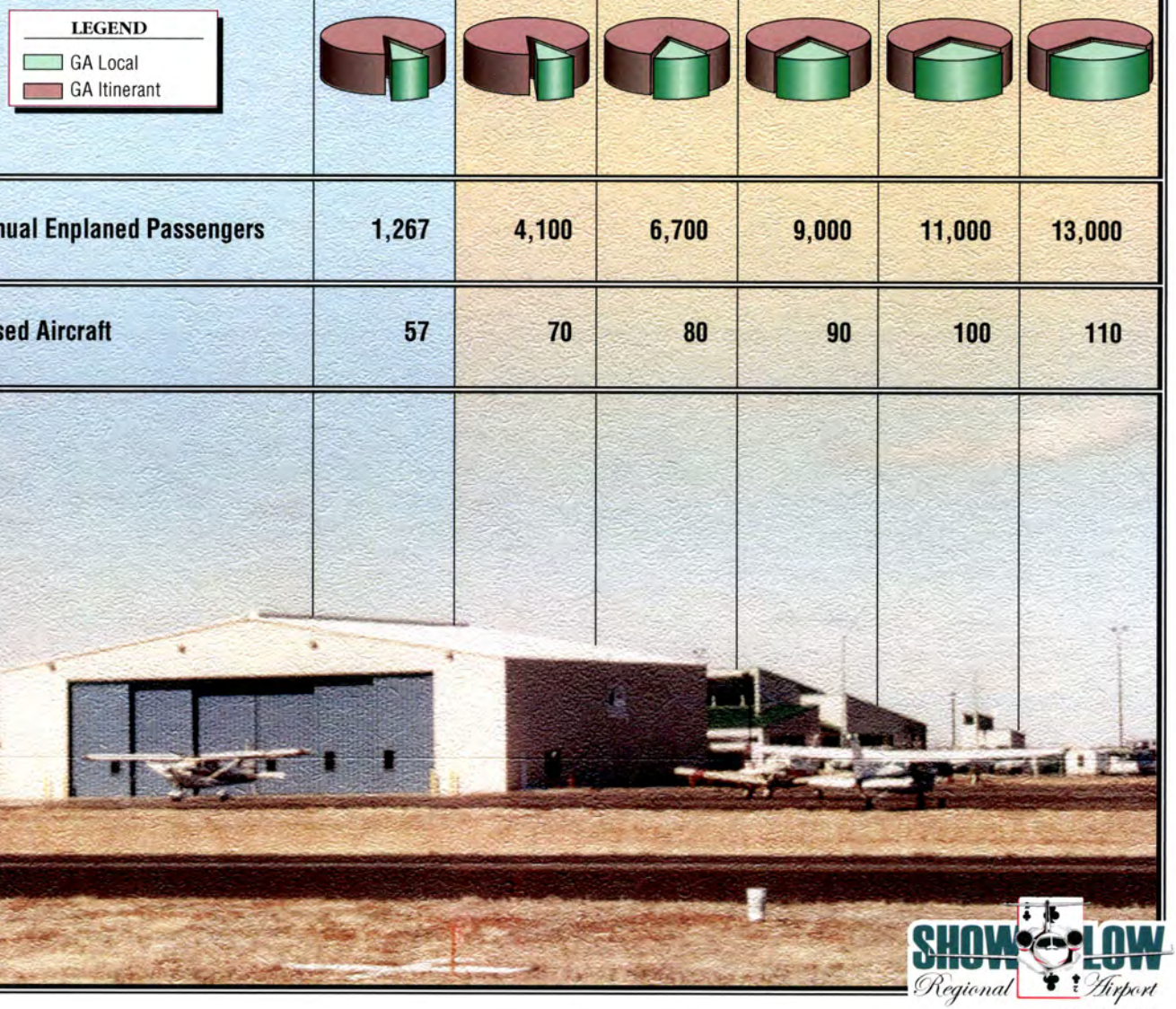
This chapter has outlined the various aviation demand levels anticipated through the year 2025 at Show Low Regional Airport. Long term growth at the airport will be influenced by many factors including the local economy, the need for a viable aviation facility in the immediate area, and trends in commercial aviation and general aviation at the national level. A summary of forecast activity is depicted on **Exhibit 2E**.

Forecasts for future enplaned air cargo have not been developed. The airport does not maintain historical air cargo data. Additionally, it is not expected that there will be a change in the role of air cargo service at the airport. The airport is expected to continue to be served by feeder aircraft from the primary hubs at Phoenix Sky Harbor International Airport. The integrated air cargo companies are expanding their ground transportation network for cost savings. This is reducing their needs for new airport hub locations. With this understanding, it can be assumed that the airport will be served by both piston-powered and turboprop aircraft in the future. These aircraft can easily be accommodated on existing apron areas.

The next step in the master planning process will be to assess the capacity of existing facilities, their ability to meet forecast demand, and to identify changes to the airfield and/or landside facilities which will create a more functional aviation facility.

SUMMARY OF AVIATION ACTIVITY PLANNING HORIZONS

	Historical	Forecasts				
CATEGORY	**2001**	**2005**	**2010**	**2015**	**2020**	**2025**
Annual Operations						
Air Carrier	226	1,600	2,000	2,600	3,000	3,400
Air Taxi/Air Cargo	5,300	5,600	6,000	6,300	6,700	7,100
General Aviation						
Itinerant	8,800	11,700	13,300	14,800	16,300	17,900
Local	1,000	1,300	2,300	3,700	5,500	7,700
Subtotal General Aviation	*9,800*	*13,000*	*15,600*	*18,500*	*21,800*	*25,600*
Total Annual Operations	**15,326**	**20,200**	**23,600**	**27,400**	**31,500**	**36,100**
Annual Enplaned Passengers	**1,267**	**4,100**	**6,700**	**9,000**	**11,000**	**13,000**
Based Aircraft	**57**	**70**	**80**	**90**	**100**	**110**



SHOW LOW Regional Airport

Exhibit 2E
AVIATION FORECAST SUMMARY

SHOW LOW
Municipal Airport

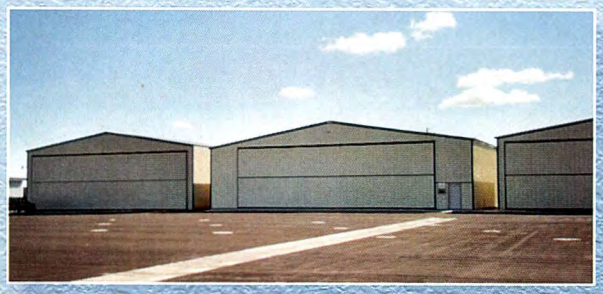
Chapter Three
AVIATION FACILITY REQUIREMENTS

Chapter Three

SHOW LOW Regional Airport

AVIATION FACILITY REQUIREMENTS

In this chapter, existing components of the airport are evaluated so that the capacities of the overall system are identified. Once identified, the existing capacities are compared to the forecast activity levels prepared in Chapter Two to determine where deficiencies currently exist or may be expected to materialize in the future. Once deficiencies in a component are identified, a more specific determination of the approximate sizing and timing of the new facilities can be made.



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

The cost-effective, efficient, and orderly development of an airport should rely more upon actual demand at an airport than a time-based forecast figure. In order to develop a master plan that is demand-based rather than time-based, a series of planning horizon milestones have been established for Show Low Regional Airport that take into consideration the reasonable range of aviation demand projections.

It is important to consider that the actual activity at the airport may be higher or lower than projected activity levels. By planning according to activity milestones, the resultant plan can accommodate unexpected shifts, or changes, in the area's aviation demand. It is important that the plan accommodate these changes so that the City of Show Low can respond to

unexpected changes in a timely fashion. These milestones provide flexibility, while potentially extending this plan's useful life if aviation trends slow over the period.

The most important reason for utilizing milestones is that they allow the airport to develop facilities according to need generated by actual demand levels. The demand-based schedule provides flexibility in development, as development schedules can be slowed or expedited according to actual demand at any given time over the planning period. The resultant plan provides airport officials with a financially responsible and need-based program. **Table 3A** presents the planning horizon milestones for each activity demand category.

TABLE 3A
Planning Horizon Activity Levels

	Existing (2001)	Short Term Planning Horizon	Intermediate Term Planning Horizon	Long Term Planning Horizon
Air Carrier Activity				
Enplaned Passengers	1,267	6,700	9,000	13,000
Annual Operations	226	2,000	2,600	3,400
General Aviation Activity				
Based Aircraft	57	80	90	110
Annual Operations	9,800	15,600	18,500	25,600
Air Taxi Operations	5,300	6,000	6,300	7,100
Total Annual Operations	15,326	23,600	27,400	36,100

AIRFIELD REQUIREMENTS

Airfield facilities include those facilities that are related to the arrival, departure, and ground movement of aircraft. Theses components include:

- Runways
- Navigational Approach Aids and Instrument Approaches
- Taxiways
- Airfield Lighting, Marking, and Signage

The adequacy of existing airfield facilities at Show Low Regional Airport is analyzed from a number of perspectives within each of these components, including (but not limited to): airfield capacity, runway length, runway pavement strength, Federal Aviation Administration (FAA) design standards, airspace configuration, and air traffic control.

AIRFIELD CAPACITY

A demand/capacity analysis measures the capacity of the airfield facilities (i.e.

runways and taxiways) in order to identify a plan for additional development needs. The capacity of the airfield is affected by several factors including airfield layout, meteorological conditions, aircraft mix, runway use, aircraft arrivals, aircraft touch-and-go activity, and exit taxiway locations. An airport's airfield capacity is expressed in terms of its annual service volume (ASV). Annual service volume is a reasonable estimate of the maximum level of aircraft operations that can be accommodated in a year.

Pursuant to FAA guidelines detailed in the FAA Advisory Circular (AC) 150/5060-5, *Airport Capacity and Delay*, the annual service volume of a two-runway configuration normally exceeds 230,000 operations. Since the forecasts for the airport indicate that activity throughout the planning period will remain below 230,000 annual operations, the capacity of the existing airfield system will not be reached, and the airfield is expected to meet operational demands. Therefore, no additional runways are needed for capacity reasons.

RUNWAY ORIENTATION

For the operational safety and efficiency of an airport, it is desirable for the primary runway of an airport's runway system to be oriented as close as possible to the direction of the prevailing wind. This reduces the impact of wind components perpendicular to the direction of travel of an aircraft that is landing or taking off (defined as a crosswind).

FAA design standards specify that additional runway configurations are needed when the primary runway configuration provides less than 95 percent wind coverage at specific crosswind components. The 95 percent wind coverage is computed on the basis of crosswinds not exceeding 10.5 knots for small aircraft weighing less than 12,500 pounds and from 13 to 16 knots for aircraft weighing over 12,500 pounds.

The airport is presently served by primary Runway 6-24 (oriented in an east-west direction) and Runway 3-21 (oriented in a northeast-southwest direction). The 1991 Master Plan recommended the development of a new crosswind runway, Runway 18-36, to improve wind coverage at the airport. This runway has not been developed, although the City will acquire the land for the development of the runway through a U.S. Forest Service land transfer.

Using the most current wind data specific to Show Low Regional Airport, a new analysis has been completed. **Exhibit 3A** presents the windrose for the airport and summarizes wind coverages based on this new data. As shown in the table, Runway 6-24 does not provide the minimum wind coverage for the airport, only providing 77.78 percent wind coverage for the 10.5 knot crosswind component and 86.31 percent wind coverage for the 13.0 knot crosswind component. Similarly, Runway 3-21 provides less than 95 percent coverage for the 10.5 knot crosswind component. Combined, Runway 6-24 and Runway 3-21 provide

only 91.08 percent coverage for the 10.5 knot crosswind component.

Based upon this analysis, it is confirmed that a new runway orientation is needed to provide the 95 percent wind coverage requirement for the 10.5 crosswind component not provided by the combined coverage of Runway 6-24 and Runway 3-21 and 13.0 knot crosswind component not provided by Runway 6-24. As shown on the exhibit, a north-south oriented runway (Runway 18-36) would provide the best wind coverage for the airport. A north-south oriented runway would provide 96.43 percent coverage for the 10.5 knot crosswind component and 98.37 percent coverage for the 13.0 knot crosswind component. Combined with Runway 6-24, Runway 18-36 would provide 98.84 percent coverage and 99.68 wind coverage for the 10.5 knot and 13.0 knot crosswind components, respectively. Therefore, a new runway with a north-south orientation should be constructed to replace Runway 3-21.

PHYSICAL PLANNING CRITERIA

The selection of appropriate FAA design standards for the development and location of airport facilities is based primarily upon the characteristics of the aircraft which are currently using, or are expected to use, the airport. Planning for future aircraft use is of particular importance since design standards are used to plan separation distances between facilities. These standards must be determined now since the relocation of these facilities would likely be extremely expensive at a later date. The most important characteristics in airfield planning are the approach speed and wingspan of the critical design aircraft anticipated to use the airport now and in the future.

The FAA has established a coding system to relate airport design criteria to the operational and physical characteristics of aircraft expected to use the airport. This code, referred to as the airport reference code (ARC), has two components: the first component, depicted by a letter, is the aircraft approach category and relates to aircraft approach speed (operational characteristic); the second component, depicted by a Roman numeral, is the airplane design group (ADG) and relates to aircraft wingspan (physical characteristic). Generally, aircraft approach speed applies to runways and runway-related facilities, while airplane wingspan primarily relates to separation criteria involving taxiways, taxilanes, and landside facilities.

According to FAA Advisory Circular (AC) 150/5300-13, *Airport Design*, Draft Change 7, an aircraft's approach category is based upon 1.3 times its stall speed in landing configuration at that aircraft's maximum certificated weight. The five approach categories used in airport planning are as follows:

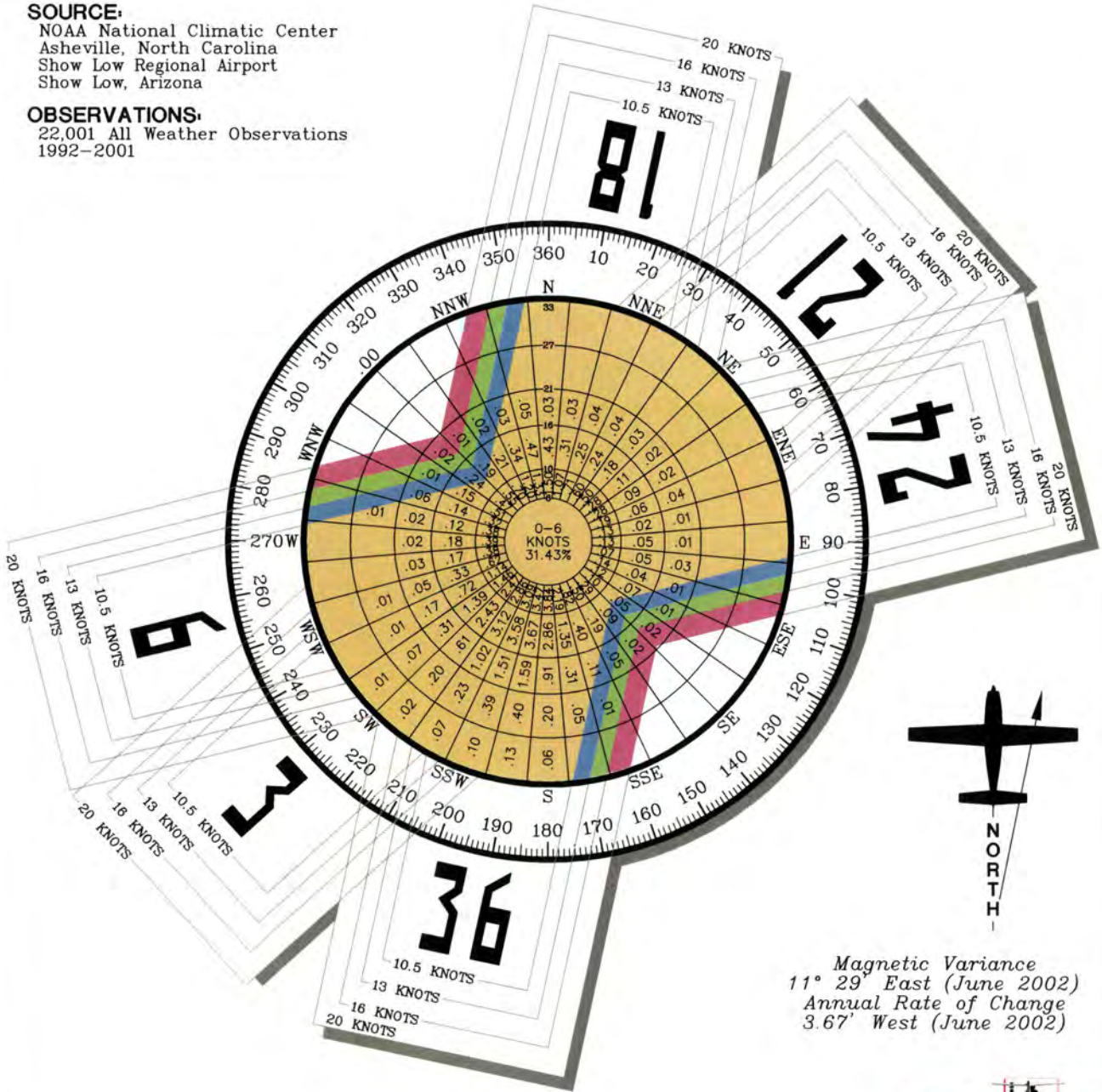
Category A: Speed less than 91 knots.
Category B: Speed 91 knots or more, but less than 121 knots.
Category C: Speed 121 knots or more, but less than 141 knots.
Category D: Speed 141 knots or more, but less than 166 knots.

ALL WEATHER WIND COVERAGE

Runways	10.5 Knots	13 Knots	16 Knots	20 Knots
Runway 3–21	*90.35%*	*95.57%*	*98.60%*	*99.66%*
Runway 6–24	*77.78%*	*86.31%*	*94.30%*	*98.25%*
Runway 18–36	*96.43%*	*98.37%*	*99.51%*	*99.86%*
Runways 3–21/6–24	*91.08%*	*96.15%*	*98.80%*	*99.71%*
Runways 6–24/18–36	*98.84%*	*99.68%*	*99.90%*	*99.96%*

SOURCE:
NOAA National Climatic Center
Asheville, North Carolina
Show Low Regional Airport
Show Low, Arizona

OBSERVATIONS:
22,001 All Weather Observations
1992–2001



Magnetic Variance
11° 29' East (June 2002)
Annual Rate of Change
3.67' West (June 2002)

SHOW LOW Regional Airport

Exhibit 3A
WINDROSE

Category E: Speed greater than 166 knots.

The airplane design group (ADG) is based upon the aircraft's wingspan. The six ADGs used in airport planning are as follows:

Group I: Up to but not including 49 feet.
Group II: 49 feet up to but not including 79 feet.
Group III: 79 feet up to but not including 118 feet.
Group IV: 118 feet up to but not including 171 feet.
Group V: 171 feet up to but not including 214 feet.
Group VI: 214 feet or greater.

In order to determine airfield facility requirements, an ARC should first be determined, then appropriate airport design criteria can be applied. This begins with a review of the type of aircraft using and expected to use Show Low Regional Airport.

Show Low Regional Airport is currently used by a wide variety of aircraft, ranging from aircraft used for scheduled airline service to general aviation recreational aircraft, general aviation business aircraft, and a limited number of helicopters. Helicopters are not included in this determination as they are not assigned an ARC.

Commercial Aircraft

The primary aircraft used for scheduled airline service in the past four years have been nine-seat turboprop and piston-engine aircraft. Between 1998 and 2001, scheduled service was provided with a Beechcraft King Air 200 (ARC B-II). In 2001/2002, Arizona Express utilized a Cessna 421 (ARC B-I) when providing air service. Arizona Express has indicated that they will provide future scheduled service with either a Beechcraft King Air or Beechcraft 1900. Both are twin-engine turboprop aircraft, which fall within ARC B-II. Cessna Caravan aircraft (ARC B-I) are used for air cargo activities at the airport.

The aviation demand forecasts noted that the Show Low Regional Airport market could support the use of 19-seat turboprop regional aircraft in the future. The Beechcraft 1900 is the most widely used 19-seat turboprop regional aircraft in use across the country. It is expected that future air service would be provided by this aircraft or a similar aircraft.

For planning purposes, an increase in the size of air cargo aircraft is anticipated. While a forecast of enplaned air cargo has not been prepared, enplaned air cargo can be expected to grow through the planning period as the local economy grows and new industries are developed in the White Mountain region. It is expected that air cargo service would continue to be regional in nature, with feeder cargo aircraft continuing to serve Phoenix Sky Harbor International Airport. This would limit the size of aircraft to multi-engine piston and turboprop aircraft. A wide variety of piston engine and turboprop aircraft could be used in air cargo service; however, it is not

expected that this would include aircraft larger than ARC B-II.

Taking into consideration the potential changes in scheduled airline and air cargo aircraft, the critical commercial aircraft are expected to fall within ARC B-II.

General Aviation

General aviation aircraft using the airport include small single and multi-engine aircraft, which fall within approach categories A and B and ADG I, and business turboprop and jet aircraft, which fall within approach categories B, C, and D and ADGs I and II. The majority of based aircraft fall within ARC A-I and ARC B-I. Representative based aircraft include the Cessna 210 and Beechcraft Bonanza.

A wide range of transient business jets operate at the airport. These include aircraft within the Cessna Citation family of business jets, Gulfstream business jets, Learjet, and Raytheon jet aircraft. Based upon the operational logs maintained by the airport, there were nearly 250 operations by business jet aircraft in fiscal year 1999-2000 and 200 in fiscal year 2000-2001.

When compared with the single and multi-engine piston aircraft, and business turboprop aircraft, business jets are the most demanding general aviation aircraft to operate at the airport. This is due to their longer wing span, higher approach speed, and higher landing and takeoff weights. Therefore, business jet aircraft comprise the critical design aircraft for the general aviation segment of activity at the airport. Presently, the critical business jets fall within ARC C-II. The aviation demand forecasts projected business jet activity to increase through the planning period. Therefore, it is expected that activity within Approach Category D would increase in the future.

AERIAL FIREFIGHTING AIRCRAFT

Show Low Regional Airport served as the command headquarters for the Rodeo-Chedeski wildfire of 2002. While Show Low Regional Airport accommodated the lead aircraft and helicopters supporting this fire, the airport was not able to accommodate the heavy air tankers due to pavement strength limitations. Instead, the heavy air tankers used other airports at Winslow, in the Phoenix metropolitan area, and Prescott. This increased enroute times and contributed to increased costs and reductions in the number of loads that could have been dropped if Show Low Regional Airport would have been able to serve the heavy tankers.

The Aerial Firefighting Industry Association (AFIA) reports that a wide variety of aircraft are used to fight forest and wildfires. These include a number of World War II vintage aircraft and a limited number of military turboprop-powered transport aircraft. The aircraft, maximum takeoff weight, and Approach Category and ADG (as known) are listed in **Table 3B**.

TABLE 3B
Aerial Firefighting Aircraft Characteristics

Aircraft Make and Model	Maximum Takeoff Weight	Approach Category	Airplane Design Group
Douglas C-54	73,000 pounds (DWL)	N/A	III
Douglas DC-6	97,200 pounds (DWL)	B	III
Douglas DC-7	126,000 pounds (DWL)	B-IV	IV
Lockheed PV-2	31,000 pounds (DWL)	N/A	II
Lockheed C-130	155,000 pounds (STWL)	C	IV
Boeing KC-97	153,000 pounds (DWL)	N/A	IV
Lockheed P2V	79,900 pounds (DWL)	N/A	III
Lockheed SP-2H	79,900 pounds (DWL)	N/A	III
Lockheed P-3A	142,000 pounds (DWL)	N/A	III

Source: Coffman Associates analysis.

In response to two fatal crashes of firefighting air tankers in 2002, the United States Department of Agriculture (USDA) Forest Service and United States Department of the Interior (USDI) - Bureau of Land Management commissioned a Blue Ribbon Panel to address aircraft safety issues. While noting that the mix of aircraft is aging and in need of better maintenance, there is currently no funding mechanism and limited aircraft types available to serve this critical role. Therefore, it is expected that this mix of aircraft will serve the heavy tanker role for the foreseeable future. The use of surplus military aircraft in the future is unknown considering current Department of Defense (DOD) policies to not have surplus military aircraft become active aircraft. On December 6, 2002, following the Blue Ribbon Panel recommendations, the USDA and USDI instituted a policy that will discontinue contracts for C-130 Model A aircraft and the PB4Y.

The use of these aircraft at the airport cannot be predicted due to the sporadic nature of wildfires. Therefore, unless there is a significant fire event or series of wildfires, these aircraft will not constitute the critical design aircraft at the airport. There are currently no known plans to develop a firebase at Show Low Regional Airport. In examining the wingspan and known approach speeds of these aircraft, these aircraft fall within the mix of general aviation and commercial airline aircraft to operate at the airport.

Considering the potential for future wildfires, facility planning should consider providing suitable facilities at Show Low Regional Airport to accommodate these aircraft should another wildfire in the region require the use of heavy tanker aircraft. The analysis to follow will include increases in pavement strength and the development of suitable apron areas to accommodate these aircraft.

Critical Design Aircraft Conclusion

For planning purposes, business jets within approach category C and ADG II define the airport's critical aircraft. Business jets are expected to comprise the critical design aircraft through the planning period as the type of aircraft used in commercial air service are not expected to increase in size or operational capabilities significantly.

Future planning should consider the increased use of the airport by larger business jet aircraft. National trends indicate both an increased use of corporate aircraft and the desire to operate larger aircraft. Although corporate aircraft are larger today then their predecessors, it is unlikely that these aircraft will exceed approach category D or design group III. The Canadair Global Express and Gulfstream V are the largest business jets and fall within ARC D-III.

Given these considerations, planning for the future critical aircraft should include all corporate aircraft up to the Canadair Global Express and Gulfstream V. Therefore, the ultimate ARC for Show Low Regional Airport should consider the requirements of approach category D and ADG III.

Runway 6-24 provides the greatest length at the airport and presently serves as the primary runway for large aircraft. This runway should ultimately consider ARC D-III design requirements.

Given its existing length, width, and role in serving small general aviation aircraft, Runway 3-21 should be maintained at ARC B-I standards. The wind analysis indicated that a crosswind runway was needed for crosswind components to 13 knots. This includes aircraft through ARC B-II. Therefore, ARC B-II planning standards should be used in the ultimate design and construction of crosswind Runway 18-36.

The design of taxiway and apron areas should consider the wingspan requirements of the most demanding aircraft to operate within that specific functional area on the airport. The airfield taxiways and main transient apron area should consider ADG III design requirements to accommodate the wingspan requirements of business jet aircraft. Other transient general aviation apron and aircraft maintenance and repair hangar areas should consider ADG II requirements to accommodate larger piston and turboprop aircraft, as well as typical business jet aircraft. T-hangar and small conventional hangar areas should consider ADG I requirements as these commonly serve smaller single and multi-engine piston aircraft.

AIRFIELD SAFETY STANDARDS

The FAA has established several imaginary surfaces to protect aircraft operational areas and keep them free from obstructions that could affect the safe operation of aircraft. These include the object free area (OFA), obstacle free zone (OFZ), runway protection zone (RPZ), and runway safety area (RSA).

The OFA is defined as "a two-dimensional ground area surrounding runways, taxiways, and taxilanes which is clear of objects except for objects whose location is fixed by function." The RSA is "a defined surface surrounding the runway prepared or suitable for reducing the risk of damage to airplanes in the event of an undershoot, overshoot, or excursion from the runway." The OFZ is a "defined volume of airspace centered above the runway centerline whose elevation is the same as the nearest point on the runway centerline and extends 200 feet beyond each runway end." The RPZ is a two-dimensional trapezoidal-shaped surface located along the extended runway centerline to protect people and property on the ground. The FAA expects these areas to be under the control of the airport and free from obstructions.

The dimensional requirements for ARC C-II and ARC D-III are summarized on **Table 3C**. Presently, Runway 6-24 does not fully meet ARC C-II or ARC D-III RSA or OFA design standards; however, there does not appear to be any obstructions of the OFZ. The RSA extends beyond the existing airport property line at each end of the runway. The RSA does not meet grade requirements beyond each runway end. Both the RSA and OFA are obstructed by perimeter fencing. The RSA and OFA behind the Runway 6 end are also obstructed by State Highway 77.

The Runway 6 threshold has been displaced 700 feet to provide for RSA and OFA during landing. The Runway 24 threshold has been displaced 750 feet for the same reasons. While providing for the RSA and OFA when landing, displacing the landing threshold does not specifically allow for the RSA and OFA during takeoff, as departure lengths are not currently limited at the airport.

The alternatives analysis to follow will examine the requirements of FAA Order 5200.8, *Runway Safety Area Program*. Established in October 1999, the order requires the FAA to make a determination of the status of each RSA at all federally-obligated airports. The objective of the order is for all airports to conform with RSA standards to the extent practicable. The alternatives analysis will follow the guidance in the order, including an analysis of the required alternatives to be considered to improve the RSA to meet the RSA standards listed in **Table 3C**.

The existing RPZs extend beyond the existing airport boundary. The U.S. Forest Service land transfer will encompass these areas, providing fee simple acquisition of the existing Runway 6-24 RPZs. The alternatives analysis will examine future RPZ acquisition needs considering the design standard and upgraded instrument approach recommendations of this Master Plan.

TABLE 3C
Airfield Safety Area Dimensional Standards (ft.)

	C-II (Existing Runway 6-24)	D-III (Ultimate Runway 6-24)
Runway Safety Area		
Width	400	500
Length Beyond Runway End	1,000	1,000
Object Free Area		
Width	800	800
Length Beyond Runway End	1,000	1,000
Precision Object Free Area		
Width	800	800
Length Beyond Runway End	200	200
Obstacle Free Zone		
Width	400	400
Length Beyond Runway End	200	200

Source: FAA Airport Design Software Version 4.2D, Change 7 to AC 150/5300-13

RUNWAY LENGTH

The determination of runway length requirements for an airport are based on four primary factors: airport elevation; mean maximum temperature of the hottest month; runway gradient (difference in elevation of each runway end); and critical aircraft type expected to use the airport. Aircraft performance declines as each of these factors increase.

For calculating runway length requirements at Show Low Regional Airport, the airport elevation is 6,412 feet above mean sea level (MSL) and the mean maximum temperature of the hottest month is 86 degrees Fahrenheit (F) (July). For Runway 6-24, the overall difference in runway end elevations is one foot.

Using the specific data for Show Low Regional Airport described above, runway length requirements for the various classifications of aircraft that may operate at the airport were examined using the FAA Airport Design computer program Version 4.2D which groups general aviation aircraft into several categories, reflecting the percentage of the fleet within each category and useful load (passengers and fuel) of the aircraft. **Table 3D** summarizes FAA recommended runway lengths for Show Low Regional Airport.

An analysis of Beechcraft 1900 operating requirements suggests that this aircraft can operate at the airport with less than 5,000 feet of runway length. With the most likely destination as Phoenix Sky Harbor International Airport, fuel loading requirements are minimal for any commercial air carrier operating from Show Low Regional Airport. This reduces the takeoff weights of these aircraft and subsequent runway length

needs. Therefore, there are no limitations on the expected mix of commercial aircraft to serve the airport and additional runway length is not needed for this segment of activity at the airport.

TABLE 3D
Runway Length Requirements

RUNWAY LENGTHS RECOMMENDED FOR AIRPORT DESIGN	
Small airplanes with less than 10 passenger seats	
75 percent of these small airplanes	5,500 feet
95 percent of these small airplanes	7,800 feet
100 percent of these small airplanes	7,800 feet
Small airplanes with 10 or more passenger seats	7,800 feet
Large airplanes of 60,000 pounds or less	
75 percent of these large airplanes at 60 percent useful load	7,200 feet
75 percent of these large airplanes at 90 percent useful load	8,600 feet
100 percent of these large airplanes at 60 percent useful load	11,000 feet
100 percent of these large airplanes at 90 percent useful load	11,000 feet

Small Aircraft - Aircraft less than 12,500 pounds
Source: FAA Airport Design computer program Version 4.2D

Business jets are most affected by the existing runway length, especially during the warm summer months when payload must be reduced to meet takeoff requirements. While business jets must reduce payload at the airport during the warm summer months, business jets have the most flexibility in operating at the airport. Business jet operators commonly control payload through exact fuel loading. While reducing fuel loading may reduce the stage length of a particular flight, business jet operators can stop enroute for additional fuel. Commercial air carriers likely do not have this option as they have a specific destination to reach and timetable to meet. Given that business jet aircraft do not necessarily need to operate at maximum gross weight from Show Low Regional Airport, and the moderate temperatures throughout most of the year that allow for greater fuel loading than in the summer months, the existing 7,200-foot length of Runway 6-24 should be sufficient for meeting short flight distance requirements for typical business jets. However, long term facility planning should consider providing additional runway length for longer stage length flights should that be needed by specific operators at the airport. The appropriate planning category for ARC D-III is 75 percent of large aircraft at 90 percent useful load. As shown in **Table 3D**, a runway length of 8,600 feet is recommended for this category. Therefore, long term facility planning should consider an ultimate runway length of 8,600 feet.

The appropriate planning category for ultimate Runway 18-36 is "75 percent of small airplanes with less than 10 passenger seats." As shown in **Table 3D**, a runway length of 5,500 feet is recommended for this category.

Runway 18-36 should ultimately be planned to this length.

RUNWAY WIDTH

Runway width is based upon the planning ARC for each runway. For ARC C-II and ARC D-III, the FAA specifies a runway width of 100 feet. Runway 6-24 is 100 feet wide, meeting this requirement. For ultimate Runway 18-36, the FAA specifies a runway width of 75 feet.

RUNWAY PAVEMENT STRENGTH

The most important feature of airfield pavement is its ability to withstand use by aircraft of significant weight on a regular basis. Currently, this includes a wide range of commercial and general aviation aircraft ranging from small single-engine aircraft to turboprop airline aircraft and business jet aircraft. Occasionally, this could include a mix of heavy air tankers for aerial firefighting.

Runway 6-24 presently has a single wheel loading (SWL) strength of 35,000 pounds and 60,000 pounds dual wheel loading (DWL). While appropriate for the mix of general aviation aircraft to operate at the airport, this pavement strength is insufficient for the heavy air tankers that could potentially use the airport. Therefore, consideration should be given to increasing the Runway 6-24 and associated taxiway pavement strength to 115,000 pounds DWL. Runway 18-36 should be planned for an ultimate pavement strength of 30,000 pounds SWL and 60,000 pounds DWL.

Exhibit 3B summarizes runway requirements for Show Low Regional Airport.

NAVIGATIONAL AIDS AND INSTRUMENT APPROACH PROCEDURES

Navigational Aids

Navigational aids are electronic devices that transmit radio frequencies which properly equipped aircraft and pilots translate into point-to-point guidance and position information. The types of electronic navigational aids available for aircraft flying to or from Show Low Regional Airport include the Show Low nondirectional beacon (NDB), St. Johns very high frequency omni-directional range (VOR) facility, global positioning system (GPS), and Loran-C. These systems are sufficient for navigation to and from the airport; therefore, no other navigational aids are needed at the airport.

GPS was developed and deployed by the United States Department of Defense as a dual-use (civil and military) radio navigation system. GPS initially provided two levels of service: the GPS standard positioning system (SPS), which supported civil GPS uses; and the GPS precise positioning system (PPS), which was restricted to U.S. Armed Forces, U.S. federal agencies and selected allied armed forces, and government use.

EXISTING	SHORT TERM NEED	LONG TERM NEED
RUNWAYS		
Runway 6-24 ARC C-II • 7,200' x 100' 35,000 SWL • 60,000 DWL ***Runway Safety Area*** 200' each side of runway centerline 1,000' beyond each runway end ***Object Free Area*** 400' each side of runway centerline 1,000' beyond each runway end ***Runway Protection Zone Each End*** Inner Width - 500' • Outer Width - 1,010' Length - 1,700'	**Runway 6-24** ARC C-II • 7,200' x 100' 35,000 SWL • 60,000 DWL ***Runway Safety Area*** 200' each side of runway centerline 1,000' beyond each runway end ***Object Free Area*** 400' each side of runway centerline 1,000' beyond each runway end ***Runway Protection Zone Each End*** Inner Width - 500' • Outer Width - 1,010' Length - 1,700'	**Runway 6-24** ARC D-III • 8,600' x 100' 60,000 SWL • 115,000 DWL ***Runway Safety Area*** 250' each side of runway centerline 1,000' beyond each runway end ***Object Free Area*** 400' each side of runway centerline 1,000' beyond each runway end ***Precision Object Free Area*** 400' each side of runway centerline 200' beyond each runway end ***Runway Protection Zone Primary End*** Inner Width - 1,000' • Outer Width - 1,750' Length - 2,500' ***Runway Protection Zone Other End*** Inner Width - 500' • Outer Width - 1,010' Length - 1,700'
Runway 3-21 ARC B-I (small aircraft only) 3,937' x 60' • 12,500 SWL ***Runway Safety Area*** 60' each side of runway centerline 240' beyond each runway end ***Object Free Area*** 125' each side of runway centerline 240' beyond each runway end ***Runway Protection Zone Each End*** Inner Width - 250' • Outer Width - 450' Length - 1,000'	**Runway 3-21** ARC B-I (small aircraft only) 3,937' x 60' • 12,500 SWL ***Runway Safety Area*** 60' each side of runway centerline 240' beyond each runway end ***Object Free Area*** 125' each side of runway centerline 240' beyond each runway end ***Runway Protection Zone Each End*** Inner Width - 250' • Outer Width - 450' Length - 1,000'	**Runway 3-21** Close **Runway 18-36** ARC B-II 5,500' x 75' • 30,000 SWL, 60,000 DWL ***Runway Safety Area*** 75' each side of runway centerline 300' beyond each runway end ***Object Free Area*** 250' each side of runway centerline 300' beyond each runway end ***Runway Protection Zone Each End*** Inner Width - 500' • Outer Width - 700' Length - 1,000'
TAXIWAYS		
Runway 6-24 Full-length Parallel Taxiway A - 50' wide 400' from runway centerline Taxiway A1 - 50' wide Taxiway A2 - 75' wide Taxiway A4 - 42' wide Taxiway A5 - 50' wide **Runway 3-21** Partial Parallel Taxiway B - 35' wide 181' from runway centerline Three Connecting Taxiways - 35' wide	**Runway 6-24** Full-length Parallel Taxiway A - 50' wide 400' from runway centerline Taxiway A1 - 50' wide Taxiway A2 - 75' wide **Taxiway A4 - 50' wide** Taxiway A5 - 50' wide **Add Exit Taxiways** **Runway 3-21** Partial Parallel Taxiway B - 35' wide 181' from runway centerline Three Connecting Taxiways - 35' wide	**Runway 6-24** Full-length Parallel Taxiway A - 50' wide 400' from runway centerline Taxiway A1 - 50' wide Taxiway A2 - 75' wide Taxiway A4 - 50' wide Taxiway A5 - 50' wide **Runway 3-21** Retain taxiways for access to south apron area after closing runway. **Runway 18-36** Full-length Parallel Taxiway - 35' wide 240' feet from runway centerline 5 exit taxiways 35' wide
HELIPAD		
None	Helipad 2 parking positions Lighted	Helipad 2 parking positions Lighted

KEY

SWL - Single wheel loading **DWL** - Dual wheel loading

Exhibit 3B
AIRCRAFT OPERATIONAL
AREA REQUIREMENTS

The differences in GPS signals have been eliminated and civil users now access the same signal integrity as federal agencies. A GPS modernization effort is underway by the FAA and focuses on augmenting the GPS signal to satisfy requirements for accuracy, coverage, availability, and integrity. For civil aviation use, this includes the development of the Wide Area Augmentation System (WAAS). The WAAS uses a system of reference stations to correct signals from the GPS satellites for improved navigation and approach capabilities. Where the present GPS provides for enroute navigation and limited instrument approach (nonprecision) capabilities, WAAS will provide for Category I (cloud ceilings 200 feet above the ground and visibilities restricted to one-half mile) approach capability at nearly every runway end equipped with an instrument approach procedure.

Once augmented, GPS will become the primary federally-provided radio-navigation system. During the transition, the FAA plans to phase-out existing navigational aids as dependence on these systems is reduced by the capabilities of the GPS system.

Instrument Approach Procedures

Instrument approach procedures have been established for the airport using the NDB and GPS navigational aids. Instrument approach procedures consist of a series of predetermined maneuvers established by the FAA for navigation during inclement weather conditions.

The capability of the NDB or GPS-A circling approach at the airport is limited. This approach only provides for landings when cloud ceilings are higher than 1,300 feet above the ground and visibility is greater than one and one-quarter miles for aircraft with approach speeds less 90 knots. For aircraft with approach speeds between 91 and 120 knots, visibility must be greater than one and one-half miles. For aircraft with approach speeds between 121 and 140 knots, the visibility must be at three miles (which is equal to visual flight minimums). Aircraft with higher approach speeds are not authorized to complete this approach. Existing terrain features, the limited navigational capabilities of the NDB system, and FAA airspace standards (which protect a broad area for aircraft maneuvering on the circling approaches), have caused the high visibility and cloud ceiling minimums associated with the existing instrument approach to the airport.

Improvement to the instrument approach capability of the airport is needed. The limited approach capability of the airport leads to diversions and canceled flights. In some cases, pilots may wish to avoid the airport if inclement weather is forecast to avoid the cost of diversion. Diversions and cancellations are particularly detrimental to scheduled airline and air cargo activities. These businesses maintain strict scheduling for customer service. As noted in the Aviation Demand Forecasts, reliable service will be a key factor in re-establishing and growing commercial air service at Show Low Regional Airport.

The advent of GPS technology will ultimately provide the airport with the capability of establishing instrument approaches. As mentioned previously, the FAA is proceeding with a program to transition from existing ground-based navigational aids to a satellite-based navigation system utilizing GPS technology. GPS is currently certified for enroute guidance and for use with instrument approach procedures. The initial GPS approaches being developed by the FAA provide only course guidance information. The WAAS is expected to allow for GPS approaches that provide descent information as well as course guidance information.

Appendix 16 of FAA AC 150/5300-13, *Airport Design*, Change 7, details the minimum airport landing surface requirements that must be met prior to the establishment of a new instrument approach procedure. This appendix details the requirements for three types of instrument approach procedures: precision instrument approaches, approach procedures with vertical guidance (APV), and nonprecision approaches. While both the precision instrument and APV will provide both descent and course guidance information, the precision approach provides the best approach minimums (visibility less than 3/4 mile and 200-foot cloud ceilings). The APV can provide similar visibility minimums, but cloud ceiling minimums only to 250 feet. The APV is applicable to any approach using GPS. Nonprecision approaches can provide for approaches with visibility minimums less than 3/4 of a mile and 300-foot cloud ceilings.

Since both course guidance and descent information is desirable for an instrument approach to Show Low Regional Airport and GPS does not require the installation of costly navigation equipment at the airport, both a precision GPS approach and an APV approach should be planned for Show Low Regional Airport. The Arizona Department of Transportation - Aeronautics Division's (ADOT) *Navigational Aids and Aviation Services Special Study*, supported the development of a precision approach at Show Low Regional Airport.

A review of Appendix 16 indicates that the existing airport site can support an APV with visibility minimums of one mile and cloud ceilings as low as 300 feet. Lower visibility and cloud ceiling minimums would require an approach lighting system, upgraded runway edge lighting, and precision runway markings. These lighting and marking improvements will be detailed later within this chapter.

As of June 2002, the FAA had initiated the development of straight-in GPS approaches to Runway 6 and Runway 24. A straight-in GPS approach could ultimately provide for lower approach minimums at the airport, perhaps reaching the one mile visibility minimum and 300-foot cloud ceiling noted above. GPS is a more precise navigation system than an NDB; therefore, the protected airspace environment is smaller in comparison to the NDB approach. The protected airspace for a straight-in instrument approach procedure is smaller than that

needed for a circling approach. These smaller airspace requirements, combined with the ability to develop a missed approach procedure directing aircraft away from the controlling terrain features, located south of the airport, should allow for better approach minimums. The FAA has indicated that these approaches should be complete in 2003.

Ultimately, one of these approaches should be upgraded to provide precision approach capabilities (½-mile visibility minimums and 200-foot cloud minimums). The other runway end should provide the best APV landing minimums. These approach capabilities will ultimately be dependent upon the ability of each approach to meet the requirements of FAA Order 8260.3, *United States Standards for Terminal Instrument Procedures (TERPS)*, which will be determined separately by the FAA. An APV approach should also be planned for each end of Runway 18-36 due to the prevalence of winds from the north and south at Show Low Regional Airport.

TAXIWAYS

Taxiways are constructed primarily to facilitate aircraft movements to and from the runway system. Some taxiways are necessary simply to provide access between the aprons and runways, whereas other taxiways become necessary as activity increases at an airport to provide safe and efficient use of the airfield.

Runway 6-24 is served by a full-length parallel taxiway (Taxiway A) and four connecting taxiways (Taxiways A1, A2, A4, and A5). Two additional connecting taxiways should be considered to improve airfield capacity. Additional connecting taxiways will provide more exit opportunities for aircraft, thus reducing the amount of time that an aircraft occupies the runway after landing.

Runway 3-21 is served by a partial parallel taxiway (Taxiway B) and four connecting taxiways. Since this runway is planned to be closed, there is not a need to improve taxiway access.

Ultimately, Runway 18-36 should be served by a full-length parallel taxiway and five connecting taxiways.

The FAA has established standards for taxiway width and runway/taxiway separation distances. Taxiway width is determined by the ADG of the most demanding aircraft to use the taxiway. According to FAA design standards, the minimum taxiway width for ADG III is 50 feet. With the exception of Taxiway A4, all taxiways serving Runway 6-24 are presently 50 feet wide or wider. Taxiway A4 is 42 wide and should ultimately be widened to 50 feet. For Runway 18-36, which is planned to serve ADG II, all taxiways should be 35 feet wide. The taxiways serving Runway 3-21 are 35 feet wide, meeting or exceeding width requirements.

Design standards for the separation distances between runways and parallel taxiways are based primarily on the ARC for that particular runway and the type of instrument approach capability. FAA design standards specify a runway/taxiway separation distance of

400 feet for a D-III runway. Presently, Taxiway A is located 400 feet from the Runway 6-24 centerline. For Runway 18-36, ARC B-II design standards specify that the parallel taxiway should be 240 feet from the runway centerline.

Design standards specify that the parallel taxiway for Runway 3-21 be located 150 feet from the runway centerline. Presently, Taxiway B is located 181 feet from Runway 3-21.

Holding aprons provide an area for aircraft to prepare for departure off the taxiway and allow aircraft to bypass other aircraft which are ready for departure. A holding apron is available at the Runway 6 and Runway 24 ends. Facility planning should include developing a holding apron at the ultimate Runway 18 and Runway 36 ends.

HELIPAD

The airport does not have a designated helipad. Helicopters utilize the same apron areas as fixed-wing aircraft. Typically, helicopters and fixed-wing aircraft are segregated to the extent possible.

Facility planning should include establishing a designated helipad at the airport. This should be supplemented with two parking positions and be lighted to allow for operations during low visibility conditions.

LIGHTING AND MARKING

There are a number of lighting and pavement marking aids serving pilots using the Show Low Regional Airport. These lighting and marking aids assist pilots in locating the airport during night or poor weather conditions, as well as assist in the ground movement of aircraft. **Exhibit 3C** summarizes the existing lighting aids and presents future requirements.

Identification Lighting

The location of an airport at night is universally indicated by a rotating beacon. The rotating beacon at the airport is located on top of a tower, south of Runway 6-24, along the center apron. The rotating beacon is sufficient and should be maintained in the future.

Runway and Taxiway Lighting

Runway and taxiway lighting utilizes light fixtures placed near the pavement edge to define the lateral limits of the pavement. This lighting is essential for safe operations at night and/or during times of low visibility in order to maintain safe and efficient access to and from the runway and aircraft parking areas.

Runway 6-24 is presently equipped with medium intensity runway lighting (MIRL). High intensity runway lighting (HIRL) will be needed to support a precision GPS approach procedure to this runway.

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EXISTING	SHORT TERM NEED	LONG TERM NEED
INSTRUMENT APPROACH PROCEDURES		
NDB or GPS Circling Approach 1 1/4 mile/1,300' Category A 1 1/2 mile/1,300' Category B 3 mile/1,300' Category C LNAV 24 1 mile/500' Categories A and B 1 1/4 mile/500' Category C	**Straight-in GPS Approach** Runway 6-24 Approach Categories A, B, C, and D One-Mile Visibility Minimum 400' Cloud Ceilings	**Precision Approach** Runway 6-24 Approach Categories A, B, C, and D One-Half Mile Visibility Minimum 200' Cloud Ceilings **Straight-in GPS Approach** Runway 18-36
AIRFIELD LIGHTING AND MARKINGS		
Rotating Beacon Pilot Controlled Lighting (Runway 6-24) **Runway 6-24** Medium Intensity Runway Edge Lighting Medium Intensity Taxiway Edge Lighting Lighted Runway/Taxiway Directional Signage Precision Approach Path Indicator - 2 Runway 6 and Runway 24 Ends Runway End Identifier Lights Runway 6 and Runway 24 Ends Nonprecision Runway Markings **Runway 3-21** Edge Reflectors Basic Runway Markings	Rotating Beacon Pilot Controlled Lighting (Runway 6-24) **Runway 6-24** Medium Intensity Runway Edge Lighting Medium Intensity Taxiway Edge Lighting Lighted Runway/Taxiway Directional Signage **Precision Approach Path Indicator - 4** Runway 6 and Runway 24 Ends Runway End Identifier Lights Runway 6 and Runway 24 Ends Nonprecision Runway Markings **Distance Remaining Signs** **Runway 3-21** Edge Reflectors Basic Runway Markings	Rotating Beacon Pilot Controlled Lighting (All Runways) **Runway 6-24** **High Intensity Runway Edge Lighting** Medium Intensity Taxiway Edge Lighting Lighted Runway/Taxiway Directional Signage Precision Approach Path Indicator - 4 Runway 6 and Runway 24 Ends Nonprecision Runway Markings Distance Remaining Signs **MALSR - Primary End** REIL - Other Runway End **Runway 3-21** (Runway Closed) **Runway 18-36** Medium Intensity Runway Edge Lighting Medium Intensity Taxiway Edge Lighting Lighted Runway/Taxiway Directional Signage Precision Approach Path Indicator - 2 Runway 18 and Runway 36 Ends Basic Runway Markings Distance Remaining Signs
WEATHER/COMMUNICATOR FACILITIES		
Lighted Wind Indicator Segmented Circle Tetrahedron	Lighted Wind Indicator Segmented Circle **Automated Surface Observation System (ASOS)** **Remote Communications Outlet (RCO)**	Lighted Wind Indicator Segmented Circle Automated Surface Observation System (ASOS) Remote Communications Outlet (RCO)

KEY

NDB - Nondirectional Beacon
GPS - Global Positioning System

SHOW LOW Regional Airport

Exhibit 3C
AIRFIELD SUPPORT REQUIREMENTS

Runway 3-21 is not lighted and is equipped with only retro-reflective markers. Lighting is not required for this runway due its limited use and plans to be ultimately closed. MIRL will be sufficient for Runway 18-36.

Effective ground movement of aircraft at night is enhanced by the availability of taxiway lighting. Presently, Taxiways A, A1, A2, A4, and A5 are equipped with medium intensity taxiway lighting (MITL). Taxiway B and the Runway 3-21 connecting taxiways are not lighted and equipped only with retro-reflective markers. MITL should be planned for Taxiway B and associated connecting taxiways, since these taxiways provide access to Runway 6-24 from the south apron area. MITL should be planned for all taxiways serving Runway 18-36.

Airfield Signs

Lighted directional and hold signs are installed along Runway 6-24 and Taxiways A, A1, A2, A4, and A5. This signage identifies runways, taxiways, and apron areas. These aid pilots in determining their position on the airport and provide directions to their desired location on the airport. These lighting aids are sufficient and should be maintained through the planning period.

Similar directional signage should be considered for Taxiway B and its associated connecting taxiways Ultimately, Runway 18-36 and its parallel taxiway will require lighted directional signage.

Distance Remaining Signs

Distance remaining signage should be planned for Runway 6-24 and Runway 18-36. These lighted signs are placed in 1,000-foot increments along the runway to notify pilots of the length of runway remaining.

Pilot-Controlled Lighting

Show Low Regional Airport is equipped with pilot-controlled lighting (PCL) for Runway 6-24. PCL allows pilots to control the intensity of runway lighting using the radio transmitter in the aircraft. PCL also provides for more efficient use of airfield lighting energy. A PCL system turns the airfield lights off or to a lower intensity when not in use. Similar to changing the intensity of the lights, pilots can turn up the lights using the radio transmitter in the aircraft. This system should be maintained through the planning period and enhanced to include the lighting for all runways and taxiways at the airport.

Visual Approach Lighting

In most instances, the landing phase of any flight must be conducted in visual conditions. To provide pilots with visual descent information during landings to the runway, visual glideslope indicators are commonly provided at airports. A precision approach path indicator (PAPI-2) is installed at the Runway 6 and Runway 24 ends for this purpose. Ultimately, the PAPI-2s should be upgraded to

PAPI-4s. PAPI-4s are more appropriate for the mix of aircraft operating on Runway 6-24. PAPI-2s should be planned for each end of Runway 18-36. Visual approach lighting is not required for Runway 3-21 since this runway is planned to be closed.

Approach Lighting

Approach lighting systems provide the basic means to transition from instrument flight to visual flight for landing. No approach lighting system is presently installed at the airport. The future precision approach will require the installation of a medium intensity approach lighting system with runway alignment lighting (MALSR).

Runway End Identification Lighting

Runway end identification lighting provides the pilot with rapid and positive identification of the runway end. The most basic system involves runway end identifier lights (REILs). REILs consist of a set of synchronized flashing lights located laterally on each side of the runway centerline at the runway end. REILs are not specifically required for the existing approaches or future instrument approaches, but can enhance the safety of nighttime operations to each runway end (without a more extensive approach lighting system). REILs provide pilots with the ability to identify these runway ends and distinguish this lighting from other lighting on the airport and in the approach areas. REILs should be planned for each runway end at the airport, with the exception of the runway end equipped with a MALSR. REILs are presently installed at the Runway 6 and Runway 24 ends.

Pavement Markings

Pavement markings are designed according to the type of instrument approach available on the runway. FAA AC 150/5340-1F, *Marking of Paved Areas on Airports*, provides the guidance necessary to design an airport's markings. Runway 6-24 is equipped with nonprecision runway markings. Precision runway markings will be required for the precision GPS approach.

Runway 3-21 is equipped with basic markings, which are sufficient and should be maintained as long as this runway is operational. Basic markings will be required for Runway 18-36.

Taxiway and apron areas also require marking to assure that aircraft remain on the pavement. Yellow centerline stripes are currently painted on all taxiway and apron surfaces at the airport to provide this guidance to pilots. Besides routine maintenance, these markings will be sufficient through the planning period.

AIR TRAFFIC CONTROL

Show Low Regional Airport does not have an operational airport traffic control tower (ATCT); therefore, no formal terminal air traffic control services are available at the airport.

The establishment of a fully-funded ATCT, staffed and maintained by FAA personnel, follows guidance provided in FAA Handbook 7031.2C, *Airway Planning Standard Number One - Terminal Air Navigation Facilities and Air Traffic Control Services.* To be identified as a possible candidate for an ATCT, the sum of the following formula must be greater than or equal to one. The formula is as follows:

AC +	AT +	GAI +	GAL +	MI +	ML =	X
38,000	90,000	160,000	280,000	48,000	90,000	

Where:

AC	=	Air Carrier Operations
AT	=	Air Taxi Operations
GAI	=	General Aviation Itinerant Operations
GAL	=	General Aviation Local Operations
MI	=	Military Itinerant Operations
ML	=	Military Local Operations

Using current activity levels and those forecast activity levels prepared in Chapter Two, it is expected that Show Low Regional Airport would not qualify as a possible candidate for a fully-funded FAA ATCT due to the levels of air traffic at the airport. At 2001 activity levels, the sum of the formula above is 0.11. At long term planning horizon levels, the sum is 0.24.

Facility planning should include identifying and reserving a location for the future development of a tower, should a tower be required in the future or the City wish to participate in the FAA Contract Tower program.

WEATHER REPORTING FACILITIES

The airport has a lighted wind cone and wind tee that provide pilots with information about wind conditions. A segmented circle provides traffic pattern information to pilots. These facilities are required when the airport is not served by a 24-hour ATCT. These facilities are sufficient and should be maintained in the future.

Airport staff presently conducts weather observations daily at the airport. However, the airport is not equipped with automated weather reporting. The primary disadvantage of this is that when the airport offices are closed, pilots cannot receive a current altimeter setting. Without a current altimeter setting, pilots cannot complete the approved NDB or GPS-A instrument approach procedure. To supplement the daily weather observations and to provide 24-hour weather observations, an automated weather reporting system should be planned for Show Low Regional Airport. This is consistent with the findings of the *Navigational Aids and Aviation Services Special*

Study, which also identified the need for automated weather observation at the airport.

To provide automated weather observations and reporting, an automated weather observation system (AWOS) or automated surface observation system (ASOS) are commonly installed at an airport. Both systems provide similar capabilities which include reporting current weather conditions such as: altimeter setting, wind direction and speed, temperature, dewpoint, density altitude, visibility, cloud ceilings data, and precipitation identification and intensity.

COMMUNICATIONS FACILITIES

A remote communications outlet (RCO) should be planned for Show Low Regional Airport. An RCO would provide pilots with a direct communication link to the Air Route Traffic Control Center (ARTCC). This communication link facilitates the opening and closing of instrument flight plans.

LANDSIDE REQUIREMENTS

Landside facilities are those necessary for handling aircraft and passengers while on the ground. These facilities provide the essential interface between air and ground transportation modes. The capacities of the various components of each area were examined in relation to projected demand to identify future landside facility needs. This includes components for commercial service and general aviation needs such as:

- Passenger Airline Terminal
- Aircraft Hangars
- Aircraft Parking Aprons
- Airport Support Facilities

AIRLINE TERMINAL AREA

Components of the terminal area complex include the terminal apron, aircraft gate positions, the functional elements within the terminal building, and the public and rental car parking areas. This section identifies the terminal area facilities required to meet the airport's needs through the planning period. These requirements are based upon specific passenger enplanement thresholds, rather than a given year. In this manner, airport management can reference the guidelines, even if growth varies from the forecast presented in Chapter Two.

The existing airline terminal area facilities were evaluated based on planning guidelines relating to the major functional elements of the terminal area as presented in AC 150/5360-9, *Planning and Design of Airport Terminal Facilities at Non-hub Locations*, the consultant's data base of terminal planning criterion, and information collected during the inventory element to prepare estimates of various terminal building requirements.

Passenger Terminal Building

Terminal area requirements have been developed for the following functional areas:

- Ticketing
- Secure Departure Area
- Baggage Claim
- Concessions and Terminal Services
- Public Lobby
- Aircraft Gate Positions

The methodology utilized in the analysis of the passenger terminal building involved the design hour passenger demands and a comparison of these requirements with existing terminal facilities. The evaluation process includes the major terminal building areas that are normally affected by peaking characteristics.

The first destination for enplaning passengers in the terminal building is the airline ticket counters. The ticketing area consists of the ticket counters, queuing area for passengers to approach the counters, and the ticket lobby which provides circulation.

The ticketing counters are presently located on the north wall of the terminal. The ticket counter is located between the fixed bag claim shelf and departure holdroom. This space is sufficient for a single airline. An expansion of the ticket counter length could not be accomplished without relocating or reconfiguring the secure departure area or baggage claim area. This ticket lobby is shared with the general public lobby area.

As shown on **Exhibit 3D**, the existing ticket counter lengths and airline operating areas are expected to be slightly undersized based upon the terminal planning criteria applied in this study. This would indicate that additional airline office, baggage make-up areas, and ticket counter length may be needed through the planning period. The alternatives analysis will examine options for meeting these needs.

The bag claim facilities at the airport are located along the east side of the ticket counter. Bag display is accomplished with a fixed shelf that opens to the airline-accessed baggage make-up area. The length of the bag claim device is sufficient through 9,000 enplanements. Additional length may be needed to meet long term passenger levels. A fixed bag claim shelf is sufficient for these levels of passengers and a mechanized bag display device is not needed.

The departure holdroom area is located along the west wall of the terminal, west of the ticket counter. While the departure area is properly-sized through the planning period, there is presently no security screening. Security screening is an important consideration in future terminal planning. It is anticipated that security screening will be required for future scheduled airline service. The current holdroom configuration accounts for security screening equipment at the departure holdroom entrance.

Additional terminal security requirements will be related to the *Aviation and Transportation Security*

Act of 2001, which was written in response to the terrorist acts of September 11, 2001. Major provisions of the law applicable to terminal planning include the federal government taking responsibility of carry-on baggage screening and new requirements for checked baggage screening. The law requires security screeners to be employees of the federal government by the end of 2002 and the establishment of a security manager at each airport. The law further requires that all checked baggage be screened by explosive detection systems (EDS) by the end of 2002. The Transportation Security Administration (TSA) was created to administer these security functions.

Prior to enactment of this law, the airlines were responsible for checked baggage screening. As mentioned, there has not been passenger screening at Show Low Regional Airport in the past; therefore, unlike other airports, there have not been separate employees for carry-on baggage security screening. With the federal government taking on this role, it can be expected that there will be dedicated staff at the airport for carry-on baggage security screening. Therefore, it can be assumed that there will be a requirement for office space for the federal security screeners and the required security manager.

The TSA has indicated that they will meet the December 2002 EDS screening requirement with the use of both trace detection devices and the use of computed tomography (CT) imaging technology. The FAA has certified two separate manufacturers' CT systems. The current EDS imaging modules span as much as seven feet without conveyor systems and are as much as eight feet wide. An area for the operator work station and maintenance must also be considered. To be effective, the EDS must be integrated with the baggage check-in and baggage make-up areas to efficiently direct checked baggage for screening. The installation of one of these systems will likely require significant modifications to the existing building. Trace detection devices are much smaller and could be integrated into the existing baggage check-in area.

The TSA is evolving and had not issued any final decisions as of June 2002 for implementation of EDS or federal security screening. The rules, regulations, costs, and procedures for these new requirements will need to be continually monitored by airport management.

Airline Apron Area

The terminal apron consists of the area and facilities used for aircraft gate parking, aircraft support, and servicing operations. In addition to actual gate positions, sufficient room must be provided for aircraft servicing, taxilanes leading to the airfield, and service/fire lanes designated for vehicles used for aircraft ground-servicing and fire equipment. Each gate should be designed to accommodate the largest air carrier aircraft expected to use the position. Apron requirements have been determined considering the wingspan and length of common turboprop aircraft. Apron requirements were determined by providing 2,200 square yards for each aircraft parking

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	EXISTING	ENPLANEMENTS 6,700	9,000	13,000
TICKETING				
Counter Length (l.f.)	10	13	18	26
Counter Area (s.f.)	114	130	180	260
Ticket Lobby (s.f.)	--[1]	340	450	650
Airline Operations/Bag Make-Up (s.f.)	321	1,150	1,200	2,290
DEPARTURE FACILITIES				
Aircraft Gates	1	1	1	2
Security Stations	0	1	1	1
Holdroom Area (s.f.)	927	330	440	640
BAGGAGE CLAIM				
Claim Display (l.f.)	23	15	20	29
Baggage Claim Lobby (s.f.)	125	520	690	990
TERMINAL SERVICES				
Rental Car				
Counter Length (l.f.)	15	7	10	14
Office Area (s.f.)	304	150	200	290
Counter Queue Area (s.f.)	--[1]	70	100	140
Food/Beverage (s.f.)	220	300	390	570
Retail (s.f.)	0	70	100	140
Restrooms (s.f.)	288	410	440	510
PUBLIC LOBBY				
Seating/Greeting/Farewell Area (s.f.)[1]	1,152	550	730	1,050
AIRPORT/ADMINISTRIATION/OFFICE SPACE	**1,543**	**1,000**	**1,000**	**1,000**
SUBTOTAL PROGRAMMED AREA	**4,994**	**5,020**	**5,920**	**8,530**
General Circulation	1,152	800	900	1,300
Mech./Elec., Maint., & Storage (s.f.)	177	600	700	1,000
TOTAL TERMINAL BUILDING	**6,323**	**6,420**	**7,520**	**10,830**
AUTO PARKING				
Public Parking/Rental Car	109	48	65	94
Employee	11	3	5	7
Total Auto Parking	**120**	**51**	**70**	**101**
TERMINAL CURB (ft.)	**200**	**29**	**39**	**57**

[1] Included in public lobby space

SHOW LOW Regional Airport

Exhibit 3D
PASSENGER TERMINAL BUILDING REQUIREMENTS

position. The existing terminal apron encompasses 8,300 square yards and is expected to be sufficient through the planning period.

Requirements for a loading bridge have not been determined. Aircraft loading is presently conducted at ground level at the airport. Typical regional airline aircraft provide this capability. Therefore, it is not expected that the airport would require loading bridges.

Terminal Curb Frontage and Roadway

The curb element is the interface between the terminal building and the ground transportation system. The length of curb required for the loading and unloading of passengers and baggage is determined by the type and volume of ground vehicles anticipated in the peak period on the design day.

A designated curb extends approximately 200 feet along the front of the terminal. As shown on **Exhibit 3D**, based upon the planning assumptions used in this study, the available curb length is anticipated to be adequate through the planning period.

The terminal roadway provides two thru-lanes and a parking lane along the terminal curb. This number of lanes ensures vehicles can pass while others are loading and unloading. The terminal roadway is a one-way loop extending around a designated parking area. This is sufficient and should be maintained through the planning period.

Automobile Parking Areas

Vehicle parking for the terminal complex area includes public, employee, and rental car spaces. The designated public parking area provides 62 designated parking spaces immediately in front of the terminal building. This parking area is surrounded by the one-way terminal loop roadway described above. This is supplemented by 11 employee parking spaces located at the west end of the terminal. Future public parking requirements are shown on **Exhibit 3D**. As indicated on the exhibit, sufficient public/rental car and employee parking is available through the planning period.

GENERAL AVIATION REQUIREMENTS

Aircraft Storage Hangars

The demand for aircraft storage hangars typically depends upon the number and type of aircraft expected to be based at the airport. For planning purposes, it is necessary to estimate hangar requirements based upon forecast operational activity. However, hangar development should be based on actual demand trends and financial investment conditions.

Utilization of hangar space varies as a function of local climate, security, and owner preferences. The trend in general aviation aircraft, whether single or multi-engine, is in more sophisticated (and, consequently, more expensive) aircraft. Therefore, many hangar owners prefer hangar space to

outside tiedowns. The climate of the regional area causes most aircraft owners to prefer inside storage. Presently, the majority of aircraft owners currently keep their aircraft in enclosed hangar space.

Future hangar requirements for the airport are summarized on **Exhibit 3E**. Future hangar requirements were developed with the assumption that a majority of aircraft owners would prefer enclosed storage and that the percentage of aircraft within enclosed hangar facilities would increase through the planning period. T-hangar requirements were determined by providing 1,200 square feet of space for aircraft within each T-hangar space. Conventional hangar space was determined by providing 1,200 square feet for single engine aircraft and 2,500 square feet for multi-engine aircraft. A larger portion of the aircraft projected for enclosed aircraft storage were anticipated to be located within conventional (clearspan) hangars, as is the current trend at the airport.

As indicated on the exhibit, additional hangar space is expected to be required through the planning period for aircraft storage and to accommodate commercial general aviation services, such as aircraft maintenance and repair. There are presently no hangars dedicated to these functions at the airport now. It is expected that aircraft storage hangar requirements will continue to be met through a combination of hangar types. The alternatives analysis will examine options available for hangar development at the airport and determine the best location for each type of hangar facility.

Aircraft Parking Apron

A parking apron should be provided for at least the number of locally-based aircraft that are not stored in hangars, as well as transient aircraft. There are approximately 135 tiedowns available for both based and transient aircraft at the airport. Although the majority of future based aircraft were assumed to be stored in an enclosed hangar, a number of based aircraft will still tiedown outside.

Along with based aircraft parking needs, transient aircraft parking needs must also be considered in determining apron requirements. Show Low Regional Airport accommodates a significant level of transient activity annually.

Total apron area requirements were determined by applying a planning criterion of 800 square yards per transient aircraft parking position and 500 square yards for each locally-based aircraft parking position. Transient business jet positions were determined by applying a planning criterion of 1,600 square yards for each transient business jet position. The results of this analysis are presented on **Exhibit 3E**. Based upon the planning criteria above and assumed transient and based aircraft users, the existing apron areas should be sufficient through the planning period. Additional apron area in excess of these needs may be needed as new hangar areas are developed on the airport which are not contiguous with the existing apron areas.

In addition to these requirements, facility planning should include

AIRCRAFT STORAGE HANGARS

	EXISTING SPACE AVAILABLE	SHORT TERM NEED	INTERMEDIATE NEED	LONG TERM NEED
Aircraft to be Hangared		69	78	96
T-Hangars/Shade Hangars	24	28	29	35
Conventional Hangar Positions	8	41	49	61
Hangar Area Requirements				
T-Hangar Area (s.f.)	24,100	42,800	48,200	64,400
Conventional Hangar Storage Area (s.f.)	57,500	79,600	96,000	122,800
Maintenance Area (s.f.)	0	3,500	4,400	5,700
Subtotal Conventional Hangar Area (s.f.)	57,500	83,100	100,400	128,500
Total Hangar Area (s.f.)	81,600	125,900	148,600	192,900

AIRCRAFT PARKING APRON REQUIREMENTS

	EXISTING	SHORT TERM NEED	INTERMEDIATE NEED	LONG TERM NEED
Single, Multi-engine Transient Aircraft Positions		17	19	22
Apron Area (s.y.)		13,300	15,300	17,600
Transient Business Jet Positions		2	2	3
Apron Area (s.y.)		3,200	3,200	4,800
Locally-Based Aircraft Positions		11	12	14
Apron Area (s.y.)		5,500	6,000	7,000
Airline Parking Position		1	1	2
Apron Area (s.y.)		2,200	200	4,400
Total Positions	141	30	33	39
Total Apron Area (s.y.)	55,100	24,200	26,700	33,800

	EXISTING	SHORT TERM NEED	INTERMEDIATE NEED	LONG TERM NEED
Fuel Storage (gallons)				
100LL AVGAS	10,000	7,500	8,500	10,000
JET-A	10,000	10,500	13,000	17,500
Other Facilities		Aircraft Wash Rack	Covered Aircraft Owner's Maintenance Facility/ Wash Rack	Covered Aircraft Owner's Maintenance Facility/ Wash Rack

Exhibit 3E
GENERAL AVIATION
FACILITY REQUIREMENTS

developing at least 7,500 square yards of pavement to accommodate two heavy tankers simultaneously at the airport in support of future wildfires in the region.

REGULATORY AND SUPPORT REQUIREMENTS

F.A.R. PART 139 CERTIFICATION REQUIREMENTS

F.A.R. Part 139, *Certification and Operations: Land Airports Serving Certain Air Carriers*, as amended, prescribes the rules governing the certification and operation of land airports which serve any scheduled or unscheduled passenger operation of an air carrier that is conducted with an aircraft having a seating capacity of more than 30 passengers. Presently, Show Low Regional Airport is not required to be certificated under F.A.R. Part 139; however, under new rule-making the airport is required to be certificated in the future.

A Notice of Proposed Rulemaking issued by the FAA on June 21, 2000 and finalized on February 10, 2004 extends certification requirements to airports serving scheduled air carrier operations in aircraft with 10-30 seats. Under the changes to the Part 139 requirements, there would be four classes of airports: Classes I, II, III, and IV. Airports serving all types of scheduled operations of large air carrier aircraft, and any other type of air carrier operations, would be known as Class I airports. Class II airports would be those airports that serve scheduled operations of small air carrier aircraft (10-30 seats) and unscheduled operations of larger air carrier aircraft (more than 30 seats). Class III airports would be those airports that serve only scheduled operations of air carrier aircraft with 10-30 seats. Class IV airports would be those airports serving only unscheduled air carrier operations in aircraft with more than 30 seats. These designations are shown in **Table 3E**. Should the airport transition to commercial airline aircraft with more than 10 passenger seats, the airport would need to comply with Class III of the regulation.

TABLE 3E
Proposed Part 139 Airport Classifications

	Proposed Airport Class			
Type of air carrier operation	**Class I**	**Class II**	**Class III**	**Class IV**
Scheduled Large Air Carrier Aircraft	X			
Unscheduled Large Air Carrier Aircraft	X	X		X
Scheduled Small Air Carrier Aircraft	X	X	X	

Each of the F.A.R. Part 139 requirements are described below and the required improvements associated with compliance are indicated in the following sections.

Airport Certification Manual Requirements

Under F.A.R. Part 139, a certificated airport must complete, and maintain, a certification manual which outlines their compliance under each provision of the regulations. Since Show Low Regional Airport is not certificated, the airport would need to prepare a certification manual.

Personnel

This section of F.A.R. Part 139 states that the certificate holder shall maintain appropriate qualified personnel to comply with the requirements of the Airport Certification Manual. To comply with the requirements, at least one person would be needed to conduct a Part 139 self-inspection of the airport facilities on a daily basis to ensure compliance. This person must be trained in the identification of deficiencies and the reporting methods to report those deficiencies.

Paved/Unpaved Areas

This section of F.A.R. Part 139 states that the certificate holder must maintain and promptly repair the pavement of each taxiway, runway, loading ramp, and parking area available for use by the air carrier. Initially at Show Low Regional Airport, this would be expected to include Runway 6-24, Taxiway A, and associated runway exit taxiways.

Safety Areas

Runways identified for air carrier use would be required to maintain the designated runway safety areas (RSA). Each safety area would require the clearing and grading of all potentially hazardous ruts, humps, depressions, or other surface variations in excess of three inches. These areas shall also be drained by grading or storm sewers to prevent water accumulation during rain storms or construction projects. All items located within these safety areas due to their function (runway lights, VASIs, etc) must be mounted on frangible structures with frangible points no higher than three inches above grade. Any items located within the safety areas at Show Low Regional Airport would need to be installed on frangible supports and all safety areas should be cleared and graded of any of the previously mentioned deficiencies. Further analysis of the safety areas at Show Low Regional Airport will be completed in Chapter Four to meet the requirements of this section and FAA Order 5200.8.

Marking and Lighting

All runways and taxiways associated with air carrier operations, as previously identified, would require markings associated with the lowest authorized approach minimums to the runway. Such markings include: taxiway centerline and edge markings; signs identifying the taxiing routes on the movement areas; and runway holding position markings and signage. The existing marking and signage meets the requirements for this section.

Snow and Ice Control

This section of Part 139 sets forth requirements for the establishment of a snow and ice control plan to ensure the timely removal of snow and ice from pavement surfaces used by air carrier aircraft. The FAA Advisory Circular 5200-30A, *Airport Winter Safety and Operations*, provides general guidance for snow clearance for commercial service airports. According to this circular, "commercial service airports should have sufficient equipment to clear one inch of snow weighing up to 25 pounds per cubic foot from the primary instrument runway, one or more principal taxiways to the ramp area, emergency or firefighters access road and sufficient ramp area to accommodate anticipated aircraft operations within the times below." These times are based on annual operations. For Show Low Regional Airport, these areas would need to be cleared within one hour.

The minimum area to be cleared for Show Low Regional Airport would include Runway 6-24, Taxiways A, A1, A2, A4, A5, and the terminal apron. This encompasses approximately 1.3 million square feet of pavement to be cleared. Assuming a density of 25 pounds per cubic foot, and one-inch snow depth, there is a requirement to clear approximately 1,300 tons of snow per hour.

Airport snow removal equipment presently includes a 1963 snow blower with a 600-ton per hour capacity, two 14-foot blades, and one 8-foot blade. This equipment is not sufficient for meeting the snow removal requirements detailed above. Therefore, consideration should be given to acquiring a new snow blower that meets these clearance requirements.

Snow removal equipment is stored outside. Current plans include the development of a snow removal equipment storage building adjacent to a future airport rescue and firefighting station west of the passenger terminal building.

Aircraft Rescue and Firefighting

The requirements for Aircraft Rescue and Firefighting (ARFF) equipment at an airport is determined by the length of the air carrier aircraft using the airport. Considering the existing and future commercial airline aircraft to use Show Low Regional Airport, it is expected that Show Low Regional Airport would need to comply with the lowest index rating: ARFF Index A.

ARFF Index A requires one vehicle carrying the following:

1) 500 pounds of sodium-based dry chemical or halon 1211; or

2) 450 pounds of potassium-based dry chemical and water with a commensurate quantity of Aqueous Film Forming Foam (AFFF) to total 100 gallons for simultaneous dry chemical and AFFF foam application.

The airport does not own a certified ARFF vehicle. Therefore, to meet this requirement, it is expected that the airport would need to acquire a certified

ARFF vehicle. There is presently no ARFF building on the airport. There is a plan to construct an ARFF building west of the passenger terminal building and acquire an ARFF vehicle. F.A.R. Part 139 also requires certified and fully trained personnel. While federal grant funding can be secured for equipment and buildings, grant funding cannot be used for firefighting training or staffing costs.

Hazardous Materials

F.A.R. Part 139 requires that each certificate holder that serves as a cargo handling agent shall establish and maintain procedures for the protection of persons and property on the airport during the handling and storing of any material regulation by the Hazardous Materials Regulations (49 CFR, Part 171), that is, or intended to be, transported by air. In addition, standards must be established and maintained for the protection against fire and explosions in storing, dispensing, and otherwise handling fuels, lubricants, and oxygen on the airport. These standards must cover facilities, procedures, and the training of staff. As aircraft fuel, lubricants, and oxygen are all stored and sold at Show Low Regional Airport, this section would be required under Part 139. In addition to the development of rules and regulations regarding the handling and storage of these materials, the airport operator would be required to perform quarterly inspections of firms and individuals handling, storing, and disbursing these materials. Inspection records must be maintained for a minimum of 12 months.

Traffic/Wind Indicators

Any airport certificated under Part 139 is required to maintain a wind cone that provides surface wind direction information visually to pilots. If the airport is open to air carrier operations at night, the wind direction indicators must be lighted. Airports serving air carrier operations when there is no airport traffic control tower operating requires the installation of a segmented circle around one wind cone and a landing strip and traffic pattern indicator for each runway with a right-hand traffic pattern. Show Low Regional Airport currently has a segmented circle and a lighted wind cone and complies with this section.

Airport Emergency Plan

A comprehensive emergency plan must be designed to minimize the possibility and extent of damage and personal injury on the airport in various emergency situations. Show Low Regional Airport, in coordination with medical support facilities, would be required to maintain an airport emergency plan. This would require the airport and supporting medical facilities to review the plan once every 12 months.

Self-Inspection Program

Show Low Regional Airport personnel would be required to inspect the airport facilities to assure compliance with Part 139 regulations. These inspections would be required on a daily basis. An additional inspection would be required

after an unusual weather condition, and immediately following any incident or accident. This inspection information shall be maintained for a period of at least six months and made available to the FAA upon request.

Obstructions

Each object in each area within the authority of the airport which exceeds any of the heights, or penetrates the imaginary surfaces described in F.A.R. Part 77, must be removed, marked, or lighted. The necessary requirements shall be determined by an approved FAA aeronautical study. Obstructions will be more fully examined during the preparation of the airport layout plan set for the airport.

Ground Vehicles

Show Low Regional Airport will be required to limit the access of ground vehicles in movement areas to those vehicles necessary for airport operations. This would require that all personnel operating ground vehicles on the movement and safety areas to be trained in the proper operation and safety procedures on the airport. Any incident or accident involving an airport ground vehicle shall be documented and made available to the FAA upon request.

Protection of Navaids

Any construction of facilities on the airport that, as determined by the FAA administrator, would degrade the operation of an electronic or visual navaid and air traffic control facilities must be prevented by the certificate holder. The certificate holder shall also assist in protecting all navaids against vandalism and theft, and to protect against the interruption of the visual or electronic signals of the associated navaid.

Public Protection

The certificated airport shall prevent inadvertent entry to the movement area by unauthorized persons or vehicles, and maintain reasonable protection of person and property from aircraft propwash or jet blast.

Security fencing and access gates are generally used to comply with this section. The airport perimeter is fenced with a mix of chain link and wildlife fencing. Portions of the north apron area are equipped with chain link fencing. There is no fencing on the south apron area. Future facility planning should include new perimeter security fencing and automated access gates to control airfield access points and comply with the ground vehicle, protection of navaids, and public protection sections of Part 139.

Secure perimeter fencing generally includes eight-foot chain link fencing with three-strand barbed-wire on the top. Taller chain link fencing may be needed at Show Low Regional Airport for wildlife protection. To prevent wildlife from burrowing under the fence, the fencing is generally stacked to the ground. Current capital improvement programming includes

replacing existing perimeter fencing with chain link fencing.

Wildlife Hazard Management

The certificated airport shall provide an ecological study to the FAA Administrator when any incident or accident occurs on or near the airport involving birds or other wildlife. This study will examine the event, the species and numbers involved, location of incident/accident, and a description of the wildlife hazard to air carrier operations. If a wildlife hazard management plan is determined to be necessary, according to the FAA Administrator, a plan shall be submitted to the FAA Administrator for approval prior to implementation. This plan will designate those personnel responsible for its implementation and the action to be taken. If any incidents or accidents occur involving birds or other wildlife at Show Low Regional Airport, the airport could be required to implement a wildlife hazard management plan.

Airport Condition Reporting

The holder of a Part 139 certificate is responsible for the collection and reporting of the airport's condition to those air carriers serving the airport. The airport shall use the Notice to Airmen (NOTAM) system to report any deficiencies in airport conditions which may affect the safe operations of air carrier activity at the airport. In addition, any construction activity at, or around, Show Low Regional Airport should also be reported through the NOTAM system.

Identifying, Marking, and Reporting Construction

Any construction areas on or near any movement areas shall be properly marked or lighted to prevent any unsafe operations around these areas. These areas should be inspected as part of the daily self-inspection process and at the end of each day's construction activities. All construction activities should be noted in the daily inspection and a NOTAM issued to inform users of the airport of the current conditions.

Noncomplying Conditions

If the airport cannot maintain compliance with F.A.R. Part 139 requirements, the air carrier operations should be limited to those portions of the airfield not affected by the noncompliance. If the noncompliance involves a reduction in the ARFF Index, the airport shall limit air carrier operations to those meeting the new, lower, ARFF Index.

AVIATION FUEL STORAGE

The City of Show Low maintains fuel storage facilities at the airport. Fuel storage totals 10,000 gallons each for 100LL and Jet A fuel. Avgas fuel use at the airport averaged 10 gallons per general aviation operation over the past year. Jet A fuel sales averaged 64 gallons per general aviation operation.

These ratios were utilized as the baseline to project future Avgas and Jet A use.

Exhibit 3E presents future Avgas and Jet A storage requirements for the airport based upon these fuel use projections. Fuel storage requirements are based upon maintaining a two-week supply of fuel during an average month. Based upon these assumptions, it is anticipated that additional Jet A fuel storage will be needed through the planning period. Avgas storage is anticipated to be adequate through the planning period. Facility planning should include a 20,000-gallon Jet-A tank and 12,000-gallon 100LL tank.

Future facility planning should consider establishing a self-service fuel island. This island should be placed near the majority of based aircraft for ease of access and use. The existing underground storage tanks should be replaced with aboveground storage tanks.

AIRCRAFT WASH FACILITY

Presently, there are no designated aircraft wash facilities on the airport. Consideration should be given to establishing an aircraft wash facility at the airport to collect aircraft cleaning fluids used during the cleaning process.

Other airports have combined an aircraft owner maintenance facility with the wash facility. This typically has involved covering the wash rack area. These areas provide for the collection of used aircraft oil and other hazardous materials and provide a covered area for aircraft washing and light maintenance. The development of a similar facility at Show Low Regional Airport could reduce environmental exposure and provide an additional revenue source which could be used to amortize development costs.

UTILITIES

Electrical, water, and sanitary sewer services are available at the airport. No information collected during the inventory effort revealed any deficiencies in providing electrical, water, or sanitary sewer services at the airport. Therefore, it is assumed that all future infrastructure needs for these services will be sufficiently met. The airport is outside the boundaries of natural gas service. Hangar owners in the south apron area have indicated a desire to have natural gas service.

A utility inventory plan was conducted under a separate contract in 2003. This study located the existing utility systems at the airport, but did not determine capacity. Therefore, specific utility needs are not known. Having new facilities will likely require new utility extensions to primary service lines and should be included in future design estimates.

SUMMARY

The intent of this chapter has been to outline the facilities required to meet potential aviation demands projected for Show Low Regional Airport through the long term planning horizon. The next step is to develop a direction for development to best meet these projected needs. The remainder of the Master Plan will be devoted to outlining this direction, its schedule, and costs.

Chapter Four
AIRPORT DEVELOPMENT ALTERNATIVES

Chapter Four

SHOW LOW Regional Airport

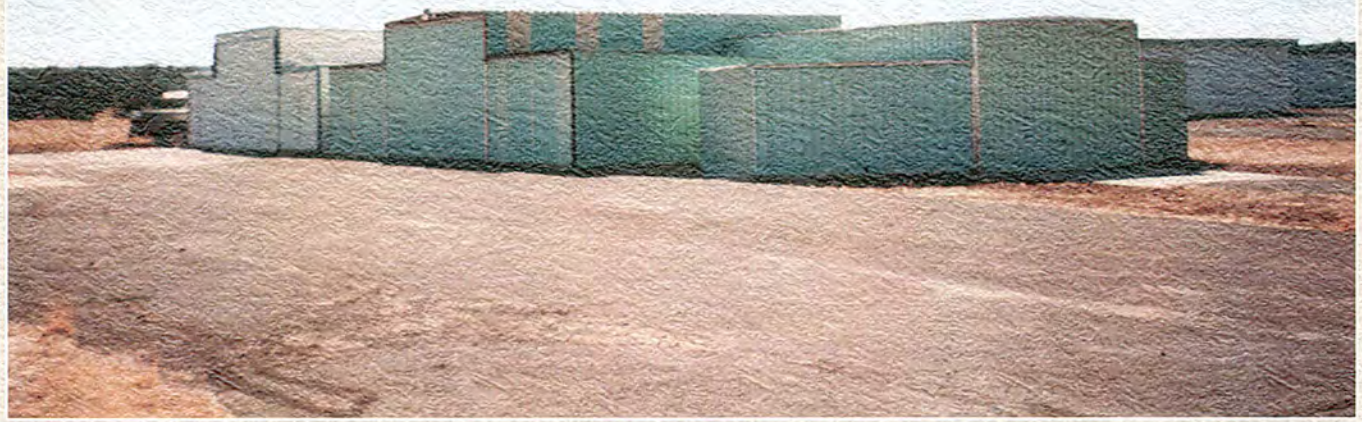
AIRPORT DEVELOPMENT ALTERNATIVES

Prior to defining the development program for Show Low Regional Airport (SOW), it is important to consider development potential and constraints at the airport. The purpose of this chapter is to consider the actual physical facilities which are needed to accommodate projected demand and meet the program requirements as defined in Chapter Three, Aviation Facility Requirements.

In this chapter, a series of airport development scenarios are considered for the airport. In each of these scenarios, different physical facility layouts are presented for the purposes of evaluation. The ultimate goal is to develop the underlying rationale which supports the final master plan recommendations. Through this process, an evaluation of the highest and best uses of airport property is made while considering local goals, physical constraints, and appropriate federal airport design standards, where appropriate.

Any development proposed by a master plan evolves from an analysis of projected needs. Though the needs were determined by the best methodology available, it cannot be assumed that future events will not change these needs. The master planning process attempts to develop a viable concept for meeting the needs caused by projected demands through the planning period.

The alternatives presented in this chapter have been developed to meet the overall program objectives for the airport in a balanced manner.



Through coordination with the Planning Advisory Committee (PAC), the public, and the City of Show Low, the alternatives (or combination thereof) will be refined and modified as necessary to develop the recommended development program. Therefore, the alternatives presented in this chapter can be considered a beginning point in the development of the recommended Master Plan development program, and input will be necessary to define the resultant development program.

NON-DEVELOPMENT ALTERNATIVES

Non-development alternatives include the no action or "do nothing" alternative, transferring service to an existing airport, or developing an airport at a new location.

NO ACTION ALTERNATIVE

The no action or "do-nothing" alternative essentially considers keeping the airport in its present condition and not providing for any type of improvement to the existing facilities. The primary result of this alternative would be the inability of the airport to satisfy the projected aviation demands of the airport service area, and would not meet safety standards.

The City of Show Low is the economic center for a large geographical area – the White Mountains region. Show Low Regional Airport is an important component of the economic development of this area, as the airport is a transportation link to other regional and national economic centers. Not improving Show Low Regional Airport to meet its commercial and general aviation needs could limit economic growth for the region.

Show Low Regional Airport is a federally designated essential air service market. This allows the air carrier serving the airport to receive an operating subsidy from the federal government in return for guarantees for scheduled service. This is done to ensure the community maintains the important transportation link noted above. Not improving the safety of the airfield or operations (through Federal Aviation Regulation (F.A.R.) Part 139 certification) would not be consistent with this federal program or community economic goals.

The general aviation industry has experienced an extended period of adjustment over the last 20 years, but it is now seen as a growth industry once more. While overall, general aviation growth will be slow, the demand for higher performance aircraft is experiencing the strongest rate of growth. With heightened interest in security due to the recent terrorist attacks in the United States, corporate general aviation could expect demand for private executive aircraft to grow even more. Although some restrictions (e.g., Class B airspace) may work to counter-balance this, these reasons, combined with Show Low Regional Airport's role as a strategically located airport, indicate a need to be capable to respond to anticipated demands for improved facilities.

One of the key considerations of this Master Plan is improving the extended runway safety areas. A no action approach would ignore this safety concern and is unacceptable to the Arizona Department of Transportation (ADOT) and the Federal Aviation Administration (FAA).

SERVICE FROM ANOTHER EXISTING AIRPORT

Service from another existing airport essentially considers relying on other airports to serve aviation demand for the local area. As detailed in Chapter One, there are only three public use airports within 30 nautical miles of Show Low Regional Airport: Taylor Airport, Cibecue Airport, and Whiteriver Airport. Cibecue Airport has only a gravel runway; Whiteriver Airport does not provide any services. While Taylor Airport has the same runway length as Show Low Regional Airport, Taylor Airport is not equipped with a passenger terminal building to serve commercial airline activity. Taylor Airport is also not considered an essential air service market. Considering the current capability of these airports, none of these airports is presently configured to provide the level of service provided at Show Low Regional Airport, without significant investments.

CONSTRUCTING A NEW AIRPORT

Another option would be constructing a new airport. From the social, political, and environmental standpoints, the commitment of a new large land area must also be considered.

Furthermore, the development of a new airport similar to Show Low Regional Airport would likely take 10 to 15 years to become a reality. The potential exists for significant environmental impacts associated with disturbing a large land area when developing a new airport site. To develop a new site with the capabilities of Show Low Regional Airport could easily cost over $50 million and would not provide the strategic location that the Show Low Regional Airport does today to the City of Show Low.

Overall, transferring service to an existing airport in the region or to an entirely new facility are unreasonable alternatives that should not be pursued further at this time. Show Low Regional Airport is a valuable asset to the economic dynamics of the regional area. It should be developed to the extent practicable to maintain and promote commerce in the area.

AIRPORT DEVELOPMENT OBJECTIVES

It is the overall objective of this effort to produce a balanced airside and landside complex to serve forecast aviation demands. However, before defining and evaluating specific alternatives, airport development objectives should be considered. As owner and operator, the City of Show Low provides the overall guidance for the operation and development of Show Low Regional Airport. It is of primary concern that the airport is marketed,

developed, and operated for the betterment of the community and its users. With this in mind, the following development objectives have been defined for this planning effort:

1. Develop a safe, attractive, and efficient aviation facility in accordance with applicable federal, state, and local regulations.

2. Identify facilities to efficiently and securely accommodate commercial airline activity, including air cargo activities.

3. Identify facilities to efficiently serve general aviation users.

4. Identify the necessary improvements that will provide sufficient airside and landside capacity to accommodate the long term planning horizon level of demand of the area.

5. Target local economic development through the development of available property.

6. Maintain and operate the airport in compliance with applicable environmental regulations, standards, and guidelines.

The remainder of this chapter will describe various development alternatives for the airside and landside facilities. Within each of these components, specific facilities are required or desired. Although each component is treated separately, planning must integrate the individual requirements so that they complement one another.

ALTERNATIVE DEVELOPMENT CONSIDERATIONS

The issues to be considered in this alternatives analysis are summarized on **Exhibit 4A**. The issues are summarized by functional use categories, which include: airfield, passenger terminal, and landside uses. These issues are the result of the findings of the Aviation Demand Forecasts and Aviation Facility Requirements evaluations, and include input from the PAC and City of Show Low.

The primary goal for Show Low Regional Airport is to operate the airport as a first-class airport facility serving general aviation, commercial airline, and air cargo needs for the White Mountains region. This requires accommodating a wide range of aircraft, from small single-engine aircraft used for recreational purposes to business jets and potentially small regional jets for the commercial airlines. Presently, the airport does not fully meet all current FAA design standards applicable to the range of aircraft it serves.

Since the last Master Plan in 1991, the FAA has upgraded its airport design standards for airports. In particular, the FAA has become stringent in ensuring that airports do everything practical to meet the design standards for runway safety areas (RSA). As discussed in the previous chapter, Runway 6-24 does not meet the design standards for the extended runway safety area.

AIRFIELD ISSUES

- Runway 6 and Runway 24 Runway Safety Area Conformance
- Closure of Runway 3-21
- Development and Role of Runway 18-36
- Improved Instrument Approaches
- Forest Service Aircraft Requirements
- Provide Location for Development of AWOS

TERMINAL BUILDING

- Secure Screening
- Expanded Ticketing / Airline Operations
- Potential for Explosive Detection Devices
- Expanded Bag Claim

LANDSIDE ISSUES

- Provide Areas for New Hangar Development
- Provide Areas for Commercial General Aviation Development
- Aircraft Wash Rack
- Consolidated and Expanded Fuel Storage
- Secure Vehicular Access
- Helipad with Two Parking Positions

SHOW LOW Regional Airport

Exhibit 4A
ALTERNATIVE DEVELOPMENT ISSUES

Planning consideration must also be given to the development of the crosswind runway. The previous Master Plan recommended the development of a new north-south runway to replace Runway 3-21. The analysis in Chapter Three concluded that, based upon the most current 10 years of wind data, a north-south aligned runway provides the best wind coverage at the airport and would increase airfield safety by allowing for more aircraft to land directly into the prevailing winds, instead of landings with direct crosswinds.

While a new north-south runway is most beneficial for smaller aircraft which are most affected by strong crosswinds, this runway should be expected to serve many of the larger aircraft that use the airport. Most pilots prefer to land into the prevailing winds regardless of the ability of their aircraft to handle the crosswind. Therefore, this runway should have a pavement strength rating of 30,000 pounds single wheel loading (SWL) and 60,000 pounds dual wheel loading (DWL). This will allow it to efficiently serve commercial airline turboprop aircraft and most business jets in the national fleet.

Improved instrument approach capability is also a need for Show Low Regional Airport. The capabilities of the existing NDB or GPS-A circling approach at the airport are limited. This approach only provides for landings when cloud ceilings are higher than 1,300 feet above the ground and visibility is greater than one and one-quarter miles for aircraft with approach speeds less than 90 knots. For aircraft with approach speeds between 91 and 120 knots, visibility must be greater than one and one-half miles. For aircraft with approach speeds between 121 and 140 knots, the visibility must be at three miles, which is equal to visual flight minimums. Aircraft with higher approach speeds are not authorized to complete this approach.

The FAA has initiated the development of straight-in GPS approaches to Runway 24. This approach is expected to provide for approach minimums with one-mile visibility and 450-foot cloud ceiling minimums. This is a marked improvement over the existing NDB or GPS-A approach.

Achieving minimums lower than the planned GPS approach to Runway 24 will require specific improvements on the airport. This includes the installation of an approach lighting system, such as the medium intensity approach lighting system with runway alignment indicator lights (MALSR) and high intensity runway edge lighting (HIRL). A larger runway protection zone (RPZ) will also be required for the runway end equipped with a lower visibility and cloud ceiling approach.

The facility requirements analysis determined that an automated weather observation system (AWOS) is needed at Show Low Regional Airport to provide important weather details to pilots, especially transient and charter aircraft operators (charter companies cannot operate to the airport without current weather data). An AWOS includes various sensors for recording

cloud height, visibility, wind, temperature, dew point, and precipitation.

Airport staff are certified National Weather Service (NWS) weather observers and are able to provide weather information during hours that the Airport offices are open. However, after normal working hours, personnel must be called out to provide weather observations, and the time needed to respond to a call-out may not be sufficient to meet the needs of inbound aircraft.

On the landside, consideration must be given to providing for adequate hangar space for a wide variety of general aviation needs. This includes corporate aviation, fixed base operators (FBOs), and other hangars as well.

Another consideration will be support facilities. In particular, existing fuel storage is separated into two areas and is projected to need to be expanded over the planning period. Also, the location of the Jet-A tank requires the fuel delivery truck to cross an active taxiway. Consideration should be given to consolidating the fuel tanks in an area easily accessible to the fuel delivery vehicles. An aircraft wash rack is needed to provide an area for aircraft washing and the proper collection and disposal of aircraft cleaning fluids and the debris from the aircraft surface.

The Master Plan should also consider reserving sufficient area for the expansion of the passenger terminal building to meet long term needs, including the public parking areas. This includes consideration for future explosive detection systems for checked baggage, larger airline operating areas, an expanded bag claim, and aligning functional areas to reduce congestion in lobby areas.

A helipad and helicopter parking areas should also be considered. There is currently no designated helipad, and helicopters must use apron areas for fixed-wing aircraft. Fixed-wing aircraft and rotary aircraft should be segregated to the extent practical.

A final consideration is maximizing the ability of the airport to be self-sustaining. Alternatives should be considered that are not only cost-effective, but that can increase revenue potential for the airport. A strong revenue capability will help to ensure that the airport does not become a financial burden on the City and the taxpayers.

SAFETY REQUIREMENTS

Federal Aviation Regulation (F.A.R.) Part 139, "Certification and Operations: Land Airports Serving Certain Air Carriers," as amended, prescribes the rules governing certification and operation of land airports which serve any scheduled or unscheduled passenger operations of an air carrier that is conducted with an aircraft having a seating capacity of more than 30 passenger seats. Presently, Show Low Regional Airport does not hold a F.A.R. Part 139 certificate. It is not required by present regulatory requirements since the airport is served

by air carrier aircraft with less than 30 passenger seats.

In the future, it can be expected that Show Low Regional Airport may be required to obtain F.A.R. Part 139 certification. A Notice of Proposed Rulemaking issued by the FAA extends certification requirements to airports serving scheduled air carrier operations in aircraft with 10 to 30 seats. While it is difficult to ascertain when Show Low Regional Airport will be required to obtain F.A.R. Part 139 certification, it is important to consider F.A.R. Part 139 requirements in the master planning process. F.A.R. Part 139, Subpart D - Operations, is most applicable to the alternatives discussion and capital requirements. The following summarizes key sections of F.A.R. Part 139 which will need to be considered in the evaluation of the airfield and landside alternatives.

F.A.R. Part 139, Section 139.309, *Safety Areas*, requires that the airport maintain appropriate safety areas for each runway and taxiway which is available for air carrier use. This section requires that the safety area be cleared and graded of all potentially hazardous ruts, humps, depressions, or other surface variations in excess of three inches. The safety areas shall also be drained by grading or storm sewers to prevent water accumulation during storms and/or construction projects. All items located within the safety area would also be required to be mounted on frangible bases, with the frangible structure no higher than three inches above the ground.

F.A.R. Part 139, Section 139.331, *Obstructions*, requires that the airport fully comply with F.A.R. Part 77, *Objects Affecting Navigable Airspace*. These regulations set forth prescribed imaginary surfaces which protect aircraft operational areas from hazards. The airport would be required to remove any existing obstructions to these surfaces and prevent the establishment of new obstructions. Most important to this study is that landside facilities are placed at a sufficient lateral distance from the runway as not to penetrate the F.A.R. Part 77 transitional surface. Powerlines west of Runway 6 are an obstruction to this approach surface and need to be relocated. The Runway 6 threshold has been displaced in an effort to provide sufficient clearance over this obstacle.

AIRFIELD ALTERNATIVES

Airfield facilities are, by nature, the focal point of the airport complex. Because of their primary role and the fact that they physically dominate airport land use, airfield facility needs are often the most critical factor in the determination of viable airport development alternatives. In particular, the runway system requires the greatest commitment of land area and often imparts the greatest influence of the identification and development of other airport facilities. Furthermore, aircraft operations dictate the FAA design criteria that must be considered when looking at airfield improvements. These criteria, depending

upon the areas around the airport, can often have a significant impact on the viability of various alternatives designed to meet airfield needs.

The design of airfield facilities includes both the pavement areas to accommodate landing and ground operations of aircraft, as well as imaginary safety areas to protect aircraft operational areas and keep them free of obstructions that could affect the safe operation of aircraft at the airport. The imaginary safety areas include the runway safety area (RSA), object free area (OFA) and runway protection zone (RPZ).

The FAA defines the OFA as "a two-dimensional ground area surrounding runways, taxiways, and taxilanes, which is clear of objects except for objects whose location is fixed by function (i.e., airfield lighting)." The RSA is defined as "a defined surface surrounding the runway prepared or suitable for reducing the risk of damage to airplanes in the event of an undershoot, overshoot, or excursion from the runway." The RPZ is a trapezoidal area centered on the extended runway centerline to protect people and property on the ground. The RPZ is a two-dimensional area and has no associated approach surface. FAA standards require these areas to be under the control of the airport to ensure that these areas are kept clear of objects that could be hazardous to aircraft operations. **Table 4A** summarizes the FAA design standards applicable to Show Low Regional Airport. These design standards are used in the analysis to follow.

TABLE 4A
Runway Design Standards

Airport Reference Code Approach Visibility Minimums	B-II One Mile	D-III One-Half Mile
RUNWAY		
Width	75	100
Runway Safety Area (RSA)		
Width (centered on runway centerline)	150	500
Length Beyond Runway End	300	1,000
Object Free Area (OFA)		
Width	500	800
Length Beyond Runway End	300	1,000
Obstacle Free Zone (OFZ)		
Width (centerline on runway centerline)	400	400
Length Beyond Runway End	200	200
Runway Centerline to:		
Parallel Taxiway Centerline	240	400
RUNWAY PROTECTION ZONES (RPZ)		
Inner Width	500	1,000
Outer Width	700	1,750
Length	1,000	2,500

Source: FAA Airport Design Software Version 4.2D

RUNWAY 6-24 SAFETY AREAS

FAA Order 5300.1F, *Modification of Agency Airport Design, Construction, and Equipment Standards,* indicates in Paragraph 6.d. the following: ". . . Runway safety areas at both certificated and non-certificated airports that do not meet dimensional standards are subject to FAA Order 5200.8, *Runway Safety Area Program.* Modifications of Standards are ***not*** issued for nonstandard runway safety areas."

FAA Order 5200.8 establishes the procedures that the FAA will follow in implementing the Runway Safety Area Program. Paragraph 5 of this Order states: "The objective of the Runway Safety Area Program is that all RSAs at federally obligated airports . . . shall conform to the standards contained in AC 150/5300-13, *Airport Design*, to the extent practicable."

The Order goes on to indicate in Paragraph 8.b.: "The Regional Airports Division Manager shall review all data collected for each RSA in Paragraph 7, along with the supporting documentation prepared by the region/ADO for that RSA, and make one of the following determinations:

(1) The existing RSA meets the current standards contained in AC 150/5300-13.

(2) The existing RSA does not meet the current standards, but it is practicable to improve the RSA so that it will meet current standards.

(3) The existing RSA can be improved to enhance safety, but the RSA will still not meet current standards.

(4) The existing RSA does not meet current standards, and it is not practicable to improve the RSA."

Appendix 2 of FAA Order 5200.8 provides the direction for an RSA determination. This includes the alternatives that must be evaluated. Paragraph 3 of Appendix 2 states: "The first alternative that must be considered in every case is constructing the traditional graded runway safety area surrounding the runway. Then, the following alternatives shall be addressed in the supporting documentation . . . :

a. Relocation, shifting, or realignment of the runway.

b. Reduction in runway length where the existing runway length exceeds that which is required for the existing or projected design aircraft.

c. A combination of runway relocation, shifting, grading realignment, or reduction.

d. Declared distances.

e. Engineered Materials Arresting Systems (EMAS)."

Out of the list above, several basic options can be considered at Show Low Regional Airport. The first, and most straightforward alternative, is to fully meet the design standards by provid-

ing for the clearing and proper fill and grading of the safety area and object free area off the runway ends. This is certainly the most desirable as long as physical, environmental, and economic considerations can be accommodated.

The next option is to relocate, shift, or realign the runway. Realigning the runway could include a new orientation or developing the future Runway 18-36 to ARC D-III standards.

Shifting the runway ends involves moving the runway either east or west to achieve the required runway safety areas within the available graded and cleared area. This is accomplished by either relocating or displacing the threshold. Unless combined with an addition of pavement and/or safety area, relocated and displaced thresholds generally reduce the effective length of the runway. The portion of pavement behind a relocated threshold is not available for takeoff or landing. The portion of pavement behind a displaced threshold is not available for landing; however, it may be available for takeoff roll. Physical constraints to shifting the runway (and meeting the safety areas for that matter) include Highway 77 to the west and Long Lake to the east.

Declared distances are used by the FAA to define the effective runway length for landing and takeoff when a displaced threshold is implemented. Currently, the Runway 6 and 24 thresholds have been displaced to meet obstacle clearance standards and provide limited compliance with runway safety area standards. However, displacing the landing thresholds only ensures that the safety area is available for landing aircraft, and pilots have no advanced knowledge of the operational limitation at the airport. Declared distances ensure that pilots have sufficient information of the operating limitations at the airport for both takeoff and landing operations.

Declared distances are defined as the amount of runway that is declared available for certain takeoff and landing operations. The four types of declared distances, as defined in FAA Advisory Circular 150/530-13, *Airport Design,* are as follows:

Takeoff Run Available (TORA) - The runway length declared available and suitable for the ground run of an airplane taking off.

Takeoff Distance Available (TODA) - The TORA plus the length of any remaining runway and/or clearway beyond the far end of the TORA.

Accelerate-Stop Distance Available (ASDA) - The runway plus stopway length declared available for the acceleration and deceleration of an aircraft aborting a takeoff.

Landing Distance Available (LDA) - The runway length declared available and suitable for landing.

The most critical of the declared distances are ASDA and LDA. ASDA is equal to the balance field length calculated by pilots prior to takeoff. The ASDA, or balanced field length, considers the runway length required by an aircraft to accelerate to rotation

speed and then decelerate safely on the remaining runway available. This is the controlling takeoff distance and is used for evaluating if sufficient takeoff distance is provided. Landing distance considers the runway length necessary for an aircraft to touch down and decelerate to a safe speed prior to exiting the runway, while allowing for appropriate safety areas at each end of the runway to safely accommodate an aircraft that may undershoot or overshoot the runway.

Paragraph 4.f. of the Appendix further states: "At any time, when it is not practicable to obtain a safety area that meets the current standards, consideration should be given to enhancing the safety of the area beyond the runway end with the installation of EMAS. The Advisory Circular (AC) 150/5220-22, Change 1, *Engineered Materials Arresting Systems (EMAS) for Aircraft Overruns,* pertaining to the installation and use of EMAS, provides details on design to be considered in determining feasibility of this alternative."

Recognizing the difficulties associated with achieving a standard safety area at all airports, the FAA undertook research programs on the use of various materials for arresting systems. Engineered Materials Arresting Systems (EMAS) are comprised of high energy absorbing materials of selected strength which will reliably and predictably crush under the weight of an aircraft. According to the AC, EMAS is not to be considered a substitute for, or equivalent to, any length or width of safety area, and does not affect declared distance calculations. It is also not intended to meet the FAA definition of a stopway.

While additional runway length on Runway 6-24 would be desirable at Show Low Regional Airport, it is first important to improve the RSA at each runway end. The same physical constraints that limit the ability to meet RSA standards also affect the ability to increase runway length. Chapter Three noted that the existing runway length is sufficient for the mix of commercial airline aircraft expected to use the airport through the planning period; however, Chapter Three did note that business jets would be affected (particularly in the warm summer months). Primarily, these aircraft would have payload restrictions that may affect the amount of fuel they could depart with. A runway length of at least 7,800 feet is recommended by the FAA for planning purposes. This is not expected to be achievable on Runway 6-24 due to cost and physical constraints.

Alternative A
Grade and Fill RSA

The first option in meeting runway safety area requirements is to look at means by which the runway safety area could be extended to the east and west, off the ends of Runway 6-24. **Exhibit 4B** depicts the area that the full safety area and object free area would need to encompass off each end of the runway.

Behind the Runway 6 end, this requires crossing Highway 77. Alternative A on **Exhibit 4B** depicts the tunneling of Highway 77 and grading of the entire RSA.

Meeting RSA standards behind the Runway 24 end requires fill within Long Lake. As much as 400,000 cubic yards (c.y.) of fill is needed to achieve RSA standards. A special consideration is that Long Lake is considered part of a 100-year floodplain. These impacts would most likely necessitate an Environmental Evaluation and studies to determine the impacts the fill would have on the floodplain.

The grading and fill of each RSA as presented is projected to cost $17.7 million, excluding any land acquisition costs. This alternative increases the landing distance over the present condition at the airport that includes displaced landing thresholds.

As an alternative to tunneling Highway 77, Alternative A also depicts a proposed realignment of Highway 77. This realignment would extend along an existing roadway to the west, through the industrial park. The feasibility of the realigned roadway is dependent upon securing right-of-way and local and state planning for this road's ultimate role. The disruption to existing facilities on this roadway is also a consideration. A cost has not been determined due to the uncertainties of securing right-of-way and the costs associated with that.

This alternative also depicts the RPZ and lighting requirements to achieve a ½-mile visibility and 200-foot cloud ceiling minimum approach. As shown, a MALSR would be required. The MALSR extends approximately 2,400 feet into the approach area. To the west, the impact of this lighting system on residents must be considered. To the east, the MALSR would extend into the Long Lake bed. The Long Lake bed is more than 60 feet below the Runway 24 end. This would necessitate constructing the MALSR on structures which would add significantly to the approximately $450,000 cost for a typical installation.

The requirements to protect the RPZ are also shown. While fee simple acquisition of the RPZ is preferable, the RPZ can also be secured with avigation easements or effective land use controls. The RPZ behind the Runway 6 end would encompasses a series of structures, which depending on their use could be considered incompatible to RPZ clearing standards. RPZ standards prohibit the congregation of people or property on the ground within the RPZ.

Alternative B
Shift Runway 6-24 East

The cost of tunneling Highway 77 and uncertainty as to whether the highway can be relocated necessitates examining options of shifting Runway 6-24 to the east to meet RSA standards. Essentially, this considers relocating the Runway 6 threshold to the east to develop the entire RSA behind the Runway 6 end on existing airport property, using the existing graded and filled area surrounding the existing runway end. In this manner, the im-

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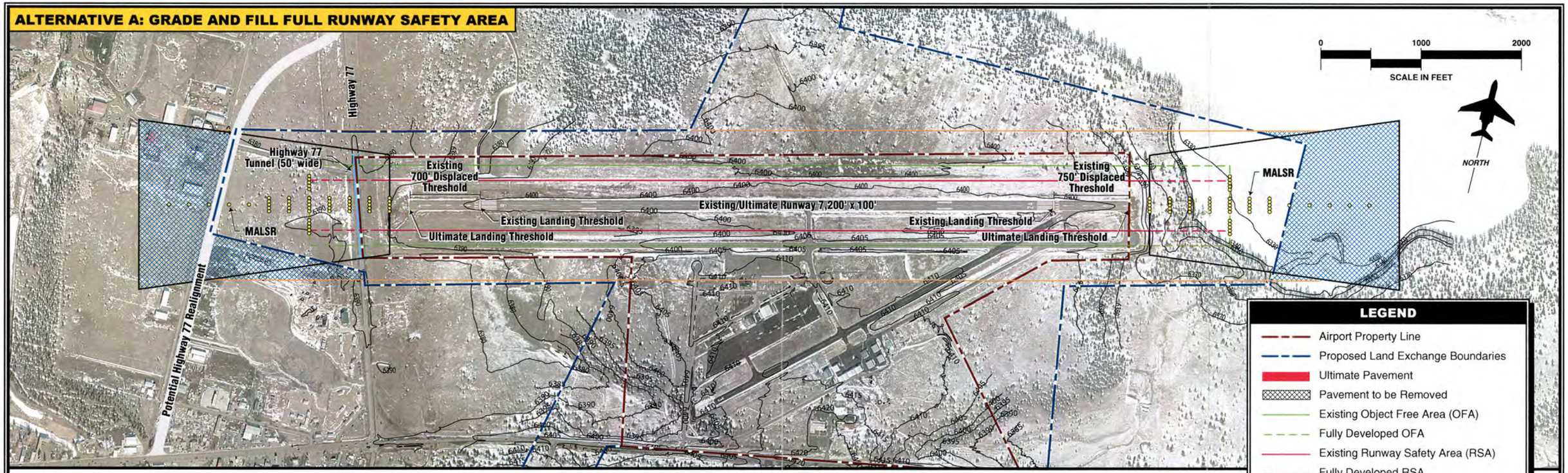
ALTERNATIVE A: GRADE AND FILL FULL RUNWAY SAFETY AREA

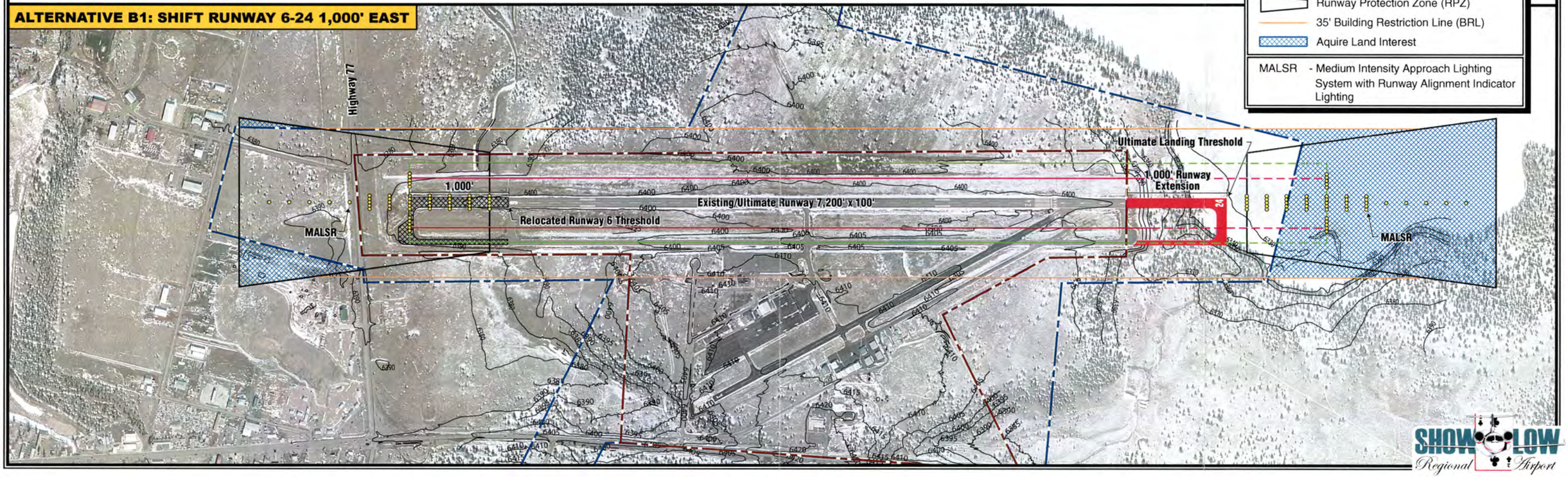


LEGEND

- Airport Property Line
- Proposed Land Exchange Boundaries
- Ultimate Pavement
- Pavement to be Removed
- Existing Object Free Area (OFA)
- Fully Developed OFA
- Existing Runway Safety Area (RSA)
- Fully Developed RSA
- Runway Protection Zone (RPZ)
- 35' Building Restriction Line (BRL)
- Aquire Land Interest

MALSR - Medium Intensity Approach Lighting System with Runway Alignment Indicator Lighting

ALTERNATIVE B1: SHIFT RUNWAY 6-24 1,000' EAST



SHOW LOW Regional Airport

Exhibit 4B
RUNWAY 6-24 SAFETY AREA ALTERNATIVES A AND B1

pacts on Highway 77 are entirely eliminated.

When relocating a runway end, the pavement behind the relocated threshold is abandoned and not available for use. In most cases, this pavement would be removed so as to ensure that it is not used inappropriately by pilots. Since there is no requirement for a paved safety area, the FAA would not fund the maintenance of pavement that is not used as runway. There is also no advantage to maintaining this as a paved stopway or overrun. The FAA does not recognize paved overruns or have any requirements for stopways. The use of stopways would have to be incorporated with an alternative that implements declared distances. The intent of these alternatives is not implementing declared distances. Furthermore, FAA standards require the full RSA to extend beyond the end of any stopway. Since this would require an additional 1,000 feet of safety area beyond the stopway, the intent of this alternative to bring the RSA on airport property would be lost.

Since stopways do not increase the departure length available to pilots, their practicality in application is questionable. The ability to implement is further diminished by the need to extend the safety area beyond the stopway.

Two alternatives of shifting Runway 6 to the east have been considered. These are discussed in further detail below. The alternatives are the same in concept; however, they are distinguished by the distance the Runway 6 threshold is displaced. This is done to consider the cost of the improvement.

- ALTERNATIVE B1

Alternative B1 considers shifting the Runway 6 threshold 1,000 feet east as shown on **Exhibit 4B**. This would relocate the Runway 6 end to Taxiway A2. Taxiway A west of Taxiway A2, Taxiway A1, and the pavement behind the relocated Runway 6 threshold would be abandoned and most likely removed. To ensure that there is not a reduction in runway length; the Runway 24 end is extended 1,000 feet east. This maintains the existing runway length. The RSA behind the extended Runway 24 end is graded and filled. This alternative is estimated to cost $9.5 million (excluding any land acquisition costs) and require more than 1.2 million c.y. of fill. This alternative increases the landing distance over the present condition at the airport that includes displaced landing thresholds.

Similar to Alternative A, this alternative also incorporates the requirements for improved instrument approach capability. In contrast with Alternative A, relocating the Runway 6 end to the east would move the MALSR and RPZ almost entirely on airport property. There would be no structures within the RPZ, although a small portion of the RPZ would extend beyond airport boundaries. However, behind the Runway 24 end, the MALSR would extend further into Long Lake, requiring a larger number of the lighting standards to be developed on large towers. Almost the en-

tire Runway 24 RPZ would extend beyond the airport property line.

- ALTERNATIVE B2

Alternative B2 is shown on the top half of **Exhibit 4C**. As stated, Alternative B2 is essentially the same as Alternative B1 except that the Runway 6 end is relocated only 650 feet east. This alternative is expected to cost $8.3 million (excluding any land acquisition costs) and require more than 1.1 million c.y. of fill. The location of the MALSR and RPZ requirements are also shown. This alternative increases the landing distance over the present condition at the airport that includes displaced landing thresholds.

Alternative C
Declared Distances

Alternative C proposes to leave the runway ends in their existing locations and implement a concept known as "declared distances" to comply with RSA and OFA design standards. Declared distances ensure that the full safety areas are provided during critical aircraft operational activities by notifying pilots of the length of runway available for landing or departure. The intent with declared distances is to limit either the takeoff or landing distance to ensure that the RSA is available during the takeoff or landing operation. No improvements are made to the RSA. The inevitable result of this alternative is that landing length and departure lengths are shortened. With Show Low Regional Airport needing up to 7,800 feet of runway length, it may not be desirable to reduce runway lengths, particularly departures which would be the result of this alternative. Alternative C is shown on the lower half of **Exhibit 4C**.

To ensure the full RSA behind the Runway 6 end, the Runway 6 landing threshold would need to be displaced 700 feet. To ensure the full RSA behind the Runway 24 end, the Runway 24 threshold would need to be displaced 1,000 feet. Unlike Alternative B, which relocated the runway ends, the pavement behind the displaced landing thresholds would be available for departures only.

The declared distances for Show Low Regional Airport, considering the displaced landing threshold discussed above, are shown on the table inset on **Exhibit 4C.** According to FAA standards, the TORA and TODA are equal to the actual pavement available. When determining the ASDA, FAA guidelines require that the full RSA and OFA safety areas be provided at the far end of the runway an aircraft is departing. For example, the ASDA for Runway 6 is reduced by 1,000 feet, the distance necessary to locate the RSA behind the Runway 24 end inside the airport property line. For Runway 24, the ASDA is reduced by 700 feet, the length necessary to locate the RSA inside the airport property line west of Runway 6.

The LDA must provide the full RSA at the approach end of the runway, as well as at the rollout end of the runway. The LDA for each runway is re-

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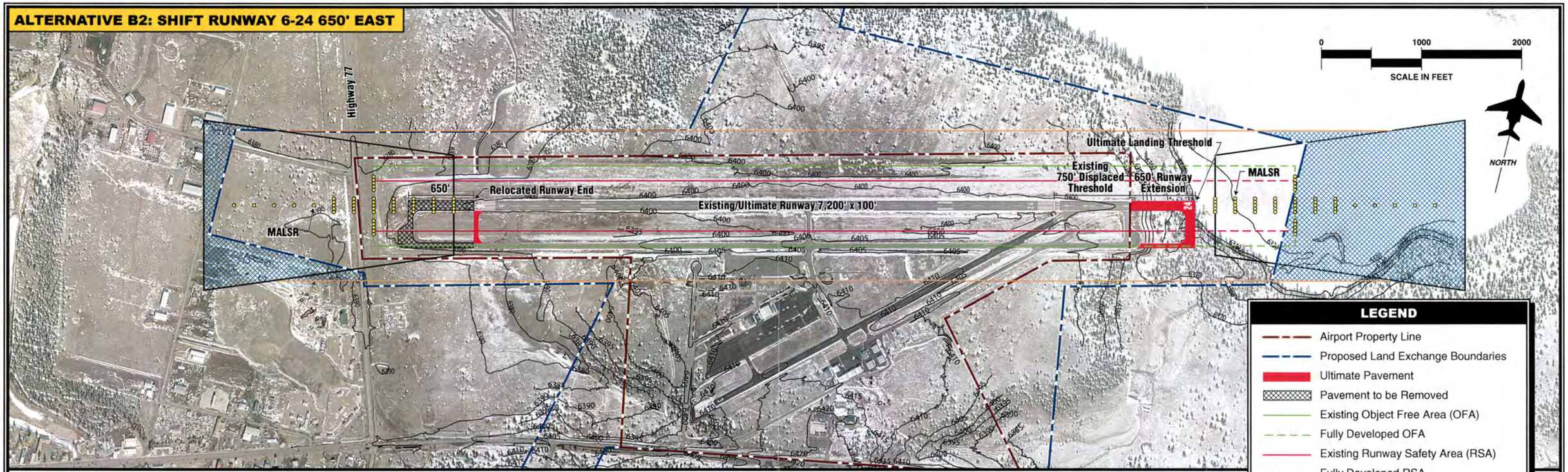
ALTERNATIVE B2: SHIFT RUNWAY 6-24 650' EAST

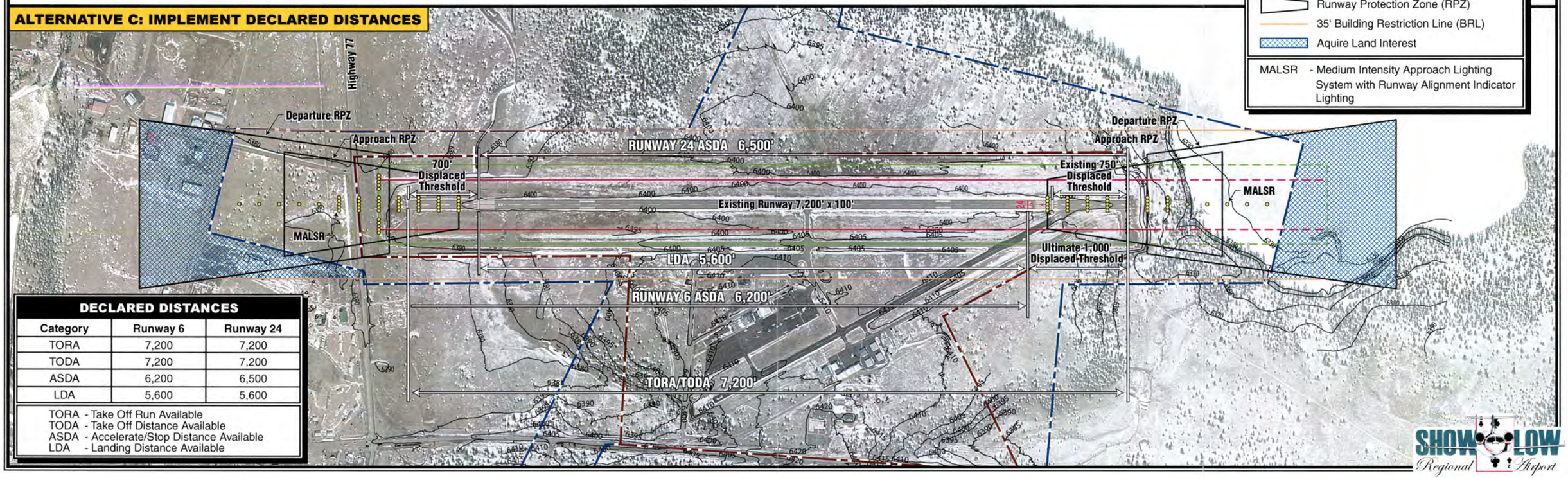


LEGEND

- Airport Property Line
- Proposed Land Exchange Boundaries
- Ultimate Pavement
- Pavement to be Removed
- Existing Object Free Area (OFA)
- Fully Developed OFA
- Existing Runway Safety Area (RSA)
- Fully Developed RSA
- Runway Protection Zone (RPZ)
- 35' Building Restriction Line (BRL)
- Aquire Land Interest

MALSR - Medium Intensity Approach Lighting System with Runway Alignment Indicator Lighting

ALTERNATIVE C: IMPLEMENT DECLARED DISTANCES



DECLARED DISTANCES

Category	Runway 6	Runway 24
TORA	7,200	7,200
TODA	7,200	7,200
ASDA	6,200	6,500
LDA	5,600	5,600

TORA - Take Off Run Available
TODA - Take Off Distance Available
ASDA - Accelerate/Stop Distance Available
LDA - Landing Distance Available

SHOW LOW Regional Airport

Exhibit 4C
RUNWAY 6-24 SAFETY AREA ALTERNATIVES B2 AND C

duced by 1,700 feet, or equal to the combination of the length of each displaced landing threshold.

The use of declared distances requires specific approval from the FAA Western-Pacific Region. While FAA AC 150/5300-13, *Airport Design*, specifies the use of declared distances for complying with RSA design standard deficiencies, the FAA has limited the implementation of declared distances at airports in this region. In most cases, the FAA has approved declared distances only at those airports that are constrained in meeting these standards at each runway end and there are no practicable methods of achieving the standard.

Alternative D
Realign Runway

Different runway alignments have been considered as a means to meet RSA standards. Essentially, this considers developing a new primary runway at the airport to replace Runway 6-24. Runway 6-24 would become a secondary runway and lesser design standards applied to the runway so that it would be in compliance with FAA design standards, or the runway would be closed.

The existing airport site is constrained by several physical factors. Along the north and east boundaries of the airport site is Long Lake and a series of drainage areas which are included in the 100-year floodplain. The terrain to the north and east declines significantly. To the east, the terrain drops by as much as 60 feet. To the north, the terrain drops by as much as 60 feet. To the northwest, there is an area of wetlands. The western boundary of the airport is marked by Highway 77 and areas of existing commercial development. The southern boundary of the airport is bordered by U.S. Highway 60. Approximately one mile south of the airport is an area of planned residential development that would be within any approach path for a north-south oriented runway. These physical constraints have been avoided in the past to the extent possible with the existing runway alignments. New runway alignments are impacted by each of these factors.

- ALTERNATIVE D1 – CONSTRUCT NEW NORTH-SOUTH ORIENTED RUNWAY

Alternative D1 considers the development of a north-south oriented runway (Runway 18-36) as the primary air carrier runway with a runway length of 7,800 feet. As shown on **Exhibit 4D,** this runway would extend across the Long Lake floodplain and across an area of rapidly rising and falling terrain. This runway greatly exceeds the design category planned for the north-south runway in the previous Master Plan from which the current Forest Service land transfer was based on. Therefore, additional land acquisition would be necessary to construct this runway. This will impact current land use plans which include commercial/industrial development northwest of Runway 6-24 along Highway 77.

While oriented into the prevailing winds, this runway would also be

aligned with existing and planned residential development to the south. This is a consideration if this runway would serve as the primary runway and receive the majority of aircraft arrivals and departures. Presently, the approach to Runway 24 is over primarily undeveloped land.

As with previous alternatives, this alternative considers the requirements for improved instrument approach capability. To the south, this might require land acquisition for the RPZ and MALSR. There would be existing incompatible development inside the RPZ boundaries.

This alternative can be expected to cost between $15 million and $20 million.

- ALTERNATIVE D2 – SKEW RUNWAY TO THE NORTHWEST

Alternative D2 considers a northwest-southeast alignment of the primary runway. In this alternative, a new runway (Runway 11-29) is developed northeast of the passenger terminal building, near the Runway 24 end. This alignment was considered to minimize impacts on the floodplain to the north, Highway 77 to the west, and existing and future residential development to the south. Impacts within the city limits could be avoided by maintaining the aircraft traffic pattern to the north.

This runway has less wind coverage than Runway 6-24. For the 10.5 knot crosswind component, this runway provides 71.92 percent wind coverage. For a 13 knot crosswind component, the wind coverage is 81.18 percent. For a 16 knot crosswind component, the wind coverage is 91.48 percent. For a 20 knot crosswind component, the wind coverage is 96.99 percent. For all but the 20 knot crosswind component, wind coverage for this runway is less than the 95 percent recommended by the FAA. Due to this, a second runway would still be needed. If Runway 6-24 were maintained, the wind coverage would only be 81.42 percent for the 10.5 knot crosswind component,,89.86 percent for the 12 knot crosswind component, 95.48 percent for the 16 knot crosswind component, and 98.79 percent for the 20 knot crosswind component. This would still not meet FAA design requirements and a new north-south runway would still be required.

This alternative should not be given further consideration since the construction of a runway in this orientation (or an orientation other than north-south) is not cost effective nor would meet any FAA accepted or industry accepted practices.

Alternative E
Engineered Materials Arresting Systems (EMAS)

In compliance with FAA Order 5200.8, EMAS is a required alternative to be considered. As indicated earlier, EMAS is not meant to be considered a substitute for, or equivalent to, any length of runway safety area, and does not affect declared distance calculations.

01MP07-4D-3/24/03

ALTERNATIVE D1: CONSTRUCT NEW NORTH-SOUTH ORIENTED RUNWAY

ALTERNATIVE D2: SKEW RUNWAY TO THE NORTHWEST

0 1,500 3,000
SCALE IN FEET

NORTH

LEGEND

- Airport Property Line
- Proposed Land Exchange Boundaries
- Proposed Land Acquisition
- Ultimate Pavement
- Floodplain
- Object Free Area (OFA)
- Obstacle Free Zone (OFZ)
- Runway Safety Area (RSA)
- Runway Protection Zone (RPZ)
- Runway Visibility Zone (RVZ)
- 35' Building Restriction Line (BRL)

MALSR - Medium Intensity Approach Lighting System with Runway Alignment Indicator Lighting

MALSR
Highway 77
Wetlands
Long Lake
U.S. Highway 60
7,600' x 100'

SHOW LOW Regional Airport

Exhibit 4D
RUNWAY 6-24 SAFETY AREA ALTERNATIVE D

The EMAS system is designed to stop an overrunning aircraft by exerting predictable deceleration forces on its landing gear as the EMAS material crushes. It must be designed to minimize the potential for structural damage to aircraft, since such damage could result in injuries to passengers and/or affect the predictability of deceleration forces.

An EMAS is located beyond the end of the runway, centered on the extended runway centerline. It typically is designed to begin at some distance beyond the runway end to avoid damage due to jet blast and short landings. The minimum width of the EMAS shall be the width of the runway, plus any sloped area as necessary. The system should be designed to decelerate jet aircraft expected to use the runway at exit speeds of 70 knots or less, without imposing loads that exceed the aircraft's structural design limits.

For planning purposes, an EMAS to serve Show Low Regional Airport and its critical aircraft would need to begin a minimum of 100 feet beyond the runway end, and extend to 400 feet beyond the runway end. Where more safety area is available, it is recommended that the system be placed to the back end of the available safety area. There is currently not adequate space to install EMAS off either or both runway ends, without some amount of fill. To achieve the recommended length, the EMAS would be required to encompass some of the existing runway pavement. Moving the EMAS closer to the runway would require reducing runway length for takeoff.

EMAS is generally limited to the width of the runway because of its cost; therefore, its effectiveness is limited to aircraft running directly off the end of the runway. There is also a cost to replace any part of the system damaged during an overrun incident.

In effect, EMAS is limited to providing an additional safety enhancement directly off the end of the runway and not for meeting RSA requirements. Even with an EMAS, the airport would still not be in compliance with RSA standards. In the case of Show Low Regional Airport, that enhancement is even more limited due to the fact that most operations are by general aviation aircraft which are within a design standard that requires a safety area of only 600 feet or less of extended RSA. In addition, most aircraft operating at the airport have limited seating compared to that of commercial jet aircraft. Less expensive aircraft and significantly fewer persons on board general aviation aircraft reduces the value of adding EMAS into the available safety area. Finally, EMAS systems are not recommended at airports with snowfall due to maintenance and longevity concerns.

CROSSWIND RUNWAY

Exhibit 4E depicts the development of Runway 18-36 to replace Runway 3-21. As mentioned previously, this runway would be closely aligned with the prevailing winds and eliminate

crosswind components, particularly for small aircraft.

Similar to the previous Master Plan, this runway would be 5,600 feet long by 75 feet wide. A parallel taxiway would be located along the east side of the runway, closest to the existing terminal area, 240 feet from the runway centerline.

In contrast to the previous Master Plan, this runway is envisioned to accommodate aircraft greater than 12,500 pounds. In fact, as stated previously, this runway is recommended to have a pavement strength rating of 30,000 pounds SWL and 60,000 DWL. This runway is now also planned for nonprecision instrument approaches. The fact that this runway would serve larger aircraft increases the design requirements for the runway. In particular, the lateral distances between buildings and the runway centerline increases and the RPZ is increased in size. As shown on the exhibit, additional land area to the southwest, near Highway 60, northeast of Runway 6-24, and northeast of the runway would need to be secured to ensure there would be no obstructions to the runway.

Additional land acquisition south of U.S. Highway 60 is needed to protect the RPZ, as shown on **Exhibit 4E**. While the Runway 36 RPZ could be located entirely on airport property by shifting the runway to the north, this would increase development costs due to increases in fill requirements and impacts on the floodplain.

AUTOMATED WEATHER OBSERVING SYSTEM

The facility requirements analysis determined that an automated weather observation system (AWOS) is needed at Show Low Regional Airport to provide important weather details to pilots, especially transient and charter aircraft operators (charter companies cannot operate to the airport without current weather data). An AWOS includes various sensors for recording cloud height, visibility, wind, temperature, dew point, and precipitation.

FAA Order 6560.20A, *Siting Criteria for Automated Weather Observing Systems (AWOS),* was reviewed for general siting requirements. While each AWOS sensor has specific siting requirements, all AWOS sensors should be located together and outside the runway and taxiway object free areas. Generally, AWOS sensors are best placed between 1,000 and 3,000 feet from the primary runway threshold and between 500 and 1,000 feet from the runway centerline. The area within 500 feet of the AWOS wind indicator is recommended to be undeveloped so as not to impact the readings of this instrument.

Since an instrument approach procedure is currently planned for Runway 24, the AWOS is best placed near the Runway 24 end. The AWOS could be located on either the north or south side of the runway, as shown on **Exhibit 4E,** by the larger rectangular box conforming to the general siting criteria described above. AWOS Al-

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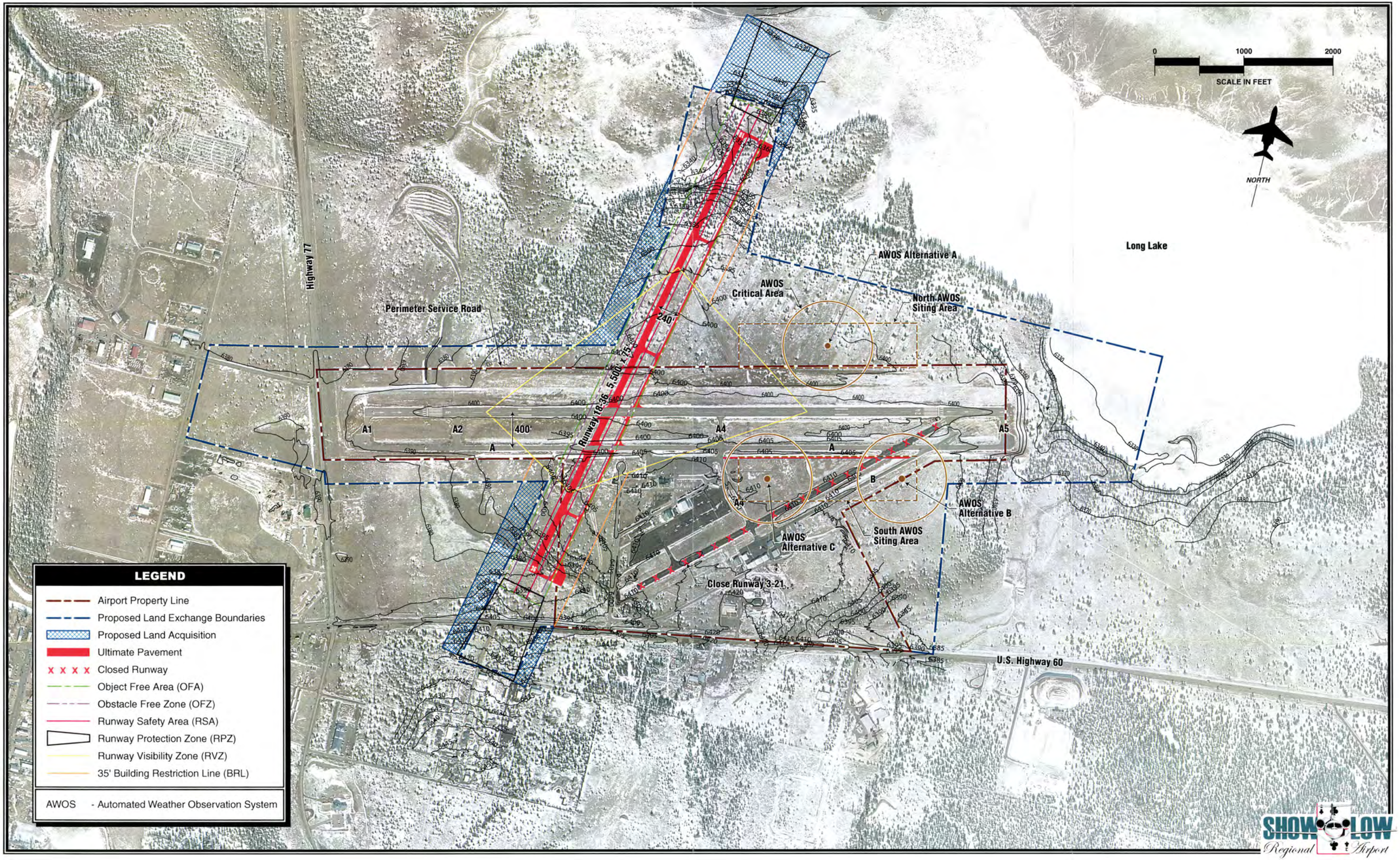

SHOW LOW Regional Airport

Exhibit 4E
CROSSWIND RUNWAY AND AWOS ALTERNATIVES

ternative A places the future AWOS north of Runway 6-24. This area is presently undeveloped and has little potential for future development as the ability to extend a public roadway to this area is limited. This site has limited electrical power, which may require that new electrical lines be extended to this area.

AWOS Alternatives B and C located the potential AWOS south of Runway 6-24 in a currently undeveloped area between Runway 6-24 and Runway 3-21. While currently undeveloped, this area has potential in the future for landside development when Runway 3-21 is closed. Placing the AWOS in this location would deter future landside development, limiting landside capacity.

PASSENGER TERMINAL BUILDING

The passenger terminal building at an airport is the primary interface between surface and air transportation. As such, its primary purpose is to provide for the safe, efficient, and comfortable transfer of passengers and their baggage to and from aircraft and to various methods of ground transportation. To accomplish this, a passenger terminal building must contain several essential components to include ticketing, passenger processing, and baggage handling. These functions are supported by concessions, rental cars, restrooms, and airline offices.

An airport passenger terminal is similar in many respects to other transportation terminals, but has some distinctly different characteristics. For example, the ground time of an aircraft is minimized; therefore, airport passenger terminals must be able to accommodate condensed peak passengers and baggage situations. In addition, airports place a greater reliance on the use of private automobiles for access to and from the airport, creating a need for adequate roadway and parking facilities.

A terminal building typically provides several separate and distinct functions. These include ticketing, airline office and baggage make-up, departure lounges, bag claim, and terminal services. Ticketing refers not only to airline ticket counters, but also to a ticket lobby for the queuing of passengers. Ticketing counters should be situated near the entrance, clearly visible, and readily accessible from the terminal curb. Airline office and baggage make-up refers to an area for airline personnel to complete administrative tasks, as well as collect outbound baggage. A separate baggage make-up location is important for baggage security, theft prevention, and sorting, and is usually situated directly behind the ticket counters.

The departure lounge or holdroom refers to an area where passengers wait to board an aircraft. Commonly, the departure lounge is secure, separated from other public areas within the terminal. All passengers and carry-on luggage are screened prior to entry. At airports served by large air carrier aircraft, the departure lounge is located on a second level to provide for jet bridge loading. Show Low Regional

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Airport uses ground level boarding. This is expected to continue as the airport is not expected to be served by large air carrier aircraft.

Baggage claim refers to the portion of the terminal used for the display of baggage to be claimed. The baggage claim lobby includes a bag claim counter and lobby for passengers awaiting baggage. Ideally, the bag claim lobby should be situated convenient to the arriving passenger flow and in proximity to the terminal curb.

Of particular importance with regard to functions of the terminal is the placement of these areas within the terminal building and the passenger flow between each area. Generally speaking, the ticketing functions should precede the departure lounge and bag claim functions, with the departure lounge ideally located between ticketing and bag claim functions. This provides for a smooth and separate flow of arriving and departing passengers. In addition, this provides for an orderly flow of traffic on the terminal curb where departing and arriving passengers are again segregated to the extent possible. At Show Low Regional Airport, the airline offices and the fixed bag claim shelf are located adjacent to each other and precede the departure holdroom. Therefore, the terminal does not fully meet this planning criterion, although it is not a major issue at this time due to relatively low passenger levels.

Overall, an efficient terminal layout will provide adequate circulation space. The amount of circulation space varies but, at a minimum, circulation space should be provided in the ticketing and bag claim areas to minimize the disruptions of passenger queues at the ticketing and bag claim counters.

A layout of the existing terminal building is reflected in **Exhibit 4F** (existing walls are shown in black). A single entrance along the south side of the terminal serves as the primary point of ingress and egress from the terminal curb. This entrance is generally aligned with common circulation space within the terminal and holdroom. A secondary entrance/exit is provided on the eastern side of the building, by the airport manager's office. While the airport has a designated holdroom, the holdroom is not secure as there is no carry-on baggage screening point. As shown on the exhibit, the design of the hold room includes a provision for carry-on baggage and passenger screening.

The facility needs evaluation identified long term needs for the passenger terminal building that include larger ticketing, baggage makeup, airline offices, baggage claim, and expanded public parking facilities. In the short term, there could be a need for a secure departure lounge and checked baggage screening.

The *Aviation and Transportation Security Act* was written in response to the terrorist acts of September 11, 2001. Major provisions of the law applicable to terminal planning include the federal government taking responsibility of carry-on baggage screening and new requirements for checked baggage screening. The law

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0 20 40

SCALE IN FEET

NORTH

Bag Claim Shell

Hold Room

Airline Offices

Baggage Make-Up

Airline Office

Hold Room

Baggage Make-Up

Ticketing Ticket Counter

Counter

Fixed Bag Shelf

Manager's Office

Closet

Admin./ Unicom

Future Terminal Expansion

Bag Claim

Baggage Screening Device

Conference Room/ Pilot Lounge

Pilot Briefing Room

Lobby

Men's Restroom

Car Rental

Office

Office

Office

Office

Office

Office

Entry/Exit

Entry/Exit

Mech. & Janitor

Vending

Women's Restroom

Mech.

Mech.

LEGEND

- New Construction
- Walls to be removed
- Arriving Passenger Flow
- Departing Passenger Flow

SHOW LOW Regional Airport

Exhibit 4F
LONG TERM TERMINAL
BUILDING CONFIGURATION

required security screeners to be employees of the federal government by the end of 2002, and the establishment of a security manager at each airport. The law further requires that all checked baggage be screened by explosive detection systems (EDS) by the end of 2002. Prior to the enactment of this law, the airlines were responsible for passenger and baggage screening. There has not been passenger or baggage screening at Show Low Regional Airport in the past.

Current checked baggage screening involves the use of EDS technology. EDS involves the use of computed tomography (CT) imaging technology. The FAA has certified two separate manufacturers' systems. To be effective, the EDS must be integrated with the baggage check-in and baggage make-up areas to efficiently direct checked baggage for screening. Presently, there is not an EDS system at the airport, nor is there is a baggage conveyor system at the airport. The current EDS imaging modules span as much as seven feet without conveyor systems and are as much as eight feet wide. An area for the operator work station and maintenance must also be considered.

Two options could be considered to implement one of the EDS systems at Show Low Regional Airport. First, this system could be placed in the lobby area near the ticket counters. This would provide the most cost-effective solution; however, this system would encompass a large portion of the existing lobby area, reducing the available space for passenger circulation and waiting. Preservation of circulation and meeting and greeting areas should be the focus of future terminal planning. Current FAA regulations prevent non-ticketed passengers from entering the secure departure area. This is intended to reduce congestion at the baggage screening area by letting only those ticketed passengers pass through security screening. This concentrates those meeting or dropping-off passengers in the general circulation area of the building.

A second option would be to place the EDS in the baggage make-up area located behind the ticket counters. There is currently limited area behind the ticket counters and it is not sizable enough to accommodate this equipment.

Electronic trace detection systems are also used in place of EDS modules at some airports. This could be an alternative to the full EDS system. Trace detection devices test for explosive residue on baggage and have been used at many locations where there is low traffic volumes or the EDS has not been installed. Final decisions with regard to EDS will need to be coordinated with the Transportation Security Administration (TSA). The rules, regulations, costs, and procedures for these new requirements will need to be continually monitored.

Exhibit 4F presents a long term terminal configuration to meet the needs discussed above. This configuration expands the airline offices, baggage makeup, and baggage claim areas. In this configuration, the baggage claim is moved to a new

addition to the west side of the terminal to meet baggage claim device display requirements and circulation space. The existing baggage claim area is converted for use as ticketing and airline offices. This area is expanded to the north to allow flexibility for the installation of the EDS within a future baggage conveyor system. The ticket counter is moved north to allow for an expanded ticketing lobby should the EDS or trace detection devices need to be placed in the lobby in the future.

A new exit point is added at the baggage claim area to segregate passenger flows. As shown on the exhibit by the orange and green arrows, by moving baggage claim to the west, departing passengers and arriving passengers' primary paths through the terminal do not cross. This meets the design requirements discussed above.

GENERAL AVIATION AND SUPPORT ALTERNATIVES

The primary planning considerations for this analysis is the development of additional general aviation storage hangars to accommodate forecast demand, identification of commercial general aviation parcels, the development of a helipad, the development of a consolidated fuel farm, and the development of a designated aircraft wash facility.

The facility requirements analysis indicated the need for additional aircraft storage facilities. This could include the development of T-hangar units and clearspan hangars. Consideration will be given to providing areas for corporate/executive hangar development as well.

As described previously, 100LL and Jet-A fuel storage is presently maintained in separate areas on the airport. Furthermore, access to the Jet-A tanks requires crossing an active taxiway. In the future, there may be a need for additional fuel storage. The alternatives consider the development of a consolidated fuel farm with access from a public roadway for the fuel delivery vehicles.

Consideration may be given to developing an aircraft wash facility to provide a suitable area for the washing of aircraft. This provides for the proper disposal of aircraft cleaning fluids.

A helipad and helicopter parking area should also be considered. There is currently no designated helipad and helicopters must use apron areas for fixed-wing aircraft. Fixed-wing aircraft and rotary aircraft should be segregated to the extent practical.

To a certain extent, landside uses should be grouped with similar uses or uses that are compatible. Other functions should be separated, or at least have well defined boundaries for reasons of safety, security, and efficient operation. Finally, each landside use must be planned in conjunction with the airfield, as well as ground access that is suitable to the function.

Runway frontage should be reserved for those uses with a high level of airfield interface, or need for exposure. Other uses with lower levels of air-

craft movements, or little need for runway exposure, can be placed in more isolated locations.

Typically, airports face development constraints of one degree or another because of their basic function, causing the alternatives analysis to focus upon specific layouts of landside facilities. Within this study, specific alternative layouts were developed for the passenger terminal building and terminal access and parking. However, only a portion of the available land area at Show Low Regional Airport is presently developed.

Developable parcels are available along the north side of the center apron extending along the main entrance road. Additional aircraft storage hangar development is available along the south apron and Taxiway B. Furthermore, once Runway 3-21 is closed, development opportunities may exist along Taxiway A in the vacant area between Runway 3-21 and Taxiway A.

The interrelationship of the landside functions discussed above is important to defining a long term landside layout for the airport. Therefore, these requirements have been combined in a series of development alternatives. Alternatives have been developed to provide for the development of these facilities in the area currently occupied by Runway 3-21 once it is closed. This maximizes the use of existing apron and utility infrastructures at the airport prior to developing new areas. Furthermore, this area provides sufficient area to accommodate long term development needs for the airport.

Landside Alternative A

Landside Alternative A is shown on **Exhibit 4G**. In this alternative, Taxiway B is extended to the west to allow for the development of at least 10 individual storage hangar parcels along Corporate Way. To the east, at least 10, 10-unit T-hangars are developed perpendicular to Taxiway B. Five individual hangar parcels are developed along the westerly T-hangar taxilane, with vehicle access from Corporate Way. This development can take place prior to the closing of Runway 3-21.

Once Runway 3-21 is closed, development along the south side of the center apron can take place. This alternative reserves the southern portion of the central apron for future commercial general aviation facilities. The center apron is expanded to the south to allow for additional aircraft parking and circulation. Vehicle access to the hangar parcels would be developed off Corporate Way.

The aircraft wash rack is developed on the northwest side of the existing apron. This location allows for immediate development. The helipad is located south of Taxiway A, east of Taxiway A4. This area is completely segregated from fixed-wing operations, but is located in close proximity to the terminal and commercial general aviation facilities for ease of servicing. The consolidated fuel farm is located

south of Corporate Way. This location allows for public access for fuel delivery trucks, but is still located close enough to the airfield for access to the on-airport mobile fuel trucks.

The area west of Airport Road is reserved for commercial/industrial development. This is the only portion of the airport where this opportunity exists. The remainder of the property is deed-restricted to aviation-related development. An on-going study is examining the infrastructure requirements for development in this area and alternative parcel layouts.

Landside Alternative B

Landside Alternative B is shown on **Exhibit 4H**. Similar to Alternative A, Taxiway B is extended to the west to allow for the immediate development of individual storage hangar parcels along Corporate Way. In contrast with Alternative A, individual hangar development is also reserved for the north side of Taxiway B once Runway 3-21 is closed. Vehicle access to these parcels is via connection with Airport Road. This roadway would serve commercial general aviation hangar development along the south side of the center apron and a new apron and hangar development area along Taxiway A. This new apron area would be developed to provide a visible location along the primary runway. The apron area would extend from Taxiway A4 to Runway 3-21. Taxiway A4 would be closed for access to the south, as the public roadway would extend across the taxiway. The helipad is integrated into the new apron area. The development of this apron area would require the relocation of the existing Jet-A fuel storage tank, segmented circle, and wind tee. The implementation of this alternative would eliminate the possibility to implement either AWOS Alternative B or C.

T-hangar development is reserved for an area south of Taxiway B, east of the south apron. In contrast with Alterative A, this configuration allows for three, 10-unit T-hangars; four, six-unit T-hangars; and six individual hangar parcels. A special consideration with this alignment is the T-hangar doors would face north. North facing hangars are sometimes prone to ice development since they do not get high levels of sun exposure in the winter months.

The consolidated fuel farm is located west of Airport Road, while the wash rack is located on the north side of the central apron.

SUMMARY

The process utilized in assessing the airside and landside development alternatives involved a detailed analysis of short and long-term requirements, as well as future growth potential. Current airport design standards were considered at each stage of development.

Upon review of this report by the City of Show Low and the Planning Advisory Committee, a final Master Plan concept can be formed. The resultant plan will represent an airside facility that fulfills safety and design

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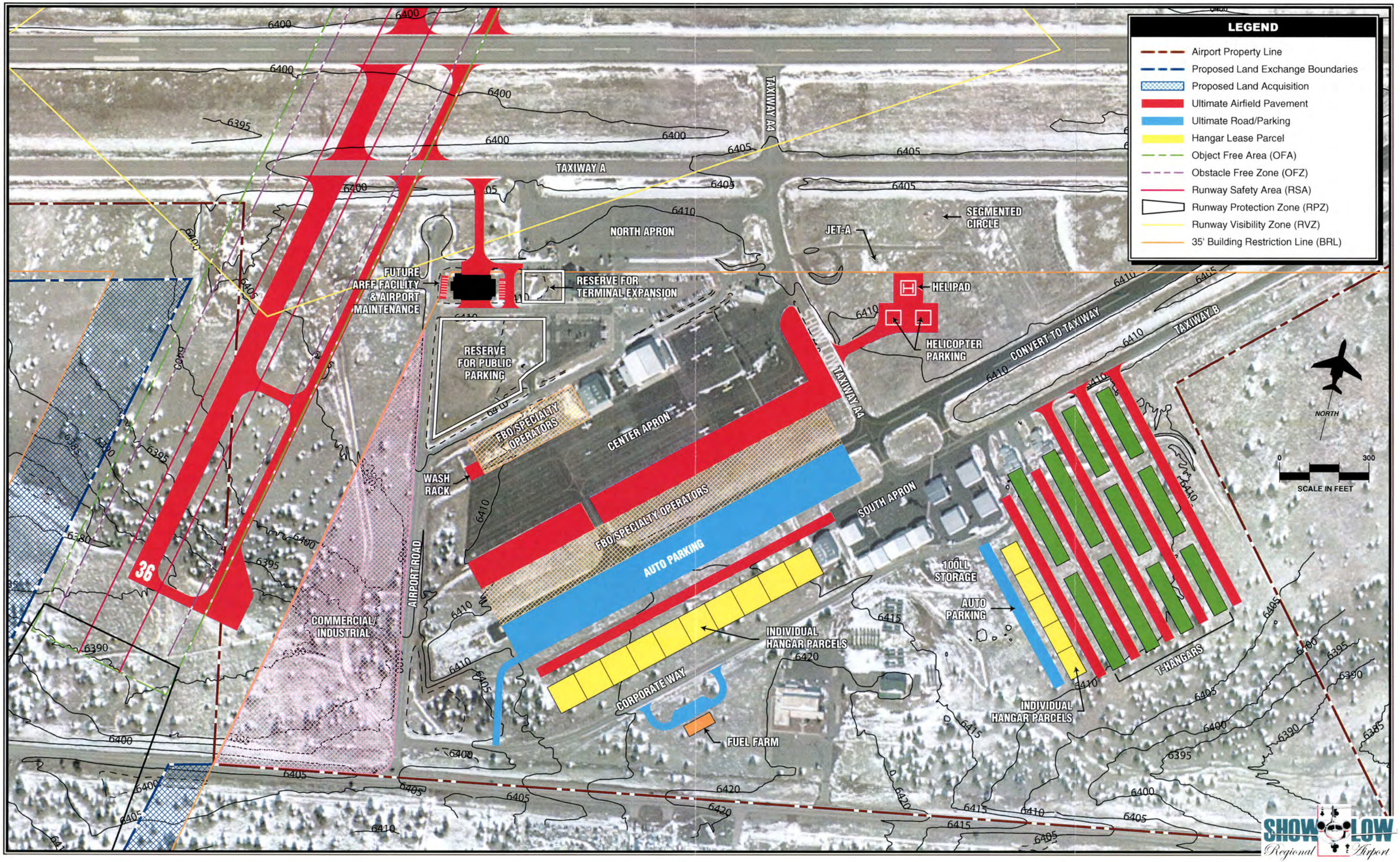

SHOW LOW Regional Airport

Exhibit 4G
LANDSIDE ALTERNATIVE A

01MP07-4H-3/24/03

LEGEND

- Airport Property Line
- Proposed Land Exchange Boundaries
- Proposed Land Acquisition
- Ultimate Airfield Pavement
- Ultimate Road/Parking
- Hangar Lease Parcel
- Object Free Area (OFA)
- Obstacle Free Zone (OFZ)
- Runway Safety Area (RSA)
- Runway Protection Zone (RPZ)
- Runway Visibility Zone (RVZ)
- 35 Building Restriction Line (BRL)

TAXIWAY A4
TAXIWAY A
NORTH APRON
SEGMENTED CIRCLE
HELIPAD
JET-A
FUTURE ARFF FACILITY & AIRPORT MAINTENANCE
RESERVE FOR TERMINAL EXPANSION
FBO/SPECIALITY OPERATORS
CONVERT TO TAXIWAY
TAXIWAY B
AUTO PARKING
RESERVE FOR PUBLIC PARKING
FUEL FARM
WASH RACK
CENTER APRON
SOUTH APRON
T-HANGARS
AIRPORT ROAD
COMMERCIAL/ INDUSTRIAL
CORPORATE WAY
36
0 300
SCALE IN FEET
NORTH

SHOW LOW Regional Airport

Exhibit 4H
LANDSIDE ALTERNATIVE B

standards and a landside complex that can be developed as demand dictates.

The proposed development plan for the airport must represent a means by which the airport can grow in a balanced manner, both on the airside as well as the landside, to accommodate forecast demand. In addition, it must provide (as all good development plans should) for flexibility in the plan to meet activity growth beyond the 20-year planning period.

The remaining chapters will be dedicated to refining the basic concept into a final plan with recommendations to ensure proper implementation and timing for a demand-based program.

SHOW LOW
Municipal Airport

Chapter Five
AIRPORT PLANS

Chapter Five

AIRPORT PLANS

The planning process for the Show Low Regional Airport Master Plan has included several analytic efforts in the previous chapters, intended to project potential aviation demand, establish airside and landside facility needs, and evaluate options for improving the airport to meet those airside and landside facility needs. The planning process, thus far, has included the presentation of two draft phase reports (representing the first four chapters of the master plan) to the Planning Advisory Committee (PAC) and City of Show Low. A plan for the use of Show Low Regional Airport has evolved considering their input. The purpose of this chapter is to describe in narrative and graphic form, the plan for the future use of Show Low Regional Airport.

The implementation of the *Aviation and Transportation Security Act of 2001* will need to be closely monitored throughout the implementation of this Master Plan. This law established the Transportation Security Administration (TSA) to administer transportation security nationally. As air carrier service expands at the airport, TSA presence at the airport may be required. Specifically, TSA personnel would be required if connecting air carrier service was provided for Show Low, to secure areas at the destination airport. TSA security includes checked baggage explosive detection screening and checkpoint baggage and passenger screening.

The TSA may also implement general aviation security regulations. As of the fall of 2003, there was no formal rulemaking for general aviation airport security. However, industry groups had made a series of recommendations to the TSA for general aviation threat assessment and security standards for general aviation airports. This Master

Plan has anticipated that greater security scrutiny will be placed on general aviation airports in the future, especially those general aviation airports serving aircraft greater than 12,500 pounds. The TSA has already implemented security provisions for air charter operations with aircraft over 12,500 pounds. For Show Low Regional Airport, the Master Plan security enhancements focus on limiting vehicle and pedestrian access to the apron areas and aircraft operational areas.

FAR Part 139, *Certification and Operations: Land Airports Serving Certain Air Carriers,* as amended, prescribes the rules governing the certification and operation of land airports which serve any scheduled or unscheduled passenger operations of an air carrier that is conducted with an aircraft having a seating capacity of more than 30 passengers. A notice of proposed rulemaking issued by the Federal Aviation Administration on June 21, 2000, extends certification requirements to airports serving scheduled air carrier operations in aircraft with 10-30 seats. While Show Low Regional Airport is not required by current regulation to maintain FAR Part 139 certification, under the new regulations which may be finalized in 2004, the airport would be required to maintain certification to continue commercial air service. Improvements included in this Master Plan are intended to meet the capital requirements of FAR Part 139 certification. Specifically, this includes improvements to the RSA and perimeter fencing.

AIRFIELD PLAN

The airfield plan for Show Low Regional Airport focuses on meeting Federal Aviation Administration (FAA) design and safety standards, constructing a new north-south oriented runway to replace Runway 3-21, lengthening Runway 6-24, establishing precision and nonprecision instrument approach procedures, installing airfield lighting aids, installing an automated weather observation system (AWOS), and strengthening Runway 6-24 and Taxiway A. **Exhibit 5A** graphically depicts the proposed airfield improvements. The following text summarizes the elements of the airfield plan.

AIRFIELD DESIGN STANDARDS

The FAA has established a variety of design criterion to define the physical dimensions of runways and taxiways, and the surrounding imaginary surfaces that protect the safe operation of aircraft at the airport. FAA design standards also define the separation criteria for the placement of landside facilities. As discussed previously in Chapter Three, FAA design criteria are a function of the critical design aircraft's (the most demanding aircraft or "family" of aircraft which will conduct 500 or more operations (take-offs and landings) per year at the airport) wingspan and approach speed, and in some cases, the runway approach visibility minimums. The Federal Aviation Administration (FAA) has

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SCALE IN FEET

NORTH

Long Lake

Highway 77

One-Mile Visibility Minimum Instrument Approach

REIL

PAPI-2

AWOS Critical Area

AWOS

240'

5,500' x 75'

Runway 18-36

Runway 6-24 (7,200' x 100' Existing) (8,600' x 100' Ultimate)

Relocated Runway End

650'

PAPI-4

400'

Precision Instrument Approach

MALSR

A1 A2 A3 A4 A5 A6 A7

Helicopter Hardstand

De-ice Pad

Reserve for Terminal Expansion

Relocated Segmented Circle

ARFF & Airport Maintenance

Terminal Public Parking & Relocated Long Term Parking

Jet-A Storage

100LL Fuel Storage

Wash Rack

Bridge

Convert to Taxiway

T-Hangars

Individual Hangar Parcels

Existing 750' Displaced Threshold

650' Shift

1,400' Runway Extension

Ultimate Landing Threshold

MALSR

PAPI-4

Precision Instrument Approach

U.S. Highway 60

One-Mile Visibility Minimum Instrument Approach

LEGEND

- Existing Airport Property Line
- Ultimate Airport Property Line
- Future U.S. Forest Service Special Use Permit
- Future Avigation Easement
- Building Height Limitations or Future Airport Property
- Ultimate Airfield Pavement
- Ultimate Roads/Auto Parking
- Pavement to be Removed
- Commercial/Industrial Parcel
- FBO/Specialty Operators
- Ultimate Taxiway Designation
- Object Free Area (OFA)
- Obstacle Free Zone (OFZ)
- Runway Safety Area (RSA)
- Runway Protection Zone (RPZ)
- Runway Visibility Zone (RVZ)
- 35' Building Restriction Line (BRL)

AWOS - Automated Weather Observation System
MALSR - Medium intensity Approach Lighting System with Runway alignment indicator lights
PAPI - Precision Approach Path Indicator
REIL - Runway End Identifier Lighting

SHOW LOW Regional Airport

Exhibit 5A
RECOMMENDED AIRFIELD CONCEPT

established the Airport Reference Code (ARC) to relate these factors to airfield design standards.

Show Low Regional Airport is currently used by a wide range of general aviation piston-powered and turbine-powered aircraft. These aircraft range from ARC A-I to ARC D-II, and D-III on occasion. General aviation business jets are the most demanding aircraft to operate at the airport due to their larger wingspans and higher approach speeds, when compared with the remaining types of aircraft operating at the airport.

For the Master Plan, business jets within approach categories C and D, and ADGs II and III are expected to comprise the critical design aircraft through the planning period. For planning purposes, aircraft through ARC D-III will be considered the critical design aircraft for Show Low Regional Airport. Assigning ARC D-III to the ultimate design of airfield facilities at Show Low Regional Airport provides for the operation of all corporate aircraft up to the Bombardier Global Express and Gulfstream V. The type of aircraft expected to be used in commercial air service is not expected to be larger than ARC B-II. This comprises 19-seat turboprop aircraft such as the Beechcraft 1900.

As the primary runway, Runway 6-24 and its associated taxiways will be designed to ARC D-III. ARC B-I design standards for aircraft less than 12,500 pounds will be applied to Runway 3-21 until it is removed from service and replaced with Runway 18-36. ARC B-II will be applied to the design of Runway 18-36.

Table 5A summarizes the ultimate ARC D-III and B-II airfield safety and facility dimensions for Show Low Regional Airport. ARC B-I (small aircraft) standards are shown. These standards were considered in the planned improvements of the existing airport site, to be discussed in greater detail later within this chapter.

AIRFIELD DEVELOPMENT

The airfield plan for Show Low Regional Airport provides for the airport to fully comply with ARC D-III design standards on Runway 6-24. A review of ARC D-III runway safety area (RSA) and object free area (OFA) standards for one-mile and one-half mile visibility minimum approaches indicate that these standards are not fully met at the airport. Meeting the full RSA and OFA criteria behind the Runway 6 end is limited by the perimeter fencing and Highway 77. The RSA and OFA behind the Runway 24 end are limited by existing airport property line and perimeter fencing. The terrain behind the Runway 24 end declines rapidly toward Long Lake.

To fully comply with ARC D-III, the airfield plan shifts Runway 6-24, 650 feet to the east. This will involve relocating the Runway 6 end and Taxiway A1 to the east, near the existing Runway 6 displaced threshold, to allow for the ARC D-III RSA and OFA to be fully developed on existing airport property behind the Runway 6 end. Since the existing paved area behind the relocated Runway 6 end will be designated for the RSA and OFA, the pavement behind the relocated Runway

6 end when the Runway 6 threshold is relocated to the east. The FAA does not require paved overruns or stopways, and does not require the RSA be paved. If these pavement areas would be designated as paved overruns or stopways, the FAA would require that the RSA and OFA extend beyond the end of the paved overrun or stopway. The airport could not meet RSA and OFA standards if the pavement behind the Runway 6 was designated as a paved overrun. The pavement is being removed to allow the development of the RSA to standard.

Shifting Runway 6-24, 650 feet east, places the RSA behind the Runway 24 end, in Long Lake. This project will require over 1.1 million cubic yards of fill. The implementation of this project will be dependent upon the results of an Environmental Assessment and successful permitting from the United States Army Corps of Engineers and State of Arizona.

The Runway 6-24, Taxiway A, and Runway 6-24 to Taxiway A connecting taxiway pavements are planned to be strengthened to 60,000 pounds single wheel loading (SWL) and 115,000 dual wheel loading (DWL). The existing pavement strength is estimated at 35,000 SWL and 60,000 DWL. This is insufficient to meet the needs of the larger corporate aircraft operating at the airport and large aerial firefighting aircraft. During the Rodeo-Chedeski wildfire of 2002, the heavy aerial firefighting aircraft were prohibited from using Show Low Regional Airport, which was located closest to the fire. The large aerial firefighting aircraft had to use more distant airports, which increased the time between fire retardant delivery due to extra time required between their base and the fire for reloading. The north apron will also be strengthened concurrently with these pavement improvements.

A 1,400-foot extension is planned for Runway 6-24. At 8,600 feet, Runway 6-24 would be able to better serve the business and corporate users of the airport by allowing for greater payloads in the warm summer months. This length could also aid large aerial firefighting aircraft takeoff lengths. These aircraft commonly depart near maximum takeoff weight.

The extension is planned to the east. Combined with the 650-foot shift to meet RSA and OFA standards, the Runway 24 threshold is planned to ultimately be 2,050 feet east of its present position. Similar to shifting Runway 6-24, 650 feet east, the implementation of the extension will be dependent upon the results of an Environmental Assessment and successful permitting from the United States Army Corps of Engineers and the State of Arizona.

This 1,400-foot extension and the shifting of Runway 6-24, 650 feet east, are planned as separate projects. The shifting of Runway 6-24 is planned to be implemented prior to the runway extension. The shifting of Runway 6-24 is given higher funding priority since it is a safety project. The actual need for the 1,400-foot extension will need to be better established as corporate use of the airport grows, to ensure future grant funding. A 110-acre U.S. Forest Service land transfer or special use permit will be required to accommodate the extension.

Two new connecting taxiways are planned between Runway 6-24 and Taxiway A. These are intended to increase airfield capacity and safety by reducing the amount of time that an aircraft occupies the runway after landing. Exhibit 5A also depicts the ultimate taxiway designations, assuming these new taxiways. Holding aprons are planned for all future runway ends. Holding aprons allow aircraft to prepare for departure off the active taxiway and allow aircraft ready for departure to bypass without waiting on the aircraft preparing for departure.

Runway 3-21 is planned to be closed and converted to a taxiway serving the south and center apron areas. Runway 3-21 will be replaced with Runway 18-36. Runway 18-36 is better oriented into the prevailing wind. Runway 18-36 is planned at 5,500 feet long and 75 feet wide. The pavement strength is planned to accommodate all but the heaviest corporate and firefighting aircraft expected to operate at the airport.

The development of this runway is in contrast to the previous Master Plan, which had planned for Runway 18-36 to be used by aircraft less than 12,500 pounds. Providing for larger aircraft use on this runway was a desire of the PAC, and supported by the wind analysis which shows that Runway 18-36 is oriented into the prevailing winds and may need to occasionally accommodate business and corporate aircraft during high wind conditions.

Planning for larger aircraft use increases the operational safety areas. The ultimate property boundary shown on Exhibit 5A was developed based on the previous Master Plan. To provide for larger aircraft use, additional transitional surface protection west of Runway 18-36 is needed. The airfield plan includes the acquisition of 16.9 acres of avigation easements to ensure development west of Runway 6-24 will not exceed FAR Part 77 height limitations. At the Runway 18 and 36 ends, additional U.S. Forest Service land transfers or special use permits will be needed to fully protect the runway protection zone (RPZ) and transitional surface. The Runway 36 end totals 5.2 acres. The Runway 18 end totals 22.5 acres.

A precision instrument approach with Category I (CAT I) minimums is planned for each end of Runway 6-24. At this present time, only the instrument landing system (ILS) provides Category I (one-half mile visibility and 200-foot cloud ceiling minimum) capabilities. While the FAA is implementing the wide area augmentation system (WAAS) to enhance the standard GPS signal for both vertical and lateral navigational approach capabilities, the current capabilities of the WAAS do not allow for CAT I approach minimums. Current lateral/vertical navigation (LNAV) approaches typically have a 400-foot cloud ceiling and 1.5 statute-mile visibility minimum. GPS approaches with CAT I standards are not envisioned until after 2015.

Planning for Cat I precision approaches to Runway 6 and Runway 24 requires a larger RPZ. As shown on Exhibit 5A, the RPZ would extend beyond the existing airport property boundary. The acquisition of a 21-acre avigation easement is planned at the Runway 6

end, to protect this RPZ from incompatible development. The Runway 24 RPZ is planned to be protected with a future U.S. Forest Service land transfer or special use permit.

One-mile visibility minimum LNAV approaches are planned for each end of Runway 18-36. Since CAT I approach capability is planned for Runway 6-24, lower approach minimums are not needed on Runway 18-36.

The airfield plan includes the installation of a medium intensity approach lighting system with runway alignment indicator lights (MALSR) at the Runway 6 and Runway 24 ends. The MALSR will be required to achieve CAT I standards. Runway end identifier lights (REILs) are planned for the Runway 18 and Runway 36 ends. REILs aid in the identification of the runway end at night and during low visibility conditions. A precision approach path indicator (PAPI) is planned for each runway end. A PAPI-4 is planned for each end of Runway 6-24, while a PAPI-2 is planned for each end of Runway 18-36. The PAPI-4 is designed for large aircraft use.

Nonprecision runway markings are planned for Runway 18-36; precision markings are planned for Runway 6-24. These are required for the planned instrument approaches. An automated weather observation system (AWOS) is planned to be installed north of Runway 6-24, in 2004. The AWOS will provide automated weather observations and reporting.

LANDSIDE PLAN

The landside plan for Show Low Regional Airport has been devised to safely, securely, and efficiently accommodate potential aviation demand. The landside plan provides for the expansion of the air carrier terminal building, development of new commercial general aviation facilities, aircraft storage facilities, an aircraft wash rack, expanded fuel storage, helipad, and deice pad. Landside improvements are shown in detail on **Exhibit 5B**.

With the exception of one hangar facility and the terminal building, most structural improvements are anticipated to be developed privately, as has been done historically in the past at Show Low Regional Airport. The capital improvement program identifies the infrastructure improvements needed at the airport to support development, and the federal and state funding assistance available to City of Show Low to make those improvements.

The landside plan depicts the development of an airport rescue and firefighting (ARFF) facility west of the terminal building. This building will also provide storage for the airport snow removal equipment. Two helicopter handstands are planned on the west side of the north apron. This will provide a segregated area for helicopter operations. A deice collection pad is also planned for the north apron. This pad will provide for collection of excess deice fluids from the deicing procedures for air carrier aircraft.

The north apron is planned to be expanded to the south and east to Taxiway A4, to allow for more transient parking near the terminal building. The southerly expansion will require relocating the existing long-term automobile parking area into the area encompassed by the Airport Drive terminal loop roadway.

A new 20,000 square yard apron is planned east of the north apron. This apron area is planned to accommodate large aircraft parking and circulation. Specifically, this apron area is planned to accommodate large aerial firefighting aircraft. The area south of the planned east apron would provide storage for the U.S. Forest Service fire retardant. Development of this apron will require the relocation of the segmented circle and lighted wind cone, east of its present position. The existing underground Jet-A storage tanks will be replaced with an aboveground tank on the south side of the east apron.

The center apron is planned to be extended to the south to allow for additional aircraft parking and circulation. Once Runway 3-21 is closed, a series of fixed base operator (FBO) parcels will be available for development on the south side of the center apron. Segregated public vehicle access would be developed from Corporate Way.

A series of FBO parcels is also designated on the north side of the center apron. The development of an aboveground 100LL fuel storage and dispensing facility is planned on the northeast corner of the center apron. This facility will provide self-service capabilities.

The existing connecting taxiway between the center apron and Taxiway A4 will be removed and replaced with two new connecting taxiways centered on the existing apron taxilanes. The existing connecting taxiway does not provide sufficient wingtip clearance for larger wingspan aircraft passing by the old terminal building. Finally, the center apron is planned to be strengthened to 30,000 SWL to allow corporate aircraft use and access to the FBO parcels.

Taxiway B is planned to be extended to the west, to allow for development of individual/corporate hangars along Corporate Way. The development of 10 separate T-hangar units is planned south of Taxiway B. Additional individual/corporate hangars are planned along the westernmost T-hangar taxilane.

An aircraft wash rack is planned on the south apron. The aircraft wash rack would provide an area for aircraft cleaning, and the proper collection of the aircraft cleaning solvents and contaminants removed from the aircraft hull during cleaning.

To reduce taxi times and distances from the center apron and south apron area to the Runway 18 end, direct taxiway access from the center apron is planned. This taxiway would be developed over Airport Drive via a bridge or tunnel.

The area west of Airport Drive to Runway 18-36 is planned for commercial/industrial uses. A specific layout of this area, including roadways, utilities, and parcels, is being conducted in a separate study. This is the only

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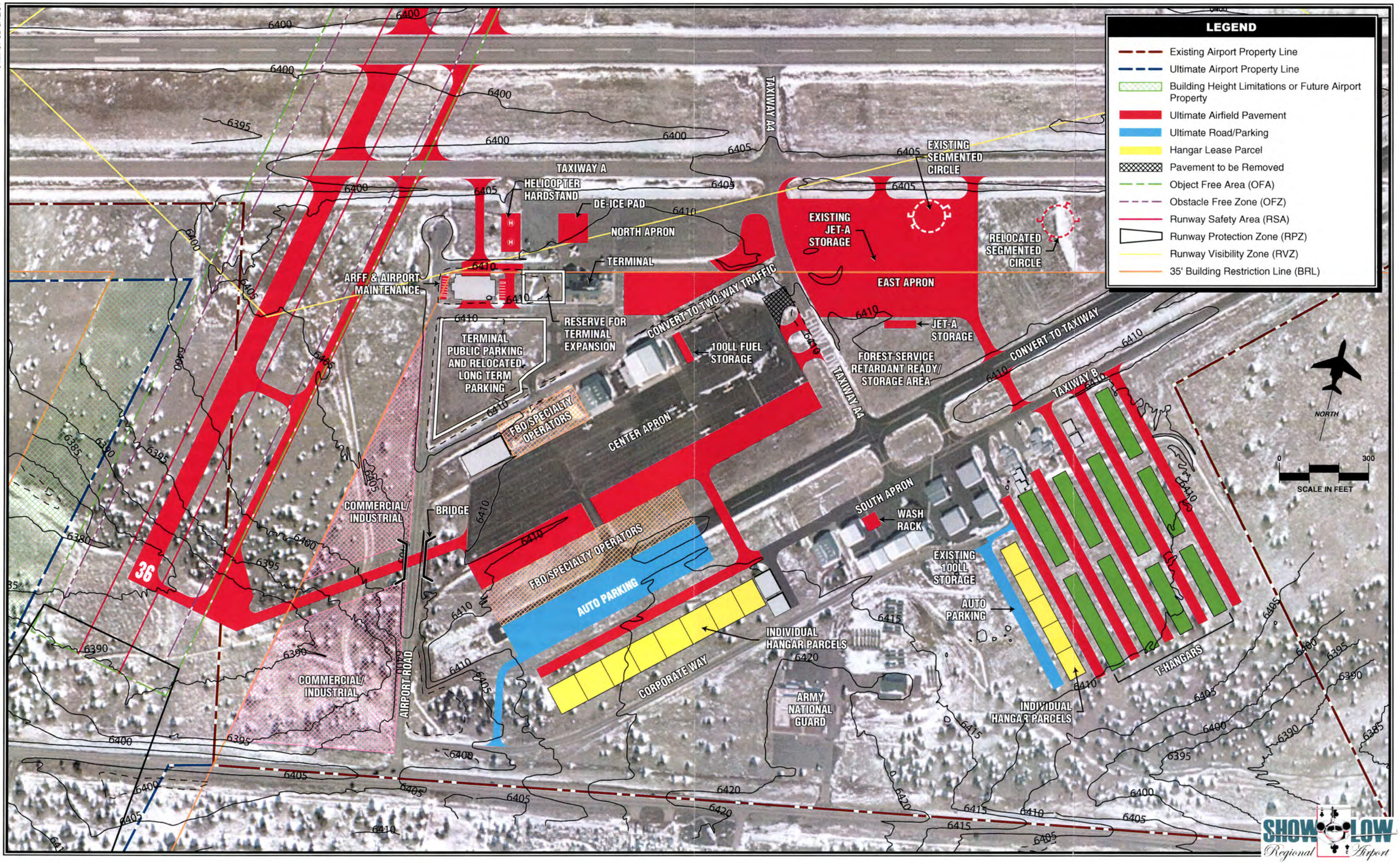

Exhibit 5B
RECOMMENDED LANDSIDE CONCEPT

area of the airport that is not deed-restricted to aviation uses.

TERMINAL BUILDING

Exhibit 5C depicts the recommended terminal building configuration. The plan for the use of the terminal building focuses on improving the segregation of the functional areas of the terminal, and expanding the terminal to meet larger passenger levels. As shown on the plan, the existing ticket counters, airline offices, and baggage make-up area would be expanded in their existing location. Baggage claim would be moved west of the secure holdroom. This allows for the segregation of the arriving and departing passenger flows. The holdroom is equipped with screening devices for passenger and carry-on baggage screening prior to flight. Besides providing for these functional areas, the terminal building configuration also provides for future terminal expansion, or alternative uses such as a restaurant west of the baggage claim area.

NOISE EXPOSURE ANALYSIS

Aircraft sound emissions are often the most noticeable environmental effect an airport will produce on the surrounding community. If the sound is sufficiently loud or frequent in occurrence, it may interfere with various activities or otherwise be considered objectionable.

To determine the noise related impacts that the proposed development could have on the environment surrounding Show Low Regional Airport, noise exposure patterns were analyzed for both existing airport activity conditions and projected long-term activity conditions.

The basic methodology employed to define aircraft noise levels involves the use of a mathematical model for aircraft noise predication. The Yearly Day-Night Average Sound Level (DNL) is used in this study to assess aircraft noise. DNL is the metric currently accepted by the FAA, Environmental Protection Agency (EPA), and Department of Housing and Urban Development (HUD) as an appropriate measure of cumulative noise exposure. These three federal agencies have each identified the 65 DNL noise contour as the threshold of incompatibility, meaning that noise levels below 65 DNL are considered compatible with underlying land uses. Most federally-funded airport noise studies use DNL as the primary metric for evaluating noise.

DNL is defined as the average A-weighted sound level as measured in decibels (dB), during a 24-hour period. A 10-dB penalty applies to noise events occurring at night (10:00 p.m. to 7:00 a.m.). DNL is a summation metric which allows objective analysis and can describe noise exposure comprehensively over a large area. The 65 DNL contour has been established as the threshold of incompatibility, meaning that noise levels below 65 DNL are considered compatible with underlying land uses.

Since noise decreases at a constant rate in all directions from a source, points of equal DNL noise levels are routinely indicated by means of a contour line. The various contour lines are then

superimposed on a map of the airport and its environs. It is important to recognize that a line drawn on a map does not imply that a particular noise condition exists on one side of the line and not on the other. DNL calculations do not precisely define noise impacts. Nevertheless, DNL contours can be used to: (1) highlight existing or potential incompatibilities between an airport and any surrounding development; (2) assess relative exposure levels; (3) assist in the preparation of airport environs land use plans; and (4) provide guidance in the development of land use control devices, such as zoning ordinances, subdivision regulations and building codes.

The noise contours for Show Low Regional Airport have been developed from the Integrated Noise Model (INM), Version 6.1. The INM was developed by the Transportation Systems Center of the U.S. Department of Transportation at Cambridge, Massachusetts, and has been specified by the FAA as one of the two models acceptable for federally-funded noise analysis.

The INM is a computer model which accounts for each aircraft along flight tracks during an average 24-hour period. These flight tracks are coupled with separate tables contained in the database of the INM, which relate to noise, distances, and engine thrust for each make and model of aircraft type selected.

Computer input files for the noise analysis assumed implementation of the proposed airfield plan. The input files contain operational data, runway utilization, aircraft flight tracks, and fleet mix as projected in the plan. The operational data and aircraft fleet mix are summarized in **Table 5B**. These estimates were derived after review of aircraft landing logs maintained by the City, and discussions with airport management.

The runway use percentages are summarized in **Table 5C**. This information was determined by reviewing wind data specific to Show Low Regional Airport.

TABLE 5B
Noise Model Input: Aircraft Operations

Operations By Type	Single Engine	Multi-Engine	Turboprop	Turbojet	Helicopter	Totals
Existing Conditions						
Local	1,303	230	0	0	0	1,533
Itinerant	5,103	2,759	5,517	277	138	13,794
Total	6,406	2,989	5,517	277	138	15,327
Long Term						
Local	3,069	542	0	0	0	3,611
Itinerant	14,619	6,498	10,397	650	325	32,489
Total	17,688	7,040	10,397	650	325	36,100

Source: Coffman Associates Analysis

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SCALE IN FEET

NORTH

Bag Claim Shelf
Hold Room
Airline Offices
Baggage Make-Up
Airline Office
Hold Room
Baggage Make-Up
Ticketing Ticket Counter
Counter
Fixed Bag Shelf
Manager's Office
Closet
Admin./ Unicom
Future Terminal Expansion
Bag Claim
Baggage Screening Device
Conference Room/ Pilot Lounge
Pilot Briefing Room
Lobby
Men's Restroom
Car Rental
Office
Office
Office
Office
Office
Mech. & Janitor
Vending
Entry/Exit
Entry/Exit
Women's Restroom
Mech.
Mech.

LEGEND

- New Construction
- Walls to be removed
- Arriving Passenger Flow
- Departing Passenger Flow

SHOW LOW Regional Airport

Exhibit 5C
RECOMMENDED TERMINAL
BUILDING CONFIGURATION

TABLE 5C
Noise Model Input: Runway Use Percentages

Aircraft	6	24	3	21
Existing				
Single Engine Piston	8.00%	25.00%	25.00%	42.00%
Multi-Engine Piston	8.00%	25.00%	25.00%	42.00%
Turboprop	30.00%	70.00%	0.00%	0.00%
Light Turbofan Business Aircraft	30.00%	70.00%	0.00%	0.00%
Ultimate				
Aircraft	**6**	**24**	**18**	**36**
Single Engine Piston	5.00%	8.00%	62.00%	25.00%
Multi-Engine Piston	5.00%	8.00%	62.00%	25.00%
Turboprop	5.00%	45.00%	25.00%	25.00%
Light Turbofan Business Aircraft	5.00%	45.00%	25.00%	25.00%
Heavy Turbofan Business Aircraft	30.00%	70.00%	0.00%	0.00%

Source: Coffman Associates analysis

The aircraft noise contours generated using the aforementioned data for Show Low Regional Airport are depicted on **Exhibit 5D**, Existing Noise Exposure and **Exhibit 5E**, Long Term Noise Exposure. For existing activity levels, the 65 DNL noise contour remains almost entirely within the existing airport property line. When considering forecast activity at the airport, a portion of the Long Term 65 DNL contour extends beyond the northern and southern airport boundary, due to the use of Runway 18-36. The portion to the north would extend over Long Lake. Since this land is not planned for development, there would not be incompatible development within the 65 DNL contour. To the south, the 65 DNL contour would extend into an industrial park, which is considered a compatible use.

ENVIRONMENTAL EVALUATION

The protection and preservation of the local environment are essential concerns in the master planning process. Now that a program for the use and development of Show Low Regional Airport has been finalized, it is necessary to review environmental issues to ensure that the program can be implemented in compliance with applicable environmental regulations, standards, and guidelines.

Once the airport begins receiving federal funding, improvements planned for Show Low Regional Airport, as depicted on the Airport Layout Plan (ALP), will require compliance with the *National Environmental Policy ACT (NEPA) of 1969,* as amended. Many of

the improvements will be categorically excluded and will not require further NEPA documentation; however, some improvements may require further analysis and NEPA documentation. As detailed in *FAA Order 5050.4A, Airport Environmental Handbook,* compliance with NEPA is generally satisfied with the preparation of an Environmental Assessment (EA). In cases where a categorical exclusion is issued, environmental issues such as wetlands, threatened or endangered species, and cultural resources are further evaluated during the federal, state, and/or local permitting processes.

This section is intended to supply a preliminary review of environmental issues that would need to be analyzed in more detail within the NEPA or the permitting process. Consequently, this analysis does not address mitigation or the resolution of environmental issues. The following pages consider the environmental resources as outlined in *FAA Order 5050.4A.*

ENVIRONMENTAL CONSEQUENCES - SPECIFIC IMPACTS

This environmental evaluation has been prepared using *FAA Order 1050.1D, Policies and Procedures for Considering Environmental Impacts,* and *FAA Order 5050.4A, Airport Environmental Handbook,* as guidelines. Several factors are considered in a formal environmental document, such as an EA or an EIS, which are not included in an environmental evaluation. These factors include details regarding the project location, alternatives analyses, existing conditions at the airport, and the purpose and need for the project. This information is available within the Master Plan document. A formal environmental document also includes the resolution of issues/impacts identified as significant during the environmental process.

Consequently, this environmental evaluation only identifies potential environmental issues and does *not* address mitigation or the resolution of environmental impacts. Each of the specific impacts categories outlined in FAA Order 5050.4A are addressed. **Table 5D** includes a discussion of each environmental category.

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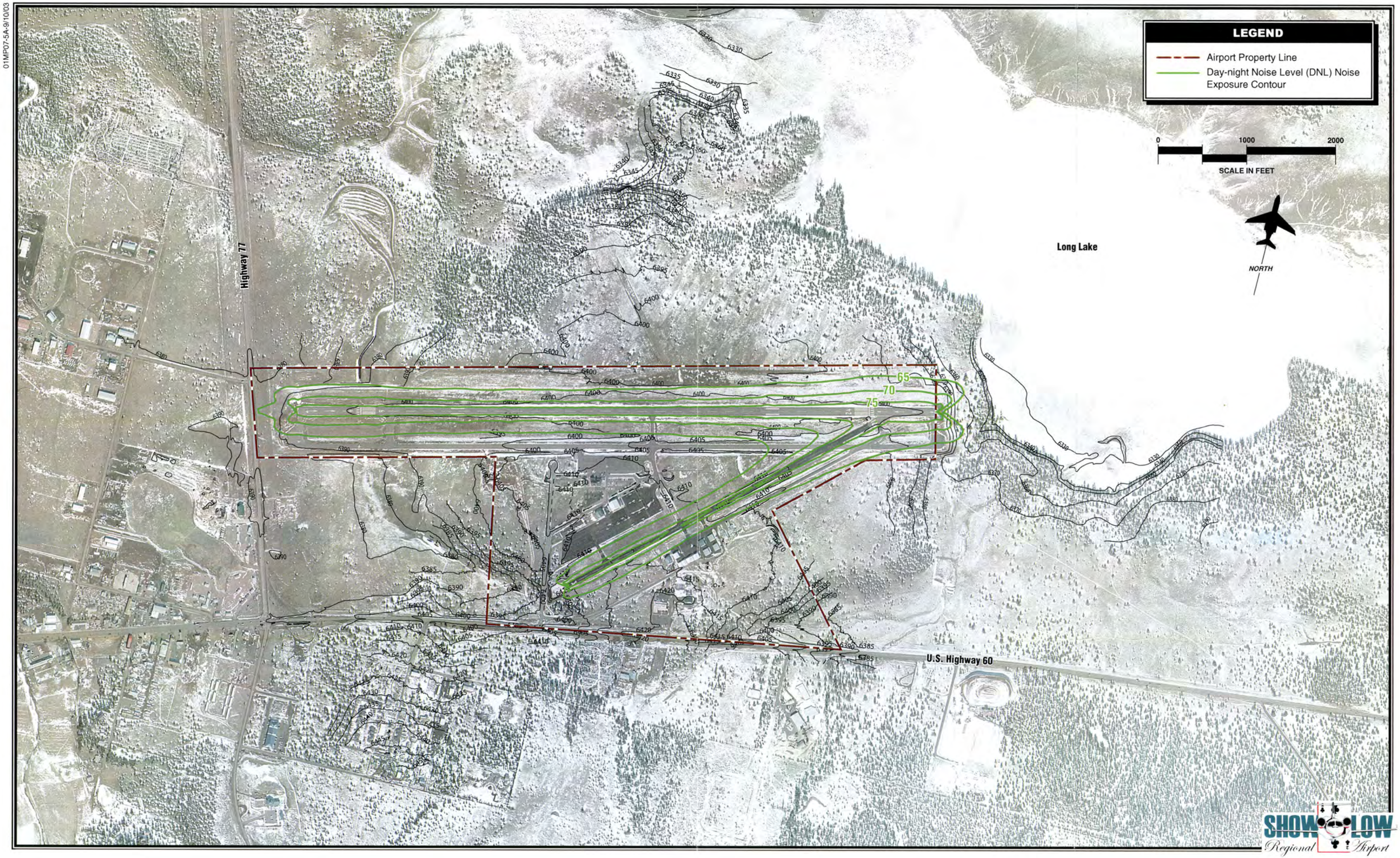

SHOW LOW Regional Airport

Exhibit 5D
EXISTING NOISE EXPOSURE CONTOURS

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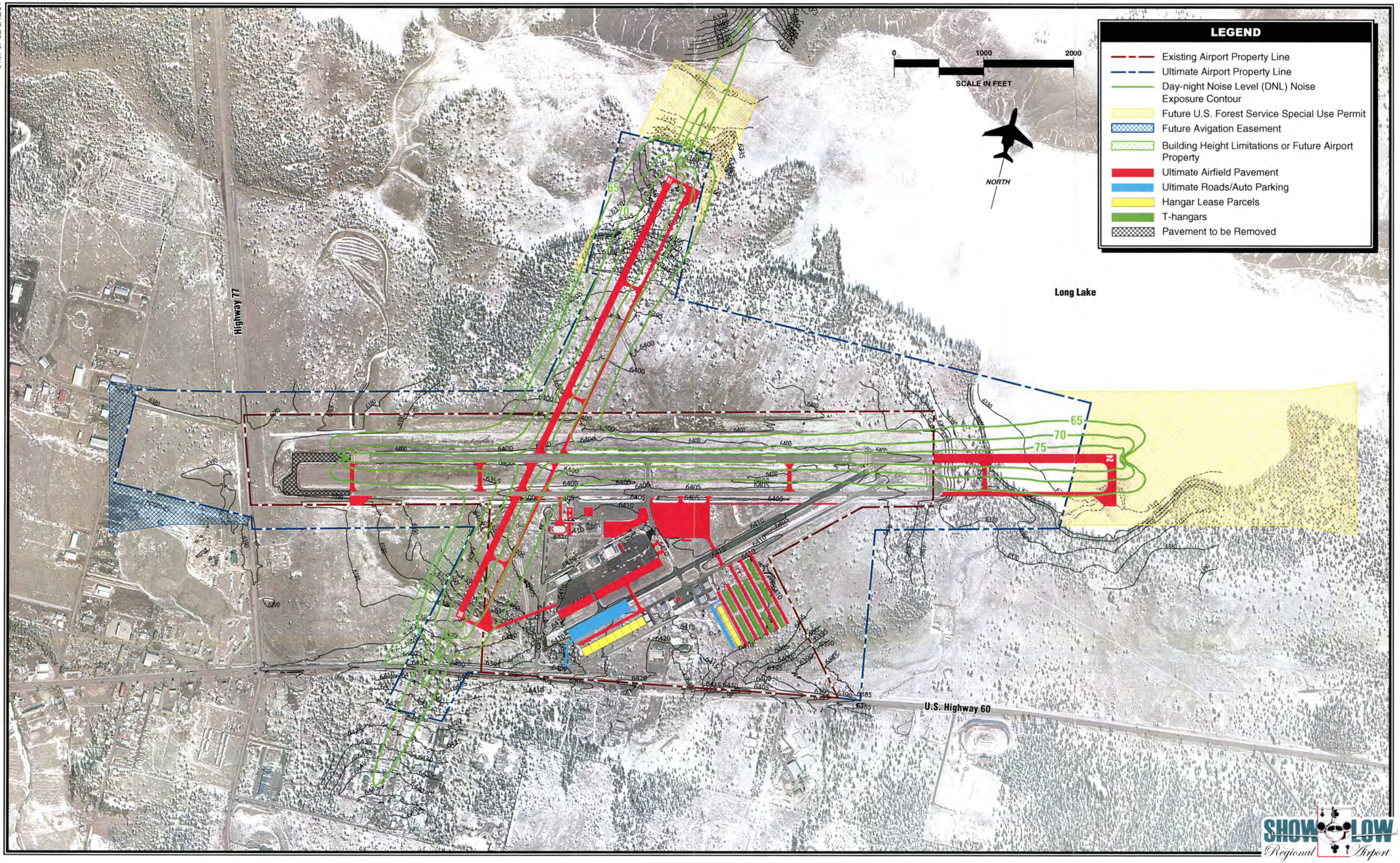

SHOW LOW Regional Airport

Exhibit 5E
LONG TERM NOISE EXPOSURE CONTOURS

TABLE 5D
Review of Environmental Resources
Potentially Impacted by Proposed Airport Improvements

Environmental Resource	Resources Potentially Affected
Noise. The Yearly Day-Night Average Sound Level (DNL) is used in this study to assess aircraft noise. DNL is the metric currently accepted by the Federal Aviation Administration (FAA), Environmental Protection Agency (EPA), and Department of Housing and Urban Development (HUD) as an appropriate measure of cumulative noise exposure. These three federal agencies have each identified the 65 DNL noise contour as the threshold of incompatibility.	• As shown previously, the noise contours based on existing activity levels are maintained almost entirely on the existing airport property. Only a portion of the 65, 70, and 75 DNL contours extend off airport property to the east, over land currently managed by the U.S. Forest Service. (It must be noted that the areas within the noise contour are currently undergoing the land transfer process to transfer ownership of the land to the City of Show Low.) No noise-sensitive development is contained within the noise contours. • When considering projected long-term noise contours, the greatest change in the noise condition is associated with proposed Runway 18-36. The 65 and 70 DNL contours for this runway extend to the south over primarily industrial land uses. To the north, the contours extend over Long Lake and do not include any incompatible development.

TABLE 5D (Continued)
Review of Environmental Resources
Potentially Impacted by Proposed Airport Improvements

Environmental Resource	Resources Potentially Affected
Compatible Land Use. The compatibility of existing and planned land uses in the vicinity of an airport is usually associated with the extent of noise impacts related to that airport. In this context, if the noise analysis described above concludes that there is no significant impact, a similar conclusion usually may be drawn out with respect to compatible land use. FAA officials shall contact the sponsor and representatives of affected communities to encourage the development of appropriate compatible land use controls early in the project planning stage.	• When evaluated as a whole, the proposed airport improvements will not result in noise impacts on noise sensitive development, as no noise-sensitive development is contained within the 2003 or long term 65 DNL contours. However, additional noise analysis will be required as each phase of the Master Plan concept is undertaken, as the development around the airport will likely increase as the city grows. Additionally, should one phase of the concept not be undertaken, such as the construction of the new runway, the contours associated with the remaining runways would likely differ from what has been presented on **Exhibit 5E**. • The proposed improvements to Show Low Regional Airport are consistent with future land use plans. The City of Show Low has prepared and adopted the City of Show Low General Plan, which designates compatible future land uses in the vicinity of the airport.
Social Impacts. These impacts are often associated with the relocation of residents or businesses or other community disruptions.	• The proposed projects will not involve the relocation of any businesses or residences. • The proposed development is not anticipated to divide or disrupt an established community, interfere with orderly planned development, or create a short-term, appreciable change in employment. The proposed airport improvements will require the acquisition of additional land managed by the U.S. Forest Service to the north and east of the airport.

TABLE 5D (Continued)
Review of Environmental Resources
Potentially Impacted by Proposed Airport Improvements

Environmental Resource	Resources Potentially Affected
Induced Socioeconomic Impacts. These impacts address those secondary impacts to surrounding communities resulting from the proposed development, including shifts in patterns of population growth, public service demands, and changes in business and economic activity to the extent influenced by the airport development.	• Significant shifts in patterns of population movement or growth, or public service demands are not anticipated as a result of the proposed development. It could be expected, however, that the proposed development would potentially induce positive socioeconomic impacts for the community over a period of years. The airport, with expanded facilities and services, would be expected to attract additional users. It is also expected to encourage tourism, industry and trade, and to enhance the future growth and expansion of the community's economic base. Future socioeconomic impacts resulting from the proposed development would be primarily positive in nature.
Air Quality. The US Environmental Protection Agency (EPA) has adopted air quality standards that specify the maximum permissible short-term and long-term concentrations of various air contaminants. The National Ambient Air Quality Standards (NAAQS) consist of primary and secondary standards for six criteria pollutants which include: Ozone (O3), Carbon Monoxide (CO), Sulfur Dioxide (SO2), Nitrogen Oxide (NO), Particulate matter (PM10), and Lead (Pb). Various levels of review apply within both NEPA and permitting requirements. For example, an air quality analysis is typically required during the preparation of a NEPA document if enplanement levels exceed 3.2 million enplanements or general aviation operations exceed 180,000.	• Show Low Regional Airport is located in Navajo County, which is in attainment for the six criteria pollutants outlined by the EPA. • According to the 2003 Airport Master Plan, the forecasted number of general aviation annual operations for 2010 is 14,000. However, in recent months, the Western-Pacific Region of the FAA has required an emissions inventory and conformity determination for all projects undertaken in the region; therefore, it is anticipated that further air quality analysis will be required during the NEPA process.

TABLE 5D (Continued)
Review of Environmental Resources
Potentially Impacted by Proposed Airport Improvements

Environmental Resource	Resources Potentially Affected
Water Quality. Water quality concerns associated with airport expansion most often relate to domestic sewage disposal, increased surface runoff and soil erosion, and the storage and handling of fuel, petroleum, solvents, etc.	• During construction of the proposed airport improvements, Best Management Practices (BMP) will need to be incorporated to reduce or prevent impacts to water quality. • The airport will need to comply with an Arizona Pollution Discharge Elimination System (APDES) operations permit. • During the preparation of NEPA documents for proposed airport improvements, drainage studies will likely be required to assess the potential impact of the additional impervious surfaces on water quality. • With regard to construction activities, the airport and all applicable contractors will need to comply with the requirements and procedures of the construction-related APDES General Permit, including the preparation of a *Notice of Intent* and a *Stormwater Pollution Prevention Plan*, prior to the initiation of product construction activities.
Section 303 [4(f)] Lands. These include publicly owned land from a public park, recreation area, or wildlife and waterfowl refuge of national, state, or local significance, or any land from a historic site of national, state, or local significance.	• The airport is bounded by U.S. Forest Service land to the north, west and east. Currently, the airport is undergoing a land exchange with the U.S. Forest Service to transfer land to the City of Show Low to expand the airport property boundary. • The recommended plan proposes the acquisition of additional land from the U.S. Forest Service. Federal lands which are utilized for multiple uses must be reviewed by the federal office having jurisdiction over the lands to determine whether section 303 is applicable. Further coordination with responsible officials is needed to determine national, state, or local significance. If it is determined the lands are classified as Section 303 lands, a detailed evaluation and alternatives analysis will need to be undertaken during the NEPA process.

TABLE 5D (Continued)
Review of Environmental Resources
Potentially Impacted by Proposed Airport Improvements

Environmental Resource	Resources Potentially Affected
Historical and Cultural Resources	• Further coordination with the State Historic Preservation Office (SHPO) is required to determine potential impacts to cultural or archaeological resources. It is anticipated that a cultural resource survey will be requested.
Threatened or Endangered Species and Biological Resources	• An internet review of the U.S. Fish and Wildlife Service, Southwest Region Ecological Services, Threatened and Endangered Species List indicated 12 species with suitable habitat in Navajo County. Critical habitats identified for threatened and endangered species listed to potentially occur in Navajo County, primarily consist of free-flowing water areas, canyons, high elevation terrain, or woody areas. The area surrounding the airport does not contain free-flowing water. However, the airport is located at 6,415 feet and is surrounded by forest land which provides woody area habitats. • Further coordination with the United States Fish and Wildlife Service, and likely a biological survey will be required to determine potential impacts.
Waters of the U.S. Including Wetlands	• Long Lake is considered jurisdictional by the U.S. Army Corps of Engineers; therefore, the extension of Runway 6-24 will likely require an Individual Permit and mitigation due to the large amount of fill which will be placed in the lake. A wetland delineation will be required to determine the presence of any other Waters of the U.S. within the proposed development areas.

TABLE 5D (Continued)
Review of Environmental Resources
Potentially Impacted by Proposed Airport Improvements

Environmental Resource	Resources Potentially Affected
Floodplains	• The extension of Runway 6-24 and the construction of Runway 18-36 will encroach upon Long Lake, which has been identified by the National Flood Insurance Program as a flood hazard area inundated by 100-year floods. Further coordination with the Federal Emergency Management Agency (FEMA) and the U.S. Army Corps of Engineers, as well as hydraulic studies, will likely be required to determine impacts.
Coastal Zone Management Program and Coastal Barriers	• No impacts. The airport is not located within a Coastal Management Zone or Coastal Barrier Area.
Wild and Scenic Rivers	• No impacts. The airport is not near any designated wild and scenic rivers. The Verde River, situated in central Arizona, is the only wild and scenic river in the state.
Farmland	• No impacts. The proposed development will not affect prime or unique farmland. The State of Arizona defines prime and unique farmland as land that is currently being irrigated; no land of this designation will be impacted by the proposed project.
Energy Supply and Natural Resources	• The proposed alternative will result in a less-than significant impact to energy supply and natural resources. Impacts are a result of increased operations and upgraded facilities.
Light Emissions	• The proposed alternative will result in a less-than significant impact to energy supply and natural resources. Impacts will be a result of hangar development to the south of Runway 6-24, and lighting associated with the proposed runway and taxiway and MALSR. These light emissions are not anticipated to be significant, as the surrounding land uses consist of compatible land uses and open space.

TABLE 5D (Continued) Review of Environmental Resources Potentially Impacted by Proposed Airport Improvements	
Environmental Resource	**Resources Potentially Affected**
Solid Waste	• As a result of an increase in operations at the airport, solid waste will slightly increase. These impacts are expected to be less-than-significant.
Construction	• Construction impacts would primarily relate to noise resulting from heavy construction equipment, fugitive dust emissions, and potential impacts on water quality from runoff and soil erosion from exposed surfaces. With mitigation, these impacts are anticipated to be less-than-significant.

PUBLIC AIRPORT DISCLOSURE MAP

Arizona Revised Statues (ARS) 28-8486, *Public Airport Disclosure,* provides for a public airport owner to publish a map depicting the "territory in the vicinity of the airport." The territory in the vicinity of the airport is defined as the traffic pattern airspace and the property that experiences 60 DNL or higher in counties with a population of more than 500,000, and 65 DNL or higher in counties with less than 500,000 residents. The DNL is calculated for the 20-year forecast condition. ARS 28-8486 provides for the State Real Estate Office to prepare a disclosure map in conjunction with the airport owner. The Disclosure Map is recorded with the County Recorder.

Exhibit 5F depicts the Disclosure Map for Show Low Regional Airport, considering the requirements of the statute above. Traffic pattern airspace is defined in FAA Order 7400.2D, *Procedures for Handling Airspace Matters.* Traffic pattern airspace is a function of the approach category for the runway. Approach category D is planned for Runway 6-24, while approach category B is planned for Runway 18-36.

According to FAA Order 7400.2D, the traffic pattern airspace for approach category D extends three miles beyond each runway end, four miles laterally from the runway centerline to encompass the traffic pattern, and 0.5 miles on the side opposite the traffic pattern when the traffic pattern is maintained on one side of the runway. For approach category B, the traffic pattern airspace extends 1.5 miles beyond each runway end, 1.5 miles laterally from the runway centerline to encompass the traffic pattern, and 0.25 miles on the side opposite the traffic pattern when the traffic pattern is maintained on one side of the runway.

The Disclosure Map for Show Low Regional Airport has been developed assuming left traffic for Runways 6 and 18 and right traffic for Runways 36 and 24. This minimizes the overflights of the City of Show Low by maintaining the traffic pattern for Runway 6-24 north of the airport over U.S. Forest Service land and east of Runway 18-36. The 65 DNL contour is shown as required by the statute.

SUMMARY

The Master Plan for Show Low Regional Airport has been developed in cooperation with the Planning Advisory Committee, interested citizens, and City of Show Low. It is designed to assist the City in making decisions relative to the future use of Show Low Regional Airport as it is maintained to meet the air transportation needs for the White Mountain region.

Flexibility will be a key to the plan, since activity may not occur exactly as forecast. The Master Plan provides the City of Show Low with options to pursue in marketing the assets of the airport for community development. Following the general recommendations of the plan, the airport can maintain its viability and continue to provide air transportation services to the region.

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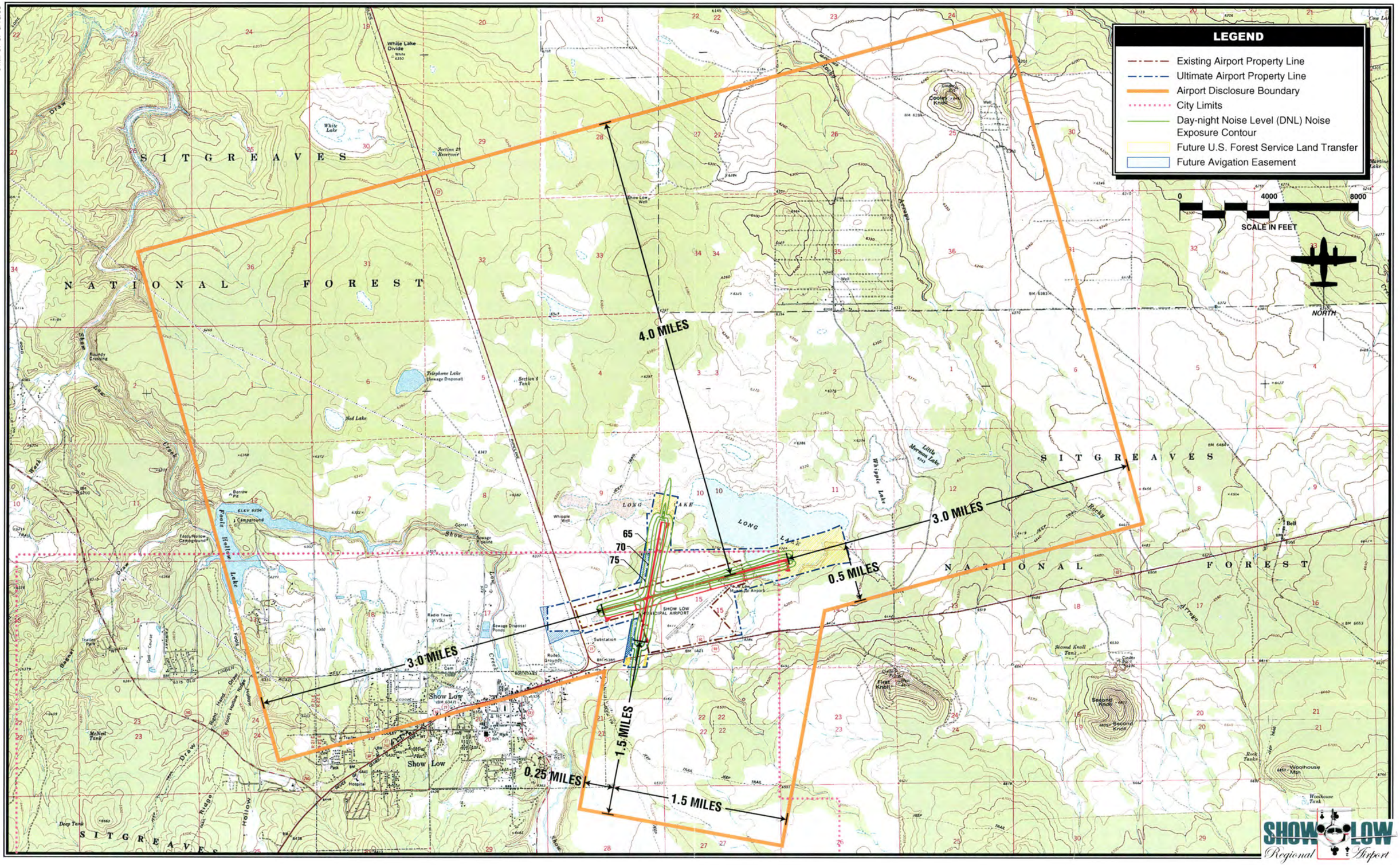


Exhibit 5F
RECOMMENDED PUBLIC AIRPORT
DISCLOSURE MAP

Chapter Six
CAPITAL IMPROVEMENT PROGRAM

CAPITAL IMPROVEMENT PROGRAM

The analyses conducted in the previous chapters evaluated airport development needs based upon safety, security, potential aviation activity, and operational efficiency. However, one of the more important elements of the Master Planning process is the application of basic financial and management rationale to each development item so that the feasibility of implementation can be assured. The purpose of this chapter is to identify capital needs at Show Low Regional Airport and identify when these should be implemented according to need, function, and demand.

The presentation of the financial plan and its feasibility has been organized into two sections. First, the airport's capital needs are presented in narrative and graphic form. Secondly, funding sources on the federal, state, and local levels are identified and discussed.

DEMAND-BASED PLAN

The Master Plan for Show Low Regional Airport has been developed according to a demand-based schedule. Demand-based planning refers to the intention to develop planning guidelines for the airport based upon airport activity levels, instead of guidelines based on points in time. By doing so, the levels of activity derived from the demand forecasts can be related to the actual capital investments needed to safely and efficiently accommodate the level of demand being experienced at the airport. More specifically, the intention of this Master Plan is that the facility improvements needed to serve

new levels of demand should only be implemented when the levels of demand experienced at the airport justify their implementation.

For example, the aviation demand forecasts projected that based aircraft could be expected to grow through the year 2025. This forecast was supported by the local community's growing economy, and population and historical trends showing growing based aircraft levels.

The forecasts noted, however, that future based aircraft levels will be dependent upon a number of economic factors. These factors could slow or accelerate based aircraft levels differently than projected in the aviation demand forecasts. Since changes in these factors cannot be realistically predicted for the entire forecast period, it is difficult to predict with the level of accuracy needed to justify a capital investment, exactly when an improvement will be needed to satisfy demand level.

For these reasons, the Show Low Regional Airport Master Plan has been developed as a demand-based plan. The Master Plan projects various activity levels for short, intermediate, and long term planning horizons. When activity levels begin to reach or exceed the level of one of the planning horizons, the Master Plan suggests planning begin to consider the next planning horizon level of demand. This provides a level of flexibility in the Master Plan, as the development program can be accelerated or slowed to meet demand. This can extend the time between Master Plan updates.

A demand-based Master Plan does not specifically require implementation of any of the demand-based improvements. Instead, it is envisioned that implementation of any Master Plan improvement would be examined against demand levels prior to implementation. In many ways, this Master Plan is similar to a community's general plan. The Master Plan establishes a plan for the use of the airport facilities consistent with potential aviation needs and the capital needs required to support that use. However, individual projects in the plan are not implemented until the need is demonstrated and the project is approved by the City of Show Low.

CAPITAL NEEDS AND COST SUMMARIES

Once the specific needs for the airport have been established, the next step is to determine a realistic schedule and costs for implementing each project. The capital needs presented in this chapter outline the costs and timing for implementation. The program outlined on the following pages has been evaluated from a variety of perspectives and represents the culmination of a comparative analysis of basic budget factors, demand, and priority assignments.

The recommended improvements are grouped into three planning horizons: short, intermediate, and long term.

Each year, the City of Show Low will need to reexamine the priorities for funding in the short-term period, adding or removing projects on the capital programming lists. **Table 6A** summarizes the key activity milestones for each planning horizon.

TABLE 6A
Planning Horizon Activity Levels

	Existing (2001)	Short Term Planning Horizon	Intermediate Term Planning Horizon	Long Term Planning Horizon
Air Carrier Activity				
Enplaned Passengers	1,267	6,700	9,000	13,000
Annual Operations	226	2,000	2,600	3,400
General Aviation Activity	57	80	90	110
Based Aircraft	9,800	15,600	18,500	25,600
Annual Operations				
Air Taxi Operations	5,300	6,000	6,300	7,100
Total Annual Operations	15,326	23,600	27,400	36,100

While some projects will be demand-based, others will be dictated by design standards, safety, or rehabilitation needs. In putting together a listing of projects, an attempt has been made to include anticipated rehabilitation needs through the planning period, and capital replacement needs. However, it is difficult to project with certainty the scope of such projects when looking 10 or more years into the future.

Exhibit 6A summarizes capital needs for Show Low Regional Airport through the planning period of this Master Plan. An estimate has been included with each project, of federal and state funding eligibility, although none of these amounts are guaranteed.

Individual project cost estimates account for engineering and other contingencies that may be experienced during implementation of the project and are in current (2003) dollars. Due to the conceptual nature of a Master Plan, implementation of capital improvement projects should occur only after further refinement of their design and costs through engineering and/or architectural analyses. Capital costs in this chapter should be viewed only as estimates subject to further refinement during design. Nevertheless, these estimates are considered sufficient for performing the feasibility analyses in this chapter.

SHORT TERM CAPITAL NEEDS

The short term planning horizon is the only planning horizon correlated to time. This is because development within this initial period is concentrated on the most immediate needs of the airfield and landside areas. Therefore, the program is presented year-by-year to assist in capital planning, not only locally, but at the state and federal levels. Short term capital needs presented on **Exhibit 6A** are estimated at $17.5 million.

Over $13.2 million of the short term planning horizon improvements are related to improving the Runway 6-24 runway safety area (RSA) and object free area (OFA), strengthening the Runway 6-24 and Taxiway A pavement, and improving instrument approach capability to Runway 24. The improvements to the Runway 6-24 RSA and OFA total $7.6 million. This provides for the shifting of Runway 6-24 to the east to provide the RSA and OFA behind the Runway 6 threshold. This also provides for grading and paving the RSA behind the Runway 24 end, and paving, marking, and lighting 650 feet of new pavement east of Runway 24 to replace the pavement that is to be removed behind the Runway 6 threshold. This will maintain the existing runway length of 7,200 feet.

Over $1.6 million is related to strengthening the Runway 6-24, Taxiway A, and Taxiway A2, A4, and A5 pavement to 60,000 pounds single wheel loading (SWL) and 115,000 pounds dual wheel loading (DWL). This additional pavement strength is needed to provide for the operation of larger corporate aircraft at the airport, and most important, allow the large aerial firefighting aircraft use of the airport. Their use of the airport was prohibited during the Rodeo-Chedeski wildfire of 2002, due to pavement strength limitations.

Finally, $4.0 million is allocated for the installation of an instrument landing system (ILS) and medium intensity approach lighting system with runway alignment indicator lighting (MALSR) to Runway 24. The ILS and MALSR will provide for a Category I (½ mile visibility and 200-foot cloud ceiling minimum) precision approach to Runway 24. CAT I capability is currently only available with an ILS system. Global positioning system (GPS) CAT I capabilities are not envisioned until after 2015.

Safety and security projects total approximately $2.3 million. This includes the installation of perimeter security fencing and controlled access gates, acquiring a runway sweeper, acquiring a snow blower, and completing the construction of the airport rescue and firefighting (ARFF) building. This building is being completed in three phases. The first two phases were funded with grants prior to 2004.

Concurrent with the runway strengthening, the north (terminal) apron is also planned to be strengthened to a similar rating. The short term planning horizon includes constructing new taxiway entrances

	Total Cost	Federally Eligible	ADOT Eligible	Local Share
Short Term Planning Horizon (First Six Years)				
2004				
Install Security Fencing - Phase II	$ 565,000	$ 536,750	$ 14,125	$ 14,125
Construct ARFF Building - Phase III	1,400,000	1,330,000	35,000	35,000
Preliminary Design Runway 6-24 RSA Improvements	360,000	342,000	9,000	9,000
Subtotal 2004	**$ 2,325,000**	**$ 2,208,750**	**$ 58,125**	**$ 58,125**
2005				
Acquire Runway Sweeper	$ 75,000	$ 71,250	$ 1,875	$ 1,875
Design East Apron - Phase I	35,000	33,250	875	875
Design Taxiway A4 Reconstruction	25,000	23,750	625	625
Improve Runway 6-24 RSA (Demolition, grade, and drain)	6,465,000	6,141,750	161,625	161,625
Install Utilities	278,000	-	250,200	27,800
Construct Taxiway B	100,000	-	90,000	10,000
Subtotal 2005	**$ 6,978,000**	**$ 6,270,000**	**$ 505,200**	**$ 202,800**
2006				
Improve Runway 6-24 RSA (Pave, Mark, and Light)	$ 848,000	$ 805,600	$ 21,200	$ 21,200
Acquire Snow Removal Equipment	250,000	237,500	6,250	6,250
Design Terminal Apron Pavement Strengthening	32,000	30,400	800	800
Design Taxiway A Strengthening	32,000	30,400	800	800
Design Runway Strengthening	36,000	34,200	900	900
Construct East Apron/Relocate Segmented Circle (20,00 s.y.)	400,000	380,000	10,000	10,000
Taxiway A-4 Reconstruction	30,000	28,500	750	750
Subtotal 2006	**$ 1,628,000**	**$ 1,546,600**	**$ 40,700**	**$ 40,700**
2007				
Construct Wash Rack	$ 50,000	$ 47,500	$ 1,250	$ 1,250
Terminal Apron Strengthening	200,000	190,000	5,000	5,000
Taxiway A Strengthening	500,000	475,000	12,500	12,500
Runway Strengthening	1,035,000	983,250	25,875	25,875
Construct De-Ice Collect System	175,000	166,250	4,375	4,375
Subtotal 2007	**$ 1,960,000**	**$ 1,862,000**	**$ 49,000**	**$ 49,000**
2008				
Install Instrument Landing System (ILS) Runway 24	$ 2,000,000	$ 1,900,000	$ 50,000	$ 50,000
Install Utilities to T-hangars	278,000	264,100	6,950	6,950
Construct T-hangar Taxilanes	100,000	95,000	2,500	2,500
Relocate Long Term Parking / Expand North Apron	200,000	190,000	5,000	5,000
Install Security Fencing (T-hangar area & North Apron)	100,000	95,000	2,500	2,500
Subtotal 2008	**$ 2,678,000**	**$ 2,544,100**	**$ 66,950**	**$ 66,950**
2009				
Install MALSR Runway 24	$ 2,000,000	$ 1,900,000	$ 50,000	$ 50,000
Subtotal Short Term Planning Horizon	**$ 17,569,000**	**$ 16,331,450**	**$ 769,975**	**$ 467,575**
Intermediate Term Planning Horizon (7-10 years)				
Runway 6 Avigation Easements (19 acres)	$ 219,000	$ 208,050	$ 5,475	$ 5,475
Construct Helicopter Hardstand	28,000	26,600	700	700
Construct Runway 18-36 and Parallel Taxiway (Taxiway D)	4,980,000	4,731,000	124,500	124,500
Install MIRL Runway 18-36, MITL Taxiway D, and Directional Signage	598,000	568,100	14,950	14,950
Install PAPI-2 and REILs to Runway 18 and Runway 36	175,000	166,250	4,375	4,375
Install Distance Remaining Signs Runway 6-24 and Runway 18-36	100,000	95,000	2,500	2,500
Close Runway 3-21/ Convert to Taxiway	69,000	65,550	1,725	1,725
Install MITL Taxiway B	282,000	267,900	7,050	7,050
Install MITL Taxiway C	520,000	494,000	13,000	13,000
Construct T-Hangar Access Taxilanes - Phase II	100,000	95,000	2,500	2,500
Overlay Center Apron, Taxiway A4, Taxiway B, and Taxiway C	1,232,000	1,170,400	30,800	30,800
Annual Pavement Maintenance/Preservation	500,000	475,000	12,500	12,500
Subtotal Intermediate Term Planning Horizon	**$ 8,803,000**	**$ 8,362,850**	**$ 220,075**	**$ 220,075**
Long Term Planning Horizon (11-20 years)				
Install PAPI-4 Runway 6 and Runway 24	$ 135,000	$ 128,250	$ 3,375	$ 3,375
Install Instrument Landing System (ILS) Runway 6	2,000,000	1,900,000	50,000	50,000
Install MALSR Runway 6	500,000	475,000	12,500	12,500
Construct Taxiways A3 and A5	118,000	112,100	2,950	2,950
Expand Center Apron South	221,000	209,950	5,525	5,525
Construct Auto Parking	106,000	100,700	2,650	2,650
Construct Taxiway Connection to Runway 36 From Center Apron	2,670,000	2,536,500	66,750	66,750
Reconfigure Airline Operations/Expand Passenger Terminal Building	1,795,000	1,705,250	44,875	44,875
Extend Runway 6-24 to 8,600'	10,425,000	9,903,750	260,625	260,625
Annual Pavement Maintenance/Preservation	1,000,000	950,000	25,000	25,000
Subtotal Long Term Planning Horizon	**$ 18,970,000**	**$ 18,021,500**	**$ 474,250**	**$ 474,250**
Total All Development	**$ 45,342,000**	**$ 42,715,800**	**$ 1,464,300**	**$ 1,161,900**

MALSR - Medium Intensity Approach Lighting System with Runway Alignment Indicator Lighting
PAPI - Precision Approach Path Indicator, RSA - Runway Safety Area
MIRL - Medium Intensity Runway Lighting
MITL - Medium Intensity Taxiway Lighting

SHOW LOW Regional Airport

Exhibit 6A
AIRPORT DEVELOPMENT PROGRAM

from Taxiway A4 to the center apron to replace the existing entrance which is located too close to the old terminal building.

The development of the east apron is planned for this planning horizon. This apron area is designed to provide an area for large aircraft parking and circulation. This area would be used by the U.S. Forest Service if there were a future fire event in the region.

Other projects include installing utilities in the south apron area to support hangar development. Taxiway B is planned to be extended approximately 1,200 feet to the west. Portions of the proposed T-hangar taxilanes are planned to be constructed to allow for continued T-hangar development as demand dictates.

The development of an aircraft wash rack on the south apron is planned to provide for the collection of aircraft cleaning fluids and debris from aircraft during washing. A deice pad is planned along the north apron. The deice pad will include a collection system to capture and hold the excess deice fluid when aircraft are sprayed with the fluid prior to departure.

INTERMEDIATE TERM AND LONG TERM CAPITAL NEEDS

Development within the intermediate term planning horizon focuses on constructing Runway 18-36. Over $5.7 million is allocated for the construction of the runway and parallel taxiway. The installation of precision approach path indicators (PAPIs) and runway end identifier lights (REILs) to each runway is also planned. The runway and taxiway will be equipped with medium intensity runway lighting (MIRL) and medium intensity taxiway lighting (MITL). Distance-to-go signs are programmed for Runway 18-36 and Runway 6-24.

Following the construction of Runway 18-36, Runway 3-21 will be closed and converted to a taxiway, being renamed as Taxiway C. The installation of MITL is planned for Taxiway B and C (converted Runway 3-21). Additional projects include strengthening the center apron, Taxiway A4, Taxiway B, and Taxiway C pavement strengths. This will allow for more corporate aircraft use of these areas without significantly degrading the pavement. The construction of additional T-hangar access taxilanes is also planned. Two helicopter handstands are planned to provide a segregated area for rotorcraft operations.

The intermediate term planning horizon includes the acquisition of avigation easements to protect the Runway 6 ultimate RPZ. The avigation easements do not transfer the current land ownership but do guarantee to the airport that the land will be developed with compatible uses to the airport.

The long term planning horizon focuses on improvements to meet projected demand levels. Runway 6-24 is planned to be extended to 8,600 feet. Taxiways A3 and A5 are added. These taxiways will reduce runway occupancy time by

allowing aircraft to exit the runway quicker. An ILS and MALSR are planned for Runway 6, while new PAPIs are planned for Runways 6 and 24.

The center apron is planned to be expanded to the south, and parking and access constructed for fixed based operator (FBO) parcels. The construction of the taxiway between Runway 18 and the center apron is planned. This taxiway will reduce taxi times between the Runway 18 end and the center and south apron areas. The long term planning horizon also includes the reconfiguration of the terminal building functional areas and expansion to accommodate the projected long term passenger levels.

A total of $100,000 annually is included in the intermediate term and long term planning horizons for pavement preservation activities. Pavement preservation activities typically include applying a slurry seal to rejuvenate and protect the pavement surface, crack sealing, and/or small pavement repairs.

Exhibits 6B and 6C graphically depict development staging.

CAPITAL IMPROVEMENTS FUNDING

Financing capital improvements at the airport will not rely exclusively upon the financial resources of City of Show Low. Capital improvement funding is available through various grants-in-aid programs at both the federal and state level. The following discussion outlines the key sources for capital improvement funding.

FEDERAL GRANTS

Through federal legislation over the years, various grants-in-aid programs have been established to develop and maintain a system of public airports throughout the United States. The purpose of this system and its federally-based funding is to maintain national defense and promote interstate commerce. The most recent legislation was enacted in early 2000 and was entitled the *Wendell H. Ford Aviation Investment and Reform Act for the 21st Century* or AIR-21. The four-year bill covered FAA fiscal years 2000, 2001, 2002, and 2003. With the 2003 fiscal year now expired, the U.S. Congress needs to pass a new authorization of the program. As of October 2003, the U.S. Congress had not finalized a new authorization, although the U.S. Congress was considering a four-year program similar to AIR-21.

The source for federal funding of airports is the Aviation Trust Fund. The Aviation Trust Fund was established in 1970 to provide funding for aviation capital investment programs (aviation development, facilities and equipment, and research and development). The Trust Fund also finances the operation of the FAA. It is funded by user fees, taxes on airline tickets, aviation fuel, and various aircraft parts.

01MP07-6B-3/12/04

SHORT TERM IMPROVEMENTS

1. Install Security Fencing - Phase II
2. Improve Runway 6-24 RSA (demolition, grade, and drain)
3. Improve Runway 6-24 RSA (pave, mark, and light)
4. Taxiway A Strengthening
5. Runway Strengthening
6. Install Instrument Landing System (ILS) Runway 24
7. Install MALSR Runway 24

INTERMEDIATE TERM IMPROVEMENTS

1. Runway 6 Avigation Easements (19 acres)
2. Construct Runway 18-36 and Parallel Taxiway (Taxiway D)
3. Install MIRL Runway 18-36, MITL Taxiway D, and Directional Signage
4. Install PAPI-2 and REILs to Runway 18 and Runway 36
5. Distance-to-Go Signs Runway 6-24 and Runway 8-36
6. Close Runway 3-21 / Convert to Taxiway
7. Install MITL Taxiway B
8. Install MITL Taxiway C

LONG TERM IMPROVEMENTS

1. Install PAPI-4 Runway 6 and Runway 24
2. Install Instrument Landing System (ILS) Runway 6
3. Install MALSR Runway 6
4. Extend Runway 6-24 to 8,600'
5. Construct Taxiways A3 and A5

0 1000 2000
SCALE IN FEET

NORTH

LEGEND

- Existing Airport Property Line
- Ultimate Airport Property Line
- Future Avigation Easement
- Building Height Limitations or Future Airport Property
- Short Term Development
- Intermediate Term Development
- Long Term Development
- Pavement to be Removed
- Ultimate Taxiway Designation
- Object Free Area (OFA)
- Obstacle Free Zone (OFZ)
- Runway Safety Area (RSA)
- Runway Protection Zone (RPZ)
- Runway Visibility Zone (RVZ)
- 35' Building Restriction Line (BRL)

AWOS - Automated Weather Observation System
MALSR - Medium intensity Approach Lighting System with Runway alignment indicator lights
PAPI - Precision Approach Path Indicator
REIL - Runway End Identifier Lighting

One-Mile Visibility Minimum Instrument Approach
Long Lake
AWOS Critical Area
AWOS
Ultimate Landing Threshold
Existing 750' Displaced Threshold
650' Shift
1,400' Runway Extension
MALSR
Precision Instrument Approach
Relocated Runway End
650'
PAPI-4
Runway 6-24 (7,200' x 100' Existing) (8,600' x 100' Ultimate)
Runway 18-36 5,500' x 75'
400'
Relocated Segmented Circle
Convert to Taxiway
PAPI-2
REIL
Bridge
U.S. Highway 60
One-Mile Visibility Minimum Instrument Approach

SHOW LOW Regional Airport

Exhibit 6B
AIRFIELD DEVELOPMENT

01MP07-6C-3/12/04

SHORT TERM IMPROVEMENTS

1. Construct ARFF Building - Phase III
2. Install Utilities
3. Construct Taxiway B
4. Construct East Apron/Relocate Segmented Circle (20,000 s.y.)
5. Taxiway A-4 Construction
6. Construct Wash Rack
7. Terminal Apron Strengthening
8. Construct De-ice Collect System
9. Install Utilities to T-hangars
10. Construct T-hangar Taxilanes
11. Relocate Long Term Parking / Expand North Apron

INTERMEDIATE TERM IMPROVEMENTS

1. Construct Helicopter Hardstands
2. Construct T-hangar Access Taxilanes - Phase II
3. Overlay Center Apron, Taxiway A4, Taxiway B, and Taxiway C

LONG TERM IMPROVEMENTS

1. Expand Center Apron South
2. Construct Auto Parking
3. Construct Taxiway Connection to Runway 36 from Center Apron

LEGEND

- Existing Airport Property Line
- Ultimate Airport Property Line
- Building Height Limitations or Future Airport Property
- Short Term Development
- Intermediate Term Development
- Long Term Development
- Pavement to be Removed
- Object Free Area (OFA)
- Obstacle Free Zone (OFZ)
- Runway Safety Area (RSA)
- Runway Protection Zone (RPZ)
- Runway Visibility Zone (RVZ)
- 35' Building Restriction Line (BRL)

TAXIWAY A
TAXIWAY A4
HELICOPTER HARDSTAND
DE-ICE PAD
NORTH APRON
TERMINAL
ARFF & AIRPORT MAINTENANCE
RESERVE FOR TERMINAL EXPANSION
TERMINAL PUBLIC PARKING AND RELOCATED LONG TERM PARKING
FBO/SPECIALTY OPERATORS
CENTER APRON
CONVERT TO TWO-WAY TRAFFIC
100LL FUEL STORAGE
EXISTING JET-A STORAGE
EXISTING SEGMENTED CIRCLE
EAST APRON
RELOCATED SEGMENTED CIRCLE
JET-A STORAGE
FOREST SERVICE RETARDANT READY/ STORAGE AREA
CONVERT TO TAXIWAY
TAXIWAY B
TAXIWAY A4
SOUTH APRON
WASH RACK
EXISTING 100LL STORAGE
AUTO PARKING
T-HANGARS
INDIVIDUAL HANGAR PARCELS
ARMY NATIONAL GUARD
CORPORATE WAY
AUTO PARKING
FBO/SPECIALTY OPERATORS
BRIDGE
COMMERCIAL/ INDUSTRIAL
COMMERCIAL/ INDUSTRIAL
AIRPORT ROAD
36
NORTH
0 300
SCALE IN FEET

SHOW LOW Regional Airport

Exhibit 6C
LANDSIDE DEVELOPMENT

Proceeds from the Aviation Trust Fund are distributed each year by the FAA from appropriations by Congress. A portion of the annual distribution is to primary commercial service airports, based upon enplanement levels. Commercial service airports enplaning more than 10,000 passengers annually are provided a $1,000,000 annual entitlement. For eligible general aviation airports, AIR-21 provided up to $150,000 of funding each year. Show Low Regional Airport does not currently qualify for the commercial service entitlement. However, the airport does receive the general aviation entitlement. The current legislation under consideration by the U.S. Congress maintains these entitlement levels. This Master Plan projected that the Show Low air service market could eventually grow beyond 10,000 annual passengers by the Long Term Planning Horizon, thus allowing the airport to qualify for the $1,000,000 annual commercial service airport entitlement.

After meeting entitlement obligations, the remaining AIP funds are distributed by the FAA based upon the priority of the project for which they have requested federal assistance through discretionary apportionments. A national priority ranking system is used to evaluate and rank each airport project. Those projects with the highest priority are given preference in funding. Each project for Show Low Regional Airport is required to follow this procedure and compete with other airport projects in the State for AIP State Apportionment dollars, and across the country for other Federal AIP funds. An important point to consider is that most funding for Show Low Regional Airport is not guaranteed, as the airport is currently only eligible for the $150,000 annual entitlement.

Airport development that meets the FAA's eligibility requirements can receive 91.06 percent federal funding in the State of Arizona. Property acquisition, airfield improvements, aprons, perimeter service roads, and access road improvements are examples of eligible items. General aviation terminal buildings, cargo buildings, and fueling facilities are not generally eligible.

As evident from the airport development schedule and cost summaries, the City of Show Low could benefit significantly from federal discretionary funding. Federal funding extends the amount of state dollars available for airport funding and guarantees a limited amount of entitlement dollars each year (assuming the current program is continued through the planning period).

FAA FACILITIES AND EQUIPMENT PROGRAM

The Airway Facilities Division of the FAA administers the national Facilities and Equipment (F&E) Program. This annual program provides funding for the installation and maintenance of various navigational aids and equipment for the national airspace system and airports. Under the F&E program, funding is provided for FAA airport traffic control towers, enroute navigational aids, and on-airport

navigational aids such as approach lighting systems. As activity levels and other development warrants, the airport may be considered by the FAA Airways Facilities Division for the installation and maintenance of navigational aids through the F&E program. This could include the installation of the proposed MALSRs, REILs, and PAPIs.

STATE AID TO AIRPORTS

In support of the state airport system, the State of Arizona also participates in airport improvement projects. The source for State airport improvement funds is the Arizona Aviation Fund. Taxes levied by the State on aviation fuel, flight property, aircraft registration tax, and registration fees (as well as interest on these funds) are deposited in the Arizona Aviation Fund. The transportation Board establishes the policies for distribution of these State funds.

Under the State of Arizona grant program, an airport can receive funding for one-half (4.47 percent) of the local share of projects receiving federal AIP funding. The State also provides 90 percent funding for projects which are typically not eligible for federal AIP funding or have not received federal funding.

State Airport Loan Program

The Arizona Department of Transportation-Aeronautics Division (ADOT) Airport Loan Program was established to enhance the utilization of State funds and provide a flexible funding mechanism to assist airports in funding improvement projects. Eligible projects include runway, taxiway, and apron improvements; land acquisition, planning studies, and the preparation of plans and specifications for airport construction projects; as well as revenue generating improvements such as hangars and fuel storage facilities. Projects which are not currently eligible for the State Airport Loan Program are considered if the project would enhance the airport's ability to be financially self-sufficient.

There are three ways in which the loan funds can be used: Grant Advance, Matching Funds, or Revenue Generating Projects. The Grant Advance loan funds are provided when the airport can demonstrate the ability to accelerate the development and construction of a multi-phase project. The project(s) must be compatible with the Airport Master Plan and be included in the ADOT 5-year Airport Development Program. The Matching Funds are provided to meet the local matching fund requirement for securing federal airport improvement grants or other federal or state grants. The Revenue Generating funds are provided for airport-related construction projects that are not eligible for funding under another program.

LOCAL FUNDING

The balance of project costs, after consideration has been given to grants, must be funded through local resources.

Assuming federal funding, this essentially equates to 4.47 percent of the project costs if all eligible FAA and state funds are available.

There are several alternatives for local finance options for future development at the airport, including airport revenues, direct funding from the City, issuing bonds, and leasehold financing. These strategies could be used to fund the local matching share, or complete the project if grant funding cannot be arranged.

The capital improvement program has assumed that some landside facility development would be completed privately. Under this type of development, the City of Show Low would complete the necessary infrastructure improvements as this development is grant-eligible.

There are several municipal bonding options available to City of Show Low including: general obligation bonds, limited obligation bonds, and revenue bonds. General obligation bonds are a common form of municipal bonds which are issued by voter approval and secured by the full faith and credit of the City. City tax revenues are pledged to retire the debt. As instruments of credit, and because the community secures the bonds, general obligation bonds reduce the available debt level of the community. Due to the community pledge to secure and pay general obligation bonds, they are the most secure type of municipal bond and are generally issued at lower interest rates and carry lower costs of issuance. The primary disadvantage of general obligation bonds is that they require voter approval and are subject to statutory debt limits. This requires that they be used for projects that have broad support among the voters, and that they be reserved for projects that have highest public priorities.

In contrast to general obligation bonds, limited obligation bonds (sometimes referred to as Self-Liquidating Bonds) are secured by revenues from a local source. While neither general fund revenues nor the taxing power of the local community is pledged to pay the debt service, these sources may be required to retire the debt if pledged revenues are insufficient to make interest and principal payments on the bonds. These bonds still carry the full faith and credit pledge of the local community and, therefore, are considered, for the purpose of financial analysis, as part of the debt burden of the local community. The overall debt burden of the local community is a factor in determining interest rates on municipal bonds.

There are several types of revenue bonds, but in general they are a form of a municipal bond which is payable solely from the revenue derived from the operation of a facility that was constructed or acquired with the proceeds of the bonds. For example, a Lease Revenue Bond is secured with the income from a lease assigned to the repayment of the bonds. Revenue bonds have become a common form of financing airport improvements. Revenue bonds present the opportunity to provide those improvements without direct burden to the taxpayer. Revenue

bonds normally carry a higher interest rate because they lack the guarantees of general and limited obligation bonds.

Leasehold financing refers to a developer or tenant financing improvements under a long term ground lease. The obvious advantage of such an arrangement is that it relieves the community of all responsibility for raising the capital funds for improvements. However, the private development of facilities on a ground lease, particularly on property owned by a municipal agency, produces a unique set of problems. In particular, it is more difficult to obtain private financing, as only the improvements and the right to continue the lease can be claimed in the event of a default. Ground leases normally provide for the reversion of improvements to the lessor at the end of the lease term, which reduces their potential value to a lender taking possession. Also, companies that want to own their property as a matter of financial policy may not locate where land is only available for lease. The City of Show Low has used long term lease arrangements successfully to finance capital improvements at the airport in the past. Most hangar facilities were developed with private funds under a long term ground lease with the City.

PLAN IMPLEMENTATION

The successful implementation of the Show Low Regional Airport Master Plan will require sound judgment on the part of the City of Show Low with regard to the implementation of projects to meet future activity demands, while maintaining the existing infrastructure and improving this infrastructure to support new development. While the projects included in the capital improvement program have been broken into short, intermediate, and long term planning periods, the City will need to consider the scheduling of projects in a flexible manner and add new projects from time-to-time to satisfy safety or design standards, or newly created demands.

In summary, the planning process requires that the City of Show Low continually monitor the need for new or rehabilitated facilities, since applications (for eligible projects) must be submitted to the FAA and State each year. The City of Show Low should continually monitor, with the FAA and State, the projects which are required for safety and security.

SHOW LOW
Municipal Airport

Appendix A
GLOSSARY OF TERMS AND ABBREVIATIONS

Appendix A

GLOSSARY OF TERMS

ACCELERATE-STOP DISTANCE AVAILABLE (ASDA): see declared distances.

AIR CARRIER: an operator which: (1) performs at least five round trips per week between two or more points and publishes flight schedules which specify the times, days of the week, and places between which such flights are performed; or (2) transport mail by air pursuant to a current contract with the U.S. Postal Service. Certified in accordance with Federal Aviation Regulation (FAR) Parts 121 and 127.

AIRPORT REFERENCE CODE (ARC): a coding system used to relate airport design criteria to the operational (Aircraft Approach Category) to the physical characteristics (Airplane Design Group) of the airplanes intended to operate at the airport.

AIRPORT REFERENCE POINT (ARP): The latitude and longitude of the approximate center of the airport.

AIRPORT ELEVATION: The highest point on an airport's usable runway expressed in feet above mean sea level (MSL).

AIRPORT LAYOUT DRAWING (ALD): The drawing of the airport showing the layout of existing and proposed airport facilities.

AIRCRAFT APPROACH CATEGORY: a grouping of aircraft based on 1.3 times the stall speed in their landing configuration at their maximum certificated landing weight. The categories are as follows:

- *Category A:* Speed less than 91 knots.
- *Category B:* Speed 91 knots or more, but less than 121 knots.
- *Category C:* Speed 121 knots or more, but less than 141 knots.
- *Category D:* Speed 141 knots or more, but less than 166 knots.
- *Category E:* Speed greater than 166 knots.

AIRPLANE DESIGN GROUP (ADG): a grouping of aircraft based upon wingspan. The groups are as follows:

- *Group I:* Up to but not including 49 feet.
- *Group II:* 49 feet up to but not including 79 feet.
- *Group III:* 79 feet up to but not including 118 feet.
- *Group IV:* 118 feet up to but not including 171 feet.
- *Group V:* 171 feet up to but not including 214 feet.
- *Group VI:* 214 feet or greater.

AIR TAXI: An air carrier certificated in accordance with FAR Part 135 and authorized to provide, on demand, public transportation of persons and property by aircraft. Generally operates small aircraft "for hire" for specific trips.

AIRPORT TRAFFIC CONTROL TOWER (ATCT): a central operations facility in the terminal air traffic control system, consisting of a tower, including an associated instrument flight rule (IFR) room if radar equipped, using air/ground communications and/or radar, visual signaling, and other devices to provide safe and expeditious movement of terminal air traffic.

AIR ROUTE TRAFFIC CONTROL CENTER (ARTCC): a facility established to provide air traffic control service to aircraft operating on an IFR flight plan within controlled airspace and principally during the enroute phase of flight.

ALERT AREA: see special-use airspace.

ANNUAL INSTRUMENT APPROACH (AIA): an approach to an airport with the intent to land by an aircraft in accordance with an IFR flight plan when visibility is less than three miles and/or when the ceiling is at or below the minimum initial approach altitude.

APPROACH LIGHTING SYSTEM (ALS): an airport lighting facility which provides visual guidance to landing aircraft by radiating light beams by which the pilot aligns the aircraft with the extended centerline of the runway on his final approach and landing.

APPROACH MINIMUMS: the altitude below which an aircraft may not descend while on an IFR approach unless the pilot has the runway in sight.

AUTOMATIC DIRECTION FINDER (ADF): an aircraft radio navigation system which senses and indicates the direction to a non-directional radio beacon (NDB) ground transmitter.

AUTOMATED WEATHER OBSERVATION STATION (AWOS): equipment used to automatically record weather conditions (i.e. cloud height, visibility, wind speed and direction, temperature, dewpoint, etc...)

AUTOMATED TERMINAL INFORMATION SERVICE (ATIS): the continuous broadcast of recorded non-control information at towered airports. Information typically includes wind speed, direction, and runway in use.

AZIMUTH: Horizontal direction expressed as the angular distance between true north and the direction of a fixed point (as the observer's heading).

BASE LEG: A flight path at right angles to the landing runway off its approach end. The base leg normally extends from the downwind leg to the intersection of the extended runway centerline. See "traffic pattern."

BEARING: the horizontal direction to or from any point, usually measured clockwise from true north or magnetic north.

BLAST FENCE: a barrier used to divert or dissipate jet blast or propeller wash.

BUILDING RESTRICTION LINE (BRL): A line which identifies suitable building area locations on the airport.

CIRCLING APPROACH: a maneuver initiated by the pilot to align the aircraft with the runway for landing when flying

a predetermined circling instrument approach under IFR.

CLASS A AIRSPACE: see Controlled Airspace.

CLASS B AIRSPACE: see Controlled Airspace.

CLASS C AIRSPACE: see Controlled Airspace.

CLASS D AIRSPACE: see Controlled Airspace.

CLASS E AIRSPACE: see Controlled Airspace.

CLASS G AIRSPACE: see Controlled Airspace.

CLEAR ZONE: see Runway Protection Zone.

CROSSWIND: wind flow that is not parallel to the runway of the flight path of an aircraft.

COMPASS LOCATOR (LOM): a low power, low/medium frequency radiobeacon installed in conjunction with the instrument landing system at one or two of the marker sites.

CONTROLLED AIRSPACE: airspace of defined dimensions within which air traffic control services are provided to instrument flight rules (IFR) and visual flight rules (VFR) flights in accordance with the airspace classification. Controlled airspace in the United States is designated as follows:

- *CLASS A:* generally, the airspace from 18,000 feet mean sea level (MSL) up to but not including flight level FL600. All persons must operate their aircraft under IFR.

- *CLASS B:* generally, the airspace from the surface to 10,000 feet MSL surrounding the nation's busiest airports. The configuration of Class B airspace is unique to each airport, but typically consists of two or more layers of air space and is designed to contain all published instrument approach procedures to the airport. An air traffic control clearance is required for all aircraft to operate in the area.

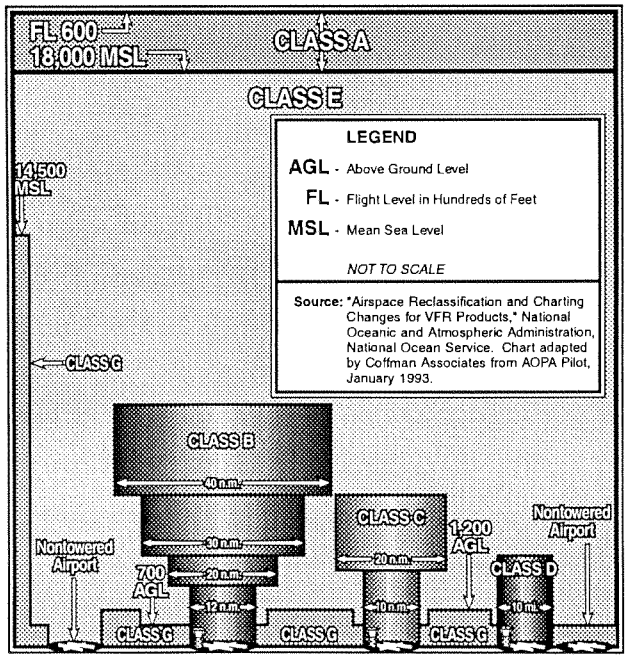
- *CLASS C:* generally, the airspace from the surface to 4,000 feet above the air port elevation (charted as MSL) surrounding those airports that have an operational control tower and radar approach control and are served by a qualifying number of IFR operations or passenger enplanements. Although individually tailored for each airport, Class C airspace typically consists of a surface area with a five nautical mile (nm) radius and an outer area with a 10 nautical mile radius that extends from 1,200 feet to 4,000 feet above the airport elevation. Two-way radio communication is required for all aircraft.

- *CLASS D:* generally, that airspace from the surface to 2,500 feet above the air port elevation (charted as MSL) surrounding those airport that have an operational control tower. Class D air space is individually tailored and configured to encompass published instrument approach procedures. Unless otherwise authorized, all

persons must establish two-way radio communication.

- *CLASS E:* generally, controlled airspace that is not classified as Class A, B, C, or D. Class E airspace extends upward from either the surface or a designated altitude to the overlying or adjacent controlled airspace. When designated as a surface area, the airspace will be configured to contain all instrument procedures. Class E airspace encompasses all Victor Airways. Only aircraft following instrument flight rules are required to establish two-way radio communication with air traffic control.

- *CLASS G:* generally, that airspace not classified as Class A, B, C, D, or E. Class G airspace is uncontrolled for all aircraft. Class G airspace extends from the surface to the overlying Class E airspace.



CONTROLLED FIRING AREA: see special-use airspace.

CROSSWIND LEG: A flight path at right angles to the landing runway off its upwind end. See "traffic pattern."

DECLARED DISTANCES: The distances declared available for the airplane's takeoff runway, takeoff distance, accelerate-stop distance, and landing distance requirements. The distances are:

- *TAKEOFF RUNWAY AVAILABLE (TORA):* The runway length declared available and suitable for the ground run of an airplane taking off;

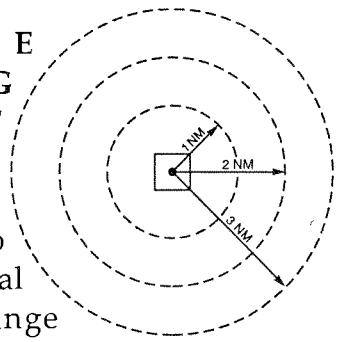
- *TAKEOFF DISTANCE AVAILABLE (TODA):* The TORA plus the length of any remaining runway and/or clear way beyond the far end of the TORA;

- *ACCELERATE-STOP DISTANCE AVAILABLE (ASDA):* The runway plus stopway length declared available for the acceleration and deceleration of an aircraft aborting a takeoff; and

- *LANDING DISTANCE AVAILABLE (LDA):* The runway length declared available and suitable for landing.

DISPLACED THRESHOLD: a threshold that is located at a point on the runway other than the designated beginning of the runway.

DISTANCE MEASURING EQUIPMENT (DME): Equipment (airborne and ground) used to measure, in nautical miles, the slant range



distance of an aircraft from the DME navigational aid.

DNL: The 24-hour average sound level, in A-weighted decibels, obtained after the addition of ten decibels to sound levels for the periods between 10 p.m. and 7 a.m. as averaged over a span of one year. It is the FAA standard metric for determining the cumulative exposure of individuals to noise.

DOWNWIND LEG: A flight path parallel to the landing runway in the direction opposite to landing. The downwind leg normally extends between the crosswind leg and the base leg. Also see "traffic pattern."

EASEMENT: The legal right of one party to use a portion of the total rights in real estate owned by another party. This may include the right of passage over, on, or below the property; certain air rights above the property, including view rights; and the rights to any specified form of development or activity, as well as any other legal rights in the property that may be specified in the easement document.

ENPLANED PASSENGERS: the total number of revenue passengers boarding aircraft, including originating, stop-over, and transfer passengers, in scheduled and non-scheduled services.

FINAL APPROACH: A flight path in the direction of landing along the extended runway centerline. The final approach normally extends from the base leg to the runway. See "traffic pattern."

FIXED BASE OPERATOR (FBO): A provider of services to users of an airport. Such services include, but are not limited to, hangaring, fueling, flight training, repair, and maintenance.

FRANGIBLE NAVAID: a navigational aid which retains its structural integrity and stiffness up to a designated maximum load, but on impact from a greater load, breaks, distorts, or yields in such a manner as to present the minimum hazard to aircraft.

GENERAL AVIATION: that portion of civil aviation which encompasses all facets of aviation except air carriers holding a certificate of convenience and necessity, and large aircraft commercial operators.

GLIDESLOPE (GS): Provides vertical guidance for aircraft during approach and landing. The glideslope consists of the following:

1. Electronic components emitting signals which provide vertical guidance by reference to airborne instruments during instrument approaches such as ILS; or

2. Visual ground aids, such as VASI, which provide vertical guidance for VFR approach or for the visual portion of an instrument approach and landing.

GLOBAL POSITIONING SYSTEM: See "GPS."

GPS - GLOBAL POSITIONING SYSTEM: A system of 24 satellites

used as reference points to enable navigators equipped with GPS receivers to determine their latitude, longitude, and altitude.

HELIPAD: a designated area for the takeoff, landing, and parking of helicopters.

HIGH-SPEED EXIT TAXIWAY: a long radius taxiway designed to expedite aircraft turning off the runway after landing (at speeds to 60 knots), thus reducing runway occupancy time.

INSTRUMENT APPROACH: A series of predetermined maneuvers for the orderly transfer of an aircraft under instrument flight conditions from the beginning of the initial approach to a landing, or to a point from which a landing may be made visually.

INSTRUMENT FLIGHT RULES (IFR): Rules governing the procedures for conducting instrument flight. Also a term used by pilots and controllers to indicate type of flight plan.

INSTRUMENT LANDING SYSTEM (ILS): A precision instrument approach system which normally consists of the following electronic components and visual aids:

1. Localizer.
2. Glide Slope.
3. Outer Marker.
4. Middle Marker.
5. Approach Lights.

LANDING DISTANCE AVAILABLE (LDA): see declared distances.

LOCAL TRAFFIC: aircraft operating in the traffic pattern or within sight of the tower, or aircraft known to be departing or arriving from the local practice areas, or aircraft executing practice instrument approach procedures. Typically, this includes touch-and-go training operations.

LOCALIZER: The component of an ILS which provides course guidance to the runway.

LOCALIZER TYPE DIRECTIONAL AID (LDA): a facility of comparable utility and accuracy to a localizer, but is not part of a complete ILS and is not aligned with the runway.

LORAN: long range navigation, an electronic navigational aid which determines aircraft position and speed by measuring the difference in the time of reception of synchronized pulse signals from two fixed transmitters. Loran is used for enroute navigation.

MICROWAVE LANDING SYSTEM (MLS): an instrument approach and landing system that provides precision guidance in azimuth, elevation, and distance measurement.

MILITARY OPERATIONS AREA (MOA): see special-use airspace.

MISSED APPROACH COURSE (MAC): The flight route to be followed if, after an instrument approach, a landing is not effected, and occurring normally:

1. When the aircraft has descended to the decision height and has not established visual contact; or

2. When directed by air traffic control to pull up or to go around again.

MOVEMENT AREA: the runways, taxiways, and other areas of an airport which are utilized for taxiing/hover taxiing, air taxiing, takeoff, and landing of aircraft, exclusive of loading ramps and parking areas. At those airports with a tower, air traffic control clearance is required for entry onto the movement area.

NAVAID: a term used to describe any electrical or visual air navigational aids, lights, signs, and associated supporting equipment (i.e. PAPI, VASI, ILS, etc..)

NOISE CONTOUR: A continuous line on a map of the airport vicinity connecting all points of the same noise exposure level.

NONDIRECTIONAL BEACON (NDB): A beacon transmitting nondirectional signals whereby the pilot of an aircraft equipped with direction finding equipment can determine his or her bearing to and from the radio beacon and home on, or track to, the station. When the radio beacon is installed in conjunction with the Instrument Landing System marker, it is normally called a Compass Locator.

NONPRECISION APPROACH PROCEDURE: a standard instrument approach procedure in which no electronic glide slope is provided, such as VOR, TACAN, NDB, or LOC.

OBJECT FREE AREA (OFA): an area on the ground centered on a runway, taxiway, or taxilane centerline provided to enhance the safety of aircraft operations by having the area free of objects, except for objects that need to be located in the OFA for air navigation or aircraft ground maneuvering purposes.

OBSTACLE FREE ZONE (OFZ): the airspace below 150 feet above the established airport elevation and along the runway and extended runway centerline that is required to be kept clear of all objects, except for frangible visual NAVAIDs that need to be located in the OFZ because of their function, in order to provide clearance for aircraft landing or taking off from the runway, and for missed approaches.

OPERATION: a take-off or a landing.

OUTER MARKER (OM): an ILS navigation facility in the terminal area navigation system located four to seven miles from the runway edge on the extended centerline indicating to the pilot, that he/she is passing over the facility and can begin final approach.

PRECISION APPROACH: a standard instrument approach procedure which provides runway alignment and glide slope (descent) information. It is categorized as follows:

- *CATEGORY I (CAT I):* a precision approach which provides for approaches with a decision height of not less than 200 feet and visibility not less than 1/2 mile or Runway Visual Range (RVR) 2400 (RVR 1800) with operative touchdown zone and runway centerline lights.

- *CATEGORY II (CAT II):* a precision approach which provides for approaches with a decision height of not less than 100 feet and visibility not less than 1200 feet RVR.

- *CATEGORY III (CAT III):* a precision approach which provides for approaches with minima less than Category II.

PRECISION APPROACH PATH INDICATOR (PAPI): A lighting system providing visual approach slope guidance to aircraft during a landing approach. It is similar to a VASI but provides a sharper transition between the colored indicator lights.

PRECISION OBJECT FREE AREA (POFA): an area centered on the extended runway centerline, beginning at the runway threshold and extending behind the runway threshold that is 200 feet long by 800 feet wide. The POFA is a clearing standard which requires the POFA to be kept clear of above ground objects protruding above the runway safety area edge elevation (except for frangible NAVAIDS). The POFA applies to all new authorized instrument approach procedures with less than 3/4 mile visibility.

PROHIBITED AREA: see special-use airspace.

REMOTE COMMUNICATIONS OUTLET (RCO): an unstaffed transmitter receiver/facility remotely controlled by air traffic personnel. RCOs serve flight service stations (FSSs). RCOs were established to provide ground-to-ground communications between air traffic control specialists and pilots at satellite airports for delivering enroute clearances, issuing departure authorizations, and acknowledging instrument flight rules cancellations or departure/landing times.

REMOTE TRANSMITTER/RECEIVER (RTR): see remote communications outlet. RTRs serve ARTCCs.

RELIEVER AIRPORT: an airport to serve general aviation aircraft which might otherwise use a congested air-carrier served airport.

RESTRICTED AREA: see special-use airspace.

RNAV: area navigation - airborne equipment which permits flights over determined tracks within prescribed accuracy tolerances without the need to overfly ground-based navigation facilities. Used enroute and for approaches to an airport.

RUNWAY: a defined rectangular area on an airport prepared for aircraft landing and takeoff. Runways are normally numbered in relation to their magnetic direction, rounded off to the nearest 10 degrees. For example, a runway with a magnetic heading of 180 would be designated Runway 18. The runway heading on the opposite end of the runway is 180 degrees from that runway end. For example, the opposite runway heading for Runway 18 would be Runway 36 (magnetic heading of 360). Aircraft can takeoff or land from either end of a runway, depending upon wind direction.

RUNWAY BLAST PAD: a surface adjacent to the ends of runways provided to reduce the erosive effect of jet blast and propeller wash.

RUNWAY END IDENTIFIER LIGHTS (REIL): Two synchronized flashing lights, one on each side of the runway threshold, which provide rapid and positive identification of the approach end of a particular runway.

RUNWAY GRADIENT: the average slope, measured in percent, between the two ends of a runway.

RUNWAY PROTECTION ZONE (RPZ): An area off the runway end to enhance the protection of people and property on the ground. The RPZ is trapezoidal in shape. Its dimensions are determined by the aircraft approach speed and runway approach type and minima.

RUNWAY SAFETY AREA (RSA): a defined surface surrounding the runway prepared or suitable for reducing the risk of damage to airplanes in the event of an undershoot, overshoot, or excursion from the runway.

RUNWAY VISUAL RANGE (RVR): an instrumentally derived value, in feet, representing the horizontal distance a pilot can see down the runway from the runway end.

RUNWAY VISIBILITY ZONE (RVZ): an area on the airport to be kept clear of permanent objects so that there is an unobstructed line-of-site from any point five feet above the runway centerline to any point five feet above an intersecting runway centerline.

SEGMENTED CIRCLE: a system of visual indicators designed to provide traffic pattern information at airports without operating control towers.

SHOULDER: an area adjacent to the edge of paved runways, taxiways or aprons providing a transition between the pavement and the adjacent surface; support for aircraft running off the pavement; enhanced drainage; and blast protection. The shoulder does not necessarily need to be paved.

SLANT-RANGE DISTANCE: The straight line distance between an aircraft and a point on the ground.

SPECIAL-USE AIRSPACE: airspace of defined dimensions identified by a surface area wherein activities must be confined because of their nature and/or wherein limitations may be imposed upon aircraft operations that are not a part of those activities. Special-use airspace classifications include:

- *ALERT AREA:* airspace which may contain a high volume of pilot training activities or an unusual type of aerial activity, neither of which is hazardous to aircraft.

- *CONTROLLED FIRING AREA:* airspace wherein activities are conducted under conditions so controlled as to eliminate hazards to nonparticipating aircraft and to ensure the safety of persons or property on the ground.

- *MILITARY OPERATIONS AREA (MOA):* designated airspace with defined vertical and lateral dimensions established outside Class A airspace to separate/segregate certain military activities from instrument flight rule (IFR) traffic and to identify for visual flight rule (VFR) traffic where these activities are conducted.

- *PROHIBITED AREA:* designated airspace within which the flight of aircraft is prohibited.

- *RESTRICTED AREA:* airspace designated under Federal Aviation Regulation (FAR) 73, within which the flight of aircraft, while not wholly prohibited, is subject to restriction. Most restricted areas are designated joint use. When not in use by the using agency, IFR/VFR operations can be authorized by the controlling air traffic control facility.

- *WARNING AREA:* airspace which may contain hazards to nonparticipating aircraft.

STANDARD INSTRUMENT DEPARTURE (SID): a pre-planned IFR departure procedure.

STANDARD TERMINAL ARRIVAL (STAR): a pre-planned IFR arrival procedure.

STOP-AND-GO: a procedure wherein an aircraft will land, make a complete stop on the runway, and then commence a takeoff from that point. A stop-and-go is recorded as two operations: one operation for the landing and one operation for the takeoff.

STRAIGHT-IN LANDING/APPROACH: a landing made on a runway aligned within 30 degrees of the final approach course following completion of an instrument approach.

TACTICAL AIR NAVIGATION (TACAN): An ultra-high frequency electronic air navigation system which provides suitably-equipped aircraft a continuous indication of bearing and distance to the TACAN station.

TAKEOFF RUNWAY AVAILABLE (TORA): see declared distances.

TAKEOFF DISTANCE AVAILABLE (TODA): see declared distances.

TAXILANE: the portion of the aircraft parking area used for access between taxiways and aircraft parking positions.

TAXIWAY: a defined path established for the taxiing of aircraft from one part of an airport to another.

TAXIWAY SAFETY AREA (TSA): a defined surface alongside the taxiway prepared or suitable for reducing the risk of damage to an airplane unintentionally departing the taxiway.

TETRAHEDRON: a device used as a landing direction indicator. The small end of the tetrahedron points in the direction of landing.

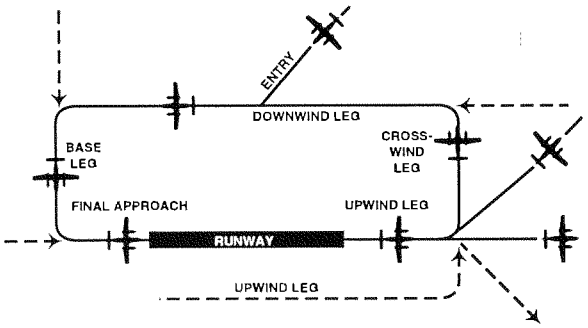
THRESHOLD: the beginning of that portion of the runway available for landing. In some instances the landing threshold may be displaced.

TOUCH-AND-GO: an operation by an aircraft that lands and departs on a runway without stopping or exiting the runway. A touch-and-go is recorded as two operations: one operation for the landing and one operation for the take-off.

TOUCHDOWN ZONE LIGHTING (TDZ): Two rows of transverse light bars located symmetrically about the runway centerline normally at 100-foot intervals. The basic system extends 3,000 feet along the runway.

TRAFFIC PATTERN: The traffic flow that is prescribed for aircraft landing at or taking off from an airport. The components of a typical traffic pattern are the upwind leg, crosswind leg, downwind leg, base leg, and final approach.

UNICOM: A nongovernment communication facility which may provide

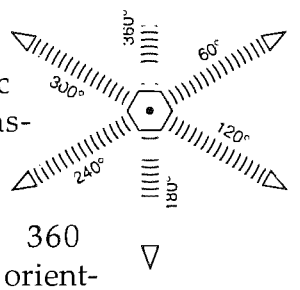


airport information at certain airports. Locations and frequencies of UNICOM's are shown on aeronautical charts and publications.

UPWIND LEG: A flight path parallel to the landing runway in the direction of landing. See "traffic pattern."

VECTOR: A heading issued to an aircraft to provide navigational guidance by radar.

VERY HIGH FREQUENCY/ OMNIDIRECTIONAL RANGE STATION (VOR): A ground-based electronic navigation aid transmitting very high frequency navigation signals, 360 degrees in azimuth, oriented from magnetic north. Used as the basis for navigation in the national airspace system. The VOR periodically identifies itself by Morse Code and may have an additional voice identification feature.



VERY HIGH FREQUENCY OMNIDIRECTIONAL RANGE STATION/TACTICAL AIR NAVIGATION (VORTAC): A navigation aid providing VOR azimuth, TACAN azimuth, and TACAN distance-measuring equipment (DME) at one site.

VICTOR AIRWAY: A control area or portion thereof established in the form of a corridor, the centerline of which is defined by radio navigational aids.

VISUAL APPROACH: An approach wherein an aircraft on an IFR flight plan, operating in VFR conditions under the control of an air traffic control facility and having an air traffic control authorization, may proceed to the airport of destination in VFR conditions.

VISUAL APPROACH SLOPE INDICATOR (VASI): An airport lighting facility providing vertical visual approach slope guidance to aircraft during approach to landing by radiating a directional pattern of

high intensity red and white focused light beams which indicate to the pilot that he is on path if he sees red/white, above path if white/white, and below path if red/red. Some airports serving large aircraft have three-bar VASI's which provide two visual guide paths to the same runway.

VISUAL FLIGHT RULES (VFR): Rules that govern the procedures for conducting flight under visual conditions. The term VFR is also used in the United States to indicate weather conditions that are equal to or greater than minimum VFR requirements. In addition, it is used by pilots and controllers to indicate type of flight plan.

VOR: See "Very High Frequency Omnidirectional Range Station."

VORTAC: See "Very High Frequency Omnidirectional Range Station/Tactical Air Navigation."

WARNING AREA: see special-use airspace.

ABBREVIATIONS

AC: advisory circular

ADF: automatic direction finder

ADG: airplane design group

AFSS: automated flight service station

AGL: above ground level

AIA: annual instrument approach

AIP: Airport Improvement Program

AIR-21: Wendell H. Ford Aviation Investment and Reform Act for the 21st Century

ALS: approach lighting system

ALSF-1: standard 2,400-foot high intensity approach lighting system with sequenced flashers (CAT I configuration)

ALSF-2: standard 2,400-foot high intensity approach light ing system with sequenced flashers (CAT II configuration)

APV: instrument approach procedure with vertical guidance

ARC: airport reference code

ARFF: aircraft rescue and fire-fighting

ARP: airport reference point

ARTCC: air route traffic control center

ASDA: accelerate-stop distance available

ASR: airport surveillance radar

ASOS: automated surface observation station

ATCT: airport traffic control tower

ATIS: automated terminal information service

AVGAS: aviation gasoline - typically 100 low lead (100LL)

AWOS: automated weather observation station

BRL: building restriction line

CFR: Code of Federal Regulations

CIP: capital improvement program

DME: distance measuring equipment

DNL: day-night noise level

DWL: runway weight bearing capacity for air

craft with dual-wheel type landing gear

DTWL: runway weight bearing capacity for aircraft with dual-tandem type landing gear

FAA: Federal Aviation Administration

FAR: Federal Aviation Regulation

FBO: fixed base operator

FY: fiscal year

GPS: global positioning system

GS: glide slope

HIRL: high intensity runway edge lighting

IFR: instrument flight rules (FAR Part 91)

ILS: instrument landing system

IM: inner marker

LDA: localizer type directional aid

LDA: landing distance available

LIRL: low intensity runway edge lighting

LMM: compass locator at middle marker

LOC: ILS localizer

LOM: compass locator at ILS outer marker

LORAN: long range navigation

MALS: medium intensity approach lighting system

MALSR: medium intensity approach lighting system with sequenced flashers

MALSR: medium intensity approach lighting system with runway alignment indicator lights

MIRL: medium intensity runway edge lighting

MITL: medium intensity taxiway edge lighting

MLS: microwave landing system

MM: middle marker

MOA: military operations area

MSL: mean sea level

NAVAID: navigational aid

NDB: nondirectional radio beacon

NM: nautical mile (6,076 .1 feet)

NPIAS: National Plan of Integrated Airport Systems

NPRM: notice of proposed rulemaking

ODALS: omnidirectional approach lighting system

OFA: object free area

OFZ: obstacle free zone

OM: outer marker

PAC: planning advisory committee

PAPI: precision approach path indicator

PFC: porous friction course

PFC: passenger facility charge

PCL: pilot-controlled lighting

PIW: public information workshop

PLASI: pulsating visual approach slope indicator

POFA: precision object free area

PVASI: pulsating/steady visual approach slope indicator

RCO: remote communications outlet

REIL: runway end identifier lighting

RNAV: area navigation

RPZ: runway protection zone

RTR: remote transmitter/receiver

RVR: runway visibility range

RVZ: runway visibility zone

SALS: short approach lighting system

SASP: state aviation system plan

SEL: sound exposure level

SID: standard instrument departure

SM: statute mile (5,280 feet)

SRE: snow removal equipment

SSALF: simplified short approach lighting system with sequenced flashers

SSALR: simplified short approach lighting system with runway alignment indicator lights

STAR: standard terminal arrival route

SWL: runway weight bearing capacity for aircraft with single-wheel type landing gear

STWL: runway weight bearing capacity for aircraft with single-wheel tandem type landing gear

TAF: Federal Aviation Administration (FAA) Terminal Area Forecast

TACAN:	tactical air navigational aid
TORA:	takeoff runway available
TODA:	takeoff distance available
TRACON:	terminal radar approach control
VASI:	visual approach slope indicator
VFR:	visual flight rules (FAR Part 91)
VHF:	very high frequency
VOR:	very high frequency omni-directional range
VORTAC:	VOR and TACAN collocated

SHOW LOW
Municipal Airport

Appendix B
BASED AIRCRAFT LISTING

BASED AIRCRAFT LISTING

SHOW LOW MUNICIPAL AIRPORT
September 2001

N-Number	Type	Make/Model
1911	SEP	Cessna 150
31592	SEP	Piper Lance
45705	SEP	Cessna 150
60024	SEP	Cessna 150
78739	SEP	Piper Supercub
4894U	SEP	Cessna 210
2280R	SEP	Cessna 210
9548X	SEP	Cessna 210
9553J	SEP	Piper Cherokee
9499X	SEP	Cessna 210
9139E	SEP	Maule M-5-235C
8981M	SEP	Beechcraft Bonanza
8003R	SEP	Beechcraft Bonanza
756WG	SEP	Cessna 206
7343P	SEP	Cessna 210
733NW	SEP	Cessna 172
726M	SEP	Cessna 210
364DD	SEP	Beechcraft A36
42K	SEP	Cessna 140
182ES	SEP	Cessna 182
53W	SEP	Bellanca
4734N	SEP	Cessna 182
5447U	SEP	Beechcraft Bonanza
555TL	SEP	Cessna 210
2471H	SEP	Ercoupe 415-C
3530C	SEP	Cessna 206

N-Number	Type	Make/Model
6618B	SEP	Cessna 210
9636U	SEP	Cessna 172
210EE	SEP	Cessna 210
6398B	SEP	Cessna 182
6465X	SEP	Beechcraft Bonanza
6887P	SEP	Piper PA-24-250
4744K	SEP	Cessna 210
6104U	SEP	Cessna 210
7226W	SEP	Piper PA-28-180
7267Z	SEP	Cessna 182
74573	SEP	Mooney M20
12WA	SEP	RU6
7472Q	SEP	Cessna 182
3531Y	SEP	Cessna 182
8174P	SEP	Piper Comanche
3118W	SEP	Beechcraft Bonanza
5441K	MEP	Navion
70PD	MEP	Cessna 421
3F	MEP	Smith Aerostar
5EU	MEP	Cessna 421
60RA	MEP	Piper Sceneca
340TS	MEP	Cessna 340
613WK	MEP	Piper Aztec
6256Y	MEP	Piper Aztec
6834C	MEP	Cessna 421
207FM	MEP	Cessna 421
11NS	MEP	Smith Aerostar
42ML	MEP	Cessna 421
N4162G	MEP	Cessna 421

926ES	TP	Cessna 425
—	Ultralight	—

Appendix C
AIRPORT LAYOUT PLAN DRAWINGS

Appendix C
AIRPORT LAYOUT PLAN DRAWINGS

Per Federal Aviation Administration (FAA) and Arizona Department of Transportation, Division of Aeronautics (ADOT) requirements, an official Airport Layout Plan (ALP) has been developed for Show Low Regional Airport. The ALP graphically presents the existing and ultimate airport layout. The ALP is used, in part by the FAA and state, to determine funding eligibility for future development projects.

The ALP was prepared on a computer-aided drafting system for future ease of use. The computerized plan set provides detailed information of existing and future facility layout on multiple layers that permits the user to focus in on any section of the airport at a desirable scale. The plan can be used as base information for design, and can be easily updated in the future to reflect new development and more detail concerning existing conditions as made available through design surveys.

A number of related drawings, which depict the ultimate airspace and landside development, are included with the ALP. The following provides a brief discussion of the additional drawings included with the ALP:

Terminal Area Drawing - The terminal area drawing provides greater detail concerning landside improvements along the center and south apron areas.

Airport Airspace Drawing - The Airport Airspace Drawing is a graphic depiction of Federal Aviation Regulations (F.A.R.) Part 77, *Objects Affecting Navigable Airspace*, regulatory criterion. The Airport Airspace Drawing is intended to aid local authorities

in determining if proposed development could present a hazard to the airport and obstruct the approach path to a runway end. This plan should be coordinated with local land use planners.

Approach Zone Profiles and Runway Profiles Drawing s - These drawings provide both plan and profile views of the F.A.R. Part 77 approach surface for each runway end. A composite profile of the extended ground line is depicted. Obstructions and clearances over roads and railroads are shown as appropriate.

Inner Portion of the Approach Surface Drawings - The Inner Portion of the Approach Surface Drawings are scaled drawings of the runway protection zone (RPZ), runway safety area (RSA), obstacle free zone (OFZ), and object free area (OFA) for each runway end. A plan and profile view of each RPZ is provided to facilitate identification of obstructions that lie within these safety areas. Detailed obstruction and facility data is provided to identify planned improvements and the disposition of obstructions (as appropriate).

On-Airport Land Use Drawing - The On-Airport Land Use Drawing is a graphic depiction of the land use recommendations. When development is proposed, it should be directed to the appropriate land use area depicted on this plan.

Airport Property Map - The Property Map provides information on the acquisition and identification of all land tracts under the control of the airport. Both existing and future property holdings are identified on the Property Map.

REGIONAL AIRPORT

AIRPORT LAYOUT PLAN SET

INDEX OF DRAWINGS

Coffman Associates
Airport Consultants

PREPARED FOR
CITY OF SHOW LOW, ARIZONA

EXISTING BUILDINGS/FACILITIES

NO.	DESCRIPTION	ELEVATIONS
1	ADMINISTRATION/TERMINAL BUILDING	6423.6' MSL
2	AIRPORT MAINTENANCE AND ARFF	–
3	ELECTRIC VAULT/EMERGENCY GENERATOR	6418.7' MSL
4	FIXED BASE OPERATION HANGAR	–
5	FIXED BASE OPERATION HANGAR	6434.0' MSL
6	FIXED BASE OPERATION HANGAR	6436.3' MSL
7	OFFICE BUILDING	6421.2' MSL
8	AIRCRAFT STORAGE HANGAR	–
9	AIRCRAFT STORAGE HANGAR	–
10	AIRCRAFT STORAGE HANGAR	6434.7' MSL
11	AIRCRAFT STORAGE HANGAR	6434.4' MSL
12	AIRCRAFT STORAGE HANGAR	6426.6' MSL
13	AIRCRAFT STORAGE HANGAR	6433.1' MSL
14	AIRCRAFT STORAGE HANGAR	6433.0' MSL
15	AIRCRAFT STORAGE HANGAR	6434.1' MSL
16	AIRCRAFT STORAGE HANGAR	6425.2' MSL
17	AIRCRAFT STORAGE HANGAR	6426.3' MSL
18	AIRCRAFT STORAGE HANGAR	6425.7' MSL
19	AIRCRAFT STORAGE HANGAR	6425.9' MSL
20	HANGAR (1 UNIT)	--
21	HANGAR (1 UNIT)	6419.3' MSL
22	HANGAR (1 UNIT)	6419.0' MSL
23	HANGAR (1 UNIT)	6420.4' MSL
24	HANGAR (1 UNIT)	6421.0' MSL
25	HANGAR (1 UNIT)	6419.7' MSL
26	HANGAR (1 UNIT)	6419.7' MSL
27	HANGAR (1 UNIT)	6420.6' MSL
28	HANGAR (1 UNIT)	--
29	HANGAR (1 UNIT)	--
30	100LL UNDERGROUND FUEL STORAGE	--
31	ARIZONA ARMY NATIONAL GUARD	6438.9' MSL
32	ARIZONA ARMY NATIONAL GUARD	6434.8' MSL
33	ELECTRIC VAULT/EMERGENCY GENERATOR	--
		--

LEGEND

EXISTING	ULTIMATE	DESCRIPTION
		AIRPORT PROPERTY LINE
		AIRPORT REFERENCE POINT (ARP)
		AIRPORT ROTATING BEACON
		AVIGATION EASEMENT (if applicable)
		BUILDING CONSTRUCTION
BRL	BRL	BUILDING RESTRICTION LINE (BRL)
		OBJECT FREE AREA (OFA)
		RUNWAY SAFETY AREA (RSA)
		OBSTACLE FREE ZONE (OFZ)
		DRAINAGE
		FACILITY CONSTRUCTION
		FENCING
PAPI-2	PAPI-2	NAVIGATIONAL AID INSTALLATION
		RUNWAY END IDENTIFICATION LIGHTS (REIL)
		RUNWAY THRESHOLD LIGHTS
		SECTION CORNER
		SEGMENTED CIRCLE/LIGHTED WIND TEE
		TOPOGRAPHIC CONTOURS
		WIND INDICATOR (Lighted)
		POWER POLE
3	3	TAXIWAY DESIGNATION
		DIRT ROADS
		RUNWAY EDGE LIGHTING
		PAVEMENT TO BE ABANDONED
		SPECIAL USE PERMIT BOUNDARY

AIRPORT DATA

SHOW LOW REGIONAL AIRPORT (SOW)

CITY: SHOW LOW, ARIZONA — COUNTY: NAVAJO

RANGE: 22 East — TOWNSHIP: 10 North — CIVIL TOWNSHIP: Not Applicable

		EXISTING	ULTIMATE
NPIAS SERVICE LEVEL		NON-PRIMARY	PRIMARY
AIRPORT REFERENCE CODE		C-III	D-III
AIRPORT ELEVATION (NAVD 88)		6415.4'	6430.0 MSL
MEAN MAXIMUM TEMPERATURE OF HOTTEST MONTH		85.9 ° F (AUG.)	SAME
AIRPORT REFERENCE POINT (ARP) COORDINATES (NAD 83)	Latitude	34°15'55.70" N	34°16'01.16" N
	Longitude	110°00'20.40" W	110°00'30.15" W
AIRPORT and TERMINAL NAVIGATIONAL AIDS		NDB BEACON	ILS BEACON
GPS AT AIRPORT		YES	YES
INSTRUMENT APPROACH TYPES		NDB/GPS	GPS/ILS

RUNWAY DATA

RUNWAY DATA	RUNWAY 6-24 EXISTING	RUNWAY 6-24 ULTIMATE	RUNWAY 3-21 (To Be Closed) EXISTING	RUNWAY 3-21 (To Be Closed) ULTIMATE	RUNWAY 18 - 36 EXISTING	RUNWAY 18 - 36 ULTIMATE
RUNWAY CATEGORY/AIRCRAFT DESIGN GROUP	C-III	D-III	B-I[2]	See Note 3	--	B-II
CRITICAL DESIGN AIRCRAFT	GLOBAL EXPRESS	GULFSTREAM 500	BEECHCRAFT KINGAIR B100	–	–	DASSAULT FALCON 50
WINGSPAN OF DESIGN AIRCRAFT	94'	93.5'	45.8'	–	–	53.5'
APPROACH SPEED OF DESIGN AIRCRAFT	122 Knots	156 Knots	111 Knots	–	–	114 Knots
MAXIMUM TAKE OFF WEIGHT (in lbs.)	95,250	85,500	11,800	–	–	30,650
RUNWAY AZIMUTH	75.97° / 255.98°	SAME	47.79° / 227.80°	–	–	12° / 192°
RUNWAY BEARING (TRUE)	N75°58'17.64"E	SAME	N47°47'01.000"E	–	–	N12°00'00.000"E
RUNWAY DIMENSIONS	7,200' x 100'	8,600' x 100'	3,937' x 60'	–	–	5,500' x 75'
ELEVATION OF RWY. TOUCH DOWN ZONE (MSL)	6404.1' / 6405.0'	6404.1' / 6405.0'	6415.4' / 6414.7	–	–	6430.0' / 6402.7'
ELEVATION OF RUNWAY HIGH POINT (above MSL)	6404.1'	6405.0'	6415.5'	–	–	6430.0'
ELEVATION OF RUNWAY LOW POINT (above MSL)	6399.3'	6383.3'	6400.7'	–	–	6363.0'
WIND COVERAGE IN MPH	12.1-77.78%/15-86.31%	SAME	12.1-90.35%/15-95.57%	–	–	12.1-96.43%/15-98.37%
APPROACH VISIBILITY MINIMUMS	VISUAL / 1 MILE	1/2 MILE / 1/2 MILE	VISUAL / VISUAL	–	–	1 MILE / 1 MILE
FAR PART 77 CATEGORY	VISUAL / NONPREC	PRECISION/PRECISION	VISUAL / VISUAL	–	–	NONPREC / NONPREC
RUNWAY INSTRUMENTATION	VISUAL / NONPREC	PRECISION/PRECISION	VISUAL / VISUAL	–	–	NONPREC / NONPREC
RUNWAY APPROACH SURFACES	20:1 / 34:1	50:1 / 50:1	20:1/20:1	–	–	34:1 / 34:1
RUNWAY THRESHOLD DISPLACEMENT	700' / 750'	NONE / NONE	NONE/NONE	–	–	NONE/NONE
RUNWAY STOPWAY	NONE	SAME	NONE	–	–	NONE
RUNWAY SAFETY AREA (RSA)	7,625' x 500'	10,600' x 500'	4,417' x 120'	–	–	6,100' x 150'
RSA DISTANCE BEYOND EACH RUNWAY END	420' / 5'	1,000' / 1,000'	240'/240'	–	–	300' / 300'
RUNWAY OBJECT FREE AREA (OFA)	7,625' x 800'	10,600' x 800'	4,417' x 250'	–	–	6,100' x 500'
OFA DISTANCE BEYOND EACH RUNWAY END	420' / 5'	1,000' / 1,000'	240'	–	–	300' / 300'
RUNWAY OBSTACLE FREE ZONE (OFZ)	7,600' x 400'	9,000' x 400'	4,337' x 250'	–	–	5,900' x 400'
OFZ DISTANCE BEYOND EACH RUNWAY END	200'	200'	200'	–	–	200'
LINE OF SITE REQUIREMENT	YES	YES	YES	–	–	YES
RUNWAY PAVEMENT MATERIAL	ASPHALT	SAME	ASPHALT	–	–	ASPHALT
RUNWAY PAVEMENT SURFACE TREATMENT	NONE	GROOVED	NONE	–	–	GROOVED
PAVEMENT STRENGTH (in thousand lbs.)[1]	35(S)60(D)	60(S)115(DW)	12.5(S)	–	–	30(S)60(D)
RUNWAY EFFECTIVE GRADIENT (in %)[1]	0.008%	0.18%	0.31%	–	–	1.2%
MAXIMUM GRADIENT (in %)	2%	SAME	2%	–	–	2%
RUNWAY LIGHTING	MIRL	SAME	DELINEATORS	–	–	MIRL
RUNWAY MARKINGS	NONPREC / NONPREC	PRECISION	VISUAL/VISUAL	–	–	NONPREC / NONPREC
RUNWAY APPROACH LIGHTING	NONE	MALSR / MALSR	NONE	–	–	NONE
TAXIWAY PAVEMENT MATERIAL	ASPHALT	SAME	ASPHALT	–	–	ASPHALT
TAXIWAY LIGHTING	MITL	SAME	DELINEATORS	–	–	MITL
TAXIWAY MARKING	CENTERLINE, HOLDLINES	SAME	CENTERLINE, HOLDLINES	–	–	CENTERLINES,HOLDLINES
THRESHOLD CROSSING HEIGHT	310' / 40'	310' / 40'	N/A	–	–	50' / 50'
VISUAL AIDS	REIL / REIL PAPI-2 / PAPI-2	PAPI-4 / PAPI-4 DISTANCE-TO-GO	NONE/NONE	–	–	REIL / REIL PAPI-4 / PAPI-4 DISTANCE-TO-GO

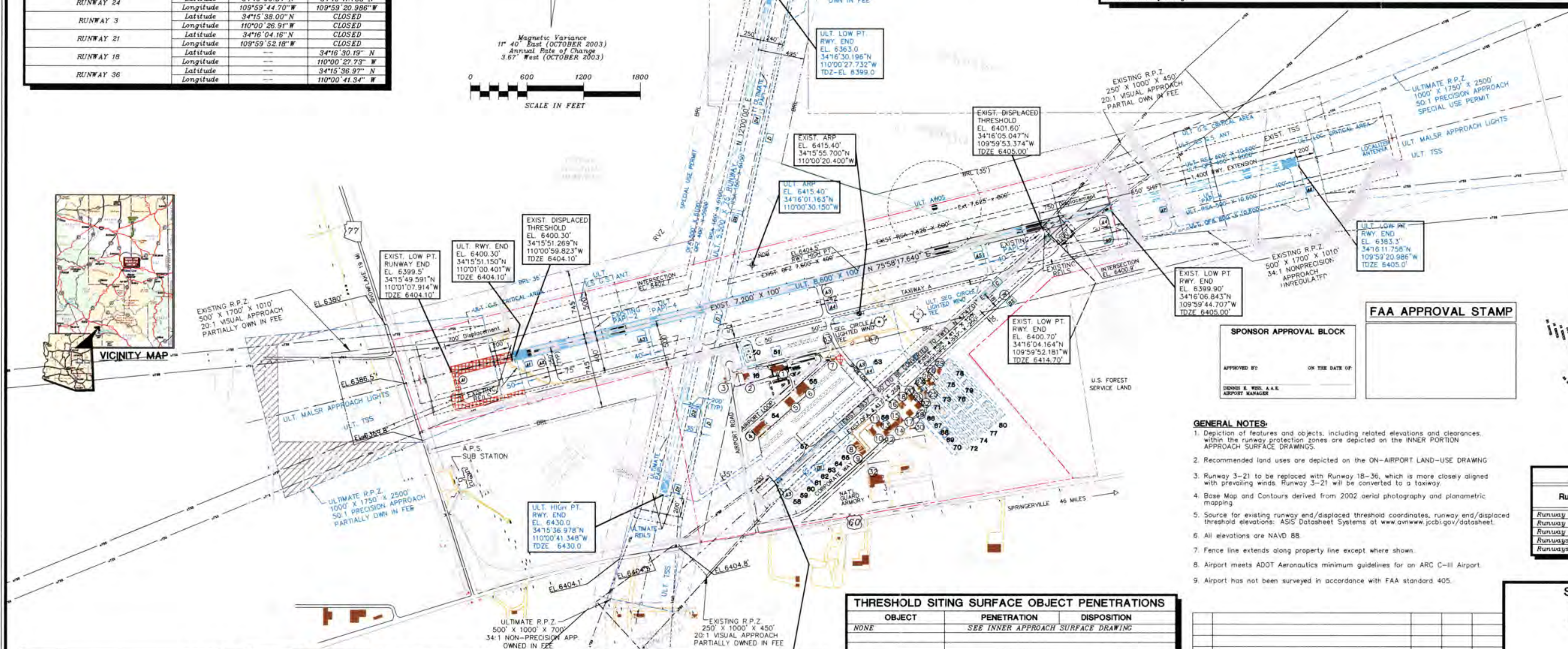
[1] Pavement strengths are expressed in Single(S), Dual(D), Dual Tandem(DT), and/or Double Dual Tandem(DDT) wheel loading capacities.
[2] Small Aircraft Only

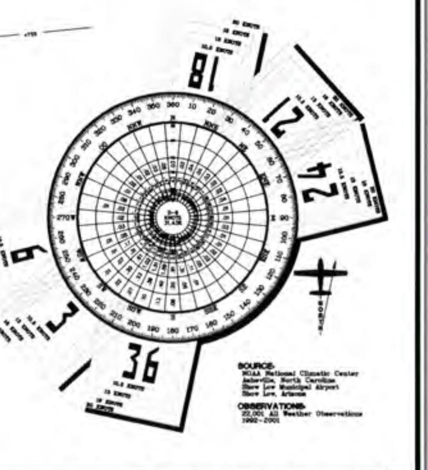
RUNWAY END COORDINATES NAD (83)

		EXISTING	ULTIMATE
RUNWAY 6	Latitude	34°15'49.59"N	34°15'51.150"N
	Longitude	110°01'07.91"W	110°01'00.401"W
RUNWAY 24	Latitude	34°16'06.84"N	34°16'11.758"N
	Longitude	109°59'44.70"W	109°59'20.986"W
RUNWAY 3	Latitude	34°15'38.00"N	CLOSED
	Longitude	110°00'26.91"W	CLOSED
RUNWAY 21	Latitude	34°16'04.16"N	CLOSED
	Longitude	109°59'52.18"W	CLOSED
RUNWAY 18	Latitude	--	34°16'30.19" N
	Longitude	--	110°00'27.73" W
RUNWAY 36	Latitude	--	34°15'36.97" N
	Longitude	--	110°00'41.34" W

ULTIMATE BUILDINGS/FACILITIES

NO.	DESCRIPTION
50	HELIPADS
51	DE-ICE PAD
52	RESERVED FUTURE ATCT
53	JET-A FUEL STORAGE
54	FBO PARCEL
55	FUEL STORAGE (100 LL)/SELF SERVICE
56	AIRCRAFT WASH RACK
57	FBO PARCEL
58-65	FBO PARCELS
66-70	FBO PARCEL
71-80	T-HANGARS





SPONSOR APPROVAL BLOCK

APPROVED BY: ON THE DATE OF:

DENNIS E. WEST, A.A.E.
AIRPORT MANAGER

FAA APPROVAL STAMP

GENERAL NOTES:

1. Depiction of features and objects, including related elevations and clearances, within the runway protection zones are depicted on the INNER PORTION APPROACH SURFACE DRAWINGS.
2. Recommended land uses are depicted on the ON-AIRPORT LAND-USE DRAWING
3. Runway 3-21 to be replaced with Runway 18-36, which is more closely aligned with prevailing winds. Runway 3-21 will be converted to a taxiway.
4. Base Map and Contours derived from 2002 aerial photography and planametric mapping.
5. Source for existing runway end/displaced threshold coordinates, runway end/displaced threshold elevations: ASIS Datasheet Systems at www.avnwww.jccbi.gov/datasheet.
6. All elevations are NAVD 88.
7. Fence line extends along property line except where shown.
8. Airport meets ADOT Aeronautics minimum guidelines for an ARC C-III Airport.
9. Airport has not been surveyed in accordance with FAA standard 405.

ALL WEATHER WIND COVERAGE

Runways	10.5 Knots 12.1 MPH	13 Knots 15.0 MPH	16 Knots 18.4 MPH	20 Knots 23.0 MPH
Runway 3-21	90.35%	95.57%	98.60%	99.66%
Runway 6-24	77.78%	86.31%	94.30%	98.25%
Runway 18-36	96.43%	98.37%	99.51%	99.86%
Runways 3-21/6-24	91.08%	96.15%	98.80%	99.71%
Runways 6-24/18-36	98.84%	99.68%	99.90%	99.96%

DEVIATIONS FROM FAA AIRPORT DESIGN STANDARDS

DEVIATION DESCRIPTION	EFFECTED DESIGN STANDARD	STANDARD	EXISTING	PROPOSED DISPOSITION
RWY 24 RSA OBSTRUCTED BY FENCE/RSA GRADE	RUNWAY SAFETY AREA	1,000'	420'	SHIFT RUNWAY 24 TO EAST
RWY 6 RSA OBSTRUCTED BY FENCE/RSA GRADE	RUNWAY SAFETY AREA	1,000'	5'	REMOVE OBSTRUCTION/GRADE AND FILL RSA
RUNWAY 24 OFA OBSTRUCTED BY FENCE	OBJECT FREE AREA	1,000'	420'	SHIFT RUNWAY 24 TO THE EAST
RUNWAY 6 OFA OBSTRUCTED BY FENCE	OBJECT FREE AREA	1,000'	5'	REMOVE OBSTRUCTION/GRADE AND FILL RSA

THRESHOLD SITING SURFACE OBJECT PENETRATIONS

OBJECT	PENETRATION	DISPOSITION
NONE	SEE INNER APPROACH SURFACE DRAWING	

OBSTACLE FREE ZONE (OFZ) OBJECT PENETRATIONS

OBJECT	PENETRATION	DISPOSITION
FENCE BEHIND RWY 24 END	5'	TO BE REMOVED

No.	REVISIONS	DATE	BY	APP'D.
2	ALP REVISION	7/28/2000	MJR	BH
1	FAA ALP APPROVED	8/2/1991	--	--

THE PREPARATION OF THESE DOCUMENTS WAS FINANCED IN PART THROUGH A PLANNING GRANT FROM THE FEDERAL AVIATION ADMINISTRATION AS PROVIDED UNDER SECTION 505 OF THE AIRPORT AND AIRWAY IMPROVEMENT ACT OF 1982, AS AMENDED. THE CONTENTS DO NOT NECESSARILY REFLECT THE OFFICIAL VIEWS OR POLICY OF THE FAA. ACCEPTANCE OF THESE DOCUMENTS BY THE FAA DOES NOT IN ANY WAY CONSTITUTE A COMMITMENT ON THE PART OF THE UNITED STATES TO PARTICIPATE IN ANY DEVELOPMENT DEPICTED HEREIN NOR DOES IT INDICATE THAT THE PROPOSED DEVELOPMENT IS ENVIRONMENTALLY ACCEPTABLE IN ACCORDANCE WITH APPROPRIATE PUBLIC LAWS.

SHOW LOW REGIONAL AIRPORT

AIRPORT LAYOUT PLAN

SHOW LOW, ARIZONA

PLANNED BY: Christopher Hugunin
DETAILED BY: Maggie Rogers
APPROVED BY: James M. Harris P.E.

March 11, 2004 — SHEET 1 OF 17

Coffman Associates
Airport Consultants
www.coffmanassociates.com

EXISTING BUILDINGS/FACILITIES

NO.	DESCRIPTION	ELEVATIONS
(1)	ADMINISTRATION/TERMINAL BUILDING	6423.6' MSL
(2)	AIRPORT MAINTENANCE AND ARFF	–
(3)	ELECTRIC VAULT/EMERGENCY GENERATOR	6418.7' MSL
(4)	FIXED BASE OPERATION HANGAR	–
(5)	FIXED BASE OPERATION HANGAR	6434.0' MSL
(6)	FIXED BASE OPERATION HANGAR	6436.3' MSL
(7)	OFFICE BUILDING	6421.2' MSL
(8)	AIRCRAFT STORAGE HANGAR	–
(9)	AIRCRAFT STORAGE HANGAR	–
(10)	AIRCRAFT STORAGE HANGAR	6434.7' MSL
(11)	AIRCRAFT STORAGE HANGAR	6434.4' MSL
(12)	AIRCRAFT STORAGE HANGAR	6426.6' MSL
(13)	AIRCRAFT STORAGE HANGAR	6433.1' MSL
(14)	AIRCRAFT STORAGE HANGAR	6433.0' MSL
(15)	AIRCRAFT STORAGE HANGAR	6434.1' MSL
(16)	AIRCRAFT STORAGE HANGAR	6425.2' MSL
(17)	AIRCRAFT STORAGE HANGAR	6426.3' MSL
(18)	AIRCRAFT STORAGE HANGAR	6425.7' MSL
(19)	AIRCRAFT STORAGE HANGAR	6425.9' MSL
(20)	HANGAR (1 UNIT)	– –
(21)	HANGAR (1 UNIT)	6419.3' MSL
(22)	HANGAR (1 UNIT)	6419.0' MSL
(23)	HANGAR (1 UNIT)	6420.4' MSL
(24)	HANGAR (1 UNIT)	6421.0' MSL
(25)	HANGAR (1 UNIT)	6419.7' MSL
(26)	HANGAR (1 UNIT)	6419.7' MSL
(27)	HANGAR (1 UNIT)	6420.6' MSL
(28)	HANGAR (1 UNIT)	– –
(29)	HANGAR (1 UNIT)	– –
(30)	100LL UNDERGROUND FUEL STORAGE	– –
(31)	ARIZONA ARMY NATIONAL GUARD	6438.9' MSL
(32)	ARIZONA ARMY NATIONAL GUARD	6434.8' MSL
(33)	ELECTRIC VAULT/EMERGENCY GENERATOR	– –
(34)	–	– –

ULTIMATE BUILDINGS/FACILITIES

NO.	DESCRIPTION
50	HELIPADS
51	DE-ICE PAD
52	RESERVED FUTURE ATCT
53	JET-A FUEL STORAGE
54	FBO PARCEL
55	FUEL STORAGE (100 LL)/SELF SERVICE
56	AIRCRAFT WASH RACK
57	FBO PARCEL
58-66	FBO PARCELS
66-70	FBO PARCEL
71-80	T-HANGARS

LEGEND

EXISTING	ULTIMATE	DESCRIPTION
		AIRPORT PROPERTY LINE
		AIRPORT REFERENCE POINT (ARP)
		AIRPORT ROTATING BEACON
		AVIGATION EASEMENT (if applicable)
		BUILDING CONSTRUCTION
BRL	BRL	BUILDING RESTRICTION LINE (BRL)
		OBJECT FREE AREA (OFA)
		RUNWAY SAFETY AREA (RSA)
		OBSTACLE FREE ZONE (OFZ)
		DRAINAGE
		FACILITY CONSTRUCTION
		FENCING
PAPI-2	PAPI-2	NAVIGATIONAL AID INSTALLATION
		RUNWAY END IDENTIFICATION LIGHTS (REIL)
		RUNWAY THRESHOLD LIGHTS
		SECTION CORNER
		SEGMENTED CIRCLE/LIGHTED WIND TEE
		TOPOGRAPHIC CONTOURS
		WIND INDICATOR (Lighted)
		POWER POLE
		TAXIWAY DESIGNATION
		DIRT ROADS
		RUNWAY EDGE LIGHTING
		PAVEMENT TO BE ABANDONED
		SPECIAL USE PERMIT BOUNDARY

No.	REVISIONS	DATE	BY	APP'D.

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Magnetic Variance
11° 40' East (OCTOBER 2003)
Annual Rate of Change
3.67' West (OCTOBER 2003)

0 100 200 300
SCALE IN FEET

SHOW LOW REGIONAL AIRPORT

TERMINAL AREA DRAWING

SHOW LOW, ARIZONA

PLANNED BY: Christopher Huguenin
DETAILED BY: Maggie Rogers
APPROVED BY: James M. Harris P.E.

March 29, 2004 SHEET 2 OF 17

Coffman Associates
Airport Consultants
www.coffmanassociates.com

GENERAL NOTES:

1. Obstructions, clearances, and locations are calculated from ultimate runway end elevations and ultimate approach surfaces, unless otherwise noted.
2. Distance for road obstructions and clearances reflect a safety clearance of 10' for airport service roads, 15' for noninterstate roads, 17' for interstate roads, and 23' for railroads.
3. Depiction of features and objects within the inner portion of the approach surfaces, is illustrated on the INNER PORTION OF RUNWAY APPROACH SURFACE DRAWING, sheets 11, 12, 13 14 and 15 of these plans.
4. Existing height and hazard ordinances are to be amended and/or referenced upon approval of updated AIRPORT AIRSPACE PLAN.
5. Article 16-2, Airport Zoning of Show Low City Codes provides height and hazard zoning for Show Low Regional Airport.
6. Obstruction data source NGS form 292, Aeronautical Data Sheet
7. Base map developed using the follow USGS Quadrangle Maps: Show Low, Show Low North, Pindale, Lakeside, Silver Springs Sponseller Mtn., Ortega Mtn. and Red Top Mtn.

OBSTRUCTION LEGEND

- OBSTRUCTION
- GROUP or MULTIPLE OBSTRUCTIONS (See Note)
- GROUND/TOPOGRAPHIC PENETRATION

* Group or Multiple Obstructions are based on 100' tree height from Ground Elevation.

OBSTRUCTION TABLE

Object Description	Object Elevation	Obstructed Part 77 Surface	Surface Elevation	Object Penetration	Proposed Object Disposition
1. WINDSOCK	6411'	PRIMARY SURFACE/RWY 6-24	6401'	10.0'	NO ACTION
2. WINDSOCK	6405'	PRIMARY SURFACE/RWY 6-24	6400.5'	4.5'	NO ACTION
3. NDB POLES	6446'	PRIMARY SURFACE	6403'	43'	RELOCATE NDB
4. POLE	6633'	HORIZONTAL SURFACE	6580.0	53.0'	TO BE LIGHTED
5. TREE	6775'	HORIZONTAL SURFACE	6580.0	195.0'	TRIM/REMOVE
6. TREE	6804'	HORIZONTAL SURFACE	6580.0	224.0'	TRIM/REMOVE
7. POLE	6567'	HORIZONTAL SURFACE	6580.0	CLEAR	TO BE LIGHTED

No.	REVISIONS	DATE	BY	APP'D.
1	--	--	--	--
2	--	--	--	--

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SHOW LOW REGIONAL AIRPORT

AIRPORT AIRSPACE DRAWING FAR PART 77 INNER SURFACES

SHOW LOW, ARIZONA

PLANNED BY: Christopher Kuzmin
DETAILED BY: Maggie Rogers
APPROVED BY: James M. Harris P.E.

March 29, 2004 SHEET 3 OF 17

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OBSTRUCTION TABLE

Object Description	Object Elevation	Obstructed Part 77 Surface	Surface Elevation	Object Penetration	Proposed Object Disposition
4. POLE	6633'	HORIZONTAL SURFACE	6580.0'	50.0'	TO BE LIGHTED
5. TREE	6775'	HORIZONTAL SURFACE	6580.0'	195.0'	TRIM/REMOVE
6. TREE	6804'	HORIZONTAL SURFACE	6580.0'	224.0'	TRIM/REMOVE
7. POLE	6567'	HORIZONTAL SURFACE	6580.0'	CLEAR	TO BE LIGHTED

GENERAL NOTES:

1. Obstructions, clearances, and locations are calculated from ultimate runway end elevations and ultimate approach surfaces, unless otherwise noted.
2. Distance for road obstructions and clearances reflect a safety clearance of 10' for airport service roads, 15' for noninterstate roads, 17' for interstate roads, and 23' for railroads.
3. Depiction of features and objects within the inner portion of the approach surfaces, is illustrated on the INNER PORTION OF RUNWAY APPROACH SURFACE DRAWING, sheets 11, 12, 13 14 and 15 of these plans.
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5. Article 16-2, Airport Zoning of Show Low City Codes provides height and hazard zoning for Show Low Regional Airport.
6. Obstruction data source NGS form 292, Aeronautical Data Sheet
7. Base map developed using the follow USGS Quadrangle Maps: Show Low, Show Low North, Pindale, Lakeside, Silver Springs Sponseller Mtn., Ortega Mtn. and Red Top Mtn.

OBSTRUCTION LEGEND

- OBSTRUCTION
- GROUP or MULTIPLE OBSTRUCTIONS (See Note)
- GROUND/TOPOGRAPHIC PENETRATION

* Group or Multiple Obstructions are based on 100' tree height from Ground Elevation.

No.	REVISIONS	DATE	BY	APP'D.
2	---	---	---	---
1	---	---	---	---

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SHOW LOW REGIONAL AIRPORT

AIRPORT AIRSPACE DRAWING
RUNWAY 24 APPROACH FAN

SHOW LOW, ARIZONA

PLANNED BY: Christopher Huguenin
DETAILED BY: Maggie Rogers
APPROVED BY: James M. Harris P.E.

March 29, 2004 | SHEET 4 OF 17

Coffman Associates
Airport Consultants
www.coffmanassociates.com

GENERAL NOTES:

1. Obstructions, clearances, and locations are calculated from ultimate runway end elevations and ultimate approach surfaces, unless otherwise noted.
2. Distance for road obstructions and clearances reflect a safety clearance of 10' for airport service roads, 15' for noninterstate roads, 17' for interstate roads, and 23' for railroads.
3. Depiction of features and objects within the inner portion of the approach surfaces, is illustrated on the INNER PORTION OF RUNWAY APPROACH SURFACE DRAWING, sheets 11, 12, 13 14 and 15 of these plans.
4. Existing height and hazard ordinances are to be amended and/or referenced upon approval of updated AIRPORT AIRSPACE PLAN.
5. Article 16-2, Airport Zoning of Show Low City Codes provides height and hazard zoning for Show Low Regional Airport.
6. Obstruction data source NGS form 292, Aeronautical Data Sheet
7. Base map developed using the follow USGS Quadrangle Maps: Show Low, Show Low North, Pindale, Lakeside, Silver Springs Sponseller Mtn., Ortega Mtn. and Red Top Mtn.

OBSTRUCTION TABLE

Object Description	Object Elevation	Obstructed Part 77 Surface	Surface Elevation	Object Penetration	Proposed Object Disposition
NONE					

OBSTRUCTION LEGEND

- OBSTRUCTION
- GROUP or MULTIPLE OBSTRUCTIONS (See Note)
- GROUND/TOPOGRAPHIC PENETRATION

* Group or Multiple Obstructions are based on 100' tree height from Ground Elevation.

LIMITS OF RECOMMENDED F.A.R. PART 77 HEIGHT ZONING

40,000' @ 40:1

4000' @ 20:1

10,000' R (TYP.)

7:1 TRANSITIONAL SURFACE

EL. 8314.6'

RWY. 6
EL. 6400.3'

Magnetic Variance
PT. 40' East (OCTOBER 2003)
Annual Rate of Change
3.67' West (OCTOBER 2003)

SCALE IN FEET
0 2000 4000 8000

No.	REVISIONS	DATE	BY	APP'D.
1	--	--	--	--
2	--	--	--	--

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SHOW LOW REGIONAL AIRPORT

AIRPORT AIRSPACE DRAWING
RUNWAY 6 APPROACH FAN

SHOW LOW, ARIZONA

PLANNED BY: Christopher Huguenin
DETAILED BY: Maggie Rogers
APPROVED BY: James M. Harris P.E.

March 29, 2004 SHEET 5 OF 17

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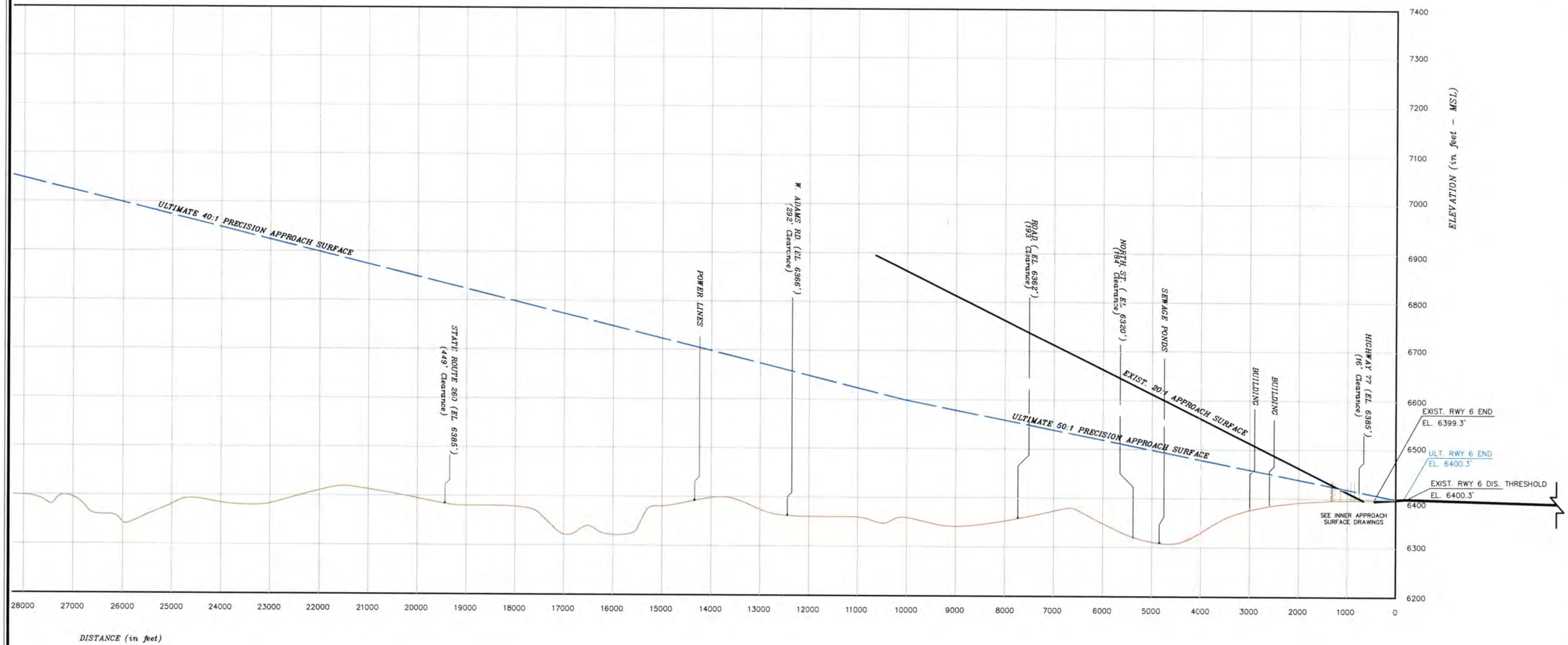
Coffman Associates-LOJ C:\dwg\17.dwg Tuesday, March 30, 2004 9:42am

RUNWAY 6 APPRAOCH SURFACE PROFILE



OBSTRUCTION TABLE					
Object Description	Object Elevation	Obstructed Part 77 Surface	Surface Elevation	Object Penetration	Proposed Object Disposition
NONE IN THE OUTER APPROACH SURFACE					SEE INNER APPROACH SURFACE DRAWINGS

GENERAL NOTES:

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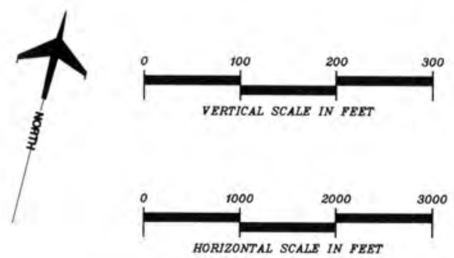
4. Existing height and hazard ordinances are to be amended and/or referenced upon approval of updated AIRPORT AIRSPACE PLAN.
5. Article 16-2, Airport Zoning of Show Low City Codes provides height and hazard zoning for Show Low Regional Airport.
6. Obstruction data source NGS form 292, Aeronautical Data Sheet.



No.	REVISIONS	DATE	BY	APP'D.
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SHOW LOW REGIONAL AIRPORT

RUNWAY 6 APPROACH SURFACE PROFILE DRAWING

SHOW LOW, ARIZONA

PLANNED BY: Christopher Hugunin
DETAILED BY: Maggie Rogers
APPROVED BY: James M. Harris P.E.

March 29, 2004 — SHEET 6 OF 17

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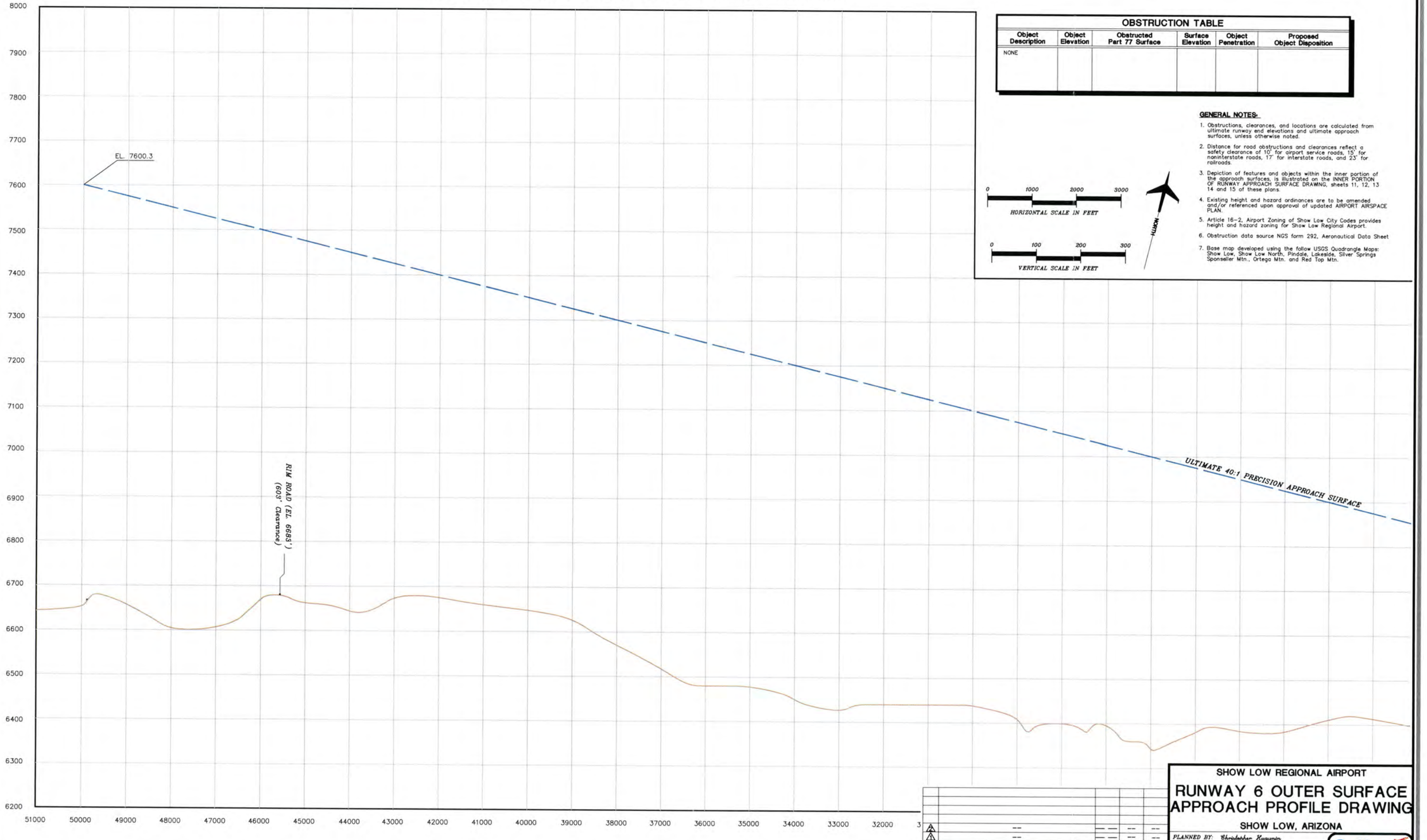
RUNWAY 6 APPROACH SURFACE PROFILE



OBSTRUCTION TABLE

Object Description	Object Elevation	Obstructed Part 77 Surface	Surface Elevation	Object Penetration	Proposed Object Disposition
NONE					

0 1000 2000 3000
HORIZONTAL SCALE IN FEET

0 100 200 300
VERTICAL SCALE IN FEET

NORTH

GENERAL NOTES:

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SHOW LOW REGIONAL AIRPORT

RUNWAY 6 OUTER SURFACE APPROACH PROFILE DRAWING

SHOW LOW, ARIZONA

PLANNED BY: Christopher Huguenin
DETAILED BY: Maggie Rogers
APPROVED BY: James M. Harris P.E.

March 29, 2004 | SHEET 7 OF 17

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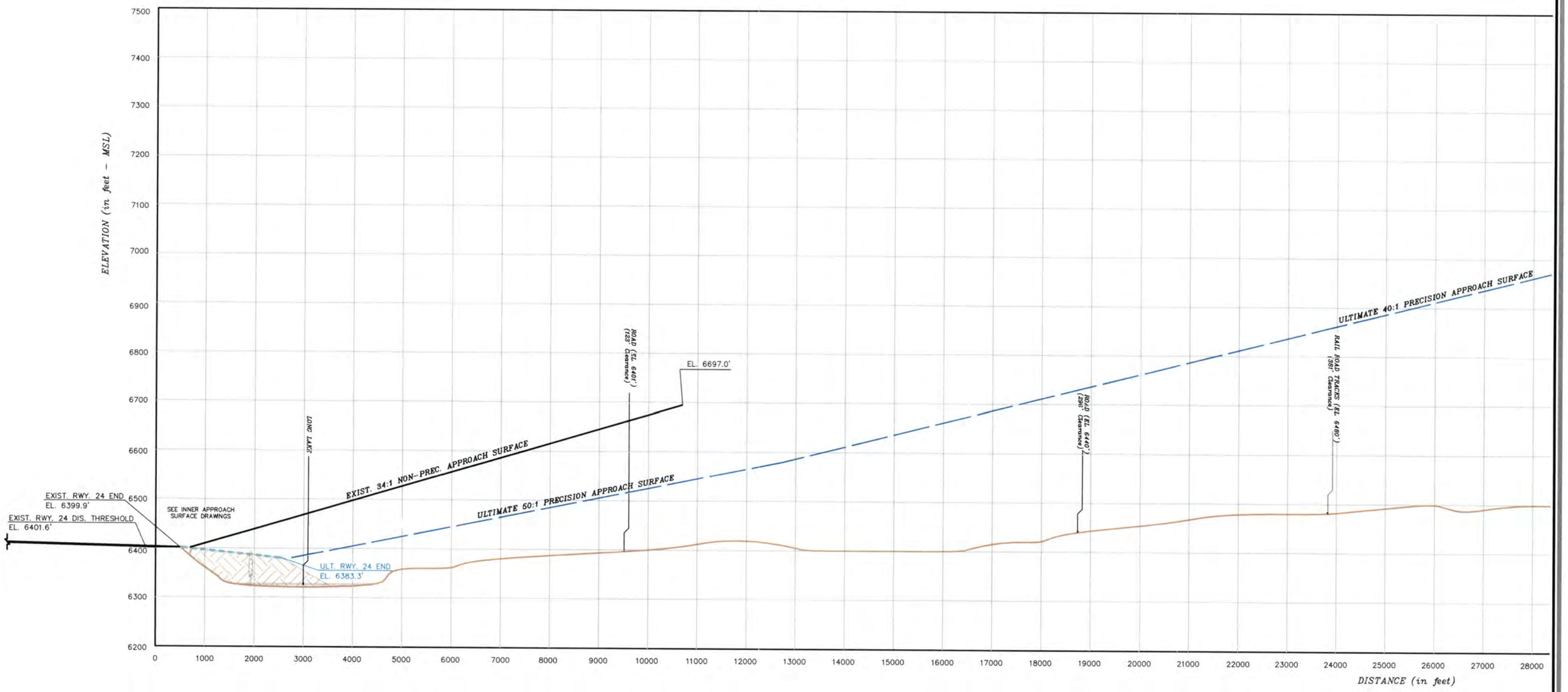
RUNWAY 24 APPROACH SURFACE PROFILE



OBSTRUCTION TABLE

Object Description	Object Elevation	Obstructed Part 77 Surface	Surface Elevation	Object Penetration	Proposed Object Disposition
NONE					SEE INNER APPROACH SURFACE DRAWING

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6. Obstruction data source NGS form 292, Aeronautical Data Sheet.

0 100 200 300
VERTICAL SCALE IN FEET

0 1000 2000 3000
HORIZONTAL SCALE IN FEET

NORTH

No.	REVISIONS	DATE	BY	APP'D.
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SHOW LOW REGIONAL AIRPORT

RUNWAY 24 APPROACH SURFACE PROFILE DRAWING

SHOW LOW, ARIZONA

PLANNED BY: Christopher Huguenin
DETAILED BY: Maggie Rogers
APPROVED BY: James M. Harris P.E.

March 29, 2004 | SHEET 8 OF 17

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GENERAL NOTES:

1. Obstructions, clearances, and locations are calculated from ultimate runway end elevations and ultimate approach surfaces, unless otherwise noted.
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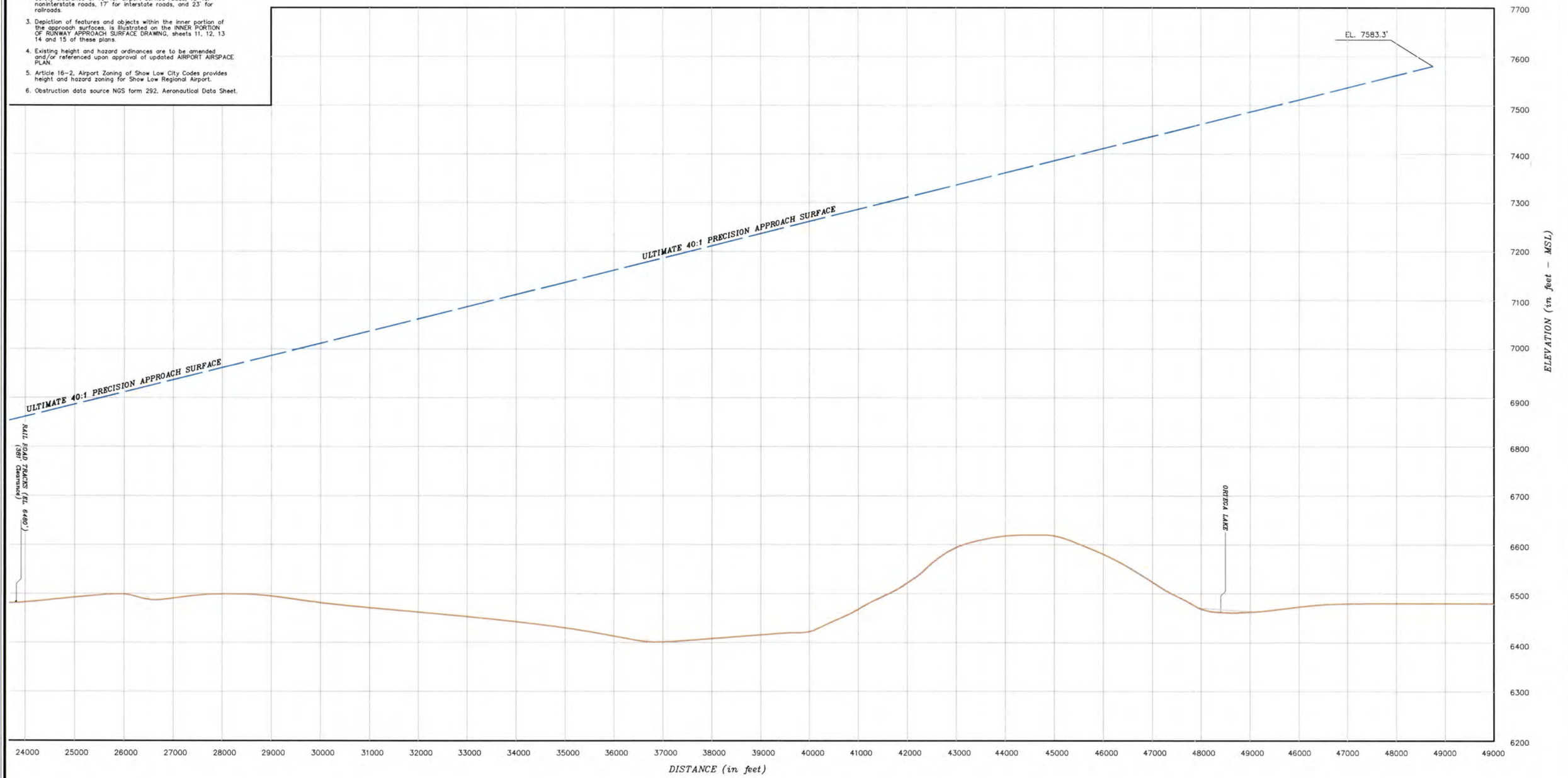
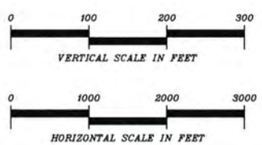
6. Obstruction data source NGS form 292, Aeronautical Data Sheet.

RUNWAY 24 APPROACH SURFACE PROFILE



OBSTRUCTION TABLE					
Object Description	Object Elevation	Obstructed Part 77 Surface	Surface Elevation	Object Penetration	Proposed Object Disposition
NONE					



No.	REVISIONS	DATE	BY	APP'D.
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1	---	---	---	---

SHOW LOW REGIONAL AIRPORT

RUNWAY 24 OUTER APPROACH SURFACE DRAWING

SHOW LOW, ARIZONA

PLANNED BY: Christopher Huguenin
DETAILED BY: Maggie Rogers
APPROVED BY: James M. Harris P.E.

March 29, 2004 | SHEET 9 OF 17

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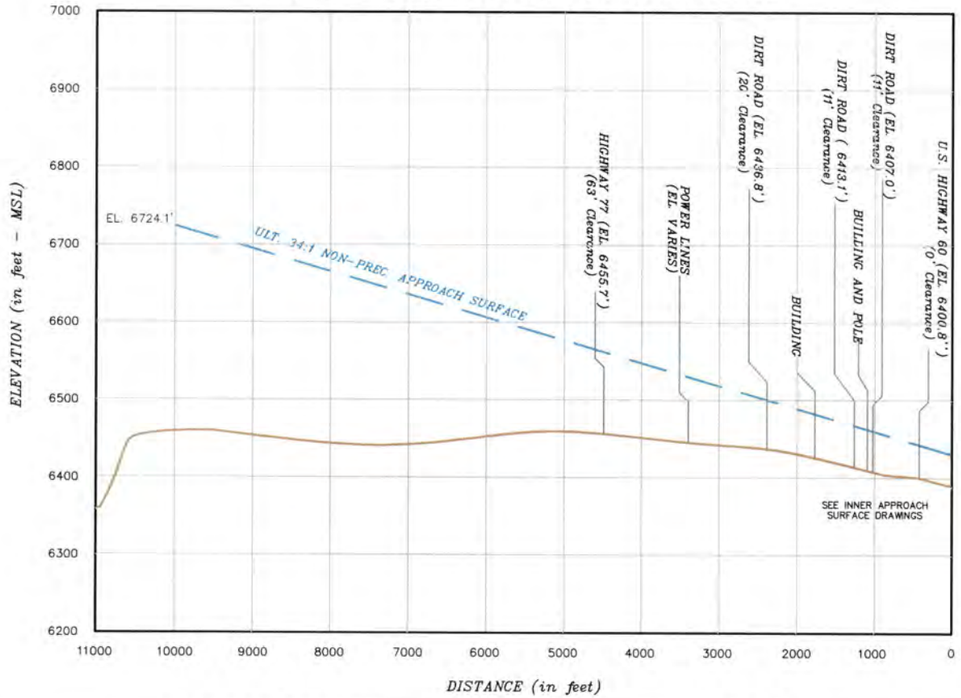
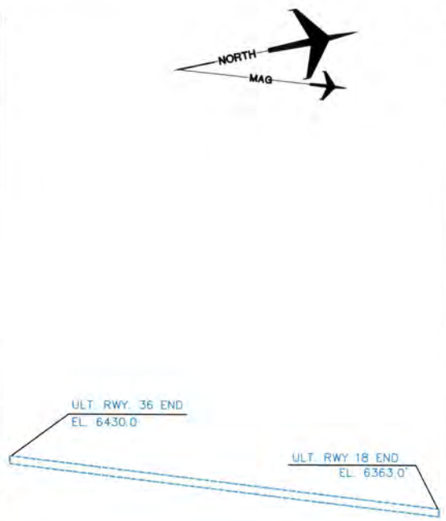
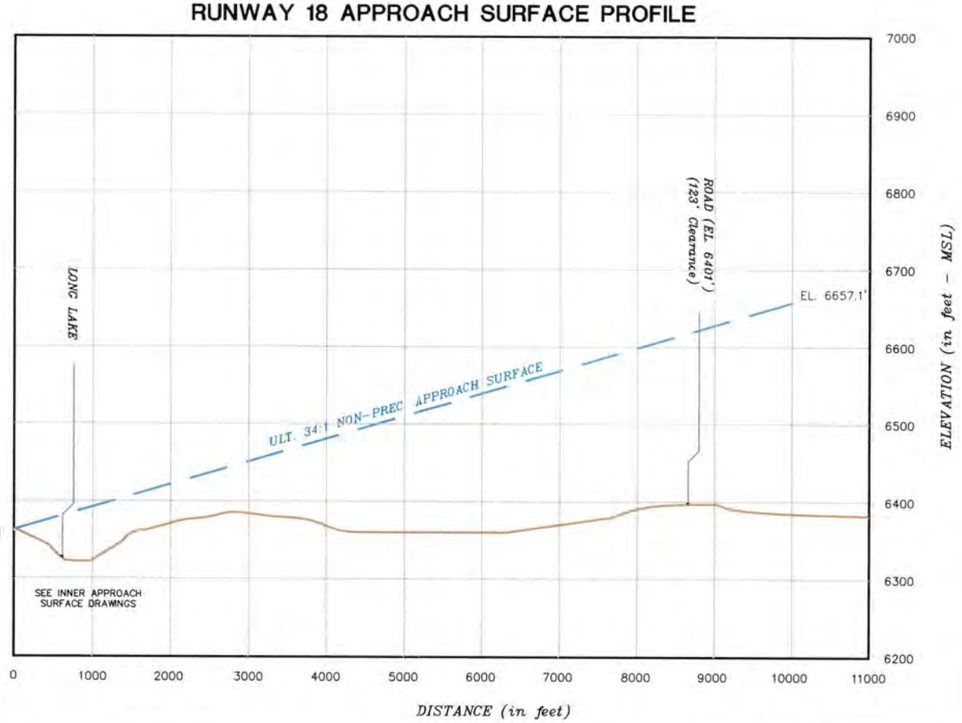
RUNWAY 36 APPROACH SURFACE PROFILE





RUNWAY 18 APPROACH SURFACE PROFILE



RUNWAY 18-36
APPROACH SURFACE PROFILES

RUNWAY 3 OBSTRUCTION TABLE

Object Description	Object Elevation	Obstructed Part 77 Surface	Surface Elevation	Object Penetration	Proposed Object Disposition
NONE	--	--	--	--	--

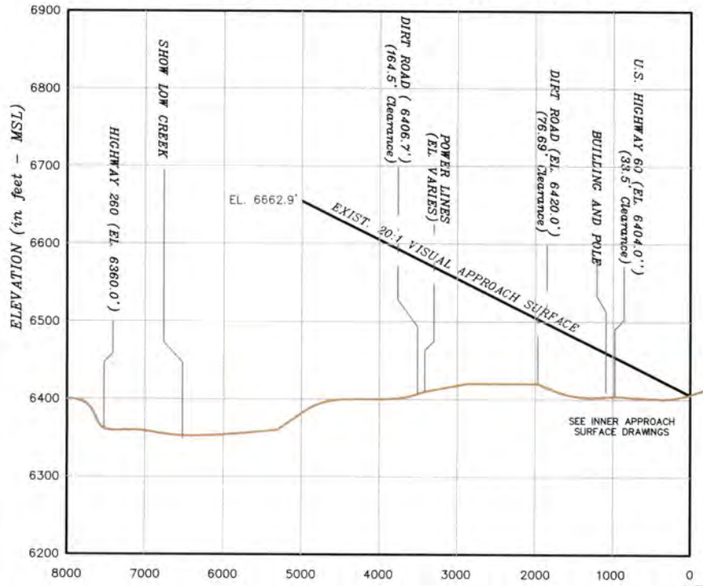
RUNWAY 36 OBSTRUCTION TABLE

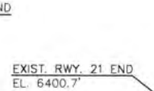
Object Description	Object Elevation	Obstructed Part 77 Surface	Surface Elevation	Object Penetration	Proposed Object Disposition
NONE	--	--	--	--	--

RUNWAY 18 OBSTRUCTION TABLE

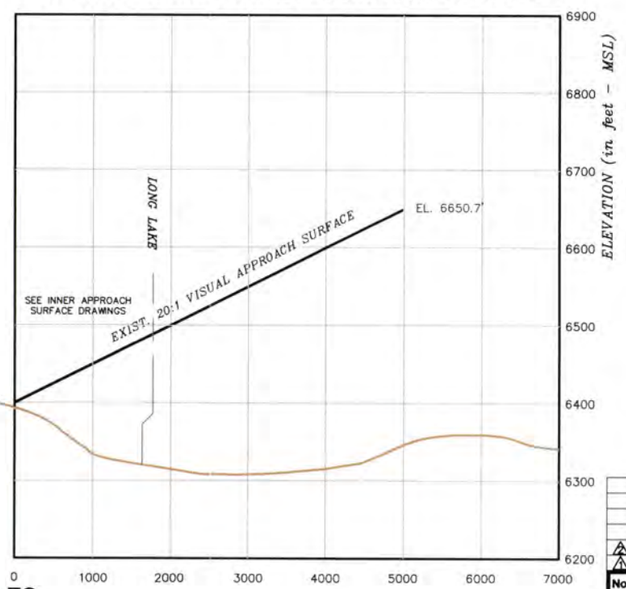
Object Description	Object Elevation	Obstructed Part 77 Surface	Surface Elevation	Object Penetration	Proposed Object Disposition
NONE	--	--	--	--	--

RUNWAY 3 APPROACH SURFACE PROFILE





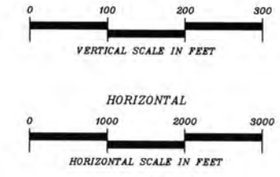
RUNWAY 21 APPROACH SURFACE PROFILE



RUNWAY 3-21
APPROACH SURFACE PROFILES

GENERAL NOTES:

1. Obstructions, clearances, and locations are calculated from ultimate runway and elevations and ultimate approach surfaces, unless otherwise noted.
2. Distance for road obstructions and clearances reflect a safety clearance of 10' for airport service roads, 15' for noninterstate roads, 17' for interstate roads, and 23' for railroads.
3. Depiction of features and objects within the inner portion of the approach surfaces, is illustrated on the INNER PORTION OF RUNWAY APPROACH SURFACE DRAWING, sheets 11, 12, 13 14 and 15 of these plans.
4. Existing height and hazard ordinances are to be amended and/or referenced upon approval of updated AIRPORT AIRSPACE PLAN.
5. Article 16-2, Airport Zoning of Show Low City Codes provides height and hazard zoning for Show Low Regional Airport.
6. Obstruction data source NGS form 292, Aeronautical Data Sheet.



RUNWAY 21 OBSTRUCTION TABLE

Object Description	Object Elevation	Obstructed Part 77 Surface	Surface Elevation	Object Penetration	Proposed Object Disposition
NONE					

No.	REVISIONS	DATE	BY	APP'D.
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SHOW LOW REGIONAL AIRPORT

RUNWAY 18-36 & RUNWAY 3-21 OUTER APPROACH SURFACE DRAWING

SHOW LOW, ARIZONA

PLANNED BY: Christopher Huguenin
DETAILED BY: Maggie Rogers
APPROVED BY: James M. Harris P.E.
March 29, 2004
SHEET 10 OF 17

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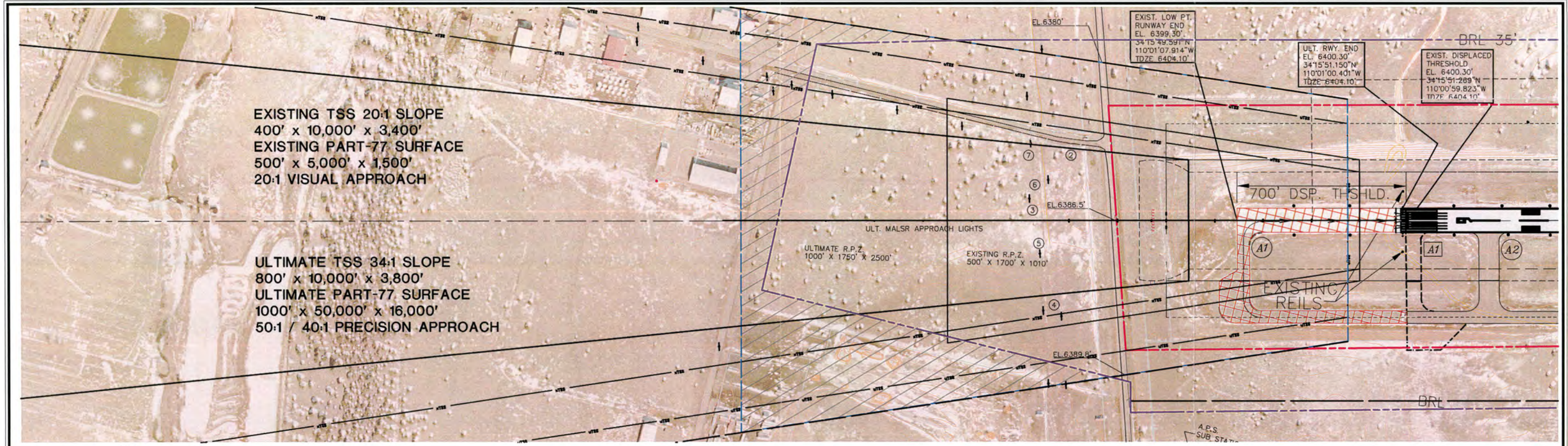

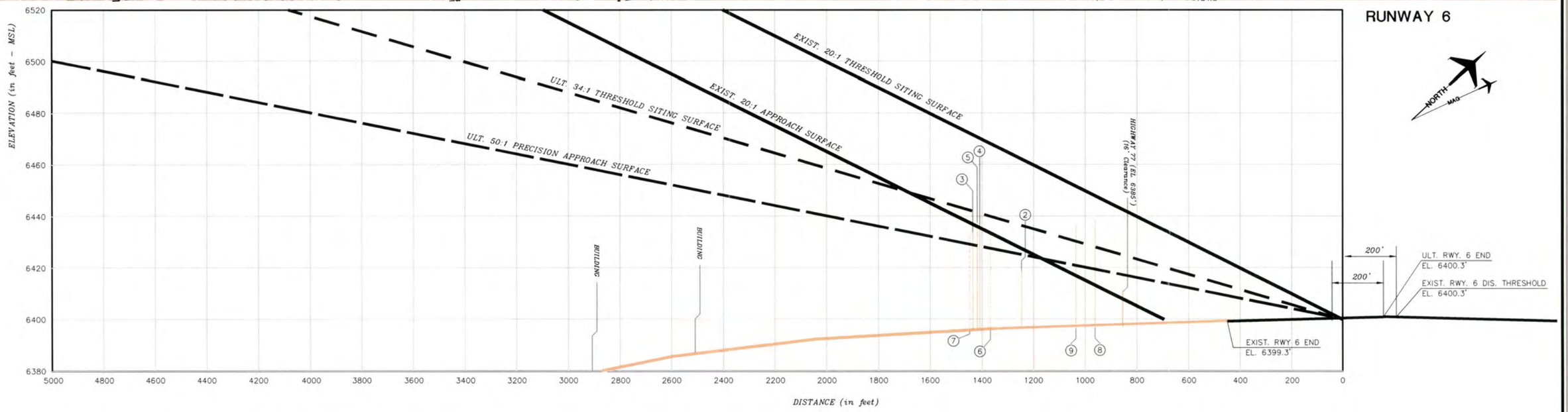

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2. Distance for road obstructions and clearances reflect a safety clearance of 10' for airport service roads, 15' for noninterstate roads, 17' for interstate roads, and 23' for railroads.
3. Depiction of features and objects within the outer portion of the approach surfaces, is illustrated on the RUNWAY APPROACH SURFACE PROFILES, sheet 6 and 7 of these plans.

OBSTRUCTION TABLE

Object Description	Object Elevation	Obstructed Part 77 Surface	Surface Elevation	Object Penetration	Proposed Object Disposition
2. LT POLE	6418 MSL	APPROACH SURFACE/RWY 6	6412.0'	6.0'	REMOVE/RELOCATE
3. POLE	6433 MSL	APPROACH SURFACE/RWY 6	6416.0'	17.0'	REMOVE/RELOCATE
4. POLE	6436 MSL	APPROACH SURFACE/RWY 6	6417.0'	19.0'	REMOVE/RELOCATE
5. POLE	6437 MSL	APPROACH SURFACE/RWY 6	6417.0'	20.0'	REMOVE/RELOCATE
6. POLE	6433 MSL	APPROACH SURFACE/RWY 6	6418.0'	15.0'	REMOVE/RELOCATE
7. POLE	6433 MSL	APPROACH SURFACE/RWY 6	6418.0'	15.0'	REMOVE/RELOCATE
8. POLE	6438 MSL	APPROACH SURFACE/RWY 6	6424.0'	14.0'	REMOVE/RELOCATE
9. POLE	6436 MSL	APPROACH SURFACE/RWY 6	6420.0'	16.0'	REMOVE/RELOCATE

0 20 40
VERTICAL SCALE IN FEET

0 200 400
HORIZONTAL SCALE IN FEET

No.	REVISIONS	DATE	BY	APP'D.
1	--	--	--	--
2	--	--	--	--

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SHOW LOW REGIONAL AIRPORT

INNER PORTION OF THE RUNWAY 6 APPROACH SURFACE DRAWING

SHOW LOW, ARIZONA

PLANNED BY: Christopher Huguenin
DETAILED BY: Maggie Rogers
APPROVED BY: James M. Harris P.E.
March 29, 2004
SHEET 11 OF 17

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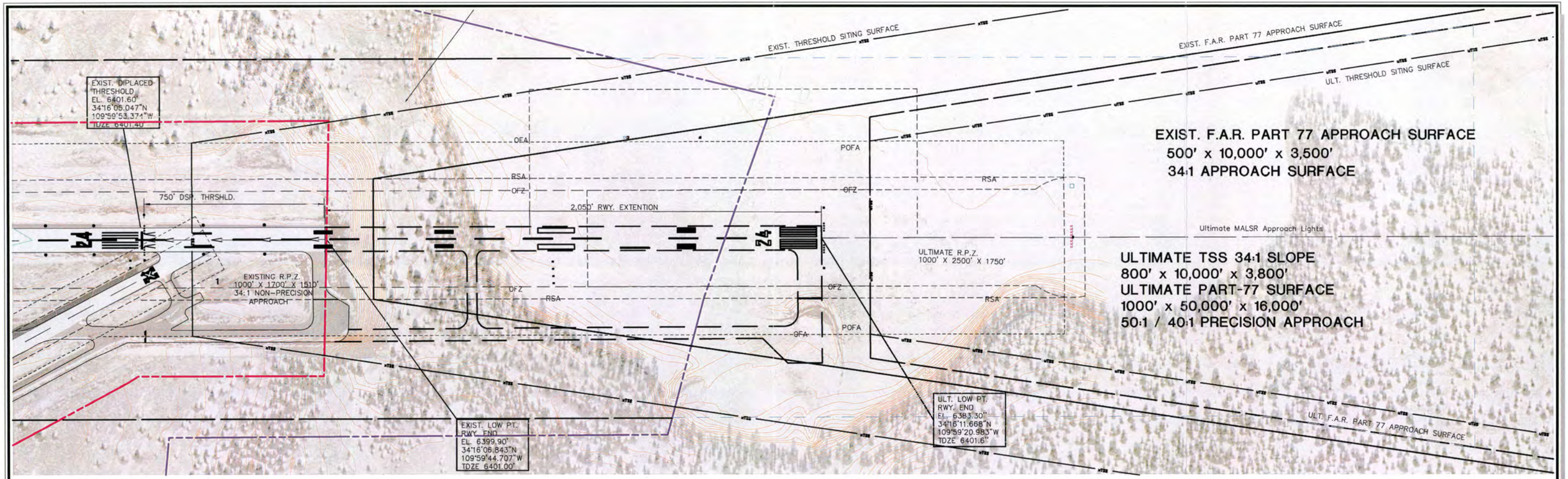

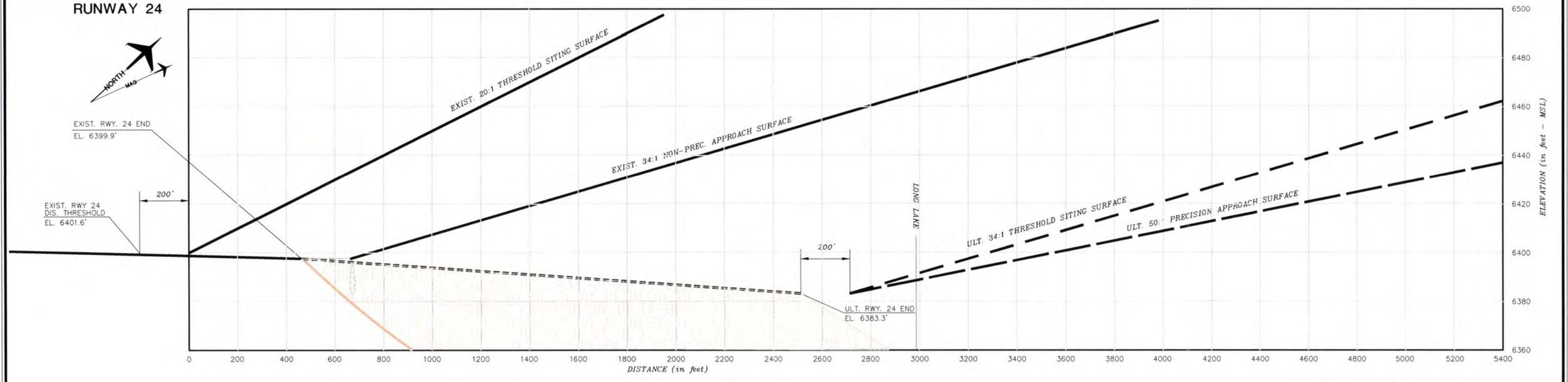

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None					

0 20 40
VERTICAL SCALE IN FEET

0 200 400
HORIZONTAL SCALE IN FEET

No.	REVISIONS	DATE	BY	APP'D.
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SHOW LOW REGIONAL AIRPORT

INNER PORTION OF THE RUNWAY 24 APPROACH SURFACE DRAWING

SHOW LOW, ARIZONA

PLANNED BY: Christopher Huguenin
DETAILED BY: Maggie Rogers
APPROVED BY: James M. Harris P.E.

March 11, 2004 | SHEET 12 OF 17

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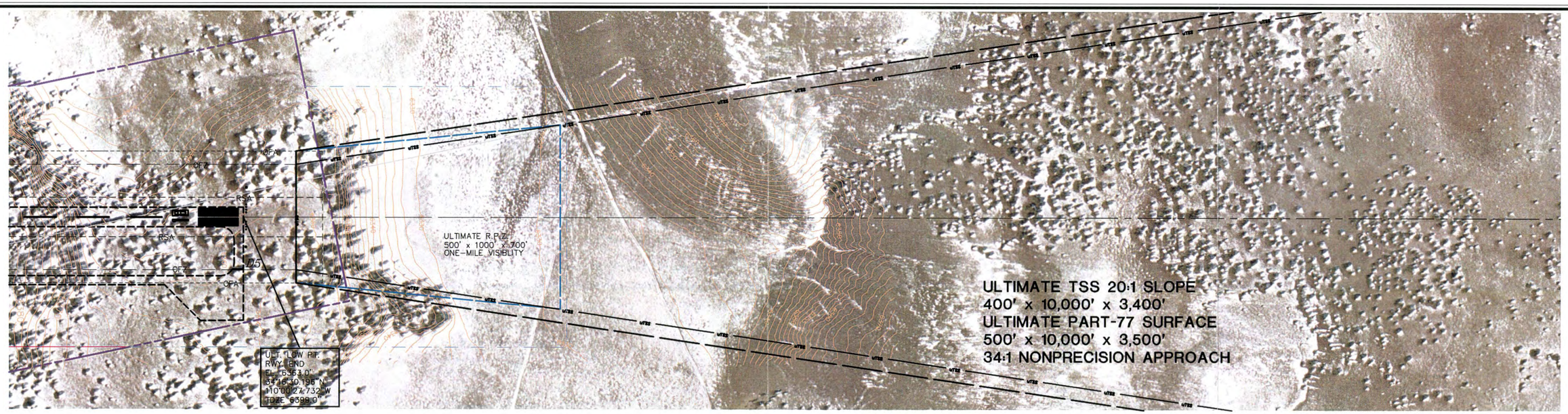
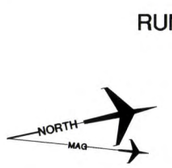


RUNWAY 18



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1. Obstructions, clearances, and locations are calculated from ultimate runway end elevations and ultimate approach surfaces, unless otherwise noted.
2. Distance for road obstructions and clearances reflect a safety clearance of 10' for airport service roads, 15' for noninterstate roads, 17' for interstate roads, and 23' for railroads.
3. Depiction of features and objects within the outer portion of the approach surfaces, is illustrated on the RUNWAY APPROACH SURFACE PROFILES, sheet 10 of these plans.

OBSTRUCTION TABLE

Object Description	Object Elevation	Obstructed Part 77 Surface	Surface Elevation	Object Penetration	Proposed Object Disposition
1. NONE 2.	--	--	--	--	-

0 20 40
VERTICAL SCALE IN FEET

0 200 400
HORIZONTAL SCALE IN FEET

No.	REVISIONS	DATE	BY	APP'D
2	--	--	--	--
1	--	--	--	--

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SHOW LOW REGIONAL AIRPORT

INNER PORTION OF THE RUNWAY 18 APPROACH SURFACE DRAWING

SHOW LOW, ARIZONA

PLANNED BY: Christopher Huguenin
DETAILED BY: Maggie Rogers
APPROVED BY: James M. Harris P.E.

March 29, 2004 | SHEET 13 OF 17

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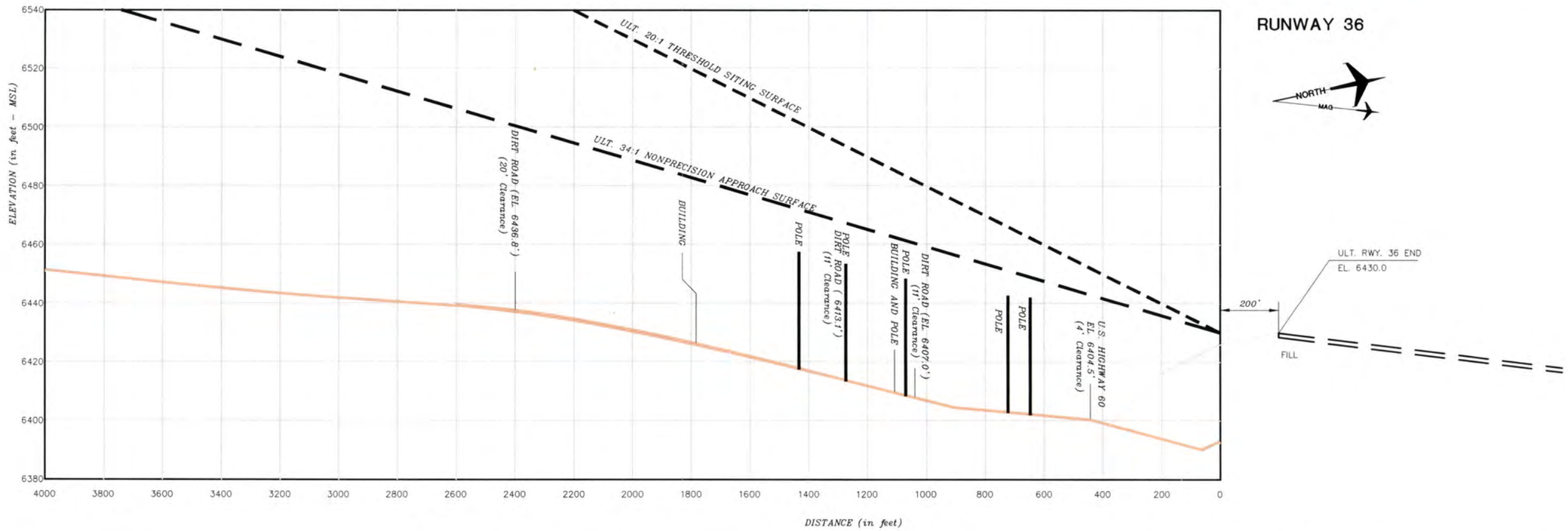

RUNWAY 36

GENERAL NOTES:

1. Obstructions, clearances, and locations are calculated from ultimate runway end elevations and ultimate approach surfaces, unless otherwise noted.
2. Distance for road obstructions and clearances reflect a safety clearance of 10' for airport service roads, 15' for noninterstate roads, 17' for interstate roads, and 23' for railroads.
3. Depiction of features and objects within the outer portion of the approach surfaces, is illustrated on the RUNWAY APPROACH SURFACE PROFILES, sheet 10 of these plans.

OBSTRUCTION TABLE

Object Description	Object Elevation	Obstructed Part 77 Surface	Surface Elevation	Object Penetration	Proposed Object Disposition
1. NONE	--	--	--	--	-

0 20 40
VERTICAL SCALE IN FEET

0 200 400
HORIZONTAL SCALE IN FEET

No.	REVISIONS	DATE	BY	APP'D.
1	--	--	--	--
2	--	--	--	--

SHOW LOW REGIONAL AIRPORT

INNER PORTION OF THE RUNWAY 36 APPROACH SURFACE DRAWING

SHOW LOW, ARIZONA

PLANNED BY: Christopher Huguenin
DETAILED BY: Maggie Rogers
APPROVED BY: James M. Harris P.E.
March 29, 2004

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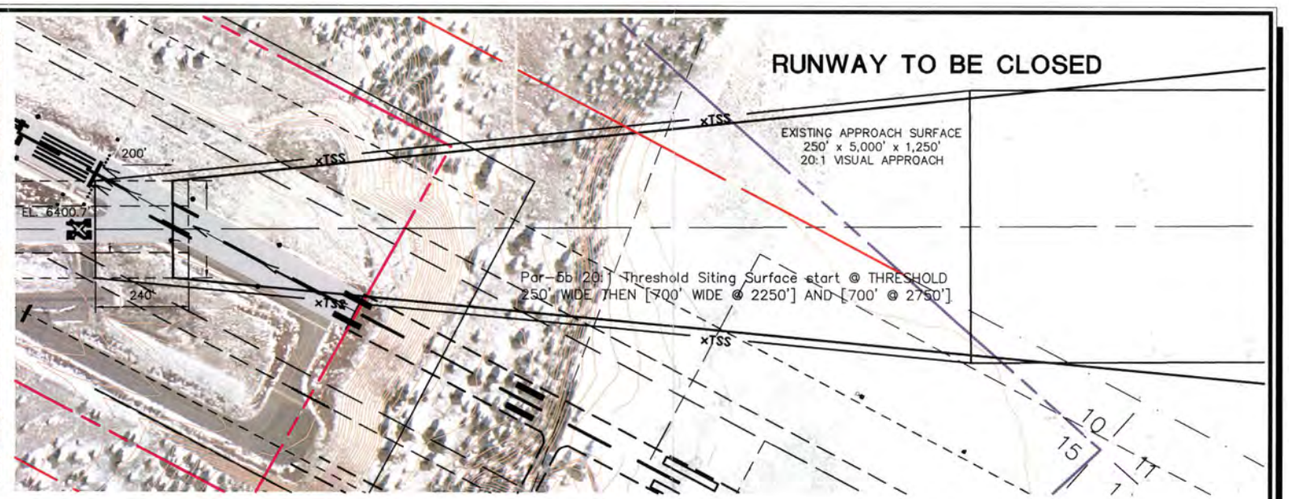

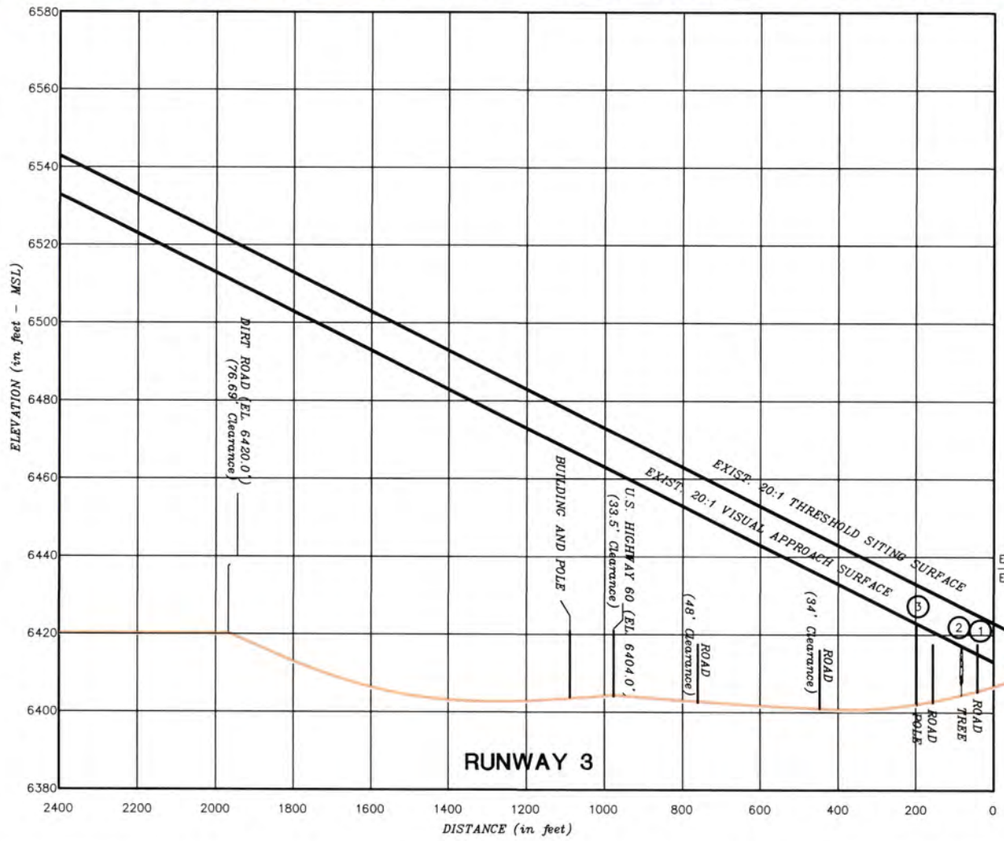

GENERAL NOTES:

1. Obstructions, clearances, and locations are calculated from ultimate runway end elevations and ultimate approach surfaces, unless otherwise noted.
2. Distance for road obstructions and clearances reflect a safety clearance of 10' for airport service roads, 15' for nonInterstate roads, 17' for interstate roads, and 23' for railroads.
3. Depiction of features and objects within the outer portion of the approach surfaces, is illustrated on the RUNWAY APPROACH SURFACE PROFILES, sheet 10 of these plans.

0 20 40
VERTICAL SCALE IN FEET

0 200 400
HORIZONTAL SCALE IN FEET

OBSTRUCTION TABLE (Runway 3 To Be Closed)

Object Description	Object Elevation	Obstructed Part 77 Surface	Surface Elevation	Object Penetration	Proposed Object Disposition
1. ROAD	6419 MSL	20:1 APPROACH	ROAD	3'	RUNWAY TO BE CLOSED
2. TREE	6417 MSL	20:1 APPROACH	ROAD	0'	RUNWAY TO BE CLOSED
3. LT POLE	6426 MSL	20:1 APPROACH	ROAD	3'	RUNWAY TO BE CLOSED

OBSTRUCTION TABLE (Runway 21 To Be Closed)

Object Description	Object Elevation	Obstructed Part 77 Surface	Surface Elevation	Object Penetration	Proposed Object Disposition
NONE					

No.	REVISIONS	DATE	BY	APP'D.
2	---	---	---	---
1	---	---	---	---

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SHOW LOW REGIONAL AIRPORT

INNER PORTION OF THE RUNWAY 3-21 APPROACH SURFACE DRAWING

SHOW LOW, ARIZONA

PLANNED BY: Christopher Huguenin
DETAILED BY: Maggie Rogers
APPROVED BY: James M. Harris P.E.
March 29, 2004 SHEET 15 OF 17

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LEGEND

EXISTING	ULTIMATE	DESCRIPTION
		AIRPORT PROPERTY LINE
		AIRPORT REFERENCE POINT (ARP)
		AIRPORT ROTATING BEACON
		AVIGATION EASEMENT (if applicable)
		BUILDING CONSTRUCTION
BRL	BRL	BUILDING RESTRICTION LINE (BRL)
		OBJECT FREE AREA (OFA)
		RUNWAY SAFETY AREA (RSA)
		OBSTACLE FREE ZONE (OFZ)
		DRAINAGE
		FACILITY CONSTRUCTION
		FENCING
E PAPI-2	E PAPI-2	NAVIGATIONAL AID INSTALLATION
		RUNWAY END IDENTIFICATION LIGHTS (REIL)
		RUNWAY THRESHOLD LIGHTS
25	25	SECTION CORNER
		SEGMENTED CIRCLE/LIGHTED WIND TEE
1080	1080	TOPOGRAPHIC CONTOURS
		WIND INDICATOR (Lighted)
		POWER POLE
9	9	TAXIWAY DESIGNATION
		DIRT ROADS
		RUNWAY EDGE LIGHTING
		PAVEMENT TO BE ABANDONED
		SPECIAL USE PERMIT BOUNDARY

ON-AIRPORT LAND USE LEGEND

- AIRFIELD OPERATIONS/ OPEN SPACE (669 ACRES)
- GENERAL AVIATION AREA (52.2 ACRES)
- COMMERCIAL/INDUSTRIAL REVENUE SUPPORT (9.6 ACRES)
- SUPPORT (2.8 ACRES)
- AIRLINE TERMINAL AREA (17.2 ACRES)
- ARIZONA ARMY NATIONAL GUARD (15.2 ACRES)

LEGEND

- EXISTING AIRPORT PROPERTY LINE
- ULTIMATE AIRPORT PROPERTY LINE
- SPECIAL USE PERMIT BOUNDARY
- EXT. PART-77 APPROACH SURFACES
- ULT. PART-77 APPROACH SURFACES

0 600 1200 1800

SCALE IN FEET

No.	REVISIONS	DATE	BY	APP'D.
1	---	---	---	---
2	---	---	---	---

SHOW LOW REGIONAL AIRPORT

ON-AIRPORT LAND-USE DRAWING

SHOW LOW, ARIZONA

PLANNED BY: Christopher Huguenin

DETAILED BY: Maggie Rogers

APPROVED BY: James M. Harris P.E.

March 29, 2004 | SHEET 16 OF 17

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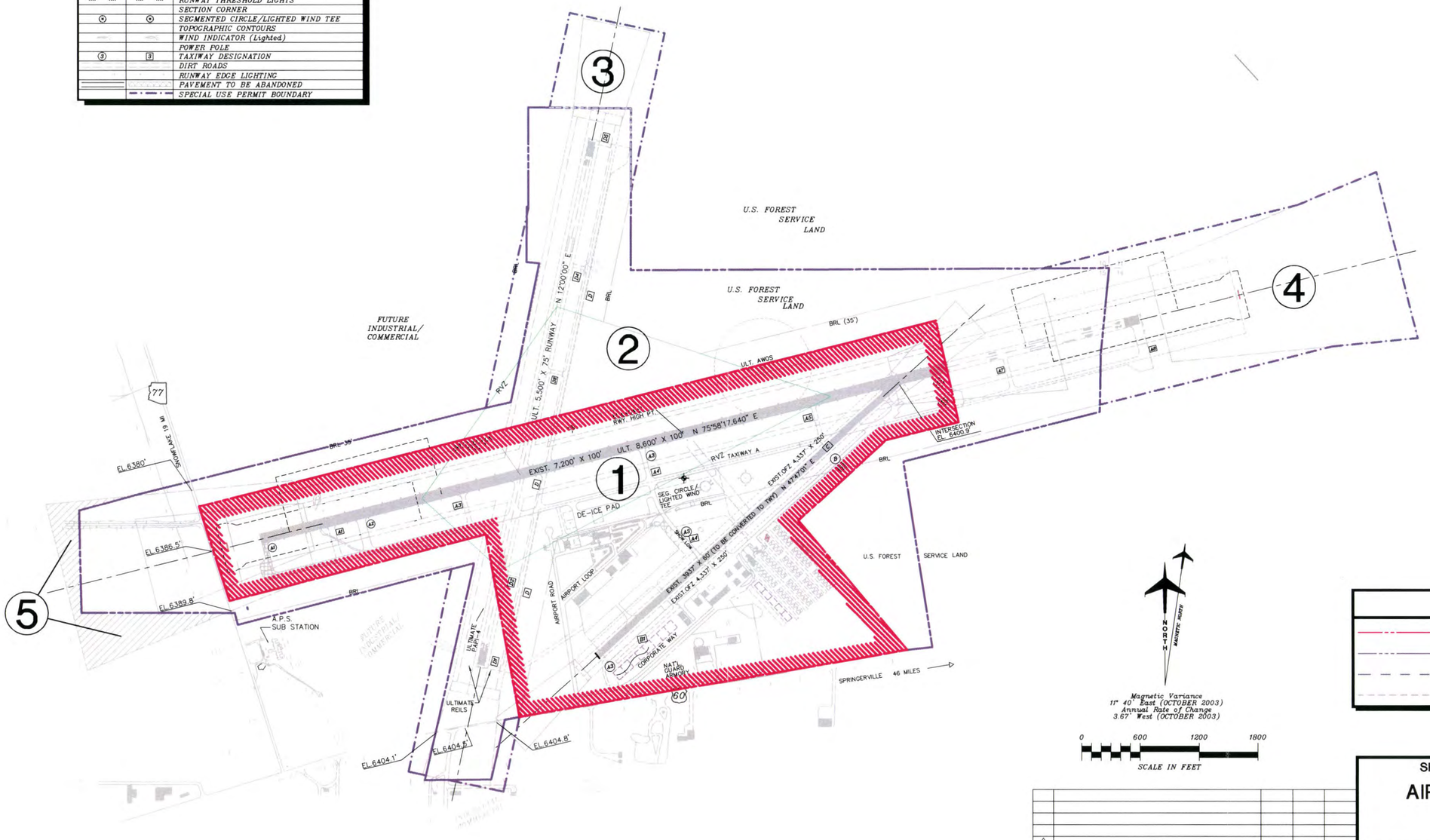
LEGEND

EXISTING	ULTIMATE	DESCRIPTION
		AIRPORT PROPERTY LINE
		AIRPORT REFERENCE POINT (ARP)
		AIRPORT ROTATING BEACON
		AVIGATION EASEMENT (if applicable)
		BUILDING CONSTRUCTION
BRL	BRL	BUILDING RESTRICTION LINE (BRL)
		OBJECT FREE AREA (OFA)
		RUNWAY SAFETY AREA (RSA)
		OBSTACLE FREE ZONE (OFZ)
		DRAINAGE
		FACILITY CONSTRUCTION
		FENCING
PAPI-2	PAPI-2	NAVIGATIONAL AID INSTALLATION
		RUNWAY END IDENTIFICATION LIGHTS (REIL)
		RUNWAY THRESHOLD LIGHTS
		SECTION CORNER
		SEGMENTED CIRCLE/LIGHTED WIND TEE
		TOPOGRAPHIC CONTOURS
		WIND INDICATOR (Lighted)
		POWER POLE
3	3	TAXIWAY DESIGNATION
		DIRT ROADS
		RUNWAY EDGE LIGHTING
		PAVEMENT TO BE ABANDONED
		SPECIAL USE PERMIT BOUNDARY

AIRPORT PROPERTY INFORMATION

PARCEL #		FAA GRANT #	ADOT GRANT #	ACRES
1	U.S. BUREAU OF LAND MANAGEMENT LAND PATENT JULY, 20 1984	N/A	N/A	358.65
2	ULTIMATE U.S. FOREST LAND TRANSFER	N/A	N/A	341.8
3	ULTIMATE U.S. FOREST SPECIAL USE PERMIT	N/A	N/A	22.5
4	ULTIMATE U.S. FOREST SPECIAL USE PERMIT	N/A	N/A	110.3
5	ULTIMATE AVIGATION EASMENT	N/A	N/A	20.5



Magnetic Variance
11° 40' East (OCTOBER 2003)
Annual Rate of Change
3.67' West (OCTOBER 2003)

0 600 1200 1800

SCALE IN FEET

LEGEND

- EXISTING AIRPORT PROPERTY LINE
- ULTIMATE AIRPORT PROPERTY LINE
- SPECIAL USE PERMIT BOUNDARY
- PARCEL BOUNDARIES

No.	REVISIONS	DATE	BY	APP'D.
2	--	--	--	--
1	--	--	--	--

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SHOW LOW REGIONAL AIRPORT

AIRPORT PROPERTY MAP

SHOW LOW, ARIZONA

PLANNED BY: Christopher Huguenin
DETAILED BY: Maggie Rogers
APPROVED BY: James M. Harris P.E.

March 29, 2004 | SHEET 17 OF 17

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