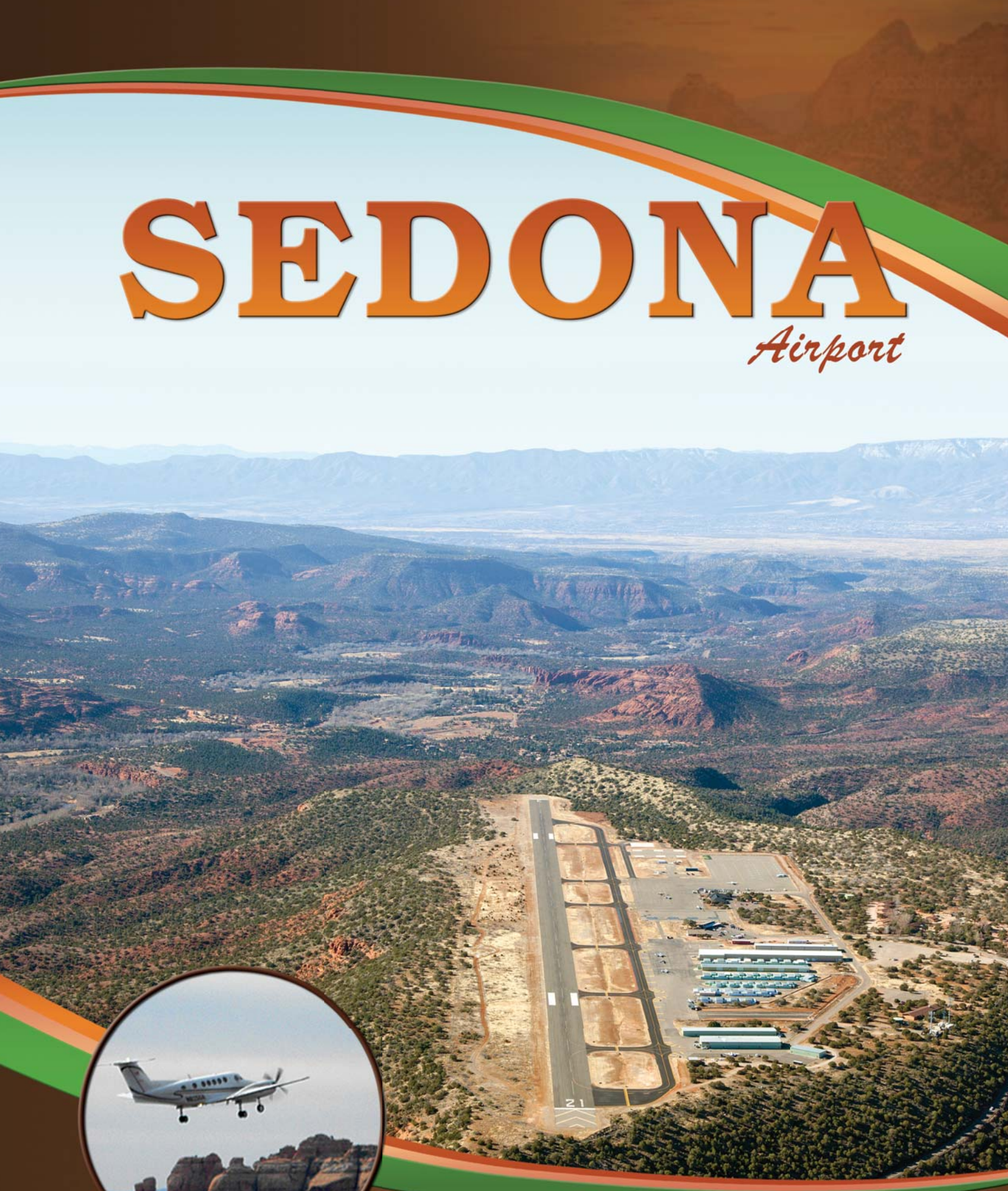
SEDONA

Airport





AIRPORT MASTER PLAN

AIRPORT MASTER PLAN

for

SEDONA AIRPORT
Yavapai County, Arizona

Prepared for

YAVAPAI COUNTY

by

Coffman Associates, Inc.

June 2017



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Sedona, Arizona

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INTRODUCTION AND SUMMARY

SEDONA
Airport

INTRODUCTION AND SUMMARY

The Airport Master Plan has been undertaken to evaluate Sedona Airport's (SEZ or Airport) capabilities and role, to forecast future aviation demand, and to plan for the timely development of new or improved 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. This is done to ensure that Yavapai County and the Sedona-Oak Creek Airport Authority (SOCAA) can coordinate project approvals, design, financing, and construction in a timely manner, prior to experiencing the detrimental effects of deteriorating or 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 on-airport land use concept which outlines specific uses for all areas of Airport property, including strategies for revenue enhancement.

The preparation of this Master Plan is evidence that Yavapai County recognizes the importance of the Airport to the surrounding area 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 local community and County. With a sound and realistic Master Plan, Sedona Airport can maintain its role as an im-



portant link to the national air transportation system for the community and maintain the public and private investments in its facilities.

MASTER PLAN GOALS AND OBJECTIVES

The primary objective of the Sedona Airport Master Plan is to develop and maintain a financially feasible, long term development program, which will satisfy aviation demand; be compatible with community development, other transportation modes, and the environment; and enhance employment and revenue for the City of Sedona and surrounding areas. The most recent planning effort for the Airport was the completion of the Airport Master Plan in December 1999. The Airport's Airport Layout Plan (ALP) has been updated or modified periodically since 1999; the most recent modification was the addition of the Taxiway A extension in December 2007.

This Master Plan is intended to provide guidance through an updated capital improvement and financial program to demonstrate the future investments required by the County and the SOCAA. The new planning study also provides justification for new priorities. The plan will be closely coordinated with other planning studies in the area and with aviation plans developed by the FAA and the State of Arizona. Specific objectives of the study include, but are not limited to, the following:

- Examine the projected aviation demand and identify the facilities necessary to accommodate the demand.

- Determine projected needs of airport users over the next 20 years, by which to support airport development alternatives.

- Recommend improvements which enhance the airport's safety and capacity to the maximum extent possible.

- Establish a schedule of development priorities and a program for the proposed improvements.

- Prioritize the Airport Capital Improvement Program (ACIP).

- Prepare a new Airport Layout Plan in accordance with Federal Aviation Administration (FAA) and Arizona Department of Transportation – Multimodal Planning Division - Aeronautics Group (ADOT-MPD – Aeronautics Group) guidelines.

- Develop active and productive public involvement throughout the planning process.

MASTER PLAN TASKS

The Master Plan accomplishes the above objectives by carrying out the following:

- Determine projected needs of Airport users through the year 2033.
- Analyze socioeconomic factors likely to affect air transportation demand in the Airport's service area, including regional factors.
- Identify potential existing and future land acquisition needs.
- Evaluate future airport facility development alternatives, which will optimize undeveloped Airport property to promote capacity and aircraft safety.
- Develop a realistic, commonsense plan for the use and improvement of the Airport.
- Present environmental considerations associated with any recommended development alternatives.
- Establish a schedule of development priorities and a program for improvements.
- Produce current and accurate base maps and ALP drawings.
- Coordinate this Master Plan with local, regional, state, and federal agencies.
- Prepare this Master Plan under guidelines established by the FAA and ADOT.

BASELINE ASSUMPTIONS

A study such as this typically requires several baseline assumptions to be used throughout the analysis. The baseline assumptions for this study are as follows:

- Sedona Airport will continue to operate as a general aviation airport through the 20-year planning period.
- Sedona Airport will continue to accommodate general aviation tenants, transient and aerial tour operations.
- The general aviation industry will continue to grow through the planning period. Specifics of projected growth in the national general aviation industry are contained in Chapter Two – Aviation Demand Forecasts.
- The socioeconomic characteristics of the region will remain as forecast (see Chapter Two).

- Both a federal grant program and a state grant program will be in place through the planning period to assist in funding future capital development needs.

MASTER PLAN ELEMENTS AND PROCESS

The Sedona Airport Master Plan was prepared in a systematic fashion following FAA guidelines and industry-accepted principles and practices, as shown on **Exhibit IA**. The Master Plan has six chapters that are intended to assist in the evaluation of future facility needs and provide the supporting rationale for their implementation.

Chapter One – Inventory summarizes the inventory efforts. The inventory efforts are focused on collecting and assembling relevant data pertaining to the Airport and the area it serves. Information is collected on existing Airport facilities and operations. Local economic and demographic data is collected to define the local growth trends and information is gathered to identify potential environmental sensitivities that might affect future improvements. Planning studies which may have relevance to the Master Plan are also collected.

Chapter Two – Forecasts examines the potential aviation demand at the Airport. The 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 Sedona Airport through the year 2033. The results of this effort are used to determine the types and sizes of facilities which will be required to meet the projected aviation demand at the Airport through the planning period.

Chapter Three – Facility Requirements comprises the demand capacity and facility requirements analyses. 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 safely serve the type of aircraft expected to operate at the Airport in the future, as well as navigational aids to increase the safety and efficiency of operations. This element also examines the general aviation terminal, hangar, apron, and support needs.

Chapter Four – Airport Alternatives considers a variety of solutions to accommodate the projected facility needs. This element proposes various facility and site plan configurations which can meet the projected facility needs. An analysis is completed to identify the strengths and weaknesses of each proposed development alternative, with the intention of determining a single direction for development.

Chapter Five – Recommended Master Plan Concept provides both a graphic and narrative description of the recommended plan for the use, development, and operation of the Airport. An environmental overview is provided at the end of this chapter to analyze potential environmental impacts of proposed airport development projects.

INITIATION

INVENTORY

PAC

May 22, 2014

FORECASTS

FACILITY REQUIREMENTS



PAC

September 30, 2014

AIRPORT ALTERNATIVES



PAC

PUBLIC WORKSHOP

January 29, 2015

RECOMMENDED MASTER PLAN CONCEPT

NEPA ENVIRONMENTAL OVERVIEW

CAPITAL IMPROVEMENT/ FINANCIAL PROGRAM



PAC

PUBLIC WORKSHOP

September 14, 2015

AIRPORT LAYOUT PLANS (ALP)

DRAFT FINAL REPORT

FINAL MASTER PLAN DOCUMENT



Exhibit IA
MASTER PLAN PROCESS FLOW

Chapter Six – Capital Improvement Program provides a proposed capital needs program which defines the schedules, costs, and funding sources for the recommended development projects.

The official ALP drawings that are produced as a result of the recommended Master Plan Concept and used by the FAA and ADOT-MPD – Aeronautics Group in determining grant eligibility and funding are included as **Appendix B** to the Master Plan.

COORDINATION

The Sedona Airport Master Plan is of interest to many within the local community and County. This includes local citizens, local businesses, community organizations, County officials, Airport users, Airport tenants, and aviation organizations. As a component of the regional, state, and national aviation systems, Sedona Airport is of importance to both state and federal agencies responsible for overseeing the air transportation system.

To assist in the development of the Master Plan, Yavapai County identified a group of government representatives, Airport users and tenants, the military, and local community representatives to act in an advisory role in the development of the Master Plan. Members of this Planning Advisory Committee (PAC) met at designated times during the study to review phase reports and provide comments to help ensure that a realistic, viable plan is developed.

To assist in the review process, draft phase reports were prepared at various milestones in the planning process. The phase report process allows for timely input and review during each step within the Master Plan to ensure that all issues are fully addressed as the recommended program develops.

SUMMARY AND RECOMMENDATIONS

The proper planning of a facility of any type must consider the demand that may occur in the future. For Sedona Airport, this involved updating forecasts to identify potential future aviation demand. Because of the cyclical nature of the economy, it is virtually impossible to predict with certainty year-to-year fluctuations in activity when looking five, ten, and twenty years into the future. Recognizing this reality, the Master Plan is keyed toward potential demand "horizon" levels rather than future dates in time. These "planning horizons" were established as levels of activity that will call for consideration of the implementation of the next step in the Airport Master Plan program. By developing the Airport to meet the aviation demand levels instead of specific points in time, the Airport will serve as a safe and efficient aviation facility which will meet the operational demands of its users while being developed in a cost-efficient manner. This program allows Yavapai County to change specific development in response to unanticipated needs or demand.

The forecast approach utilized historical and forecasted general aviation and economic trends resulting in the growth projections summarized in **Table IA**.

TABLE IA
Forecast Summary by Planning Horizon
Sedona Airport

	Base Year (2013)	Short Term	Intermediate Term	Long Term
BASED AIRCRAFT				
Single Engine Piston	77	79	84	87
Multi-Engine Piston	4	4	3	3
Turboprop	1	2	2	5
Jet	1	2	3	6
Helicopter	4	5	6	8
Total Based Aircraft	**92**	**97**	**103**	**115**
AIRCRAFT OPERATIONS				
General Aviation				
Itinerant	24,050	26,210	28,564	33,925
Local	0	0	0	0
Air Taxi				
Itinerant	10,850	12,578	14,581	19,596
Military				
Itinerant	100	400	400	400
Local	0	0	0	0
Total Itinerant Operations	35,000	39,188	43,545	53,921
Total Local Operations	0	0	0	0
Total Annual Operations	**35,000**	**39,188**	**43,545**	**53,921**

Source: Coffman Associates analysis

The previous Master Plan for Sedona Airport was completed in 1999. The 1999 Master Plan recommended several airside and landside improvements, including resurfacing Runway 3-21, installation of non-precision approach markers, expansion of the apron, improvements to the vehicle roadway network and parking lots, expanded water storage capacity, and hangar storage capacity expansion. Since the completion of that Master Plan, the airfield pavements have been rehabilitated, Runway 3-21 was widened to 100 feet, utilities and water storage capacity have been expanded, and the aircraft parking apron has been expanded.

MASTER PLAN CONCEPT

The Master Plan concept includes improvements to the airfield and landside area to satisfy FAA design and safety standards and to meet current and forecast needs. Improvements are also designed to ensure a viable aviation facility for the region and state well into the future. The following summarizes recommendations in the Master Plan Concept. **Exhibit IB** depicts the Recommended Master Plan Concept.

0 600 1200
SCALE IN FEET
NORTH
Aerial Date: November 2013

Greater than 3/4 Mile Visibility Runway Protection Zone
One-Mile or Greater Visibility Runway Protection Zone
Fill/Grade RSA
Realigned Perimeter Fence
Proposed Sky Ranch Lodge Expansion Area
Sky Ranch Lodge
Airport Road
Masons Lodge Building 1.3 Acre Leasehold
Air Terminal Drive
Shrine Road
BRL
28.2 Acres
0.1 Acres
0.1 Acres
0.16 Acres
2.6 Acres
A10 A9 A8 A7 A6 A5 A5 A4 A4 A3 A3 A2 A2 A1
1,000′
830′
460′
RUNWAY 3-21 (5,132′ x 100′)
3
21
Ultimate Non-Precision Markings
Ultimate Non-Precision Markings
One-Mile or Greater Visibility Runway Protection Zone
Fill/Grade RSA
8.0 Acres

0 400 800
SCALE IN FEET
Proposed Sky Ranch Lodge Expansion Area
4.6 Acres
Sky Ranch Lodge
6.1 Acres
2.8 Acres
Airport Road
Masons Lodge Building 1.3 Acre Leasehold
Fire Suppression System Expansion (Additional 160,000 gallons of water storage capacity and fire pump)
12.9 Acres
Shrine Road Realignment
2.3 Acres
3.0 Acres
Air Terminal Drive
Shrine Road
Maintenance Equipment Storage
0.3 Acres
Fuel Farm Relocation
2.4 Acres
Executive Hangars (8,250 sf)
6.5 Acres
0.9 Acres
Expanded Aircraft/ Helicopter Parking (14,400 sq yds)
Terminal Parking Expansion (Additional 44 spaces)
4,500 sf Terminal Expansion
Restaurant Septic Drain Field
BRL

LEGEND

- Airport Property Line
- Existing Easement Line
- Existing Fence Line
- Ultimate Fence Line
- Runway Safety Area (RSA)
- Object Free Area (OFA)
- Runway Protection Zone (RPZ)
- 30′ Building Restriction Line (BRL)
- Future Airfield Pavement
- Future Road/Parking
- Pavement to be Removed/Abandoned
- Hangar/Aviation-Related Development
- Non-Aviation Revenue Support
- Future Property Easement
- A Taxiway Designation
- A Ultimate Taxiway Designation

Exhibit IB
RECOMMENDED DEVELOPMENT CONCEPT

Airfield Improvements – Key airfield improvements include:

- Filling and grading portions of the Runway Safety Area (RSA) that do not meet FAA grading standards. This project involves the placing of fill material off both ends of the runway with these fill areas being held in place by retaining walls to ensure the stability of the RSA.

- Removal of obstructions to the RSA and the Runway Object Free Area (ROFA). The perimeter security fence and vegetation obstruct portions of the RSA and the ROFA. This project would realign the perimeter fence outside of the RSA and ROFA where possible and remove overgrown vegetation from these areas.

- Extend Taxiway A to the Runway 3 threshold. The existing taxiway system requires aircraft to back-taxi on the runway when utilizing Runway 3 for departure. A full-length parallel taxiway would provide a safer and more efficient taxiway system.

- Removal of connecting taxiways A2, A3, A4, A5, and A6 and the construction of new off-set connecting taxiways to eliminate direct access from an apron to the runway. This project will mitigate the potential for runway incursions.

- Consideration of improved instrument approach procedures (greater than ¾-mile visibility minimums) to Runway 3. Improved minimums will make the Airport more accessible during poor weather conditions.

- Acquisition of avigation easements from the United States Forest Service (USFS) for land contained within the Runway Protection Zone (RPZ) of both runway ends. Currently, portions of both RPZs extend beyond Airport property and existing clear zone easements. This project will afford the County a level of control over the airspace within the entire RPZ, which protects people and objects on the ground.

- Realignment of the perimeter security fence. Originally, the fence line was constructed on USFS property in some areas due to an error in the Airport's boundary survey. This project would realign the perimeter fence to be consistent with the Airport property boundary.

Landside Facilities – The Master Plan's landside facility recommendations have been devised to efficiently accommodate potential aviation demand and provide revenue enhancement possibilities. Landside facility development will only occur as demand dictates; in this manner, the facilities will only be constructed if required by verifiable demand.

The major landside issues addressed in the Master Plan Concept include the following:

- Meeting landside facility needs within the existing Airport property. The purpose of this was to avoid having to acquire new lands for landside facilities since there is adequate land available for development already owned by the Airport.

- Construct additional aircraft storage hangars in existing development areas as well as through the improvement of undeveloped parcels on Airport property.

- Expansion of terminal facilities to accommodate potential growth in air tour activities as well as use by transient travelers visiting the Sedona area and to expand leasable office space capacity to generate additional revenues.

- Expansion of the terminal aircraft parking ramp (Ramp A) to provide additional large aircraft parking spaces and helicopter parking spaces.

- Identification of areas for revenue enhancement through the development of aviation-related and/or non-aviation related activities.

DEVELOPMENT FUNDING

The full implementation of the Airport Master Plan is likely to take two decades or more at a cost of $31.0 million in 2015 dollars. The breakdown of funding over the three planning horizons is presented in **Table IB**. More than 70 percent of the total is eligible for grant funding from the federal (FAA) and state (ADOT) sources. The source for FAA funding is the Aviation Trust Fund, which is funded through user fees and taxes on airline tickets, aviation fuel, and aircraft parts. 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 State Transportation Board establishes the policies for distribution of these state funds.

TABLE IB
Development Funding Summary
Sedona Airport

PLANNING HORIZON	Total Costs	Federal/State Share	Local Share
Short Term Program	$14,284,000	$13,016,686	$1,267,314
Intermediate Term Program	$5,472,900	$4,095,276	$1,377,624
Long Term Program	$11,282,000	$5,132,333	$6,149,667
Total Program Costs	**$31,038,900**	**$22,244,295**	**$8,794,605**

Note: Column totals may not add up due to rounding.

With the Airport Master Plan Update completed, the most important challenge is implementation. The cost of developing and maintaining aviation facilities is an investment which yields impressive benefits for the County. This plan and associated development program provides the tools Yavapai County and the SOCAA will require to meet the challenges of the future. By providing a safe and efficient facility, Sedona Airport will continue to be a valuable asset to the County and the surrounding region.



Chapter One

INVENTORY

Chapter One

INVENTORY

To produce a realistic and adequate plan for future growth at Sedona Airport (SEZ or Airport), it is essential to understand the framework within which the Airport functions. An initial task within this Master Plan consists of gathering data to provide a clear definition of the Airport's physical and operational features, including facilities, users, and activity levels. The information that follows formed the baseline for developing this report.

The initial action necessary in preparing a master plan is the collection of all pertinent data that relates to the area served by the Airport, as well as the Airport itself. This inventory was conducted using the following sources of information:

- *Sedona Airport Master Plan Update (1997-2017)*, December 1999
- On-site visits
- Aerial and ground photography
- Interviews with Sedona-Oak Creek Airport Authority (SOCAA), Yavapai County staff, tenants, and users
- Federal, state, and local publications
- Project record drawings

This chapter briefly describes the physical facilities at the Airport. Aviation-specific information on the airspace, aviation activity, and role of the Airport are described. The chapter also details the environment in which the Airport operates, including surrounding land uses and the socioeconomic characteristics of the region.



AIRPORT SETTING

LOCALE

Sedona Airport consists of approximately 220 acres located atop Table Top Mountain overlooking the City of Sedona. The City of Sedona is a tourist destination averaging between two and four million tourists per year. Tourists come to Sedona for outdoor recreation attractions including Oak Creek Canyon with its red-rock formations and riparian areas as well as for the local art galleries and many annual cultural festivals.

The City of Sedona is located approximately 116 miles north of Phoenix and 25 miles southwest of Flagstaff. From Phoenix, drivers utilize Interstate Highway 17 and State Route 179 to arrive in Sedona. From Flagstaff, drivers utilize State Route 89A to arrive in Sedona. The Airport elevation is 4,830 feet mean sea level (MSL). Yavapai County (County) owns the property through a deed from the United States (U.S.) Forest Service, dated October 31, 1956. The Airport's location and vicinity features are depicted on **Exhibit 1A**.

Sedona Airport is classified as a General Aviation airport by the *National Plan of Integrated Airport Systems (2013-2017)* (NPIAS), and is one of 79 public-use airports located within Arizona. An airport must be listed in the NPIAS to be eligible for federal funding. The Airport is also included in the *2008 Arizona State Aviation System Plan* (SASP) as a General Aviation Community airport. General Aviation-Community airports serve regional economies, connecting to state and national economies, and serve all types of general aviation aircraft. According to the Arizona Department of Transportation (ADOT) *Airport Development Guidelines* document prepared in October 2011, ADOT grant funding is available to General Aviation-Community airports for up to 90 percent of projects of local, regional, or State significance, including projects that may not otherwise be funded or eligible under the FAA Airport Improvement Program (AIP).

LAND USE

The Airport is surrounded by U.S. Forest Service land within the Red Rock Ranger District of the Coconino National Forest. However, there is residential development within 0.5 mile of the Airport to the east and within 0.25 mile to the north. There is one park, Sunset Park, located northwest of the Airport plateau approximately 0.35 mile at its closest point (measured from Sky Ranch Lodge), and one house of worship (Rainbow Ray Focus), located 0.46 mile to the north at its closest point (measured from the Runway 21 end). There are no schools, hospitals, or other types of noise-sensitive land uses within 0.5 mile of the Airport.

The Sedona Airport is located on a plateau above the surrounding development and provides panoramic views from its northern edge. These views are available to the public from a scenic overlook located off Airport Road within Airport property as well as from Sky Ranch Lodge. Trails located on the adjacent U.S. Forest Service lands also provide scenic views, including from one of the four "vortexes" located within the Sedona area.

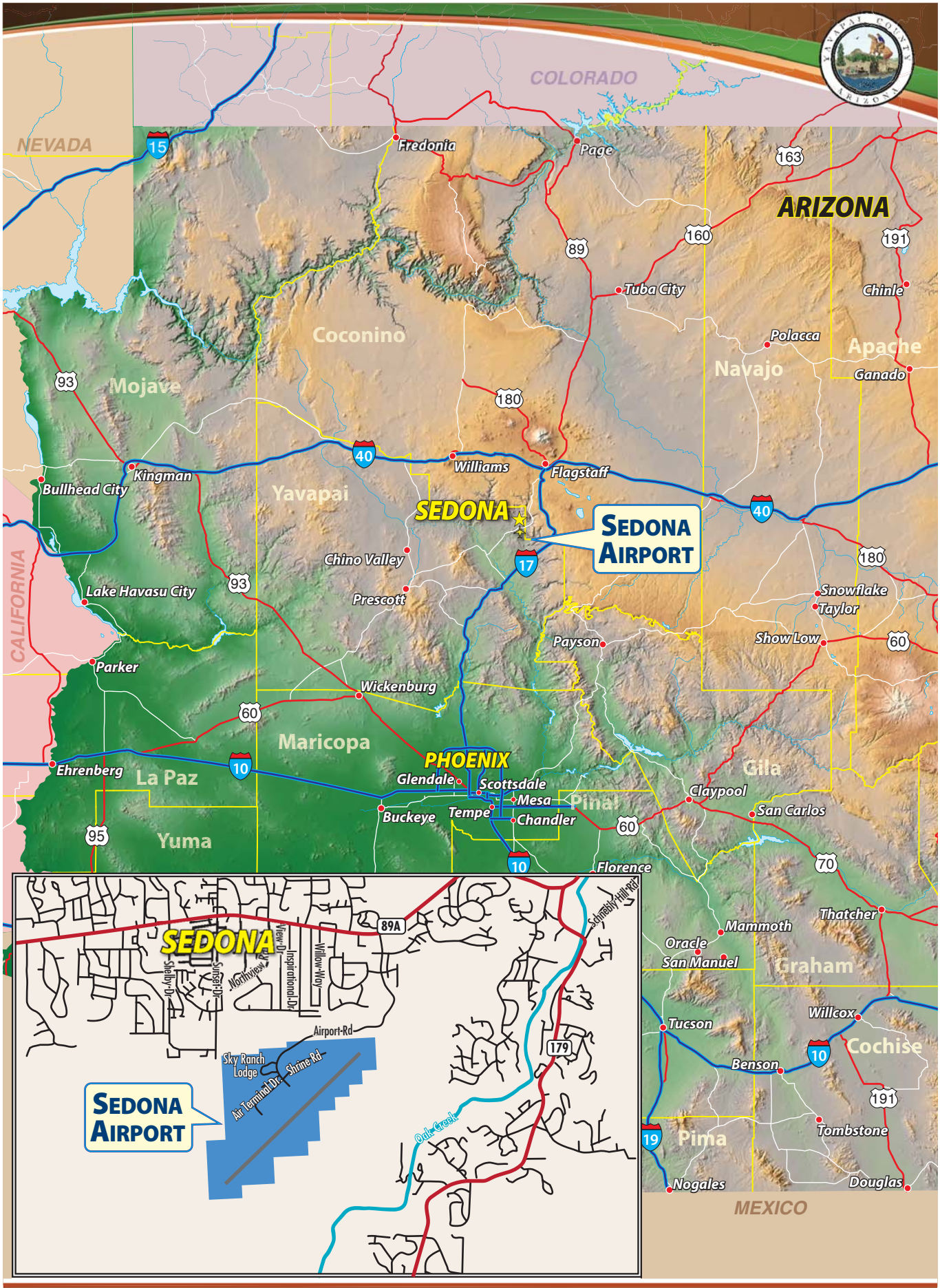


Exhibit 1A
AIRPORT LOCATION

Local Zoning and Land Use Regulation

Although owned by Yavapai County and surrounded by Coconino National Forest land, the Airport is located within the jurisdictional boundaries of the City of Sedona. The recently approved *Sedona Community Plan* (2013) designates most of the Airport property as Public/Semi-Public; however, the Sky Ranch Lodge is designated as Commercial/Lodging (**Exhibit 1B**). Page 27 of the newly approved Community Plan (2013) states with respect to the Airport and the Sky Ranch Lodge, "Existing and planned lodging uses at the Sedona Airport are designated on the Future Land Use Map. No additional areas are recommended." The 2013 *Sedona Community Plan* was ratified by a public vote, which occurred on March 11, 2014.

The entire Airport, including the Sky Ranch Lodge, is zoned Community Facilities (CF) District. The CF District is intended primarily for the accommodation of public/semi-public uses, the identification of public-accessible areas, and the identification and preservation of areas of historic significance.[1] According to the 2013 Community Plan (page 55), the top priority Action Item of the new plan is: "Revise Land Development Code to be consistent with Community Plan land use designations and CFA/PA planning/review processes, CFA Specific Plans and land acquisition tools such as transfer of development rights." The Sky Ranch Lodge development team is currently pursuing a rezone in keeping with its Community Plan land use designation.

Any land-use activities or changes in land-use at the Airport are subject to the land-use regulations established under the local zoning authority of the City of Sedona, provided such uses are deemed proprietary endeavors and not traditional governmental functions.

Other Governmental Land Use Controls

The largest governmental landowner in the vicinity of the Airport as well as within the City of Sedona is the U.S. Forest Service. The adjacent Forest Service land is used for passive recreational uses such as hiking and is located within the Red Rock Ranger District.

Public Disclosure Map

The State of Arizona provides for the disclosure of aviation activities to prospective buyers of real estate. In 1997, the State adopted legislation allowing airport sponsors to identify Airport Influence Areas (AIA) around public and commercial airports. The establishment of an AIA is voluntary and requires a public hearing. The boundary of the AIA must be recorded with the county in which the airport is located.

In addition, the 1999 Arizona State Legislature adopted legislation (Arizona Revised Statutes [A.R.S.] §28-8486) requiring the State's Department of Real Estate to prepare and maintain a series of maps depicting the traffic pattern airspace of each public-use airport in

[1] *Sedona Land Development Code*. Available at: www.codepublishing.com/AZ/sedona/ldc.html, accessed June 2014.

the state. These maps are to be provided to the public on request. The intent of the maps is to provide disclosure of the location of the airport as well as the potential influence the airport may have on the surrounding property.

The current public disclosure map for Sedona Airport, available on the Arizona Department of Real Estate's website, is shown in **Exhibit 1C**. As a part of the master plan process, the public airport disclosure map will be updated and included as an appendix in the final Master Plan document.

CLIMATE

Table 1A summarizes climatic data for the Sedona area. In general, Sedona's climate can be described as having cool winters with average snowfall around four inches and hot summer months with heavier rain accumulations in the late summer and early fall months. The months with the most precipitation days are July and August with an average of 61 precipitation days throughout the year.

TABLE 1A
Monthly Climate Summary
Sedona, Arizona

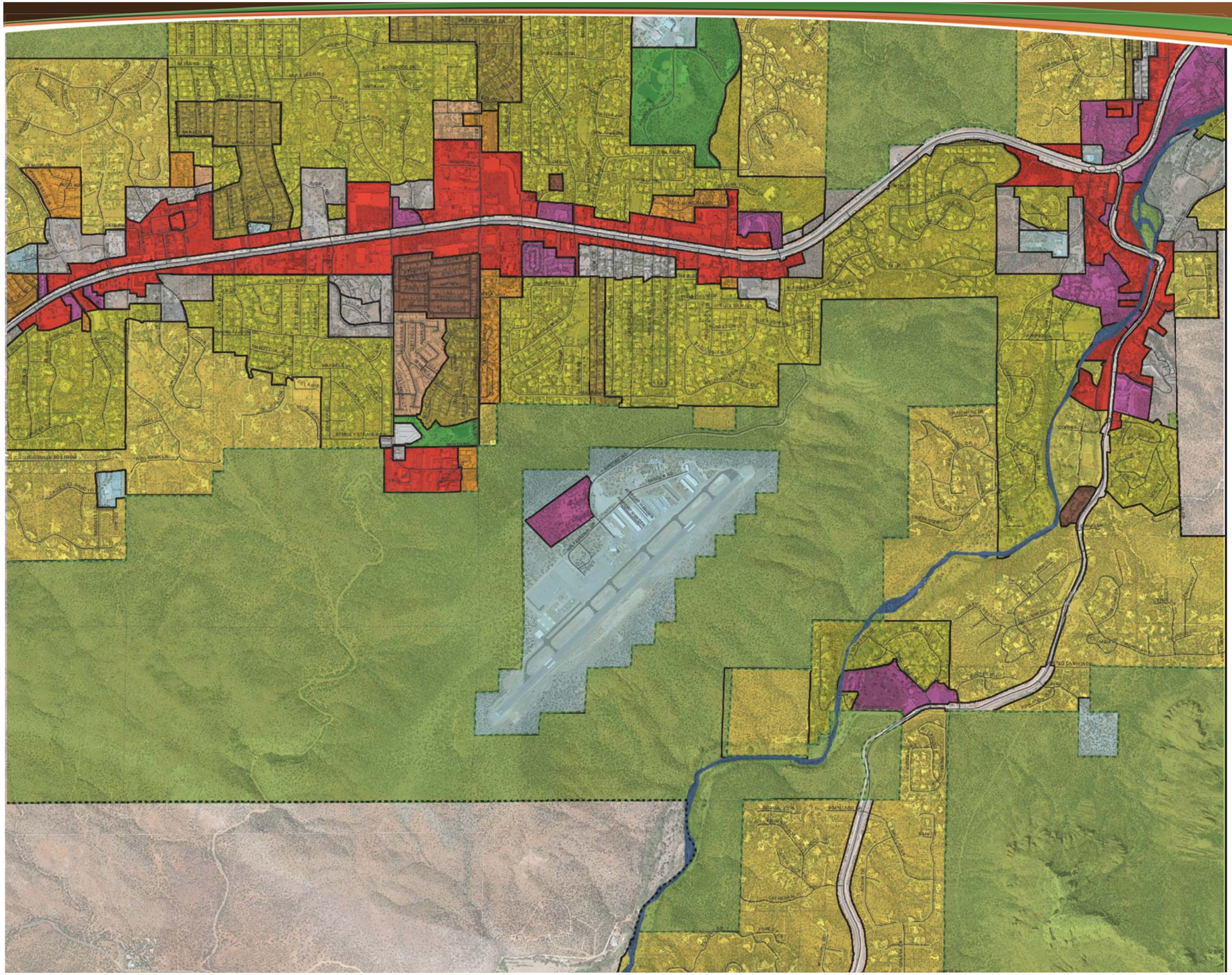
	Monthly Temperature Averages		Precipitation		
Month	**Maximum (F)**	**Minimum (F)**	**Mean (inches)**	**Avg. Snowfall (inches)**	**Avg. Precipitation Days**
January	56.0	30.8	2.03	1.4	6
February	60.0	33.3	1.86	0.8	5
March	64.8	36.6	1.96	0.6	6
April	72.9	42.3	1.11	0.2	4
May	82.4	49.8	0.59	0.0	3
June	92.3	58.1	0.37	0.0	2
July	96.1	65.1	1.76	0.0	8
August	93.4	63.8	2.15	0.0	9
September	88.3	58.2	1.61	0.0	5
October	77.8	48.6	1.42	0.0	4
November	65.4	37.6	1.33	0.1	4
December	56.5	30.9	1.65	1.1	5
Annual	75.5	46.3	17.85	4.2	61

Source: Western Regional Climate Center; Sedona Ranger Station, Period of Record: 10/20/1943 to 09/30/2010.

AIRPORT HISTORY

In order to maintain a detailed account of the history of the Sedona Airport, the *History of the Sedona Airport* section from the 1999 Master Plan Update has been carried forward and updated to include recent Airport developments.

Based on the need of local businesspersons Joe Mosher and Ray Steele, the development of Sedona Airport was underway in the 1950s. At the time, the City of Sedona was not incor-



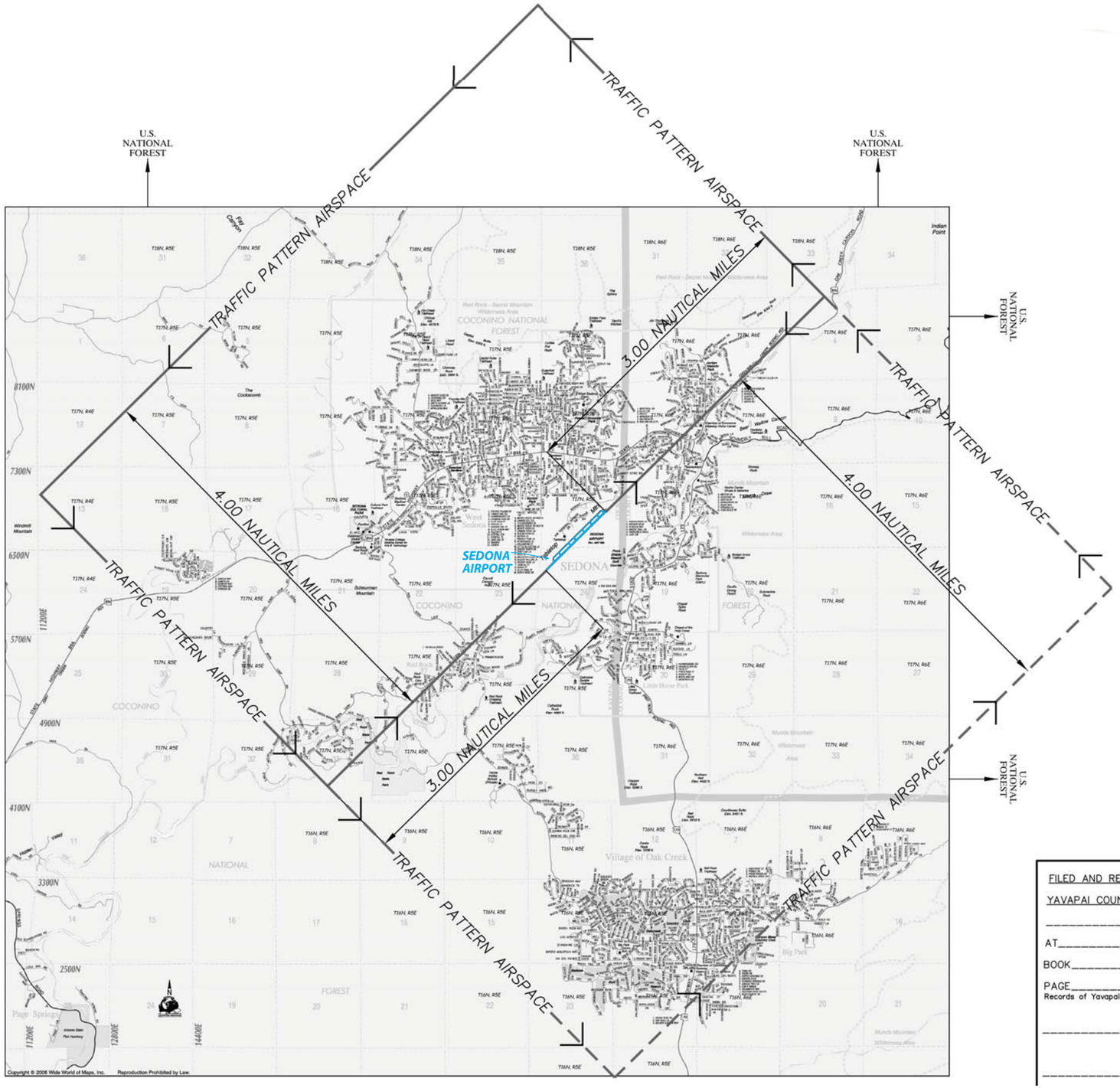
LEGEND

- Single Family Very Low Density (0 to .5 DU/AC)
- Single Family Low Density (.5 to 2 DU/AC)
- Single Family Medium Density (2 to 4 DU/AC)
- Single Family High Density (4 to 8 DU/AC)
- Multi Family Medium Density (4 to 8 DU/AC)
- Multi Family Medium & High Density (4 to 12 DU/AC
- Mobile Home
- Commercial
- Commercial / Lodging
- Planned Area
- Public / Semi-Public
- Parks
- National Forest & other Natural Open Space
- Equestrain Area
- Oak Creek
- Street Centerline
- City Boundary

N

Source:
City of Sedona - Future Land Use Map,
November 2013
Aerial - Google Maps

Exhibit 1B
CITY OF SEDONA FUTURE LAND USE MAP



SEDONA PUBLIC AIRPORT DISCLOSURE MAP

LOCATED IN:

T18N, R5E
SECTIONS 13, 14, 22–28, 32–36

T18N, R6E
SECTIONS 19, 29–33

T17N, R4E
SECTIONS 12, 13, 24

T17N, R5E
SECTIONS 1–30, 32–36

T17N, R6E
SECTIONS 3–11, 13–35

T16N, R5E
SECTIONS 8–16, 22–26

T16N, R6E
SECTIONS 7–9, 17–19

NOTES:

1. This map has been prepared in accordance with the Arizona Revised Statutes, Section 28–8486, relating to Public Airport Disclosure.
2. Traffic Pattern Airspace Boundaries have been established in accordance with the guidelines provided in Federal Aviation Administration (FAA) Order 7400.2F for Category D aircraft.
3. 1 Nautical Mile = 6,080 feet or 1.1516 statute miles.

BASE MAP INFORMATION:

Copyright 2006 Wide World of Maps
Reproduced with Permission No. 442329

N

0 3000 6000 9000
SCALE IN FEET

FILED AND RECORDED AT REQUEST OF
YAVAPAI COUNTY PUBLIC WORKS DEPT.

_____A.D. 20____

AT_____O'CLOCK ____M.

BOOK_____

PAGE_____

Records of Yavapai County, Arizona

_____
County Recorder

_____
Deputy Recorder

SEDONA PUBLIC AIRPORT DISCLOSURE MAP

SEDONA, ARIZONA

Source: Arizona Department of Real Estate website. Accessed May, 2014

porated. Federal and State sponsorship of such an endeavor was not legally possible. As a result, Yavapai County sponsored the ultimate construction of the Airport.

The initial land was acquired in October of 1956 from the U.S. Forest Service under a Section 16 land grant through the Federal Aviation Administration (FAA). Runway and aircraft parking construction broke ground in 1957 with an FAA grant of $13,420. In the 1970s, the local communities recognized their role in the authority of the airport. The Sedona Airport Administration was formed in 1970. The sponsor, Yavapai County, gave the responsibility to the Administration for overseeing the development of the Sedona Airport in 1971.

As the Airport's activity grew, additional facilities were eventually needed. The first Airport Master Plan was prepared in 1983 to help visualize the potential needs of the Sedona Airport in the future. The construction of the terminal building occurred in 1991, along with improvements to the access road and construction of the water storage tank and fire protection facility. An update of the original Master Plan was initiated in 1991 and completed in May of 1992. The most recent update to the Master Plan was completed in December 1999. Projects proposed as a result of that Master Plan Update included: the relocation of Taxiway A to its current separation distance from the runway centerline (250 feet) to accommodate larger aircraft wingspans; Apron A expansion to compensate for the taxiway relocation; expansion of taxilanes and hangar facilities to accommodate more based aircraft; expansion of the terminal facility; and miscellaneous improvements to access roadways, perimeter fencing, and airport utilities. Since the completion of the 1999 Master Plan Update, Taxiway A has been relocated, Runway 3-21 has been widened to 100 feet, Ramp A has been expanded, and various utility upgrades and pavement maintenance projects have been completed and the new Mesa Grill restaurant building was constructed.

FAA AIRPORT IMPROVEMENT PROGRAM (AIP) PROJECTS

To assist in funding capital improvements, the FAA has provided funding assistance to the Airport through the Airport Improvement Program (AIP). The AIP is funded through the Aviation Trust Fund, which 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 a portion of the operation of the FAA and is funded by user fees, taxes on airline tickets, aviation fuel, and various aircraft parts.

Table 1B summarizes FAA AIP grants for Fiscal Year (FY) 1999 through FY 2013. The FAA has granted over $7.6 million for improvements at Sedona Airport over the past 14 years. ADOT-MPD – Aeronautics Group has also provided assistance to Sedona Airport. **Table 1C** presents a summary of these projects and grant totals for FY 2003 through pending projects for FY 2015. Including the pending grants, ADOT has granted over $3.9 million for improvements to the Sedona Airport over the past 12 years.

TABLE 1B
AIP Grant History FY1999-FY2013
Sedona Airport

Fiscal Year	Grant Number	Development Description	AIP Grant Total
1999	10	Rehabilitate taxiway (Phase II)	$480,000
2001	11	Extend Taxiway E; install precision approach path indicator	$245,862
2002	12	Rehabilitate apron	$260,000
2004	13	Widen runway 3-21	$2,531,256
2005	15	Improve utilities (fire protection waterline); rehabilitate and expand apron	$1,019,500
2006	16	Rehabilitate taxiway	$1,150,000
2007	17	Expand apron (southwest ramp design)	$110,000
2008	19	Conduct environmental study – apron expansion	$87,320
2011	20	Expand Ramp A 174,000 s.f.	$1,290,453
2012	21	Construct taxiway (Taxilane B7), install airfield guidance signs	$438,650
Total			$7,613,041

Source: FAA Airport Improvement Program (AIP) Grant Histories, http://www.faa.gov/airports/aip/grant_histories/.
Note: All AIP funded projects included a locally funded match.

TABLE 1C
ADOT Grant History FY2003-FY2015
Sedona Airport

Fiscal Year	Grant Number	Development Description	ADOT Grant Total
2003	3F35	Rehabilitate north apron, phase 2	$12,763
2003	3S96C	Airport Pavement Preservation Program (APPP)	$161,073
2004	4S40	Design only: Apron A expansion, Apron A rehabilitation & security runway lighting upgrade	$104,850
2005	5S30	Design/construct Apron A expansion to NE, runway safety area improvements	$170,370
2005	5F58	Widen Runway 3/21 (5,130'x100')	$66,614
2006	6F55	Fire line improvements and Apron A expansion to NE	$26,830
2006	6S15	Expand fire protection system	$466,018
2007	7S21	Design/construct runway safety area (RSA) improvements & blast pad	$585,000
2007	7S02	Design only: Taxiway A rehabilitation	$80,000
2007	7F47	Rehabilitate parallel Taxiway A	$30,264
2008	8S20	Design Apron A reconstruction (approximately 31,110 sy)	$85,500
2008	8S21	Remove and replace AWOS	$90,000
2008	8S22	Design hangar pad extensions and taxilanes B4 & B5, approximately 400' x 100'	$40,500
2008	8F54	Expand apron (southwest ramp) – design only	$2,895
2009	9F26	Conduct environmental study for taxiway extension	$2,298
2011	1S48	Design new Taxilane B7 – phase 1 (400' x 70')	$45,000
2012	2S75	Design grading and drainage improvements between Runway 3/21 and Taxiway A	$45,000
2012	2S1U	Thin asphalt overlay/PFC TWBSD (Sec 10)	$311,999
2012	2F1J	Expand apron (expand alpha apron approximately 300 feet by 580 feet)	$33,960
2013	3S2C	Design terminal parking lot expansion (400' x 300'), including lighting	$78,592

TABLE 1C (Continued)
ADOT Grant History FY2003-FY2015
Sedona Airport

Fiscal Year	Grant Number	Development Description	ADOT Grant Total
2013	3S3L	Design pavement recon./rehab. Taxilanes B1, B2, B3, B4, and B5; Construct B1 and B2 (Phase 1)	$382,500
2013	3F3D	Construct Taxilane B7 and install airfield guidance signs, including post project as-built airport layout plan	$21,532
2014	4S2C	Master Plan including new ALP	$242,211
2015*	5S1U	Construct taxilanes B1 (350' x 50') and B2 (350' x 60') pavement recon. Crack seal and seal coat B3, B4 & B5	$315,000
2015*	4S5Z	Construct infield area grading & drainage improvements between Rwy 3/21 & Taxiway A	$540,000
Total			$3,940,769

* - 2015 grants are currently pending.
Source: ADOT MPD – Aeronautics Group, Grant Detail Reports
Note: All ADOT funded projects included a locally funded match.

AIRPORT ADMINISTRATION

The Airport is owned by Yavapai County and managed under a Master Lease Agreement with the SOCAA, a 501(c)(3) non-profit organization. The lease agreement was most recently renewed on February 12, 2003 with terms set to expire on June 30, 2050. The SOCAA is governed by a Board of Directors, which includes seven members who are elected for five year terms with a 10-year term limit. Day-to-day operation of the airport is overseen by a General Manager, a Business Manager, and six staff members. The SOCAA also owns and operates the Airport's fixed base operator (FBO), Red Rock Aviation. The SOCAA's organizational chart is represented on **Exhibit 1D**.

GOVERNING DOCUMENTS

Most airports have governing documents that outline general day-to-day operating procedures and minimum standards to be maintained by tenants and service providers. The SOCAA has approved and adopted the following governing documents for the Sedona Airport:

- *Operations Policies and Procedures*, Revision 1, March 19, 2014

According to the *Operations Policies and Procedures* document, SOCAA's mission statement is as follows:

> *"The primary objective of the Sedona-Oak Creek Airport Authority is the development and promotion of the Sedona Airport as a well-managed modern, attractive, and efficient airport that takes its environmental and safety objectives seriously and provides exceptional aviation-related services and products, competitively priced and designed to meet the general and commercial aviation needs of Yavapai County, the City of Sedona, and the State of Arizona."*

The intended purpose of the *Operations Policies and Procedures* is to guide day-to-day operations of the Airport and is used by Airport management to conduct daily business in an efficient manner, consistent with the policies of the FAA, Yavapai County, and the SOCAA.

- *Minimum Standards for Aeronautical Activity*, Effective Date: March 19, 2014

The stated purpose of the Minimum Standards document is to promote fair competition at the Airport, not expose those who have undertaken to provide commodities and services to irresponsible competition, and to provide a safe operating environment for commercial operators, visitors to the Airport, and airport patrons.

FINANCIAL DATA

The SOCAA has made available on its website (sedonaairport.org) audited annual financial statements detailing accounting and financial data. A summary of this financial data can be found in **Tables 1D** and **1E**.

TABLE 1D
SOCAA Assets and Liabilities

	2007	2008	2009	2010	2011	2012	2013
Assets:							
Total Current Assets	$1,139,998	$1,288,457	$1,246,321	$1,185,232	$418,946	$910,004	$810,109
Property & Equip.	$1,193,050	$1,179,789	$1,165,142	$1,224,114	$2,573,346	$2,839,972	$2,832,712
Other Assets	$184,178	$188,153	$234,436	$295,927	$0	$0	$0
Total Assets	**$2,517,227**	**$2,656,399**	**$2,645,899**	**$2,705,273**	**$2,992,292**	**$3,749,976**	**$3,642,821**
Total Liabilities	**$132,130**	**$105,129**	**$91,859**	**$111,307**	**$348,310**	**$1,001,117**	**$971,730**
Net Assets	$2,385,098	$2,551,270	$2,554,040	$2,593,966	$2,643,982	$2,748,859	$2,671,091
Total Liabilities and Net Assets	**$2,517,227**	**$2,656,399**	**$2,645,899**	**$2,705,273**	**$2,992,292**	**$3,749,976**	**$3,642,821**

Source: SOCAA Financial Statements

TABLE 1E
SOCAA Revenues and Expenses

	2008	2009	2010	2011	2012	2013
Operating Revenues:						
Rents	$634,938	$574,856	$591,380	$602,548	$660,880	$669,643
Fuel and oil sales	$1,651,546	$1,122,727	$1,167,777	$1,477,750	$1,584,089	$1,609,014
Fees, catering and miscellaneous income	$34,204	$17,332	$17,670	$35,351	$37,784	$28,875
Total Revenues	**$2,320,689**	**$1,714,915**	**$1,776,827**	**$2,115,649**	**$2,282,753**	**$2,307,532**
Cost of Sales:						
Fuel and oil	$1,313,857	$793,862	$871,567	$1,178,760	$1,264,873	$1,270,387
Catering and miscellaneous	$0	$13,417	$7,491	$10,163	$10,273	$12,736
Total cost of sales	**$1,334,669**	**$807,279**	**$879,058**	**$1,188,923**	**$1,275,146**	**$1,283,123**
Gross Profit	**$986,019**	**$907,636**	**$897,769**	**$926,726**	**$1,007,607**	**$1,024,409**
General and Administrative Expenses	$898,871	$953,754	$936,535	$932,655	$1,015,465	$1,138,724
Excess Expenditures Over Revenues from Operations	$87,148	$-46,118	$-38,766	$-5,929	$-7,858	$-114,315
Non-Operating Revenues	$79,024	$48,888	$78,692	$55,945	$112,735	$36,547
Excess of Revenues Over Expenditures	**$166,172**	**$2,770**	**$39,926**	**$50,016**	**$104,877**	**$-77,768**

Source: SOCAA Financial Statements

SEDONA–OAK CREEK AIRPORT AUTHORITY ORGANIZATIONAL CHART



Exhibit 1D
SEDONA-OAK CREEK AIRPORT AUTHORITY
ORGANIZATIONAL CHART

AVIATION ACTIVITY

Analysis of historical activity levels aid in projecting future trends which will enhance the Airport's ability to plan for facility demands in a timely manner. The following information outlines basic operational activities at the Airport. A more detailed analysis of aviation activity will be provided and discussed in the next chapter on aviation forecasts.

OPERATIONS

Records of airport operational activities are essential for determining required facilities (types and sizes), as well as eligibility for federal funding. Since the Airport is non-towered, a detailed account of aircraft operations (takeoffs and landings) is not available. The current FAA Form 5010 - Airport Master Record for the Airport estimates the Airport accommodated 35,000 operations for 12 months ending May 1, 2012. The total operations breakdown includes: 40 percent itinerant general aviation (GA); 31 percent air taxi; 25 percent local GA; and 4 percent military. The FAA's *Terminal Area Forecast* (TAF) is another source for historical operations estimates. **Table 1F** provides a summary of the TAF operations statistics dating back to 1990.

TABLE 1F
FAA Terminal Area Forecast – Aviation Activity History
Sedona Airport

Year	Itinerant	Local	Total Operations	Based Aircraft
1990	9,500	7,000	16,500	110
1991	30,000	36,500	56,500	112
1992	21,500	5,000	26,500	101
1993	25,000	5,000	30,000	101
1994	25,000	5,000	30,000	101
1995	25,000	5,000	30,000	101
1996	25,000	5,000	30,000	101
1997	33,500	7,500	41,000	101
1998	33,500	7,500	41,000	101
1999	26,382	54,750	81,132	102
2000	33,500	7,500	41,000	101
2001	34,000	7,500	41,500	101
2002	34,080	7,500	41,580	101
2003	34,000	7,500	41,500	101
2004	34,000	7,500	41,500	101
2005	34,000	7,500	41,500	101
2006	37,500	12,500	50,000	102
2007	37,500	12,500	50,000	102
2008	37,500	12,500	50,000	64
2009	37,500	12,500	50,000	66
2010	37,500	12,500	50,000	66
2011	37,500	12,500	50,000	66
2012	26,250	8,750	35,000	78
2013*	26,250	8,750	35,000	78

*Projected
Source: FAA *Terminal Area Forecast* (TAF), February 2014

BASED AIRCRAFT

Identifying the current number of based aircraft is important to the master plan analysis as this number helps determine existing demand for a number of different facilities, including aircraft storage hangar space, parking aprons, pilot and passenger services, and various other aircraft support facilities. The FAA TAF was utilized to provide historical based aircraft levels presented in **Table 1F**.

TABLE 1G
Based Aircraft Fleet Mix
Sedona Airport

Type	#
Single-Engine Piston	59
Multi-Engine Piston	4
Experimental – Single-Engine	18
Experimental – Turboprop	1
Jet	1
Helicopter	4
Other	5
Total	92

Aircraft Examples:
Single-Engine Piston – Cessna 172
Multi-Engine Piston – Cessna 414
Experimental Single-Engine – Vans RV-6
Experimental Turboprop – Lancair Evolution
Jet – Cessna Citation I (501)
Helicopter – Robinson R44
Other – Hot air balloon

Source: SOCAA Records as of March 2014

As of March 2014, SOCAA records indicate there are 92 total based aircraft at Sedona Airport. The Airport's based aircraft total represents approximately 16.6 percent of all registered aircraft (553) in Yavapai County. The existing based aircraft fleet mix is summarized in **Table 1G**. The bulk of based aircraft (83.7 percent) are single-engine aircraft including experimental home-build aircraft, while more sophisticated aircraft such as jets, turboprops, and helicopters make up approximately 6.5 percent of based aircraft.

AIRFIELD FACILITIES

Airport facilities can be functionally classified into two broad categories: airfield and landside. The airfield category includes those facilities directly associated with aircraft operations. The landside category includes those facilities necessary to provide a safe transition from surface to air transportation and support aircraft parking, servicing, storage, maintenance, and operational safety. This section describes the airfield facilities, including runways, taxiways, lighting, marking, navigational aids, and weather reporting. Airfield facilities are depicted and detailed on **Exhibit 1E**. Pictures of the airfield facilities taken during the inventory trip for this Master Plan are shown on **Exhibit 1F**.

RUNWAYS

Sedona Airport has a single asphalt Runway 3-21 that measures 5,132 feet long and 100 feet wide with no displaced thresholds. Both ends of the runway are equipped with blast pads measuring 100 feet wide and 120 feet beyond the runway ends. Runway gradient describes the average slope of a runway. Gradient is determined by dividing the runway's high and low points by its length. Runway 3-21 slopes down from its high point (Runway 21 end) toward its low point (Runway 3 end) by 93.9 feet resulting in a 1.8 percent gradient.

RUNWAY DATA

Surface Type -	Asphalt
Weight Bearing Capacity -	15,000 SWL 30,000 DWL
Runway Edge Lights -	MIRL; REILs
Calm Wind Runway -	Runway 3
Traffic Pattern Altitude -	1,173' AGL (Propeller) 2,173' AGL (Jet)

	Runway 3	Runway 21
Traffic Pattern -	Left	Left
Runway Markings -	Basic	Basic
Visual Approach Aid -	PAPI-4	PAPI-4

Instrument Approaches	Weather Minimums*	
Type	*Cloud Height*	*Visibility*
GPS Rwy 3	1,348 (A) 1,448' (B) 1,768' (C)	1.5 (A) 1.5 (B) 3.0 (C)

** Denotes lowest approved cloud heights in AGL and visibility in miles*

HELIPAD DATA

Surface Type:	Concrete
Dimensions -	50' x 50'
Lighting -	Flood Lights

TAXIWAY DATA

Surface Material -	Asphalt
Edge Lighting -	MITL

Sky Ranch Lodge
Scenic Overlook
Airport Road
Water Tank
Gravel Parking Lot
Masonic Lodge
Air Terminal Drive
Shrine Road
Airport Beacon
Water Tank
Wind Cone
Helicopter Parking
Lighted Wind Cone
Helicopter Pad
Terminal
The Mesa Grill
Fuel Farm
Wind Cone
PAPI-4 (3.50° Glide Path)
REILs
Blast Pad
End Elevation 4,736.1 MSL
Wind Cone
Tower
Distance Remaining Signage
AWOS
Perimeter Service Road
Segmented Circle / Lighted WindCone
Distance Remaining Signage
PAPI-4 (3.50° Glide Path)
REILs
Blast Pad
End Elevation 4,830.0 MSL
Wind Cone
RUNWAY 3-21 (5,132'X100')
(1.8% Runway Gradient)
A8 A7 A6 A5 A4 A3 A2 A1
A B A A A
35' 40' 250' 135' 150'

KEY

SWL - Single Wheel Loading
DWL - Double Wheel Loading
MIRL - Medium Intensity Runway Lights
MITL - Medium Intensity Taxiway Lights
REIL - Runway End Identifier Lights
PAPI - Precision Approach Path Indicator
AGL - Above Ground Level
GPS - Global Positioning System

LEGEND

Airport Property Line
Existing Easement Line
Perimeter Security Fence

0 500 1000
SCALE IN FEET

NORTH

Aerial Date: November 2013

Exhibit 1E
EXISTING AIRFIELD FACILITIES



Runway 21 Threshold (Northeast)



Runway 21 Threshold (Southwest)



Gravel Perimeter Service Road



Vegetation East of Runway



Distance Remaining Signage and PAPIs



Lighted Wind Cone



Wind Cone and REIL
(Runway 3 Threshold)



AWOS Antenna



Perimeter Security Fencing



Runway 3 Threshold (Northeast)



Runway 3 Threshold (Southwest)



PAPI Light Box



Runway Holdline Marking



Taxiway A (Northeast)



Helicopter Pad

Runway load bearing strength for Runway 3-21 is shown on **Exhibit 1E**. Single wheel loading (SWL) refers to design aircraft landing gear with a single wheel on each main landing gear strut. Dual wheel loading (DWL) refers to design aircraft landing gear with two wheels on each main landing gear strut.

TAXIWAYS

Taxiway A, with a width of 35 feet, serves as the partial-length parallel taxiway to Runway 3-21. Taxiway A extends from the Runway 21 end to a point approximately 600 feet northeast of the Runway 3 threshold. Taxiway A's centerline is located 250 feet from the runway centerline. Taxiway A has eight 40-foot wide connecting taxiways to Runway 3-21 designated as taxiways A1-A8. Taxiway B, with a width of 25 feet, serves as a partial-parallel taxiway to Taxiway A, extending from Ramp A to the helipad with a centerline separation distance of approximately 83 feet from Taxiway A. The entirety of the taxiway system is constructed of asphalt.

AIRFIELD PAVEMENT CONDITION

As a part of the Arizona Department of Transportation (ADOT) Airport Pavement Preservation Program (APPP), Sedona Airport's airfield pavements are inspected on a 3-year cycle. Pavements are assessed using the pavement condition index (PCI) methodology for visually assessing pavement conditions. PCI provides a numerical indication of overall pavement condition. Types and amounts of deterioration are used to calculate the PCI value of the section. The PCI ranges from 0 to 100, with 100 representing a pavement in excellent condition.

Sedona Airport's pavements were inspected on June 7, 2013. The PCI values reported for each pavement section on the Airport are depicted on **Exhibit 1G**. Runway 3-21 was found to have a PCI rating of 86; Taxiway A had a PCI rating of 100; Taxiway B had a PCI rating of 100; and Apron A had a PCI rating of 78, 100, and 83 (northeastern portion near restaurant). The taxilanes serving the T-hangar and corporate hangar area were found to be in the worst condition with PCI ratings ranging from 29 to 71. Other pavement areas such as helicopter parking areas, the helipad, and the far northeast hangar taxilanes were found to have PCI ratings ranging from 67 to 84.

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 the Airport for this purpose. They are categorized by function as follows:

Airport Identification Lighting: The location of the airport at night or during low-visibility weather is universally identified by a rotating beacon. A rotating beacon projects

two beams of light, one white and one green, 180 degrees apart. The airport beacon is located atop of the north corner of T-hangar row F.

Runway Pavement and Edge Lighting: Pavement edge lighting utilizes light fixtures placed near the edge of the pavement to define the lateral limits of the pavement. This lighting is essential for safe operations during night and/or times of low visibility in order to maintain safe and efficient access to and from the runway and aircraft parking areas. Runway 3-21 is equipped with a medium intensity runway lighting (MIRL) system.

Runway End Identifier Lights (REILs): REILs provide a visual identification of the runway end for landing aircraft. The system consists of two flashing light assemblies located approximately 40 feet to either side of the runway landing threshold. These flashing lights can be seen day or night for a distance of up to 20 miles depending on visibility conditions. Runway ends serving jet aircraft but without an approach lighting system should be outfitted with REILs. Both ends of Runway 3-21 are equipped with REILs.

Taxiway Lighting: Taxiway A and associated connector taxiways are equipped with blue medium intensity taxiway lights (MITL). Taxiway B is not equipped with pavement edge lighting.

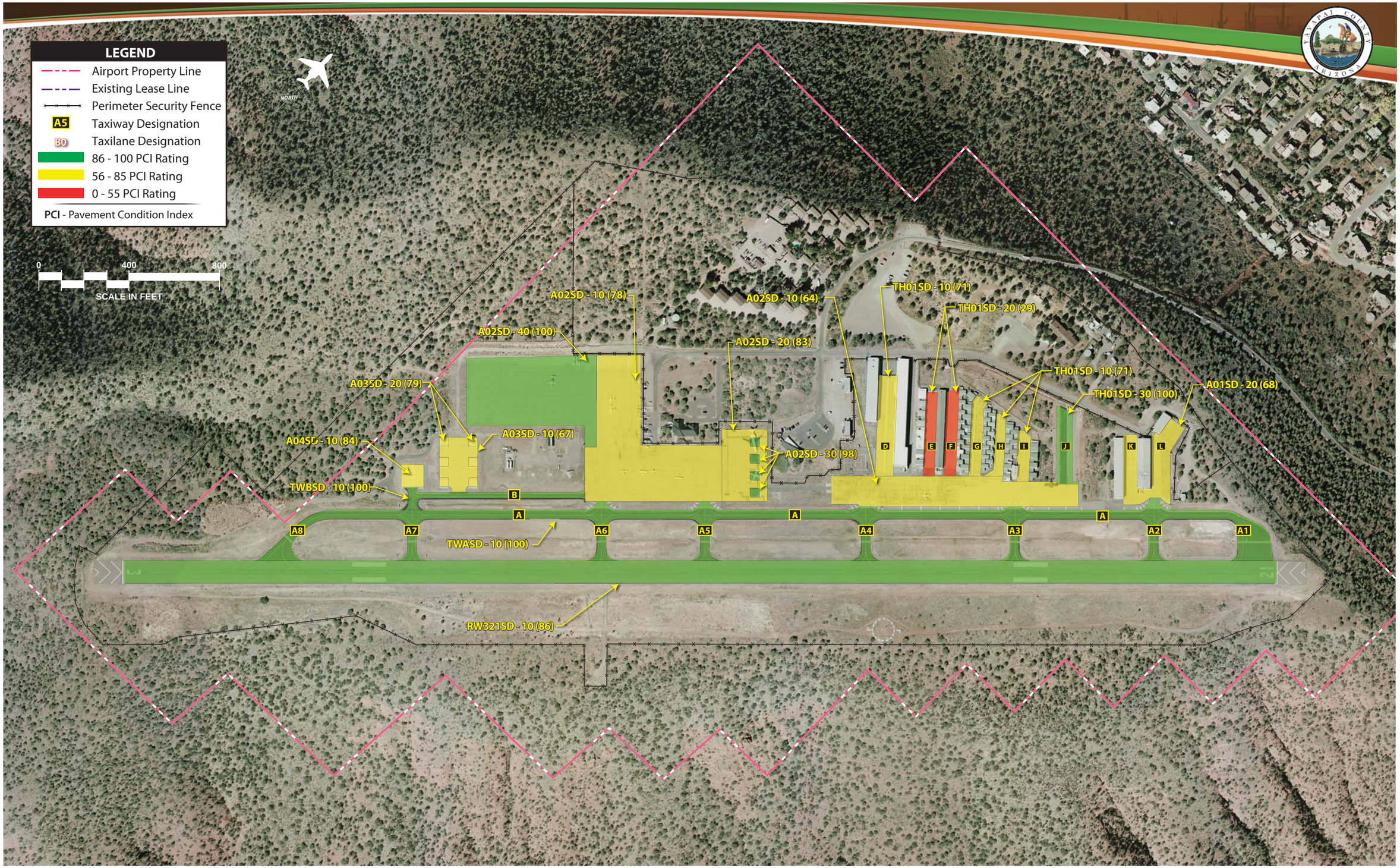
Obstruction Lighting: Objects which obstruct the Federal Aviation Regulation (FAR) Part 77 imaginary surfaces are marked with red lights. Obstructions marked at the Airport include the weather reporting station (ASOS).

Visual Approach Lighting: Visual approach aids have been installed at the Airport to assist pilots in determining the correct descent path to the runway end during an approach to the Airport. Precision approach path indicators (PAPI-4s) are available on both ends of Runway 3-21. The PAPIs provide approach path guidance with a series of light units. The four-unit PAPIs give the pilot an indication of whether their approach is above, below, or on-path, through the pattern of red and white lights visible from the light units. Both PAPI systems are set at a 3.5-degree approach glide path.

Pilot-Controlled Lighting: The airfield lights are turned off at nighttime. Pilots can utilize the pilot-controlled lighting system (PCL) to activate certain airfield lights from their aircraft through a series of clicks of their radio transmitter utilizing the CTAF frequency (123.0 MHz). The edge lights for Runway 3-21, the taxiway system, and the REILs can be turned on with this system. Typically, the airfield lights will remain on for approximately 15 minutes. The PAPI-4s run continuously and therefore are not activated by the PCL system.

AIRFIELD SIGNAGE

Airfield identification signs assist pilots in identifying runways, taxiway routes, and critical areas. Runway 3-21 is identified with lighted signs located at each taxiway intersection.



Source: Arizona Airport Pavement Management System, Inspection Date - June 7, 2013

Exhibit 1G
PAVEMENT CONDITION

Taxiways are identified using lighted location, directional, and informational signs. Lighted signage is also available to provide guidance to the terminal and helicopter activity area.

Distance Remaining Signage: Runway 3-21 is equipped with lighted distance remaining signage on the east side of the runway. These signs alert pilots to how much runway length remains in 1,000-footincrements.

AIRPORT MARKINGS

Pavement markings aid in the movement of aircraft along airport surfaces and identify closed or hazardous areas on the airport. The Airport provides and maintains parking systems in accordance with Part 139.311(a) and Advisory Circular 150/5340-1, *Standards for Airport Marking*.

Runway 3-21 has basic runway markings that identify the runway centerline, designation, aiming point, and aircraft holding positions.

All taxiways at the Airport are marked with yellow centerline and hold position markings. Centerline markings assist pilots in maintaining proper clearance from pavement edges and objects near the taxiway edges.

Aircraft hold positions are also marked at each runway/taxiway intersection. Yellow holding position markings for Runway 3-21 are located 135 feet from the runway centerline.

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 Sedona Airport include the very-high frequency omni-directional range (VOR) and global positioning system (GPS).

The VOR 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 to provide distance as well as direction information to the pilot. The Flagstaff VOR/DME, located 18.8 miles north of Sedona Airport, serves the regional area, including Sedona Airport.

GPS was initially developed by the United States Department of Defense for military navigation around the world. However, GPS is now used extensively for a wide variety of civilian uses, including civil aircraft navigation.

GPS uses satellites placed in orbit around the globe to transmit electronic signals, which pilots of properly equipped aircraft use to determine altitude, speed, and navigational in-

formation. This provides more freedom in flight planning and allows for more direct routing to the final destination. GPS provides for enroute navigation and non-precision straight-in instrument approaches to Sedona Airport.

WEATHER REPORTING

Sedona Airport is served by an automated weather observing system (AWOS). The AWOS provides automated aviation weather observations 24 hours per day. The system updates weather observations every minute, continuously reporting significant weather changes as they occur. The AWOS system reports cloud ceiling, visibility, temperature, dew point, wind direction, wind speed, altimeter setting (barometric pressure), and density altitude (airfield elevation corrected for temperature). The AWOS equipment is located on the east side of the airfield.

LANDSIDE FACILITIES

Landside facilities including the terminal building, hangars, apron areas, and access roads and parking lots are detailed on **Exhibit 1H**. The pictures included on the exhibit were taken during the inventory trip in February 2014.

TERMINAL

Constructed in 1991, the 4,263 square foot terminal building facilitates a range of services including: FBO activities, administration offices, lobby/reception area; flight planning room; conference room; leased space for car rental and aviation service providers; and restrooms. The terminal is located west of midfield and is accessible via Airport Road from State Route 89A. The terminal hours of operation are from 7:00 a.m. to 5:30 p.m. from October to March and 6:00 a.m. to 6:00 p.m. April to October. Businesses with space in the terminal include Red Rock Aviation (FBO) and Sedona Sky Treks. Rental car companies, including Northern Arizona Limousines, Enterprise, Hertz, and Sedona Rent a Car also provide services at the terminal. A layout of the terminal building is depicted on **Exhibit 1J**.

ACCESS AND PARKING

Airport Road, a two-lane roadway, is the only vehicle access point to the Airport. The terminal and all other landside facilities are accessible by traveling approximately four miles up the mesa on Airport Road from State Route 89A.

The terminal has an adjacent parking lot with 30 spaces. A separate lot with 16 spaces is located immediately south of the terminal and is used by the rental car companies. Other businesses on the airport also have parking lots, including the aerial tour operators, which

HANGAR DETAILS

Hangar	Type	Unit s.f.
D	Corporate	5 x 2,750 s.f. units
D	Corporate	2 x 3,000 s.f. units
		4 x 2,750 s.f. units
		1 x 2,500 s.f. unit
		1 x 4,960 s.f. unit
E	T-Hangars	8 x 1,386 s.f. units
E/F	T-Hangars	10 x 1,512 s.f. units
F/G	T-Hangars	11 x 1,287 s.f. units
		5 x 1,386 s.f. units
G/H	T-Hangars	13 x 1,287 s.f. units
H/I	T-Hangars	8 x 1,386 s.f. units
		1 x 1,287 s.f. unit
I	T-Hangars	4 x 1,386 s.f. units
K	Corporate	6 x 1,848 s.f. units
K/L	Corporate	1 x 3,068 s.f. unit
		1 x 3,304 s.f. unit
		1 x 2,596 s.f. unit
	T-Hangars	2 x 1,716 s.f. units
L	Corporate	2 x 1,848 s.f. units

LEGEND

- Airport Property Line
- Perimeter Security Fence
- A — Hangar Designator
- A1 — Taxiway Designator

0 400 800
SCALE IN FEET

NORTH

Scenic Overlook
Sky Ranch Lodge
Airport Road
Masonic Lodge 1.3 Acre Leasehold
Fire Department Radio Antenna and Cell Phone Communication Tower
Water Tank
4 Helicopter Parking Positions
Water Tank
Air Terminal Drive
Aerial Tour Operator
Shrine Road
Gravel Parking ± 44 Spaces
Vehicle Parking 16 Spaces
Terminal Parking 30 Spaces
53 Parking Positions
Terminal
The Mesa Grill
Water Tank
6 Helicopter Parking Positions (4,200 sy)
Maintenance Equipment Hut
Helipad (1,111 sy)
Fuel Farm
Ramp A 27 Parking Positions (52,500 sy)
4 Parking Positions
Aerial Tour Operator
Ramp B 15 Parking Positions (7,000 sy)
Electrical Vault
Civil Air Patrol
Taxilane L 6 Parking Positions (1,475 sy)
Office Building
A8 A7 A6 A5 A4 A3 A2 A1
RUNWAY 3-21 (5,132' X 100')

Terminal



Helipad



Helicopter Parking



Fuel Farm



Ramp A



Ramp A



Taxilane L



T-Hangars



Civil Air Patrol



T-Hangars



Ramp A (Helicopter Parking)



Office Building (L2)



T-Hangars



T-Hangars



Corporate Hangars



Mesa Grill



Scenic Overlook



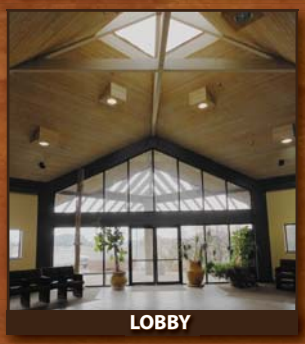
Sky Ranch Lodge



Exhibit 1H
LANDSIDE FACILITIES



CONFERENCE ROOM



LOBBY



MAIN ENTRANCE

CONFERENCE ROOM

AIRPORT ADMINISTRATION

AIRPORT ADMINISTRATION

AIRPORT ADMINISTRATION

AIRPORT ADMINISTRATION

WOMEN'S RESTROOM

MEN'S RESTROOM

OFFICE SPACE

MAIN ENTRANCE

CAR RENTAL COUNTER

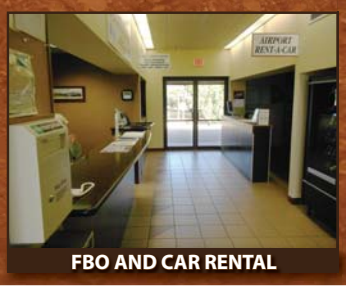
VENDING MACHINES

LOBBY

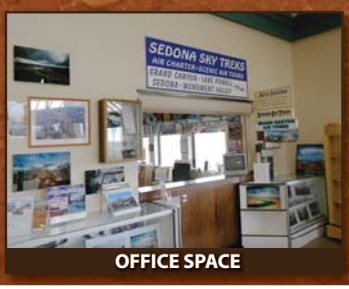
CAR RENTAL COUNTER

RED ROCK AVIATION

MECHANICAL



FBO AND CAR RENTAL



OFFICE SPACE

Exhibit 1J
AIRPORT TERMINAL LAYOUT

share a gravel parking lot that provides approximately 44 spaces, and Mesa Grill restaurant lot, which has 37 spaces.

FIXED BASE OPERATOR (FBO) AND OTHER SERVICE PROVIDERS/TENANTS

Red Rock Aviation is the Airport's only FBO with a customer service counter located in the terminal building. Red Rock's hours of operation are from 8:00 a.m. to 5:00 p.m. daily. Red Rock Aviation is operated by the SOCAA and provides the following services:

- Aviation fuel (Jet A/100LL)
- Ground support/catering
- Tiedowns and overnight parking
- Rental cars/limousine

Due to its scenic location, Sedona Airport has significant aerial tour/sightseeing operations conducted by numerous fixed-wing and helicopter operators.

Other tenants located on the Airport include:

- Civil Air Patrol – Unit 205, Verde Valley Composite Squadron, Sedona
- Sky Ranch Lodge – Lodging facilities and services
- Mesa Grill – Airport restaurant
- Airport Rent A Car of Sedona – Car rentals
- Masonic Lodge – Freemasonry fraternal organization

HANGAR AND APRON FACILITIES

The Airport has several hangar facilities ranging in size and type including T-hangars and box or corporate style hangars. The hangar detail table on **Exhibit 1H** identifies each hangar designator along with the type and square footage of each hangar unit. In all, the Airport has 25 corporate style hangar units with total aircraft storage capacity of 61,962 square feet and 62 T-hangar style hangar units with total aircraft storage capacity of 85,377 square feet. As of March 2014, all hangar units are occupied with the exception of one 1,512 square foot T-hangar unit. This results in a current hangar occupancy rate of 98.9 percent.

The Airport has designated ramp areas to accommodate the variety of uses served. Ramp A is the main ramp area adjacent to the terminal building and the airport restaurant. Ramp A is approximately 52,500 square yards with a total of 84 total aircraft parking positions, including four helicopter parking positions at the southwest end of the ramp. Four positions adjacent to the restaurant have been designed for larger jet aircraft.

Ramp B is located adjacent to the T-hangar facilities, has an area of approximately 7,000 square yards, and has a total of 15 aircraft parking positions. Taxilane L is located at the far northeast end of the landside area adjacent to Hangars L. Taxilane L has an area of approx-

imately 1,475 square yards and has six aircraft parking positions. The helicopter parking positions at the southwest end of the landside area has an area of approximately 4,200 square yards and provides six helicopter parking positions.

The Airport also has a single lighted 1,111 square yard (100' x 100') helipad located at the far southwest end of the landside area. The helipad consists of a square (50' x 50') touch-down and lift-off (TLOF) inner area and a final approach and takeoff area (FATO) surrounding the TLOF.

Combined, the Airport has approximately 66,286 square yards of aircraft ramp and 115 total marked tie-down positions (10 helicopter spaces; 4 large jet aircraft spaces; 101 spaces for small and medium sized based and transient aircraft).

SUPPORT FACILITIES

Several support facilities serve as critical links in providing the necessary efficiency to aircraft ground operations, such as aircraft rescue and firefighting (ARFF), airport maintenance, and fuel storage.

Aircraft Rescue and Firefighting Facilities (ARFF)

Only Part 139 certificated airports are required to provide aircraft rescue and firefighting (ARFF) services. Since Sedona Airport is not a Part 139 certificated airport, it does not have on-site ARFF services. The Sedona Fire District provides fire protection services to the Airport. The Airport is within three miles of two stations (Station 1 and Station 4).

Maintenance Facilities

The Airport does not have a dedicated maintenance facility but does have mowing equipment as well as other typical lawn and facility maintenance equipment on-site. This equipment is stored in a storage hut between the fuel farm and Ramp A. Regular airfield maintenance activities are performed by SOCAA staff.

Fuel Storage

The SOCAA owns and maintains a fuel farm consisting of two above-ground 10,000-gallon fuel tanks (one each for Jet A and 100LL Avgas) located southwest of Ramp A. The fuel farm also has two 500-gallon tanks, one each for Mogas and diesel fuel. Fuel is distributed to aircraft via two fuel trucks with capacities of 1,500 gallons of 100LL and 3,000 gallons of Jet A. The fuel farm tanks were purchased used in 1992, making them over 22 years old.

Historic fuel flowage on the Airport for the years 2007 through January 2014 is presented in **Table 1H**. These records indicate that over this time period, Jet A fuel flowage has accounted for 63.3 percent of all flowage at the Airport. Since flowage records for only the month of January in 2014 were available, a comparison to the same month of 2013 was made. The resulting analysis indicates that Jet A fuel flowage in January 2014 was down from January 2013 by 19.1 percent. The same comparison for Avgas shows an increase in flowage up 67.7 percent from January 2013. A comparison of the most recent two full years of data shows that total fuel flowage at Sedona Airport rose from 2012 to 2013 by 2.4 percent. Fuel flowage at the Airport is down from highs experienced in 2007; however, total flowage has increased each year since 2010. The flowage drop-off occurred at the same time as the national economic downturn, and as economic conditions have improved in recent years, flowage has begun to climb back.

TABLE 1H
Historic Fuel Flowage (gallons)
Sedona Airport

Year	Avgas	Jet A
2007	154,811	241,089
2008	139,267	218,099
2009	119,360	198,281
2010	100,998	193,958
2011	105,235	201,009
2012	106,384	206,767
2013	109,370	211,801
2014*	7,446	10,410

*Records through January 2014
Source: SOCAA

UTILITIES

The availability and capacity of the utilities serving the Airport are factors in determining the development potential of Airport property. The Airport receives water services from the Oak Creek Water Company. Arizona Public Service (APS) provides electrical power to the various Airport facilities. The Airport also has a diesel emergency generator to power runway and taxiway edge lights, REILs, and PAPIs. Telecommunications, including telephone and internet services, are provided by Century Link. Propane gas is provided to the Airport by Graves Propane.

AREA AIRSPACE AND AIR TRAFFIC CONTROL

The *Federal Aviation Administration (FAA) Act of 1958* established the FAA as the responsible agency for the control and use of navigable airspace within the United States. The FAA has established the National Airspace System (NAS) to protect persons and property on the ground and to establish a safe and efficient airspace environment for civil, commercial, and military aviation. The NAS covers the common network of U.S. airspace, including air navigation facilities; airports and landing areas; aeronautical charts; associated rules, regulations, and procedures; technical information; and personnel and material. The system also includes components shared jointly with the military.

AIRSPACE STRUCTURE

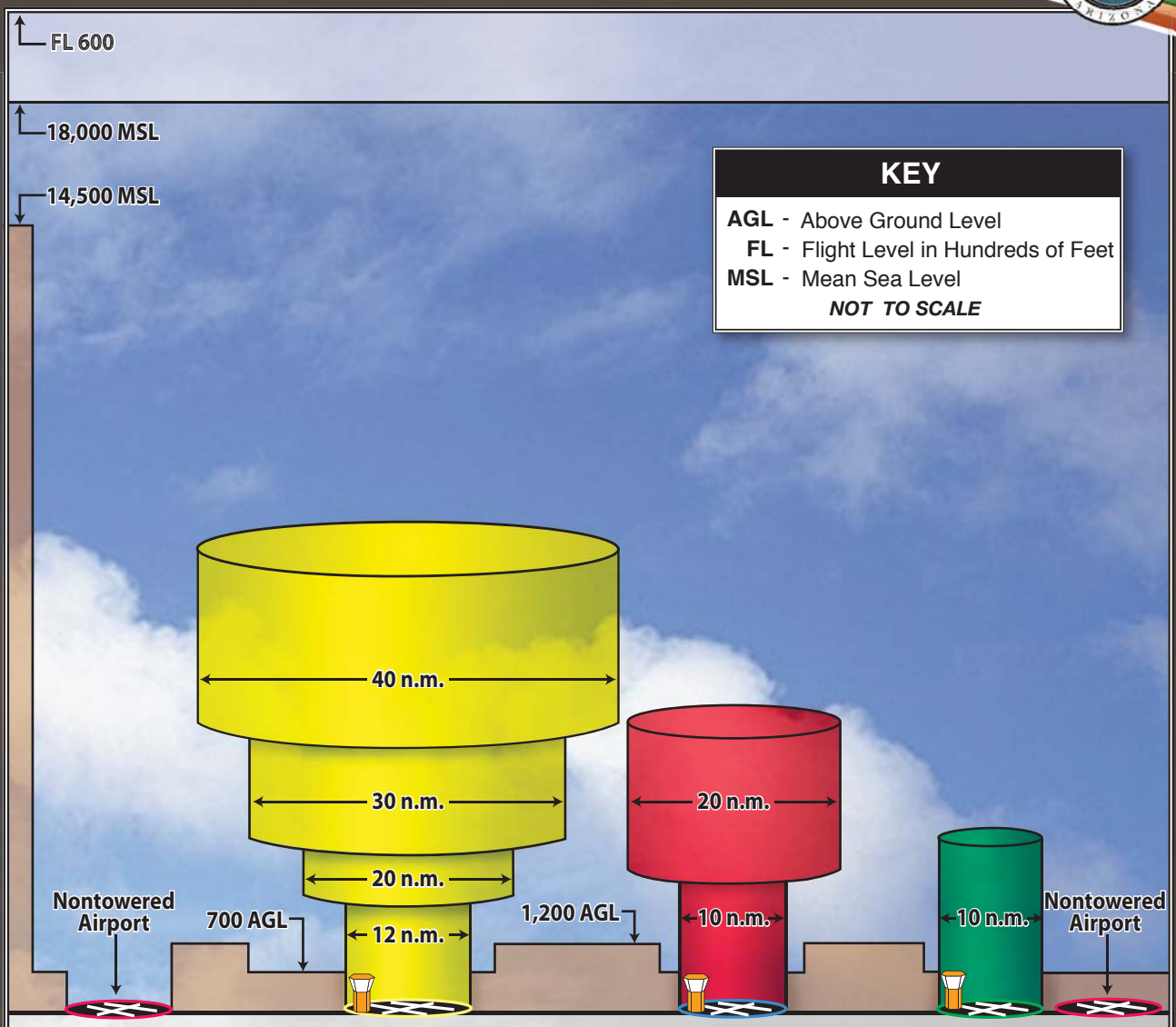
Airspace within the United States is broadly classified as either "controlled" or "uncontrolled." The difference between controlled and uncontrolled airspace relates primarily to requirements for pilot qualifications, ground-to-air communications, navigation and air traffic services, and weather conditions. Six classes of airspace have been designated in the United States, as shown on **Exhibit 1K**. Airspace designated as Class A, B, C, D, or E is considered controlled airspace. Aircraft operating within controlled airspace are subject to varying requirements for positive air traffic control. Airspace in the vicinity of Sedona Airport is depicted on **Exhibit 1L**.

Class A Airspace: Class A airspace includes all airspace from 18,000 feet mean sea level (MSL) to flight level (FL) 600 (approximately 60,000 feet MSL) over the contiguous 48 states and Alaska. This airspace is designated in Federal Aviation Regulation (F.A.R.) Part 71.33 for positive control of aircraft. All aircraft must be on an instrument flight rules (IFR) clearance to operate within Class A airspace.

Class B Airspace: Class B airspace has been designated around some of the country's major airports, such as Phoenix Sky Harbor International Airport, to separate all aircraft within a specified radius of the primary airport. Each Class B airspace is specifically tailored for its primary airport. All aircraft operating within Class B airspace must have an ATC clearance. Certain minimum aircraft equipment and pilot certification requirements must also be met. This airspace is the most restrictive controlled airspace routinely encountered by pilots operating under visual flight rules (VFR) in an uncontrolled environment. The nearest Class B airspace is centered on Phoenix Sky Harbor International Airport (PHX), approximately 86 nautical miles to the south.

Class C Airspace: The FAA has established Class C airspace at approximately 120 airports around the country that have significant levels of instrument flight rules (IFR) traffic. Class C airspace is designed to regulate the flow of uncontrolled traffic above, around, and below the arrival and departure airspace required for high-performance, passenger-carrying aircraft at major airports. In order to fly inside Class C airspace, an aircraft must have a two-way radio, an encoding transponder, and have established communication with the ATC facility. Aircraft may fly below the floor of the Class C airspace or above the Class C airspace ceiling without establishing communication with ATC. The nearest Class C airspace to Sedona Airport surrounds the Tucson International Airport and Davis Monthan Air Force Base, approximately 169 nautical miles to the southwest.

Class D Airspace: Class D airspace is controlled airspace surrounding airports with an ATCT. The Class D airspace typically constitutes a cylinder with a horizontal radius of four or five nautical miles (NM) from the airport, extending from the surface up to a designated vertical limit, typically set at approximately 2,500 feet above the airport elevation. If an airport has an instrument approach or departure, the Class D airspace sometimes extends along the approach or departure path. Flagstaff Pulliam Airport and Prescott Municipal Airport both operate in Class D airspace.



CLASSIFICATION	DEFINITION
CLASS A	Generally airspace above 18,000 feet MSL up to and including FL 600.
CLASS B	Generally multi-layered airspace from the surface up to 10,000 feet MSL surrounding the nation's busiest airports.
CLASS C	Generally airspace from the surface to 4,000 feet AGL surrounding towered airports with service by radar approach control.
CLASS D	Generally airspace from the surface to 2,500 feet AGL surrounding towered airports.
CLASS E	Generally controlled airspace that is not Class A, Class B, Class C, or Class D.
CLASS G	Generally uncontrolled airspace that is not Class A, Class B, Class C, Class D, or Class E.

Source: "Airspace Reclassification and Charting Changes for VFR Products," National Oceanic and Atmospheric Administration, National Ocean Service. Chart adapted by Coffman Associates from AOPA Pilot, January 1993.



LEGEND

- Airport with hard-surfaced runways 1,500' to 8,069' in length
- Airports with hard-surfaced runways greater than 8,069' or some multiple runways less than 8,069'
- VOR-DME
- VORTAC
- Compass Rose
- Wilderness Areas
- Victor Airways
- Class D Airspace
- Class E Airspace with floor at surface
- Class E Airspace with floor 700' above surface
- Military Operations Area
- Prohibited, Restricted and Warning Area
- Military Training Route

NORTH

NOT TO SCALE

Exhibit 1L
VICINITY AIRSPACE

Class E Airspace: Class E airspace consists of controlled airspace designed to contain IFR operations near an airport and while aircraft are transitioning between the airport and en-route environments. Unless otherwise specified, Class E airspace terminates at the base of the overlying airspace. Only aircraft operating under IFR are required to be in contact with air traffic control when operating in 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.

Sedona Airport is located within Class E airspace as depicted on **Exhibit 1L**. The Airport's Class E airspace surrounds the airport and is merged with the Class E airspace surrounding Flagstaff Pulliam Airport to the northeast. This Class E airspace begins at 700 feet AGL with Class G airspace below down to the surface.

Class G Airspace: Airspace not designated as Class A, B, C, D, or E is considered uncontrolled, or Class G, airspace. Air traffic control does not have the authority or responsibility to exercise control over air traffic within this airspace. Class G airspace lies between the surface and the overlaying Class E airspace (700 to 1,200 feet above ground level).

While aircraft may technically operate within this Class G airspace without any contact with ATC, it is unlikely that many aircraft will operate this low to the ground. Furthermore, federal regulations specify minimum altitudes for flight. F.A.R. Part 91.119*, Minimum Safe Altitudes*, generally states that except when necessary for takeoff or landing, pilots must not operate an aircraft over any congested area of a city, town, or settlement, or over any open-air assembly of persons, at an altitude of 1,000 feet above the highest obstacle within a horizontal radius of 2,000 feet of the aircraft.

Over less congested areas, pilots must maintain an altitude of 500 feet above the surface, except over open water or sparsely populated areas. In those cases, the aircraft may not be operated closer than 500 feet to any person, vessel, vehicle, or structure. Helicopters may be operated at less than the minimums prescribed above if the operation is conducted without hazard to persons or property on the surface. In addition, each person operating a helicopter shall comply with any routes or altitudes specifically prescribed for helicopters by the FAA.

Special Use Airspace

Special use airspace is defined as airspace where activities must be confined because of their nature or where limitations are imposed on aircraft not taking part in those activities. These areas are depicted on **Exhibit 1L**.

Wilderness Areas: As depicted on **Exhibit 1L**, there are numerous protected wilderness areas in the vicinity of the Airport that are subject to Federal Aviation Administration's (FAA) Advisory Circular (AC) 91-36D, *Visual Flight Rules (VFR) Flight Near Noise-Sensitive Areas*. In part, AC 91-36D specifies a minimum altitude of 2,000 feet above the highest terrain within 2,000 feet laterally or 2,000 feet above the upper-most rim of a canyon or valley (FAA, 2004).

Victor Airways: For aircraft arriving or departing the regional area using VOR facilities, a system of Federal Airways, referred to as Victor Airways, has been established. 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. Victor Airways are shown with gold lines on **Exhibit 1L**.

For aircraft enroute or departing Sedona Airport, there are several Victor Airways available. The Flagstaff VOR-DME located at the Flagstaff Pulliam Airport, 18.8 nautical miles to the north, is a converging point for Victor Airways in the Sedona area.

Military Operations Areas: Military Operating Areas (MOAs) are areas of airspace where military activities are conducted. The nearest MOA to Sedona Airport is the Sunny MOA located approximately 30 nautical miles to the north.

Military Training Routes: Military training routes near Sedona Airport are identified with the letters IR or VR and a three-digit number. The arrows on the route indicate the direction of travel. Military aircraft travel on these routes below 10,000 feet MSL and at speeds in excess of 250 knots. **Exhibit 1L** depicts the military training routes in the vicinity of Sedona Airport.

Restricted Areas: Restricted areas are depicted on **Exhibit 1L** with brown hatched lines. The only restricted area in the vicinity of Sedona Airport is R-2302, located immediately west of Flagstaff Pulliam Airport. This restricted area encompasses the airspace from the surface to an altitude of 10,000 feet and is in use from 8:00 a.m. to 12:00 a.m. Monday through Saturday. The controlling agency for R-2302 is the Albuquerque Air Route Traffic Control Center (ARTCC).

AIRSPACE CONTROL

On February 6, 2014, the Phoenix Terminal Radar Approach Control (TRACON) took over instrument flight rules (IFR) and approach control services from the Albuquerque ARTCC for northern Arizona including Prescott Ernest A. Love Field, Flagstaff Pulliam Airport, and Sedona Airport. The control services are available coincident with the operating hours of Prescott tower (6:00 a.m. to 10:00 p.m.). TRACON controllers provide IFR services as well as visual flight rule (VFR) flight following and practice approach services.

Instrument Approach Procedures

Instrument approach procedures are a series of predetermined maneuvers established by the FAA using electronic navigational aids that assist pilots in locating and landing at an airport, especially during instrument flight conditions. There is currently one published non-precision GPS instrument approach into Runway 3 at Sedona Airport. Non-precision approaches provide course guidance to the pilot without vertical guidance.

The capability of an instrument is defined by the visibility and cloud ceiling minimums associated with the approach. Visibility minimums define the horizontal distance the pilot

must be able to see in order to complete the approach. Cloud ceilings define the lowest level a cloud layer (defined in feet above the ground) can be situated for the pilot to complete the approach. If the observed visibility or ceilings are below the minimums prescribed for the approach, the pilot cannot complete the instrument approach. Instrument approach minimums are summarized on **Exhibit 1E** in the runway data table.

Local Operating Procedures

The traffic pattern at the Airport is maintained to provide the safest and most efficient use of the airspace. A standard left-hand traffic pattern is published for Runway 3-21. For either runway end, the approach to landing is made using a series of left turns. Runway 3 is designated for use during calm wind conditions (wind speeds of less than five knots). The Airport has designated traffic pattern altitudes for propeller aircraft at 1,173 feet above ground level (AGL) and 2,173 feet AGL for jet aircraft.

Sedona Airport does not have aircraft restrictions, curfews, or a mandatory noise abatement program, as these programs would violate the federal *Airport Noise and Capacity Act* (ANCA) of 1990. Federal law requires the Airport to remain open 24 hours a day, 7 days a week, and to accept all civilian and military aircraft that can be safely accommodated. The Airport does have recommended noise abatement procedures for VFR traffic at less than 7,500 feet MSL. The general noise abatement procedures published on the Airport's website include:

- All arrivals and departures use standard uncontrolled airport Aeronautical Information Manual (AIM) procedures.
- Land and take off into the wind. Left hand traffic to both runways.
- All landings, takeoffs and touring aircraft, for safety's sake, "heads up" and use your radio.
- No scenic flights below 6,500 feet MSL.
- No mid-field or intersection departures.
- No touch-and-go or stop-and-go operations.
- Climb as high as possible before leaving airport boundaries, consistent with safety.
- Fly standard left patterns, no low approaches, no straight ins when a pattern is required.
- Follow the PAPI consistent with safety, use best rate of climb (Vy) on takeoff for noise abatement.
- Administrative runway weight restriction is 60,000 pounds for dual wheels.
- Compliance with airport noise abatement procedures is requested.

Informally, the SOCAA requests that helicopter tour operators voluntarily utilize a corridor as they transition to/from the Airport. This corridor, depicted in **Figure 1A**, minimizes arrival and departure noise over the community. While this procedure has not been formally adopted by the SOCAA, it is attempting to work with the existing operators to ensure this corridor is utilized to the greatest extent practicable.



FIGURE 1A
Helicopter Corridor

AREA AIRPORTS

A review of other public-use airports with at least one paved runway within a 50-nautical mile radius of Sedona Airport was conducted to identify and distinguish the types of air service provided in the region. It is important to consider the capabilities and limitations of these airports when planning for future changes or improvements at Sedona Airport. **Exhibit 1M** provides information on public-use airports within the vicinity of the Sedona Airport. Information pertaining to each airport was obtained from FAA Form 5010-1, Airport Master Record.

SOCIOECONOMIC PROFILE

The following sections will analyze socioeconomic indicators including population, economy/employment, and income for the City of Sedona, Yavapai County, Coconino County, and the State of Arizona. Socioeconomic data was obtained from the U.S. Census Bureau; the U.S. Department of Labor, Bureau of Labor Statistics; and Woods and Pool Economics, *The Complete Economic and Demographic Data Source*, 2014. Tables and charts depicting socioeconomic data are presented on **Exhibit 1N**.

POPULATION

The City of Sedona, while having experienced the highest compound annual growth rate (CAGR) of each entity analyzed (5.1 percent), has seen its population drop slightly since

COTTONWOOD AIRPORT (P52)

Airport Sponsor: City of Cottonwood

Distance from SEZ:
14.1 n.m. Southwest

Airport Classification:
General Aviation

Primary Runway: 14-32
Length: 4,252′
Width: 75′



Surface Type/Condition: Asphalt
Strength Rating: 4,000 lbs. SWL
Marking: Basic
Runway Lighting: MIRL
Visual Approach Aids: PAPI-2 (14 & 32)
2014 Based Aircraft: 52
Estimated Operations: 18,720
Services Provided: Self-Serve Aircraft Fuel (100LL); Aircraft Parking; Minor Airframe & Powerplant Service
Published Instrument Approach Procedures: None

FLAGSTAFF PULLIAM AIRPORT (FLG)

Airport Sponsor: City of Flagstaff

Distance from SEZ:
18.5 n.m. Northeast

Airport Classification:
Primary Commercial Service

Primary Runway: 3-21
Length: 8,800′
Width: 150′



Surface Type/Condition: Asphalt/Porous Friction Courses (PFC)
Strength Rating: 30,000 lbs. SWL/95,000 lbs. DWL/140,000 lbs. DTWL
Marking: Non-precision (3); Precision (21)
Runway Lighting: HIRL
Visual Approach Aids: VASI-4 (3); PAPI-4 (21)
2014 Based Aircraft: 134
Operations: 50,854 (12-mos. ending 12/31/2012)
Services Provided: Aircraft Fuel (100LL, JetA); Major Airframe & Powerplant Service; Low bulk oxygen; Ground handling; Aircraft Parking (ramp or tiedown) Hangars, GPU/Powercart; Passenger Terminal and Lounge; Flight Instruction; Aircraft Charter
Published Instrument Approach Procedures: 7 (including Precision ILS and GPS procedures)

KEY

DWL - Dual Wheel Loading
DTWL - Dual-Tandem Wheel Loading
GPS - Global Positioning System
GPU - Ground Power Unit
HIRL - High Intensity Runway Lighting
ILS - Instrument Landing System
MIRL - Medium Intensity Runway Lights
NM - Nautical Miles
PAPI - Precision Approach Path Indicator
SWL - Single Wheel Loading
VASI - Visual Approach Slope Indicator

NORTH (All Pictures)



ERNEST A. LOVE FIELD AIRPORT (PRC)

Airport Sponsor: City of Prescott

Distance from SEZ:
33.2 n.m. Southwest

Airport Classification:
Commercial Service

Primary Runway: 3R-21L
Length: 7,619′
Width: 150′



Surface Type/Condition: Asphalt/PFC
Strength Rating: 63,000 lbs. SWL/80,000 lbs. DWL/100,000 lbs. DTWL
Marking: Non-precision (3R); Precision (21L)
Runway Lighting: MIRL
Visual Approach Aids: PAPI-4 (3R & 21L)
2014 Based Aircraft: 231
Operations: 244,080 (for 12-mos. ending 12/31/2012)
Services Provided: Aircraft Fuel (100LL, JetA); GPU; Aircraft Maintenance; Avionics; Ground Support Equipment; Aircraft Tiedowns
Published Instrument Approach Procedures: 6 (including Precision ILS and GPS procedures)

H.A. CLARK MEMORIAL FIELD AIRPORT (CMR)

Airport Sponsor: City of Williams

Distance from SEZ:
33.9 n.m. Northwest

Airport Classification:
General Aviation

Primary Runway: 18-36
Length: 6,000′
Width: 100′



Surface Type/Condition: Asphalt
Strength Rating: 15,000 lbs. SWL
Marking: Non-precision (18 & 36)
Runway Lighting: MIRL
Visual Approach Aids: PAPI-2 (18 & 36)
2014 Based Aircraft: 4
Operations: 6,100
Services Provided: Aircraft Fuel (100LL); Hangar Leasing/Sales, Tiedowns
Published Instrument Approach Procedures: None

PAYSON AIRPORT (PAN)

Airport Sponsor: Town of Payson

Distance from SEZ:
41.9 n.m. Southeast

Airport Classification:
General Aviation

Primary Runway: 6-24
Length: 5,504
Width: 75′



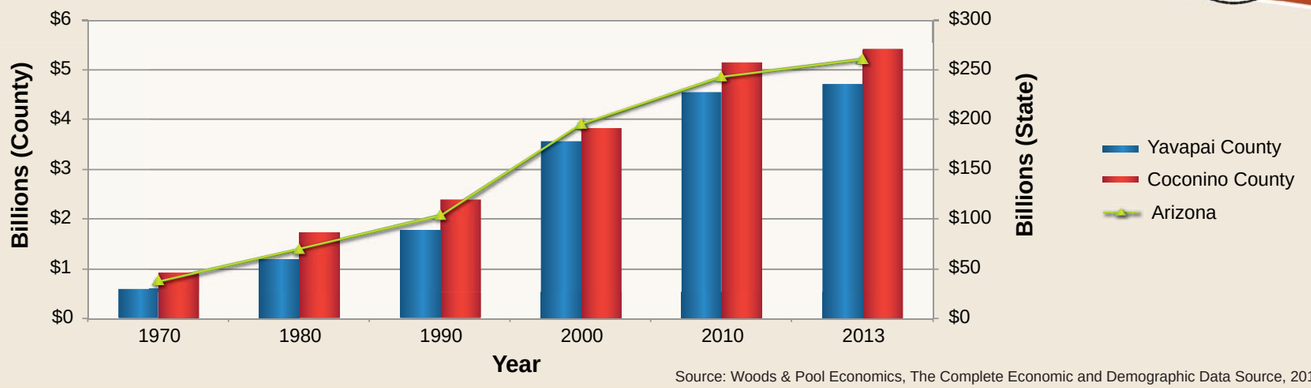
Surface Type/Condition: Asphalt
Strength Rating: 40,000 lbs. SWL/50,000 lbs. DWL/100,000 lbs. DTWL
Marking: Non-precision (8 & 24)
Runway Lighting: MIRL
Visual Approach Aids: PAPI-2 (24)
2014 Based Aircraft: 35
Estimated Operations: 41,850
Services Provided: Aircraft Fuel (100LL, JetA); Tiedowns; Minor Aircraft Maintenance
Procedures: 1 Non-precision GPS procedure

POPULATION

Year	City of Sedona	Yavapai County	Coconino County	Arizona	USA
1970	1,230	37,005	48,326	1,775,399	204,053,325
1980	3,590	68,145	75,008	2,718,425	226,548,632
1990	7,720	107,714	96,591	3,665,228	248,709,873
2000	10,192	167,517	116,320	5,130,632	281,421,906
2010	10,031	211,033	134,421	6,392,017	308,745,538
2012-13 est.	10,037	215,133	136,539	6,626,624	316,128,839
CAGR*	5.1%	4.2%	2.4%	3.1%	1.0%

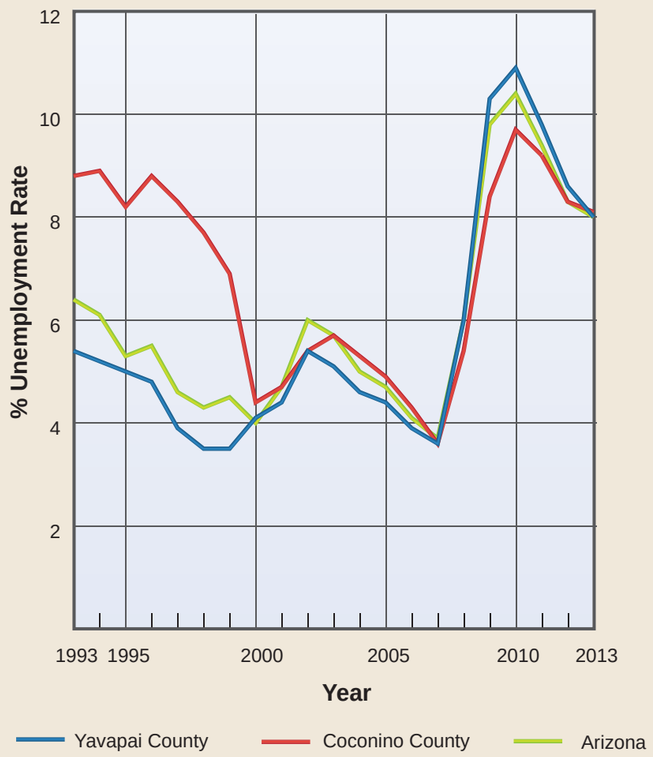
* CAGR - Compound Annual Growth Rate
Source: U.S. Census Bureau

GROSS REGIONAL PRODUCT (2009 dollars)



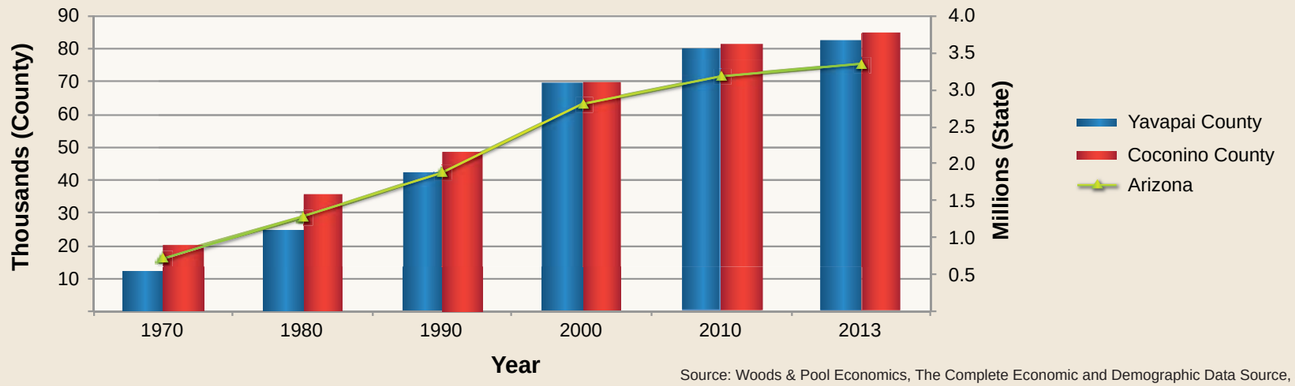
Source: Woods & Pool Economics, The Complete Economic and Demographic Data Source, 2014

UNEMPLOYMENT RATE
(not seasonally adjusted)



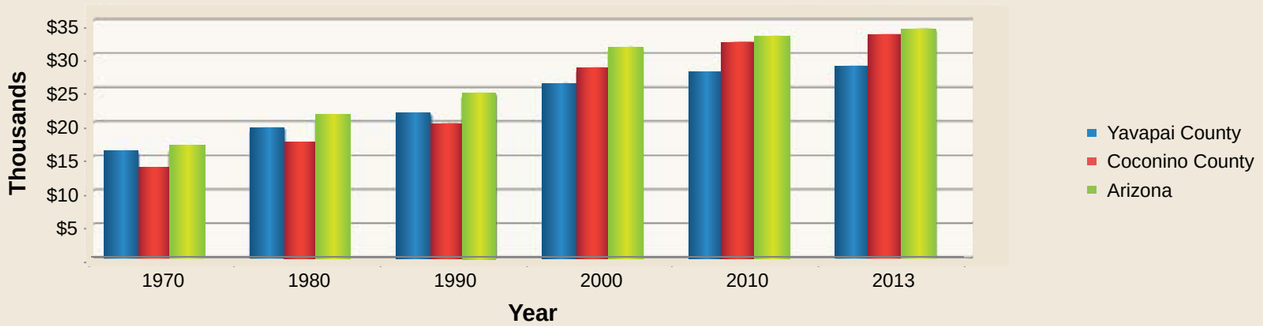
Source: US Department of Labor, Bureau of Labor Statistics

TOTAL EMPLOYMENT



Source: Woods & Pool Economics, The Complete Economic and Demographic Data Source, 2014

PER CAPITA PERSONAL INCOME (2009 dollars)



Source: Woods & Pool Economics, The Complete Economic and Demographic Data Source, 2014

2000 to an estimated total of 10,037 in 2012. Yavapai and Coconino Counties have experienced fairly steady growth over the past four decades; however, Yavapai County has grown at a faster pace of 4.2 percent CAGR compared to Coconino County's 2.4 percent CAGR, which was also outpaced by the State of Arizona with a 3.1 percent CAGR.

ECONOMY

Gross regional product (GRP) is a measure of the market value of the goods and services produced within an area in a given period of time. Despite the recent worldwide economic recession, GRP for the Counties and State of Arizona have shown solid growth in recent years. CAGRs over the past four decades are very similar with Yavapai County's GRP growing at 4.9 percent annually; Coconino County at 4.2 percent annually; and the State of Arizona's GRP growing at 4.6 percent annually.

In general, employment trends have been fairly similar for Yavapai County, Coconino County, and the State of Arizona over the past four decades. Similar to population growth, employment growth in Yavapai County has outpaced Coconino County and the State of Arizona (CAGRs: Yavapai County – 4.5 percent; Coconino County – 3.4 percent; Arizona – 3.6 percent).

Historical unemployment rates show the effects of the recent economic recession on employment. As of 2013, the Counties and the State of Arizona have unemployment rates around eight percent. This is an improvement over rates experienced in 2010, but still significantly above the four decade averages (Yavapai County - 5.7 percent; Coconino County – 6.9 percent; Arizona – 6.0 percent).

INCOME

Data shows that both counties lag behind the State for per capita personal income (PCPI). The period between 2000 and 2010 was the slowest 10-year growth period since 1970 for both Counties and the State of Arizona (CAGRs: Yavapai County – 0.6 percent; Coconino County – 1.3 percent; Arizona - 0.5 percent). As of 2013, Yavapai County's PCPI was 13.9 percent less than Coconino County's PCPI.

ENVIRONMENTAL INVENTORY

Research was done for each of the environmental impact categories described within the FAA's Order 1050.1E, *Environmental Impacts: Policies and Procedures*. The following resources cannot be inventoried but will be analyzed in the Environmental Overview section of this Master Plan:

- Resources that were not inventoried:
    - Construction Impacts
    - Energy Supply and Natural Resources

- Noise
- Social Impacts

Available information regarding the existing conditions at Sedona Airport has been derived from internet resources, agency maps, and existing literature. The intent of this task is to inventory potential environmental sensitivities that might affect future improvements at the Airport.

The following sections provide a discussion of the remaining resource categories.

AIR QUALITY

United States (U.S.) Environmental Protection Agency (EPA) has established National Ambient Air Quality Standards (NAAQS) based on health risks for six pollutants: carbon monoxide (CO); nitrogen dioxide (NO_2); sulfur dioxide (SO_2); lead (Pb); ozone (O_3); and two sizes of particulate matter (PM), PM measuring 10 micrometers or less in diameter (PM_{10}) and PM measuring 2.5 micrometers in diameter ($PM_{2.5}$).

An area with ambient air concentrations exceeding the NAAQS for a criteria pollutant is said to be a nonattainment area for the pollutant's NAAQS, while an area where ambient concentrations are below the NAAQS is considered an attainment area. EPA requires that areas designated as nonattainment demonstrate how they will attain the NAAQS by an established deadline. To accomplish this, states prepare State Implementation Plans (SIPs). SIPs are typically a comprehensive set of reduction strategies and emissions budgets designed to bring the area into attainment.

Sedona Airport is located in Yavapai County, Arizona. According to EPA's *Green Book – Currently Designated Nonattainment Areas for All Criteria Pollutants*, Yavapai County is in attainment for all of the NAAQS standards.

Various levels of project-specific review could apply to the airport within both the *National Environmental Policy Act* (NEPA) and local permitting requirements for airport development projects. Potentially significant air quality impacts associated with an FAA project or action would be demonstrated by the project or action exceeding one or more of the NAAQS for any of the time periods analyzed.

COASTAL RESOURCES

Federal activities involving or affecting coastal resources are governed by the *Coastal Barriers Resource Act* (CBRA), the *Coastal Zone Management Act* (CZMA), and Executive Order (E.O.) 13089, *Coral Reef Protection*.

Sedona Airport is located approximately 340 miles from the Pacific Ocean, the nearest U.S. protected coastal area. Thus, the Airport is not located within a Coastal Zone.

DEPARTMENT OF TRANSPORTATION (DOT) ACT: SECTION 4(f)

Section 4(f) of the DOT Act, which was recodified and renumbered as Section 303(c) of 49 United States Code (USC), provides that the Secretary of Transportation will not approve any program or project that requires the use of any publicly owned land from a historic site, public park, recreation area, or waterfowl or wildlife refuge of national, state, regional, or local importance unless there is no feasible and prudent alternative to the use of such land, and the project includes all possible planning to minimize harm resulting from the use.

The term "use" includes not only the physical taking of such lands, but "constructive use" of such lands. "Constructive use" of lands occurs when "a project's proximity impacts are so severe that the protected activities, features, or attributes that qualify a resource for protection under Section 4(f) are substantially impaired" (23 Code of Federal Regulations [CFR] Section 771.135).

The closest known Section 4(f) property to the Airport is the Coconino National Forest, located immediately adjacent to the Airport on its south and west sides. The forest is used for passive recreational uses such as hiking; the closest campground is approximately 0.75 mile east of the Airport near Oak Creek. There are no waterfowl or wildlife refuges within the vicinity of the Airport.

Sunset Park is located approximately 0.5 mile west of Air Terminal Drive at the Airport. This park is owned by the City of Sedona and includes children's play areas and fields, tennis courts, and basketball courts. It also includes a trail that connects to the Coconino National Forest.

The nearest historic site listed on the National Register of Historic Properties (NRHP) is Jordan Ranch, located approximately two miles northeast of the Airport. Saddlerock Ranch, a residence built in 1949 that is a unique example of Contemporary Folk, is a Historical Landmark for Sedona. Saddlerock Ranch is located approximately 0.2 mile north of the Airport at 255 Rockridge Drive.

FARMLAND

The Sedona Airport is not listed on the U.S. Department of Agriculture, Natural Resources Conservation Services (NRCS) web soil survey. However, communication with the NRCS regarding interim soil mapping at the Airport indicates that Airport soils are not considered prime or unique farmland (Anderson 2011).

Based on field work conducted by the NRCS in 1996, the area soils are Biplane soils (417) and Urban land, 0 to 3 percent slopes. Biplane soils are clayey with a high shrink-swell potential and do not meet the criteria for prime or unique farmland. Therefore, the *Farmland Protection Policy Act* is not applicable to development at the Airport.

FISH, WILDLIFE, AND PLANTS

U.S. Fish and Wildlife Service (USFWS) is charged with overseeing the requirements of the *Endangered Species Act* (ESA), specifically Section 7, which sets forth requirements for consultation to determine if a proposed action "may affect" a federally endangered or threatened species.

If an agency determines that an action "may affect" a federally protected species, then Section 7(a)(2) requires the agency to consult with USFWS to ensure that any action the agency authorizes, funds, or carries out is not likely to jeopardize the continued existence of any federally-listed endangered or threatened species, or result in the destruction or adverse modification of critical habitat. If a species has been listed as a candidate species, Section 7(a)(4) states that each agency must confer with USFWS.

In Yavapai County, USFWS has identified 13 threatened or endangered species, two species proposed as threatened, and three species listed as experimental and non-essential. (For consultation purposes, experimental, nonessential populations of endangered species are treated as threatened species on public land, and as species proposed for listing on private land.) Final critical habitats also lie fully or partially within Yavapai County.

Federally-listed species known to occur in Yavapai County and their habitat requirements are listed in **Table 1J**. As noted in the table, habitat to support federally-listed species is not present at the Airport.

TABLE 1J
Federally Listed Species
Yavapai County, Arizona

Common Name	Status	Habitat	Habitat At Airport
Amphibians			
Chiricahua leopard frog	T	Streams, rivers, backwaters, ponds, and stock tanks that are mostly free from introduced fish, crayfish, and bullfrogs.	No
Birds			
California condor	E	High desert canyons and plateaus. (NOTE: Current condor distribution is limited to three introduction sites, the closest of which is near the Vermilion cliffs and the Grand Canyon in Coconino County.)	No
Mexican spotted owl	T	Nests in canyons and dense forests with multilayered foliage structure.	No
Southwestern willow flycatcher	E	Cottonwood/willow and tamarisk vegetation communities along rivers and streams.	No
Yellow-billed cuckoo	PT	Large blocks of riparian woodlands (cottonwood, willow, or tamarisk galleries).	No
Fish			
Colorado pikeminnow	EXPN, XN	Warm, swift, turbid rivers. Prefers eddies and pools.	No
Desert pupfish	E	Shallow springs, small streams, and marshes. Tolerates saline and warm water.	No
Gila chub	E	Pools, springs, cienegas, and streams.	No

TABLE 1J (Continued)
Federally Listed Species
Yavapai County, Arizona

Common Name	Status	Habitat	Habitat At Airport
Fish (Continued)			
Gila topminnow	E	Small streams, springs, and cienegas vegetated shallows.	No
Gila trout	T	Gila trout habitat currently consists of small headwater streams with limited pool availability and generally low base flows.	No
Loach minnow	E	Small to large perennial streams with swift shallow water over cobble and gravel.	No
Razorback sucker	E	Riverine and lacustrine areas, generally not in fast moving water and may use backwaters.	No
Spikedace	E	Medium to large perennial streams with moderate to swift velocity waters over cobble and gravel substrate. Recurrent flooding and natural hydrograph important to withstand invading exotic species.	No
Woundfin	EXPN, XN	This species is found in moderate to large perennial streams with moderate to swift currents, where it inhabits shallow riffles with sand, gravel, and rubble substrates. Specific habitat for this species consists of shear zones where rapid flow borders slower flow, areas of sheet flow at the upper ends of mid-channel sand/gravel bars; and eddies at downstream riffle edges. All suitable habitats are found under 2,000 meters elevation.	No
Flowering Plants			
Arizona cliffrose	E	White limestone soils derived from tertiary lakebed deposits.	No
Mammals			
Black-footed ferret	EXPN, XN	Grassland plains generally found in association with prairie dogs.	No
Lesser Long-Nosed Bat	E	Requires caves and mines for roost sites (maternity, male-only, late-summer, and night roosts are used differently) and access to healthy stands of saguaro cactus and paniculate agaves for foraging. The Sonoran desertscrub vegetation community provides the early summer forage base, with bats found in southwestern Arizona. The semi-desert grassland and oak woodlands provide the late summer agave resources in the southeastern portion of the state.	No
Reptiles			
Northern Mexican gartersnake	PT	Cienegas, stock tanks, large-river riparian woodlands and forests, streamside gallery forests.	No

PT = proposed threatened. Species proposed for official listing as threatened.
T = threatened. A species "likely to become endangered within the foreseeable future throughout all or a significant portion of its range."
E = endangered. A species "in danger of extinction throughout all or a significant portion of its range."
EXPN, XN = experimental non-essential population. For consultation purposes, experimental, nonessential populations of endangered species (e.g., red wolf) are treated as threatened species on public land, and as species proposed for listing on private land.

Sources: USFWS. Available at: http://www.fws.gov/southwest/es/ES_Lists_Main.cfm, accessed March 2014; Arizona Game and Fish Department (AGFD). Available at: http://www.azgfd.gov/w_c/california_condor.shtml, accessed March 2014.

There are also four candidate species for listing on the ESA known to occur in Yavapai County. There is no known habitat at the Airport for these species. Three of the species are

fish or aquatic organisms; the fourth species is the Sonoran desert tortoise. The Sonoran desert tortoise is found within Mohave and Sonoran desertscrub communities. The Airport is located within the Great Basin conifer woodland community.

Other federal laws potentially applicable to the airport include the *Migratory Bird Treaty Act,* which prohibits activities that would harm migratory birds, their eggs or nests, and E.O. 13312, *Invasive Species,* which aims to prevent the introduction of invasive species as a result of a proposed action.

The *Arizona Native Plant Law* (Arizona Revised Statutes [ARS], Section 3-904) also protects certain native plants classified by the Arizona Department of Agriculture (ADA). The law states that protected plants cannot be removed from any lands without permission and a permit from the ADA.

FLOODPLAINS

E.O. 11988, *Floodplain Management* directs federal agencies to take action to reduce the risk of flood loss, to minimize the impact of floods on human safety, health and welfare, and to restore and preserve the natural and beneficial values served by the floodplains.

Furthermore, as defined in FAA Order 1050.1E, *Environmental Impacts: Policies and Procedures* (FAA 2006), agencies are required to "make a finding that there is no practicable alternative before taking action that would encroach on a base floodplain based on a 100-year flood." FAA Order 1050.1E (9.2b) also clarifies that "if the proposed action and reasonable alternatives are not within the limits of, or if applicable, the buffers of a base floodplain, a statement to that effect should be made"; no further analysis is necessary. The limits of base floodplains are determined by Flood Insurance Rate Maps (FIRMs) prepared by Federal Emergency Management Agency (FEMA).

The Sedona Airport is not located within a 100-year floodplain. According to the most recent FIRM for the Airport (Panel No. 04025C1435G, dated September 3, 2010), the entire Airport is located in Zone X. Zone X is defined as areas of 0.2 percent annual chance of flood (500-year flood), areas of one percent annual chance flood (100-year flood) with average depths of less than one foot or with drainage areas less than one square mile, or areas protected by levees from one percent annual chance flood.

GREENHOUSE GASES AND CLIMATE

Greenhouse gases (GHGs) are those that trap heat in the earth's atmosphere. Greenhouse gases can be either naturally occurring or anthropogenic (man-made) and include water vapor (H_2O) and carbon dioxide (CO_2). Several classes of halogenated substances that contain fluorine, chlorine, or bromine are also GHGs, but they are, for the most part, solely a product of industrial activities. All GHG inventories measure CO_2 emissions, but beyond

CO_2, different inventories include different greenhouse gases (such as methane [CH_4], nitrous oxide [N_2O], and O_3).

No federal significance thresholds for the creation of GHG have been promulgated to date. However, research has shown that there is a direct correlation between fuel combustion and GHG emissions. In terms of U.S. contribution, the General Accounting Office (GAO) (2009) reports that "domestic aviation contributes about 3 percent of total carbon dioxide emissions, according to EPA data," compared with other industrial sources, including the remainder of the transportation sector (20 percent) and power generation (41 percent). The International Civil Aviation Organization (ICAO) estimates that GHG emissions from aircraft account for roughly 3 percent of all anthropogenic (man-made) GHG emissions globally (Melrose 2010). Climate change due to GHG emissions is a global phenomenon, so the affected environment is the global climate.[2]

The scientific community is continuing efforts to better understand the impact of aviation emissions on the global atmosphere. The FAA is leading and participating in a number of initiatives intended to clarify the role that commercial aviation plays in GHG and climate. The FAA, with support from the U.S. Global Change Research Program and its participating federal agencies (e.g., the National Aeronautics and Space Administration [NASA], National Oceanic and Atmospheric Administration [NOAA], EPA, and Department of Energy [DOE]), has developed the Aviation Climate Change Research Initiative (ACCRI) in an effort to advance scientific understanding of regional and global climate impacts of aircraft emissions. FAA also funds the Partnership for Air Transportation Noise & Emissions Reduction (PARTNER) Center of Excellence research initiative to quantify the effects of aircraft exhaust and contrails on global and U.S. climate and atmospheric composition. Similar research topics are being examined at the international level by the International Civil Aviation Organization (ICAO) (Maurice and Lee 2007).

HAZARDOUS MATERIALS, POLLUTION PREVENTION, AND SOLID WASTE

Federal, state, and local laws, including the *Resource Conservation Recovery Act* (RCRA) and the *Comprehensive Environmental Response, Compensation, and Liability Act* (CERCLA), as amended (also known as the Superfund), regulate hazardous materials use, storage, transport, and disposal. These laws may extend to past and future landowners of properties containing these materials. Disturbing areas that contain hazardous materials or contaminates can cause significant impacts to soil, surface water, groundwater, air quality, and the organisms using these resources.

According to EPA's EJ View EnviroMapper website, there are no Superfund or Brownfield sites in proximity to the Airport. There are also no businesses at the Airport reporting to EPA under RCRA. Fuel storage facilities located at the Airport are required to comply with all applicable regulations.

[2]As explained by the U.S. EPA (2009), "greenhouse gases, once emitted, become well mixed in the atmosphere, meaning U.S. emissions can affect not only the U.S. population and environment but other regions of the world as well; likewise, emissions in other countries can affect the United States."

Solid waste transport and disposal at Sedona Airport is provided by private business. Yavapai County uses a waste disposal site operated by Waste Management of Arizona (WMAZ) (i.e., Grey Wolf Regional Landfill, located approximately 25 miles southwest of the Airport in Dewey, Arizona).

HISTORICAL, ARCHITECTURAL, ARCHAEOLOGICAL, AND CULTURAL RESOURCES

Determination of a project's environmental impact to historic and cultural resources is made under guidance in the *National Historic Preservation Act* (NHPA) *of 1966*, as amended, the *Archaeological and Historic Preservation Act* (AHPA) *of 1974*, the *Archaeological Resources Protection Act* (ARPA), and the *Native American Graves Protection and Repatriation Act* (NAGPRA) *of 1990*, among others. Impacts can occur when the proposed project causes an adverse effect on a property which has been identified (or is unearthed during construction) as having historical, architectural, archaeological, or cultural significance.

Numerous archaeological surveys have been conducted within one mile of the Airport, including five surveys at the Airport itself. Based on the most recent survey (SWCA 2014), there are four known cultural resources sites located at the Airport. Only one of these sites (AZ O:1:166[ASM]) is considered by the surveying archaeologists to be potentially eligible for listing on the National Register of Historic Properties (NRHP).

Because AZ O:1:166[ASM] is located on a part of the Airport that is undeveloped and is not planned to be developed at this time, FAA has not conducted Section 106 consultation with the State Historic Preservation Office to confirm the site's overall potential eligibility. It should be noted, however, that a portion of AZ O:1:166[ASM] may be affected by a proposed land release at the Airport. This portion has been determined by the archaeologists to be ineligible for listing on the NRHP. Given the extremely low density and diversity of artifacts within the land release area as well as the amount the site has been affected by historical and modern activities, the context of artifacts is questionable and there is no potential for subsurface deposits. This determination will need to be confirmed as FAA conducts its Section 106 consultation during the environmental review for the proposed land release.

WATER QUALITY

The Airport is located in the Upper Verde drainage area of the Verde watershed and discharges storm water into drainages that feed into Oak Creek. There are no natural washes, drainages, or streams located on Airport property; the Airport is located atop of a mesa (i.e., Table Top Mountain). Storm water leaving the mesa to the north and west eventually flows into Carroll Canyon, which empties into Oak Creek approximately 1.5 miles downstream from the southern end of the runway; storm water leaving the mesa to the south and east goes directly into Oak Creek, which is located approximately 0.5 mile from the Airport runway system. According to EPA's My WATERS mapper, Waterbody Quality As-

sessment Report, Oak Creek Canyon is a Section 404(d) listed "Impaired" water for Escherichia (E.) coli.

Under the *Clean Water Act* (CWA), the State of Arizona has been given authority by EPA to establish water quality standards, control discharges, and regulate other issues concerning water quality. The use of best management practices (BMPs) during construction is a requirement of construction-related permits such as Arizona Pollutant Discharge Elimination System (AZPDES) Construction General Permit (AZG2003-001) and is incorporated into the appropriate storm water pollution prevention plan (SWPPP). The Airport sponsor has an Airport-wide SWPPP, dated November 2013.

WETLANDS

Certain drainages (both natural and human-made) come under the purview of the U.S. Army Corps of Engineers (USACE) under Section 404 of the CWA; wetlands are also protected. In addition, E.O. 11990, *Protection of Wetlands* also provides definitions and protection of wetlands. Wetlands typically exhibit three characteristics: hydrology, hydrophytes (plants able to tolerate various degrees of flooding or frequent saturation), and poorly drained or "hydric" soils.

USFWS's National Wetlands Inventory indicates that there are no wetlands located on the Sedona Airport property.

WILD AND SCENIC RIVERS

Wild and scenic rivers refer to designations within U.S. Department of the Interior, National Park Service's *Nationwide Rivers Inventory*. Public Law 90-542 states that such rivers are free flowing and possess "outstanding remarkable scenic, recreational, geologic, fish and wildlife, historic, cultural or other similar values."

The State of Arizona has two designated Wild and Scenic Rivers: Fossil Creek and Verde River. These resources are located approximately 40 miles south of the Airport.

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Chapter Two

AVIATION DEMAND FORECASTS

Chapter Two

AVIATION DEMAND FORECASTS

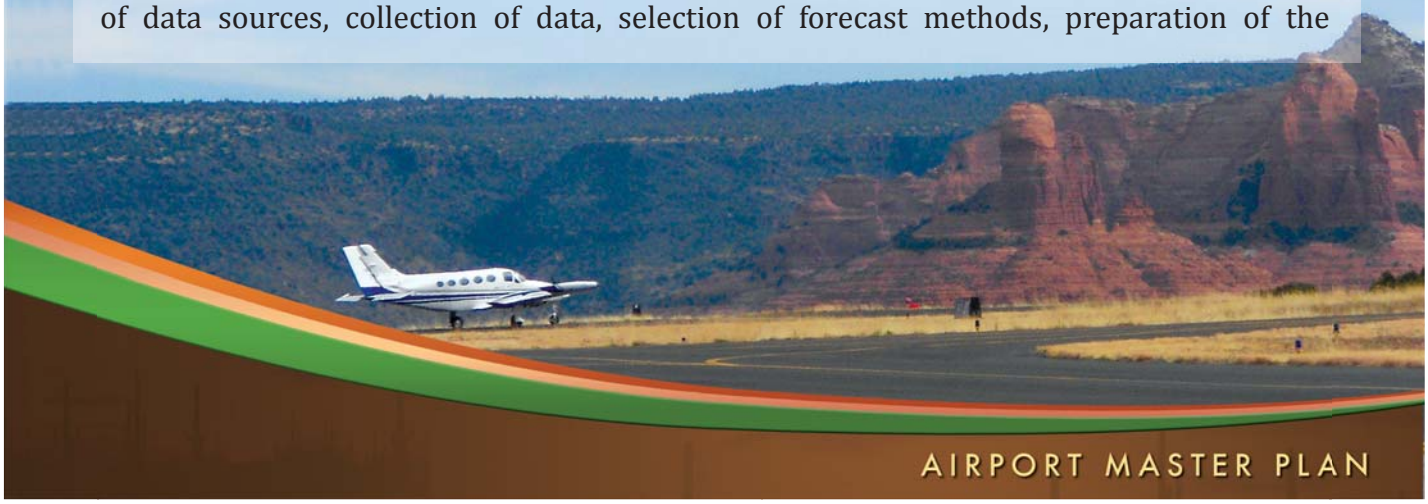
An important factor when planning the future needs of an airport involves a definition of aviation demand that may reasonably be expected to occur in both the near term (five years) and long term (20 years). For a general aviation airport such as Sedona Airport (SEZ or Airport), forecasts of based aircraft and operations (takeoffs and landings) serve as the basis for facility planning.

The Federal Aviation Administration (FAA) has oversight responsibility to review and approve aviation forecasts developed in conjunction with airport planning studies. The FAA reviews such forecasts with the objective of comparing them to the FAA *Terminal Area Forecasts* (TAF) and the *National Plan of Integrated Airport Systems* (NPIAS). In addition, aviation activity forecasts may be an important input to the benefit-cost analyses associated with some airport development projects.

FAA Order 5090.3C, *Field Formulation of the National Plan of Integrated Airport Systems*, dated December 4, 2004, states that forecasts should be:

- Realistic
- Based on the latest available data
- Reflective of current conditions at the airport
- Supported by information in the study
- Able to provide adequate justification for airport planning and development

The forecast process for an airport master plan consists of a series of basic steps that vary in complexity depending upon the issues to be addressed and the level of effort required. The steps include a review of previous forecasts, determination of data needs, identification of data sources, collection of data, selection of forecast methods, preparation of the



forecasts, and evaluation and documentation of the results. FAA Advisory Circular (AC) 150/5070-6B, *Airport Master Plans*, outlines seven standard steps involved in the forecast process, including:

1) **Identify Aviation Activity Measures**: The level and type of aviation activities likely to impact facility needs. For general aviation, this typically includes based aircraft and operations.

2) **Review Previous Airport Forecasts**: May include the FAA *Terminal Area Forecast*, state or regional system plans, and previous master plans.

3) **Gather Data**: Determine what data are required to prepare the forecasts, identify data sources, and collect historical and forecast data.

4) **Select Forecast Methods**: There are several appropriate methodologies and techniques available, including regression analysis, trend analysis, market share or ratio analysis, exponential smoothing, econometric modeling, comparison with other airports, survey techniques, cohort analysis, choice and distribution models, range projections, and professional judgment.

5) **Apply Forecast Methods and Evaluate Results**: Prepare the actual forecasts and evaluate for reasonableness.

6) **Summarize and Document Results**: Provide supporting text and tables as necessary.

7) **Compare Forecast Results with FAA's TAF**: Follow guidance in FAA Order 5090.3C, *Field Formulation of the National Plan of Integrated Airport Systems*. In part, the Order indicates that forecasts should not vary significantly (more than 10 percent) from the TAF. When there is a greater than 10 percent variance, supporting documentation should be supplied to the FAA.

The aviation demand forecasts are then submitted to the FAA for their approval. Master plan forecasts for operations and based aircraft for general aviation airports are considered to be consistent with the TAF if they meet certain criteria:

Where the 5- year or 10-year forecasts exceed 100,000 total annual operations or 100 based aircraft:

a) Forecasts differ by less than 10 percent in the 5-year forecast and 15 percent in the 10-year period, or
b) Forecasts do not affect the timing or scale of an airport project, or
c) Forecasts do not affect the role of the airport as defined in the current version of FAA Order 5090.3C.

Aviation activity can be affected by many influences on the local, regional, and national levels, making it virtually impossible to predict year-to-year fluctuations of activity over 20 years with certainty. Therefore, it is important to remember that forecasts are to serve only as guidelines, and planning must remain flexible enough to respond to a range of unforeseen developments.

The following forecast analysis for Sedona Airport was produced following these basic guidelines. Existing forecasts are examined and compared against current and historic activity. The historical aviation activity is then examined along with other factors and trends that can affect demand. The intent is to provide an updated set of aviation-demand projections for Sedona Airport that will permit County officials to make planning adjustments as necessary to maintain a viable, efficient, and cost-effective facility.

FORECASTING APPROACH

The development of aviation forecasts proceeds through both analytical and judgmental processes. A series of mathematical relationships is tested to establish statistical logic and rationale for projected growth. However, the judgment 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.

Beyond five years, the predictive reliability of the forecasts can diminish. Therefore, it is prudent for the airport to update the forecasts, reassess the assumptions originally made, and revise the forecasts based on current airport and industry conditions. Facility and financial planning usually require at least a 10-year preview, since it often takes several 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 activity occurring 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. A recent example is the substantial growth in the production and delivery of business jet aircraft, which resulted in a growth rate that far exceeded expectations. Such changes are difficult to predict, but over time, reasonable growth trends can be identified. Using a broad spectrum of demographic, economic, and industry data, forecasts for Sedona Airport have been developed.

For each aviation demand indicator, such as based aircraft and operations, several forecasts are developed. These forecasts are presented to define a reasonable planning envelope. The selected forecast for a particular demand indicator may be one of the forecasts or it may be an average of all of the forecasts. Several standard statistical methods have been employed to generate various projections of aviation demand.

Trend series projections are probably the simplest and most familiar of the forecasting techniques. By fitting growth curves to historical demand data and 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 a direct relationship between two separate sets of historic data. Should there be a reasonable correlation between the data, further evaluation using regression analysis may be employed.

Regression analysis measures the statistical relationship between dependent and independent variables, yielding a "correlation coefficient." The correlation coefficient (Pearson's "r") measures the association between changes in a dependent variable and independent variable(s). If the r-squared (r^2) value (coefficient determination) is greater than 0.90, it indicates good predictive reliability. A value below 0.90 may be used with the understanding that the predictive reliability is lower.

Historical growth analysis is a simple forecasting method in which the historical compound annual growth rate (CAGR) is identified and then extended out to forecast years. This analysis method assumes factors that impacted growth in the past will continue into the future.

Market share analysis involves a historical review of 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.

Utilizing these statistical methods, available existing forecasts, and analyst expertise, forecasts of aviation demand for Sedona Airport have been developed. The remainder of this chapter presents the aviation demand forecasts and includes activity in two broad categories: based aircraft and annual operations.

NATIONAL AVIATION TRENDS AND FORECASTS

Each year, the FAA updates and publishes a national aviation forecast. Included in this publication are forecasts for the large air carriers, regional/commuter air carriers, 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 the general public. The current edition when this chapter was prepared was FAA *Aerospace Forecasts – Fiscal Years 2014-2034*, published in March 2014. The FAA primarily uses 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. The following discussion is summarized from the FAA Aerospace Forecasts.

U.S. ECONOMIC OUTLOOK

Since the beginning of the century, the aviation industry has suffered several major shocks that have led to reduced demand for air travel. These shocks include the terror attacks of September 11, 2001, periods of rising fuel prices, and the most significant global economic recession since the Great Depression. According to the FAA Forecast report, as the economy recovers from the most serious economic downturn and slow recovery in recent history, aviation will continue to grow over the long run. Fundamentally, demand for aviation is driven by economic activity. As economic growth picks up, so will growth in aviation activity. In the next five years, growth is anticipated to be somewhat muted, primarily due to uncertainty that surrounds the U.S. and global economies.

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U.S. economic performance in 2013 continued to be mixed, with modest growth in real GDP and real incomes, a slowly falling unemployment rate, and oil prices and consumer inflation remaining in check. The economy grew at an average annual rate of 1.6 percent in fiscal year (FY) 2013 after expanding 2.8 percent in FY 2012. Given the uncertainty that characterized 2013, it was not surprising that growth in 2013 was lower than the previous year. GDP growth accelerated throughout the year with the negative effects of Hurricane Sandy and the expiration of the temporary payroll tax cut impacting the first and second quarters. Despite the slow growth, there were some favorable signs as the housing market continued to improve, the stock market entered record territory, and the labor market saw steady but slow improvement.

One of the unique features about the economic recovery (now in its 5th year) has been the slow improvement in the nation's unemployment rate. Since 1960, there have been five economic expansions in the U.S. that have lasted longer than 48 months, including this latest expansion. On average, for the prior four expansions, the unemployment rate four years after the peak rate in the recession prior to the expansion, has declined by about one-third. If the current recovery had been similar to the prior four recoveries, the unemployment rate would be 0.6 to 0.7 points lower than the 7.5 percent in the fourth quarter of FY 2013, and 7.6 percent for all of FY 2013. The persistently high unemployment rate is thought to be a contributing factor to the slow recovery in consumer spending and aviation demand that has been experienced since 2009.

In the medium term (the four-year period between 2015 and 2019), U.S. economic growth is projected to average 3.0 percent per year with rates ranging between 2.9 and 3.2 percent. Income growth picks up during the same period, averaging 3.2 percent per year. For the balance of the forecast period, both U.S. real GDP and real income growth slow to around 2.4 percent annually. The long-term stability of U.S. economic growth depends on sustained growth in the workforce and capital stock along with improved productivity and competitiveness.

FAA GENERAL AVIATION FORECASTS

The FAA forecasts the fleet mix and hours flown for single-engine piston aircraft, multi-engine piston aircraft, turboprops, business jets, piston and turbine helicopters, light sport, experimental, and others (gliders and balloons). The FAA forecasts "active aircraft," not total aircraft. An active aircraft is one that is flown at least one hour during the year. **Exhibit 2A** presents the historical and forecast U.S. active general aviation aircraft.

After growing rapidly for most of the past decade, the demand for business jet aircraft has slowed over the past few years as the industry has been hard hit by the economic recession. Nonetheless, the FAA forecast calls for robust growth in the long-term, driven by higher corporate profits and the growth of worldwide GDP. Additionally, continued concerns about safety, security, and flight delays keep business aviation attractive relative to commercial air travel. Overall, business aviation is projected to outpace personal/recreational use.

The active general aviation fleet is projected to increase at an average annual rate of 0.5 percent through 2034, growing from a 2013 estimate of 202,865 to 225,700 in 2034.

The turbine fleet, including helicopters, is forecast to grow annually at 2.6 percent, growing from 29,110 in 2013 to 49,565 in 2034. The fixed wing jet aircraft portion is forecast to grow 3.0 percent annually from a 2013 estimate of 11,890 to 14,370 in 2034. The turbine helicopter segment is forecast to grow 3.0 percent annually reaching 13,145 by 2034.

Piston-powered aircraft, including helicopters, are projected to decrease from the 2013 total of 141,325 to 131,615 through 2034, with declines in both single and multi-engine fixed wing aircraft but growth in piston helicopters. Over the forecast period, piston-powered fixed-wing aircraft are projected to decrease by an average annual rate of 0.4 percent. Although piston helicopters are forecast to increase by 1 percent a year, they are a relatively small portion of this segment of general aviation aircraft and, therefore, have little effect on the overall trend. Single-engine fixed-wing piston aircraft, which are much more numerous, are projected to decline at an annual rate of 0.4 percent, while multi-engine fixed wing piston aircraft are projected to decline by 0.5 percent a year.

The FAA began tracking the light sport aircraft segment of the general aviation fleet in 2005. At the end of 2013, a total of 2,110 of these aircraft were estimated. By 2034, a total

U.S. Active General Aviation Aircraft

	2013	2018	2023	2028	2033
FIXED WING					
Piston					
Single Engine	123,730	119,435	116,190	114,125	113,780
Multi-Engine	14,235	13,955	13,575	13,220	12,935
Turbine					
Turboprop	10,195	10,285	10,820	12,045	13,930
Turbojet	11,890	13,225	15,315	18,045	21,340
ROTORCRAFT					
Piston	3,360	3,710	4,030	4,340	4,680
Turbine	7,025	8,405	9,870	11,305	12,825
EXPERIMENTAL					
	25,305	27,705	29,715	31,850	34,010
SPORT AIRCRAFT					
	2,110	2,830	3,450	4,170	4,780
OTHER					
	5,015	5,065	5,110	5,150	5,190
TOTAL	**202,865**	**204,615**	**208,075**	**214,250**	**223,470**



Source: FAA Aerospace Forecasts, Fiscal Years 2014-2034.
Notes: An active aircraft is one that has a current registration and was flown at least one hour during the calendar year.

of 4,880 light sport aircraft are forecast to be in the fleet for an annual growth rate of 4.1 percent.

RISKS TO THE FORECASTS

While the FAA is confident that its forecasts for aviation demand and activity can be achieved, this hinges on a number of factors, including the strength of the global economy, security (including the threat of international terrorism), and the level of oil prices. Higher oil prices could lead to further shifts in consumer spending away from aviation, dampening a recovery in air transport demand. In the long term, the FAA foresees a competitive and profitable industry characterized by increasing demand for air travel and airfares growing more slowly than inflation.

SOCIOECONOMIC PROJECTIONS

The socioeconomic conditions provide an important baseline for preparing aviation demand forecasts. Local socioeconomic variables such as population, employment, and income are indicators for understanding the dynamics of the community and can relate to local trends in aviation activity. Analysis of the demographics of the airport service area will give a more comprehensive understanding of the socioeconomic situations affecting the region which supports Sedona Airport. The following is a summary of historical demographic trends as well as forecasts of those socioeconomic characteristics.

Table 2A summarizes historical and forecast population, employment, and income estimates for Yavapai County, Coconino County, and the State of Arizona. Over the next 20 years, Yavapai County's socioeconomic indicators are anticipated to grow at nearly the same rates as the State. Coconino County is anticipated to have steady growth rates as well, but not quite as strong compared to Yavapai County and the State. Detailed historical and forecasted socioeconomic data for the City of Sedona was not readily available; however, the Arizona Department of Administration Office of Employment and Population Statistics has prepared population projections for sub-county incorporated places including the City of Sedona. According to that projection, the City of Sedona is anticipated to grow at a CAGR of 1.1 percent between 2013 and 2033, growing the City's population from 10,037 in 2012 to approximately 12,600 by 2033.

TABLE 2A
Socioeconomic Trends and Forecast

	HISTORIC				FORECAST			
	2000	2010	2013	CAGR 2000-2013	2018	2023	2033	CAGR 2013-2033
Yavapai County								
Population	167,517	211,033	215,133	1.9%	237,437	256,969	298,529	1.7%
Employment	69,762	79,982	82,458	1.3%	90,148	98,544	117,759	1.8%
Income (PCPI)	$26,319	$28,025	$28,916	0.7%	$30,936	$33,519	$39,919	1.6%
Coconino County								
Population	116,320	134,421	136,539	1.2%	149,638	161,122	185,300	1.5%
Employment	69,647	81,239	84,749	1.5%	92,444	100,658	118,836	1.7%
Income (PCPI)	$28,609	$32,498	$33,567	1.2%	$35,779	$38,605	$45,585	1.5%
Arizona								
Population	5,130,632	6,392,017	6,626,624	2.0%	7,316,486	7,960,875	9,352,247	1.7%
Employment	2,795,771	3,188,128	3,353,389	1.4%	3,689,228	4,057,382	4,904,173	1.9%
Income (PCPI)	$31,629	$33,223	$34,355	0.6%	$36,723	$39,749	$47,294	1.6%

CAGR: Compound Annual Growth Rate
PCPI - Per Capita Personal Income ($2009)
Source: Historic population – U.S. Census Bureau; All other historic and forecast data - *Woods & Poole Economics - Complete Economic Demographic Data Source (CEDDS-2014);*

AVIATION DEMAND FORECASTS

To determine the types and sizes of facilities that should be planned to accommodate aviation activity, certain elements of this activity must be forecast. Indicators of aviation demand include:

- Based Aircraft
- Based Aircraft Fleet Mix
- Operations
- Peaking Period Operations

The remainder of this chapter will examine historical trends with regard to these areas of aviation demand and project future demand for these segments of activity at the Airport. These forecasts, once approved by the FAA, will become the basis for planning future facilities, both airside and landside, at the Airport.

FAA AND STATE FORECASTS

In an effort to assist the FAA in developing its programs and budgets, the TAF is updated annually. FAA staffing standards and other resource models also use the TAF to forecast requirements for operating the airspace system. Historical and forecast data for enplanements, airport operations, and based aircraft help the FAA, state aviation authorities, and other aviation entities in planning for future airport improvements.

The Arizona Department of Transportation – Multimodal Planning Division - Aeronautics Group (ADOT-MPD – Aeronautics Group) assists airports in the state in identifying infrastructure needs with a state aviation needs study and other special aviation studies. The most recent study on a statewide basis is the *2008 Arizona State Airports System Plan* (SASP), which includes forecasts of aviation activity in the state and for individual airports. The TAF and SASP are referenced throughout the remainder of this chapter as they relate to forecast aviation demand at Sedona Airport

REGISTERED AIRCRAFT FORECAST

The number of based aircraft is the most basic indicator of general aviation demand at an airport. By first developing a forecast of based aircraft, other demand segments can be projected utilizing the forecast trend in based aircraft. One method of forecasting based aircraft is to first examine local aircraft ownership by reviewing aircraft registrations in the region. To help identify the service area of the Airport, the distribution of based aircraft is depicted on **Exhibit 2B**. Based upon the distribution, the approximate service area of the Airport is focused primarily in the immediate Sedona area, but also extends from Yavapai County to Coconino County to the east/northeast. **Table 2B** presents historical data regarding aircraft registered in both Yavapai and Coconino Counties.

TABLE 2B
Historical Registered Aircraft

Year	Yavapai County	Coconino County	Total
1993	426	276	702
1994	451	280	731
1995	464	286	750
1996	468	296	764
1997	486	308	794
1998	514	300	814
1999	541	308	849
2000	572	331	903
2001	642	308	932
2002	628	305	933
2003	626	288	914
2004	657	293	950
2005	658	295	953
2006	626	288	914
2007	641	306	947
2008	728	307	1,035
2009	695	335	1,030
2010	659	309	968
2011	647	316	963
2012	575	292	867
2013	554	267	821
CAGR 1993-2013	**1.3%**	**-0.2%**	**0.8%**
CAGR 2008-2013	**-5.3%**	**-2.8%**	**-4.5%**

CAGR – Compound Annual Growth Rate
Source: FAA Aircraft Registry Database; FAA Census of U.S. Civil Aircraft

The trend in registered aircraft shows that both counties achieved 20-year highs of registered aircraft in the 2008 to 2009 timeframe. Those aircraft levels have since declined in the past five years due to the economic recession, with the counties losing a combined 214 registered aircraft since 2008. The bulk of lost registered aircraft were from Yavapai County, which accounted for 174 of the 214.

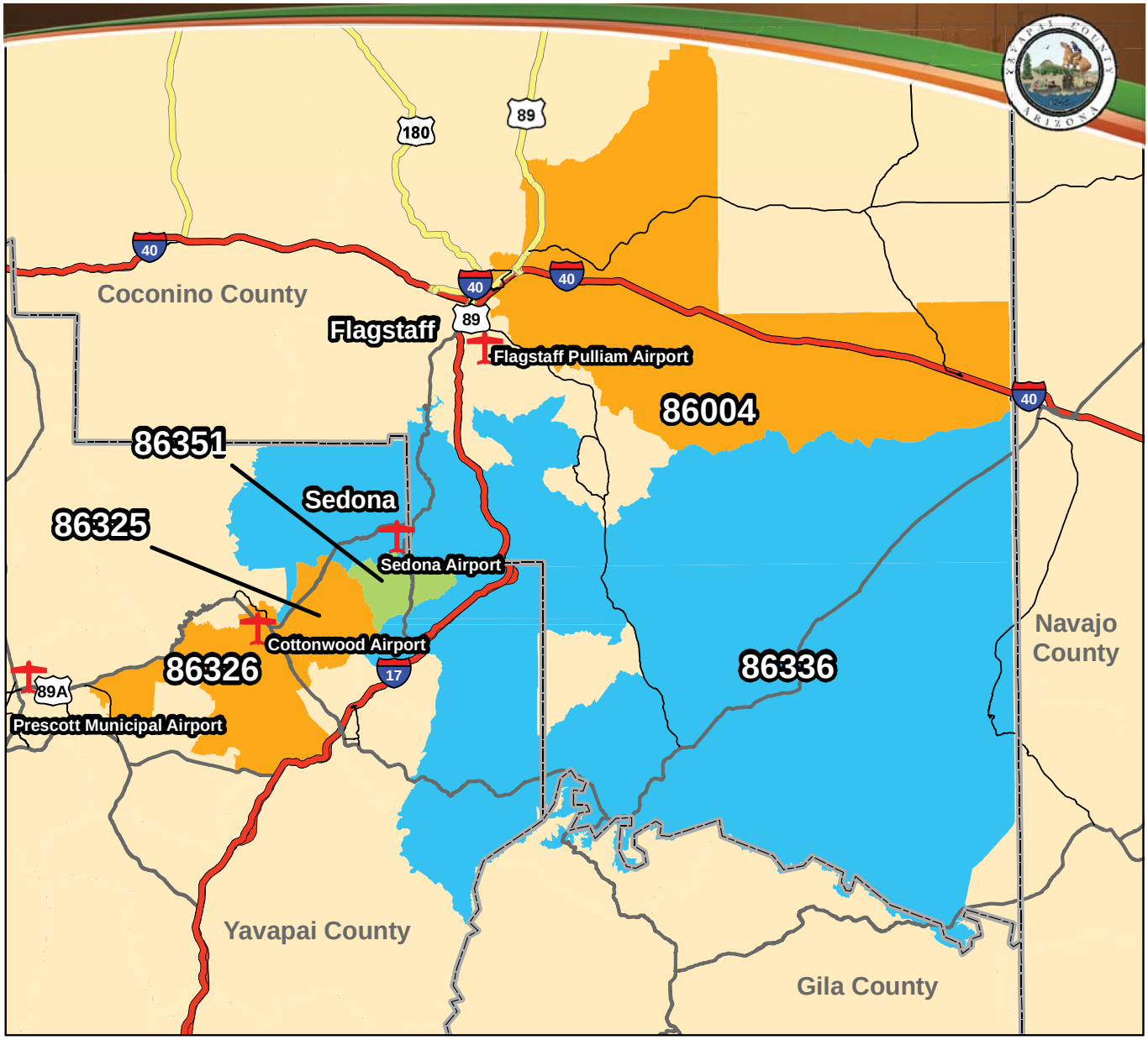
The first forecast considers the relationship between historical registered aircraft and the population. By maintaining the same ratio of aircraft per 1,000 people (2.3), a long term forecast emerges, resulting in 1,130 registered aircraft for both counties combined by 2033 and a compound annual growth rate (CAGR) of 1.6 percent. This forecast seems overly optimistic since the ratio of aircraft per 1,000 people has been trending down.

A forecast has been developed utilizing a market share ratio of the active U.S. general aviation fleet as forecast by the FAA. In 2013, the counties combined registered aircraft represented 0.405 percent of the total general aviation fleet of 202,865. This rate is down from the 20-year average of 0.422 percent but not to a significant degree. Maintaining the current market share over the forecast periods results in 904 registered aircraft in both counties combined by 2033 and a CAGR of 0.5 percent.

A third forecast was prepared, which maintains the 20-year registered aircraft growth trend of a 0.8 percent CAGR. Projecting that trend to continue for the next 20-year period results in 960 total registered aircraft in both counties combined by 2033.

Three regression forecasts were prepared, including two single-variable regressions examining registered aircraft's correlation with combined Yavapai County and Coconino County population growth trends and its correlation with U.S. active general aviation aircraft. The third regression is a multiple variable regression combining the population and U.S. active general aviation aircraft variables. None of the regressions resulted in an r^2 value of over 0.9; however, they are included for comparison purposes. The highest single variable correlation was found with the U.S. active general aviation, which produced an r^2 value of 0.839. The multiple variable regression produced an r^2 value of 0.860, while the population regression produced an r^2 value of just 0.735. The forecasts produced from these regressions resulted in registered aircraft growth ranging from 955 to 1,193 aircraft by 2033.

With registered aircraft in both counties trending downward and with the national general aviation fleet anticipating limited growth over the next 20 years, big gains in registered aircraft are not expected. Economic conditions in the region are still struggling through a recovery period, and there is potential for some growth over time to recover to registered aircraft levels that existed in the not too distant past. Therefore, the 20-year trend forecast has been selected for use in this Master Plan. Total registered aircraft for both counties combined are forecasted at 854 in 2018, 888 in 2023, and 960 in 2033. **Exhibit 2C** shows the forecast growth in registered aircraft for the combined Yavapai and Coconino counties. These registered aircraft forecasts will be one element considered in the based aircraft forecasts to follow.



LEGEND

Number of Sedona Airport Based Aircraft in Zip Code

- 0
- 1
- 21
- 47
- County Boundary
- Airport

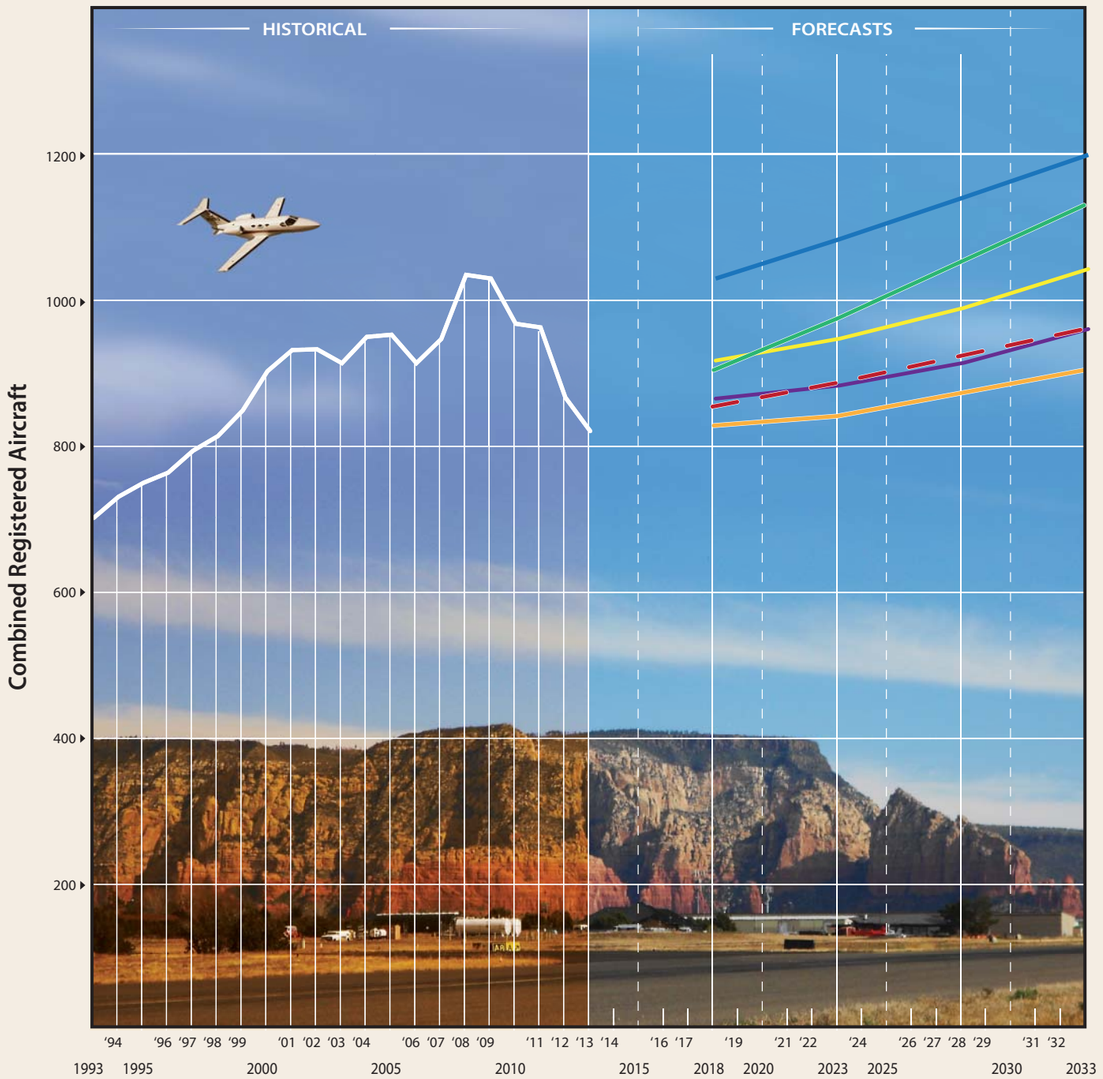
0 5 10 20

1" = 15 Miles

N

Zip Code	Number of Based Aircraft
86336	47
86351	21
86326	1
86004	1
86325	1
Other AZ Zip Codes	9
Out of State Zip Codes	12

Year	Combined Registered Aircraft[1]	US Active Aircraft	Percent of U.S. Active Aircraft	Combined Population[1]	Aircraft Per 1,000 Population
1993	702	177,120	0.396%	223,100	3.15
1994	731	172,935	0.423%	231,000	3.16
1995	750	182,605	0.411%	238,900	3.14
1996	764	187,312	0.408%	248,075	3.08
1997	794	189,328	0.419%	259,550	3.06
1998	814	205,700	0.396%	270,125	3.01
1999	849	219,500	0.387%	278,725	3.05
2000	903	217,533	0.415%	283,837	3.18
2001	932	211,466	0.441%	298,080	3.13
2002	933	211,244	0.442%	305,750	3.05
2003	914	209,606	0.436%	316,245	2.89
2004	950	219,319	0.433%	325,045	2.92
2005	953	224,257	0.425%	335,635	2.84
2006	914	221,942	0.412%	345,555	2.65
2007	947	231,606	0.409%	358,832	2.64
2008	1035	228,664	0.453%	362,961	2.85
2009	1030	223,876	0.460%	365,229	2.82
2010	968	223,370	0.433%	345,454	2.80
2011	963	220,453	0.437%	345,409	2.79
2012	867	209,034	0.415%	345,896	2.51
2013	821	202,865	0.405%	351,672	2.33
Constant Aircraft Per 1,000 Population CAGR: 1.6%					
2018	904	204,615	0.442%	387,075	2.33
2023	976	208,075	0.469%	418,091	2.33
2028	1,052	214,250	0.491%	450,448	2.33
2033	1,130	223,470	0.505%	483,829	2.33
Constant Share of U.S. Fleet CAGR: 0.5%					
2018	828	204,615	0.405%	387,075	2.14
2023	842	208,075	0.405%	418,091	2.01
2028	867	214,250	0.405%	450,448	1.92
2033	904	223,470	0.405%	483,829	1.87
Single Variable Regression - Population CAGR: 1.9%					
2018	1,024	204,615	0.500%	387,075	2.64
2023	1,078	208,075	0.518%	418,091	2.58
2028	1,135	214,250	0.530%	450,448	2.52
2033	1,193	223,470	0.534%	483,829	2.47
Single Variable Regression - U.S. Active Aircraft CAGR: 0.8%					
2018	860	204,615	0.420%	387,075	2.22
2023	878	208,075	0.422%	418,091	2.10
2028	909	214,250	0.424%	450,448	2.02
2033	955	223,470	0.428%	483,829	1.97
Multiple Variable Regression - Population and U.S. Active Aircraft CAGR: 1.2%					
2018	912	204,615	0.446%	387,075	2.36
2023	942	208,075	0.453%	418,091	2.25
2028	984	214,250	0.459%	450,448	2.18
2033	1,037	223,470	0.464%	483,829	2.14
20-year CAGR Trend Forecast - Selected Forecast CAGR: 0.8%					
2018	854	204,615	0.417%	387,075	2.21
2023	888	208,075	0.427%	418,091	2.12
2028	923	214,250	0.431%	450,448	2.05
2033	960	223,470	0.430%	483,829	1.98



- Constant Aircraft Per 1,000 Population
- Constant Share of U.S. Fleet
- Single Variable Regression - Population
- Single Variable Regression - U.S. Active Aircraft
- Multiple Variable Regression - Population and U.S. Active Aircraft
- 20-year CAGR Trend Forecast - ***Selected Forecast***

CAGR - Compound Annual Growth Rate
[1]Yavapai County and Coconino County Combined

Exhibit 2C
REGISTERED AIRCRAFT FORECASTS

BASED AIRCRAFT FORECASTS

Prior to generating statistical forecasts of based aircraft for the Airport, it is important to establish the current number of based aircraft. Until recently, the FAA has not required airports to maintain annual based aircraft figures. The FAA began a National Based Aircraft Inventory Program to create a database of based aircraft at non-primary airports in the National Plan of Integrated Airport System (NPIAS). To be considered a based aircraft in the FAA's registry, an aircraft must be operational and air worthy and be typically based at the airport for a majority of the year. The most recent data available for Sedona Airport from this database indicates a validated based aircraft count of 60. According to Airport staff, the most recent (September 2015) count of aircraft meeting the database definition included 67 aircraft. It is anticipated that the Airport will submit this count to the FAA database in its next database update in 2016.

In addition to these 67 based aircraft, the Airport has 25 aircraft that are air worthy and operational and lease hangar space; however, these aircraft do not meet the standard of being based at the airport a majority of the year. As a community with a large number of second homes, the Airport has numerous aircraft owners that also hangar their aircraft at other airports throughout the year. However, since these additional aircraft utilize Airport facilities and occupy hangar space, it is important that they be included for facility planning purposes. As such, the total based aircraft at the Airport for planning purposes will be based on 92 aircraft.

The first forecast generated for based aircraft utilizes the previously determined forecast of registered aircraft for Yavapai and Coconino counties. This is a distributive forecast that recognizes that aircraft registered in both counties utilize other public-use general aviation airports other than Sedona Airport. By taking the forecast number of registered aircraft and distributing a relative percentage as based aircraft, a forecast emerges.

Sedona Airport accounted for 11.2 percent of the registered aircraft in both counties in 2013. By maintaining this market share of registered aircraft as a constant, a forecast of based aircraft is presented. For Sedona Airport, this forecast results in 96 based aircraft by 2018, 100 based aircraft by 2023, and 108 based aircraft by 2033.

Existing Forecasts

There are several existing forecasts of based aircraft for Sedona Airport, as shown in **Table 2C**. The FAA TAF is a generalized annual forecast of airport activity produced by the FAA. It can be used for long term planning when other statistical measures support its forecasts. The TAF estimates that in 2013, there were 78 based aircraft at the Airport. The TAF shows no growth in based aircraft, staying static at 78 through 2033. Since it is likely that over the course of the 20-year planning period the Airport will experience some growth in based aircraft, the TAF forecast will be used for comparison purposes but will not be considered a viable forecast for this Master Plan.

TABLE 2C
Existing Based Aircraft Forecasts
Sedona Airport

		Projections Adjusted to Plan Years of this Master Plan				
	Base Year of Study	2013	2018	2023	2033	CAGR 2013-2033
Existing Projection Source						
2014 FAA *Terminal Area Forecast*	78 (2014)	78	78	78	78	0.0%
1999 Master Plan	103 (1997)	145	159	175	211	1.9%
2008 *Arizona State Airports System Plan – Low*	104 (2007)	111	117	124	140	1.2%
2008 *Arizona State Airports System Plan – Medium*	104 (2007)	113	121	129	149	1.4%
2008 *Arizona State Airports System Plan – High*	104 (2007)	122	140	159	206	2.7%

CAGR: Compound annual growth rate
Source: Coffman Associates analysis

A second existing forecast is from the previous master plan finalized in 1999. The base year for the previous master plan forecast was 1997, when a total of 103 based aircraft were identified. The 1999 Master Plan forecasts reflected a CAGR of 1.9 percent, which is similar to the population growth rate experienced between 2000 and 2013 for Yavapai County.

A third existing forecast is from the SASP. The SASP has a base year of 2007, and it identified 104 based aircraft at that time. Three forecasts were prepared in the SASP: a high, medium, and low. Each of these forecasts are presented in the table below; however, it was concluded in the SASP that the medium forecast is the most reasonable for long range planning; therefore, that is what will be used for comparison purposes in this Master Plan. The SASP medium forecast for the Airport reflected a CAGR of 1.4 percent.

These existing forecasts have been interpolated and extrapolated to the plan years of this Master Plan, as shown in the table. The previous forecasts can serve as a comparison to the selected based aircraft forecast to emerge from this Master Plan and they can also serve as the basis for several new forecasts.

New Based Aircraft Forecasts

Several new forecasts of based aircraft have been developed and are presented in **Table 2D**. The first three forecasts simply utilize the CAGR from the existing based aircraft forecasts and apply that to the actual current based aircraft figure of 92. This results in growth rates that are the same as the previous forecasts, but the new based aircraft figures are relative to the plan years of this Master Plan and to the current based aircraft count.

The 1999 Master Plan's growth rate of 1.9 percent results in significant based aircraft growth to 134 by 2033. The SASP medium growth rate of 1.4 percent results in 121 based aircraft by 2033.

TABLE 2D
Existing Based Aircraft Forecasts
Sedona Airport

	2013 (Base Year)	2018	2023	2033	CAGR 2013-2033
Comparison Projections					
1999 Master Plan Growth Rate	92	101	111	134	1.9%
2008 *Arizona State Airport System Plan – Medium Growth Rate*	92	99	106	121	1.4%
Additional Projections					
Constant Share of County[1] Registered Aircraft	92	96	100	108	0.8%
2014 FAA Active GA Aircraft Forecast Growth Rate	92	94	97	102	0.5%
Combined County[1] Population/Income Growth Rates	92	100	108	126	1.6%
Combined County[1] Employment Growth Rate	92	101	110	131	1.8%
City of Sedona Population Growth Rate – Selected Forecast	**92**	**97**	**103**	**115**	**1.1%**

[1]Yavapai County and Coconino County combined.
CAGR: Compound annual growth rate
Source: Coffman Associates analysis

Several additional new forecasts have been developed that are based on applying the forecast growth rate of one variable to the current based aircraft figure. The first variable considered is the FAA forecast of a CAGR of 0.5 percent for active aircraft. When applying this growth rate to the current based aircraft figure of 92, we see a long term based aircraft figure of 102. Other forecasts have been similarly developed which consider the forecast growth rate for population, employment, and income in Yavapai and Coconino Counties and population growth for the City of Sedona.

SELECTED BASED AIRCRAFT FORECAST

It is difficult to justify a based aircraft growth rate that exceeds the projected population growth rate for the primary community served by the Airport, which is the City of Sedona. This is especially true since the historic trends have shown very limited growth. Therefore, for the purposes of this Master Plan, the City of Sedona population growth rate forecast will be used to project based aircraft. The following is the based aircraft forecast for Sedona Airport to be utilized for this Airport Master Plan:

2013 – 92
2018 – 97
2023 – 103
2028 – 108
2033 – 115

Exhibit 2D presents the based aircraft forecasts and the selected forecast.

BASED AIRCRAFT FLEET MIX PROJECTION

Knowing the aircraft fleet mix expected to utilize 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 existing based aircraft fleet mix is comprised of 77 single-engine piston aircraft; four multi-engine piston aircraft; one turboprop aircraft; one jet; four helicopters; and five "other" aircraft such as hot air balloons.

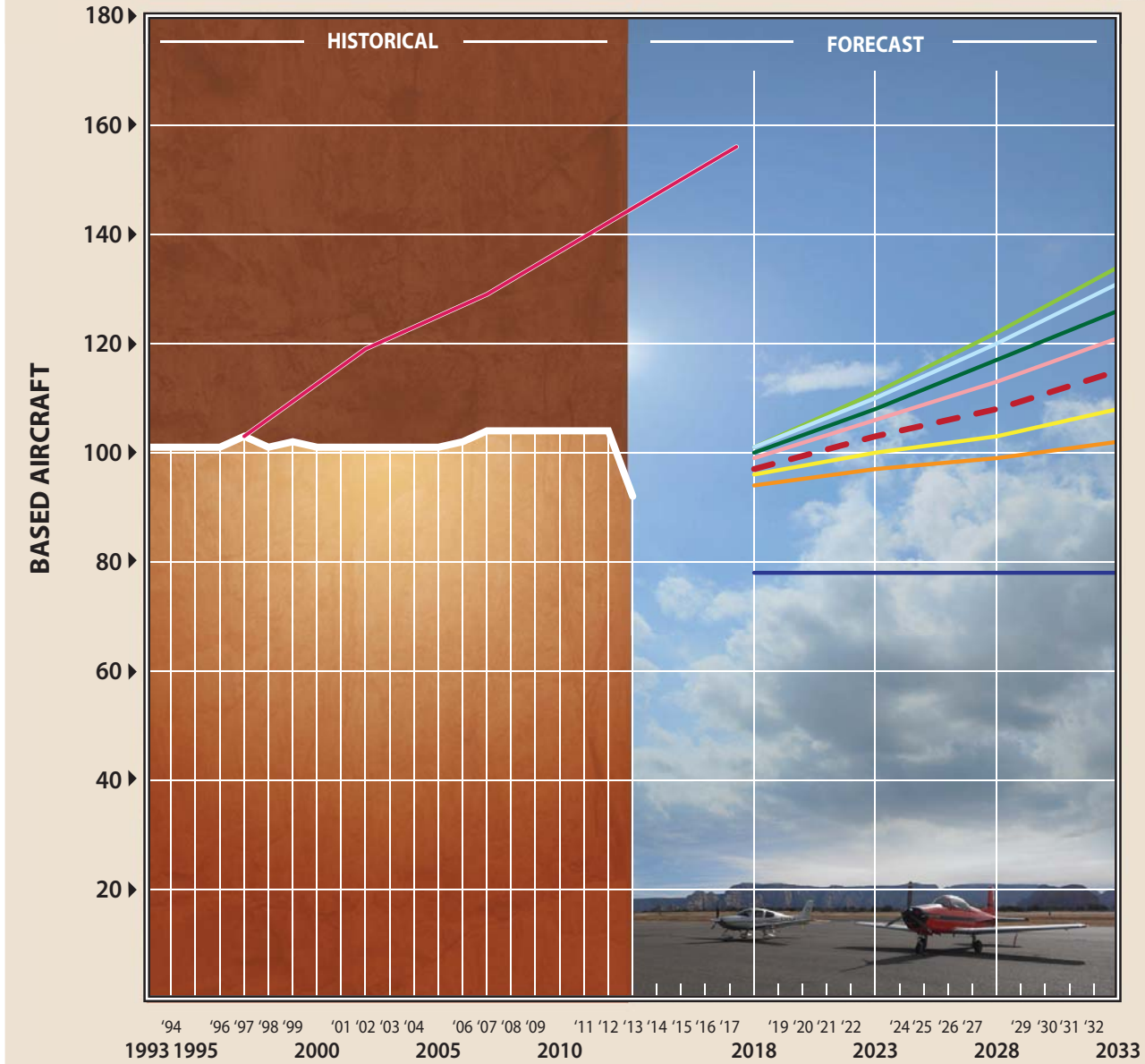
Several factors must be considered when projecting a future fleet mix. As discussed previously, on the national level, the growth areas for the general aviation fleet are in turbine-powered aircraft (business jets and helicopters), while piston-powered aircraft are forecast to remain relatively flat.

On a more local level, the trends in registered aircraft in Yavapai County and Coconino County dating back to 1993 have been identified and are presented in **Table 2E**. The regional trends are similar to national trends with declining single and multi-engine piston aircraft and turboprop and helicopter categories growing. Historical records show a significant loss of jet aircraft between 2009 and 2010; however, the cause of this loss is not known and could be due to a change in record keeping methods. Regardless, the jet category has been identified as a significant growth category by the FAA and is anticipated to grow over the planning period.

TABLE 2E
Yavapai County and Coconino County (Combined) Registered Aircraft Fleet Mix Projections

Year	SEP	%	MEP	%	TP	%	J	%	R	%	O	%	Total
1993	579	82.5%	51	7.3%	14	2.0%	13	1.9%	9	1.3%	36	5.1%	702
1994	594	81.3%	56	7.7%	13	1.8%	20	2.7%	9	1.2%	39	5.3%	731
1995	592	78.9%	66	8.8%	17	2.3%	19	2.5%	10	1.3%	46	6.1%	750
1996	598	78.3%	64	8.4%	16	2.1%	23	3.0%	8	1.0%	55	7.2%	764
1997	613	77.2%	65	8.2%	21	2.6%	24	3.0%	8	1.0%	63	7.9%	794
1998	646	79.4%	60	7.4%	19	2.3%	24	2.9%	7	0.9%	58	7.1%	814
1999	673	79.3%	64	7.5%	19	2.2%	26	3.1%	10	1.2%	57	6.7%	849
2000	713	79.0%	71	7.9%	18	2.0%	26	2.9%	13	1.4%	62	6.9%	903
2001	718	77.0%	61	6.5%	42	4.5%	27	2.9%	16	1.7%	68	7.3%	932
2002	717	76.8%	62	6.6%	41	4.4%	29	3.1%	16	1.7%	68	7.3%	933
2003	691	75.6%	37	4.0%	72	7.9%	35	3.8%	16	1.8%	63	6.9%	914
2004	713	75.1%	39	4.1%	76	8.0%	37	3.9%	18	1.9%	67	7.1%	950
2005	722	75.8%	41	4.3%	71	7.5%	28	2.9%	20	2.1%	71	7.5%	953
2006	713	78.0%	49	5.4%	23	2.5%	22	2.4%	31	3.4%	76	8.3%	914
2007	726	76.7%	52	5.5%	19	2.0%	25	2.6%	36	3.8%	89	9.4%	947
2008	810	78.3%	56	5.4%	30	2.9%	29	2.8%	18	1.7%	92	8.9%	1,035
2009	793	77.0%	60	5.8%	28	2.7%	26	2.5%	28	2.7%	95	9.2%	1,030
2010	743	76.8%	56	5.8%	23	2.4%	6	0.6%	41	4.2%	99	10.2%	968
2011	739	76.7%	55	5.7%	23	2.4%	6	0.6%	43	4.5%	97	10.1%	963
2012	668	77.0%	46	5.3%	20	2.3%	5	0.6%	38	4.4%	90	10.4%	867
2013	629	76.6%	42	5.1%	18	2.2%	5	0.6%	38	4.6%	89	10.8%	821
Chg.		-5.9%		-2.1%		+0.2%		-1.2%		+3.3%		+5.7%	
FLEET MIX PROJECTIONS													
2018	645	75.5%	38	4.4%	24	2.8%	9	1.1%	45	5.3%	93	10.9%	854
2023	656	73.9%	35	3.9%	30	3.4%	16	1.8%	54	6.1%	97	10.9%	888
2028	664	71.9%	32	3.5%	41	4.4%	24	2.6%	63	6.8%	99	10.7%	923
2033	672	70.0%	29	3.0%	53	5.5%	32	3.3%	72	7.5%	102	10.6%	960

SEP-Single-engine Piston; MEP-Multi-Engine Piston; TP-Turboprop; J-Jet; R-Rotor (Helicopter); O-Other
Source: Coffman Associates analysis of FAA Aircraft Registry Database



LEGEND

- 1999 Master Plan (1997 Base Year)
- 1999 Master Plan Growth Rate (1.9% compound annual growth rate)
- FAA Terminal Area Forecast (TAF)
- Combined County Employment Growth Rate
- Combined County Population/Income Growth Rate
- 2008 Arizona State Airports System Plan Growth Rate (Medium Forecast)
- 2014 FAA Active GA Aircraft Forecast Growth Rate
- Constant Share of County Registered Aircraft Forecast
- City of Sedona Population Growth Rate - ***Selected Forecast***

Source: Historical Based Aircraft Sources: FAA Terminal Area Forecast; 1999 Airport Master Plan; Arizona State Airports System Plan, 2008; SAA Records

Exhibit 2D
BASED AIRCRAFT FORECASTS

Table 2F presents the forecast fleet mix of based aircraft for Sedona Airport. Growth trends for the Airport will closely mirror national and regional trends. Single-engine piston aircraft are forecast to continue to account for the vast majority of based aircraft, while modestly decreasing as a percentage of the total based aircraft due to growth in other categories such as jets, turboprops, and helicopters.

TABLE 2F
Based Aircraft Fleet Mix Projections
Sedona Airport

Year	SEP	%	MEP	%	TP	%	J	%	R	%	O	%	Total
1997	93	90.3%	7	6.8%	0	0.0%	0	0.0%	3	2.9%	0	0.0%	103
2013	77	83.7%	4	4.3%	1	1.1%	1	1.1%	4	4.3%	5	5.4%	92
Chg.		-6.6%		-2.4%		+1.1%		+1.1%		+1.4%		+5.4%	
FLEET MIX PROJECTIONS													
2018	79	81.4%	4	4.1%	2	2.1%	2	2.1%	5	5.2%	5	5.2%	97
2023	84	81.6%	3	2.9%	2	1.9%	3	2.9%	6	5.8%	5	4.9%	103
2028	86	79.6%	3	2.8%	3	2.8%	4	3.7%	6	5.6%	6	5.6%	108
2033	87	75.7%	3	2.6%	5	4.3%	6	5.2%	8	7.0%	6	5.2%	115

SEP-Single-engine Piston; MEP-Multi-Engine Piston; TP-Turboprop; J-Jet; R-Rotor (Helicopter); O-Other
Source: Coffman Associates analysis

ANNUAL OPERATIONS

Since the Airport is not equipped with an airport traffic control tower (ATCT), precise operational (takeoff and landing) counts are not available. The FBO Manager at the Airport does maintain annual operations estimates, which show 35,000 annual operations for each year from 2009 to 2013 and an estimated 45,000 annual operations for the years 2007 and 2008. To confirm these estimates, a method for estimating operations was utilized. This method, the *Model for Estimating General Aviation Operations at Non-Towered Airports*, was prepared for the FAA Statistics and Forecast Branch in July 2001. This report develops and presents a regression model for estimating general aviation operations at non-towered airports. The model was derived using a combined data set for small towered and non-towered general aviation airports and incorporates a dummy variable to distinguish the two airport types. In addition, the report applies the model to estimate activity at 2,789 non-towered general aviation airports contained in the FAA *Terminal Area Forecast*. The estimate of annual operations at Sedona Airport was computed using the recommended equation (#15) for non-towered airports. Independent variables used in the equation include airport characteristics (i.e., number of based aircraft, number of flight schools), population totals, and geographic location. The results of the equation confirm the FBO Manager's operational estimate of 35,000 annual operations for 2013.

Typically, operations are reported in four general categories: air carrier, air taxi, general aviation, and military. Sedona Airport does not presently experience scheduled air carrier operations. Air taxi operations primarily associated with the Airport's air tour operators are a significant portion of total operations and are estimated to account for 31 percent of total operations. The air tour operators primarily utilize Bell 206 Jet Ranger helicopters to conduct their operations. General aviation operations include a wide range of activity from

personal to business and corporate uses. Most operations at the Airport would be considered general aviation. Military operations include operations conducted by various branches of the U.S. military and are estimated at approximately 100 total operations in 2013. Virtually all military operations are conducted by helicopters.

Aircraft operations are further classified as local and itinerant. A local operation is a take-off 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. Generally, local operations are characterized by training operations (touch-and-go operations). Itinerant operations are those performed by aircraft with a specific origin or destination away from the airport. The Airport prohibits most local operations, including touch-and-go's; therefore, for the purposes of this Master Plan, all operations are assumed to be itinerant. Typically, itinerant operations increase with business and commercial use since business aircraft are used primarily to transport passengers from one location to another.

The FBO also tracks the total number of jet operations. In 2013, a total of 615 jet operations were recorded. To date in 2014 (July 17), the Airport has recorded 239 jet operations. A search of AirportIQ.com, which collects flight plan data, indicates that a wide range of business jet aircraft utilized Sedona Airport in 2013, including the Hawker 400, several Cessna Citation variants including the Citation 560XL and Citation Sovereign, the Eclipse 500, Lear 55, Falcon 2000, and the Gulfstream G450. The jet aircraft that conducted the most operations in 2013, according to AirportIQ.com records, was the Cessna Citation I aircraft that is based at the Airport.

EXISTING TOTAL OPERATIONS FORECASTS

There are several existing forecasts of total operations for Sedona Airport which are presented in **Table 2G**. These have been interpolated and extrapolated to the plan years of this Master Plan. When interpolating the operations forecast from each source, the 2013 figures are considerably higher than the estimated 2013 operations level of 35,000. Each of these forecasts, aside from the FAA TAF, were prepared before the economic recession and do not consider the turbulent aviation environment of the last several years; therefore, these forecasts are not considered reasonable.

The 2014 TAF from the FAA presents a flat-lined forecast of 35,000 total operations through 2033. The TAF does not consider a potential growth scenario for the Airport. Prior to the economic recession, the Airport experienced higher activity levels, so it is reasonable to consider growth scenarios to at least previously experienced levels of operations.

The FAA indicates that the overall growth rate for the state from the TAF can also be applied to individual airports to produce a forecast. The TAF growth rate for Arizona is 0.6 percent. Applying this growth rate from the base 2013 operations level results in a long term forecast of 39,190 annual operations.

TABLE 2G
Existing Total Operations Forecasts
Sedona Airport

		Projections Adjusted to Plan Years of this Master Plan				
	Base Year of Study	**2013**	**2018**	**2023**	**2033**	**CAGR 2013-2033**
Existing Projection Source						
2014 FAA *Terminal Area Forecast*	35,000	35,000	35,000	35,000	35,000	0.0%
1999 Master Plan	40,897	57,220	63,169	69,737	84,992	2.0%
2008 *Arizona SASP – Low*	50,000	53,762	57,195	60,812	69,173	1.3%
2008 *Arizona SASP – Medium*	50,000	55,562	60,672	66,355	79,490	1.8%
2008 *Arizona SASP – High*	50,000	57,529	64,722	72,947	92,356	2.4%

CAGR: Compound annual growth rate
Source: Coffman Associates analysis

GENERAL AVIATION OPERATIONS FORECAST

General aviation operations constitute the largest share of operations at Sedona Airport. In 2013, general aviation operations represented an estimated 69 percent of total operations. **Exhibit 2E** presents a summary of the operations forecasts which follow.

According to estimates by the Airport's FBO, operations have not fluctuated greatly since 2009. The most significant change was a drop of approximately 21.5 percent in general aviation operations after 2008 when the economy went into recession. The market share of itinerant general aviation operations at the Airport, as a percentage of general aviation itinerant operations at all towered airports, stayed generally consistent, averaging 0.164 percent over the past five years, indicating that Sedona Airport general aviation operations have followed a similar trend to national general aviation operations. Before the economic recession, the Airport's market share of national general aviation itinerant operations was approximately 0.175 percent. **Table 2H** presents several new forecasts of itinerant general aviation operations.

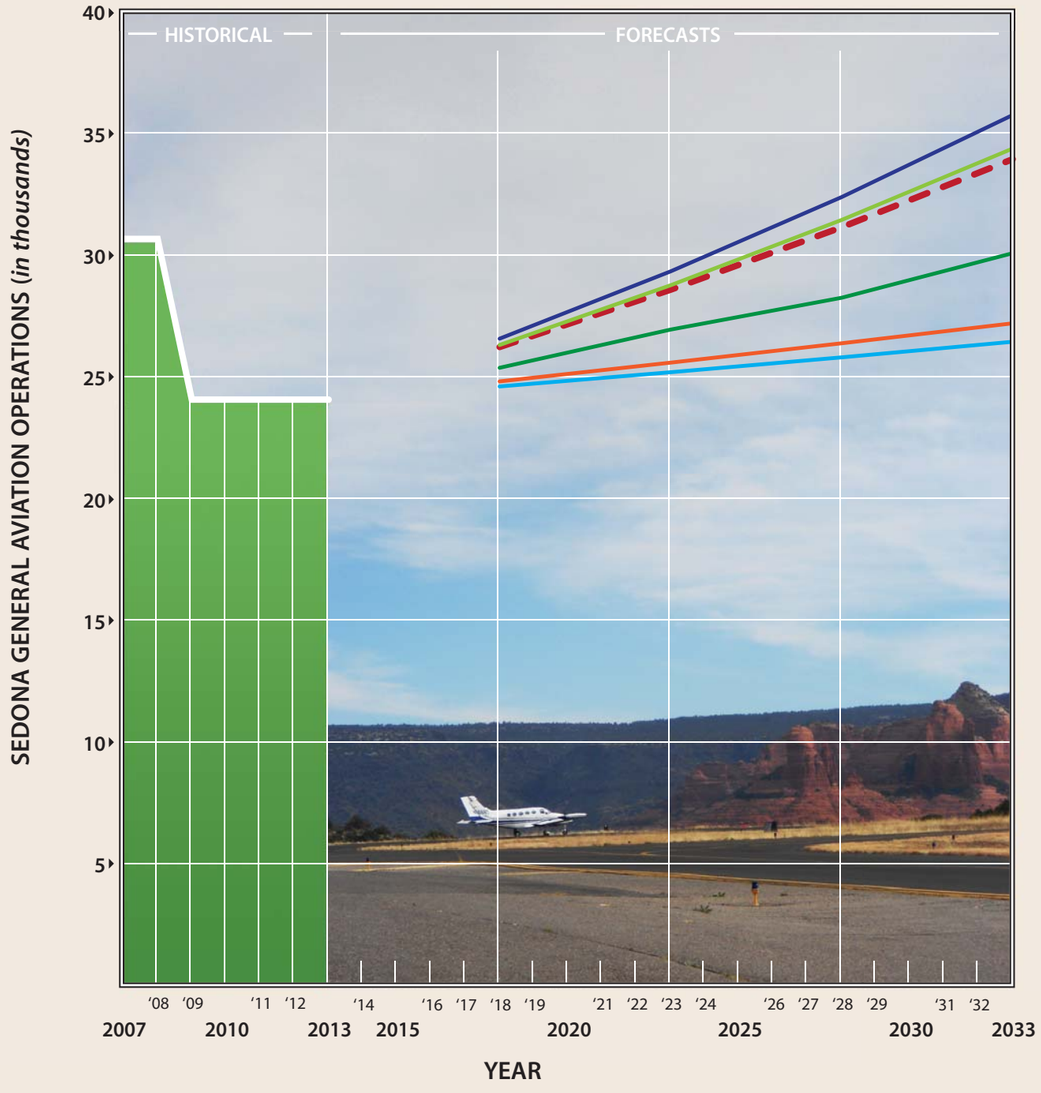
A total of six forecasts of general aviation itinerant operations are presented in the table. The first two forecasts consider the market share of total U.S. itinerant general aviation operations that Sedona Airport has experienced. The next two consider the ratio of itinerant general aviation operations to based aircraft at the Airport. It should be noted that since no reliable historical sources for based aircraft were available between 2007 and 2012 (the FAA TAF count differs significantly from 2007 and current counts), the 2008 SASP count was carried forward through 2008, and the current count of 92 was estimated back to 2009 when the Airport experienced a decline in operations. The last two forecasts utilize the projected CAGRs for operations established in the 2008 SASP – medium forecast and the 1999 Master Plan.

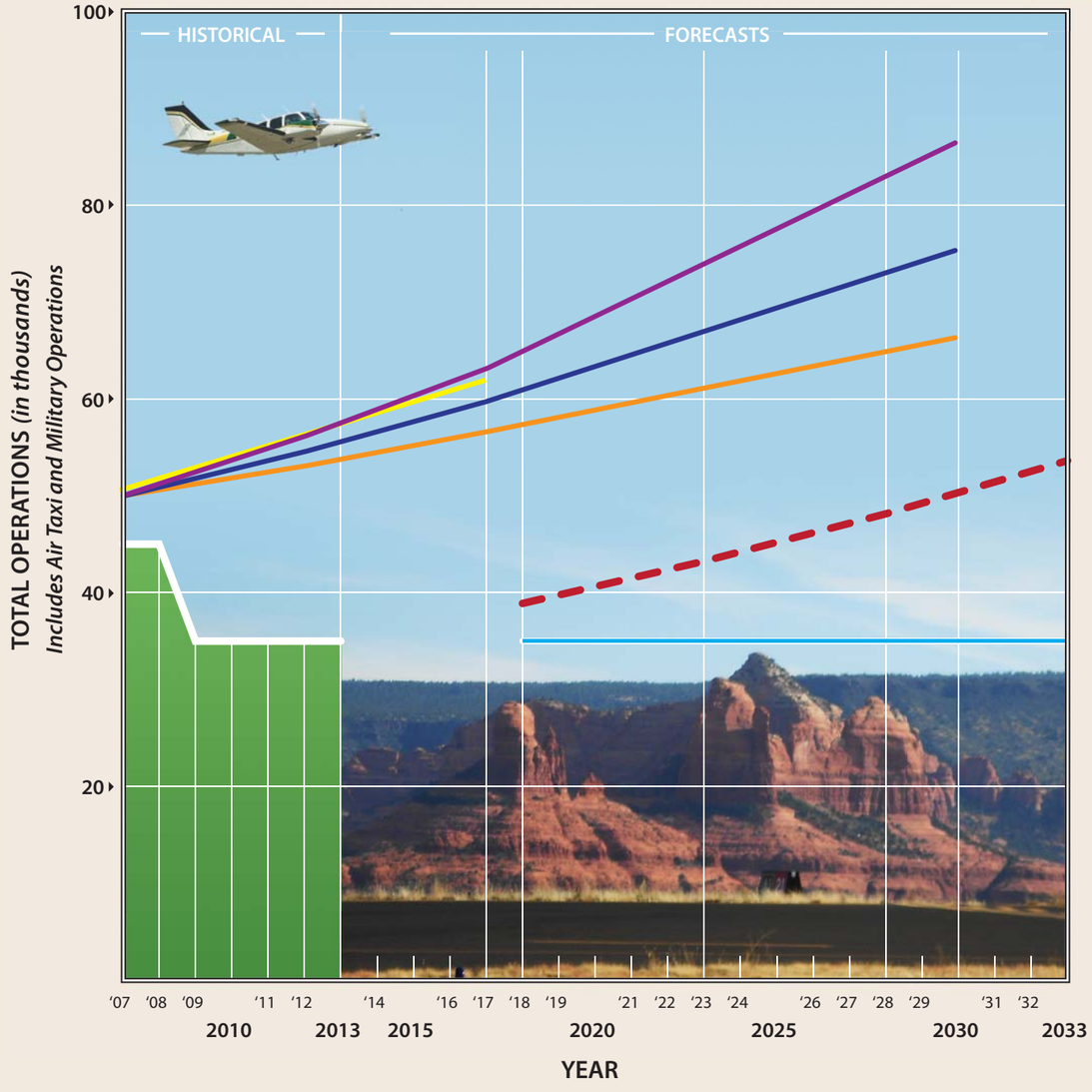
TABLE 2H
General Aviation Itinerant Operations Forecast
Sedona Airport

Year	SEZ GA Ops[1]	US GA Itinerant Ops	SEZ Market Share	SEZ Based Aircraft[2]	GA Ops Per Based Aircraft
2007	30,650	18,575,200	0.165%	104	295
2008	30,650	17,492,700	0.175%	104	295
2009	24,050	15,571,100	0.154%	92	261
2010	24,050	14,863,900	0.162%	92	261
2011	24,050	14,527,900	0.166%	92	261
2012	24,050	14,521,700	0.166%	92	261
2013	24,050	14,119,000	0.170%	92	261
Constant 2013 Market Share (CAGR = 0.5%)					
2018	24,590	14,435,900	0.170%	97	254
2023	25,174	14,778,800	0.170%	103	244
2028	25,785	15,137,800	0.170%	108	239
2033	26,426	15,513,900	0.170%	115	230
Market Recapture (CAGR = 0.6%)					
2018	24,798	14,435,900	0.172%	97	256
2023	25,568	14,778,800	0.173%	103	248
2028	26,363	15,137,800	0.174%	108	244
2033	27,183	15,513,900	0.175%	115	236
Constant Operations Per Based Aircraft (CAGR = 1.1%)					
2018	25,357	14,435,900	0.176%	97	261
2023	26,926	14,778,800	0.182%	103	261
2028	28,233	15,137,800	0.187%	108	261
2033	30,063	15,513,900	0.194%	115	261
Increasing Operations Per Based Aircraft (CAGR = 1.7%) – Selected Forecast					
2018	26,210	14,435,900	0.182%	97	270
2023	28,564	14,778,800	0.193%	103	277
2028	31,129	15,137,800	0.206%	108	288
2033	33,925	15,513,900	0.219%	115	295
Arizona SASP Medium Forecast Growth Rate (CAGR = 1.8%)					
2018	26,294	14,435,900	0.182%	97	271
2023	28,747	14,778,800	0.195%	103	279
2028	31,429	15,137,800	0.208%	108	291
2033	34,361	15,513,900	0.221%	115	299
1999 Master Plan Forecast Growth Rate (CAGR = 2.0%)					
2018	26,553	14,435,900	0.184%	97	274
2023	29,317	14,778,800	0.198%	103	285
2028	32,368	15,137,800	0.214%	108	300
2033	35,737	15,513,900	0.230%	115	311

[1] Historical estimates provided by Sedona Airport FBO – Red Rock Aviation.
[2] Based aircraft figure is a composite with year 2007 and 2008 from the 2008 Arizona State Airports System Plan (SASP) and the 2013 actual count estimated back from 2012 to 2009.
CAGR = Compound annual growth rate from 2013 to 2033
Source: Coffman Associates analysis

The 2013 constant market share forecast considers the Airport maintaining a constant share of total U.S. itinerant operations. The result is a long term total of 26,426 itinerant operations. This forecast is the lowest of the six prepared and underestimates the potential





LEGEND

- 1999 Master Plan Forecast Growth Rate
- Arizona SASP Medium Forecast Growth Rate
- Constant Ops Per Based Aircraft
- Market Recapture
- Constant 2013 Market Share
- Increasing Operations Per Based Aircraft - ***Selected Forecast***

LEGEND

- 1999 Master Plan (1997 Base Year)
- Arizona SASP - High (2007 Base Year)
- Arizona SASP - Medium (2007 Base Year)
- Arizona SASP - Low (2007 Base Year)
- 2014 FAA Terminal Area Forecast
- ***Selected Master Plan Forecast***

for growth associated with increased based aircraft. The second forecast considers the possibility of the Airport recapturing its high market share of 0.175 percent (2008), which results in a 2033 itinerant operational level of 27,183.

The next forecast considers maintaining a constant 2013 itinerant general aviation operations per based aircraft of 261. This results in a long term total of 30,063 itinerant general aviation operations for the Airport. Another forecast considers increasing operations per based aircraft to 295, which is the level experienced in 2008. This results in a total of 33,925 itinerant general aviation operations by 2033.

The 2008 Arizona SASP and 1999 Master Plan CAGR forecasts both project higher operations levels; however, as it was previously stated, these forecasts were prepared prior to the economic recession and do not consider existing conditions of the industry.

These six forecasts of itinerant general aviation operations create the planning envelope spread of 9,311 operations from the highest to the lowest 2033 projected levels. The increasing operations per based aircraft forecast has been selected as the most reasonable potential growth scenario as it achieves an operations per based aircraft level that was experienced as recently as 2008. Should economic conditions improve as projected state and nationwide, positive impacts should trickle down and be felt at Sedona Airport with increased business operations and tourists flying in to visit the many sites in the area.

AIR TAXI AND MILITARY OPERATIONS FORECAST

Air taxi operations at Sedona Airport consist primarily of aerial tour/sightseeing operations conducted by Sedona Sky Treks, Sky Safari, Red Rock Biplane Tours, Red Rock Helicopter Tours, and Arizona Helicopter Adventures. The vast majority of these operations are conducted by helicopters, primarily the Bell 206 Jet Ranger helicopter. The only operator to utilize fixed-wing aircraft is Red Rock Biplane Tours, which operates a Waco Aircraft Company open-cockpit biplane. The Airport's FBO estimates that aerial tour operations account for 31 percent of total operations, which is 10,850 annual operations from 2009 to 2013 and 13,950 annual operations from 2007 to 2008.

Air taxi operations such as aerial tour/sightseeing operations can be closely tied to economic conditions. As seen historically, when the country entered into a recession in 2008, tourism slowed down and aerial tours/sightseeing operations declined. As economic conditions improve over time, it can be anticipated that tourist numbers will rise and so too will aerial tours. According to Woods & Poole Economics, the State of Arizona's gross regional product (GRP) is projected to grow at a CAGR of 3.0 percent from 2013 through 2035. The selected Master Plan forecast applies this CAGR to air taxi operations, resulting in a total of 19,596 operations by 2033.

Military operations are estimated to have accounted for approximately 400 annual operations historically, but estimated at only around 100 in 2013 by the Airport's FBO. Military operations are typically helicopter operations with rare fixed-wing operations by

Beechcraft King Air aircraft. Since the Airport has a policy restricting local training operations (touch-and-go), all military operations are considered itinerant operations. Because of the unpredictable nature of military activity and readiness, the historical military operational trend of 400 operations is planned for future operations. **Table 2J** presents a summary of air taxi and military operations forecasts.

TABLE 2J
Air Taxi and Military Operations Forecasts
Sedona Airport

Year	Air Taxi Operations (Itinerant)	Military (Local)	Military (Itinerant)	Total Military
2007	13,950	0	400	400
2008	13,950	0	400	400
2009	10,850	0	400	400
2010	10,850	0	400	400
2011	10,850	0	400	400
2012	10,850	0	400	400
2013	10,850	0	100	100
Selected Forecast				
2018	12,578	0	400	100
2023	14,581	0	400	100
2028	16,904	0	400	100
2033	19,596	0	400	100

Sources: Air taxi and military operations estimates provided by Sedona Airport FBO – Red Rock Aviation.
Selected Forecast prepared by Coffman Associates.

TOTAL OPERATIONS FORECAST

Table 2K summarizes the selected operations forecast for Sedona Airport. By 2018, operations are forecast to increase to 39,188. By the long term planning period, total operations are forecast to reach 53,921, a CAGR of 2.2 percent.

TABLE 2K
Total Operations Forecast
Sedona Airport

	Itinerant Operations				Local Operations			
Year	Air Taxi	GA	Military	Total Itinerant	GA	Military	Total Local	Total Operations
2013	10,850	24,050	100	35,000	0	0	0	35,000
2018	12,578	26,210	400	39,188	0	0	0	39,188
2023	14,581	28,564	400	43,545	0	0	0	43,545
2028	16,904	31,129	400	48,433	0	0	0	48,433
2033	19,596	33,925	400	53,921	0	0	0	53,921
CAGR:	3.0%	1.7%	7.2%	2.2%	0.0%	0.0%	0.0%	2.2%

CAGR: Compound annual growth rate 2013 through 2033
Source: Coffman Associates analysis

COMPARISON TO THE TAF

The FAA will review the forecasts of this Master Plan and compare them to the TAF. Where the 5- or 10-year forecasts exceed 100,000 total annual operations or 100 based aircraft, the FAA prefers that the forecasts differ by less than 10 percent in the 5-year period and 15 percent in the 10-year period. Where the forecasts do differ, supporting documentation should be provided.

Table 2L presents a direct comparison of the 2014 TAF to the forecasts in this Master Plan. In the 5-year timeframe, the Master Plan forecast is 12.0 percent higher than the TAF, which is flat lined at 35,000 throughout the planning period. By 2033, the Master Plan forecast is 54.1 percent higher than the TAF. The primary reason for the difference is the TAF presents a zero growth scenario. The Master Plan forecast reflects an annual growth rate of 2.2 percent.

TABLE 2L
Forecast Comparison to the Terminal Area Forecast
Sedona Airport

Year	Master Plan Forecast	2014 FAA TAF	Percent Difference
TOTAL OPERATIONS			
2013	35,000	35,000	0.0%
2018	39,188	35,000	12.0%
2023	43,545	35,000	24.4%
2028	48,433	35,000	38.4%
2033	63,921	35,000	54.1%
CAGR 2013-2033	2.2%	0.0%	
BASED AIRCRAFT			
2013	92	78	17.9%
2018	97	78	24.4%
2023	103	78	32.1%
2028	108	78	38.5%
2033	115	78	47.4%
CAGR 2013-2033	1.1%	0.0%	

CAGR – Compound annual Growth Rate
Source: Coffman Associates analysis

The 2013 based aircraft total from the Master Plan exceeds the TAF total and was established utilizing records kept by the SOCAA, which includes aircraft registration numbers. The TAF again maintains a zero growth forecast through 2033. By 2033, the Master Plan forecast of 115 based aircraft exceeds the TAF by 47.4 percent.

ANNUAL INSTRUMENT APPROACHES (AIAs)

An instrument approach, as defined by the FAA, is "an approach to an airport with the intent to land 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, aircraft must land at the airport after following one of the published instrument approach procedures. Forecasts of annual

instrument approaches (AIAs) provide guidance in determining an airport's requirements for navigational aid facilities. Practice or training approaches do not count as annual AIAs.

While AIAs can be partially attributed to weather, they may be expected to increase as transient operations and operations by more sophisticated aircraft increase through the planning period. For this reason, AIA projections consider a constant percentage of 2.0 of annual general aviation itinerant operations. Air taxi and military operations were excluded since they are primarily helicopter operations. The projections are presented in **Table 2M**.

TABLE 2M
Annual Instrument Approaches (AIAs)
Sedona Airport

Year	General Aviation Itinerant Operations	Ratio	AIAs
2013	24,050	2.00%	481
2018	26,210	2.00%	524
2023	28,564	2.00%	571
2028	31,129	2.00%	623
2033	33,925	2.00%	679

Source: Coffman Associates analysis

PEAKING CHARACTERISTICS

Many aspects of facility planning relate to levels of peaking activity – times when the airport is busiest. For example, the appropriate size of a terminal building can be estimated by determining the number of people that could reasonably be expected to use the facility at a given time. The following planning definitions apply to the peak periods:

- **Peak Month** -- The calendar month when peak aircraft operations occur.
- **Design Day** -- The average day in the peak month.
- **Busy Day** -- The busy day of a typical week in the peak month.
- **Design Hour** -- The peak hour within the design day.

It is important to note that only the peak month is an absolute peak within a given year. All other peak periods will be exceeded at various times during the year. The peak period forecasts represent reasonable planning standards that can be applied without overbuilding or being too restrictive.

According to the Airport's FBO, the peak operational months occur in early spring (April and May) and in the early fall (September and October). A five-year history of monthly operations as reported on Airport IQ's online database indicated that the months of October, followed closely by April and May, have been the peak operational months over that time period with 10.8 percent, 10.6 percent, and 10.4 percent of annual operations respectively.

The design day is equal to the average number of operations in a month, divided by the number of days in the month. The month of April had fewer operations than October over the past five years, but since it has one fewer day than October, the highest design day resulted in April (124). The busiest day of each week typically accounts for approximately 18 percent of weekly operations. Thus, to determine the typical busy day, the design day is multiplied by 1.25, which represents approximately 18 percent of the days in a week. Design hour operations were determined at 15 percent of the design day operations. Utilizing these factors, the peaking characteristics for the future can be estimated, as shown in **Table 2N**.

TABLE 2N
Total Peak Operations Forecast
Sedona Airport

	% of Total Operations	Estimated Monthly Operations[1]	Design Day	Busy Day	Design Hour
January	5.8%	2,016	65	81	10
February	6.5%	2,292	82	102	12
March	9.0%	3,162	102	128	15
April	10.6%	3,715	**124**	**155**	**19**
May	10.4%	3,656	118	147	18
June	6.8%	2,391	80	100	12
July	7.6%	2,668	86	108	13
August	7.1%	2,470	80	100	12
September	8.8%	3,063	102	128	15
October	**10.8%**	**3,794**	122	153	18
November	9.8%	3,419	114	142	17
December	6.7%	2,352	76	95	11
Forecast					
2018	10.8%	4,249	137	171	21
2023	10.8%	4,721	152	190	23
2028	10.8%	5,251	169	212	25
2033	10.8%	5,846	189	236	28

Boldface *indicates peak*
[1]Peak month for forecast years
Source: Monthly operation percentage data - Airport IQ Data Center for years 2009 through 2013; Forecast data - Coffman Associates analysis

DESIGN AIRCRAFT

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. The critical design aircraft is used to define the design parameters for the airport. In most cases, the design aircraft is a composite aircraft representing a collection of aircraft classified by three parameters: Aircraft Approach Category (AAC), Airplane Design Group (ADG), and Taxiway Design Group (TDG). The first consideration is the safe operation of aircraft likely to use the airport. Any operation of an aircraft that exceeds design criteria of the airport may result in either an unsafe operation or a lesser safety margin; however, it is not the usual practice to base the airport design on an aircraft that uses the airport infrequently.

The design aircraft is defined as the most demanding category of aircraft, or family of aircraft, which conducts at least 500 itinerant operations per year at the airport. Planning for future aircraft use is of particular importance since the design standards are used to plan separation distances between facilities. These future standards must be considered now to ensure that short term development does not preclude the long range potential needs of the airport.

Exhibit 2F summarizes representative design aircraft categories. The Airport does not currently, nor is it expected to; regularly serve larger commercial transport aircraft such as Boeing or Airbus manufactured aircraft. Large transport aircraft are used by commercial carriers which do not currently use, nor are they expected to use, the Airport through the planning period.

In order to determine airfield design requirements, a design aircraft, or group of aircraft with similar characteristics, is determined for the runway. This begins with a review of aircraft currently using the Airport and those expected to use the airport through the 20-year planning period.

Runway Design Code (RDC)

The AAC, ADG, and approach visibility minimums are combined to form the RDC of a particular runway. The RDC provides the information needed to determine certain design standards that apply. The first component, depicted by a letter, is the AAC and relates to aircraft approach speed (operational characteristics). The second component, depicted by a Roman numeral, is the ADG and relates to either the aircraft wingspan or tail height (physical characteristics), whichever is most restrictive. The third component relates to the visibility minimums expressed by runway visual range (RVR) values in feet of 1,200, 1,600, 2,400, 4,000, and 5,000. The third component should read "VIS" for runways designed for visual approach use only. Generally, runway standards are related to aircraft approach speed, aircraft wingspan, and designated or planned approach visibility minimums. **Table 2P** presents the RDC parameters.

CURRENT/ULTIMATE DESIGN AIRCRAFT

The critical design aircraft is defined as the most demanding category of aircraft which conduct 500 or more itinerant operations at the airport each year. In some cases, more than one specific make and model of aircraft comprises the airport's critical design aircraft. One category of aircraft may be the most critical in terms of approach speed, while another is most critical in terms of wingspan and/or tail height, which affects runway/taxiway width and separation design standards. The critical design aircraft for a general aviation airport may be a specific aircraft model or it can be a combination of several aircraft within the same design code that, when combined, exceed the 500 operations threshold.

A critical design aircraft will be determined for Runway 3-21. The largest design aircraft in terms of approach speed and airplane design group will determine the appropriate design

A-I



- Beech Baron 55
- **Beech Bonanza**
- Cessna 150
- Cessna 172
- Cessna Citation Mustang
- Eclipse 500/550
- Piper Archer
- Piper Seneca

B-I



- Beech Baron 58
- Beech King Air 100
- Cessna 402
- **Cessna 421**
- Piper Navajo
- Piper Cheyenne
- Swearingen Metroliner
- Cessna Citation I (525)

B-II



- Super King Air 200
- Cessna 441
- DHC Twin Otter
- Super King Air 350
- Beech 1900
- Citation Excel (560), Sovereign (680)
- Falcon 50, 900, 2000
- **Citation Bravo (550)**
- Embraer 120

A-III, B-III



- DHC Dash 7
- **DHC Dash 8**
- DC-3
- Convair 580
- Fairchild F-27
- ATR 72
- ATP

C-I, D-I



- Beech 400
- **Lear 31, 35,** 45, 60
- Israeli Westwind

C-II, D-II



- CRJ-200/700
- **Cessna Citation X (750)**
- Gulfstream 100, 200,300
- Challenger 300/600
- ERJ-135, 140, 145
- Embraer Regional Jet
- Lockheed JetStar

C-III, D-III *less than 100,000 lbs.*



- ERJ-170
- CRJ 705, 900
- Falcon 7X
- **Gulfstream 500**, 550, 650
- Global Express, Global 5000
- Q-400

C-III, D-III *over 100,000 lbs.*



- ERJ-90
- Boeing Business Jet
- B-727
- **B-737**-300, **700,** 800
- MD-80, DC-9
- A319, A320

C-IV, D-IV



- **B-757**
- B-767
- C-130 Hercules
- DC-8-70
- MD-11

D-V



- **B-747-400**
- B-777
- B-787
- A-330, A-340

Note: Aircraft pictured is identified in bold type.

standards for the runway and its associated taxiways. The determination of the design aircraft (or family of aircraft) will first examine the types of based aircraft followed by an analysis of itinerant activity.

TABLE 2P
Runway Design Code Parameters

Aircraft Approach Category (AAC)		
Category	**Approach Speed**	
A	less than 91 knots	
B	91 knots or more but less than 121 knots	
C	121 knots or more but less than 141 knots	
D	141 knots or more but less than 166 knots	
E	166 knots or more	
Airplane Design Group (ADG)		
Group #	**Tail Height (ft)**	**Wingspan (ft)**
I	<20	<49
II	20-<30	49-<79
III	30-<45	79-<118
IV	45-<60	118-<171
V	60-<66	171-<214
VI	66-<80	214-<262
Visibility Minimums		
RVR (ft)	**Flight Visibility Category (statute miles)**	
VIS	3-mile or greater visibility minimums	
5,000	Lower than 3 miles but not lower than 1-mile	
4,000	Lower than 1-mile but not lower than ¾-mile (APV ≥ ¾ but < 1-mile)	
2,400	Lower than ¾-mile but not lower than ½-mile (CAT-I PA)	
1,600	Lower than ½-mile but not lower than ¼-mile (CAT-II PA)	
1,200	Lower than ¼-mile (CAT-III PA)	

RVR: Runway Visual Range
APV: Approach Procedure with Vertical Guidance
PA: Precision Approach
Source: FAA AC 150/5300-13A, Airport Design

Based Aircraft

The current based aircraft fleet mix consists primarily of small single piston aircraft represented by the Cessna 172 but also includes larger aircraft, including the Cessna 414 and the Cessna Citation I business jet. While the Airport is used extensively by helicopters, they are not included in this determination as they are not assigned an approach speed or an airplane design group.

Itinerant Aircraft

According to the FAA's Traffic Flow Management System Counts (TFMSC) records, the Airport had 1,074 jet and turboprop operations in 2013. The type of jets operating at Sedona

Airport range greatly from the Cessna Citation family of aircraft and Hawker 400 to large business jets such as the Gulfstream G450 and G550. While no one single business jet or turboprop conducts enough operations to meet the FAA's operational threshold to be considered the design aircraft, there are enough jet and turboprop operations to consider a family of jet and turboprop aircraft as the design aircraft.

Runway 3-21 Design Aircraft

Sedona Airport experiences regular business jet operations and should be designed and planned to continue to accommodate these types of aircraft. FAA's TFMSC records indicate the Cessna Citation Excel (C560XL) a RDC B-II aircraft, is the most frequent jet equipment operating at the Airport with 71 total operations in 2013. In 2013, jet and turboprop aircraft in AAC B conducted a combined 798 operations and aircraft in ADG II conducted a combined 531 operations. By comparison, aircraft in AAC C conducted only 201 operations in 2013 and aircraft in ADG III conducted only 13 operations. **Therefore, this Master Plan will consider an existing RDC of B-II-5000 as applied to Runway 3-21.**

The aviation demand forecasts indicate the potential for continued growth in business jet activity at the Airport. This includes six based jets and five based turboprops by the long term planning horizon. The type and size of business jets/turboprops using the Airport regularly can impact the design standards to be applied to the airport system. Therefore, it is important to have an understanding of what type of aircraft may use the Airport in the future. Factors such as population and employment growth in the airport service area, the proximity and level of service of other regional airports, and development at the Airport can influence future activity.

The trend toward manufacturing of a larger percentage of medium and large business jets, those in AACs C and D, may lead to greater utilization of these aircraft at Sedona Airport by the long term horizons. Additionally, with customer deliveries of the Gulfstream G650, which began in 2012, and continued operational growth of the Gulfstream business jet aircraft nationally, the Airport might experience increased usage by these aircraft within AACs C and D. However, as of 2013, only approximately 21.4 percent of jet operations were conducted by AAC C and D aircraft (230 operations) and there is no indication at this time that these categories of aircraft will grow to exceed the 500 annual operations threshold by the long term planning horizon.

The majority of operations throughout the planning period of this Master Plan are expected to be by aircraft within AAC's A and B and within ADG's I and II. **Therefore, the future critical design aircraft for Runway 3-21 is projected to remain within the RDC B-II family of aircraft such as the Cessna Citation Excel business jet aircraft.** Future approach visibility minimums will be discussed in the next chapter.

SUMMARY

This chapter has outlined the various activity levels that might reasonably be anticipated over the next 20 years at Sedona Airport. **Exhibit 2G** presents a summary of the aviation demand forecasts. The baseline year for forecast data is 2013. The forecasting effort extends 20 years to the year 2033.

General aviation activity often trends with national and local economies. The country was in a recessionary period from December 2007 through the third quarter of 2009 and has been slow to recover. Activity at both commercial service airports and general aviation airports has been down. Sedona Airport has not been immune to these national trends, experiencing a decline in operations from pre-recession years.

Forecasts of aviation activity, including based aircraft and operations, is key to determining future facility requirements. There are currently 92 aircraft based at the Airport, and this is forecast to grow to 115 aircraft by 2033. The Airport experienced an estimated 35,000 operations in 2013. This is forecast to grow to approximately 53,921 operations annually by 2033.

The fleet mix operations, or type and frequency of aircraft use, is important in determining facility requirements and environmental impacts. While single-engine piston-powered aircraft are expected to represent the majority of based aircraft, the forecast considers the possibility of more turboprop and business jet aircraft utilizing and basing at the Airport over the course of the planning period.

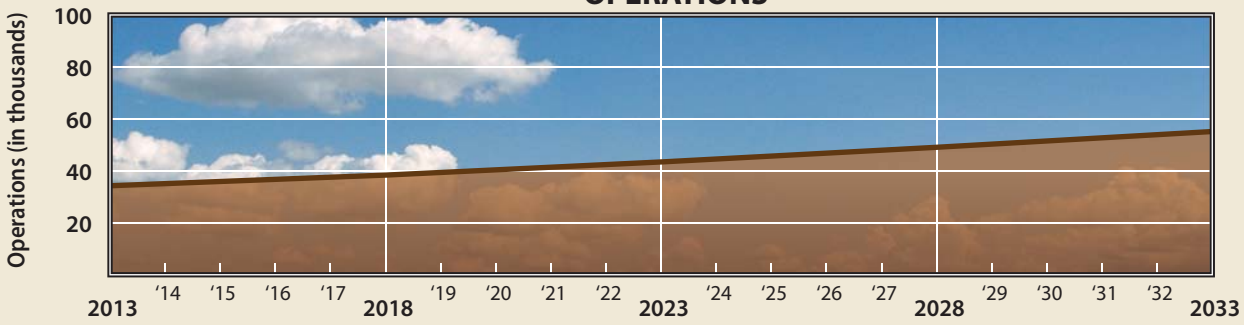
The next step in the Master Plan process is to use the forecasts to determine development needs for the Airport through 2033. Chapter Three – Facility Requirements will address airside elements, such as safety areas, runways, taxiways, lighting, and navigational aids, as well as landside requirements, including hangars, aircraft aprons, and support services. As a general observation, Sedona Airport is well-positioned for growth into the future. The remaining portions of the Master Plan will lay out how that growth can be accommodated in an orderly, efficient, and cost-effective manner.

FAA Review and Approval

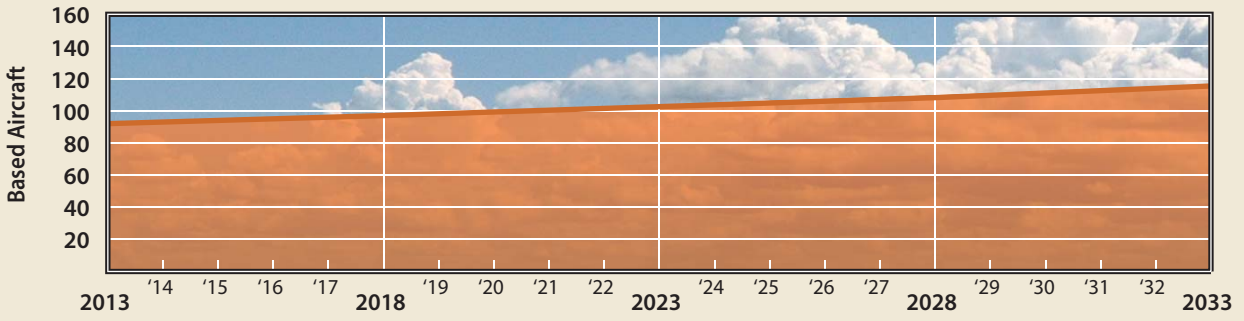
The aviation demand forecast materials presented in this chapter were submitted to the FAA for review and approval on August 19, 2015. In a letter dated December 8, 2015, the FAA approved the forecast for airport planning purposes, including Airport Layout Plan (ALP) development. A copy of the FAA approval letter is included at the end of this chapter.

	Actual	Forecast			
	2013	2018	2023	2028	2033
ANNUAL OPERATIONS FORECAST					
General Aviation					
Itinerant	24,050	26,210	28,564	31,129	33,925
Local	-	-	-	-	-
Military (Itinerant)	100	400	400	400	400
Air Taxi (Itinerant)	10,850	12,578	14,581	16,904	19,596
Total Itinerant	***35,000***	***39,188***	***43,545***	***48,433***	***53,921***
Total Local	-	-	-	-	-
Total Operations	***35,000***	***39,188***	***43,545***	***48,433***	***53,921***
PEAKING CHARACTERISTICS					
Peak Month	3,794	4,249	4,721	5,251	5,846
Design Day	124	137	152	169	189
Busy Day	155	171	190	212	236
Design Hour	19	21	23	25	28
ANNUAL INSTRUMENT APPROACHES	**481**	**524**	**571**	**623**	**679**
BASED AIRCRAFT FORECAST					
Single Engine Piston	77	79	84	86	87
Multi-Engine Piston	4	4	3	3	3
Turboprop	1	2	2	3	5
Business Jet	1	2	3	4	6
Helicopter	4	5	6	6	8
Other	5	5	5	6	6
Total Based Aircraft	***92***	***97***	***103***	***108***	***115***

OPERATIONS



BASED AIRCRAFT



U.S. Department
of Transportation
**Federal Aviation
Administration**

Federal Aviation Administration
Phoenix Airports Field Office

3800 N Central Ave
Suite 1025
Phoenix, AZ 85012

December 8, 2015

Mr. Russell Widmar
Airport Manager
235 Air Terminal Drive
Sedona, AZ 86336

Dear Mr. Widmar:

Sedona Municipal Airport (SEZ)
Aviation Activity Forecast Approval

The Federal Aviation Administration (FAA) has reviewed the aviation forecast for the Sedona Airport (SEZ) dated November 24, 2015. The FAA approves these forecasts for airport planning purposes, including Airport Layout Plan development.

In summary, while the difference between the FAA TAF and Sedona's forecast update regarding total operations isn't within the targeted TAF allowance for the 5 year and 15 year planning horizon, the airport forecast provides justification for this discrepancy.

The forecast was developed using current data and appropriate methodologies, therefore the FAA locally approves this forecast for planning purposes at the Sedona Airport. It is important to note that the approval of this forecast doesn't guarantee future funding for large scale capital improvements as future projects will need to be justified by current activity levels reached at the time the projects are proposed for implementation.

If you have any questions about this forecast approval, please call me at 602-379-3023.

Sincerely,

Kyler Erhard
Airport Planner

cc: Ms. Jennifer Grunest, ADOT, Airport Grant Manager



Chapter Three

AIRPORT FACILITY REQUIREMENTS

Chapter Three

AIRPORT FACILITY REQUIREMENTS

To properly plan for the future of Sedona Airport (SEZ or Airport), it is necessary to translate forecast aviation demand into the specific types and quantities of facilities that can adequately serve the identified demand. This chapter uses the results of the forecasts presented in Chapter Two, as well as established planning criteria, to determine the airside (i.e., runway, taxiways, navigational aids, marking and lighting) and landside (i.e., hangars, aircraft parking apron, and automobile parking) facility requirements.

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 these may be needed to accommodate forecast demands. Having established these facility requirements, alternatives for providing these facilities will be evaluated in Chapter Four - Alternatives to determine the most cost-effective and efficient means for implementation.

PLANNING HORIZONS

An updated set of aviation demand forecasts for Sedona Airport has been prepared and presented in Chapter Two. These activity forecasts include annual operations, based aircraft, fleet mix, peaking characteristics, and the critical design aircraft. With this information, specific components of the airfield and landside system can be evaluated to determine their capacity to accommodate future demand.

Cost-effective, efficient, and orderly development of an airport should rely more upon actual demand at an airport than on a time-based forecast figure. In order to develop a master



plan update that is **demand-based** rather than time-based, a series of planning horizon milestones have been established that take into consideration the reasonable range of aviation demand projections. The planning horizons are the Short Term (approximately years 1-5), the Intermediate Term (years 6-10), and the Long Term (years 11-20). **Table 3A** presents the planning horizon milestones for each aviation activity category.

TABLE 3A
Planning Horizon Activity Levels
Sedona Airport

	Current (2013)	Short Term (1-5 Years)	Intermediate Term (6-10 Years)	Long Term (11-20 Years)
ANNUAL GENERAL AVIATION OPERATIONS				
General Aviation Operations	24,050	26,210	28,564	33,925
Air Taxi Operations	10,850	12,578	14,581	19,596
Military Operations	100	400	400	400
Total Operations	35,000	39,188	43,545	53,921
BASED AIRCRAFT				
Single-Engine Piston	77	79	84	87
Multi-Engine Piston	4	4	3	3
Turboprop	1	2	2	5
Business Jet	1	2	3	6
Rotorcraft	4	5	6	8
Other	5	5	5	6
Total Based Aircraft	92	97	103	115

It is important to consider that the actual activity at the Airport may be higher or lower than what the annualized forecast portrays. By planning according to activity milestones, the resultant plan can accommodate unexpected shifts or changes in the area's aviation demand. It is important for the plan to accommodate these changes so that airport officials can respond to unexpected changes in a timely fashion.

The most important reason for utilizing milestones is it allows airport management the flexibility to make decisions and 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 demand at any given time over the planning period. The resultant plan provides airport officials with a financially responsible and needs-based program.

AIRFIELD DESIGN STANDARDS

The FAA published Advisory Circular (AC) 150/5300-13A, *Airport Design*, to guide airport planning and design. The AC provides guidance on various design elements of an airport intended to maintain or improve safety at airports. The design standards include airport elements such as runways, taxiways, safety areas, and separation distances. According to the AC, *"airport planning should consider both the present and potential aviation needs and demand associated with the airport."* Consideration should be given to planning runway and taxiway locations that will meet future separation requirements even if the width, strength, and length must increase later. Such decisions should be supported by the avia-

tion demand forecasts and coordinated with the FAA and shown on the Airport Layout Plan (ALP).

FAA AC 150/5300-13A, *Airport Design*, was published on September 28, 2012 (Change 1 published on February 26, 2014). It is intended to replace AC 150/5300-13, *Airport Design*, which was dated September 29, 1989. The latter was subject to 18 published changes over 23 years.

The new AC defines the Airport Reference Code (ARC) as, *"An airport designation that signifies the airport's highest Runway Design Code (RDC), minus the third (visibility) component of the RDC. The ARC is used for planning and design only and does not limit the aircraft that may be able to operate safely on the airport."*

The RDC is defined as, *"A code signifying the design standards to which the runway is to be built."* The Aircraft Approach Category (AAC), the Airplane Design Group (ADG), and the approach visibility minimums combine to form the RDC of a particular runway. These provide the information needed to determine certain design standards that apply.

The new design AC also establishes parameters for a runway approach reference code (APRC) and departure reference code (DPRC). The APRC and DPRC are meant to "*describe the current operational capabilities of a runway and adjacent taxiways. In contrast, the RDC is based on planned development and has no operational application."* The APRC is composed of three components: the AAC and ADG, and visibility minimums while the DPRC is composed of the AAC and ADG without the visibility minimums component. Furthermore, the DPRC "*represents those aircraft that can take off from a runway while any aircraft are present on adjacent taxiways, under particular meteorological conditions with no special operational procedures necessary."*

It was determined in the forecast chapter of this Master Plan that the existing and ultimate critical design aircraft falls within ARC B-II. Based upon current operational capabilities of Runway 3-21 (runway to taxiway separation of greater or equal to 250 feet and visibility minimums not lower than 1 mile), the APRC is B-II-5000 and the DPRC is B-II. Therefore, design standards for these groups will be applied to existing and ultimate facility design.

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). ASV 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 AC 150/5060-5, *Airport Capacity and Delay*, the ASV of a single runway configuration is approximately 230,000 operations at general aviation airports similar to Sedona Airport. The forecasts for the Airport indicate that activity throughout the planning period will remain well below 230,000 annual operations.

Current (2013) operations reached only 15.2 percent of the Airport's ASV and are forecast to reach only 23.4 percent of ASV by the long term horizon. The capacity of the existing airfield system will not be reached, and the airfield is expected to accommodate the forecasted operational demands. Therefore, consideration of additional airfield capacity improvements is not warranted at this time.

AIRFIELD REQUIREMENTS

As indicated earlier, airport facilities include both airfield and landside components. Airfield facilities include those facilities that are related to the arrival, departure, and ground movement of aircraft. These components include:

- Runway Configuration
- Safety Area Design Standards
- Runways
- Taxiways
- Navigational Approach Aids

RUNWAY CONFIGURATION

The Airport is currently served by a single-runway system. Runway 3-21 is 5,132 feet long and is orientated in a northeast to southwest manner.

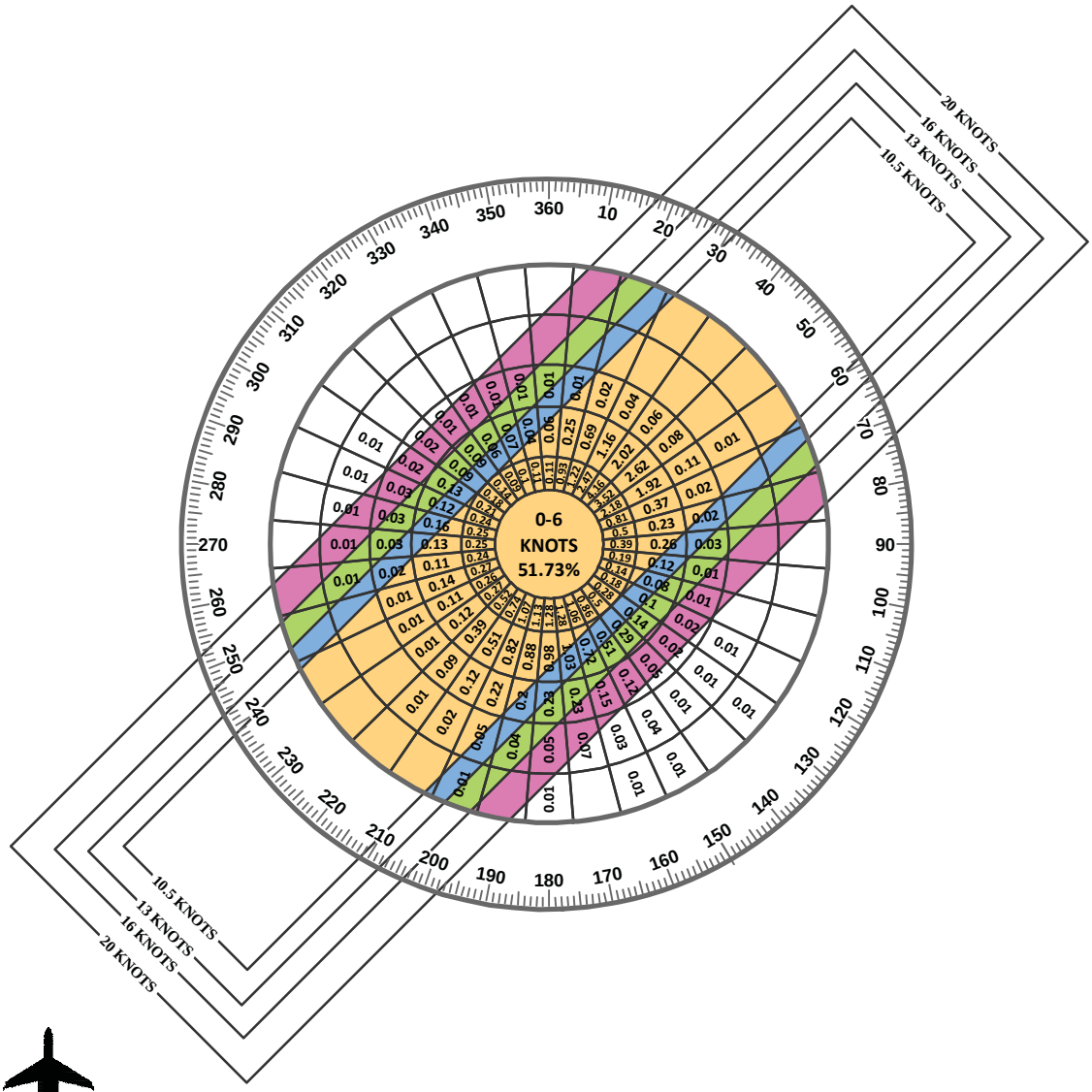
For the operational safety and efficiency of an airport, it is desirable for the primary runway to be oriented as close as possible to the direction of the prevailing wind. This reduces the impact of wind components perpendicular (crosswind) to the direction of travel of an aircraft that is landing or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

FAA Advisory Circular 150/5300-13A, *Airport Design,* recommends that a crosswind runway be made available when the primary runway orientation provides for less than 95 percent wind coverage for specific crosswind components. The 95 percent wind coverage is computed on the basis of the crosswind component not exceeding 10.5 knots (12 mph) for RDC A-I and B-I, 13 knots (15 mph) for RDC A-II and B-II, and 16 knots (18 mph) for RDC A-III, B-III, C-I through C-III, and D-I through D-III.

Weather data specific to the Airport was obtained from the National Oceanic Atmospheric Administration (NOAA) National Climatic Data Center. This data was collected from the on-field automated weather observation system (AWOS) over a continuous 5-year period from 2009 to 2014. A total of 127,860 observations of wind direction and other data points were made.

Runway 3-21 provides 94.84 percent wind coverage for 10.5 knot crosswinds, 97.28 percent coverage at 13 knots, 99.08 percent at 16 knots, and 99.73 percent at 20 knots. **Exhibit 3A** presents the all-weather wind rose for the Airport.

ALL WEATHER WIND COVERAGE				
Runway	10.5 Knots	13 Knots	16 Knots	20 Knots
Runway 03-21	94.84%	97.28%	99.08%	99.73%



Magnetic Declination
10° 46' East (Aug. 2014)
Annual Rate of Change
00° 6.5' West (Aug. 2014)

SOURCE:
NOAA National Climatic Center
Asheville, North Carolina
Sedona Airport
Sedona, AZ

OBSERVATIONS:
127,860 All Weather Observations
2009-2014

This wind rose data tells us that Runway 3-21 is 0.16 percent short of satisfying the 95 percent wind coverage recommendation. However, due to the Airport's location on top of a mesa, development of a crosswind runway is not considered feasible.

RUNWAY DESIGN STANDARDS

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

The entire RSA, ROFA, and ROFZ should be under the direct ownership of the airport sponsor to ensure these areas remain free of obstacles and can be readily accessed by maintenance and emergency personnel. The RPZ should also be under airport ownership. An alternative to outright ownership of the RPZ is the purchase of avigation easements (acquiring control of designated airspace within the RPZ) and having sufficient land use control measures in places which ensure the RPZ remains free of incompatible development. The existing and ultimate ARC B-II airport safety areas are presented on **Exhibit 3B**.

Dimensional standards for the various safety areas associated with the runways are a function of the type of aircraft expected to use the runways as well as the instrument approach capability. **Table 3B** presents the FAA design standards as they apply to the runway at Sedona Airport.

Runway Safety Area (RSA)

The RSA is defined in FAA AC 150/5300-13A, *Airport Design,* as a "surface surrounding the runway prepared or suitable for reducing the risk of damage to airplanes in the event of undershoot, overshoot, or excursion from the runway." The RSA is centered on the runway and dimensioned in accordance to the approach speed of the critical design aircraft using the runway. The FAA requires the RSA to be cleared and graded, drained by grading or storm sewers, capable of accommodating the design aircraft and fire and rescue vehicles, and free of obstacles not fixed by navigational purpose such as runway edge lights or approach lights.

The FAA has placed a higher significance on maintaining adequate RSA at all airports. Under Order 5200.8, effective October 1, 1999, the FAA established the *Runway Safety Area Program.* The 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 Advisory Circular 150/5300-13, *Airport Design*, to the extent practicable." Each Regional Airports Division of the FAA is obligated to collect and maintain data on the RSA for each runway at the airport and perform airport inspections.

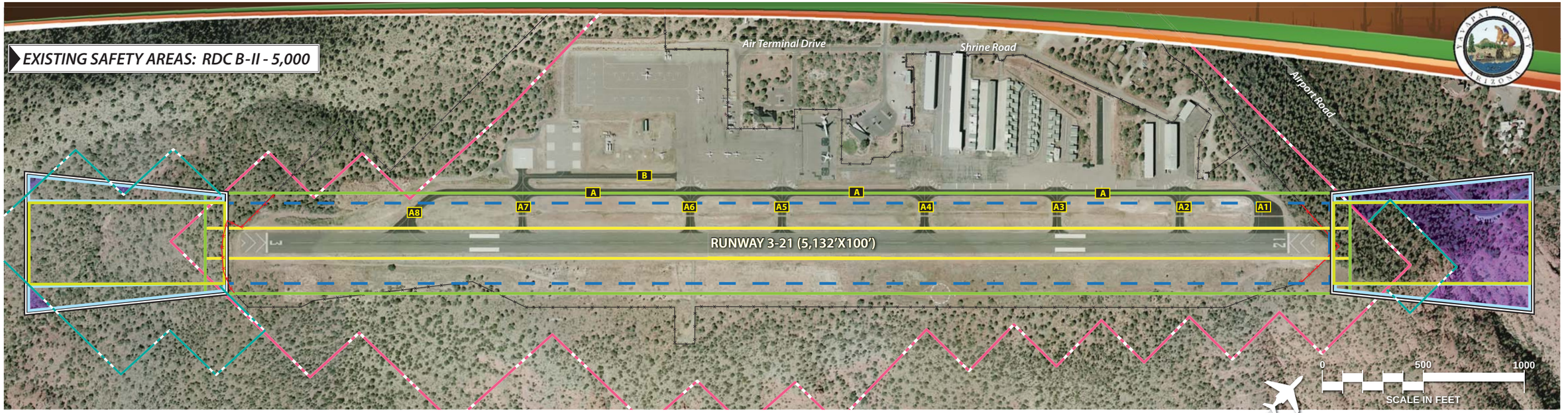
TABLE 3B
Runway Design Standards
Sedona Airport

	Runway 3-21
Runway Design Code	**Existing/Ultimate B-II**
RUNWAY DESIGN	
Runway Width	75
Runway Shoulder Width	10
SAFETY AND OBJECT FREE AREAS	
Runway Safety Area (RSA)	
Width	150
Length Beyond Departure End	300
Length Prior to Threshold	300
Runway Object Free Area (ROFA)	
Width	500
Length Beyond Departure End	300
Length Prior to Threshold	300
Runway Obstacle Free Zone (ROFZ)	
Width	400
Length Beyond End	200
Precision Obstacle Free Zone (POFZ)	
Width	NA
Length	NA
RUNWAY PROTECTION ZONE DIMENSIONS	
Approach and Departure Runway Protection Zone (RPZ) – Visual and Not Lower than 1 Mile Visibility Minimums	
Length	1,000
Inner Width	500
Outer Width	700
Approach and Departure Runway Protection Zone (RPZ) – Not Lower than ¾-mile Visibility Minimums	
Length	1,700
Inner Width	1,000
Outer Width	1,510
RUNWAY SEPARATION	
Runway Centerline to:	
Holding Position	200
Parallel Taxiway	240
Aircraft Parking Area	250

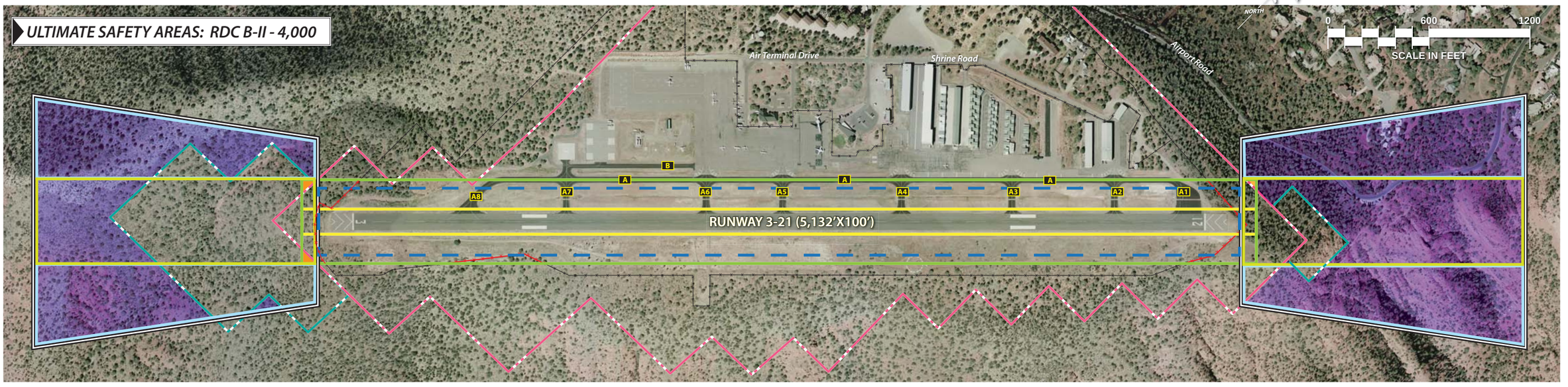
Note: All dimensions in feet
NA – Not Applicable
Source: FAA AC 150/5300-13A, *Airport Design*

As shown on **Exhibit 3B**, the RSA is obstructed by the security perimeter fence and vegetation. Another consideration is the ground slope within the RSA. **Exhibit 3C** depicts the ground slope off each runway end. FAA standards for the RSA require that grades not exceed -3.0 percent beyond the runway end, and as can be seen on the exhibit, that standard is exceeded in certain areas of the RSA. Consideration needs to be given to relocating the fence outside of the RSA, removing obstructing vegetation, and grading those surfaces that exceed grading standards.

EXISTING SAFETY AREAS: RDC B-II - 5,000



ULTIMATE SAFETY AREAS: RDC B-II - 4,000



EXAMPLE VEGETATION OBSTRUCTION



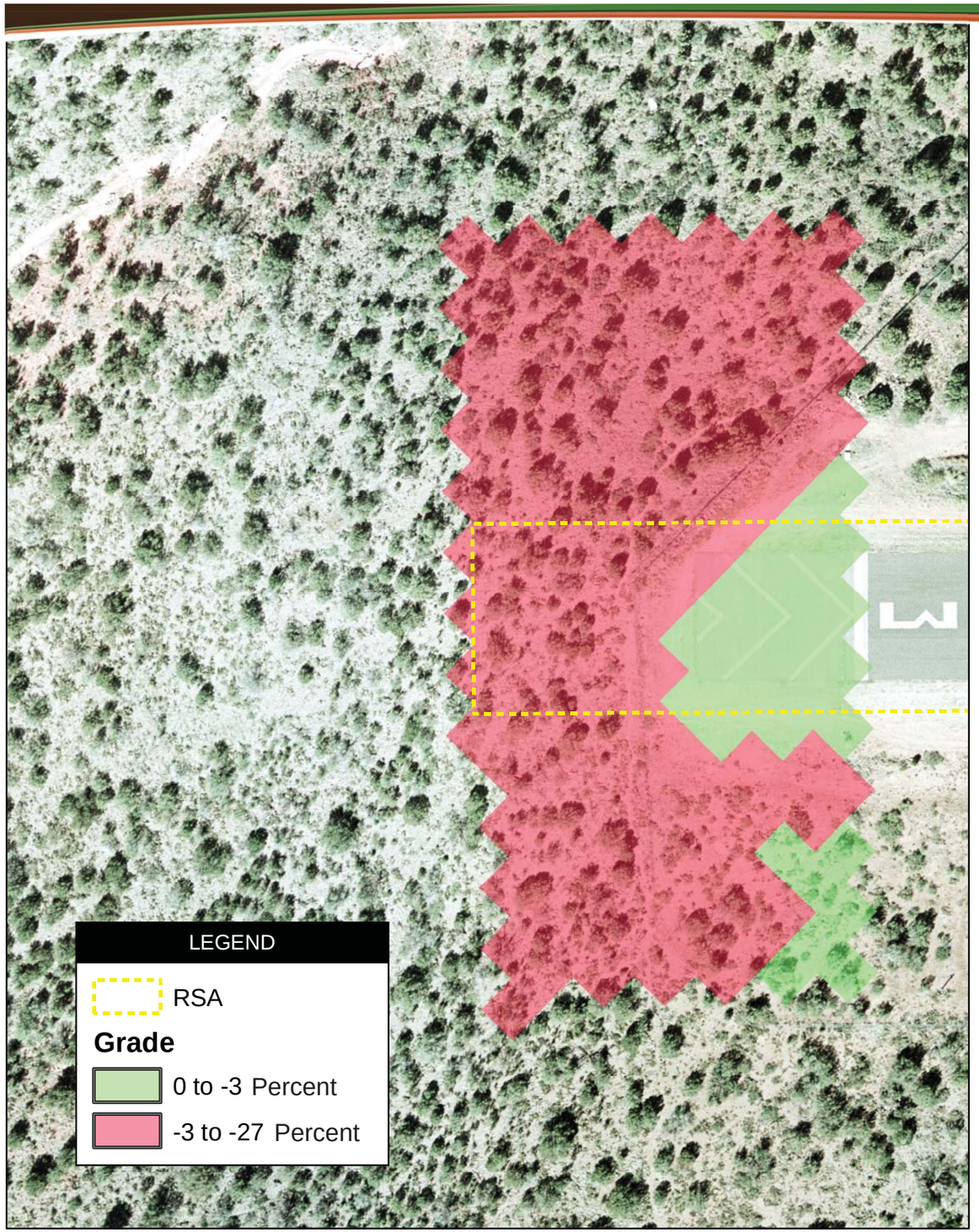


LEGEND

- Airport Property Line
- Existing Easement Line
- Perimeter Security Fence
- Perimeter Security Fence in Safety Area
- Runway Safety Area (RSA)
- Runway Object Free Area (ROFA)
- Runway Obstacle Free Zone (ROFZ)
- Runway Protection Zone (RPZ)
- RPZ - Central Portion
- RPZ - Controlled Activity Area
- Uncontrolled RPZ
- Uncontrolled ROFA

Aerial Date: November 2013

Exhibit 3B
SAFETY AREA DIMENSIONS



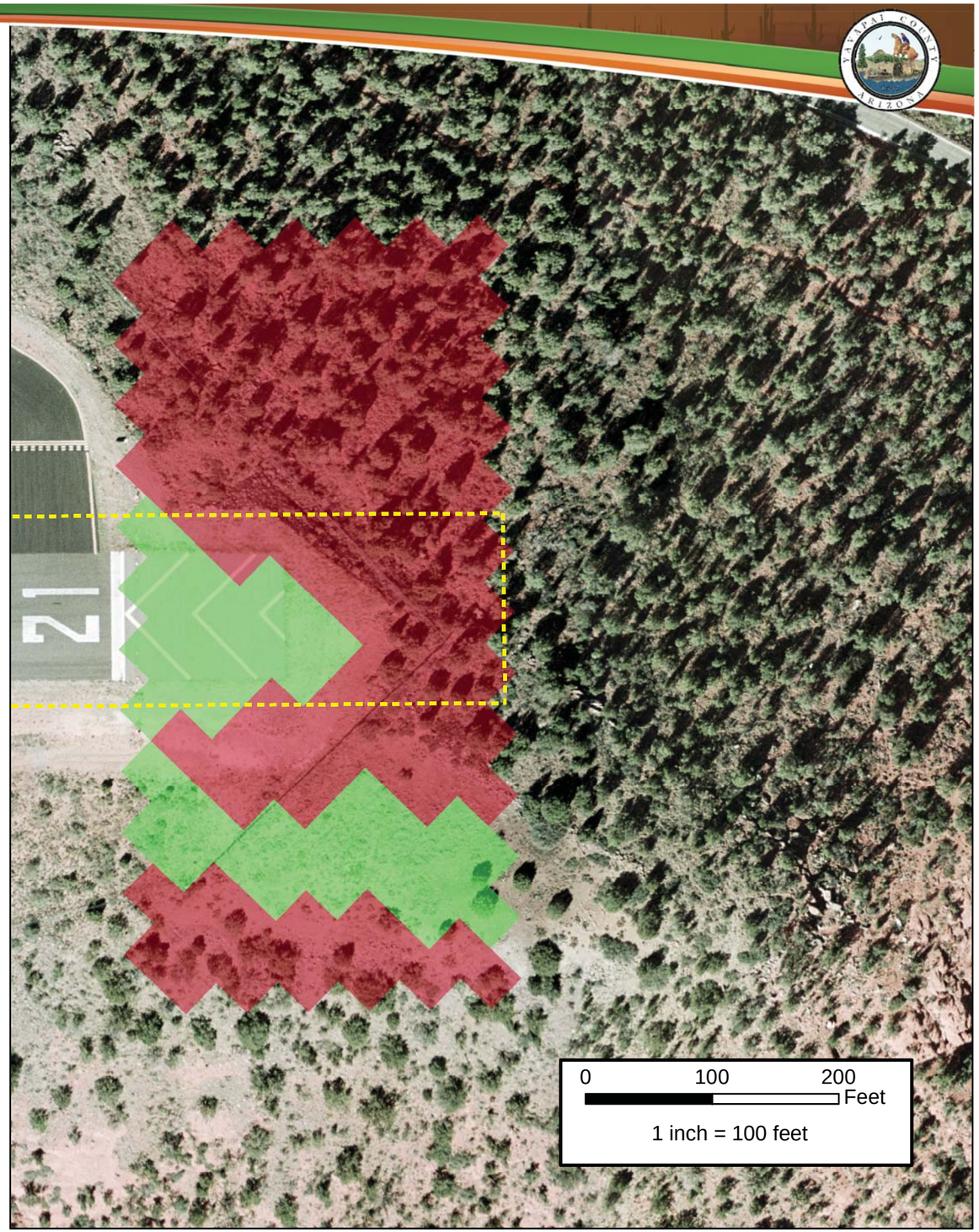


Exhibit 3C
RUNWAY SAFETY AREA GRADES

Runway Object Free Area (ROFA)

The ROFA is "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 ROFA does not have to be graded and level like the RSA; instead, the primary requirement for the ROFA is that no object in the ROFA penetrates the lateral elevation of the RSA. The ROFA is centered on the runway, extending out in accordance to the critical design aircraft utilizing the runway.

The ROFA conditions are depicted on **Exhibit 3B**. Similar to the RSA deficiencies, the perimeter security fence extends through the ROFA and should be relocated outside of these safety areas. In addition, vegetation on the east side of the runway and off each runway end has grown large enough to be considered obstructions. Obstructing vegetation should be removed. Small portions of the ROFA extend beyond Airport property. These areas should be acquired by the airport to maintain full control of the ROFA.

Runway Obstacle Free Zone (ROFZ)

The ROFZ is an imaginary volume of airspace which precludes object penetrations, including taxiing and parked aircraft. The only allowance for ROFZ obstructions is navigational aids mounted on frangible bases which are fixed in their location by function, such as airfield signs. The ROFZ is established to ensure the safety of aircraft operations. If the ROFZ is obstructed, the airport's approaches could be removed or approach minimums could be increased.

Similar to the RSA and ROFA, the ROFZ is obstructed by the perimeter security fence and vegetation east of the runway and off each runway end. The perimeter security fence should be located outside the ROFZ, and vegetation obstructing the ROFZ should be removed.

Runway Protection Zones (RPZ)

The RPZ is a trapezoidal area centered on the runway, typically beginning 200 feet beyond the runway end. The RPZ has been established by the FAA to provide an area clear of obstructions and incompatible land uses, in order to enhance the protection of people and property on the ground. The RPZ is comprised of the central portion of the RPZ and the controlled activity area. The central portion of the RPZ extends from the beginning to the end of the RPZ, is centered on the runway, and is the width of the ROFA. The controlled activity area is any remaining portions of the RPZ. The dimensions of the RPZ vary according to the visibility minimums serving the runway and the type of aircraft (design aircraft) operating on the runway.

While the RPZ is intended to be clear of incompatible objects or land uses, some uses are permitted with conditions, while other land uses are prohibited. According to AC 150/5300-13A, the following land uses are permissible within the RPZ:

- Farming that meets the minimum buffer requirements,
- Irrigation channels as long as they do not attract birds,
- Airport service roads, as long as they are not public roads and are directly controlled by the airport operator.
- Underground facilities, as long as they meet other design criteria, such as RSA requirements, as applicable,
- Unstaffed navigational aids (NAVAIDs) and facilities, such as required for airport facilities that are fixed-by-function in regard to the RPZ.

Any other land uses considered within RPZ land owned by the Airport sponsor must be evaluated and approved by the FAA Office of Airports. The FAA has published the *Interim Guidance on Land Uses within a Runway Protection Zone* (9.27.2012), which identifies several potential land uses that must be evaluated and approved prior to implementation. The specific land uses requiring FAA evaluation and approval include:

- Buildings and structures. Examples include, but are not limited to: residences, schools, churches, hospitals or other medical care facilities, commercial/industrial buildings, etc.
- Recreational land use. Examples include, but are not limited to: golf courses, sports fields, amusement parks, other places of public assembly, etc.
- Transportation facilities. Examples include, but are not limited to:
  -- Rail facilities - light or heavy, passenger or freight
  -- Public roads/highways
  -- Vehicular parking facilities
- Fuel storage facilities (above and below ground)
- Hazardous material storage (above and below ground)
- Wastewater treatment facilities
- Above ground utility infrastructure (i.e., electrical substations), including any type of solar panel installations.

The *Interim Guidance on Land within a Runway Protection Zone* states, "RPZ land use compatibility also is often complicated by ownership considerations. Airport owner control over the RPZ land is emphasized to achieve the desired protection of people and property on the ground. Although the FAA recognizes that in certain situations the airport sponsor may not fully control land within the RPZ, the FAA expects airport sponsors to take all possible measures to protect against and remove or mitigate incompatible land uses."

Currently, the RPZ review standards are applicable to any new or modified RPZ. The following actions or events could alter the size of an RPZ, potentially introducing an incompatibility:

- An airfield project (e.g., runway extension, runway shift)
- A change in the critical design aircraft that increases the RPZ dimensions
- A new or revised instrument approach procedure that increases the size of the RPZ
- A local development proposal in the RPZ (either new or reconfigured)

Since the interim guidance only addresses new or modified RPZs, existing incompatibilities are essentially grandfathered under certain circumstances. While it is still necessary for the airport sponsor to take all reasonable actions to meet the RPZ design standard, FAA funding priority for certain actions, such as relocating existing roads in the RPZ, will be determined on a case-by-case basis.

Existing and ultimate RPZs are depicted on **Exhibit 3B**. Currently, portions the RDC B-II-5000 RPZs extend beyond airport property and beyond existing clear zone easements off both runway ends. The clear zone easements, which were deeded to Yavapai County by the United States Assistant Secretary of Agriculture for Rural Development and Conservation in December 1969, are depicted with a blue dashed line on **Exhibit 3B**. These clear zone easements afford the County control over the airspace within these areas. Land contained within the RPZs is undeveloped with the exception of Airport Road, which extends through the Runway 21 RPZ.

Upgrading to RDC B-II-4000 standards (down to ¾-mile visibility minimums) would alter the size of the RPZ, growing it from 13.77 acres to 48.978 acres. The larger Runway 21 RPZ would introduce residential land uses to the RPZ, which are an incompatible land use. As a result, it may not be feasible to implement lower visibility minimums to Runway 21. Per FAA recommendations, the Airport should attempt to acquire ownership or at least expand the existing easement rights to protect the portions of the RPZs that are currently beyond Airport property and clear zone easements.

Runway/Taxiway Separation

The design standards for the separation between runways and parallel taxiways are a function of the critical design aircraft and the instrument approach visibility minimum. The separation standard for RDC B-II-4000 is 240 feet from the runway centerline to the parallel taxiway centerline. This standard applies to those taxiway segments that are parallel to Runway 3-21. Taxiway A is 250 feet from the runway. Therefore, Taxiway A meets separation design standards.

RUNWAYS

The adequacy of the existing runway at Sedona Airport has been analyzed from a number of perspectives, including runway orientation and adherence to safety area standards. From this information, requirements for runway improvements were determined for the Airport. Runway elements, such as length, width, and strength, will be analyzed in the following sections.

Runway Length

The determination of runway length requirements for the airport is based on four primary factors:

- Mean maximum temperature of the hottest month
- Airport elevation
- Runway gradient
- Performance characteristics and operating weight of aircraft

The mean maximum daily temperature of the hottest month for Sedona Airport is 96.1 degrees Fahrenheit (F), which occurs in July. The Airport elevation is 4,830 feet above mean sea level (MSL). The runway end elevation difference is 93.9 feet, resulting in a gradient of 1.8 percent. The ultimate RDC for Runway 3-21 is B-II-4000.

Advisory Circular 150/5325-4B, *Runway Length Requirements for Airport Design*, provides guidance for determining runway length needs. Airplanes operate on a wide variety of available runway lengths. Many factors will govern the suitability of those runway lengths for aircraft such as elevation, temperature, wind, aircraft weight, wing flap settings, runway condition (wet or dry), runway gradient, vicinity airspace obstructions, and any special operating procedures. Airport operators can pursue policies that can maximize the suitability of the runway length. Policies, such as area zoning and height and hazard restricting, can protect an airport's runway length. Airport ownership (fee simple or easement) of land leading to the runway ends can reduce the possibility of natural growth or man-made obstructions. Planning of runways should include an evaluation of aircraft types expected to use the airport now and in the future. Future plans should be realistic and supported by the FAA approved forecasts and should be based on the critical design aircraft (or family of aircraft).

The first step in evaluating runway length is to determine general runway length requirements for the majority of aircraft operating at the Airport. The majority of fixed-wing aircraft operations at Sedona Airport are conducted using small aircraft weighing less than 12,500 pounds. Following guidance from AC 150/5325-4B, to accommodate 95 percent of small aircraft with less than 10 passenger seats, a runway length of 6,200 feet is recommended. To accommodate 100 percent of these small aircraft, a runway length of 6,400 feet is recommended.

Runway length requirements for business jets weighing less than 60,000 pounds have also been calculated. These calculations take into consideration the runway gradient. AC 150/5325-4B stipulates that runway length determination for business jets consider a grouping of airplanes with similar operating characteristics. The AC provides two separate "family groupings of airplanes" each based upon their representative percentage of aircraft in the national fleet. The first grouping is those business jets that make up 75 percent of the national fleet, and the second group is those making up 100 percent of the national fleet. **Table 3C** presents a partial list of common aircraft in each aircraft grouping. A third group considers business jets weighing more than 60,000 pounds. Runway length deter-

mination for these aircraft must be based on the performance characteristics of the individual aircraft.

TABLE 3C
Business Jet Categories for Runway Length Determination

75 percent of the national fleet	MTOW	75-100 percent of the national fleet	MTOW	Greater than 60,000 pounds	MTOW
Lear 35	20,350	Lear 55	21,500	Gulfstream II	65,500
Lear 45	20,500	Lear 60	23,500	Gulfstream IV	73,200
Cessna 550	14,100	Hawker 800XP	28,000	Gulfstream V	90,500
Cessna 560XL	20,000	Hawker 1000	31,000	Global Express	98,000
Cessna 650 (VII)	22,000	Cessna 650 (III/IV)	22,000		
IAI Westwind	23,500	Cessna 750 (X)	36,100		
Beechjet 400	15,800	Challenger 604	47,600		
Falcon 50	18,500	IAI Astra	23,500		

MTOW: Maximum Take Off Weight
Source: FAA AC 150/5325-4B, *Runway Length Requirements for Airport Design*

Table 3D presents the results of the runway length analysis for business jets developed following the guidance provided in AC 150/5325-4B. To accommodate 75 percent of the business jet fleet at 60 percent useful load, a runway length of 7,700 feet is recommended. This length is derived from a raw length of 6,700 feet that is adjusted, as recommended, for runway gradient. To accommodate 100 percent of the business jet fleet at 60 percent useful load, a runway length of 12,000 feet is recommended.

TABLE 3D
Runway Length Requirements
Sedona Airport

Airport Elevation	4,830 feet above mean sea level
Average High Monthly Temp.	96.1 degrees (July)
Runway Gradient	1.8% - 93.9'

Fleet Mix Category	Raw Runway Length from FAA AC	Runway Length With Gradient Adjustment (+939')	Final Runway Length
95% of small aircraft	6,200	N/A	6,200
100% of small aircraft	6,400	N/A	6,400
75% of business jet fleet at 60% useful load	6,700’	7,640	7,700’
75% of business jet fleet at 90% useful load	8,600’	9,540’	9,600’
100% of business jet fleet at 60% useful load	11,000’	11,940’	12,000’
100% of business jet fleet at 90% useful load	11,000’	11,940’	12,000’

N/A – Not Applicable
Source: FAA AC 150/5325-4B, *Runway Length Requirements for Airport Design.*

Utilization of the 90 percent category for runway length determination is generally not considered by the FAA unless there is a demonstrated need at the airport. This could be documented activity by a business jet operator that flies out frequently with heavy loads. To accommodate 75 percent of the business jet fleet at 90 percent useful load, a runway

length of 9,600 feet is recommended. For 100 percent of the business jet fleet at 90 percent useful load, a runway length of 12,000 feet is recommended.

Runway 3-21's current length is 5,132 feet. The runway length analysis indicates that the current length does not satisfy the runway length recommendations per FAA's runway length design AC; however, these lengths consider the most extreme temperature conditions, which occur only during a small percentage of the year, and aircraft operating fully-loaded. The Airport has been serving a variety of aircraft, including business jets, for many years at this runway length without incident. While it may be desirable to extend the runway to accommodate heavier aircraft loads, a runway extension is not considered feasible. The Airport is located on a mesa with significant negative ground slopes off each runway end. Filling these areas to allow for a runway extension would be cost prohibitive and is considered impractical. Furthermore, a runway extension project could result in impacts on the surrounding community, including residential land uses. Therefore, the runway should be maintained at its current length.

Runway Width

The width of the runway is a function of the airplane design group (ADG). Runway 3-21 is 100 feet wide, which exceeds the RDC B-II design standard of 75 feet. As was previously discussed, Runway 3-21 is 0.16 percent shy of satisfying the FAA's 95 percent 10.5 knot crosswind component recommendation. Having a wider runway width makes landing operations safer for smaller aircraft during crosswind conditions. Therefore, Runway 3-21 should be maintained at its current width for the duration of the planning period.

It should be noted that due to recent changes in the FAA's Airport Improvement Program (AIP) Handbook, the FAA can no longer fund pavement reconstruction projects that exceed FAA standards; however, pavement rehabilitation projects that exceed FAA standards are still eligible for funding. Since Runway 3-21 exceeds the runway width standard, this policy change may affect future runway pavement projects.

Runway Strength

An important feature of airfield pavement is its ability to withstand repeated use by aircraft. The current pavement strength for Runway 3-21 is 15,000 pounds single wheel loading (SWL) and 30,000 pounds dual wheel loading (DWL).

Strength ratings refer to the configuration of the aircraft landing gear. For example, SWL indicates an aircraft with a single wheel on each landing gear. The strength ratings of a runway do not preclude operations by aircraft that weigh more; however, frequent activity by heavier aircraft can shorten the useful life of that pavement. The vast majority of aircraft operating at the Airport now and anticipated to use the Airport in the future can be accommodated by the current runway strength ratings, including business jet aircraft such as the Cessna Citation Sovereign and similar mid-sized jet aircraft. Therefore, the strength rating for Runway 3-21 is adequate and should be maintained through the planning period.

TAXIWAYS

The design standards associated with taxiways are determined by the taxiway design group (TDG) or the airplane design group (ADG) of the critical design aircraft. As determined previously, the applicable ADG for Runway 3-21 is ADG-II. **Table 3E** presents the various taxiway design standards related to ADG II.

TABLE 3E
Taxiway Dimensions and Standards
Sedona Airport

STANDARDS BASED ON WINGSPAN	ADG II
Taxiway Protection	
Taxiway Safety Area (TSA) width	79'
Taxiway Object Free Area (TOFA) width	131'
Taxilane Object Free Area width	115'
Taxiway Separation	
Taxiway Centerline to:	
Fixed or Movable Object	65.5'
Parallel Taxiway/Taxilane	105'
Taxilane Centerline to:	
Fixed or Movable Object	57.5'
Parallel Taxilane	97'
Taxiway Centerline to:	
Runway Centerline	240'
Wingtip Clearance	
Taxiway Wingtip Clearance	26'
Taxilane Wingtip Clearance	18'
STANDARDS BASED ON TDG	**TDG 2**
Taxiway Width Standard	35'
Taxiway Edge Safety Margin	7.5'
Taxiway Shoulder Width	15'

ADG: Airplane Design Group
TDG: Taxiway Design Group
Source: FAA AC 150/5300-13A, *Airport Design*

The table also shows those taxiway design standards related to TDG. The TDG standards are based on the Main Gear Width (MGW) and the Cockpit to Main Gear (CMG) distance of the critical design aircraft expected to use those taxiways. Different taxiways/taxilane pavements can and should be designed to the most appropriate TDG design standards.

For aircraft utilizing Runway 3-21 currently, the critical TDG is 2. This means that the taxiways associated with this runway should be at least 35 feet wide. Taxiway A meets the 35-foot standard and the connecting taxiways (A2 to A8) exceed the standard with 40-footwidths each. These taxiway widths should be maintained. Taxiway A1 has a width of 150 feet, which far exceeds the design standard. The FAA recommends eliminating excessive taxiway widths to mitigate the potential for pilots to miss guidance signage and lighting and inadvertently enter the runway environment. Therefore, consideration should be given to reducing the Taxiway A1 pavement width.

The ultimate condition considers the potential for instrument approach procedures with visibility minimums below one mile. If a GPS approach with vertical guidance (APV) with visibility minimums below one mile are pursued, the FAA recommends the runway threshold to be accessible by a full-length parallel taxiway. Currently, Taxiway A does not extend to the Runway 3 threshold. Consideration should be given to extending Taxiway A to the Runway 3 threshold in anticipation of improved APV instrument approach procedures.

Taxiway Design Considerations

FAA AC 150/5300-13A, *Airport Design*, provides guidance on recommended taxiway and taxilane layouts to enhance safety by avoiding runway incursions. A runway incursion is defined as, "any occurrence at an airport involving the incorrect presence of an aircraft, vehicle, or person on the protected area of a surface designated for the landing and takeoff of aircraft."

The taxiway system at Sedona Airport generally provides for the efficient movement of aircraft; however, recently published AC 150/5300-13A, *Airport Design*, provides new recommendations for taxiway design. One particular recommendation that is applicable to Sedona Airport is limiting direct access to runways to reduce the potential for runway incursions. *Airport Design* recommends to planners, "do not design taxiways to lead directly from an apron to a runway. Such configurations can lead to confusion when a pilot typically expects to encounter a parallel taxiway."

Presently, connecting taxiways A6, A5, A4, A3, and A2 provide direct access to the runway from the apron. The FAA recommends taxiway design should increase pilot situational awareness by forcing pilots to consciously make turns by staggering taxiway layout. *Airport Design* states that, "existing taxiway geometry should be improved whenever feasible. To the extent practicable, the removal of existing pavement may be necessary to correct confusing layouts."

The alternatives chapter of this Master Plan will consider various designs to improve taxiway layout.

Taxilane Design Considerations

Taxilanes are distinguished from taxiways in that they do not provide access to or from the runway system directly. Taxilanes typically provide access to hangar areas. As a result, taxilanes can be designed to varying design standards depending on the type of aircraft utilizing the taxilane. For example, a taxilane leading to a T-hangar area only needs to be designed to accommodate those aircraft typically accessing a T-hangar.

The alternatives chapter will consider various designs for improving the safe movement of aircraft via taxilanes as hangar and apron facilities expand over time.

INSTRUMENT NAVIGATIONAL AIDS

The Airport has one published non-precision instrument approach procedure. This approach provides for visibility minimums as low as 1½-mile and cloud ceilings down to 1,348 feet. These are excellent instrument approaches providing all-weather capability for the Airport and they should be maintained in the future.

Recent advancements in the accuracy of GPS instrument approaches has led to the possibility of new or improved approach visibility minimums across the country at little or no expense to the airport. Currently, APVs such as the localizer performance with vertical guidance (LPV) approaches with visibility minimums as low as ¾-mile are being implemented at airports without any additional ground-based navigational aids such as approach lighting systems (ALS); however, these navigation aids are recommended.

The alternatives chapter of this Master Plan will give consideration to the potential for improved instrument approaches to both ends of Runway 3-21. Specifically, the impacts of GPS LPV precision instrument approaches with ¾-mile visibility minimums will be considered for these runway ends.

VISUAL AIDS

The airport beacon is located on top of a T-hangar facility and should be maintained.

Both ends of Runway 3-21 are equipped with 4-light precision approach path indicator (PAPIs) and runway end identification lights (REILs). These lighting systems should be maintained for their useful life.

The FAA does not require but recommends an ALS for approaches with ¾-mile visibility minimums. Acceptable systems that would achieve ¾-mile visibility minimums include the ODALS, MALS, SSALS, and SALS. Due to the negative sloping terrain off each runway end, implementation of an ALS is not considered practical.

WEATHER AIDS

Sedona Airport is equipped with an automated weather observing system (AWOS). This is an important system that automatically records weather conditions such as wind speed, wind gust, wind direction, temperature, dew point, altimeter setting, visibility, fog/haze condition, precipitation, and cloud height. This information is then transmitted at regular intervals (usually once per hour). Aircraft in the vicinity can receive this information if they have their radio tuned to the correct frequency (118.525 MHz). In addition, pilots and individuals can call a published telephone number (928-282-1993) and receive the information via an automated voice recording. This system should be maintained through the planning period.

A summary of the airside needs at Sedona Airport is presented on **Exhibit 3D**.

NON-STANDARD AIRFIELD CONDITIONS SUMMARY

Existing airfield conditions that do not meet FAA's RDC B-II-5000 design standards are summarized in **Table 3G**. These items should receive a high priority by the County and the FAA and ADOT when considering future capital improvement projects. In cases where practicable solutions are not feasible, the FAA may allow an airport sponsor to request a modification to design standard; however, the FAA will not grant modifications to RSA design standards. The alternatives chapter will examine various solutions to correct the identified non-standard conditions.

TABLE 3G
Non-Standard Airfield Conditions
Sedona Airport

Effected Design Standard	Existing Condition
Runway Safety Area (RSA)	The RSA beyond both runway ends is obstructed by the perimeter security fence and overgrown vegetation. In addition, terrain within the RSA in the same area exceeds the maximum allowable grade of -3.0 percent.
Runway Object Free Area (ROFA)	The ROFA is obstructed by the perimeter security fence and overgrown vegetation.
Runway Protection Zone (RPZ)	Portions of both RPZs extend beyond Airport property and clear zone easements.
Taxiway Geometry – Runway Incursion Potential	Connecting taxiways A2, A3, A4, A5, and A6 lead directly from aircraft parking areas to the runway. In addition, Taxiway A1 (150 feet) is considered a wide pavement area, exceeding the design standard of 35 feet by 115 feet.

Source: Coffman Associates analysis

LANDSIDE REQUIREMENTS

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

- Aircraft Hangars
- Aircraft Parking Aprons
- Terminal Building Services
- Auto Parking and Access
- Airport Support Facilities

HANGARS

Utilization of hangar space varies as a function of local climate, security, and owner preferences. The trend in general aviation, whether single or multi-engine aircraft, is toward



	AVAILABLE	SHORT TERM	LONG TERM
	Runway 3-21:	**Runway 3-21:**	**Runway 3-21:**
	RDC B-II-5000	RDC B-II-5000	RDC B-II-4000
	5,132' x 100'	Maintain	Maintain
	15,000 SWL; 30,000 DWL	Maintain	Maintain
	RSA/ROFA/ROFZ Obstructions	Relocate/remove obstructions: perimeter security fence; vegetation; grade RSA to meet standards	Maintain
	Uncontrolled land within RPZs	Establish control of RPZs via or easements	Establish control of expanded RPZs via easements
	Basic Markings	Non-precision markings	Maintain
	MIRL	Maintain	Maintain
TAXIWAYS	TDG-2	Maintain	Maintain
	Centerline Marking	Maintain	Maintain
	Partial-Parallel Taxiway A	Extend Taxiway A to Runway 3 threshold	Maintain
	Taxiway A is 35' Wide	Maintain	Maintain
	MITL	Maintain	Maintain
	Connector layout deficiencies - direct access from aprons to runway	Correct connector deficiencies	Maintain
	Taxiway A1 width exceeds standard	Reduce Taxiway A1 pavement width	
NAVIGATIONAL AND WEATHER AIDS	AWOS	Maintain	Maintain
	Beacon	Maintain	Maintain
	REILs	Maintain	Maintain
	PAPI-4s	Maintain	Maintain
	GPS Non-Precision Instrument Approach	Maintain	Consider GPS precision APV instrument approach with visibility minimums down to 3/4-Mile

KEY

APV - Approach with Vertical Guidance
AWOS - Automated Weather Observing System
DWL - Dual Wheel Loading
GPS - Global Positioning System
MIRL - Medium Intensity Runway Lights
MITL - Medium Intensity Taxiway Lights
PAPI - Precision Approach Path Indicator
RDC - Runway Design Code
REIL - Runway End Identifier Lights
ROFA - Runway Object Free Area
ROFZ - Runway Obstacle Free Zone
RPZ - Runway Protection Zone
RSA - Runway Safety Area
SWL - Single Wheel Loading
TDG - Taxiway Design Group

more sophisticated aircraft (and, consequently, more expensive aircraft); therefore, many aircraft owners prefer enclosed hangar space to outside tie-downs.

The demand for aircraft storage hangars is dependent upon the number and type of aircraft expected to be based at the airport in the future. However, hangar development should be based upon actual demand trends and financial investment conditions.

While a majority of aircraft owners prefer enclosed aircraft storage, a number of based aircraft owners may still tie-down outside (due to the lack of hangar availability, hangar rental rates, and/or operational needs). Therefore, enclosed hangar facilities do not necessarily need to be planned for each based aircraft. At Sedona Airport, nearly all aircraft are stored in a covered facility; however, ten based aircraft are stored on outside tie-downs. Therefore, it will not be assumed that all future based aircraft will be housed in a hangar.

There are two types of aircraft storage hangars at Sedona Airport: T-hangars and corporate hangars. T-hangars are similar in size and will typically house a single-engine piston-powered aircraft. Some multi-engine aircraft owners may elect to utilize these facilities as well. The average size of a T-hangar unit at Sedona Airport is approximately 1,375 square feet. There are typically many T-hangar units "nested" within a single structure. There are 62 T-hangar units at the Airport encompassing 85,377 square feet of storage space. Only one T-hangar unit (1,512 square feet) is currently unoccupied.

Corporate hangars are open-space facilities with no interfering supporting structure. Corporate hangars can vary in size and can either be attached to others or be standalone hangars. Typically, corporate hangars will house larger multi-engine turboprops, jets, or helicopters. At Sedona Airport, there are 25 corporate hangars with a total of 61,962 square feet of storage space. Each corporate hangar is currently occupied.

Table 3H presents aircraft storage needs based on the demand forecasts. Assumptions have been made on owner preferences for a hangar type based on trends at general aviation airports. Facility requirements consider space requirements for 21 additional aircraft anticipated to require storage space through the planning period. All additional turboprops, business jets, and helicopters are assumed to be stored in corporate hangars. Additional piston aircraft are assumed to be housed in T-hangars.

TABLE 3H
Hangar Needs
Sedona Airport

	Current Capacity	Short Term	Intermediate Term	Long Term	Long Term Need Less Current Capacity
Based Aircraft	92	97	103	115	
Hangared Aircraft	82	87	93	104	
Hangar Area Requirements					
T-Hangar Area (s.f.)	85,377	86,752	92,252	95,002	9,625
Corporate Hangar Area (s.f.)	61,962	68,462	72,462	90,462	28,500
Total Storage Area (s.f.)	**147,339**	**155,214**	**164,714**	**185,464**	**38,125**

Source: Coffman Associates analysis.

There is 147,339 square feet of hangar storage space available currently. Throughout the planning period, it is anticipated the most significant change in aircraft storage needs will occur for more sophisticated aircraft (turbine and helicopters). By the long term planning horizon, it is anticipated that an additional nine turbine aircraft and four helicopters could base at the Airport. A planning standard of 2,500 square feet per turbine aircraft and 1,500 square feet per helicopter was utilized to generate additional corporate hangar space needs for each planning period. By the long term planning period, a total of 28,500 square feet of conventional hangar space is forecast as needed.

T-hangar requirements increase over time to account for an additional eight piston aircraft. A planning criterion of 1,375 square feet per piston aircraft was used to generate additional hangar space needs. It is assumed that the currently unoccupied T-hangar unit will accommodate one piston aircraft in the short term horizon. By the long term horizon, a need for an additional 9,625 square feet (seven units) of T-hangar storage is identified.

Hangar requirements are general in nature and are based on standard hangar size estimates. If a private developer desires to construct or lease a large hangar to house one plane, any extra space in that hangar may not be available for other aircraft. The actual hangar area needs will be dependent on the usage within each hangar.

AIRCRAFT PARKING APRON

The aircraft parking apron is an expanse of paved area intended for aircraft parking and circulation. Typically, a main apron is centrally located near the airside entry point, such as the terminal building or FBO facility. Ideally, the main apron is large enough to accommodate transient airport users as well as a portion of locally based aircraft. Often, smaller aprons are available adjacent to hangars and at other locations around the airport. The apron layout at Sedona Airport follows this typical pattern.

The Airport has a total of approximately 66,286 square yards of aircraft ramp space including 115 marked tie-down positions (10 helicopter positions; 4 turbine aircraft positions; and 101 small aircraft positions). The bulk of the apron space is provided by Ramp A, which is located adjacent to the terminal building.

FAA AC 150/5300-13A, *Airport Design*, suggests a methodology by which transient apron requirements can be determined from knowledge of busy-day operations. At Sedona Airport, the number of itinerant spaces required is estimated at 13 percent of the busy day itinerant operations. This results in a current need for 22 itinerant aircraft parking spaces. Of these, two should be for heavier turboprops and business jets, and 20 should be for small aircraft. By the long term planning period, 30 spaces are estimated to be needed, with five identified for heavier turbine aircraft and 25 for small aircraft.

A planning criterion of 800 square yards per aircraft was applied to determine future transient apron area requirements for single and multi-engine aircraft. For turboprops and business jets (which are typically larger), a planning criterion of 1,600 square yards per

aircraft position was used. The short term need for transient apron area is 19,200 square yards. By the long term planning period, approximately 28,000 square yards is estimated.

An aircraft parking apron should provide space for the number of locally based aircraft that are not stored in hangars and transient aircraft. For local tie-down needs, 20 percent of the based aircraft total will be used to determine the parking apron requirements, due to some aircraft requiring both hangar storage and parking apron space on occasion. This results in a need for 14,950 square yards of local apron area by the long term.

Helicopter parking positions are a significant portion of existing apron space due to aerial tour activities. Currently, the Airport has 10 designated helicopter parking positions. Should aerial tour activities increase over time, so will the need for expanded helicopter parking. By the long term, it is estimated that an additional 12 helicopter parking positions (approximately 6,500 square yards) will need to be added.

Total apron parking requirements are presented in **Table 3J**. While existing apron area is shown to exceed most long term needs, the alternatives chapter will examine the potential for new apron areas in association with the construction of new facilities and for expanded helicopter activities.

TABLE 3J
Aircraft Apron Requirements
Sedona Airport

	Current Capacity	Short Term	Intermediate Term	Long Term	Long Term Need Less Current Capacity
Local Apron Positions	101[a]	19	21	23	Capacity Exceeds Demand
Local Apron Area (s.y.)		12,350	13,650	14,950	
Transient Apron Positions					
Piston Transient Positions	101[a]	20	22	25	Capacity Exceeds Demand
Turbine Transient Positions	4	2	3	5	1
Transient Apron Area (s.y.)		19,200	22,400	28,000	
Helicopter Parking Positions	10	14	16	22	12
Helicopter Parking Area (s.y.)	7,811	9,100	10,400	14,300	6,489
Total Positions	115	55	62	75	Capacity Exceeds Demand
Total Apron Area (s.y.)	66,286	40,650	46,450	57,250	Capacity Exceeds Demand

[a]Sedona Airport currently has 101 tie-down positions for both transient and local fixed-wing aircraft.
Source: Coffman Associates analysis

TERMINAL BUILDING FACILITIES

General aviation terminal facilities have several functions. Space is necessary for flight planning, concessions, management, and storage. More advanced airports will have leasable space in the terminal building for such features as a restaurant, FBO line services, and other needs. This space is not necessarily limited to a single, separate terminal building, but can include space offered by FBOs in their hangars for these functions and services.

Sedona Airport's terminal facility provides a wide range of general aviation terminal services, including FBO offices, leasable space for on-airport businesses, flight planning, con-

cessions, management, conference room, and restrooms. The facility was constructed in 1991 and has a total area of 4,263 square feet.

The methodology used in estimating general aviation terminal facility needs is based on the number of airport users expected to utilize general aviation facilities during the design hour. General aviation space requirements were then based upon providing 150 square feet per design hour itinerant passenger. Design hour itinerant passengers are determined by multiplying design hour itinerant operations by the number of passengers on the aircraft (multiplier). An increasing passenger count (from 1.7 to 2.0) is used to account for a potential increase in the number of passengers utilizing general aviation services. **Table 3K** outlines the general aviation terminal facility space requirements for Sedona Airport.

TABLE 3K
General Aviation Terminal Area Facilities
Sedona Airport

	Existing	Short Term	Intermediate Term	Long Term
Design Hour Itinerant Operations		21	23	28
Multiplier		1.7	1.9	2.0
Total Design Hour Itinerant Passengers		36	44	56
Total Terminal Building Space (s.f.)	4,263	5,400	6,600	8,400

Source: Coffman Associates analysis

Terminal building calculations based on forecast passenger activity indicates that the existing terminal building may need to be expanded over time to maintain a level of service for an increasing number of terminal users. The terminal building is the entrance to the community for many visitors to the area. It should be assumed that these passengers include individuals who may be considering investment in the community. Therefore, it is recommended that the airport sponsor be cognizant of the appearance of the Airport and the terminal building in particular.

SUPPORT REQUIREMENTS

Various facilities that do not logically fall within classifications of airside or landside facilities have also been identified. These other areas provide certain functions related to the overall operation of the airport.

AUTOMOBILE PARKING

Planning for adequate automobile parking is a necessary element for any airport. Parking needs can effectively be divided between transient airport users, locally based users, and airport business needs. Transient users include those employed at the airport and visitors, while locally based users primarily include those attending to their based aircraft. A planning standard of 1.9 times the design hour passenger count provides the minimum number of vehicle spaces needed for transient users. Locally based parking spaces are calculated as

one-half the number of based aircraft. A planning standard of 315 square feet per space is utilized to determine total vehicle parking area necessary, which includes area needed for circulation and handicap clearances. Parking requirements for the Airport are summarized in **Table 3L**.

TABLE 3L
GA Vehicle Parking Requirements
Sedona Airport

	Existing	Short Term	Intermediate Term	Long Term
Design Hour Itinerant Passengers		36	44	56
VEHICLE PARKING SPACES				
GA Itinerant Spaces		68	84	106
GA Based Spaces		49	52	58
Total Parking Spaces	127[a]	117	136	164
VEHICLE PARKING AREA				
Total Parking Area (s.f.)	65,438[a]	36,855	42,840	51,660

[a]Includes paved parking lots and an estimate for unmarked, gravel parking areas.
Source: Coffman Associates analysis

There appears to be enough designated vehicle parking through the short term planning period. Expanding parking areas will need to be considered as aerial tour operations and general aviation itinerant operations increase over time. In an effort to limit the level of vehicle traffic on the aircraft movement areas, many general aviation airports are providing separate parking in support of facilities with multiple aircraft parking positions, such as T-hangars. Vehicle parking spaces will be considered in conjunction with additional facility needs in the alternatives chapter.

AIRPORT ACCESS ROADS

Airport Road, a paved two-lane road, serves as the only access point to the Airport. This road is utilized by visitors to the Airport and its tenants, as well as tourists traveling up the mesa to the scenic overlook point and visitors to the Sky Ranch Lodge. A roadway capacity expansion is not considered necessary at this time and the existing Airport Road infrastructure should be maintained through the planning period.

Visitors to the scenic overlook point park in a gravel parking lot and must walk across Airport Road to get to the scenic overlook point. The configuration of the existing crosswalk does not meet current design standards for a mid-block crosswalk as recommended by the *Manual for Uniform Traffic Control Devices* (MUTCD). Improvements should be made to the crosswalk to bring it into compliance with current standards.

FUEL STORAGE

The Sedona-Oak Creek Airport Authority (SOCAA) owns two above-ground fuel storage tanks west of the terminal building. The tanks consist of two 10,000-gallon tanks for both AvGas and Jet A. The SOCAA has two fuel delivery trucks with capacities of 1,500 gallons of AvGas and 3,000 gallons of Jet A.

Additional fuel storage capacity and upgrades should be planned when the airport is unable to maintain an adequate supply and reserve. While each airport (or FBO) determines their own desired reserve, a 14-day reserve is common for general aviation airports. When additional capacity is needed, it should be planned in 10,000- to 12,000-gallon increments. Common fuel tanker trucks have an 8,000-gallon capacity.

Table 3M presents a forecast of fuel demand through the planning period. Fuel needs were based on a five-year average of Jet A and AvGas fuel flowage per operation. Forecasted Jet A fuel needs were based on 5.6 gallons purchased per operation and AvGas needs were forecast based on 3.1 gallons per operation.

TABLE 3M
Fuel Storage Requirements
Sedona Airport

		Planning Horizon		
	Current Capacity	Short Term	Intermediate Term	Long Term
Jet A Requirements	10,000			
Annual Usage (gal.)		217,300	241,600	299,600
Daily Usage (gal.)		595	662	821
14-Day Storage (gal.)		8,335	9,267	11,492
AvGas Requirements	10,000			
Annual Usage (gal.)		122,200	135,900	168,500
Daily Usage (gal.)		335	372	462
14-Day Storage (gal.)		4,687	5,213	6,463

Assumptions:
Jet A 5.6 gallons per operation
Avgas 3.1 gallons per operation

Source: FBO fuel sales; Coffman Associates analysis

By the estimates developed, the current capacity of AvGas is adequate through the long term planning period. The current capacity of Jet A fuel may be inadequate to maintain a two-week supply by the long term horizon.

The existing fuel farm is not equipped with an appropriate spill containment system. The fuel farm should be upgraded with a spill containment system to satisfy applicable operational and environmental safety standards.

PERIMETER FENCING

The entire Airport boundary is equipped with barbed-wire and chain-link fencing. Secured gates provide vehicular access to the apron, hangar facilities, AWOS, and fuel storage facilities. The secured gates are accessible only to Airport tenants with magnetic cards. Portions of the perimeter fencing extend into the RSA and ROFA. Where possible, perimeter fencing should be relocated outside of the RSA and ROFA.

A summary of landside and support needs is presented on **Exhibit 3E**.

SECURITY RECOMMENDATIONS

In cooperation with representatives of the general aviation community, the Transportation Security Administration (TSA) published security guidelines for general aviation airports. These guidelines are contained in the publication entitled, *Security Guidelines for General Aviation Airports*, published in May 2004. Within this publication, the TSA recognized that general aviation is not a specific threat to national security. However, the TSA does believe that general aviation may be vulnerable to misuse by terrorists as security is enhanced in the commercial portions of aviation and at other transportation links.

To assist in defining which security methods are most appropriate for a general aviation airport, the TSA defined a series of airport characteristics that potentially affect an airport's security posture. These include:

1. Airport Location – An airport's proximity to areas with over 100,000 residents or sensitive sites that can affect its security posture. Greater security emphasis should be given to airports within 30 miles of mass population centers (areas with over 100,000 residents) or sensitive areas such as military installations, nuclear and chemical plants, centers of government, national monuments, and/or international ports.

2. Based Aircraft – A smaller number of based aircraft increases the likelihood that illegal activities will be identified more quickly. Airports with based aircraft weighing more than 12,500 pounds warrant greater security measures.

3. Runways – Airports with longer paved runways are able to serve larger aircraft. Shorter runways are less attractive as they cannot accommodate the larger aircraft which have more potential for damage.

4. Operations – The number and type of operations should be considered in the security assessment.

Table 3N summarizes the recommended airport characteristics and ranking criterion. The TSA suggests that an airport rank its security posture according to this scale to determine the types of security enhancements that may be appropriate. As shown in the table, the Sedona Airport ranking on this scale is 11. Points are assessed for the Airport being located

near the City of Flagstaff population center. Points are also assessed for a based aircraft count of 92, having a runway greater than 5,001 feet in length, having a paved runway surface, and for having 14 CFR Part 135 air charter operations.

TABLE 3N
General Aviation Airport Security Measurement Tool
Transportation Security Administration

	Assessment Scale	
Security Characteristic	**Public Use Airport**	**Sedona Airport**
Location		
Within 20nm of mass population areas[1]	5	0
Within 30nm of a sensitive site[2]	4	0
Falls within outer perimeter of Class B airspace	3	0
Falls within boundaries of restricted airspace	3	0
Based Aircraft		
Greater than 101 based aircraft	3	0
26-100 based aircraft	2	2
11-25 based aircraft	1	0
10 or fewer based aircraft	0	0
Based aircraft over 12,500 pounds	3	0
Runways		
Runway length greater than 5,001 feet	5	5
Runways less than 5,000 feet and greater than 2,001 feet	4	0
Runway length less than 2,000 feet	2	0
Asphalt or concrete runway	1	1
Operations		
Over 50,000 annual operations	4	0
Part 135 operations (Air taxi and fractionals)	3	3
Part 137 operations (Agricultural aircraft)	3	0
Part 125 operations (20 or more passenger seats)	3	0
Flight training	3	0
Flight training in aircraft over 12,500 pounds	4	0
Rental aircraft	4	0
Maintenance, repair, and overhaul facilities conducting long-term storage of aircraft over 12,500 pounds	4	0
Totals	**64**	**11**

[1] An area with a population over 100,000
[2] Sensitive sites include military installations, nuclear and chemical plants, centers of government, national monuments, and/or international ports

Source: *Security Guidelines for General Aviation Airports* (TSA 2004)

As shown in **Table 3P**, a rating of 11 points places Sedona Airport in Tier 4 ranking of security measures by the TSA. This rating clearly illustrates the importance of meeting security needs at Sedona Airport as the activity at the Airport grows. The Airport is not projected to transition to the third tier during the planning period. Based upon the results of the security assessment, the TSA recommends five potential security enhancements for Sedona Airport. These enhancements are discussed in detail as follows:

AIRCRAFT STORAGE HANGAR REQUIREMENTS



	BASE YEAR (2013)	SHORT TERM	INTERMEDIATE TERM	LONG TERM
Based Aircraft	92	97	103	115
Aircraft to be Hangared	82	87	93	104
T-Hangar Area (s.f.)	85,377	86,752	92,252	95,002
Corporate Hangar Area (s.f.)	61,962	68,462	72,462	90,462
Total Storage Area (s.f.)	147,339	155,214	164,714	185,464

AIRCRAFT PARKING APRON REQUIREMENTS



Local Apron Positions	101*	19	21	23
Piston Transient Positions	101*	20	22	25
Turbine Transient Positions	4	2	3	5
Helicopter Positions	10	14	16	22
Total Positions	115	55	62	75
Total Apron Area (s.y.)	66,286	40,650	46,450	57,250

*Sedona Airport currently has 101 tie-down positions for both transient and local fixed-wing aircraft

GENERAL AVIATION TERMINAL FACILITY REQUIREMENTS



Terminal Building Area (s.f.)	4,263	5,400	6,600	8,400
Automobile Parking Spaces	127	117	136	164

14-DAY FUEL STORAGE REQUIREMENTS



AvGas	10,000	4,687	5,213	6,463
Jet A	10,000	8,335	9,267	11,492

SUPPORT FACILITY REQUIREMENTS

	Perimeter Fence	Relocate perimeter fence from RSA and ROFA	Maintain	Maintain
	Airport Access Road	Improve crosswalk to scenic overlook point	Maintain	Maintain

RSA - Runway Safety Area
ROFA - Runway Object Free Area

TABLE 3P
Recommended Security Enhancements

	Points Determined Through Airport Security Characteristics Assessment			
Security Enhancements	**Tier 1 > 45**	**Tier 2 25-44**	**Tier 3 15-24**	**Tier 4 0-14**
Fencing	X			
Hangars	X			
Closed-Circuit Television (CCTV)	X			
Intrusion Detection System	X			
Access Controls	X	X		
Lighting System	X	X		
Personal ID/Vehicle ID System	X	X		
Challenge Procedures	X	X		
Law Enforcement Support	X	X	X	
Security Committee	X	X	X	
Transient Pilot Sign-in/Sign-Out Procedures	X	X	X	
Signs	X	X	X	
Documented Security Procedures	X	X	X	X
Positive/Passenger/Cargo/Baggage ID	X	X	X	X
Aircraft Security	X	X	X	X
Community Watch Program	X	X	X	X
Contact List	X	X	X	X

X = Recommended
Source: *Security Guidelines for General Aviation Airports*

Documented Security Procedures: This refers to having a written security plan. This plan would include documenting the security initiatives already in place at Sedona Airport, as well as any new enhancements. This document should consist of Airport and local law enforcement contact information and include utilization of a program to increase airport user awareness of security precautions, such as an airport watch program.

Positive/Passenger/Cargo/Baggage ID: A key point to remember regarding general aviation passengers is that the persons boarding these flights are generally better known to airport personnel and aircraft operators than the typical passenger on a commercial airliner. Recreational general aviation passengers are typically friends, family, or acquaintances of the pilot in command. Charter/sightseeing passengers typically will meet with the pilot or other flight department personnel well in advance of any flights. Suspicious activities, such as use of cash for flights or probing or inappropriate questions, are more likely to be quickly noted and authorities could be alerted. For corporate operations, typically all parties onboard the aircraft are known to the pilots. Airport operators should develop methods by which individuals visiting the airport can be escorted into and out of aircraft movement and parking areas.

Aircraft Security: The main goal of this security enhancement is to prevent the intentional misuse of general aviation aircraft for criminal purposes. Proper securing of aircraft is the most basic method of enhancing general aviation airport security. Pilots should employ

multiple methods of securing their aircraft to make it as difficult as possible for an unauthorized person to gain access to it. Some basic methods of securing a general aviation aircraft include: ensuring that door locks are consistently used to prevent unauthorized access or tampering with the aircraft; using keyed ignitions where appropriate; storing the aircraft in a hangar, if available; and locking hangar doors, using an auxiliary lock to further protect aircraft from unauthorized use (i.e., propeller, throttle, and/or tie-down locks); and ensuring that aircraft ignition keys are not stored inside the aircraft.

Community Watch Program: The vigilance of airport users is one of the most prevalent methods of enhancing security at general aviation airports. Typically, the user population is familiar with those individuals who have a valid purpose for being on the airport property. Consequently, new faces are quickly noticed. A watch program should include elements similar to those listed below. These recommendations are not all-inclusive. Additional measures that are specific to each airport should be added as appropriate, including:

- Coordinate the program with all appropriate stakeholders, including Airport officials, pilots, businesses, and/or other Airport users.

- Hold periodic meetings with the Airport community.

- Develop and circulate reporting procedures to all who have a regular presence on the Airport.

- Encourage proactive participation in aircraft and facility security and heightened awareness measures. This should include encouraging airport and line staff to "query" unknowns on ramps, near aircraft, etc.

- Post signs promoting the program, warning that the Airport is watched. Include appropriate emergency phone numbers on the sign.

- Install a bulletin board for posting security information and meeting notices.

- Provide training to all involved for recognizing suspicious activity and appropriate response tactics.

Contact List: This involves the development of a comprehensive list of responsible personnel/agencies to be contacted in the event of an emergency procedure. The list should be distributed to all appropriate individuals. Additionally, in the event of a security incident, it is essential that first responders and Airport management have the capability to communicate. Where possible, coordinate radio communication and establish common frequencies and procedures to establish a radio communications network with local law enforcement.

Other security measures may be considered by the Airport as the local need demands. The additional measures include full perimeter fencing, hangar availability, closed-circuit television, intrusion detection systems, access controls, lighting systems, personal/vehicle ID

systems, challenge procedures, law enforcement support, establishing a security committee, transient pilot sign-in/sign-out procedures, and signage.

SUMMARY

The intent of this chapter has been to outline the facilities required to meet potential aviation demand projected for Sedona Airport for the next 20 years. In an effort to provide a more flexible master plan, the yearly forecasts from Chapter Two have been converted to planning horizon levels. The short term roughly corresponds to a five-year time frame, the intermediate term is approximately 10 years, and the long term is 20 years. By utilizing planning horizons, Airport management can focus on demand indicators for initiating projects and grant requests rather than on specific dates in the future.

Runway 3-21 has been planned and designed to meet FAA design standards associated with RDC B-II-4000. This category includes most small- and medium-size business jets, such as the Cessna Citation Sovereign and the Embraer Legacy 500.

The existing runway has been adequately serving a wide ranging aircraft fleet mix including business jet aircraft. While additional runway length may be desirable to serve heavier aircraft, a runway extension project would be highly controversial and impractical due to terrain constraints. Therefore, no runway extension or widening projects will be considered in this Master Plan. Taxiway efficiency improvements will be considered in the alternatives chapter, such as extending Taxiway A to the Runway 3 threshold and providing offset taxiways to limit direct access from aprons to the runway. Consideration will also be given to improving instrument approach procedures to provide lower visibility minimums and make the airport more accessible during low visibility conditions.

On the landside, planning calculations show a need for expanded aircraft storage hangar capacity as more sophisticated aircraft (i.e., business jets and turboprops) base at the Airport. Hangar space will largely depend on individual desires and may not precisely follow the forecast. If demand indicates a desire for additional T-hangars, then these should be the first priority. The availability of additional hangar space is a significant factor as to whether the Airport will experience and can accommodate the forecast growth in based aircraft.

The next chapter, Airport Development Alternatives, will examine potential improvements to the airfield system and the landside. Most of the alternatives discussion will focus on those capital improvements that would be eligible for federal grant funds. Other projects of local concern will also be presented. On the landside, several facility layouts that meet the forecast demands over the next 20 years will be presented. Ultimately, an overall airport layout that presents a vision beyond the 20-year scope of the Master Plan will be developed.



Chapter Four

AIRPORT DEVELOPMENT ALTERNATIVES

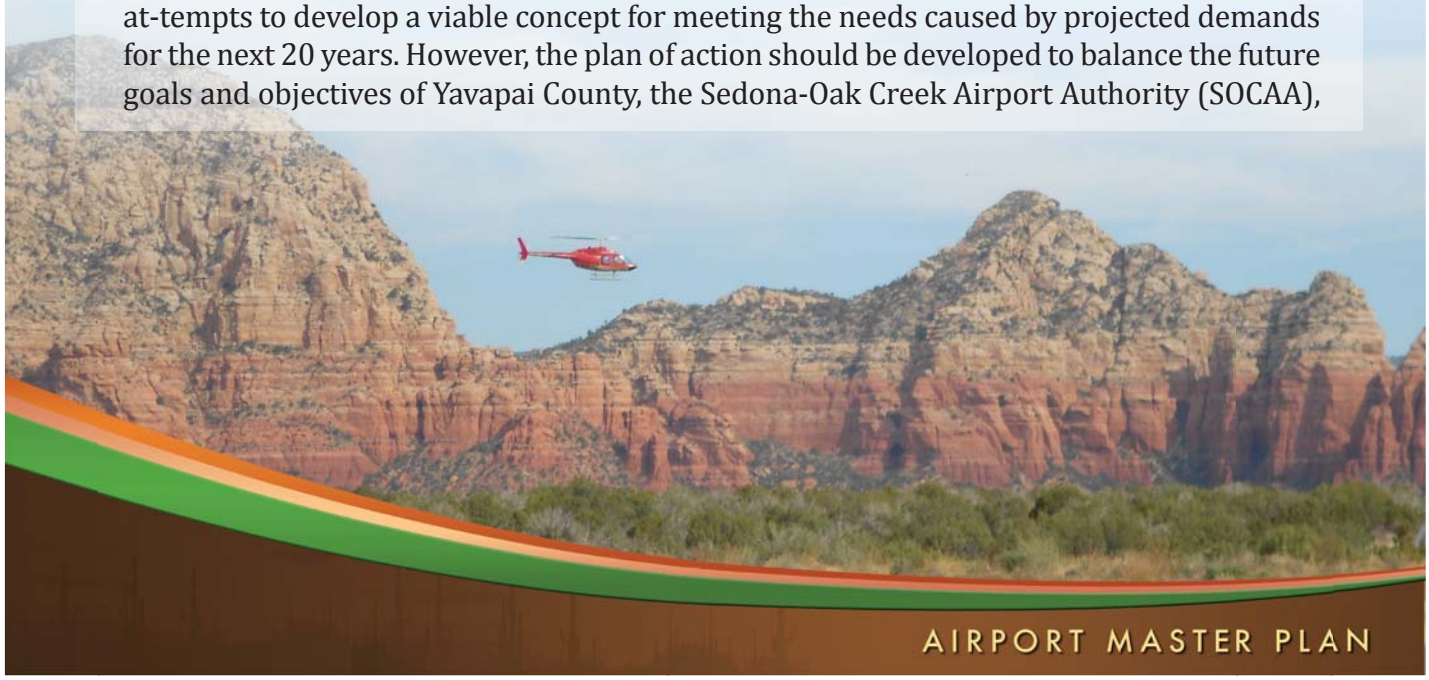
Chapter Four

AIRPORT DEVELOPMENT ALTERNATIVES

Prior to defining the recommended development program for Sedona Airport (Airport), it is important to first consider development potential as well as constraints to future development at the Airport. The previous chapters have focused on the Airport's available facilities, existing and potential future demand levels, and the types of facilities that are needed to meet the demand. Specific attention was also given to defining Federal Aviation Administration (FAA) design standards that are applicable to the Airport.

In some cases, development needs are straightforward, while for other items, alternative methods for meeting projected aviation demand should be considered. In this chapter, airport development alternatives are considered for the Airport, where applicable. For each alternative, different physical layouts are presented for the purpose of evaluation. The ultimate goal is to develop the underlying rationale which supports the recommended development concept. Through this process, an evaluation of the most realistic and best uses of Airport property is made while considering local development goals, physical and environmental constraints, and appropriate FAA airport design standards.

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 at-tempts to develop a viable concept for meeting the needs caused by projected demands for the next 20 years. However, the plan of action should be developed to balance the future goals and objectives of Yavapai County, the Sedona-Oak Creek Airport Authority (SOCAA),



and the City of Sedona, who have a vested interest in the development and operation of the Airport.

The development alternatives for Sedona Airport can be categorized into two functional areas: airside (runways, taxiways, navigational aids, marking and lighting) and landside (aircraft storage hangars, terminal area, aircraft parking aprons, automobile parking, and support services). Each functional area interrelates and affects the development potential of the others. Therefore, all areas must be examined individually, and then coordinated as a whole, to ensure the final plan is functional, efficient, and cost-effective. The total impact of all these factors on the existing airport must be evaluated to ensure that the Sedona Airport will meet the needs of the region, both during and beyond 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), Yavapai County officials, and the SOCAA, the alternatives (or combination thereof), will be refined and modified as necessary to develop the recommended development concept. Therefore, the alternatives presented in this chapter can be considered a beginning point in the development of the recommended concept for the future development of Sedona Airport.

CONSIDERATION OF NON-DEVELOPMENT ALTERNATIVES

In analyzing and comparing the advantages and disadvantages of various development alternatives, it is important to consider the consequences of no future development at Sedona Airport and transferring services to another airport.

NO ACTION ALTERNATIVE

The "no action" alternative essentially considers keeping the airfield in its present condition and not providing for any improvements to existing facilities. The primary result of this alternative, as in any changing air transportation market, would be the eventual inability of the Airport to satisfy the demands of the local service area.

The Airport's aviation demand forecasts and facility requirements call for the potential expansion of aircraft storage hangar capacity, terminal facility space, fueling services, and improved instrument approach capabilities. A policy of "no action" would be considered an irresponsible approach, ignoring not only the long term viability of the Airport and the investment that has been made in it, but also the economic well-being of the region. If facilities are not maintained and improved so that the Airport can provide a pleasant experience to the flying public, then pilots and passengers may consider alternate airport locations. Therefore, the "no action" alternative is not considered as prudent or feasible.

TRANSFER SERVICES TO ANOTHER AIRPORT

Limiting development at Sedona Airport and relying on other airports to serve aviation demand for the local area is an alternative for consideration. As discussed in Chapter One, there are five public-use airports located within 50 nautical miles (nm) of Sedona Airport. Cottonwood Airport is located approximately 14 nm southwest of Sedona Airport and has a primary runway length of 4,252 feet. Flagstaff Pulliam Airport, located 19 nm to the northeast, has a primary runway length of 8,800 feet. Ernest A. Love Field Airport in Prescott, H.A. Clark Memorial Field Airport in Williams, and Payson Airport are each located greater than 30 nm from Sedona Airport. Flagstaff Pulliam Airport is classified as a primary commercial service airport with scheduled airline operations. Cottonwood Airport has a shorter runway length than Sedona, and its pavement strength rating would not support business jet aircraft that regularly utilize Sedona Airport. General aviation users desiring to use any of these airports would have to drive considerable distances in order to reach these public-use airports. The commute may be considered a substantial supplementary expense, especially when Sedona Airport already exists.

Shifting aviation services away from the Airport could hinder the services provided to the City of Sedona and its tourist-driven economy. Furthermore, relocating aviation activities at the Airport would not be a viable option given the amount of federal and state grant funding that Yavapai County has accepted, in addition to matching funds the County/SOCAA has invested to complete recent improvements.

REVIEW OF PREVIOUS MASTER PLAN AND AIRPORT LAYOUT PLAN

The previous Master Plan for Sedona Airport was completed in 1999. The Airport Layout Plan (ALP) was updated and approved by the FAA in 2000. The 1999 Master Plan recommended several airside and landside improvements, including resurfacing Runway 3-21, installation of non-precision approach markers, expansion of the apron, improvements to the vehicle roadway network and parking lots, expanded water storage capacity, and hangar storage capacity expansion. Since the completion of the Master Plan in 1999, the airfield pavements have been rehabilitated, Runway 3-21 was widened to 100 feet, utilities and water storage capacity have been expanded, and the aircraft parking apron has been expanded.

The analysis to follow in this alternatives chapter will revisit the recommendations presented in the previous Master Plan and on the current ALP. Some elements may be carried over to this Master Plan and others may be removed from further consideration.

AIRPORT DEVELOPMENT OBJECTIVES

It is the overall objective of this effort to produce a balanced airport complex to serve forecast aviation demands. Before defining and evaluating specific alternatives, airport devel-

opment objectives should be established. The primary goal of the Master Plan is to define a development concept which allows for the airport to be developed and safely operated for the betterment of the surrounding region and its users. With this in mind, the following development objectives have been defined for this planning effort.

- Conform to FAA and Arizona Department of Transportation – Multimodal Planning Division – Aeronautics Group (ADOT-MPD – Aeronautics Group) design and safety standards for the mix of aircraft that could potentially use the airport during the 20-year planning period of the Master Plan;

- Develop facilities to safely and efficiently serve aviation users and support the potential for future growth;

- Reflect and support, wherever applicable, the long term planning efforts currently applicable to the region;

- Identify any future land acquisition needs;

- Develop a facility with a focus on self-sufficiency and cost recovery; and

- Ensure that any recommended future development is environmentally compatible.

AIRPORT PLANNING CONSIDERATIONS

The development alternatives are categorized into two functional areas: airside and landside. Airside considerations relate to runways, taxiways, navigational aids, etc. and require the greatest commitment of land area to meet the physical layout of the airport, as well as the required airfield safety standards. The design of the airfield also defines the minimum set-back distances from the runway and object clearance standards. These criteria are defined first to ensure that the fundamental needs of the Airport are met. Landside considerations include hangars, aircraft parking aprons, terminal facilities and services, as well as the utilization of remaining airport property to provide revenue support for the Airport and to benefit the economic development and well-being of the regional area.

Each functional area interrelates and affects the development potential of the others. Therefore, all areas must be examined individually, and then coordinated as a whole, to ensure the final plan is functional, efficient, and cost-effective. The total impact of all these factors on the existing airport must be evaluated to determine if the investment in Sedona Airport will meet the needs of the surrounding area, both during and beyond the planning period of this study.

Exhibit 4A presents both the airside and landside planning considerations that will be specifically addressed in this analysis. These issues are the result of the findings of the avia-

AIRSIDE CONSIDERATIONS

- Maintain Runway Design Code (RDC) B-II-5000 FAA design standards
- Relocate/remove obstructions (perimeter security fence; vegetation) and improve RSA to meet FAA design standards
- Establish control of RPZs via acquisition or easements
- Upgrade runway to non-precision markings
- Extend Taxiway A to Runway 3 threshold
- Maintain Taxiway Design Group (TDG) 2 FAA design standards
- Correct taxiway geometry deficiencies



LANDSIDE CONSIDERATIONS

- Locations for expanded aircraft storage hangar capacity
- Terminal facilities expansion
- Consolidated air tour operator facilities
- Locations for revenue support development
- Self-service fuel facility
- Locations for an aircraft wash rack



tion demand forecasts and airport facility requirements evaluations, as well as input from the PAC.

The remainder of this chapter will describe various development alternatives for airside and landside facilities. Although each area is treated separately, ultimate planning will integrate the individual requirements so that they can complement one another.

AIRSIDE DEVELOPMENT CONSIDERATIONS

This section identifies and evaluates various airside development factors at Sedona Airport. Airside facilities are, by nature, the focal point of an 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 options.

AIRPORT DESIGN CRITERIA

Applicable standards for airport design are outlined in FAA Advisory Circular (AC) 150/5300-13A, *Airport Design*. The design of airfield facilities is primarily based on the physical and operational characteristics of aircraft using the airport. As discussed in Chapter Three, the Runway Design Code (RDC) is applied to an airport's runway in order to identify the appropriate design standards for the runway and associated taxiway system. The RDC is made up of the Aircraft Approach Category (AAC), the Airplane Design Group (ADG), and the approach visibility minimums expressed in runway visual range (RVR) values. It relates to the largest and fastest aircraft which conducts 500 or more annual operations at the airport. While this can, at times, be represented by one specific make and model of aircraft, a runway's RDC can also be representative of several different aircraft, which collectively operate frequently at the airport.

The existing RDC for Runway 3-21 is B-II-5000. Analysis in Chapter Two indicated that the RDC at Sedona Airport is planned to remain in B-II, which accommodates all general aviation propeller aircraft, as well as some small and medium sized business jets. Current instrument approach capabilities provide visibility minimums down to 1.5-miles. Should the Airport seek to implement an instrument approach with visibility minimums not lower than ¾-miles, the RDC would be B-II-4000.

SAFETY AREAS

The design of airfield facilities includes both the pavement areas to accommodate landing and ground operations of aircraft, as well as the required 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 safety areas include the runway safety area (RSA), runway ob-

ject free area (OFA), obstacle free zone (OFZ), and runway protection zone (RPZ). As was discussed in the previous chapter, the RSA does not meet FAA grading standards of a maximum -3.0 percent grade off each runway end. The following alternatives, depicted on **Exhibit 4B**, are considered to meet FAA RSA design standards:

1. **Improving the existing RSA with grading and retention wall construction** - This alternative maintains the existing runway length and meets FAA RSA design standards by conducting a grading project at both ends of the runway. This project would require the placement of fill material to bring the grade up to FAA design standards and likely would involve the construction of a retention wall to contain the filled area. This alternative is more desirable since it maintains the existing runway length; however, this alternative would be more expensive as placing the fill and constructing a retention wall would be a significant construction project.

2. **Reducing runway length** – To meet RSA grading standards, this alternative proposes shifting the RSA in to the end of the existing runway blast pads. To provide the full 300 feet of RSA beyond the runway end, each threshold would need to be relocated 175 feet (175-foot runway reduction plus 125 feet of the existing blast pad equals 300-foot RSA beyond runway end). The lost runway pavement would be remarked with chevrons and be added to the existing blast pad. The resulting runway length would be 4,786 feet.

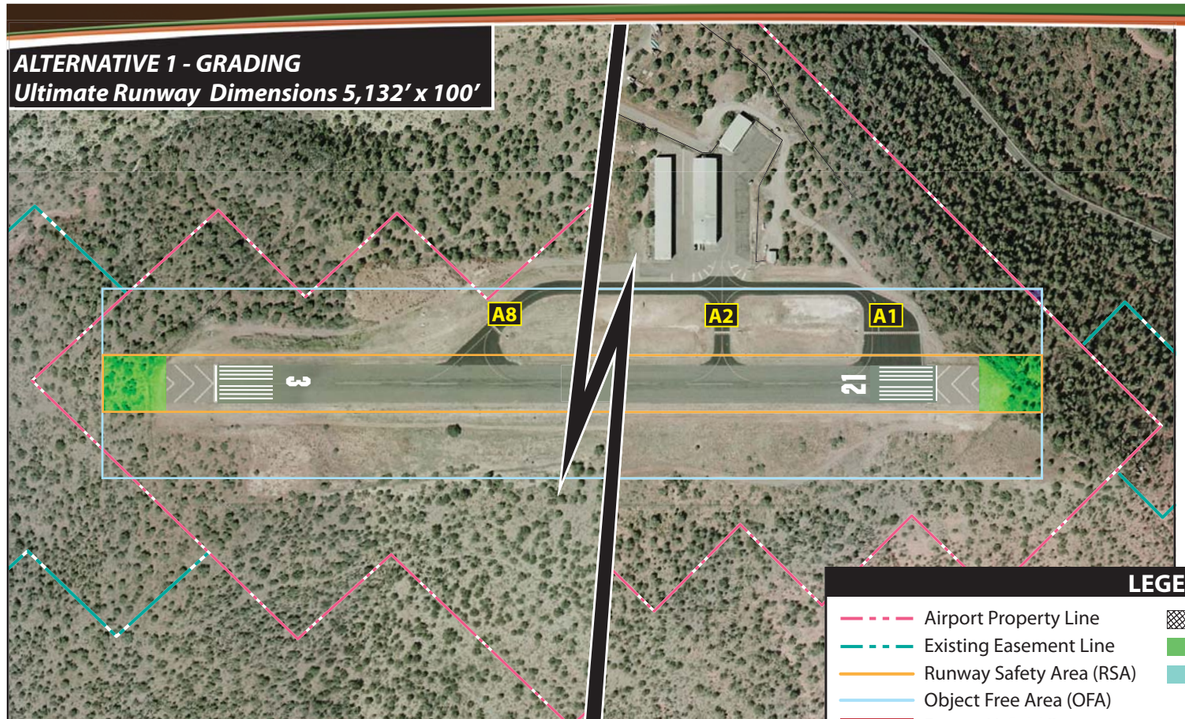
   The runway length analysis conducted in the previous chapter identified the FAA recommended length for 95 percent of small aircraft of 6,200 feet. The existing runway length does not meet this standard and reducing it further would only reduce the Airport's utility to its existing and forecasted users, which include small- and medium-sized business jets. While this alternative satisfies FAA RSA design standards in a cost-effective way (without major construction activities), this alternative also threatens the viability and safety of the Sedona Airport to meet the needs of its existing and forecasted users.

3. **Implementing declared distances** – Declared distances are used by the FAA to define the effective runway length for landing and takeoff when a displaced threshold is involved. The four types of declared distances, as defined in FAA AC 150/5300-13A, *Airport Design,* are as follows:

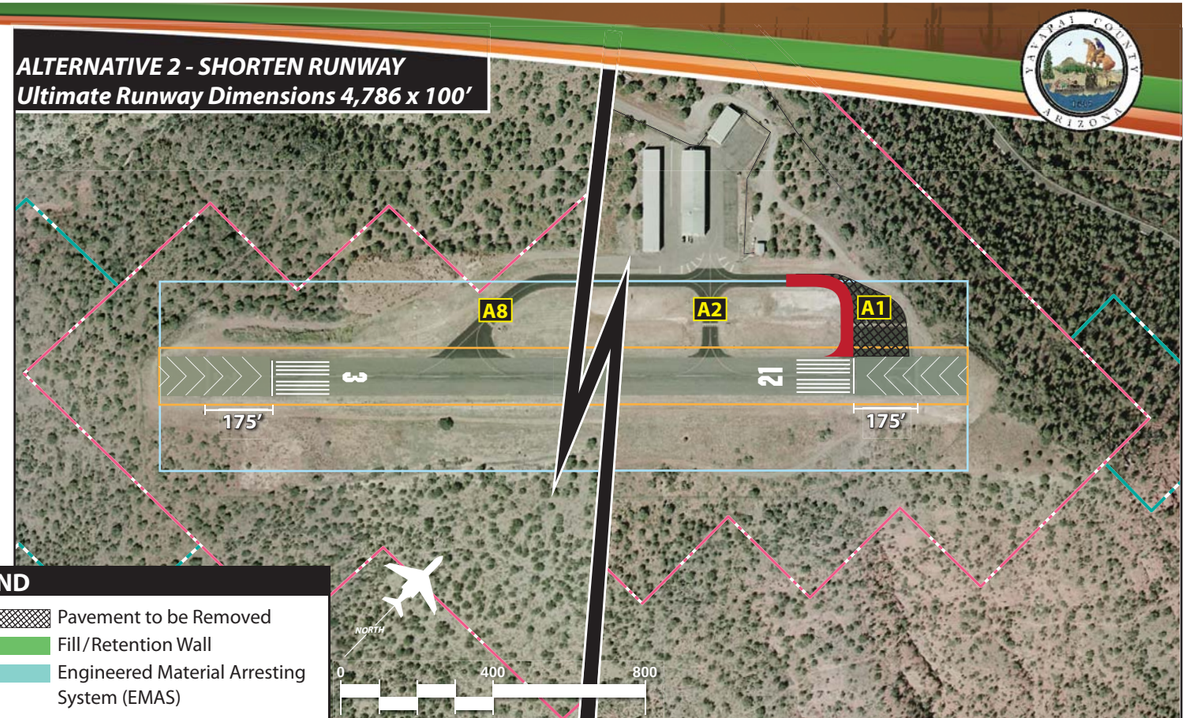
   Takeoff Run Available (TORA) **–** The runway length declared available and suitable for satisfying takeoff run requirements. This declared distance reflects the length of pavement that can handle the weight of an aircraft. TORA does not take into consideration RSA design standards.

   Takeoff Distance Available (TODA) **–** The TORA plus the length of any remaining runway and/or clearway beyond the departure end of the TORA available for satisfying takeoff distance requirements.

ALTERNATIVE 1 - GRADING
Ultimate Runway Dimensions 5,132′ x 100′



ALTERNATIVE 2 - SHORTEN RUNWAY
Ultimate Runway Dimensions 4,786 x 100′



LEGEND

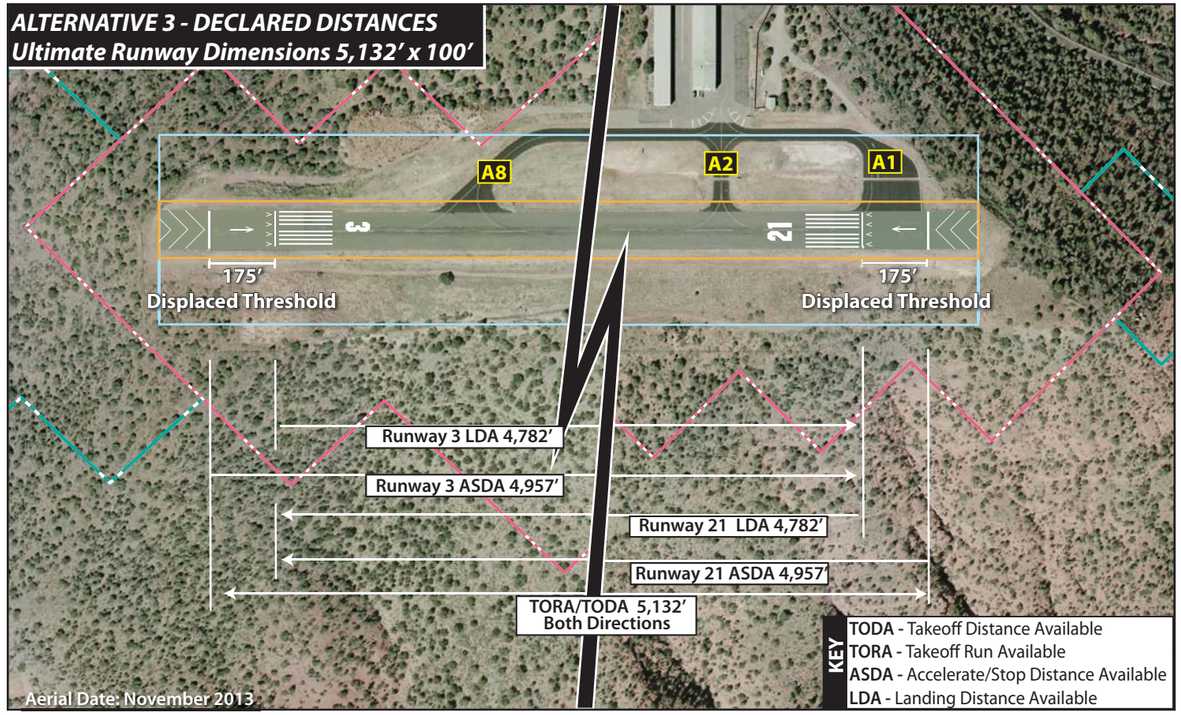
- Airport Property Line
- Existing Easement Line
- Runway Safety Area (RSA)
- Object Free Area (OFA)
- Future Airfield Pavement
- Pavement to be Removed
- Fill/Retention Wall
- Engineered Material Arresting System (EMAS)

NORTH

0 400 800

SCALE IN FEET

ALTERNATIVE 3 - DECLARED DISTANCES
Ultimate Runway Dimensions 5,132′ x 100′



KEY

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

Aerial Date: November 2013

ALTERNATIVE 4 - EMAS
Ultimate Runway Dimensions 4,992′ x 100′

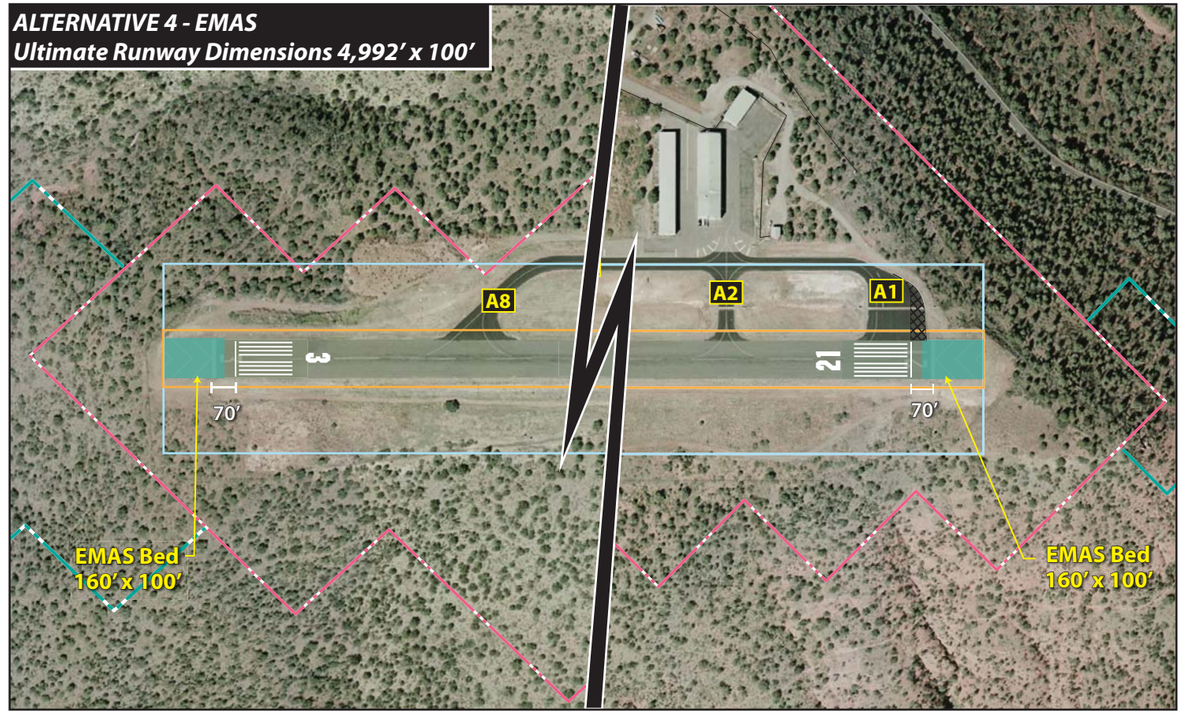


Exhibit 4B
RUNWAY SAFETY AREA ALTERNATIVES

Accelerate-Stop Distance Available (ASDA) **–** The runway declared available for the acceleration and deceleration of an aircraft aborting a takeoff. ASDA takes into consideration RSA standards, thereby improving safety margins for users.

Landing Distance Available (LDA) **–** The runway length declared available and suitable for landing taking into account the RSA standard.

Proposed TORA and TODA at the Sedona Airport are equal to the actual pavement length and do not take into consideration the RSA. The more critical of the declared distances are ASDA and LDA as these lengths take into account the RSA.

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.

LDA 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 overrun the runway. ASDA and LDA take into account the RSA and reduce takeoff and landing distances to reflect approach or departure RSA.

To bring the RSA within proper grades, its boundary needs to be shifted in to the end of the runway blast pads on both ends of the runway. To provide 300 feet of RSA prior to the landing threshold, both runway thresholds would need to be displaced by 175 feet, accounting for 125 feet of the existing blast pad. The displaced pavement could still be used for takeoff operations but not for landing operations. To calculate the resulting ASDA lengths, the existing runway length of 5,132 is reduced by 175 feet to account for providing 300 feet of RSA beyond the runway. Therefore, the ASDA for both runway ends would be 4,957 feet. Calculating the resulting LDA, the existing runway length of 5,132 is reduced by 175 feet to account for 300 feet of RSA prior to the landing threshold and an additional 175 feet to account for 300 feet of RSA beyond the runway end. Therefore, the LDA for both runways would be 4,782 feet.

Like Alternative 2, this alternative meets FAA RSA design standards without major construction activities; however, reducing the amount of runway available for use will be detrimental to the existing and forecasted users of the Airport.

4. **Installation of engineered material arresting system (EMAS) beds at each runway end** – As described in FAA AC 150/5200-22b, *Engineered Materials Arresting Systems (EMAS) for Aircraft Overruns*, EMAS 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 af-

fect the predictability of deceleration forces. EMAS is located beyond the runway end and centered on the extended runway centerline. It is usually set back from the runway threshold to avoid damage due to jet blast and undershoots. The design of the EMAS bed length is typically based upon the aircraft using the runway that imposes the greatest demand upon the EMAS (the heaviest/largest aircraft). The minimum width of the EMAS bed must be the width of the runway (100 feet at Sedona Airport).

The ultimate design aircraft identified in Chapter Two is the Cessna Citation II, which has a maximum takeoff weight of 15,100 pounds. The EMAS advisory circular provides for bed length planning charts for various aircraft, the smallest of which is the Bombardier CRJ-200 aircraft that has a gross weight of 53,000 pounds. The planning chart for the CRJ-200 identifies a minimum EMAS bed length of approximately 160 feet. Therefore, for planning purposes only, it is assumed that an EMAS bed length of 160 feet will be sufficient to stop the lighter Cessna Citation II aircraft. Specific design and construction of an EMAS bed at Sedona Airport will require field or laboratory testing so the 160-foot EMAS bed length is considered strictly for planning purposes only.

Due to the sloping terrain off each runway end, the EMAS beds are planned to be located at the end of the runway blast pads to limit the amount of grading work that would need to be conducted. The 160-foot EMAS bed along with a 35-foot setback would result in a need to relocate the runway ends by 195 feet from the end of the blast pad (125 feet of blast pad and 70 feet of existing runway pavement). This results in an ultimate runway length of 4,992 feet.

Again, due to the terrain constraints, construction of EMAS in this alternative will result in a reduction of runway length, which would be detrimental to existing and ultimate users of the Airport. Furthermore, once the EMAS bed is installed, the Airport will be responsible for inspecting and maintaining it over its service life. This will involve hiring or training existing personnel to conduct these inspections and preventative maintenance. The Airport also has the option to hire the EMAS manufacturer to maintain the EMAS bed. In either case, costs associated with maintaining the EMAS bed need to be factored in as well. If an aircraft should overrun or undershoot the runway, typically the aircraft owner is held responsible for repair costs of the EMAS bed. EMAS could be considered to have the largest service-life costs compared to the other alternatives when factoring in initial construction and inspection/maintenance costs over the anticipated service life of the EMAS bed.

PERIMETER SECURITY FENCE AND VEGETATION OBSTRUCTIONS

As was detailed in the previous chapter, the RSA and OFA are obstructed by the perimeter security fence and overgrown vegetation. Where possible, the perimeter fence should be relocated outside of the RSA and OFA and all vegetation within the RSA and OFA should be removed.

In addition, due to a previous error in the Airport's boundary survey, the perimeter security fence was constructed outside of the Airport's actual western boundary. To correct this, alternatives considered relocating the perimeter security fence within the existing Airport boundary or acquiring the property from the United States Forest Service (USFS) between the Airport boundary and the fence line. The total amount of property that would need to be acquired is approximately 11.3 acres.

Exhibit 4C depicts the locations where the perimeter security fence should be relocated outside of the OFA and the alternatives for the fence line along the Airport's west boundary.

RUNWAY PROTECTION ZONE

The RPZs for each runway end should be considered individually. The FAA recommends that the airport have ownership control of the RPZ lands where feasible. If outright ownership is not feasible, then easements are acceptable. Easements in the RPZ should allow the airport to positively limit the height of structures. A third option for protection of the RPZs that extend beyond airport property is implementation of strict land use zoning that, at a minimum, prohibits residential development that could serve as a congregating point for people and restricts structure heights.

Since the land beyond each runway end is controlled by the USFS, the likelihood of incompatible development is slim. However, control should still be sought by the Airport to protect the RPZs. The simplest method for establishing control of land encompassed by the RPZs would be to acquire an avigation easement from the USFS. The Airport already has clear zone easements for portions of the Runway 3 and 21 RPZs, so this alternative would consider an expansion of those existing easements with the USFS. An avigation easement typically grants the airport sponsor a perpetual and exclusive easement to utilize the airspace above the property for aviation purposes. If full ownership control of the property is desired, the airport sponsor could consider purchasing the land from the USFS outright; however, this may be considerably more expensive and controversial depending on the stance of the USFS. Discussions with the USFS may be necessary to establish the most feasible method to protect and control Sedona Airport's RPZs.

The existing not lower than 1-mile visibility RPZs encompass 13.77 acres of land. Airport Road, the public-use Airport access road, passes through the Runway 21 RPZ. Given the physical land constraints within this area, there is no feasible alternative to relocating the road outside the RPZ. Implementing lower visibility minimums to Runway 21 would result in a larger RPZ. This would result in residential developments north of the Airport being located within the RPZ. Since residential development is not a compatible use within an RPZ, improved instrument approach capabilities will not be considered for Runway 21.

On the opposite end of the airfield, Runway 3 has no incompatible developments within or in the vicinity of the RPZ. Therefore, consideration will be given to improved instrument approach capabilities (down to ¾-mile visibility minimums) to Runway 3. As was previ-

ously discussed in Chapter Three, any modifications to the existing RPZs will require further review and approval by the FAA.

RUNWAY MARKINGS

Runway 3-21 is currently equipped with basic runway markings, including the runway designation, centerline, and aiming points. With instrument approach procedures to Runway 3, the FAA recommends non-precision markings be implemented. Upgrading to non-precision markings requires the addition of threshold markings and edge markings. Non-precision runway markings are depicted on **Exhibit 4C**.

TAXIWAYS

Taxiways are the primary transport surface linked with the runway and its operations. Such surfaces include parallel taxiways, entrance/exit taxiways, and connecting taxiways. Currently, Taxiway A, the parallel taxiway, does not connect to the Runway 3 threshold. Aircraft must back-taxi to the Runway 3 end in order to utilize the full runway length for takeoff. The FAA recommends runways with instrument approach capabilities be equipped with a full-length parallel taxiway leading to each runway end to improve operational safety and efficiency. Therefore, the alternatives consider the extension of Taxiway A to the Runway 3 threshold, as depicted on **Exhibit 4C**.

AC 150/5300-13A instituted new design standards for taxiways, most of which were enacted to mitigate the potential for runway incursion events. Changes were also aimed at improving pilot situational awareness. One of these standards recommends the avoidance of direct aircraft access between a parking apron and a runway. Currently, Taxiways A2, A3, A4, A5, A6, and A7 provide direct access to the runway from apron areas. The alternatives analysis proposes installing elevated and/or in-pavement runway guard lights, which will maintain airfield efficiency and improve situational awareness. Runway guard lights can be installed at runway/taxiway intersections and are primarily used to enhance the awareness of the intersection. They consist of a pair of elevated flashing yellow lights (wig-wags) installed on either side of a taxiway and can also include a row of in-pavement yellow lights installed across the entire taxiway. Both are typically located at the runway hold line position.

At a minimum, these elevated and in-pavement runway guard lights should be implemented on those taxiways that provide direct access from an aircraft parking apron to Runway 3-21 as mentioned above. Furthermore, elevated runway guard lighting could be installed on all entrance/exit taxiways to enhance overall safety and situational awareness on the airfield. These proposed improvements are depicted on **Exhibit 4C**.

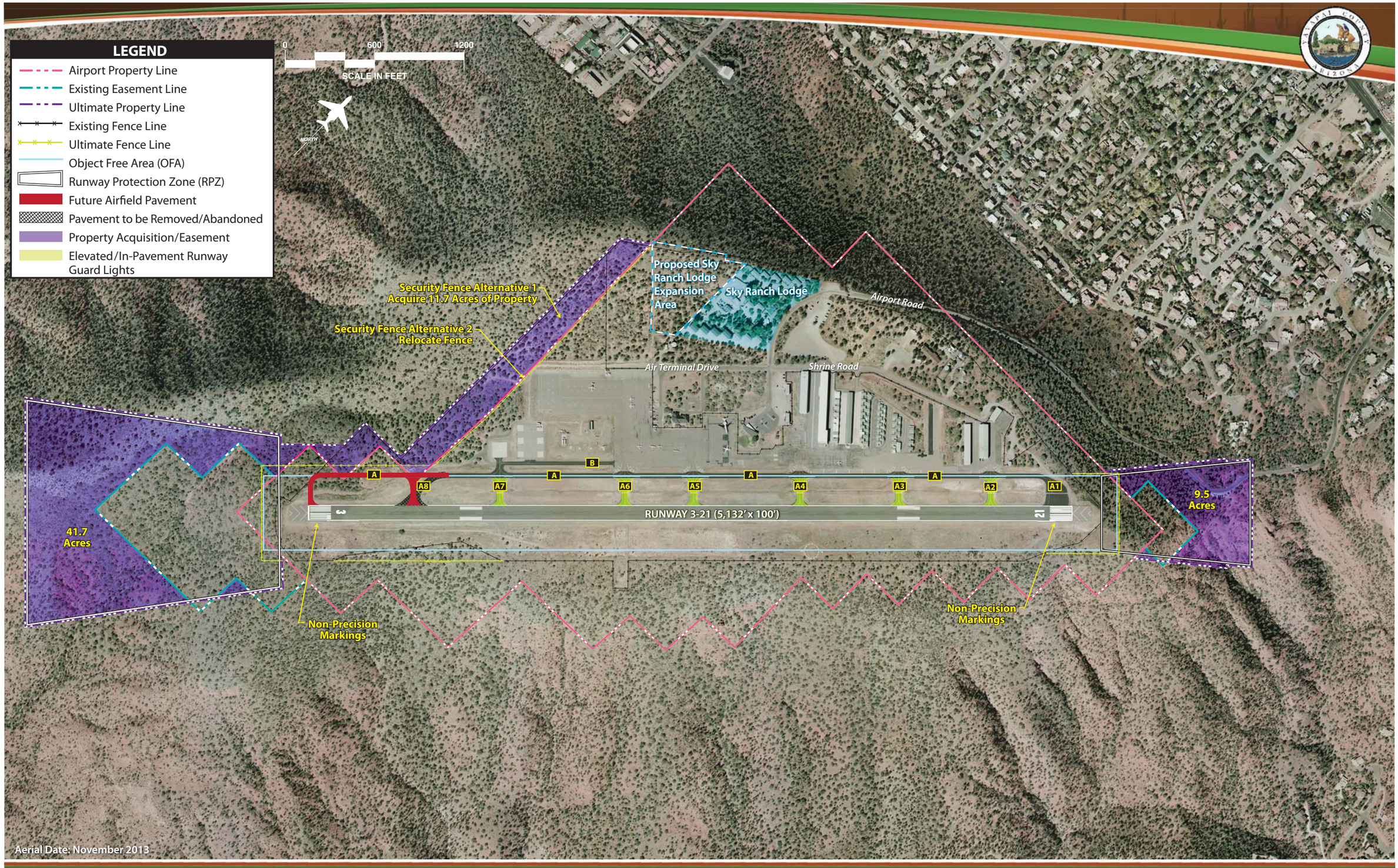


Exhibit 4C
AIRSIDE ALTERNATIVES

LANDSIDE DEVELOPMENT CONSIDERATIONS

Generally, landside issues are related to those airport facilities necessary, or desired, for the safe and efficient parking and storage of aircraft, movement of passengers and pilots to and from aircraft, and overall revenue support functions. Landside planning considerations are summarized on **Exhibit 4A**.

AIRCRAFT HANGAR DEVELOPMENT

Landside alternatives to follow will consider the construction of additional aircraft hangars at Sedona Airport. Hangar development takes on a variety of sizes corresponding with several different uses.

The facilities associated with general aviation businesses and corporations with company-owned aircraft include conventional and executive type hangars which are capable of storing multiple aircraft. High levels of activity often characterize these operations, with a need for apron space for the storage and circulation of aircraft. These facilities are best placed along ample apron frontage with good visibility from the runway system. Utility services are needed for these types of facilities, as well as automobile parking areas.

Aircraft hangars used for the storage of smaller aircraft primarily involve T-hangars or linear box hangars. Since storage hangars often have lower levels of activity, these types of facilities can be located away from the primary apron areas in more remote locations of the airport. Limited utility services are needed for these areas.

AIRPORT TERMINAL FACILITY

A terminal facility is often the first impression air travelers have of the area. A functional and attractive terminal facility can be needed to secure and build air travelers' favorable opinion of the surrounding area, particularly business leaders who may be investing in communities adjacent to the airport. Sedona Airport's 4,263 square-foot terminal building was constructed in 1991 and provides office space for the Airport's FBO and Sedona-Oak Creek Airport Authority (SOCAA) employees. There is also a passenger lobby and conference room and space leased to one of the Airport's aerial tour operators. Over time as itinerant passengers increase, additional terminal space may need to be added.

Currently, the aerial tour operators occupy two modular facilities on the Airport. As activity increases, it may be more convenient to consolidate the tour operators into the terminal building or construct a separate aerial tour operator terminal. Being one of the biggest draws of tourists to the Airport, having the tour operators in a new, attractive facility could help increase business and give a better impression of the Airport as a whole.

BUILDING RESTRICTION LINE

The building restriction line (BRL) identifies suitable building area locations on the airport. The BRL encompasses the RPZs, the OFA, navigational aid critical areas, areas required for terminal instrument procedures, and other areas necessary for meeting airport line-of-sight criteria.

Two primary factors contribute to the determination of the BRL: type of runway (utility or other-than-utility) and the capability of the instrument approaches. Runway 3-21 is considered a "nonprecision instrument" runway with visibility minimums down to 1.5-miles.

The BRL is the product of CFR Part 77 transitional surface clearance requirements. These requirements stipulate that no object be located in the primary surface, defined as being no closer than 125 feet from a visual runway centerline and not closer than 250 feet to a runway served by a non-precision instrument approach (visibility minimums not lower than ¾-mile). From the primary surface, the transitional surface extends outward at a slope of one vertical foot to every seven horizontal feet. For Runway 3-21, the 30-foot BRL is set at 460 feet from the runway centerline.

FUEL STORAGE FACILITIES

The existing fuel farm at Sedona Airport consists of two 10,000-gallon aboveground tanks, one each for AvGas and Jet A fuel. Over the 20-year planning period of the Master Plan, it is anticipated that additional Jet A fuel storage capacity may be needed. In addition, the existing fuel farm is not equipped with a fuel spillage containment system. Due to the existing fuel farm's location along the flightline, alternatives will consider relocating the fuel farm to allow for expansion of other facilities that may be better suited for the location, such as apron space or hangar development. In addition, alternatives will consider the possibility of installing a self-service fuel facility for added convenience to general aviation users.

AIRCRAFT WASH RACK

Consideration should be given to developing an aircraft wash rack to provide a suitable area for washing aircraft. This location would be equipped with proper disposal systems for aircraft cleaning fluids. Ideally, this facility should be located in an easily accessible, centralized location where existing utilities are present or easily expanded.

LANDSIDE ALTERNATIVES

Three landside alternatives have been developed and are presented in the following section. These alternatives are not the only options for development. In some cases, a portion of one alternative could be intermixed with another. Also, some development concepts could be replaced with others. The final recommended plan only serves as a guide for the Airport. Many times, airport operators change their plan to meet the need of specific users.

The goal in analyzing landside alternatives is to focus future development so that airport property can be maximized.

Landside Alternative 1

Landside Alternative 1, as depicted on **Exhibit 4D**, proposes an expansion of the terminal facility of 4,500 square feet. In this scenario, the air tour operators could relocate their services into the terminal building. An expansion of the adjacent terminal parking lot, which is already in the design phase, would accommodate future passengers and air tour operator customers.

Hangar/aviation-related development parcels are identified immediately north of the terminal building (two parcels at 0.5 acres each). These parcels could be developed by an FBO or specialty operator with hangars that would be accessible to the airfield by extending apron pavement to the northwest from the large aircraft parking area. Additional hangar/aviation-related development parcels are identified on the west side of the airport (5.6 total acres). These parcels have direct access to the airfield via a proposed taxilane that would extend to the northwest from the existing apron. Tenants of the 2.6-acre parcel would be required to access its facilities by passing through a secured gate since no public access road would be available.

This alternative proposes expanding the apron to the south and constructing six more helicopter parking spaces along Taxiway B. The additional helicopter parking spaces can be cross-utilized by the air tour operators as well as by the aerial firefighting helicopters during firefighting season. The fuel farm and maintenance storage facility would need to be relocated in this scenario to a location along Air Terminal Drive.

Additional hangar development is proposed to occur in the vicinity of the existing hangar facilities along Shrine Road. An additional 28,600 square feet of executive hangar space and 34 new T-hangar units are proposed.

An aircraft wash rack is proposed in this alternative to be located in the north corner of Ramp A.

This alternative assumes the perimeter fence line would be relocated to within the existing Airport property boundary and that no new property would be acquired west of the Airport.

Landside Alternative 2

Exhibit 4E depicts Landside Alternative 2. This alternative is similar to what is proposed in the previous Master Plan. This alternative assumes property will be acquired on the west side of the Airport to where the existing perimeter security fence is located. Acquiring this property will allow for more expanded landside facilities in this area.

This alternative proposes extending Air Terminal Drive to the west where it would provide public vehicle access to two hangar/aviation-related development parcels totaling 1.4 acres. These parcels could be developed by an FBO or specialty operator with hangars that would have direct access to the airfield via an extended taxiway from Taxiway B and the existing apron. Helicopter parking would also be expanded in this area, with six new parking positions to accommodate both air tour operators and aerial firefighting activities. The apron would be expanded as well north of Taxiway B to provide additional movement area and parking adjacent to a new T-hangar facility that would provide 19 new storage units. Three mid-sized (5,625 square feet) executive hangars are proposed adjacent to the terminal building. A disadvantage of extending Air Terminal Drive to the west is that it would not allow for further aviation development to the north. However, with the proposed expansion of the Sky Ranch Lodge, having aviation-related development in that area may be detrimental to the Sky Ranch Lodge, which markets its scenic setting and views. Therefore, the 10.25 acres of land west of Air Terminal Drive could be reserved for other revenue support developments that would not need direct airfield access that may be more compatible with the Sky Ranch Lodge.

In this scenario, the aerial tour operators would not relocate to the existing terminal, instead moving to a new 10,000 square foot aerial tour operator terminal/hangar located adjacent to Hangars A and B. Two more mid-size executive hangars are planned in the vacant lot between the restaurant and the terminal building. An expansion of the existing apron to these hangars would provide access to the airfield and a location for the relocated fuel farm with a self-service fuel facility, an aircraft wash rack, and maintenance facility. Six additional mid-sized executive hangars are proposed on either side of existing Taxilane B7.

Landside Alternative 3

Landside Alternative 3, as depicted on **Exhibit 4F**, again assumes the Airport will acquire the property between the perimeter security fence and the current Airport western border. This alternative proposes no expansion of the existing terminal building and would rely on a new 9,000 square foot aerial tour operator terminal located immediately adjacent to the existing terminal at the north end of Ramp A. This new terminal would have direct access to the airfield so it could include hangar facilities as well. The 2.3-acre vacant lot between the terminal and the restaurant is identified for revenue support development for a tenant or operator that does not need airfield access.

Air Terminal Drive is again extended in this alternative but to the northwest where it would provide public access to five hangar/aviation-related development parcels totaling 1.15 acres. Taxilanes would be constructed to the northwest to provide access to the parcels and four new T-hangar facilities providing 52 total storage units. Three new large aircraft parking positions are planned adjacent to the existing maintenance facility and fuel farm along with expanded apron for a self-service fuel facility. Six new helicopter parking positions to accommodate expanded air tour and aerial firefighting activities are planned northwest of the helipad with a connecting taxiway.

LEGEND

- Airport Property Line
- Perimeter Security Fence
- Hangar/Aviation Related Development
- Ultimate Airport Maintenance
- Ultimate Airfield Pavement
- Ultimate Parking
- Ultimate Building
- To Be Removed
- 30' Building Restriction Line (BRL)

0 300 600
SCALE IN FEET

NORTH

Proposed Sky Ranch Lodge Expansion Area

Sky Ranch Lodge

Airport Road

Fuel Farm and Maintenance Storage

0.3 Acres

2.6 Acres

0.6 Acres

0.6 Acres

0.6 Acres

0.6 Acres

0.6 Acres

Aircraft Wash Rack

Air Terminal Drive

0.5 Acres

0.5 Acres

Shrine Road

34 T-Hangar Units

To Be Relocated

Expanded Air Tour/ Aerial Firefighting Helicopter Parking

Terminal Expansion (4,500 sq ft)

Executive Hangar (10,000 sq ft)

Executive Hangar (18,600 sq ft)

BRL

BRL

BRL

460'

D E F G H I J K L

A A A

A8 A7 A6 A5 A4 A3 A2 A1

B

RUNWAY 3-21 (5,132' X 100')

21

Exhibit 4D
LANDSIDE ALTERNATIVE 1

LEGEND

- Airport Property Line
- Ultimate Property Line
- Perimeter Security Fence
- Revenue Support
- Hangar/Aviation Related Development
- Ultimate Airfield Pavement
- Ultimate Airport Maintenance
- Ultimate Road/Parking
- Ultimate Building
- To Be Removed
- 30' Building Restriction Line (BRL)

0 300 600
SCALE IN FEET

NORTH

10.25 Acres

Proposed Sky Ranch Lodge Expansion Area

Sky Ranch Lodge

Airport Road

Fuel Farm

Aircraft Wash Rack

Maintenance Storage

Executive Hangars (5,625 sf units)

T-Hangars 19 units

Air Terminal Drive

Self-Serve Fuel Facility

0.3 Acres

Shrine Road

Executive Hangars (5,625 sf units)

0.7 Acres

0.7 Acres

To Be Relocated

Executive Hangars (5,625 sf units)

Expanded Air Tour/ Aerial Firefighting Helicopter Parking

BRL

BRL

BRL

To Be Removed

Aerial Tour Operator Terminal/Hangar (10,000 sf)

D E F G H I K L

B

A

A8 A7 A6 A5 A4 A3 A2 A1

460'

RUNWAY 3-21 (5,132' X 100')

Exhibit 4E
LANDSIDE ALTERNATIVE 2

LEGEND

- Airport Property Line
- Ultimate Property Line
- Perimeter Security Fence
- Hangar/Aviation Related Development
- Revenue Support
- Ultimate Airfield Pavement
- Ultimate Road/Parking
- Ultimate Building
- To Be Removed
- 30' Building Restriction Line (BRL)

0 300 600
SCALE IN FEET

NORTH

Proposed Sky Ranch Lodge Expansion Area

Sky Ranch Lodge

Airport Road

T-Hangars 52 units

0.23 Acres
0.23 Acres
0.23 Acres
0.23 Acres
0.23 Acres

Executive Hangars (14,000 sf)

To Be Removed

Air Terminal Drive

Shrine Road

Expanded Air Tour/ Aerial Firefighting Helicopter Parking

Aerial Tour Operator Terminal/Hangar (9,000 sf)

2.3 Acres

Self-Service Fuel Facility

Fuel Farm to be Expanded in Current Location

Aircraft Wash Rack

0.3 Acres
0.3 Acres

Large Aircraft Parking

BRL

460'

RUNWAY 3-21 (5,132' X 100')

Exhibit 4F
LANDSIDE ALTERNATIVE 3

The existing modular facilities utilized by the aerial tour operators would be removed in this alternative to make way for a new 14,000 square foot executive hangar along with new taxilane pavement. Two additional 0.3-acre parcels are proposed at Taxilane B7 for new executive hangar construction or FBO/specialty operator development.

An aircraft wash rack is proposed in this alternative immediately to the east of the Mesa Grill restaurant, where it would be accessible via Ramp B.

SUMMARY

The development alternatives considered in this chapter provide a vision for future development at Sedona Airport through the long term planning period of this Master Plan. A detailed analysis of facility requirements was utilized in assessing the airside and landside alternatives.

After review and input from the PAC, Yavapai County officials, and the SOCAA, a recommended development concept will be put forth by the consultant. The resultant plan will represent an airside facility that fulfills safety design standards and a landside complex that can be developed as demand dictates.

The development plan for Sedona Airport must represent a means by which the Airport can evolve in a balanced manner to accommodate the forecast demand. In addition, the plan must provide flexibility to meet activity growth beyond the long range planning horizon.



Chapter Five

RECOMMENDED MASTER PLAN CONCEPT

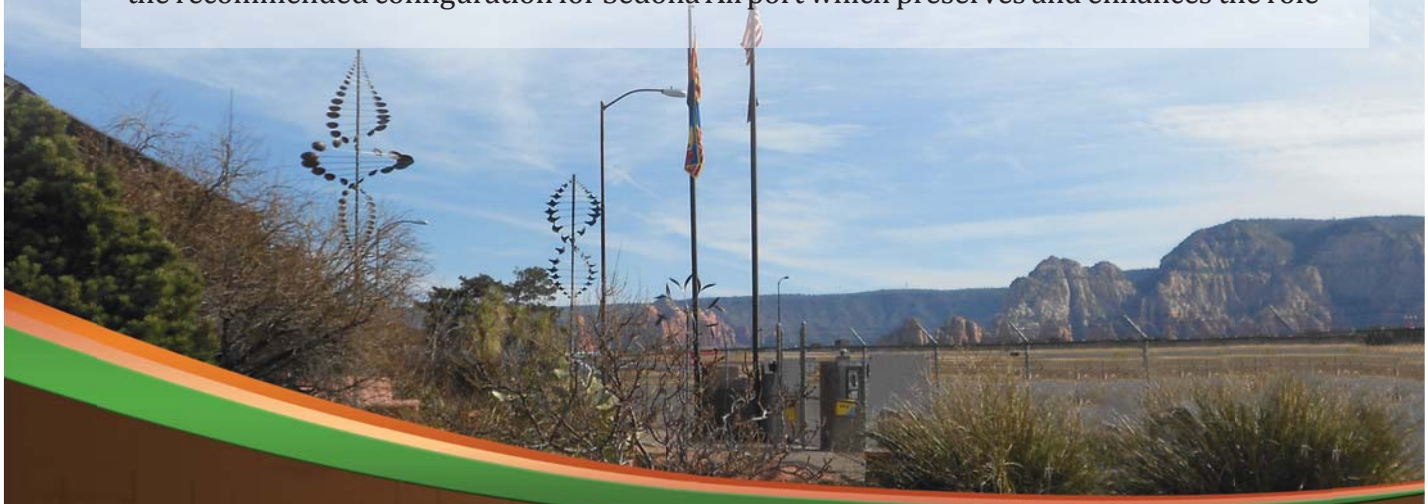
Chapter Five

RECOMMENDED MASTER PLAN CONCEPT

The Airport Master Plan for Sedona Airport (Airport) has evolved through the development of forecasts for future demand, an assessment of future facility needs, and an evaluation of airport development alternatives to meet those future facility needs. The planning process has included the development of draft phase reports. These phase reports have been presented to the Planning Advisory Committee (PAC), which is comprised of representatives from Yavapai County (County), Sedona-Oak Creek Airport Authority (SOCAA), Airport tenants, the City of Sedona, local residents, Federal Aviation Administration (FAA), Arizona Department of Transportation (ADOT), and various interest groups. A presentation to the Sedona Airport Board of Directors has also been made to inform and update its members. These diverse groups have provided extremely valuable input into the Master Plan. Additionally, Public Information Workshops have been conducted as a part of this planning process providing the general public an opportunity to be involved and educated about the study.

In the previous chapter, several alternatives were considered and evaluated for the potential future development of airside and landside facilities at the airport. Each alternative offered a differing approach to facility development, and the layouts were presented for the purposes of evaluation. The alternatives have been refined into a single development concept for the Master Plan. This chapter describes narratively and graphically the recommended direction for the future use and development of Sedona Airport.

The recommended Master Plan development concept, as shown on **Exhibit 5A**, presents the recommended configuration for Sedona Airport which preserves and enhances the role



of the Airport while meeting FAA design standards to the extent practicable. A phased program to achieve the recommended Master Plan development concept is presented in Chapter Six. When assessing development needs, this study has separated the Airport into airside and landside functional areas. The following sub-sections describe the Master Plan Concept in detail.

One of the objectives of the Master Plan is to equip decision-makers with the ability to either accelerate or slow development goals based on actual demand. If demand slows, development of the Airport beyond routine airport safety and maintenance could be minimized. If aviation demand accelerates, development could be expedited.

AIRSIDE DEVELOPMENT CONCEPT

The airside plan generally considers those improvements related to the runway and taxiway system and often requires the greatest commitment of land area to meet the physical layout of the airport. Operational activity at Sedona Airport is anticipated to grow modestly through the 20-year planning horizon of this Master Plan study, and the Airport is projected to continue serving the full range of general aviation aircraft operations. The Master Plan does not anticipate the establishment of scheduled commercial operations at the Airport.

RUNWAY CONFIGURATION AND PAVEMENT STRENGTH

Sedona Airport is served by a single runway. Runway 3-21 is 5,132 feet long by 100 feet wide and is capable of handling the full array of aircraft in the general aviation fleet mix. Analysis in Chapter Three concluded that the existing runway dimensions are capable of accommodating a variety of business jet aircraft; however, additional runway length would make the Airport more accessible to heavier mid- and large-size business jet aircraft. Ultimately, an extension of the runway is infeasible due to the Airport's location on a mesa with significant sloping terrain off each runway end. Providing the proper grading as well as the additional land to allow for a runway extension would be cost prohibitive and could possibly result in potentially significant environmental impacts on the surrounding community. Therefore, the runway dimensions are to remain unchanged from their current configuration as represented on **Exhibit 5A**.

Runway 3-21 is strength rated at 15,000 pounds single wheel loading (SWL) and 30,000 pounds dual wheel loading (DWL). The FAA allows aircraft to operate at the Airport with gross weights in excess of these strength ratings; however, more frequent use by heavier aircraft can result in more rapid deterioration of runway pavement. The Master Plan anticipates only limited use by aircraft weighing more than the existing pavement strength; therefore, Runway 3-21 should be maintained at its current strength rating.

0 600 1200
SCALE IN FEET
NORTH
Aerial Date: November 2013

Greater than 3/4 Mile Visibility Runway Protection Zone
One-Mile or Greater Visibility Runway Protection Zone
Fill/Grade RSA
Realigned Perimeter Fence
Proposed Sky Ranch Lodge Expansion Area
Sky Ranch Lodge
Airport Road
Masons Lodge Building 1.3 Acre Leasehold
Air Terminal Drive
Shrine Road
28.2 Acres
0.1 Acres
0.1 Acres
0.16 Acres
2.6 Acres
BRL
A10 A9 A8 A7 A6 A5 A5 A4 A4 A3 A3 A2 A2 A1
1,000′
830′
460′
RUNWAY 3-21 (5,132′ x 100′)
3
21
Ultimate Non-Precision Markings
Ultimate Non-Precision Markings
Fill/Grade RSA
One-Mile or Greater Visibility Runway Protection Zone
8.0 Acres

0 400 800
SCALE IN FEET
Proposed Sky Ranch Lodge Expansion Area
4.6 Acres
Sky Ranch Lodge
6.1 Acres
Airport Road
Masons Lodge Building 1.3 Acre Leasehold
Fire Suppression System Expansion (Additional 160,000 gallons of water storage capacity and fire pump)
12.9 Acres
Shrine Road Realignment
2.3 Acres
3.0 Acres
2.8 Acres
Air Terminal Drive
Shrine Road
Maintenance Equipment Storage
0.3 Acres
Fuel Farm Relocation
2.4 Acres
Executive Hangars (8,250 sf)
6.5 Acres
0.9 Acres
Expanded Aircraft/ Helicopter Parking (14,400 sq yds)
Terminal Parking Expansion (Additional 44 spaces)
4,500 sf Terminal Expansion
Restaurant Septic Drain Field
BRL

LEGEND

- Airport Property Line
- Existing Easement Line
- Existing Fence Line
- Ultimate Fence Line
- Runway Safety Area (RSA)
- Object Free Area (OFA)
- Runway Protection Zone (RPZ)
- 30′ Building Restriction Line (BRL)
- Future Airfield Pavement
- Future Road/Parking
- Pavement to be Removed/Abandoned
- Hangar/Aviation-Related Development
- Non-Aviation Revenue Support
- Future Property Easement
- A Taxiway Designation
- A Ultimate Taxiway Designation

Exhibit 5A
RECOMMENDED DEVELOPMENT CONCEPT

RUNWAY DIMENSIONAL STANDARDS

The FAA has established design criteria to define the physical dimensions of the runways and taxiways, as well as the imaginary surfaces surrounding them which protect the safe operation of aircraft at airports. These design standards also define the criteria for the placement of landside facilities.

As discussed previously, the design criteria for airside development primarily relates to an airport's critical design aircraft. The critical design aircraft is the most demanding aircraft or family of aircraft which currently, or are projected to, conduct 500 or more itinerant operations (takeoffs or landings) per year at an airport. Airport design factors include an aircraft's wingspan, approach speed, tail height, and, in some cases, the instrument approach visibility minimums for each runway. The FAA has established the Runway Design Code (RDC) to relate these design aircraft factors to airfield design standards. The highest RDC is also considered the overall Airport Reference Code (ARC) for an airport.

Analysis in previous chapters concluded that the current and ultimate RDC for Runway 3-21 falls in the B-II category. The safety areas associated with this design category include the runway safety area (RSA), runway object free area (ROFA), obstacle free zone (OFZ), and the runway protection zone (RPZ). Currently, the RSA and ROFA do not meet design standards due to obstructions including the perimeter security fence and overgrown vegetation. In addition, the RSA does not meet grading standards off each runway end.

RSA Grade Improvements

Several alternatives to meet FAA's grading design standards for the RSA (maximum -3.0 percent grade) were considered in the previous chapter including:

1. Fill and grading the areas that do not meet grade. This alternative does not impact the runway dimensions, maintaining the existing length of 5,132 feet. Depending upon the final design, it appears this alternative can be constructed entirely on existing Airport property.
2. Reduce runway length to shift the RSA off of the ground that exceeds grading standards. The resulting runway length provided in this alternative was 4,786 feet.
3. Displace the runway thresholds and implement declared distances to shift the RSA off of ground exceeding grading standards. The resulting landing distance provided by this alternative is 4,782 feet and the available takeoff distance provided, accounting for RSA dimensions, is 4,957 feet.
4. Installation of engineered material arresting system (EMAS) beds at each runway end to reduce the length of the RSA beyond the runway end.

As was discussed in Chapter Three, the existing runway length is adequate to serve existing piston aircraft and most turbine/business jet aircraft; however, any reduction in available runway length would result in increased weight restrictions on many jet aircraft and limit the range of aircraft operating from the Airport. A reduction in traffic will result in less fuel

sales making it more difficult to remain financially self-sufficient. Discussions with the PAC determined that any alternative which reduces available runway length would be inadequate. Therefore, Alternatives 2 and 3 were eliminated from consideration. The EMAS alternative was also eliminated from consideration due to the limited use of the Airport by heavy/large aircraft. However, if heavier/large aircraft operate at the Airport more frequently in the future, consideration should be given to the installation of EMAS to provide additional safety margins. As a result, Alternative 1, which maintains the existing runway dimensions, has been selected as the preferred development alternative to eliminate potential impacts to the available runway dimensions.

Filling and grading the RSA will involve placing fill material at both ends of the runway. This fill material will be held in place by appropriately designed and constructed retaining walls to ensure the stability of the RSA, which is designed to accommodate the weight of aircraft that might overrun the runway and emergency service vehicles.

RSA/ROFA Obstruction Removal

The RSA and ROFA should be clear of obstructions other than "fixed-by-function" navigational aid equipment that is fixed to frangible mounts. The perimeter security fence is considered an obstruction to these areas. As depicted on **Exhibit 5A**, the perimeter security fence is planned to be realigned, where possible, to be located outside of the RSA and ROFA. The fence realignment results in its removal entirely from the RSA; however, the ROFA extends beyond Airport property to a slight degree on both ends of the runway. The Airport has clear zone easements on both ends of the runway, which were deeded to Yavapai County by the United States Assistant Secretary of Agriculture for Rural Development and Conservation in December 1969. The clear zone easements are depicted with a blue dashed line on **Exhibit 5A**. The land subject to the clear zone easements is owned and managed today by the United States Forest Service (USFS). The deeded easement rights include the following:

1. The continuing and perpetual right to cut to ground level and remove trees, bushes, shrubs, or any other perennial growth or undergrowth extending into, or which in the future could infringe upon or extend into or above, the Northeast and Southwest clear zone approach surfaces.
2. The right to remove, raze, or destroy those portions of buildings, other structures, and land infringing upon or extending into said approach surfaces, together with the right to prohibit the future erection of buildings or other structures which would infringe upon or extend into said surfaces.
3. The right to mark and light as obstructions to air navigation, any and all structures, trees or other objects that may at any time project or extend above said surfaces.
4. The right of ingress to and egress from and passage over the land of the Grantor within the clear zone approach areas for the above purposes.
5. For the use and benefit of the public, the right of flight for the passage of aircraft in the airspace above said clear zone approach surfaces together with the right to

cause in said airspace such noise as may be inherent in the operation of aircraft, using said airspace of landing at, taking off from or operating on the Airport.

The rights above do not include rights to allow the County to construct facilities within the clear zone areas. As a result, the Master Plan recommends realigning the perimeter security fence to the existing Airport boundary to mitigate its current penetration into the ROFA. Under this condition, the fence line will still penetrate the extreme north, south, and west corners of the ROFA. If permission is granted by the USFS to amend the easement to allow for the construction of the perimeter security fence onto its property, the fence should be relocated entirely outside of the ROFA. If permission to realign the fence into USFS property is not granted, then the Airport should seek FAA approval of a modification to design standard to allow the fence to penetrate the ROFA. This modification to design standard process will be undertaken during the FAA's review and approval of the Airport Layout Plan (ALP) drawing set, which is being prepared as part of this Master Plan process.

Overgrown vegetation has been observed within areas of the ROFA on the southeast side of the runway. Vegetation within the ROFA should be removed to meet FAA standards.

TAXIWAY CONSTRUCTION

The recommended Master Plan development concept proposes extending Taxiway A to the Runway 3 threshold to create a full-length parallel taxiway. Currently, aircraft departing on Runway 3 that utilize the full runway length for takeoff must back-taxi approximately 600 feet from the southern-most connecting taxiway (Taxiway A8). This increases the amount of time aircraft are present on the active runway, increasing the potential for runway incursions. The full-length parallel taxiway would provide a safer and more efficient taxiway system.

To allow for an extension of Taxiway A, coordination with the USFS will be required as a portion of the construction would occur on USFS property. The property in question is identified in **Exhibit 5A** and encompasses approximately 2.6 acres. Permission is needed to allow for the clearing and grading of the land, which will involve additional fill placement in areas that need to be raised to the existing airfield elevation to meet FAA taxiway grade standards, and for the construction of the taxiway pavement and drainage. An easement for this USFS property should be acquired that allows for the construction of this project.

The proposed taxiway improvements should be constructed to meet Taxiway Design Group (TDG) 2 standards. Taxiway shoulders, medium intensity taxiway lighting (MITL), and airfield guidance signs would be included with the extension of Taxiway A.

TAXIWAY GEOMETRY ENHANCEMENTS

FAA guidance discourages direct taxiway access from an aircraft parking apron to the runway system. Configurations that allow for direct access from an apron to the runway have

been targeted as they tend to increase risks for runway incursions. As highlighted on **Exhibit 5A**, connecting Taxiways A2, A3, A4, A5, and A6 provide direct connections between aircraft parking aprons and Runway 3-21. The recommended Master Plan development concept proposes the closure/removal of these taxiways and the construction of new taxiways in off-set positions, which will force pilots to make turns from the apron prior to entering the runway. Furthermore, new bypass taxiways (A2 and A9) are planned at each end of the runway to provide the opportunity for aircraft to bypass each other in the event that a preceding aircraft is not ready for takeoff and blocks the access taxiway.

Additionally, FAA guidance encourages the avoidance of wide pavement expanses, particularly where taxiways and runways intersect. Wide pavements require placement of signs and other visual cues farther from a normal pilot visual range. As a result, in low visibility conditions pilots may have less situational awareness. Currently, connecting Taxiway A1 is 150 feet wide, which exceeds the TDG 2 design standard width of 35 feet. It is recommended that this pavement area be reduced in width to comply with FAA's taxiway width design standard.

INSTRUMENT APPROACHES

As detailed in previous chapters, one published instrument approach procedure is available at the Airport providing a GPS straight-in approach to Runway 3 with visibility minimums down to 1.5-miles and a circling approach to the runway system. Advancements in global positioning system (GPS) technology continue to enhance the opportunity for improved instrument approach procedures at airports. Through the use of the GPS wide area augmentation system (WAAS), it is now possible to provide both vertical and lateral navigation approaches without the need for an airport to install ground-based navigational equipment. Subject to FAA approval, GPS WAAS approaches could possibly be implemented at Sedona Airport.

The recommended plan for approach instrumentation at Sedona Airport is to maintain what is currently available and pursue any improvements that do not require expensive ground-based navigation equipment. The Master Plan development concept considers Runway 3 continuing to be served by the existing instrument approach procedure with the potential for a new procedure that provides visibility minimums down to but greater than ¾-mile visibility. The Master Plan had previously evaluated potential impacts of providing an instrument approach procedure with visibility minimums down to ¾-mile. An approach procedure having ¾-mile visibility minimums would increase the runway's Part 77 primary surface from 500 feet wide (250 feet from the runway centerline) to a width of 1,000 feet (500 feet from the runway centerline). As a result, many of the existing landside facilities including the restaurant and many of the hangar facilities would then become obstructions to the airport's airspace. An approach procedure of greater than ¾-mile visibility minimums would maintain the existing 500-foot wide primary surface. Therefore, providing instrument approach capabilities down to, but greater than ¾-mile visibility, is recommended for Runway 3. It is also recommended that a one-mile or greater visibility instrument approach be established for Runway 21.

These instrument approach procedures will make the Airport more accessible during poor weather conditions and make it a more attractive destination to corporate/business operators who are more likely to use airports with these types of instrument procedures. Both of these approaches will require further analysis by the FAA and additional consideration by the County and SOCAA before implementation.

RUNWAY PROTECTION ZONES

The runway protection zone (RPZ) is the trapezoidal area located 200 feet beyond the runway thresholds. The function of the RPZ is to protect people and property on the ground. Typically, this is achieved through airport ownership of the RPZs, although proper land use control measures, such as easements, are acceptable. The RPZs should be clear of any incompatible land uses or activities. Incompatible land uses have historically included residences or places of public assembly such as churches, schools, hospitals, office buildings, and shopping centers.

As shown on **Exhibit 5A**, each runway end currently has a one-mile or greater visibility RPZ. The FAA recommends that the airport sponsor exercise control of the RPZ property. Portions of the RPZs associated with each end of Runway 3-21 currently extend beyond the airport property line and the previously discussed clear zone easements. The existing RPZ for Runway 3 encompasses only approximately 0.36 acres of USFS land beyond the limits of the existing clear zone easement. If an instrument procedure with visibility minimums lower than one mile but greater than ¾-mile is implemented for Runway 3, the RPZ increases in size to encompass an additional 27.84 acres of USFS property (28.2 acres in total). The existing Runway 21 RPZ encompasses approximately 8.0 acres of USFS land beyond the limits of the existing clear zone easement. Airport Road extends through the Runway 21 RPZ, providing vehicle access to the Airport. In addition, there are several other facilities in the RPZ including a parking lot and pedestrian walkways significantly below the runway end elevation. These existing uses are allowed under current FAA guidance.

In September 2012, the FAA published *Interim Guidance on Land Uses within a Runway Protection Zone*. The guidance addresses actions necessary for new or modified RPZs. Any action that would introduce new land use incompatibilities into the RPZ will have to be specifically reviewed and approved by the FAA.

The recommended Master Plan development concept does propose improvements to the runway system (instrument approach visibility minimums) at Sedona Airport; however, these modifications would not introduce new land use incompatibilities into the RPZs. The FAA ultimately has the authority to approve the existing and ultimate RPZs and the land uses within them. RPZ approval is ultimately determined during the ALP approval process.

The land within the RPZs that extends beyond Airport property and beyond the clear zone easements is owned by the USFS. The terrain of this land includes steep grades that would make development within these areas highly unlikely. However, the County and the SOCAA should continue to work closely with the USFS to ensure incompatible land uses are not in-

troduced into these areas. Furthermore, discussions with the USFS should include the possibility of expanding the clear zone easements to include all land within the existing and ultimate RPZs.

PERIMETER SECURITY FENCE REALIGNMENT

It was previously discussed that portions of the perimeter security fence need to be realigned to be removed from obstructing the RSA and ROFA. In addition to those realignments, much of the western portion of security fencing was previously constructed on USFS property due to an error in the Airport's boundary survey. The affected fence line length totals approximately 3,100 linear feet. The recommended Master Plan development concept shows a realignment of the western fence line to be located entirely on Airport property. This project will also need to be coordinated with the USFS as it will require accessing USFS land with construction equipment and the removal of the existing fence line.

LANDSIDE DEVELOPMENT CONCEPT

The primary goal of landside facility planning is to provide adequate aircraft storage space to meet forecast needs, while also maximizing operational efficiencies and land uses. Also important is identifying the overall land use classification of airport property in order to preserve the aviation purpose of the airport well into the future. Achieving these goals yields a development concept which segregates aircraft activity levels while maximizing the airport's revenue potential. **Exhibit 5A** presents the planned landside development for the airport.

There are numerous potential facility layout concepts that could be considered. Several potential layouts were presented in the previous chapter, and proposed landside development presented in the Master Plan Concept is a compilation of the alternatives presented, as well as further refinement based upon discussions with the County, SOCAA, PAC, and the general public.

The plan presented considers the potential for aviation development space located in close proximity to existing facilities. It also follows the design philosophy of co-locating facilities which would be intended for similar levels of aviation activity.

The major landside issues addressed in the Master Plan Concept include the following:

- Meeting landside facility needs within the existing Airport property. The purpose of this was to avoid having to acquire new lands for landside facilities since there is adequate land available for development already owned by the Airport.

- Construct additional aircraft storage hangars in existing development areas as well as through the improvement of undeveloped parcels on Airport property.

- Expansion of terminal facilities to accommodate potential growth in air tour activities as well as use by transient travelers visiting the Sedona area and to expand leasable office space capacity to generate additional revenues.

- Expansion of the terminal aircraft parking ramp (Ramp A) to provide additional large aircraft parking spaces and helicopter parking spaces.

- Identification of areas for revenue enhancement through the development of aviation-related and/or non-aviation related activities.

AIRCRAFT HANGARS

Chapter Four presented several options for locating new hangar facilities at Sedona Airport. The landside development concept on **Exhibit 5A** identifies locations for hangar development, including specific types of hangars that could be constructed, while other areas identified with blue shading represent development parcels without specific types or configurations. Identifying hangar development parcels allows flexibility to the County, SOCAA, and potential developers to construct the facilities that best meet customer demand. In addition to hangar facilities, taxilane and ramp pavement is assumed to be developed within these areas along with vehicle access roads and utilities. It should be noted that prior to any new hangar development, the Airport's fire suppression system needs to be expanded. This important project phasing is discussed in more detail in Chapter Six.

Hangar development proposed in the recommended Master Plan development concept includes the following:

- Construction of 8,250 square feet of new conventional hangar connected to existing hangar on the south side of Hangar Row D.

- Realignment of Shrine Road to the north, which allows for the construction of new T-hangar facilities providing an additional 34 individual storage units for small aircraft. Taxilanes associated with the existing hangars in this area (Taxilanes G, H, I, and J) would also be extended to provide airfield access.

- Designate land for future hangar/aviation-related development. This includes:
    - 6.5-acres at the north end of the landside area. This parcel would require extensive grading towards the Airport property line to provide level terrain for new hangars. Taxilane access could be extended to this area from the existing Taxilane L or K. Realigned Shrine Road would provide vehicle access to this parcel.
    - 0.9-acres between Taxilanes J and I. This parcel was designated for hangar development in previous planning efforts and has taxilane access and vehicle access routes already established.
    - 2.4-acres north of the terminal building. This parcel, with its close proximity to the terminal building and convenient vehicle access from Air Terminal Drive,

could accommodate larger hangar facilities or a complex of hangars to support a specialty aviation service operator (SASO). Access to the airfield could be extended from the existing ramp area adjacent to the parcel. This parcel footprint was designed to avoid a septic drain field that serves the restaurant.

- 3.0- and 2.3-acre parcels at the west side of the landside area. These two parcels would need to be cleared and graded to allow for additional mid-size or small hangar facilities or for SASO development. Vehicle access to the 3.0-acre parcel would be provided by a new connecting roadway with Air Terminal Drive. A new taxilane extending from the existing ramp would allow for access to the airfield. This taxilane would split these two parcels and prevent public vehicle access to the 2.3-acre parcel. These parcels could also be combined and leased as one large development parcel in the event that a large-scale operation seeks to locate at the Airport in the future.

TERMINAL FACILITY EXPANSION

The existing 4,263 square-foot terminal, which was constructed in 1991, is centrally located within the landside area, providing good visibility and access from both the airside and landside. The facility provides a location for the Airport's fixed base operator (FBO)-related services, administration offices, lobby/reception area, flight planning, conference room, restrooms, car rental operators and leased office space. The recommended Master Plan development concept proposes the expansion of this terminal facility by 4,500 square feet, resulting in a total of 8,763 square feet of terminal space.

Expansion of the terminal parking lot is already under design and is identified within the Master Plan recommendations. The existing terminal parking lot provides 30 vehicle parking spaces. The expansion would add an additional 44 spaces for a total of 74 vehicle parking spaces at the terminal.

A need for expanded aircraft parking and movement areas within the terminal area was previously identified to accommodate larger/heavier aircraft and for additional helicopter parking spaces. To accommodate this need, the terminal ramp (Ramp A) is planned to be expanded by 14,400 square yards. This new ramp will provide parking and movement areas for both fixed-wing and aerial tour helicopter activity as well as seasonal aerial firefighting aircraft parking. To allow for this ramp construction, the maintenance equipment storage facility will need to be relocated. The relocation of this facility will be discussed in more detail in the following section.

AVIATION SUPPORT FACILITIES

The recommended Master Plan development concept proposes a site for the relocation of the maintenance equipment storage facilities. The proposed site is located at the northwest corner of the existing terminal aircraft parking ramp. A maintenance storage facility will provide storage capacity for SOCAA equipment utilized to maintain and service the

Airport facilities. The site identified is approximately 0.3-acres and could include a storage garage and a maintenance yard or shaded parking spaces for fuel distribution trucks.

The fuel farm is planned to be relocated to a new site adjacent to the maintenance equipment hut and upgraded with a spill containment system. Previous consideration was given to planning for a self-service fuel system; however, through discussions with the SOCAA it was determined that the self-service option should be removed from consideration. However, the SOCAA may still consider the addition of self-service fuel at some time in the future.

Another consideration from previous chapters was the addition of an aircraft wash rack. Wash racks provide a suitable site for aircraft owners to wash their aircraft and are equipped with oil/water separators to prevent contaminants from entering the sanitary sewer system. This is a common amenity provided at general aviation airports. The SOCAA and the County agree that such a facility should be considered for future development but do not wish to identify a specific location for the wash rack at this time.

The Airport's existing fire suppression system provides services to the Terminal building, the Mesa Grill Restaurant, and the Hangar D facilities on Taxilane D. The current system consists of the following components:

- 88,000-gallon water storage tank and associated water well. The water well is a 1,100-foot deep well located adjacent to the current pump house and water tank.
- 1,000 gallons per minute (gpm) water pump
- One pressure tank (maintains static system at 60 psi)
- Two auxiliary pressure tank pumps
- Associated control circuits
- Distribution piping

An evaluation of the fire suppression system completed on April 16, 2015 concluded that in order to accommodate anticipated future facility growth at the Airport, the system needs to increase both pump capacity and overall water storage capacity. It is recommended that the Airport install an additional 160,000 gallons of water storage capacity located at the north end of the Airport adjacent to an existing Oak Creek Water Company water tank. This water tank expansion site is identified on **Exhibit 5A**. In addition, installation includes a 2,500 gpm fire pump and extended 8-inch distribution piping to the existing water system. Connecting the existing system to the new system would eliminate the need to install a new well.

VISTA OVERLOOK EXPANSION

The Airport owns and maintains the Vista Overlook on the north side of the Airport, which is an important tourist attraction that generates significant revenue in the form of donations. It was previously discussed in Chapter One that the current crosswalk configuration from the gravel parking lot to the Vista Overlook does not meet current design standards

for a mid-block crosswalk and that improvements are necessary to bring it into compliance with current standards.

A study was prepared for the SOCAA in 2011 that provided a conceptual design for the re-design of the Vista Overlook and the associated parking areas. The purpose of the redesign was to improve the Vista Overlook experience to help set a more positive theme for Airport infrastructure in general, welcome visitors better, and help establish a stronger community interface. The resulting conceptual plan included realignment of Airport Road to allow for the expansion of the Vista Overlook and the construction of two paved vehicle parking lots. The recommended Master Plan development concept reserves this land for non-aviation revenue support. In total, this area consists of 12.9 acres of land, which includes the current Masons Lodge leasehold (1.3 acres). Determination on the ultimate Vista Overlook re-development will ultimately be made at a later time by the County and the SOCAA.

ADDITIONAL REVENUE SUPPORT

In addition to the Vista Overlook, another major non-aviation related revenue source for the Airport is the Sky Ranch Lodge. The existing facility is located on approximately 6.1 acres of Airport land located northwest of the terminal building. This land has been leased from the SOCAA since June 1982; the most recent renewal extended the lease until June 30, 2050. Originally constructed with 35 units, the facility now includes 94 lodging units housed in 21 cottages or four-plexes. In addition to the lodging units, the Sky Ranch Lodge accommodates weddings in an outdoor garden and has a pool/Jacuzzi area, an on-site wine bar, a reception area, and a gift shop. There are also several maintenance structures and one modular building. There are no restaurant facilities on the property; instead, hotel guests can utilize the on-Airport restaurant, the Mesa Grill, which is within walking distance of the Lodge.

The Airport is currently conducting an Environmental Assessment (EA) which proposes the release from federal obligation of approximately 4.6 acres of undeveloped land located west of the existing Sky Ranch Lodge. The release of land allows for the expansion of the Sky Ranch Lodge through an existing amendment of its lease. The proposed expansion would include 40 new lodging units, as well as an approximately 6,000 square foot conference/meeting center and additional hotel parking, landscaping, and amenities.

In addition, utility improvements proposed by the Sky Ranch Lodge expansion include the construction of a tertiary waste water treatment plant to treat effluent from the area's septic systems for use as non-potable water in landscaping. This waste water system is intended to provide for the existing and proposed development and, based on preliminary concept design, would consist of a textile filter system with a capacity of 17,500 gallons per day (gpd).

Other revenue sources for the Airport include the Masonic Lodge, Mesa Grill restaurant, and other ancillary buildings located at the north side of the Airport. It is anticipated that these areas will continue to be utilized for revenue support in the recommended Master Plan development concept.

ENVIRONMENTAL OVERVIEW

Analysis of the potential environmental impacts of recommended airport development projects, as discussed in this chapter and depicted on **Exhibit 5A**, is an important component of the Airport Master Plan process. The primary purpose of this Environmental Overview is to identify significance thresholds for the various resource categories contained in Federal Aviation Administration (FAA) Order 1050.1F, *Environmental Impacts: Policies and Procedures*, Exhibit 4-1 and FAA Order 5050.4B, *National Environmental Policy Act* (NEPA) *Implementation Instructions for Airport Actions*, Table 7.1. The overview then evaluates the development program to determine whether proposed actions could individually or collectively affect the quality of the environment.

The construction of any improvements depicted on the recommended development concept plan would require compliance with NEPA to receive federal financial assistance or if the project would require a federal action. For projects not "categorically excluded" under FAA Order 1050.1F, compliance with NEPA is generally satisfied through the preparation of an Environmental Assessment (EA). In instances where significant environmental impacts are expected, an Environmental Impact Statement (EIS) may be required. While this portion of the Airport Master Plan process is not designed to satisfy the NEPA requirements for a Categorical Exclusion (CatEx), EA, or EIS, it is intended to supply a preliminary review of environmental issues.

This Environmental Overview is based on information contained in the Environmental Inventory of Chapter One.

POTENTIAL ENVIRONMENTAL CONCERNS

The following table (**Table 5A**) summarizes potential environmental concerns associated with implementation of the recommended Master Plan development concept. Analysis under NEPA includes direct, indirect, and cumulative impacts.

TABLE 5A
Summary of Potential Environmental Concerns
Sedona Airport

Environmental Impact Category	Significance Threshold/ Factors to Consider	Potential Concern
Air Quality	**Threshold: The action would cause pollutant concentrations to exceed one or more of the National Ambient Air Quality Standards (NAAQS), as established by the United States (U.S.) Environmental Protection Agency (EPA) under the *Clean Air Act*, for any of the time periods analyzed, or to increase the frequency or severity of any such existing violations.**	Although the projected increase in operations over the 20-year planning horizon of the Airport Master Plan would result in additional emissions, Yavapai County currently meets federal NAAQS standards. Thus, general conformity review per the *Clean Air Act* is not required. According to the most recent FAA *Aviation Emissions and Air Quality Handbook* (2015), an emissions inventory under NEPA may be necessary for any proposed action that would result in a reasonable foreseeable increase in emissions due to its implementation. For construction emissions, a qualitative or quantitative emissions inventory under NEPA may be required, depending on the type of environmental review required for the project.

TABLE 5A (Continued)
Summary of Potential Environmental Concerns
Sedona Airport

Environmental Impact Category	Significance Threshold/ Factors to Consider	Potential Concern
Biological Resources (including fish, wildlife, and plants)	**Threshold: The U.S. Fish and Wildlife Service (FWS) or the National Marine Fisheries Service (NMFS) determines that the action would be likely to jeopardize the continued existence of a federally listed threatened or endangered species, or would result in the destruction or adverse modification of federally designated critical habitat.** FAA has not established a significance threshold for non-listed species. However, factors to consider are if an action would have the potential for: • Long term or permanent loss of unlisted plant or wildlife species; • Adverse impacts to special status species or their habitats; • Substantial loss, reduction, degradation, disturbance, or fragmentation of native species' habitats or their populations; or • Adverse impacts on a species' reproductive rates, non-natural mortality, or ability to sustain the minimum population levels required for population maintenance.	**For federally-listed species:** None. There is no habitat for federally-listed species present at the Airport. **For designated critical habitat:** None. There is no designated critical habitat located at or near the Airport. **For non-listed species:** Non-listed species of concern include those protected by the *Migratory Bird Treaty Act*. The potential for the presence of migratory birds should be evaluated on a project-specific basis.
Climate	FAA has not established a significance threshold for Climate; refer to FAA Order 1050.1F's Desk Reference for the most up-to-date methodology for examining impacts associated with climate change.	An increase in greenhouse gas (GHG) emissions could occur over the 20-year planning horizon of the Airport Master Plan. Project-specific analysis may be required per the FAA Order 1050.1F Desk Reference based on the parameters of the individual projects.
Coastal Resources	FAA has not established a significance threshold for Coastal Resources. Factors to consider are if an action would have the potential to: • Be inconsistent with the relevant state coastal zone management plan(s); • Impact a coastal barrier resources system unit; • Pose an impact to coral reef ecosystems; • Cause an unacceptable risk to human safety or property; or • Cause adverse impacts to the coastal environment that cannot be satisfactorily mitigated.	None. The Airport is not located within a designated Coastal Zone.

TABLE 5A (Continued)
Summary of Potential Environmental Concerns
Sedona Airport

Environmental Impact Category	Significance Threshold/ Factors to Consider	Potential Concern
Department of Transportation (DOT) *Act*: Section 4(f)	**Threshold: The action involves more than a minimal physical use of a Section 4(f) resource or constitutes a "constructive use" based on an FAA determination that the aviation project would substantially impair the Section 4(f) resource. Resources that are protected by Section 4(f) are publicly owned land from a public park, recreation area, or wildlife and waterfowl refuge of national, state, or local significance; and publicly or privately owned land from an historic site of national, state, or local significance. Substantial impairment occurs when the activities, features, or attributes of the resource that contribute to its significance or enjoyment are substantially diminished.**	The Airport is surrounded by United States Forest Service (USFS) lands, which are used for passive recreational uses including hiking trails, and are, thus, considered a Section 4(f) property. At this time, the Master Plan does not propose any acquisition of USFS lands. Avigation easements do not permanently affect the resource and are not considered a constructive use. If acquisition does occur at a later date, a Section 4(f) study may be required to ascertain that the Proposed Action complies with regulations protecting Section 4(f) resources. The Airport's existing (year 2013) Day-Night Average Sound Level (DNL) noise exposure contours are shown in **Exhibit 5B**. Although the 65 and 70 decibel (dB) contours are over portions of adjacent USFS land, based on the active use of hiking trails in the area, this noise does not substantially impair the forest as a Section 4(f) resource. The Airport's future (year 2033) DNL noise exposure contours are shown in **Exhibit 5C**. The change in noise over forest land is minor and is not expected to adversely affect USFS lands currently used for hiking trails or substantially impair the forest as a Section 4(f) resource. There are known cultural resources at the Airport that have not yet been evaluated for significance under Section 106 of the *National Historic Preservation Act*. If impacts result to a cultural site that is determined to be significant, a Section 4(f) impact would also occur.
Farmlands	**Threshold: The total combined score on Form AD-1006, *Farmland Conversion Impact Rating*," ranges between 200 and 260.** (Form AD-1006 is used by the U.S. Department of Agriculture, Natural Resources Conservation Service (NRCS) to assess impacts under the *Farmland Protection Policy Act* (FPPA).) Factors to consider are if an action would have the potential to convert important farmlands to non-agricultural uses. Important farmlands include pastureland, cropland, and forest considered to be prime, unique, or statewide or locally important land.	None. Soils at the Airport are not classified as farmland by the NRCS.

TABLE 5A (Continued)
Summary of Potential Environmental Concerns
Sedona Airport

Environmental Impact Category	Significance Threshold/ Factors to Consider	Potential Concern
Hazardous Materials, Solid Waste, and Pollution Prevention	FAA has not established a significance threshold for Hazardous Materials, Solid Waste, and Pollution Prevention. However, factors to considered are if an action would have the potential to: • Violate applicable federal, state, tribal, or local laws or regulations regarding hazardous materials and/or solid waste management; • Involve a contaminated site; • Produce an appreciably different quantity or type of hazardous waste; • Generate an appreciably different quantity or type of solid waste or use a different method of collection or disposal and/or would exceed local capacity; or • Adversely affect human health and the environment.	The Airport has a fuel farm and provides opportunity for aircraft maintenance activities that could involve fossil fuels or other types of hazardous materials or wastes; these operations are regulated and monitored by the appropriate regulatory agencies, such as the U.S. EPA, the Arizona Department of Environmental Quality (ADEQ), and Yavapai County. The recommended Master Plan development concept does not anticipate land uses that would produce an appreciably different quantity or type of hazardous waste. However, should this type of land use be proposed, further NEPA review and/or permitting would be required. There are no known hazardous materials or waste contamination sites at the Airport. Existing and future solid waste is, or would be, collected and taken to Grey Wolf Regional Landfill by a private business.
Historical, Architectural, Archaeological, and Cultural Resources	FAA has not established a significance threshold for Historical, Architectural, Archaeological, and Cultural Resources. Factors to consider are if an action would result in a finding of "adverse effect" through the Section 106 process. However, an adverse effect finding does not automatically trigger preparation of an EIS (i.e., a significant impact).	There are known cultural resources located at the Airport in an undeveloped area that is identified for future aviation development. Additionally, unsurveyed areas of the Airport also have the potential to contain protected resources. Thus, any areas at the Airport that would be subject to ground disturbance should be surveyed for cultural resources prior to construction unless previously disturbed to the point that artifacts could no longer be intact. Data recovery (to determine the extent and significance of resources) and/or monitoring during construction activities may also be required.
Land Use	FAA has not established a significance threshold for Land Use. There are also no specific independent factors to consider. The determination that significant impacts exist is normally dependent on the significance of other impacts.	None. The proposed development concept plan includes avigation easements over the airport runway protection zones to prevent land use compatibility impacts with the Airport.
Natural Resources and Energy Supply	FAA has not established a significance threshold for Natural Resources and Energy Supply. However, factors to consider are if an action would have the potential to cause demand to exceed available or future supplies of these resources.	Planned development projects at the Airport are not anticipated to result in a demand for natural resources or energy consumption beyond what is available by service providers. However, if water becomes a scarce resource in the County, additional analysis may be required.

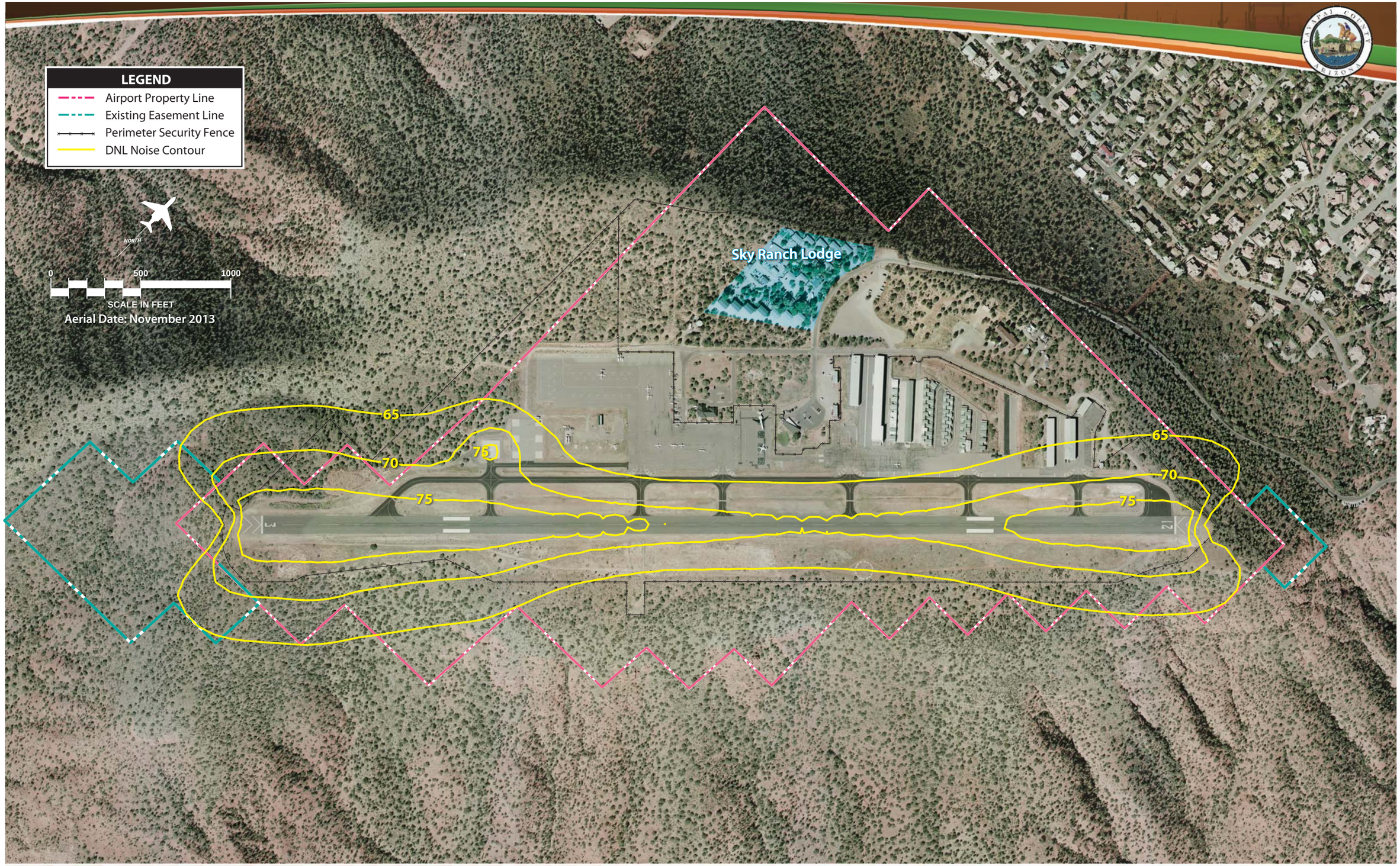


Exhibit 5B
2013 NOISE EXPOSURE CONTOURS

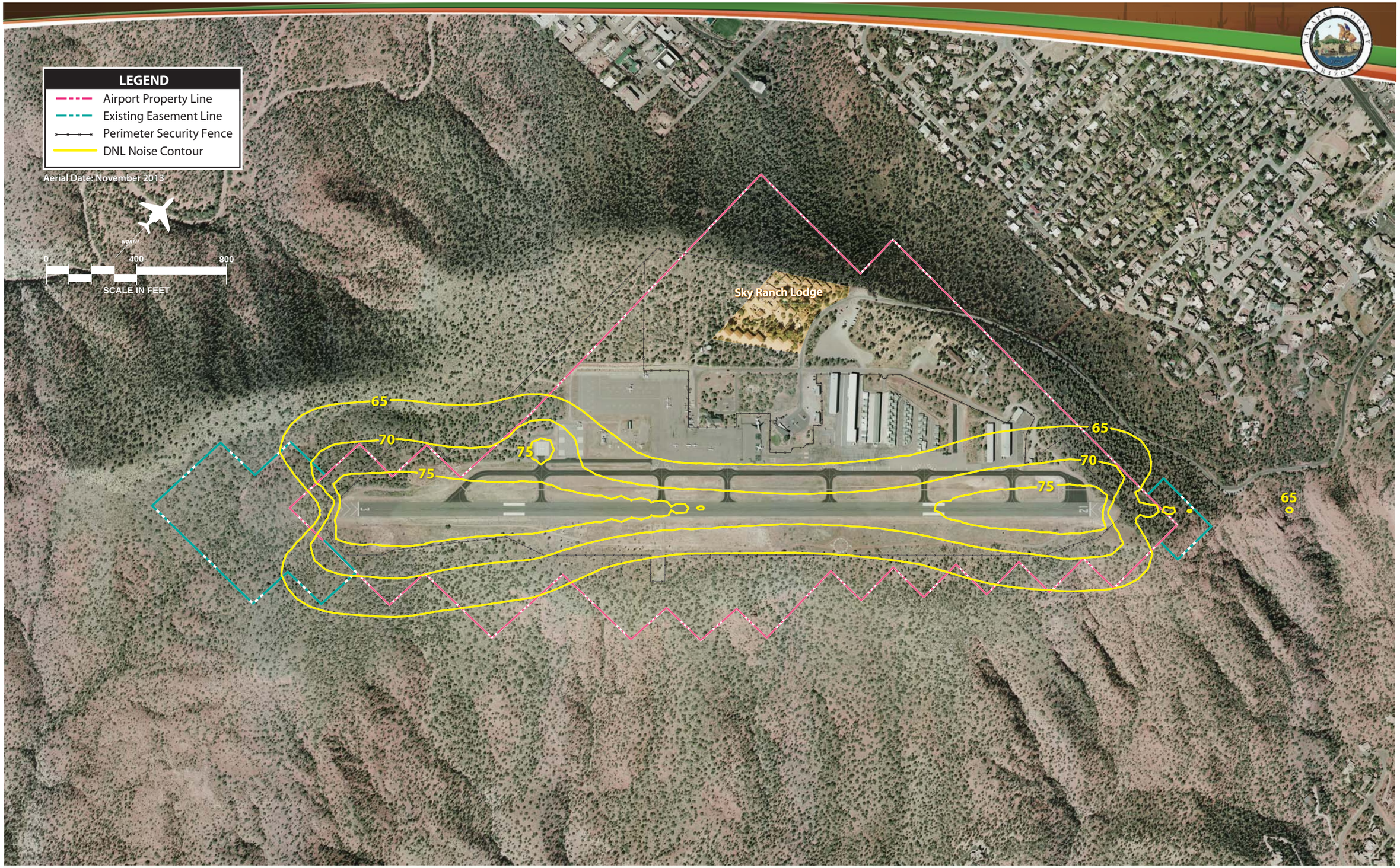


Exhibit 5C
2033 NOISE EXPOSURE CONTOURS

TABLE 5A (Continued)
Summary of Potential Environmental Concerns
Sedona Airport

Environmental Impact Category	Significance Threshold/ Factors to Consider	Potential Concern
Noise and Noise-Compatible Land Use	**Threshold: The action would increase noise by Day-Night Average Sound Level (DNL) 1.5 decibel (dB) or more for a noise-sensitive area that is exposed to noise at or above the DNL 65 dB noise exposure level, or that will be exposed at or above the DNL 65 dB level due to a DNL 1.5 dB or greater increase, when compared to the no action alternative for the same timeframe.** Another factor to consider is that special consideration needs to be given to the evaluation of the significance of noise impacts on noise-sensitive areas within Section 4(f) properties where the land use compatibility guidelines in Title 14 Code of Federal Regulations (CFR) part 150 are not relevant to the value, significance, and enjoyment of the area in question.	The Airport's existing and future DNL noise exposure contours are shown on **Exhibits 5B** and **5C**). The Airport is bound by undeveloped open space, primarily owned by the USFS, and its 65 or higher noise exposure contours do not affect any developed noise-sensitive areas. However, since Sky Ranch Lodge is located within the Airport's perimeter, hours of construction should be limited to daytime hours to the extent feasible. In terms of Section 4(f) lands, there are no parks, refuges, known historic sites, or known traditional cultural properties in proximity to the Airport. However, there are known cultural resources present at the Airport, for which significance has yet to be determined. In addition, as discussed previously, the forest itself is considered a Section 4(f) resource. The change anticipated in noise exposure contours during the Master Plan's 20-year planning horizon is minor and is not expected to substantially impair the forest's value, significance, or enjoyment.
Socioeconomic Impacts, Environmental Justice, and Children's Environmental Health and Safety Risks		
Socioeconomics	FAA has not established a significance threshold for Socioeconomics. However, factors to consider are if an action would have the potential to: • Induce substantial economic growth in an area, either directly or indirectly (e.g., through establishing projects in an undeveloped area); • Disrupt or divide the physical arrangement of an established community; • Cause extensive relocation when sufficient replacement housing is unavailable; • Cause extensive relocation of community businesses that would cause severe economic hardship for affected communities; • Disrupt local traffic patterns and substantially reduce the levels of service of roads serving the airport and its surrounding communities; or • Produce a substantial change in the community tax base.	Proposed development projects would occur on the Airport property itself and would not result in substantial economic growth or a physical disruption or division within the Sedona area. No relocation of housing or community businesses, disruption of local traffic patterns, or a substantial change in the community tax base would occur. Traffic volumes on Airport Road are substantially less than the road's capacity and would not result in an unacceptable level of service due to Airport projects.[1]

[1] Recent traffic counts (February 2015) on Airport Road by the City of Sedona report total average daily traffic (ADT) of 2,307 with 207 trips occurring during the p.m. peak hour; Airport Road can handle approximately 1,100 vehicles per hour while still operating at a level of service D.

TABLE 5A (Continued)
Summary of Potential Environmental Concerns
Sedona Airport

Environmental Impact Category	Significance Threshold/ Factors to Consider	Potential Concern
Environmental Justice	FAA has not established a significance threshold for Environmental Justice. However, factors to consider are if an action would have the potential to lead to a disproportionately high and adverse impact to an environmental justice population, i.e., a low-income or minority population, due to: • Significant impacts in other environmental impact categories; or • Impacts on the physical or natural environment that affect an environmental justice population in a way that FAA determines are unique to the environmental justice population and significant to that population.	None. The Airport is bounded by undeveloped open space owned by the USFS and is separated from the nearest residential area by both distance and elevation.
Children's Environmental Health and Safety Risks	FAA has not established a significance threshold for Children's Environmental Health and Safety Risks. However, factors to consider are if an action would have the potential to lead to a disproportionate health or safety risk to children.	None. The Airport is bounded by undeveloped open space owned by the USFS and is separated from the nearest residential or recreational areas by both distance and elevation. The closest schools are more than one mile from the Airport.
Visual Effects		
Light Emissions	FAA has not established a significance threshold for Light Emissions. However, a factor to consider is the degree to which an action would have the potential to: • Create annoyance or interfere with normal activities from light emissions; and • Affect the visual character of the area due to the light emissions, including the importance, uniqueness, and aesthetic value of the affected visual resources.	Most new lighting associated with the recommended Master Plan development concept would remain on the airfield and other developed portions of the Airport. However, the Master Plan also recommends future development north of the developed areas of the Airport to the east and west of Sky Ranch Lodge. Development in these areas may involve additional building security lighting. Due to the distance between the Airport and the closest residential development (i.e., the closest residence is approximately 500 feet away as well as approximately 165 feet lower in elevation), no significant lighting impacts are anticipated. The City of Sedona is designated a "Dark Sky City" by the International Dark-Sky Association. Airport development shall be consistent with the City of Sedona Outdoor Lighting Code (Land Development Code, Article 9, Development Standards, Section 911) and the Yavapai County Light Pollution Control Ordinance (Planning and Zoning Ordinance, Section 603), both of which include requirements for the shielding of light fixtures and contain a preference for low pressure sodium (LPS) lamps whenever "its use would not be detrimental to the use of the property."

TABLE 5A (Continued)
Summary of Potential Environmental Concerns
Sedona Airport

Environmental Impact Category	Significance Threshold/ Factors to Consider	Potential Concern
Visual Resources/ Visual Character	FAA has not established a significance threshold for Visual Resources/Visual Character. However, a factor to consider is the extent an action would have the potential to: • Affect the nature of the visual character of the area, including the importance, uniqueness, and aesthetic value of the affected visual resources; • Contrast with the visual resources and/or visual character in the study area; and • Block or obstruct the views of the visual resources, including whether these resources would still be viewable from other locations.	None. Development planned in the recommended Master Plan development concept would not change the overall visual character of the Airport.
Water Resources (including Wetlands, Floodplains, Surface Waters, Groundwater, and Wild and Scenic Rivers)		
Wetlands	**Threshold: The action would:** **1. Adversely affect a wetland's function to protect the quality or quantity of municipal water supplies, including surface waters and sole source and other aquifers;** **2. Substantially alter the hydrology needed to sustain the affected wetland system's values and functions or those of a wetland to which it is connected;** **3. Substantially reduce the affected wetland's ability to retain floodwaters or storm runoff, thereby threatening public health, safety or welfare (the term welfare includes cultural, recreational, and scientific resources or property important to the public);** **4. Adversely affect the maintenance of natural systems supporting wildlife and fish habitat or economically important timber, food, or fiber resources of the affected or surrounding wetlands.** **5. Promote development of secondary activities or services that would cause the circumstances listed above to occur; or** 6. **Be inconsistent with applicable state wetland strategies.**	None. There are no wetlands or other jurisdictional waters present on the Airport.
Floodplains	**Threshold: The action would cause notable adverse impacts on natural and beneficial floodplain values. Natural and beneficial floodplain values are defined in Paragraph 4.k of DOT Order 5650.2, *Floodplain Management and Protection.***	None. There are no 100-year floodplains located on the Airport, which is located on top of a plateau.

TABLE 5A (Continued)
Summary of Potential Environmental Concerns
Sedona Airport

Environmental Impact Category	Significance Threshold/ Factors to Consider	Potential Concern
Surface Waters	**Threshold: The action would:** **1. Exceed water quality standards established by federal, state, local, and tribal regulatory agencies; or** **2. Contaminate public drinking water supply such that public health may be adversely affected.** Factors to consider are when a project would have the potential to: • Adversely affect natural and beneficial water resource values to a degree that substantially diminishes or destroys such values; • Adversely affect surface water such that the beneficial uses and values of such waters are appreciably diminished or can no longer be maintained and such impairment cannot be avoided or satisfactorily mitigated; or • Present difficulties based on water quality impacts when obtaining a permit or authorization.	The Airport has an approved storm water pollution prevention plan (SWPPP) as part of its Arizona Pollutant Discharge Elimination System (AZPDES) permit. Airport projects such as additional apron, parking lots, or other impervious surfaces could increase the amount of runoff from the Airport. The Airport's storm water drainage system will need to be upgraded to handle additional runoff quantities, when necessary, and its AZPDES permit and SWPPP updated accordingly. An AZPDES General Construction permit would be required for all projects involving ground disturbance of over one acre. FAA's Advisory Circular (AC) 150/5370-10G, *Standards for Specifying Construction of Airports, Item P-156, Temporary Air and Water Pollution, Soil Erosion and Siltation Control* should also be implemented during construction projects at the Airport.
Groundwater	**Threshold: The action would:** **1. Exceed groundwater quality standards established by federal, state, local, and tribal regulatory agencies: or** **2. Contaminate an aquifer used for public water supply such that public health may be adversely affected.** Factors to consider are when a project would have the potential to: • Adversely affect natural and beneficial groundwater values to a degree that substantially diminishes or destroys such values; • Adversely affect groundwater quantities such that the beneficial uses and values of such groundwater are appreciably diminished or can no longer be maintained and such impairment cannot be avoided or satisfactorily mitigated; or • Present difficulties based on water quality impacts when obtaining a permit or authorization.	None. The proposed projects would not substantially change the amount of water used by the Airport. The Airport does not serve as a significant source of groundwater recharge due to its location on top of a plateau. See also the previous discussion under Surface Water regarding water quality measures at the Airport.

TABLE 5A (Continued)
Summary of Potential Environmental Concerns
Sedona Airport

Environmental Impact Category	Significance Threshold/ Factors to Consider	Potential Concern
Wild and Scenic Rivers	FAA has not established a significance threshold for Wild and Scenic Rivers. Factors to consider are when an action would have an adverse impact on the values for which a river was designated (or considered for designation) through: • Destroying or altering a river's free-flowing nature; • A direct and adverse effect on the values for which a river was designated (or under study for designation); • Introducing a visual, audible, or other type of intrusion that is out of character with the river or would alter outstanding features of the river's setting; • Causing the river's water quality to deteriorate; • Allowing the transfer or sale of property interests without restrictions needed to protect the river or the river corridor; or • Any of the above impacts preventing a river on the Nationwide Rivers Inventory (NRI) or a Section 5(d) river that is not included in the NRI from being included in the Wild and Scenic River System or causing a downgrade in its classification (e.g., from wild to recreational).	None. The closest designated Wild and Scenic river segments (i.e., Fossil Creek and Verde River) are approximately 40 miles from the Airport. The closest river listed on the NRI is Oak Creek. The recommended Airport projects would not have adverse effects on the creek's outstanding remarkable values under consideration in the NRI (i.e., scenery, recreation, geology, fish, wildlife, and history).

Source: Coffman Associates Analysis

ENVIRONMENTAL ACTION SUMMARY

Prior to construction, some of the recommended Master Plan development projects would require further NEPA environmental consideration and analysis. As discussed previously, the three types of environmental documentation under NEPA are the CatEx, EA, or EIS. A CatEx must meet the criteria in 40 CFR §1508.4, which are defined as "a category of actions that do not normally require an EA or EIS because they do not individually or cumulatively have a significant effect on the human environment, with the exception of extraordinary circumstances." It is the duty of the responsible FAA official to determine whether extraordinary circumstances exist and, if so, deem the action appropriate for an EA. **Table 5B** provides an annotated description of extraordinary circumstances as detailed in FAA Order 5050.4B.

TABLE 5B
Extraordinary Circumstances
FAA Order 5050.4B (Table 6-3)

Extraordinary Circumstance Category	Annotated Description
Air Quality	An action that would violate applicable federal, state, tribal, or local air quality standards under the *Clean Air Act of 1990*, as amended.
Coastal Zone Areas	Federal actions in, or affecting, coastal resources must meet requirements of *Coastal Zone Management Act* programs.
Community Disruption	An action dividing or disrupting an established community or planned development, or that is inconsistent with plans or goals of a community where the project would occur.
Cumulative Impacts	An action likely to cumulatively cause significant impacts.
Endangered Species	An action that may affect listed or candidate species under the *Endangered Species Act*, including designated or proposed critical habitats.
Farmlands Conversion	An action that would convert important farmland protected by the *Farmland Protection Act*.
Floodplains	An impact on natural, ecological, or scenic floodplain resources of federal, state, tribal, or local significance caused by an action in the 100-year floodplain.
Hazardous Materials	An action involving or causing contamination of areas, based on Phase I or II Environmental Due Diligence Audits.
Highly Controversial Action	Effects are considered highly controversial when reasonable disagreement exists over a project's risks of causing environmental harm.
Historic or Cultural Property	An action causing an adverse effect on historic or cultural property protected by Section 106 of the *National Historic Preservation Act*.
Inconsistency with Applicable Laws	An action that is likely to be inconsistent with any applicable federal, state, local or tribal law relating to the proposed action's environmental aspects.
Noise	Noise impact on noise-sensitive areas.
Section 4(f) Resources	An action having an impact on properties protected by DOT Act, Section 4(f) such as publicly owned land in a park, recreation area, or wildlife and waterfowl refuge of national, state, or local significance or a historical site of national, state, or local significance.
Traffic Congestion	An action causing transportation congestion due to unacceptable Levels of Service.
U.S. Waters, including Jurisdictional Wetlands	An action affecting these waters or wetlands that does not qualify for a U.S. Army Corps of Engineers General Permit under Section 404 of the *Clean Water Act*.
Water Quality	An impact on water quality, a sole source aquifer, a public water supply system or State or Tribal water quality or water standards established under the *Clean Water Act* or the *Safe Drinking Water Act*.
Wild and Scenic Rivers	An action affecting a river segment that is listed in the Wild and Scenic River System, the NRI, or one that is eligible for the Inventory.

An EA, at a minimum, must be prepared for a proposed action when the initial review of the proposed action indicates that it is not categorically excluded, involves at least one extraordinary circumstance, or the action is not one known normally to require an EIS and is not categorically excluded. The purpose of an EA is to document the FAA determination as to whether or not a proposed action has the potential for significant environmental impacts. If none of the potential impacts are likely to be significant, then the responsible FAA official shall prepare a Finding of No Significant Impact (FONSI), which briefly presents, in writing, the reasons why an action, not otherwise categorically excluded, will not have a significant impact on the human environment and the approving official may approve it.

Issuance of a FONSI signifies that FAA will not prepare an EIS and has completed the NEPA process for the proposed action.

If the responsible FAA official determines that the proposed action may significantly affect the quality of the human environment, an EIS shall be prepared. An EIS is a clear, concise, and appropriately detailed document that provides agency decision-makers and the public with a full and fair discussion of significant environmental impacts of the proposed action and reasonable alternatives, and implements the requirement in NEPA §102(2)(C) for a detailed written statement.

Some of the actions normally requiring an EA are projects included in the recommended Master Plan development concept (**Table 5C**). However, most of the proposed improvements, unless involving extraordinary circumstances, could be evaluated in terms of NEPA compliance using one of the CatExes listed in FAA Order 1050.1F. In addition, some of the projects would not require a federal action or federal funding. For projects using only state/local funding and that do not require a federal approval, a state environmental determination would be required rather than an environmental evaluation under NEPA.

TABLE 5C
Anticipated Environmental Review For Future Projects
Sedona Airport Master Plan

Recommended Project	Initial NEPA Action
Short Term Projects	
Runway 3/21 Crack Seal/Asphalt Emulsion Seal Coat	n/a[1]
Terminal Roadway & Parking Lot Rehabilitation	CatEx
Upgrade Fire Suppression System	CatEx or EA
RSA/Airfield Drainage – Phase 2	n/a[1]
Apron D Reconstruction/Rehabilitation	n/a[1]
Upgrade Fuel Farm	CatEx
Taxilanes H and I Extensions	CatEx
Taxiway A Extension/Acquire Avigation Easement from USFS	EA
Runway 3/21 RSA Improvements	EA
Intermediate Term Projects	
Relocate Perimeter Security Fence	CatEx or EA
Acquire Avigation Easements from USFS for Runway 3/21 RPZs	CatEx or EA[2]
Taxiway A1 Pavement Reduction	CatEx
New Connecting Taxiway Construction	CatEx
Install Runway 3/21 Non-precision Markings	CatEx
Construct Executive Hangar (8,250 sf)	CatEx
Expand Terminal Ramp (14,400 sy)	CatEx
Construct Terminal Building Parking Lot Expansion	CatEx
Airport Pavement Maintenance	CatEx

TABLE 5C (Continued)
Anticipated Environmental Review For Future Projects
Sedona Airport Master Plan

Recommended Project	Initial NEPA Action
Long Term Projects	
Construct Maintenance Equipment Storage (1,500 sf)	CatEx
Terminal Building Expansion (4,500 sf)	CatEx
Shrine Road Realignment	CatEx
Construct Taxilane G, H, I, and J Extensions	CatEx
Construct T-Hangar Facilities (44,750 sf)	CatEx
Airport Pavement Maintenance	CatEx

[1] n/a – Not applicable. NEPA is not applicable if there is no federal action (e.g., approval of an Airport Layout Plan revision) or federal funding; however, a state Environmental Determination is required.
[2] Per FAA Order 1050.1F, paragraph 5-6.4bb, a CatEx is only available for avigation easements if there will be no ground disturbance within the foreseeable future (i.e., next 5 years)

NEPA – *National Environmental Policy Act*
CatEx – Categorical Exclusion
RSA – runway safety area
EA – Environmental Assessment
USFS – United States Forest Service
RPZs – runway protection zones
sf = square feet
sy = square yards

SUMMARY

The recommended Master Plan development concept has been developed with significant input from the County, SOCAA, PAC, and the public. The Sedona Airport Board of Directors has provided additional input to help guide the planning process. This plan helps to position Sedona Airport to accommodate and best meet the needs of anticipated growth over the next 20 years.

The recommended development concept is designed to help Yavapai County and the SOCAA in making decisions on the future growth and development of Sedona Airport. The plan presents an airfield facility that fulfills aviation needs for the Airport, while conforming to safety and design standards to the extent practicable. It also provides a landside complex that can be developed as demand dictates.

Flexibility will be very important to future development at the Airport, as activity and growth may not occur as predicted. The development plan provides airport stakeholders with a general guide that, if followed, can maintain the Airport's long term viability and allow the Airport to continue to provide air transportation service to the region. The next chapter of this Master Plan will consider strategies for funding the recommended improvements and will provide a reasonable schedule for undertaking the projects based on safety and demand over the course of the next 20 years.



Chapter Six

FINANCIAL/CAPITAL IMPROVEMENT PROGRAM

Chapter Six

FINANCIAL/CAPITAL IMPROVEMENT PROGRAM

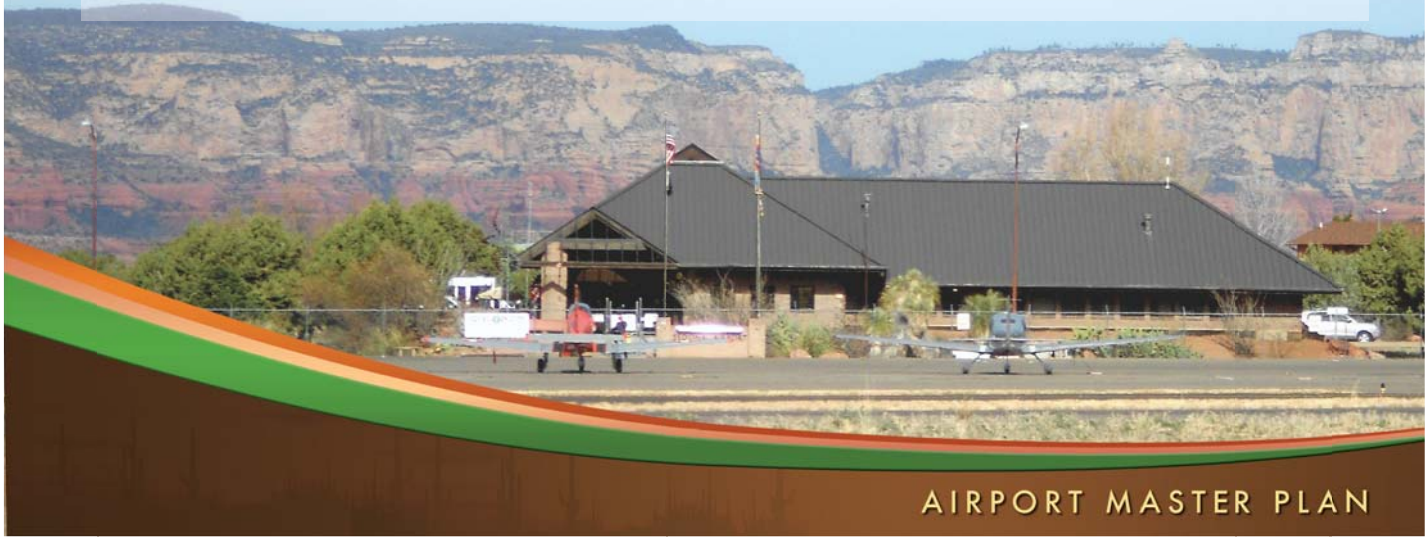
The analyses completed in the preceding chapters evaluated development needs at Sedona Airport (Airport) over the next 20 years based on forecast activity and operational efficiency. The next step is to apply basic economic, financial, and management rationale to each development item so that the feasibility of each item in the plan can be assessed.

The presentation of the capital improvement program (CIP) has been organized into three sections. First, the Airport's capital program needs are recognized by various categories ranging from enhancing safety to satisfying demand. Second, the Airport development schedule and project cost estimates are presented in narrative and graphic form. Third, capital improvement funding sources on the federal, state, and local levels are identified and discussed.

The CIP is developed following Federal Aviation Administration (FAA) guidelines for Master Plans and primarily identifies those projects that are likely eligible for FAA and/or Arizona Department of Transportation – Multi-Modal Planning Division (ADOT-MPD) – Aeronautics Group grant funding. Other aviation projects that are not programmed to receive federal and/or state funding participation are also presented.

AIRPORT DEVELOPMENT NEEDS

In an effort to identify capital needs at the Airport, this section provides an analysis regarding the associated development needs of projects included in the CIP. While some projects will be demand-based, others will be dictated by safety or rehabilitation needs.



Each development need is categorized according to this schedule. The applicable category, or categories, included are presented on **Exhibit 6A**. The proposed projects can be categorized as follows:

1) **Safety/Security (SS)** – these are capital needs considered necessary for operational safety and protection of aircraft and/or people and property on the ground near the Airport.

2) **Environmental (EN)** – these are capital needs which are identified to enable the Airport to operate in an environmentally acceptable manner.

3) **Maintenance (MN)** – these are capital needs required to maintain the existing infrastructure at the Airport.

4) **Efficiency (EF)** – these are capital needs intended to optimize aircraft ground operations or users of landside facilities.

5) **Demand (DM)** – these are capital needs required to accommodate levels of aviation demand. The implementation of these projects should only occur when demand for these needs is verified.

6) **Opportunities (OP)** – these are capital needs intended to take advantage of opportunities afforded by the Airport setting. Typically, this will involve improvements to property intended for lease to aviation or non-aviation related development.

AIRPORT DEVELOPMENT SCHEDULE AND COST SUMMARIES

With the recommended Master Plan concept developed and specific needs and improvements for the Airport having been established, the next step is to determine a realistic implementation timeline and associated costs for the plan. The recommended improvements are grouped by planning horizon: short term (current – 5 years), intermediate term (6 – 10 years), and long term (11 – 20 years). **Table 6A** summarizes key activity milestones for the three planning horizons.

A key aspect of this Master Plan is the use of demand-based planning milestones. Many projects should be considered based on actual demand levels. As short term horizon activity levels are reached, it will then be time to program for the intermediate term based upon the next activity milestones. Similarly, when the intermediate term milestones are reached, it will be time to program for the long term activity milestones.

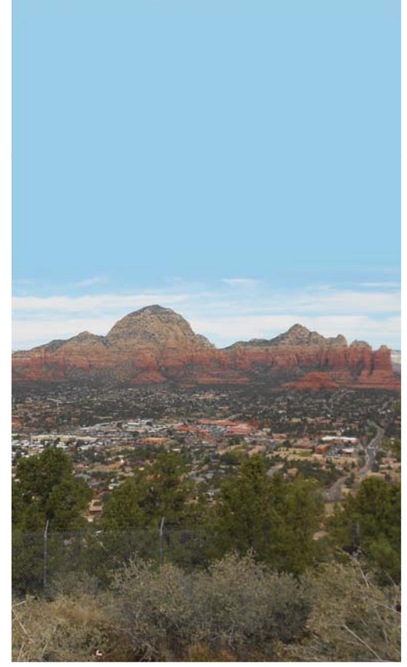
Many development items included in the recommended concept will need to follow these demand indicators. For example, the plan includes new hangar development. Based aircraft necessitating the need for additional hangar development and the need to accommodate growth in overall Airport activity will be the primary indicator for these projects. If

Project #	Project Name	Project Category	Federal Funding	State Funding	Airport/Local Share	Cost Estimate
	Short Term Projects (2016 - 2021)					
	2016					
1	Runway 3/21 Crack Seal/Asphalt Emulsion Seal Coat	MN	$-	$231,300	$25,700	$257,000
2	Construction - Terminal Roadway and Parking Lot Rehabilitation	MN	$637,420	$31,290	$31,290	$700,000
3	Upgrade Fire Suppression System	SS/DM	$-	$-	$450,000	$450,000
	2017					
4	Design/Construction - RSA/Airfield Drainage Phase 2	EN/MN	$-	$587,700	$65,300	$653,000
5	Design/Construction - Apron D Reconstruction/Rehabilitation	MN	$-	$85,500	$9,500	$95,000
6	Environmental Assessment - T/W A Extension and RSA Improvements	EN	$273,180	$13,410	$13,410	$300,000
	2018					
7	Construction - Upgrade/Relocate Fuel Farm	EN/SS	$-	$-	$125,000	$125,000
8	Construction - Taxilanes H and I Extensions	DM/OP	$-	$389,700	$43,300	$433,000
	2019					
9	Design - Runway 3/21 RSA Improvements	SS	$910,600	$44,700	$44,700	$1,000,000
10	Design - Taxiway A Extension	SS/EF	$227,650	$11,175	$11,175	$250,000
11	Acquire Avigation Easements from USFS for Taxiway A Extension (2.6 Acres)	SS/EF	$-	$-	$-	TBD
	2020					
12	Construction - Taxiway A Extension	SS/EF	$2,600,674	$127,663	$127,663	$2,856,000
	2021					
13	Construction - Runway 3/21 RSA Improvements	SS	$6,524,449	$320,276	$320,276	$7,165,000
	Short Term Subtotal		***$11,173,973***	***$1,842,714***	***$1,267,314***	***$14,284,000***
	Intermediate Term Projects (2022 - 2026)					
14	Environmental/Design/Construct - Relocate Perimeter Security Fence (6,400 lf)	SS/EN	$411,318	$20,191	$20,191	$451,700
15	Acquire Avigation Easements from USFS for Runway 3/21 RPZs (36.2 Acres)	SS	$-	$-	$-	TBD
16	Design/Construct Taxiway A1 Pavement Reduction to 35' Wide	SS	$206,888	$10,156	$10,156	$227,200
17	Design/Construct New Taxiway Connectors (A2, A3, A4, A5)	SS	$594,622	$29,189	$29,189	$653,000
18	Design/Construct Runway 3/21 Non-Precision Markings	SS	$241,309	$11,846	$11,846	$265,000
19	Design/Construct Executive Hangar Facility (8,250 sf)	DM/OP	$-	$-	$1,186,000	$1,186,000
20	Design/Construct Expanded Terminal Ramp (14,400 sy)	EF/DM	$856,875	$42,063	$42,063	$941,000
21	Design/Construct Terminal Building Parking Lot Expansion	EF/DM	$682,039	$33,480	$33,480	$749,000
22	Airport Pavement Maintenance	MN	$910,600	$44,700	$44,700	$1,000,000
	Intermediate Term Subtotal		***$3,903,651***	***$191,624***	***$1,377,624***	***$5,472,900***
	Long Term Projects (Beyond 2026)					
23	Design/Construct Maintenance Equipment Storage Facility (1,500 sf)	MN	$-	$-	$491,000	$491,000
24	Design/Construct Terminal Building Expansion (4,500 sf)	EF/DM/OP	$1,247,522	$61,239	$61,239	$1,370,000
25	Design/Construct Shrine Road Realignment	OP/DM	$416,144	$20,428	$20,428	$457,000
26	Design/Construct Taxilane G, H, I, and J Extensions	OP/DM	$-	$521,100	$57,900	$579,000
27	Design/Construct T-Hangar Facilities (44,750 sf)	OP/DM	$-	$-	$5,385,000	$5,385,000
28	Airport Pavement Maintenance	MN	$2,731,800	$134,100	$134,100	$3,000,000
	Long Term Subtotal		***$4,395,466***	***$736,867***	***$6,149,667***	***$11,282,000***
	Capital Improvement Program Totals		**$19,473,090**	**$2,771,205**	**$8,794,605**	**$31,038,900**
	Funding Source %s		**62.7%**	**8.9%**	**28.3%**	

Category Legend:

SS - Safety/Security
EN - Environmental
MN - Maintenance
EF - Efficiency
DM - Demand
OP - Opportunities





based aircraft growth occurs as projected, additional hangars should be constructed to meet the demand. If growth slows or does not occur as forecasted, some projects may be delayed. As a result, capital expenditures are planned to be made on an as-needed basis, which leads to a more responsible use of capital assets.

TABLE 6A
Forecast Summary by Planning Horizon
Sedona Airport

	Base Year (2013)	Short Term	Intermediate Term	Long Term
BASED AIRCRAFT				
Single Engine Piston	77	79	84	87
Multi-Engine Piston	4	4	3	3
Turboprop	1	2	2	5
Jet	1	2	3	6
Helicopter	4	5	6	8
Total Based Aircraft	**92**	**97**	**103**	**115**
AIRCRAFT OPERATIONS				
General Aviation				
Itinerant	24,050	26,210	28,564	33,925
Local	0	0	0	0
Air Taxi				
Itinerant	10,850	12,578	14,581	19,596
Military				
Itinerant	100	400	400	400
Local	0	0	0	0
Total Itinerant Operations	35,000	39,188	43,545	53,921
Total Local Operations	0	0	0	0
Total Annual Operations	**35,000**	**39,188**	**43,545**	**53,921**

Source: Coffman Associates analysis

At Sedona Airport, hangars are either privately owned by tenants, which then have land lease contracts or owned by the Sedona-Oak Creek Airport Authority (SOCAA) and leased to tenants. Because of economic realities, few airports are constructing new hangars on their own, instead relying on private developers. In some cases, private developers can keep construction costs lower, which in turn lowers the monthly fee necessary to amortize the cost of development. To the greatest extent possible, private development of all hangar types should be supported and promoted by Yavapai County and the SOCAA. The CIP for the Airport assumes that the potential for future hangars would most likely be constructed through public/private partnerships. This assumption does not preclude the possibility of the Airport constructing new hangars. Ultimately, the County and the SOCAA will determine, based upon demand and the specific needs of a potential developer, whether to self-fund hangar construction or to rely on private developers.

Not all projects identified are necessary to meet projected demand. Other projects are necessary to enhance the safety and efficiency of the Airport, maintain existing pavement infrastructure, or to address FAA design standards.

Since a Master Plan is a conceptual document, implementation of the capital projects should only be undertaken after further refinement of their design and costs through architectural and engineering analyses. Moreover, some projects may require additional infrastructure improvements (i.e., drainage improvements, extension of utilities, etc.) that may increase the estimated cost of the project or increase the timeline for completion.

Once a list of necessary projects was identified and refined, project-specific cost estimates were developed. The cost estimates include design, engineering, construction administration, and contingencies that may arise on the project. Capital costs presented here should be viewed only as estimates subject to further refinement during design. Nevertheless, they are considered sufficient for planning purposes. Cost estimates for several projects included in the CIP were provided by the Airport's engineer, C&S Companies. Other project costs, particularly those in the short term program, have been taken from the Airport's CIP that is currently on file with the FAA and ADOT-MPD – Aeronautics Group. Easement acquisition costs were estimated based upon local land values obtained from the Yavapai County Assessor's Office. Cost estimates for each of the development projects in the CIP are based on present-day construction, design, and administration costs. Adjustments will need to be applied over time as construction costs or capital equipment costs change.

Exhibit 6A presents the proposed 20-year CIP for Sedona Airport. An estimate of FAA and ADOT-MPD – Aeronautics Group funding eligibility has been included, although actual funding is not guaranteed. For those projects that would be eligible for federal funding, FAA's Airport Improvement Program (AIP) provides 91.06 percent of the total project cost. The federal eligibility breakdown is based upon the Airport's FAA designation (general aviation) in addition to the percentage of federal land within the State of Arizona. The remaining amount would be equally shared between the ADOT-MPD – Aeronautics Group and Yavapai County at 4.47 percent each. Other projects in the CIP are funded solely with state and local funding. Under these scenarios, the ADOT-MPD – Aeronautics Group would fund 90 percent of the total project cost with the remaining 10 percent being the responsibility of Yavapai County.

As detailed in the CIP, the majority of projects listed are eligible for both federal and state funding. Obviously, demand and justification for these projects must be provided prior to a grant being issued by the FAA and/or ADOT-MPD – Aeronautics Group.

The FAA and ADOT-MPD – Aeronautics Group each utilize a priority ranking system to help objectively evaluate potential airport projects. Projects are weighted toward safety, infrastructure preservation, meeting design standards, and capacity enhancement. The FAA will participate in the highest priority projects before considering lower priority projects, even if a lower priority project is considered a more urgent need by the local sponsor. Nonetheless, the project should remain a priority for the Airport and funding support should continue to be requested in subsequent years.

Some projects identified in the CIP will require environmental documentation. The level of documentation necessary for each project must be determined in consultation with the

FAA and ADOT-MPD – Aeronautics Group. There are three major levels of environmental review to be considered under the *National Environmental Policy Act* (NEPA) that include categorical exclusions (CatEx), Environmental Assessments (EA), and Environmental Impact Statements (EIS). Each level requires more time to complete and more detailed information. Guidance on what level of documentation is required for a specific project is provided in FAA Order 1050.1E, *Environmental Impacts: Policies and Procedures*. The Environmental Overview presented in Chapter Five addresses NEPA and provides an evaluation of potential environmental impacts for Sedona Airport.

The following sections will describe in greater detail the projects identified for the airport over the next 20 years. The short term projects are subdivided into yearly increments and refer to the federal fiscal year (FY) (October – September). The intermediate and long terms are grouped by local priority. While the CIP shows the priority ranking of the projects, the list should be evaluated and revised on a regular basis.

SHORT TERM PROGRAM

The short term planning period is the only planning horizon separated into single years. This is to allow the CIP to be coordinated with the five-year planning cycle of the FAA and ADOT-MPD – Aeronautics Group programs. If any of these projects cannot be funded in the timeframe indicated, Yavapai County should consider the project for the following year.

Projects called out during this timeframe are very specific in terms of actual design and construction. Several projects in the short term may also need to be addressed in a CatEx or an EA. As such, some projects are initially put through an environmental and/or design phase and then followed up with actual construction.

The short term program considers 13 projects for the planning period as presented on **Exhibit 6A** and depicted on **Exhibit 6B**. The following provides a detailed breakdown of each project within FY 2016 through 2021. The Master Plan CIP includes FY 2016 projects to be consistent with the current ACIP submitted to the FAA, resulting in a total of six years included within the short term program.

FY 2016 Projects

Project #1: Runway 3/21 Crack Seal/Asphalt Emulsion Seal Coat
Description: According to the most recent pavement inspection (June 7, 2013), the runway pavement was reported as having low- and medium-severity raveling where aggregate was missing from the porous friction course (PFC) surface. Smaller amounts of unsealed, low-severity longitudinal and transverse (L&T) cracking and bleeding were also observed. Bleeding was identified where asphalt cement or similar material had come through the surface of the pavement. The most recent runway pavement work was a PFC overlay com-

pleted in September 2005 when the runway was widened to 100 feet from 75 feet. This project is a standard maintenance project to extend the useful life of the pavement.
Cost Estimate: $257,000
Funding Sources: ADOT – 90 percent / Local – 10 percent.

Project #2: Construction – Terminal Roadway and Parking Lot Rehabilitation
Description: The existing parking lot pavement is failing and needs to be rehabilitated. This project also includes the installation of lighting to increase safety and security.
Cost Estimate: $700,000
Funding Sources: FAA – 91.06 percent / ADOT – 4.47 percent / Local – 4.47 percent.

Project #3: Upgrade Fire Suppression System
Description: The existing fire suppression system is at its service capacity and needs to be expanded to allow for future landside facility development. This project will add 160,000 gallons of storage to the existing system along with a new fire suppression pump.
Cost Estimate: $450,000
Funding Sources: Local – 100 percent. This project is planned to be self-funded through the ADOT State Airport Loan Program.

FY 2017 Projects

Project #4: Design/Construct – Runway Safety Area (RSA)/Airfield Drainage Phase 2
Description: This project is a continuation of an existing project to improve stormwater drainage on the airfield and grading to comply with FAA RSA design standards.
Cost Estimate: $653,000
Funding Eligibility: ADOT – 90 percent / Local – 10 percent.

Project #5: Design/Construct – Apron D Reconstruction/Rehabilitation
Description: Existing Apron D pavement within the hangar area is severely deteriorated and in need of rehabilitation. This project will extend the useful life of this pavement.
Cost Estimate: $95,000
Funding Eligibility: ADOT – 90 percent / Local – 10 percent.

Project #6: Environmental Assessment (EA) – Taxiway A Extension and RSA Improvements
Description: This project examines the potential NEPA impacts of the construction of Taxiway A to the Runway 3 threshold and for the improvement of the RSA off both ends of the runway, which will involve placing fill and grading currently undisturbed land.
Cost Estimate: $300,000
Funding Eligibility: FAA – 91.06 percent / ADOT – 4.47 percent / Local – 4.47 percent.

LEGEND

- Airport Property Line
- Existing Easement Line
- Existing Fence Line
- Ultimate Fence Line
- Runway Safety Area (RSA)
- Runway Protection Zone (RPZ)
- 30' Building Restriction Line (BRL)
- Hangar/Aviation Related Development
- Non-Aviation Revenue Support
- Short Term Project
- Beyond Short Term Development

0 600 1200
SCALE IN FEET

NORTH

Aerial Date: November 2013

Proposed Sky Ranch Lodge Expansion Area
Sky Ranch Lodge
Airport Road
Air Terminal Drive
Shrine Road
BRL
One-Mile or Greater Visibility Runway Protection Zone
2.6 Acres
0.1 Acres
0.1 Acres
0.16 Acres
8.0 Acres
460'
RUNWAY 3-21 (5,132' x 100')
A1 A2 A3 A4 A5 A6 A7 A8 A9 A10
B

0 400 800
SCALE IN FEET

Proposed Sky Ranch Lodge Expansion Area
4.6 Acres
Sky Ranch Lodge
6.1 Acres
Airport Road
12.9 Acres
2.3 Acres
3.0 Acres
2.8 Acres
Air Terminal Drive
Shrine Road
0.3 Acres
2.4 Acres
6.5 Acres
0.9 Acres
BRL

SHORT TERM PROJECTS (2016 - 2021)

2016
1. Runway 3/21 Crack Seal/Asphalt Emulsion Seal Coat
2. Construction - Terminal Roadway and Parking Lot Rehabilitation
3. Upgrade Fire Suppression System

2017
4. Design/Construction - RSA/Airfield Drainage Phase 2
5. Design/Construction - Apron D Reconstruction/Rehabilitation
6. Environmental Assessment - T/W A Extension and RSA Improvements - NP

2018
7. Construction - Relocate/Upgrade Fuel Farm
8. Construction - Taxilanes H and I Extensions

2019
9. Design - Runway 3/21 RSA Improvements
10. Design - Taxiway A Extension
11. Acquire Avigation Easements from USFS for Taxiway A Extension (2.6 Acres)

2020
12. Construction - Taxiway A Extension

2021
13. Construction - Runway 3/21 RSA Improvements

NP - Not Pictured

Exhibit 6B
DEVELOPMENT STAGING - SHORT TERM PROJECTS

FY 2018 Projects

Project #7: Upgrade/Relocate Fuel Farm
Description: The existing fuel farm needs to be relocated and upgraded to meet spill containment regulations.
Cost Estimate: $125,000
Funding Eligibility: Local – 100 percent. This project is also planned to be self-funded through the ADOT State Airport Loan Program.

Project #8: Construction – Taxilanes H and I Extensions
Description: This project will extend existing taxilanes in the hangar area allowing for the development of new hangar facilities.
Cost Estimate: $433,000
Funding Eligibility: ADOT – 90 percent / Local – 10 percent.

FY 2019 Projects

Project #9: Design – Runway 3/21 RSA Improvements
Description: Design-only project for the improvement of the RSA off both runway ends.
Cost Estimate: $1,000,000
Funding Eligibility: FAA – 91.06 percent / ADOT – 4.47 percent / Local – 4.47 percent.

Project #10: Design – Taxiway A Extension
Description: Design-only project for the extension of Taxiway A to the Runway 3 threshold.
Cost Estimate: $250,000
Funding Eligibility: FAA – 91.06 percent / ADOT – 4.47 percent / Local – 4.47 percent.

Project #11: Acquire Avigation Easements from the United States Forest Service (USFS) for Taxiway A Extension
Description: A portion of the land within the construction impact area for an extension of Taxiway A to the Runway 3 threshold is owned by the USFS. An easement for approximately 2.6 acres of USFS land needs to be acquired for this property to allow for the construction of the taxiway extension and for a future project to relocate the perimeter security fence.
Cost Estimate: To be determined based upon coordination between the County/SOCAA and the USFS.
Funding Eligibility: To be determined.

FY 2020 Project

Project #12: Construction – Taxiway A Extension
Description: Extension of Taxiway A to the Runway 3 threshold will improve operational safety of the Airport by eliminating the need for aircraft to back-taxi from Taxiway A8 to the Runway 3 threshold for northeast departures. The taxiway extension includes the construction of a bypass taxiway which will allow aircraft to bypass each other if necessary. These taxiway improvements are planned to meet Taxiway Design Group (TDG) 2 standards and include taxiway shoulders, medium intensity taxiway lighting (MITL), and airfield guidance signage.
Cost Estimate: $2,856,000
Funding Eligibility: FAA – 91.06 percent / ADOT – 4.47 percent / Local – 4.47 percent.

FY 2021 Project

Project #13: Construction – Runway 3/21 RSA Improvements
Description: Portions of the RSA do not meet FAA grading standards. This project involves the construction of retaining walls beyond each runway end to allow for the filling and grading of the RSA to bring it entirely within FAA design standards.
Cost Estimate: $7,165,000
Funding Eligibility: FAA – 91.06 percent / ADOT – 4.47 percent / Local – 4.47 percent.

Short Term CIP Summary

The short term CIP includes projects that enhance the overall safety, efficiency, and maintenance of the airfield while also implementing landside improvements. The total investment necessary for the short term CIP is approximately $14.3 million. Approximately $13.0 million is programmed for federal/state funding assistance. The remaining $1.3 million is to be provided through local funding sources.

INTERMEDIATE TERM PROGRAM

The intermediate term covers the period 6 through 10 years and includes ten projects. These projects are listed on **Exhibit 6A** and depicted on **Exhibit 6C**. Planning new projects beyond the short term timeframe can be challenging. Due to the fluid nature of funding availability and the possibility of changing priorities, these projects have been grouped together into a single project list and not prioritized by year. Further evaluation of these projects should occur during this planning horizon to determine their order of importance based on airport safety, demand, and efficiency.

LEGEND

- Airport Property Line
- Existing Easement Line
- Existing Fence Line
- Ultimate Fence Line
- Runway Safety Area (RSA)
- Runway Protection Zone (RPZ)
- 30' Building Restriction Line (BRL)
- Hangar/Aviation Related Development
- Non-Aviation Revenue Support
- Intermediate Term Project
- Long Term Project
- Private Development or Beyond Planning Period

Aerial Date: November 2013

0 600 1200
SCALE IN FEET

NORTH

Greater than 3/4 Mile Visibility Runway Protection Zone
One-Mile or Greater Visibility Runway Protection Zone
28.2 Acres
0.1 Acres
0.1 Acres
0.16 Acres
2.6 Acres
Proposed Sky Ranch Lodge Expansion Area
Sky Ranch Lodge
Airport Road
Shrine Road
BRL
460'
RUNWAY 3-21 (5,132' x 100')
A
B
A10 A9 A8 A7 A6 A5 A4 A3 A2 A1
One-Mile or Greater Visibility Runway Protection Zone
8.0 Acres

0 400 800
SCALE IN FEET

Proposed Sky Ranch Lodge Expansion Area
4.6 Acres
Sky Ranch Lodge
6.1 Acres
Airport Road
2.3 Acres
3.0 Acres
2.8 Acres
12.9 Acres
Air Terminal Drive
Shrine Road
2.4 Acres
0.3 Acres
6.5 Acres
0.9 Acres
BRL
D E F G H I J K L

INTERMEDIATE TERM PROJECTS (2022 - 2026)

14 Environmental/Design/Construct - Relocate Perimeter Security Fence (6,400 lf)
15 Acquire Avigation Easements from USFS for RWY 3/21 RPZs (36.2 Acres)
16 Design/Construct Taxiway A1 Pavement Reduction
17 Design/Construct New Taxiway Connectors (A2, A3, A4, A5)
18 Design/Construct Runway 3/21 Non-Precision Markings
19 Design/Construct Executive Hangar Facility (8,250 sf)
20 Design/Construct Expanded Terminal Ramp (14,400 sy)
21 Design/Construct Terminal Building Parking Lot Expansion
22 Airport Pavement Maintenance - NP

LONG TERM PROJECTS (BEYOND 2026)

23 Design/Construct Maintenance Equipment Storage Facility (1,500 sf)
24 Design/Construct Terminal Building Expansion (4,500 sf)
25 Design/Construct Shrine Road Realignment
26 Design/Construct Taxilane G, H, I, and J Extensions
27 Design/Construct T-Hangar Facilities (44,750 sf)
28 Airport Pavement Maintenance - NP

NP - Not Pictured

Exhibit 6C
DEVELOPMENT STAGING - INTERMEDIATE AND LONG TERM PROJECTS

Project #14: Environmental/Design/Construct – Relocate Perimeter Security Fence
Description: Portions of the perimeter security fence lie outside of Airport property, while yet other portions lie within the runway object free area (ROFA). The relocation of approximately 6,400 linear feet (lf) of the existing fence line is included within this project. Since this project may require significant field survey work, additional fee for an EA is included in the cost estimate.
Cost Estimate: $451,700
Funding Eligibility: FAA – 91.06 percent / ADOT – 4.47 percent / Local – 4.47 percent.

Project #15: Acquire Avigation Easements from USFS for Runway 3/21 Runway Protection Zones (RPZs)
Description: The RPZs for both runway ends currently extend beyond Airport property and clear zone easements deeded to Yavapai County by the USFS. To protect this property from incompatible development that might impair aviation activity at the Airport, this project will give the Airport control over the entire RPZ. Furthermore, if the Airport pursues improved instrument approach procedures for Runway 3 that provide approach minimums less than one-mile visibility and greater than ¾-mile visibility, the RPZ dimensions increase significantly. For planning purposes, the avigation easement acquisition should include the future greater than ¾-mile visibility Runway 3 RPZ dimensions. In total, the avigation easement would encompass approximately 36.2 acres of USFS property.
Cost Estimate: To be determined based upon coordination between the County/SOCAA and the USFS.
Funding Eligibility: To be determined.

Project #16: Design/Construct Taxiway A1 Pavement Reduction
Description: Taxiway A1 is a connecting taxiway from Taxiway A to the Runway 21 threshold. The current pavement width is 150 feet, which exceeds the TDG 2 width standard of 35 feet. The FAA encourages airport design to limit wide pavement areas, which can lead to runway incursions. This project reduces the pavement width of Taxiway A1 per FAA guidance including the relocation of guidance signage and pavement edge lighting.
Cost Estimate: $227,200
Funding Eligibility: FAA – 91.06 percent / ADOT – 4.47 percent / Local – 4.47 percent.

Project #17: Design/Construct New Taxiway Connectors
Description: Several existing taxiways provide direct access from the aircraft parking ramps to the Runway. Affected taxiways include A2, A3, A4, A5, and A6. The FAA encourages airport design to eliminate direct access taxiways, which can lead to runway incursions. This project involves the closure of the existing connecting taxiways and the construction of new off-set taxiways that will require aircraft to make turns prior to entering the runway.
Cost Estimate: $653,000
Funding Eligibility: FAA – 91.06 percent / ADOT – 4.47 percent / Local – 4.47 percent.

Project #18: Design/Construct Runway 3/21 Non-Precision Markings
Description: The runway is currently equipped with basic runway markings including the runway designation, centerline, and aiming points. This project upgrades the runway markings to non-precision markings by adding threshold markings.
Cost Estimate: $265,000
Funding Eligibility: FAA – 91.06 percent / ADOT – 4.47 percent / Local – 4.47 percent.

Project #19: Design/Construct Executive Hangar Facility
Description: All hangar construction is intended to be developed only on an on-demand basis. Aviation demand forecasts prepared for this Master Plan indicated a need for expanded hangar facilities over time. This project expands upon an existing executive hangar facility by adding 8,250 square feet (sf) of additional aircraft storage capacity.
Cost Estimate: $1,186,000
Funding Eligibility: Local – 100 percent. All future hangar construction is anticipated to be funded locally by the County/SOCAA and/or through agreements with third-party developers.

Project #20: Design/Construct Expanded Terminal Ramp
Description: This project includes the expansion of the terminal aircraft parking ramp by approximately 14,400 square yards (sy). This ramp expansion will allow for additional heavy aircraft and helicopter parking. It will also provide for additional ramp space for seasonal aerial firefighting aircraft parking.
Cost Estimate: $941,000
Funding Eligibility: FAA – 91.06 percent / ADOT – 4.47 percent / Local – 4.47 percent.

Project #21: Design/Construct Terminal Building Parking Lot Expansion
Description: As aviation activity (itinerant general aviation and air taxi) increases over time, it is anticipated that the existing terminal vehicle parking lot will need to be expanded. This project will include an additional 44 vehicle parking spaces.
Cost Estimate: $749,000
Funding Eligibility: FAA – 91.06 percent / ADOT – 4.47 percent / Local – 4.47 percent.

Project #22: Airport Pavement Maintenance
Description: This is a nonspecific project to account for routine airfield (runway/taxiway/apron) pavement maintenance work that is anticipated over the course of the planning period.
Cost Estimate: $1,000,000
Funding Eligibility: FAA – 91.06 percent / ADOT – 4.47 percent / Local – 4.47 percent.

Intermediate Term CIP Summary

Projects included in the intermediate term continue to improve the overall safety and efficiency of the airfield as well as expand landside service areas. The total investment necessary for the intermediate term CIP is approximately $5.4 million. Approximately $4.1 mil-

lion is programmed for federal/state funding assistance. The remaining $1.4 million is to be provided through local funding sources.

LONG TERM PLANNING PROGRAM

The long term covers the period 11 through 20 years. This planning horizon includes six projects for the timeframe as listed on **Exhibit 6A** and depicted on **Exhibit 6C**. The following section includes a description of each project.

Project #23: Design/Construct Maintenance Equipment Storage Facility
Description: The expansion of the terminal aircraft parking ramp will require the removal of the existing maintenance equipment storage hut. This project constructs a new 1,500 sf storage facility at the north corner of Ramp A.
Cost Estimate: $491,000
Funding Eligibility: Local – 100 percent.

Project #24: Design/Construct Terminal Building Expansion
Description: As operational activity grows over time it may become necessary to expand the terminal building to maintain an appropriate level of service. The 4,500 sf expansion includes leasable space for the potential consolidation of the air tour operators within the terminal building.
Cost Estimate: $1,370,000
Funding Eligibility: FAA – 91.06 percent / ADOT – 4.47 percent / Local – 4.47 percent.

Project #25: Design/Construct Shrine Road Realignment
Description: Shrine Road extends north from an intersection with Airport Road and Air Terminal Drive, providing public roadway access to the north hangar facilities. This project realigns a portion of Shrine Road to the north to provide space for the expansion of hangar facilities. The impacted segment is approximately 750 lf.
Cost Estimate: $457,000
Funding Eligibility: FAA – 91.06 percent / ADOT – 4.47 percent / Local – 4.47 percent.

Project #26: Design/Construct Taxilane G, H, I, and J Extensions
Description: A follow-up project to the realignment of Shrine Road is the extension of taxilanes that provide airfield access to the affected hangar area (Taxilanes G, H, I, and J).
Cost Estimate: $579,000
Funding Eligibility: FAA – 91.06 percent / ADOT – 4.47 percent / Local – 4.47 percent.

Project #27: Design/Construct T-Hangar Facilities
Description: This project involves the construction of additional T-hangar style hangar facilities for small aircraft storage. The hangar development area included within this project is anticipated to include up to approximately 44,750 sf of additional aircraft storage capacity.
Cost Estimate: $5,385,000

Funding Eligibility: Local – 100 percent. All future hangar construction is anticipated to be funded locally by the County/SOCAA and/or through agreements with third-party developers.

Project #28: Airport Pavement Maintenance
Description: This is a nonspecific project to account for routine airfield (runway/taxiway/apron) pavement maintenance work that is anticipated over the course of the planning period.
Cost Estimate: $3,000,000
Funding Eligibility: FAA – 91.06 percent / ADOT – 4.47 percent / Local – 4.47 percent.

Long Term CIP Summary

The total costs associated with the long term program are estimated at $11.3 million. Of this total, approximately $5.1 million could be eligible for federal/state funding, and the local share is projected at $6.2 million.

CAPITAL IMPROVEMENT SUMMARY

The CIP is intended as a road map of airport improvements to help guide Yavapai County, the SOCAA, the FAA, and ADOT-MPD – Aeronautics Group. The plan as presented will help accommodate increases in forecast demand at Sedona Airport over the next 20 years and beyond. The first five years of the CIP are separated into yearly installments, and the intermediate and long term projects are grouped together respectively. The sequence of projects may change due to availability of funds or changing priorities. Nonetheless, this is a comprehensive list of capital projects the airport should consider in the next 20 years.

The total 20-year CIP proposes approximately $31.0 million in airport development needs. Of this total, approximately $22.2 million could be eligible for federal/state funding assistance. The local funding estimate for the proposed 20-year CIP is $8.8 million.

CAPITAL IMPROVEMENT FUNDING SOURCES

There are generally four sources of funds used to finance airport development which include:

- Airport cash flow
- Revenue and general obligation bonds
- Federal/state/local grants
- Passenger facility charges (PFCs), which are reserved for commercial service airports

Access to these sources of financing varies widely among airports, with some large airports maintaining substantial cash reserves and the smaller commercial service and general aviation airports often requiring subsidies from local governments to fund operating expenses and finance modest improvements.

Financing capital improvements at the Airport will not rely solely on the financial resources of the County and the SOCAA. Capital improvement funding is available through various grant-in-aid programs on both the federal and state levels. Historically, Sedona Airport has received federal and state grants. While some years more funds could be available, the CIP was developed with project phasing in order to remain realistic and within the range of anticipated grant assistance. The following discussion outlines key sources of funding potentially available for capital improvements at the Airport.

FEDERAL GRANTS

Through federal legislation over the years, various grant-in-aid programs have been established to develop and maintain a system of public use airports across the United States. The purpose of this system and its federally based funding is to maintain national defense and to promote interstate commerce. The most recent legislation affecting federal funding was enacted on February 17, 2012 and is titled the *FAA Modernization and Reform Act of 2012*.

The law authorizes the FAA's AIP at $3.35 billion for fiscal years 2012 through 2015. Eligible airports, which include those in the *National Plan of Integrated Airports Systems* (NPIAS), such as Sedona Airport, can apply for airport improvement grants. **Table 6B** presents the approximate distribution of the AIP funds. Sedona Airport is eligible to apply for grants which may be funded through state apportionments, the small airport fund, discretionary, and/or set-asides categories.

Funding for AIP-eligible projects is undertaken through a cost-sharing arrangement in which the FAA provides up to 90 percent of the cost. In exchange for this level of funding, the airport sponsor is required to meet various grant assurances, including maintaining the improvement for its useful life, usually 20 years. As discussed earlier in this chapter, the FAA provides up to 91.06 percent of the cost of eligible projects for Sedona Airport. An additional 4.47 percent of AIP-eligible project costs can be funded through the ADOT-MPD – Aeronautics Group.

The source for AIP funds 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 Aviation Trust Fund also finances the operation of the FAA. It is funded by user fees, including taxes on airline tickets, aviation fuel, and various aircraft parts.

TABLE 6B
Federal AIP Funding Distribution

Funding Category	Percent of Total*	Funds**
Apportionment/Entitlement		
Passenger Entitlements	26.6%	$891,100,000
Cargo Entitlements	3.5%	$117,250,000
Alaska Supplemental	0.7%	$23,450,000
State Apportionment for Non-Primary Entitlements	12.5%	$418,750,000
State Apportionment Based on Area and Population	7.4%	$247,900,000
Carryover	22.1%	$740,350,000
Small Airport Fund		
Small Hubs	2.2%	$73,700,000
Non-Hubs	8.7%	$291,450,000
Non-Primary (GA and Reliever)	4.3%	$144,050,000
Discretionary		
Capacity/Safety/Security/Noise	5.4%	$180,900,000
Pure Discretionary	1.8%	$60,300,000
Set-Asides		
Noise	4.2%	$140,700,000
Military Airports Program	0.5%	$16,750,000
Reliever	0.1%	$3,350,000
Totals	100.0%	$3,350,000,000

*Percentages based on FAA fiscal year 2013 final funding breakdown.
***FAA Modernization and Reform Act of 2012*
AIP - Airport Improvement Program

Source: FAA Order 5100.38D, *Airport Improvement Program Handbook*

Apportionment (Entitlement) Funds

Federal AIP funds 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 minimum enplanement levels of at least 10,000 passengers annually. If the threshold is met, the airport receives $1 million annually in entitlement funds. Other entitlement funds are distributed to cargo service airports, states and insular areas (state apportionment), and Alaska airports.

General aviation airports included in the NPIAS can receive up to $150,000 each year in non-primary entitlement (NPE) funds. These funds can be carried over and combined for up to four years, thereby allowing for completion of a more expensive project. In the past, Sedona Airport has received NPE funding.

The FAA also provides a state apportionment based on a federal formula that takes into account area and population. The FAA then distributes these funds for projects at various airports throughout the state.

Small Airport Fund

If a large or medium hub commercial service airport chooses to institute a PFC, which is a fee of up to $4.50 on each airline ticket for funding of capital improvement projects, then their apportionment is reduced. A portion of the reduced apportionment goes to the small airport fund. The small airport fund is reserved for small-hub primary commercial service airports, non-hub commercial service airports, and general aviation airports. Sedona Airport is eligible for small airport funds.

Discretionary Funds

The remaining AIP funds are distributed by the FAA based on 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 from airports across the country are given preference in funding. High priority projects include those related to meeting design standards, capacity improvements, and other safety enhancements.

Under the AIP program, examples of eligible development projects include the airfield, public aprons, and access roads. Additional buildings and structures may be eligible if the function of the structure is to serve airport operations in a non-revenue generating capacity, such as maintenance facilities. Some revenue-enhancing structures, such as T-hangars and fuel farms, may be eligible if all airfield improvements have been made; however, the priority ranking of these facilities is very low. At Sedona Airport, funding for these types of projects is unlikely due to higher-priority projects being recognized.

Whereas entitlement monies are guaranteed on an annual basis, discretionary funds are not assured. If the combination of entitlement, discretionary, and airport sponsor match does not provide enough capital for planned development, projects may be delayed.

Set-Aside Funds

Portions of AIP funds are set-asides designed to achieve specific funding minimums for noise compatibility planning and implementation, select former military airfields (Military Airport Program), and select reliever airports. Sedona Airport does not qualify for set-aside funds as it is a not a former military airfield or a reliever airport.

FAA Facilities and Equipment Program

The Airway Facilities Division of the FAA administers the Facilities and Equipment (F&E) Program. This program provides funding for the installation and maintenance of various navigational aids and equipment of the national airspace system. Under the F&E program,

funding is provided for FAA airport traffic control towers (ATCTs), enroute navigational aids, on-airport navigational aids, and approach lighting systems.

While F&E still installs and maintains some navigational aids, on-airport facilities at general aviation airports have not been a priority. Therefore, airports often request funding assistance for navigational aids through AIP and then maintain the equipment on their own[1].

STATE AID TO AIRPORTS

The ADOT-MPD – Aeronautics Group recognizes the valuable contribution to the state's transportation economy that airports make. Therefore, it administers several programs to aid in maintaining airports in the state. 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 State Transportation Board establishes the policies for distribution of these state funds.

Under the State of Arizona's grant program, an airport can receive funding for one-half (currently 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. Sedona Airport is eligible for these funding allocations.

Pavement Maintenance Program

The airport system in Arizona is a multi-million dollar investment of public and private funds that must be protected and preserved. State aviation fund dollars are limited and the State Transportation Board recognizes the need to protect and extend the maximum useful life of the airport system's pavement. The Arizona Pavement Management System (APMS) has been established to assist in the preservation of Arizona airports' system infrastructure.

Public Law 103-305 requires that airports requesting federal AIP funding for pavement rehabilitation or reconstruction have an effective pavement maintenance program system. To this end, ADOT-MPD – Aeronautics Group maintains the APMS.

The Arizona APMS uses the Army Corps of Engineers' "Micropaver" program as a basis for generating a Five-Year Arizona Pavement Preservation Program (APPP). The APMS con-

[1] Guidance on the eligibility of a project for federal AIP grant funding can be found in FAA Order 5100.38D, *Airport Improvement Program Handbook*, which can be accessed at:
http://www.faa.gov/airports/aip/aip_handbook/media/AIP-Handbook-Order-5100-38D

sists of visual inspections of all airport pavements. Evaluations are made of the types and severities observed and entered into a computer program database. Pavement Condition Index (PCI) values are determined through the visual assessment of pavement conditions in accordance with the most recent FAA Advisory Circular 150/5380-7, *Pavement Management System*, and range from 0 (failed) to 100 (excellent). Every three years, a complete database update with new visual observations is conducted. Individual airport reports from the update are shared with all participating system airports. ADOT-MPD – Aeronautics Group ensures that the APMS database is kept current, in compliance with FAA requirements.

Every year, ADOT-MPD – Aeronautics Group, utilizing the APMS, will identify airport pavement maintenance projects eligible for funding for the upcoming five years. These projects will appear in the state's Five-Year Airport Development Program. Once a project has been identified and approved for funding by the State Transportation Board, the airport sponsor may elect to accept a state grant for the project and not participate in the APPP, or the airport sponsor may sign an Inter-Government Agreement (IGA) with ADOT-MPD – Aeronautics Group to participate in the APPP. Sedona Airport is eligible to participate in this program.

State Airport Loan Program

The ADOT Airport Loan Program was established to enhance the utilization of state funds and provide a flexible funding mechanism to assist airports in funding revenue-generating projects, 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.

LOCAL FUNDING

The balance of project costs, after consideration has been given to other funding sources described above, must be funded through local resources. Sedona Airport is owned by Yavapai County and operated by the SOCAA. By the terms of its lease agreement with the County, the SOCAA is required to operate as a self-sufficient enterprise without financial subsidies or other payments by the County. The SOCAA is further required to operate the Airport in a prudent and businesslike manner, promoting aeronautical activities at the Airport and to promote other types of revenue producing activities as appropriate. The Airport has historically been completely financially self-sufficient.

Airport revenues are generated by airport operations through the collection of various rates and charges. Revenues collected by the airport are to be used specifically to help fund the operation and maintenance of the airport and for additions or improvements to airport facilities.

All general aviation airports should establish standard base rates for various leases. All lease rates should be set to adjust to a standard index such as the consumer price index (CPI) to assure that fair and equitable rates continue to be charged into the future. Many factors will impact what the standard lease rate should be for a particular facility or ground parcel. For example, ground leases for aviation-related facilities should have a different lease rate than for non-aviation leases. When airports own hangars, a separate facility lease rate should be added to the ground rent. The lease rate for any individual parcel or hangar can vary due to availability of utilities, condition, location, and other factors. Nonetheless, standard lease rates should fall within an acceptable range.

There are several alternatives for local financing options for future development at the airport, including airport revenues, direct funding (subsidizing) from the County, 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.

There are several bonding options available, including general obligation bonds, limited obligation bonds, and revenue bonds. General obligation bonds are a common form of bond which is issued by voter approval and secured by the full faith and credit of the county, and future 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 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 are reserved for projects that have the 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 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 bonds.

There are several types of revenue bonds, but in general, they are a form of 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 government agency, produces a unique set of concerns.

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.

It is also acceptable for the airport to enter into some form of public/private partnership for various airport projects. Typically, this would be limited to hangar construction, but there are some examples where a private developer constructs, for example, a taxilane, then deeds it to the airport for ongoing maintenance. When entering any such arrangement, the airport must be sure that the private developer does not gain an economic advantage over other airport tenants.

MASTER PLAN IMPLEMENTATION

To implement the Master Plan recommendations, it is key to recognize that planning is a continuous process and does not end with approval of this document. The airport should implement measures that allow them to track various demand indicators, such as based aircraft, hangar demand, and operations. The issues that this Master Plan is based on will remain valid for a number of years. The primary goal is for the Airport to best serve the air transportation needs of the region, while continuing to be economically self-sufficient.

The actual need for facilities is best established by airport activity levels rather than a specified date. For example, projections have been made as to when additional hangars may be needed at the Airport. In reality, the timeframe in which the development is needed may be substantially different. Actual demand may be slower to develop than expected. On the other hand, high levels of demand may establish the need to accelerate development. Although every effort has been made in this master planning process to conservatively estimate when facility development may be needed, aviation demand will dictate timing of facility improvements.

The value of a Master Plan is keeping the issues and objectives at the forefront of managers and decision-makers. In addition to adjustments in aviation demand, when to undertake the improvements recommended in this Master Plan will impact how long the plan remains valid. The format of this plan reduces the need for formal and costly updates by simply adjusting the timing of project implementation. Updating can be done by the manager, thereby improving the plan's effectiveness.

In summary, the planning process requires Yavapai County and the SOCAA to consistently monitor the progress of Sedona Airport in terms of aircraft operations and based aircraft. Analysis of aviation demand is critical to the timing and need for new Airport facilities.



Appendix A

GLOSSARY OF TERMS

Glossary of Terms

A

ABOVE GROUND LEVEL: The elevation of a point or surface above the ground.

ACCELERATE-STOP DISTANCE AVAILABLE (ASDA): See declared distances.

ADVISORY CIRCULAR: External publications issued by the FAA consisting of nonregulatory material providing for the recommendations relative to a policy, guidance and information relative to a specific aviation subject.

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) transports 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.

AIRCRAFT: A transportation vehicle that is used or intended for use for flight.

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.

AIRCRAFT OPERATION: The landing, takeoff, or touch-and-go procedure by an aircraft on a runway at an airport.

AIRCRAFT OPERATIONS AREA (AOA): A restricted and secure area on the airport property designed to protect all aspects related to aircraft operations.

AIRCRAFT OWNERS AND PILOTS ASSOCIATION: A private organization serving the interests and needs of general aviation pilots and aircraft owners.

AIRCRAFT RESCUE AND FIRE FIGHTING: A facility located at an airport that provides emergency vehicles, extinguishing agents, and personnel responsible for minimizing the impacts of an aircraft accident or incident.

AIRFIELD: The portion of an airport which contains the facilities necessary for the operation of aircraft.

AIRLINE HUB: An airport at which an airline concentrates a significant portion of its activity and which often has a significant amount of connecting traffic.

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.

AIRPORT AUTHORITY: A quasi-governmental public organization responsible for setting the policies governing the management and operation of an airport or system of airports under its jurisdiction.

AIRPORT BEACON: A navigational aid located at an airport which displays a rotating light beam to identify whether an airport is lighted.

AIRPORT CAPITAL IMPROVEMENT PLAN: The planning program used by the Federal Aviation Administration to identify, prioritize, and distribute funds for airport development and the needs of the National Airspace System to meet specified national goals and objectives.

AIRPORT ELEVATION: The highest point on the runway system at an airport expressed in feet above mean sea level (MSL).

AIRPORT IMPROVEMENT PROGRAM: A program authorized by the Airport and Airway Improvement Act of 1982 that provides funding for airport planning and development.

AIRPORT LAYOUT DRAWING (ALD): The drawing of the airport showing the layout of existing and proposed airport facilities.

AIRPORT LAYOUT PLAN (ALP): A scaled drawing of the existing and planned land and facilities necessary for the operation and development of the airport.

AIRPORT LAYOUT PLAN DRAWING SET: A set of technical drawings depicting the current and future airport conditions. The individual sheets comprising the set can vary with the complexities of the airport, but the FAA-required drawings include the Airport Layout Plan (sometimes referred to as the Airport Layout Drawing (ALD), the Airport Airspace Drawing, and the Inner Portion of the Approach Surface Drawing, On-Airport Land Use Drawing, and Property Map.

AIRPORT MASTER PLAN: The planner's concept of the long-term development of an airport.

AIRPORT MOVEMENT AREA SAFETY SYSTEM: A system that provides automated alerts and warnings of potential runway incursions or other hazardous aircraft movement events.

AIRPORT OBSTRUCTION CHART: A scaled drawing depicting the Federal Aviation Regulation (FAR) Part 77 surfaces, a representation of objects that penetrate these surfaces, runway, taxiway, and ramp areas, navigational aids, buildings, roads and other detail in the vicinity of an airport.

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 SPONSOR: The entity that is legally responsible for the management and operation of an airport, including the fulfillment of the requirements of laws and regulations related thereto.

AIRPORT SURFACE DETECTION EQUIPMENT: A radar system that provides air traffic controllers with a visual representation of the movement of aircraft and other vehicles on the ground on the airfield at an airport.

AIRPORT SURVEILLANCE RADAR: The primary radar located at an airport or in an air traffic control terminal area that receives a signal at an antenna and transmits the signal to air traffic control display equipment defining the location of aircraft in the air. The signal provides only the azimuth and range of aircraft from the location of the antenna.

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: A facility which provides en route air traffic control service to aircraft operating on an IFR flight plan within controlled airspace over a large, multi-state region.

AIRSIDE: The portion of an airport that contains the facilities necessary for the operation of aircraft.

AIRSPACE: The volume of space above the surface of the ground that is provided for the operation of aircraft.

AIR TAXI: An air carrier certificated in accordance with FAR Part 121 and 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.

AIR TRAFFIC CONTROL: A service operated by an appropriate organization for the purpose of providing for the safe, orderly, and expeditious flow of 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 en route phase of flight.

AIR TRAFFIC CONTROL SYSTEM COMMAND CENTER: A facility operated by the FAA which is responsible for the central flow control, the central altitude reservation system, the airport reservation position system, and the air traffic service contingency command for the air traffic control system.

AIR TRAFFIC HUB: A categorization of commercial service airports or group of commercial service airports in a metropolitan or urban area based upon the proportion of annual national enplanements existing at the airport or airports. The categories are large hub, medium hub, small hub, or non-hub. It forms the basis for the apportionment of entitlement funds.

AIR TRANSPORT ASSOCIATION OF AMERICA: An organization consisting of the principal U.S. airlines that represents the interests of the airline industry on major aviation issues before federal, state, and local government bodies. It promotes air transportation safety by coordinating industry and governmental safety programs and it serves as a focal point for industry efforts to standardize practices and enhance the efficiency of the air transportation system.

ALERT AREA: See special-use airspace.

ALTITUDE: The vertical distance measured in feet above mean sea level.

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.

APPROACH SURFACE: An imaginary obstruction limiting surface defined in FAR Part 77 which is longitudinally centered on an extended runway centerline and extends outward and upward from the primary surface at each end of a runway at a designated slope and distance based upon the type of available or planned approach by aircraft to a runway.

APRON: A specified portion of the airfield used for passenger, cargo or freight loading and unloading, aircraft parking, and the refueling, maintenance and servicing of aircraft.

AREA NAVIGATION: The air navigation procedure that provides the capability to establish and maintain a flight path on an arbitrary course that remains within the coverage area of navigational sources being used.

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.

AUTOMATED SURFACE OBSERVATION SYSTEM (ASOS): A reporting system that provides frequent airport ground surface weather observation data through digitized voice broadcasts and printed reports.

AUTOMATIC WEATHER OBSERVATION STATION (AWOS): Equipment used to automatically record weather conditions (i.e. cloud height, visibility, wind speed and direction, temperature, dew point, etc.)

AUTOMATIC DIRECTION FINDER (ADF): An aircraft radio navigation system which senses and indicates the direction to a non-directional radio beacon (NDB) ground transmitter.

AVIGATION EASEMENT: A contractual right or a property interest in land over which a right of unobstructed flight in the airspace is established.

AZIMUTH: Horizontal direction expressed as the angular distance between true north and the direction of a fixed point (as the observer's heading).

B

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."

BASED AIRCRAFT: The general aviation aircraft that use a specific airport as a home base.

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.

BLAST PAD: A prepared surface adjacent to the end of a runway for the purpose of eliminating the erosion of the ground surface by the wind forces produced by airplanes at the initiation of takeoff operations.

BUILDING RESTRICTION LINE (BRL): A line which identifies suitable building area locations on the airport.

C

CAPITAL IMPROVEMENT PLAN: The planning program used by the Federal Aviation Administration to identify, prioritize, and distribute Airport Improvement Program funds for airport development and the needs of the National Airspace System to meet specified national goals and objectives.

CARGO SERVICE AIRPORT: An airport served by aircraft providing air transportation of property only, including mail, with an annual aggregate landed weight of at least 100,000,000 pounds.

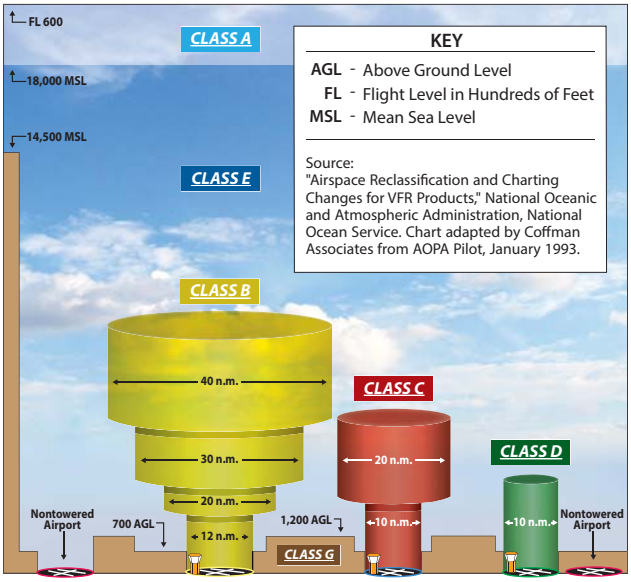
CATEGORY I: An Instrument Landing System (ILS) that provides acceptable guidance information to an aircraft from the coverage limits of the ILS to the point at which the localizer course line intersects the glide path at a decision height of 200 feet above the horizontal plane containing the runway threshold.

CATEGORY II: An ILS that provides acceptable guidance information to an aircraft from the coverage limits of the ILS to the point at which the localizer course line intersects the glide path at a decision height of 100 feet above the horizontal plane containing the runway threshold.

CATEGORY III: An ILS that provides acceptable guidance information to a pilot from the coverage limits of the ILS with no decision height specified above the horizontal plane containing the runway threshold.

CEILING: The height above the ground surface to the location of the lowest layer of clouds which is reported as either broken or overcast.

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.

COMMERCIAL SERVICE AIRPORT: A public airport providing scheduled passenger service that enplanes at least 2,500 annual passengers.

COMMON TRAFFIC ADVISORY FREQUENCY: A radio frequency identified in the appropriate aeronautical chart which is designated for the purpose of transmitting airport advisory information and procedures while operating to or from an uncontrolled airport.

COMPASS LOCATOR (LOM): A low power, low/medium frequency radio-beacon installed in conjunction with the instrument landing system at one or two of the marker sites.

CONICAL SURFACE: An imaginary obstruction-limiting surface defined in FAR Part 77 that extends

from the edge of the horizontal surface outward and upward at a slope of 20 to 1 for a horizontal distance of 4,000 feet.

CONTROLLED AIRPORT: An airport that has an operating airport traffic control tower.

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 airport 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 airports that have an operational control tower. Class D airspace is individually tailored and configured to encompass published instrument approach procedure. 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: A wind that is not parallel to a runway centerline or to the intended flight path of an aircraft.

CROSSWIND COMPONENT: The component of wind that is at a right angle to the runway centerline or the intended flight path of an aircraft.

CROSSWIND LEG: A flight path at right angles to the landing runway off its upwind end. See "traffic pattern."

D

DECIBEL: A unit of noise representing a level relative to a reference of a sound pressure 20 micro newtons per square meter.

DECISION HEIGHT/ DECISION ALTITUDE: The height above the end of the runway surface at which a decision must be made by a pilot during the ILS or Precision Approach Radar approach to either continue the approach or to execute a missed approach.

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.

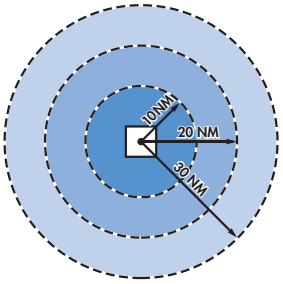
- **TAKEOFF DISTANCE AVAILABLE (TODA):** The TORA plus the length of any remaining runway and/or clear way beyond the far end of the TORA.
- **ACCELERATE-STOP DISTANCE AVAILABLE (ASDA):** The runway plus stopway length declared available for the acceleration and deceleration of an aircraft aborting a takeoff.
- **LANDING DISTANCE AVAILABLE (LDA):** The runway length declared available and suitable for landing.

DEPARTMENT OF TRANSPORTATION: The cabinet level federal government organization consisting of modal operating agencies, such as the Federal Aviation Administration, which was established to promote the coordination of federal transportation programs and to act as a focal point for research and development efforts in transportation.

DISCRETIONARY FUNDS: Federal grant funds that may be appropriated to an airport based upon designation by the Secretary of Transportation or Congress to meet a specified national priority such as enhancing capacity, safety, and security, or mitigating noise.

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 Aweighted 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."

E

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.

ELEVATION: The vertical distance measured in feet above mean sea level.

ENPLANED PASSENGERS: The total number of revenue passengers boarding aircraft, including originating, stop-over, and transfer passengers, in scheduled and nonscheduled services.

ENPLANEMENT: The boarding of a passenger, cargo, freight, or mail on an aircraft at an airport.

ENTITLEMENT: Federal funds for which a commercial service airport may be eligible based upon its annual passenger enplanements.

ENVIRONMENTAL ASSESSMENT (EA): An environmental analysis performed pursuant to the National Environmental Policy Act to determine whether an action would significantly affect the environment and thus require a more detailed environmental impact statement.

ENVIRONMENTAL AUDIT: An assessment of the current status of a party's compliance with applicable environmental requirements of a party's environmental compliance policies, practices, and controls.

ENVIRONMENTAL IMPACT STATEMENT (EIS): A document required of federal agencies by the National Environmental Policy Act for major projects are legislative proposals affecting the environment. It is a tool for decision-making describing the positive and negative effects of a proposed action and citing alternative actions.

ESSENTIAL AIR SERVICE: A federal program which guarantees air carrier service to selected small cities by providing subsidies as needed to prevent these cities from such service.

F

FEDERAL AVIATION REGULATIONS: The general and permanent rules established by the executive departments and agencies of the Federal Government for aviation, which are published in the Federal Register. These are the aviation subset of the Code of Federal Regulations.

FEDERAL INSPECTION SERVICES: The provision of customs and immigration services including passport inspection, inspection of baggage, the collection of duties on certain imported items, and the inspections for agricultural products, illegal drugs, or other restricted items.

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."

FINAL APPROACH AND TAKEOFF AREA (FATO). A defined area over which the final phase of the helicopter approach to a hover, or a landing is completed and from which the takeoff is initiated.

FINAL APPROACH FIX: The designated point at which the final approach segment for an aircraft landing on a runway begins for a non-precision approach.

FINDING OF NO SIGNIFICANT IMPACT (FONSI): A public document prepared by a Federal agency that presents the rationale why a proposed action will not have a significant effect on the environment and for which an environmental impact statement will not be prepared.

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.

FLIGHT LEVEL: A measure of altitude used by aircraft flying above 18,000 feet. Flight levels are indicated by three digits representing the pressure altitude in hundreds of feet. An airplane flying at flight level 360 is flying at a pressure altitude of 36,000 feet. This is expressed as FL 360.

FLIGHT SERVICE STATION: An operations facility in the national flight advisory system which utilizes data interchange facilities for the collection and dissemination of Notices to Airmen, weather, and administrative data and which provides pre-flight and in-flight advisory services to pilots through air and ground based communication facilities.

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.

G

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.

GENERAL AVIATION AIRPORT: An airport that provides air service to only general aviation.

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 (GPS): A system of 48 satellites used as reference points to enable navigators equipped with GPS receivers to determine their latitude, longitude, and altitude.

GROUND ACCESS: The transportation system on and around the airport that provides access to and from the airport by ground transportation vehicles for passengers, employees, cargo, freight, and airport services.

H

HELIPAD: A designated area for the takeoff, landing, and parking of helicopters.

HIGH INTENSITY RUNWAY LIGHTS: The highest classification in terms of intensity or brightness for lights designated for use in delineating the sides of a runway.

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.

HORIZONTAL SURFACE: An imaginary obstruction-limiting surface defined in FAR Part 77 that is specified as a portion of a horizontal plane surrounding a runway located 150 feet above the established airport elevation. The specific horizontal dimensions of this surface are a function of the types of approaches existing or planned for the runway.

I

INITIAL APPROACH FIX: The designated point at which the initial approach segment begins for an instrument approach to a runway.

INSTRUMENT APPROACH PROCEDURE: 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): Procedures for the conduct of flight in weather conditions below Visual Flight Rules weather minimums. The term IFR is often also used to define weather conditions and the type of flight plan under which an aircraft is operating.

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.

INSTRUMENT METEOROLOGICAL CONDITIONS: Meteorological conditions expressed in terms of specific visibility and ceiling conditions that are less than the minimums specified for visual meteorological conditions.

ITINERANT OPERATIONS: Operations by aircraft that are not based at a specified airport.

K

KNOTS: A unit of speed length used in navigation that is equivalent to the number of nautical miles traveled in one hour.

L

LANDSIDE: The portion of an airport that provides the facilities necessary for the processing of passengers, cargo, freight, and ground transportation vehicles.

LANDING DISTANCE AVAILABLE (LDA): See declared distances.

LARGE AIRPLANE: An airplane that has a maximum certified takeoff weight in excess of 12,500 pounds.

LOCAL AREA AUGMENTATION SYSTEM: A differential GPS system that provides localized measurement correction signals to the basic GPS signals to improve navigational accuracy integrity, continuity, and availability.

LOCAL OPERATIONS: Aircraft operations performed by aircraft that are based at the airport and that operate in the local traffic pattern or within sight of the airport, that are known to be departing for or arriving from flights in local practice areas within a prescribed distance from the airport, or that execute simulated instrument approaches at the airport.

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.

LONG RANGE NAVIGATION SYSTEM (LORAN): Long range navigation is 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 en route navigation.

LOW INTENSITY RUNWAY LIGHTS: The lowest classification in terms of intensity or brightness for lights designated for use in delineating the sides of a runway.

M

MEDIUM INTENSITY RUNWAY LIGHTS: The middle classification in terms of intensity or brightness for lights designated for use in delineating the sides of a runway.

MICROWAVE LANDING SYSTEM (MLS): An instrument approach and landing system that provides precision guidance in azimuth, elevation, and distance measurement.

MILITARY OPERATIONS: Aircraft operations that are performed in military aircraft.

MILITARY OPERATIONS AREA (MOA): See special-use airspace

MILITARY TRAINING ROUTE: An air route depicted on aeronautical charts for the conduct of military flight training at speeds above 250 knots.

MISSED APPROACH COURSE (MAC): The flight route to be followed if, after an instrument approach, a landing is not affected, 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.

N

NATIONAL AIRSPACE SYSTEM: The network of air traffic control facilities, air traffic control areas, and navigational facilities through the U.S.

NATIONAL PLAN OF INTEGRATED AIRPORT SYSTEMS: The national airport system plan developed by the Secretary of Transportation on a biannual basis for the development of public use airports to meet national air transportation needs.

NATIONAL TRANSPORTATION SAFETY BOARD: A federal government organization established to investigate and determine the probable cause of transportation accidents, to recommend equipment and procedures to enhance transportation safety, and to review on appeal the suspension or revocation of any certificates or licenses issued by the Secretary of Transportation.

NAUTICAL MILE: A unit of length used in navigation which is equivalent to the distance spanned by one minute of arc in latitude, that is, 1,852 meters or 6,076 feet. It is equivalent to approximately 1.15 statute mile.

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.)

NAVIGATIONAL AID: A facility used as, available for use as, or designed for use as an aid to air navigation.

NOISE CONTOUR: A continuous line on a map of the airport vicinity connecting all points of the same noise exposure level.

NON-DIRECTIONAL 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.

NON-PRECISION APPROACH PROCEDURE: A standard instrument approach procedure in which no electronic glide slope is provided, such as VOR, TACAN, NDB, or LOC.

NOTICE TO AIRMEN: A notice containing information concerning the establishment, condition, or change in any component of or hazard in the National Airspace System, the timely knowledge of which is considered essential to personnel concerned with flight operations.

O

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.

ONE-ENGINE INOPERABLE SURFACE: A surface emanating from the runway end at a slope ratio of 62.5:1. Air carrier airports are required to maintain a technical drawing of this surface depicting any object penetrations by January 1, 2010.

OPERATION: The take-off, landing, or touch-and-go procedure by an aircraft on a runway at an airport.

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.

P

PILOT CONTROLLED LIGHTING: Runway lighting systems at an airport that are controlled by activating the microphone of a pilot on a specified radio frequency.

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 APPROACH RADAR: A radar facility in the terminal air traffic control system used to detect and display with a high degree of accuracy the direction, range, and elevation of an aircraft on the final approach to a runway.

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.

PRIMARY AIRPORT: A commercial service airport that enplanes at least 10,000 annual passengers.

PRIMARY SURFACE: An imaginary obstruction limiting surface defined in FAR Part 77 that is specified as a rectangular surface longitudinally centered about a runway. The specific dimensions of this surface are a function of the types of approaches existing or planned for the runway.

PROHIBITED AREA: See special-use airspace.

PVC: Poor visibility and ceiling. Used in determining Annual Service Volume. PVC conditions exist when the cloud ceiling is less than 500 feet and visibility is less than one mile.

R

RADIAL: A navigational signal generated by a Very High Frequency Omni-directional Range or VORTAC station that is measured as an azimuth from the station.

REGRESSION ANALYSIS: A statistical technique that seeks to identify and quantify the relationships between factors associated with a forecast.

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 en route 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 en route 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 ALIGNMENT INDICATOR LIGHT: A series of high intensity sequentially flashing lights installed on the extended centerline of the runway usually in conjunction with an approach lighting system.

RUNWAY DESIGN CODE: A code signifiying the design standards to which the runway is to be built.

RUNWAY END IDENTIFICATION LIGHTING (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 REFERENCE CODE: A code signifying the current operational capabilities of a runway and associated taxiway.

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 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.

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.

S

SCOPE: The document that identifies and defines the tasks, emphasis, and level of effort associated with a project or study.

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.

SMALL AIRCRAFT: An aircraft that has a maximum certified takeoff weight of up to 12,500 pounds.

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 preplanned coded air traffic control IFR departure routing, preprinted for pilot use in graphic and textual form only.

STANDARD INSTRUMENT DEPARTURE PROCEDURES: A published standard flight procedure to be utilized following takeoff to provide a transition between the airport and the terminal area or en route airspace.

STANDARD TERMINAL ARRIVAL ROUTE (STAR): A preplanned coded air traffic control IFR arrival routing, preprinted for pilot use in graphic and textual or textual form only.

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.

STOPWAY: An area beyond the end of a takeoff runway that is designed to support an aircraft during an aborted takeoff without causing structural damage to the aircraft. It is not to be used for takeoff, landing, or taxiing by aircraft.

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.

T

TACTICAL AIR NAVIGATION (TACAN): An ultrahigh 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 DESIGN GROUP: A classification of airplanes based on outer to outer Main Gear Width (MGW) and Cockpit to Main Gear (CMG) distance.

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.

TERMINAL INSTRUMENT PROCEDURES: Published flight procedures for conducting instrument approaches to runways under instrument meteorological conditions.

TERMINAL RADAR APPROACH CONTROL: An element of the air traffic control system responsible for monitoring the en-route and terminal segment of air traffic in the airspace surrounding airports with moderate to high levels of air traffic.

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 takeoff.

TOUCHDOWN: The point at which a landing aircraft makes contact with the runway surface.

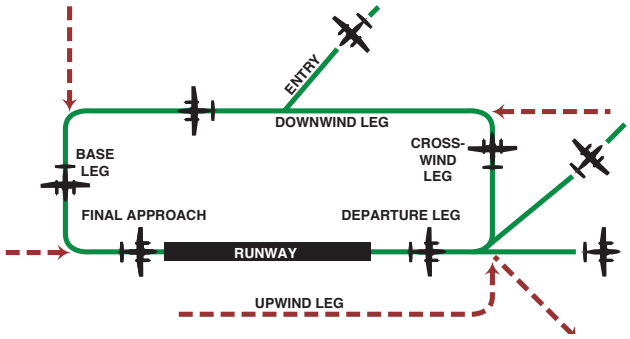
TOUCHDOWN AND LIFT-OFF AREA (TLOF): A load bearing, generally paved area, normally centered in the FATO, on which the helicopter lands or takes off.

TOUCHDOWN ZONE (TDZ): The first 3,000 feet of the runway beginning at the threshold.

TOUCHDOWN ZONE ELEVATION (TDZE): The highest elevation in the touchdown zone.

TOUCHDOWN ZONE (TDZ) LIGHTING: 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.



U

UNCONTROLLED AIRPORT: An airport without an air traffic control tower at which the control of Visual Flight Rules traffic is not exercised.

UNCONTROLLED AIRSPACE: Airspace within which aircraft are not subject to air traffic control.

UNIVERSAL COMMUNICATION (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.

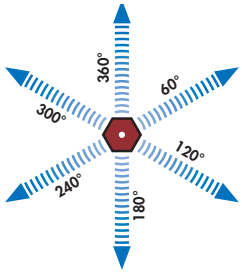
UPWIND LEG: A flight path parallel to the landing runway in the direction of landing. See "traffic pattern."

V

VECTOR: A heading issued to an aircraft to provide navigational guidance by radar.

VERY HIGH FREQUENCY/ OMNIDIRECTIONAL RANGE (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 OMNI-DIRECTIONAL RANGE/ 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.

VISUAL METEOROLOGICAL CONDITIONS: Meteorological conditions expressed in terms of specific visibility and ceiling conditions which are equal to or greater than the threshold values for instrument meteorological conditions.

VOR: See "Very High Frequency Omnidirectional Range Station."

VORTAC: See "Very High Frequency Omnidirectional Range Station/Tactical Air Navigation."

W

WARNING AREA: See special-use airspace.

WIDE AREA AUGMENTATION SYSTEM: An enhancement of the Global Positioning System that includes integrity broadcasts, differential corrections, and additional ranging signals for the purpose of providing the accuracy, integrity, availability, and continuity required to support all phases of flight.

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 lighting system with sequenced flashers (CAT II configuration)

AOA: Aircraft Operation Area

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: automatic weather observation station

BRL: building restriction line

CFR: Code of Federal Regulation

CIP: capital improvement program

DME: distance measuring equipment

DNL: day-night noise level

DWL: runway weight bearing capacity of aircraft with dual-wheel type landing gear

DTWL: runway weight bearing capacity of 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

LOM: compass locator at outer marker

LORAN: long range navigation

MALS: medium intensity approach lighting system with 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)

NPES: National Pollutant Discharge Elimination System

NPIAS: National Plan of Integrated Airport Systems

NPRM: notice of proposed rule making

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

PVC: poor visibility and ceiling

RCO: remote communications outlet

RRC: Runway Reference Code

RDC: Runway Design Code

REIL: runway end identification lighting

RNAV: area navigation

RPZ: runway protection zone

RSA: runway safety area

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 runway alignment indicator lights

STAR: standard terminal arrival route

SWL: runway weight bearing capacity for aircraft with single-wheel tandem type landing gear

TACAN: tactical air navigational aid

TAF: Federal Aviation Administration (FAA) Terminal Area Forecast

TDG: Taxiway Design Group

TLOF: Touchdown and lift-off

TDZ: touchdown zone

TDZE: touchdown zone elevation

TODA: takeoff distance available

TORA: takeoff runway 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



Appendix B

AIRPORT LAYOUT PLAN DRAWINGS

Appendix B
AIRPORT LAYOUT PLAN DRAWINGS

Per Federal Aviation Administration (FAA) and Arizona Department of Transportation – Multimodal Planning Division – Aeronautics Group (ADOT-MPD – Aeronautics Group) requirements, an official Airport Layout Plan (ALP) has been developed for the Sedona Airport. The ALP is used in part by the FAA and ADOT-MPD – Aeronautics Group to determine funding eligibility for future development projects.

These drawings were created on a computer-aided drafting system (CAD) and serve as the official depiction of the current and planned condition of the airport. These drawings have been reviewed and inspected by the FAA and ADOT-MPD – Aeronautics Group. In a letter dated April 17, 2017, the FAA approved the ALP set and accepted the Master Plan. This letter is included within this appendix.

The following is a description of the ALP drawings included with this Master Plan.

Title Sheet (Sheet 1 of 10) – The Title Sheet details the index of drawings included in the ALP drawing set.

Airport Layout Drawing (Sheet 2 of 10) – The Airport Layout Drawing (ALD) graphically presents the existing and ultimate layout plan of the airport. The ALD includes such elements as the physical airport features, location of airfield facilities (i.e., runway, taxiways, navigational aids), and existing general aviation development. Also presented on the ALD are the runway safety areas, airport property boundary, and revenue support areas. Existing and ultimate conditions for the airport as they relate to the runway, taxiways, navigational aids, and wind data tabulations are also presented in various data tables.

Terminal Area Plan (Sheet 3 of 10) – The Terminal Area Plan provides greater detail concerning landside improvements at a larger scale than on the ALD.

Airport Pavement Data (Sheet 4 of 10) – This sheet includes pavement condition data sourced from the Arizona Airport Pavement Management System.

Airport Airspace Drawing (Sheet 5 of 10) – The Airport Airspace Drawing is a graphic depiction of the Title 14 Code of Federal Regulations (CFR) Part 77, *Objects Affecting Navigable Airspace*, regulatory criterion. This 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. These plans should be coordinated with local land use planners.

Outer Approach Surface for Runway 3-21 (Sheet 6 of 10) – The Outer Approach Surface Drawing provides both plan and profile views of Title 14 CFR Part 77 approach surfaces for each runway end. A composite profile of the extended ground line is depicted. Obstructions and clearances over roads are shown as appropriate.

Inner Approach Surface Plan and Profile for Runway 3-21 (Sheet 7 of 10) – The Inner Portion of the Approach Surface Drawing provides scaled drawings of the safety areas associated with each runway end. A plan and profile view of the safety areas are 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 (Sheet 8 of 10) – The On-Airport Land Use Drawing is a geographic depiction of the land use recommendations. The objective of this drawing is to coordinate uses of the airport property in a manner compatible with the functional design of the airport facility. When development is proposed, it should be directed to the appropriate land use area depicted on this plan.

Exhibit "A" Airport Property Map (Sheet 9 of 10) – The Airport 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.

Departure Surface Drawing (Sheet 10 of 10) – The Departure Surface Drawing provides detailed analysis of the ultimate departure surface for each corresponding runway end. A composite profile of the extended ground line is depicted. Obstructions are shown as appropriate. The departure surface is only applicable to a runway with instrument departure procedures in place.

U.S. Department
of Transportation
Federal Aviation Administration

Western-Pacific Region
Office of Airports
Phoenix Airports District Office

3800 N. Central Avenue
Suite 1025, 10th Floor
Phoenix, AZ 85012

April 17, 2017

Tim Stotler
Yavapai County
Assistant County Engineer
1100 Commerce Drive
Prescott, AZ 86305

Dear Mr. Stotler:

The Sedona Airport Layout Plan (ALP), prepared by Coffman Associates, and bearing your signature, is approved and the master plan is accepted. A signed copy of the approved ALP is enclosed.

An aeronautical study (no.2016-AWP-1109-NRA) was conducted on the proposed development. This determination does not constitute FAA approval or disapproval of the physical development involved in the proposal. It is a determination with respect to the safe and efficient use of navigable airspace by aircraft and with respect to the safety of persons and property on the ground.

In making this determination, the FAA has considered matters such as the effects the proposal would have on existing or planned traffic patterns of neighboring airports, the effects it would have on the existing airspace structure and projected programs of the FAA, the effects it would have on the safety of persons and property on the ground, the effects that existing or proposed manmade objects (on file with the FAA), and known natural objects within the affected area would have on the airport proposal.

The FAA has only limited means to prevent the construction of structures near an airport. The airport sponsor has the primary responsibility to protect the airport environs through such means as local zoning ordinances, property acquisition, avigation easements, letters of agreement or other means.

Approval of the plan does not indicate that the United States will participate in the cost of any development proposed. Additionally, the United States will only participate in the cost of projects that meet the standards for which that airport is designed. Associated costs for any projects that exceed the appropriate airport design standard will be the responsibility of the airport sponsor.

This ALP approval is conditioned on acknowledgement that any development on airport property requiring Federal environmental approval must receive such written approval from FAA prior to commencement of the subject development. This ALP approval is also

conditioned on acceptance of the plan under local land use laws. We encourage appropriate agencies to adopt land use and height restrictive zoning based on the plan.

AIP funding requires evidence of eligibility and justification at the time a funding request is ripe for consideration. When construction of any proposed structure or development indicated on the plan is undertaken, such construction requires normal 45-day advance notification to FAA for review in accordance with applicable Federal Aviation Regulations (i.e., Parts 77, 157, 152, etc.). More notice is generally beneficial to ensure that all statutory, regulatory, technical and operational issues can be addressed in a timely manner.

Additionally, any future development that will require amendments to instrument flight procedures must be coordinated by the airport district office and the airport manager to ensure those changes are made in a timely manner.

Please attach this letter to the Airport Layout Plan and retain it in the airport. We wish you great success in your plans for the development of the airport. If we can be of further assistance, please do not hesitate to call Mr. Kyler Erhard, Airport Planner, at 602-792-1073.

Sincerely,

Mike N Williams
Manager, Phoenix Airports District Office

cc: ADOT

Enclosure: Updated Airport Layout Plan

AIRPORT MASTER PLAN SEDONA, ARIZONA

SEDONA

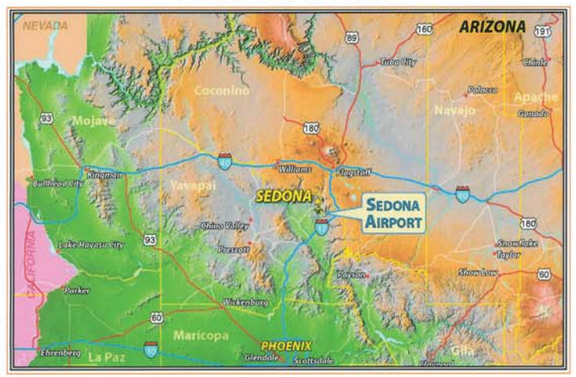
AIRPORT

AIRPORT LAYOUT PLAN SET

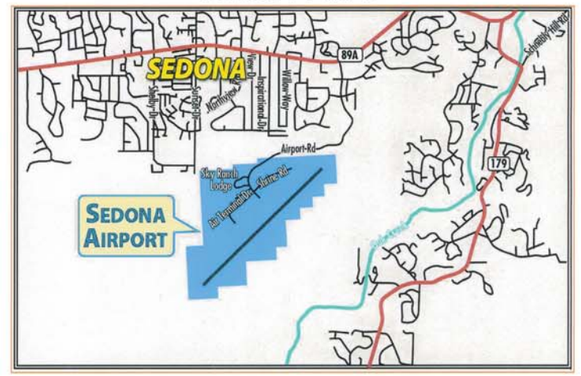
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1. TITLE SHEET
2. AIRPORT LAYOUT DRAWING
3. TERMINAL AREA PLAN
4. AIRPORT PAVEMENT DATA
5. AIRPORT AIRSPACE DRAWING
6. OUTER APPROACH SURFACE FOR RUNWAY 3-21
7. INNER APPROACH SURFACE PLAN AND PROFILE FOR RUNWAY 3-21
8. ON-AIRPORT LAND USE DRAWING
9. EXHIBIT "A" AIRPORT PROPERTY MAP
10. DEPARTURE SURFACE DRAWING

LOCATION MAP



VICINITY MAP



SUBMITTED BY:
Coffman Associates
FOR APPROVAL BY:

APPROVED BY: ON THE DATE OF:
3/3/17
Byron Jaspers
Public Works Director

PREPARED FOR
YAVAPAI COUNTY

No.	REVISIONS	DATE	BY	APPD.
1				
2				
3	MASTER PLAN	02/17	CA	--
4	TAXIWAY "A" EXTENTION ADDED	12/07	Z&H	--
5	RUNWAY WIDENING "AS BUILT" UPDATE	05/06	Z&H	--

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 OF 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 THE APPROPRIATE PUBLIC LAWS.

SEDONA, AIRPORT

TITLE SHEET

SEDONA, ARIZONA

PLANNED BY: Eric Pfeifer
DETAILED BY: Maggie Beaver
APPROVED BY: Jim Harris P.E.

FEBRUARY 2017 SHEET 1 OF 10

Coffman Associates
Airport Consultants
www.coffmanassociates.com

RUNWAY DATA	RUNWAY 3-21			
	EXISTING		ULTIMATE	
	3	21	3	21
RUNWAY DESIGN CODE (RDC)	B-II-5000		SAME	
APPROACH REFERENCE CODE	B-II/5000		SAME	
DEPARTURE REFERENCE CODE	B-II		SAME	
RUNWAY AZIMUTH (TRUE)	45.76°	225.77°	SAME	SAME
RUNWAY BEARING (TRUE)	N 45.76° E		SAME	
APPROACH TYPE	GPS NON-PREC	VISUAL	GPS LPV	GPS NON-PREC
PART 77 APPROACH CATEGORY	34:1	20:1	SAME	34:1
APPROACH VISIBILITY MINIMUMS	1 MILE	VISUAL	> 3/4 MILE	1 MILE/GREATER
RUNWAY DEPARTURE SURFACE	40:1	40:1	SAME	SAME
TYPE OF AERONAUTICAL SURVEY REQUIRED	NON-VERTICALLY GUIDED		VERTICALLY GUIDED	
THRESHOLD SITING SURFACE	20:1	20:1	SAME	SAME
DESIGN AIRCRAFT	CESSNA CITATION 560XL		SAME	
DESIGN AIRCRAFT UNDERCARRIAGE WIDTH (FEET)	13.66'		SAME	
DESIGN AIRCRAFT WINGSPAN	77.83'		SAME	
DESIGN AIRCRAFT TAIL HEIGHT	24.42'		SAME	
RUNWAY LENGTH	5132'		SAME	
RUNWAY WIDTH	100'		SAME	
PERCENT OF WIND COVERAGE 10.5 knots	94.84%		SAME	
PERCENT OF WIND COVERAGE 13 knots	97.28%		SAME	
PERCENT OF WIND COVERAGE 16 knots	99.08%		SAME	
RUNWAY END ELEVATION [1]	4736.1'	4830.0'	SAME	SAME
TOUCH DOWN ZONE ELEVATION [1]	4792.9'	4830.4'	SAME	SAME
DISPLACED THRESHOLD [1]	NONE	NONE	SAME	SAME
EFFECTIVE RUNWAY GRADIENT	1.8%		SAME	
MAXIMUM GRADIENT	2.0%		SAME	
RUNWAY SURFACE TYPE	ASPHALT		SAME	
RUNWAY PAVEMENT STRENGTH (in thousand lbs.) [2]	15(S),30(D)		SAME	
RUNWAY SURFACE TREATMENT	NONE		NONE	
RUNWAY LIGHTING	MIRL	MIRL	SAME	SAME
RUNWAY MARKING	VISUAL	VISUAL	NON-PREC	NON-PREC
VISUAL AND NAVIGATIONAL AIDS	AWOS BEACON REILs PAPI-4s GPS		SAME SAME SAME SAME SAME	
RUNWAY SAFETY AREA BEYOND STOP END	300'	300'	SAME	SAME
RUNWAY SAFETY AREA WIDTH	150'		SAME	
OBJECT FREE AREA BEYOND STOP END	300'	300'	SAME	SAME
OBJECT FREE AREA WIDTH	500'		SAME	
OBSTACLE FREE ZONE BEYOND STOP END (ACTUAL)	200'	200'	SAME	SAME
OBSTACLE FREE ZONE WIDTH	400'		SAME	
RUNWAY PROTECTION ZONE	500'x700' x1000'	500'x700' x1000'	1000'x1700' x1510'	SAME
TAXIWAY DESIGN GROUP (TDG)	TDG-2		SAME	
TAXIWAY WIDTH	35'		SAME	
TAXIWAY OBJECT FREE AREA WIDTH	131'		SAME	
TAXIWAY SAFETY AREA WIDTH	79'		SAME	
TAXIWAY WING TIP CLEARANCE	26'		SAME	
TAXIWAY CL TO FIXED OR MOVEABLE OBJECT	65.5		SAME	
TAXIWAY LIGHTING	MITL		SAME	
TAXIWAY SURFACE MATERIAL	ASPHALT		SAME	
TAXIWAY TO RUNWAY SEPARATION	250'		SAME	
HOLDBAR TO RUNWAY CENTERLINE DISTANCE	135'		200'	
TAXIWAY TO AIRCRAFT PARKING DISTANCE	100'		SAME	
RUNWAY CENTERLINE TO AIRCRAFT PARKING	313' (250' standard)		SAME	
THRESHOLD SITING SURFACE OBJECT PENETRATIONS	NONE		SAME	

NOTES:
1. RUNWAY END ELEVATIONS, COORDINATES, DISTANCES, AND BEARING NOTED IN THIS ALP ARE FROM THE AVN DATASHEET.
2. SW-SINGLE WHEEL, DW-DUAL WHEEL.

AIRPORT DATA

SEDONA AIRPORT (SEZ)

CITY: SEDONA, ARIZONA — COUNTY: YAVAPAI COUNTY, ARIZONA

RANGE: --- TOWNSHIP: --- — CIVIL TOWNSHIP: N/A

		EXISTING	ULTIMATE
NPIAS SERVICE LEVEL		GENERAL AVIATION	SAME
STATE SERVICE ROLE		GENERAL AVIATION COMMUNITY AIRPORT	SAME
CRITICAL DESIGN AIRCRAFT		CESSNA CITATION 560XL	SAME
AIRPORT REFERENCE CODE (ARC)		B-II	SAME
AIRPORT ELEVATION (ABOVE MEAN SEA LEVEL)		4830.4'	SAME
MEAN MAXIMUM TEMPERATURE OF HOTTEST MONTH		96.1°F (July)	SAME
AIRPORT REFERENCE POINT (ARP) COORDINATES (NAD 83)	Latitude	34°50'54.9000"N	SAME
	Longitude	111°47'18.4000"W	SAME
AIRPORT INSTRUMENT NAVIGATIONAL AIDS		GPS (1.5 MILE)	GPS LPV(>3/4 MILE)
MISCELLANEOUS FACILITIES (OWNERSHIP)		AIRPORT BEACON PAPI-4s (STATE) LIGHTED WIND CONE AWOS MITL (STATE)	SAME SAME SAME SAME SAME

RUNWAY END COORDINATES (NAD 83)

		EXISTING	ULTIMATE
RUNWAY 3	Latitude	34°50'37.2207"N	SAME
	Longitude	111°47'40.4587"W	SAME
RUNWAY 21	Latitude	34°51'12.6197"N	SAME
	Longitude	111°46'56.3606"W	SAME

EXISTING AIRPORT FACILITIES

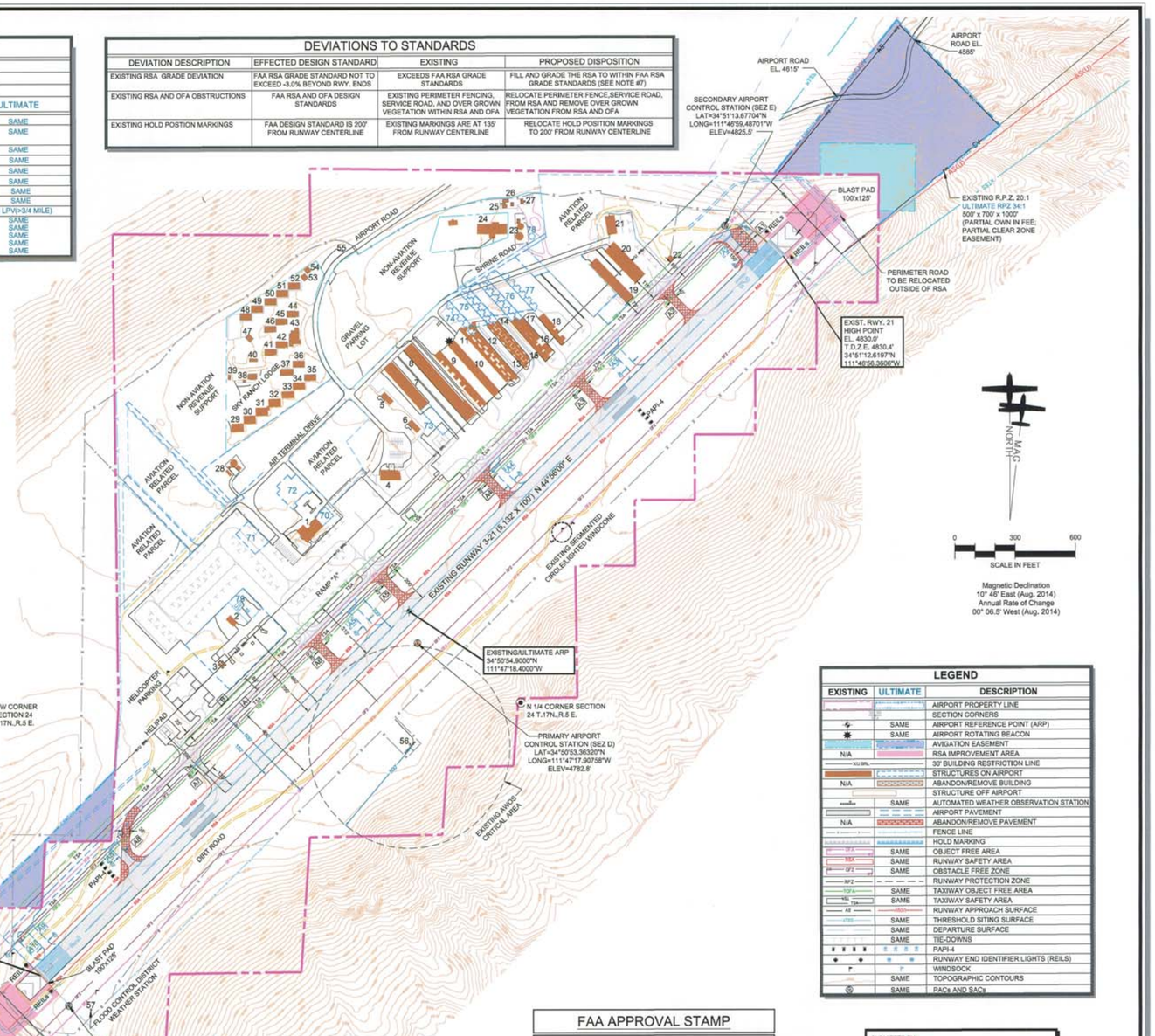
NO.	DESCRIPTION	ELEV. (MSL)	NO.	DESCRIPTION	ELEV. (MSL)
1	TERMINAL	4808.72'	30	SKY RANCH LODGE BUILDING	4808.85'
2	MAINTENANCE EQUIPMENT HUT	4787.27'	31	SKY RANCH LODGE BUILDING	4809.67'
3	FUEL FARM (TO BE RELOCATED)	4787.27'	32	SKY RANCH LODGE BUILDING	4811.10'
4	MESA GRILL	4811.98'	33	SKY RANCH LODGE BUILDING	4802.93'
5	ARIZONA HELICOPTER ADV.	4807.01'	34	SKY RANCH LODGE BUILDING	4803.95'
6	SKY SAFARI	4805.72'	35	SKY RANCH LODGE BUILDING	4805.51'
7	CORPORATE HANGARS	4817.96'	36	SKY RANCH LODGE BUILDING	4804.83'
8	CORPORATE HANGARS	4824.06'	37	SKY RANCH LODGE BUILDING	4803.81'
9	T-HANGARS	4816.06'	38	SKY RANCH LODGE BUILDING	4799.18'
10	T-HANGARS	4820.11'	39	SKY RANCH LODGE BUILDING	4794.42'
11	T-HANGARS	4815.86'	40	SKY RANCH LODGE BUILDING	4799.46'
12	T-HANGARS	4819.10'	41	SKY RANCH LODGE BUILDING	4803.61'
13	T-HANGARS	4820.98'	42	SKY RANCH LODGE BUILDING	4804.29'
14	T-HANGARS	4819.53'	43	SKY RANCH LODGE BUILDING	4803.58'
15	T-HANGARS	4822.42'	44	SKY RANCH LODGE BUILDING	4804.56'
16	CIVIL AIR PATROL	4822.64'	45	SKY RANCH LODGE BUILDING	4803.68'
17	T-HANGARS	4822.40'	46	SKY RANCH LODGE BUILDING	4802.65'
18	T-HANGARS	4824.02'	47	SKY RANCH LODGE BUILDING	4799.48'
19	CORPORATE HANGARS	4837.67'	48	SKY RANCH LODGE BUILDING	4798.77'
20	CORPORATE HANGARS	4844.17'	49	SKY RANCH LODGE BUILDING	4799.52'
21	CORPORATE HANGARS	4837.98'	50	SKY RANCH LODGE BUILDING	4800.66'
22	OFFICE BUILDING	4837.98'	51	SKY RANCH LODGE BUILDING	4802.11'
23	WATER TANKS	4831.36'	52	SKY RANCH LODGE BUILDING	4803.61'
24	MASONIC LODGE	4829.66'	53	SKY RANCH LODGE BUILDING	4805.04'
25	YAVAPAI COUNTY SHERIFFS	4882.64'	54	SKY RANCH LODGE BUILDING	4804.76'
26	FIRE DEPARTMENT	4822.67'	55	SCENIC OVERLOOK	4791.00'
27	COMMUNICATIONS TOWER	4902.44'	56	AWOS	--
28	WATER TANK	4800.41'	57	WEATHER STATION	±4756.00'
29	SKY RANCH LODGE BUILDING	4807.15'			

ULTIMATE AIRPORT FACILITIES

NO.	DESCRIPTION	ELEV. (MSL)
70	TERMINAL EXPANSION	±4809'
71	MAINTENANCE FACILITY	N/A
72	VEHICLE PARKING	N/A
73	CORPORATE HANGAR	±4817'
74	T-HANGARS	±4819'
75	T-HANGARS	±4819'
76	T-HANGARS	±4819'
77	T-HANGARS	±4819'
78	FIRE SUPRESSION WATER TANK (SEE NOTE #5)	±4831'
79	FUEL FARM	±4787'

DEVIATIONS TO STANDARDS

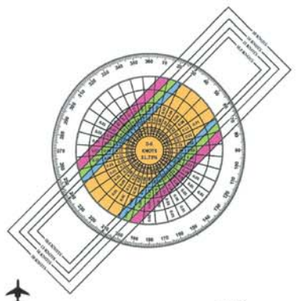
DEVIATION DESCRIPTION	EFFECTED DESIGN STANDARD	EXISTING	PROPOSED DISPOSITION
EXISTING RSA GRADE DEVIATION	FAA RSA GRADE STANDARD NOT TO EXCEED -3.0% BEYOND RWY. ENDS	EXCEEDS FAA RSA GRADE STANDARDS	FILL AND GRADE THE RSA TO WITHIN FAA RSA GRADE STANDARDS (SEE NOTE #7)
EXISTING RSA AND OFA OBSTRUCTIONS	FAA RSA AND OFA DESIGN STANDARDS	EXISTING PERIMETER FENCING, SERVICE ROAD, AND OVER GROWN VEGETATION WITHIN RSA AND OFA	RELOCATE PERIMETER FENCE,SERVICE ROAD, FROM RSA AND REMOVE OVER GROWN VEGETATION FROM RSA AND OFA
EXISTING HOLD POSTION MARKINGS	FAA DESIGN STANDARD IS 200' FROM RUNWAY CENTERLINE	EXISTING MARKINGS ARE AT 135' FROM RUNWAY CENTERLINE	RELOCATE HOLD POSITION MARKINGS TO 200' FROM RUNWAY CENTERLINE



Magnetic Declination
10° 46' East (Aug. 2014)
Annual Rate of Change
00° 06.5' West (Aug. 2014)

ALL WEATHER WIND COVERAGE

Runway	10.5 Knots	13 Knots	16 Knots	20 Knots
Runway 03-21	94.84%	97.28%	99.08%	99.77%



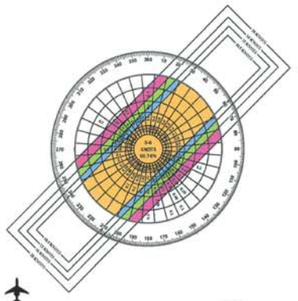
Magnetic Declination
10° 46' East (Aug. 2014)
Annual Rate of Change
00° 6.5' West (Aug. 2014)

SOURCE:
NOAA National Climatic Center
Asheville, North Carolina
Sedona Airport
Sedona, AZ

OBSERVATIONS:
127,880 All Weather Observations
2005-2014

IFR WIND COVERAGE

Runway	10.5 Knots	13 Knots	16 Knots	20 Knots
Runway 03-21	88.79%	93.94%	98.00%	99.40%



Magnetic Declination
10° 46' East (Aug. 2014)
Annual Rate of Change
00° 6.5' West (Aug. 2014)

SOURCE:
NOAA National Climatic Center
Asheville, North Carolina
Sedona Airport
Sedona, AZ

OBSERVATIONS:
1,050 IFR Observations
2005-2014

DECLARED DISTANCES

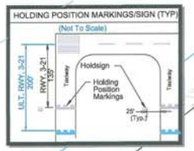
	RUNWAY			
	EXISTING		ULTIMATE	
	3	21	3	21
TAKEOFF RUN AVAILABLE (TORA)	5,132'	5,132'	5,132'	5,132'
TAKEOFF DISTANCE AVAILABLE (TODA)	5,132'	5,132'	5,132'	5,132'
ACCELERATE-STOP DISTANCE AVAILABLE (ASDA)	5,132'	5,132'	5,132'	5,132'
LANDING DISTANCE AVAILABLE (LDA)	5,132'	5,132'	5,132'	5,132'

TAXIWAY DESIGN GROUP

	EXISTING	TDG	ULTIMATE	TDG
TWY A1	150'	TDG-2	40'	TDG-2
TWY A	35	TDG-2	35'	TDG-2
TWY A2-A7	40'	TDG-2	40'	TDG-2
TWY A8	35'	TDG-2	40'	TDG-2
TWY A9	0'	TDG-2	40'	TDG-2
TWY B	25'	TDG-2	25'	TDG-2

HOLDING POSITION MARKINGS/SIGN (TYP)

(Not To Scale)



NOTES:
1. HORIZONTAL DATUM: NORTH AMERICAN DATUM 1983-NAD83:VERTICAL DATUM : NORTH AMERICAN DATUM 1988 - NAVD88.
2. RUNWAY END ELEVATIONS, COORDINATES, DISTANCES, AND BEARING NOTED IN THIS ALP ARE FROM THE AVN DATASHEET.
3. UNLESS NOTED OTHERWISE, EXISTING BUILDING ELEVATIONS NOTED IN THIS ALP ARE FROM AGIS DATA PREPARED BY WOOLPERT, BOTHELL, WA.
4. SEE AIRPORT PROPERTY MAP FOR PROPERTY OWNERSHIP DETAILS.
5. FIRE SUPPRESSION SYSTEM EXPANSION IN THIS LOCATION TO INCLUDE AN ADDITIONAL 160,000 GALLONS OF WATER STORAGE CAPACITY AND A 2500 GALLON PER MINUTE PUMP.
6. PAVEMENT DATA IS LOCATED ON PAGE 4 OF THIS DRAWING SET.
7. AN RSA IMPROVEMENT PROJECT IS PLANNED TO FILL/GRADE LAND OFF BOTH RUNWAY ENDS TO MEET FAA GRADING STANDARDS.THE RSA IMPROVEMENT PROJECT AREA IS SHOWN ON THE DRAWING AS A SHADED AREA. THE FILL MATERIAL WILL BE HELD IN PLACE BY APPROPRIATELY DESIGNED AND CONSTRUCTED RETAINING WALLS TO ENSURE THE STABILITY OF THE RSA, WHICH IS DESIGNED TO ACCOMMODATE THE WEIGHT OF AIRCRAFT THAT MIGHT OVERRUN THE RUNWAY AND EMERGENCY SERVICE VEHICLES.
8. FUTURE PLANNING INCLUDES ELEVATED RUNWAY GUARD LIGHTS (WIG-WAGS) AND IN-PAVEMENT RUNWAY GUARD LIGHTING FOR CONNECTING TAXIWAYS A2 - A7 TO IMPROVE SITUATIONAL AWARENESS AT THESE DIRECT ACCESS POINTS FROM THE APRON TO THE RUNWAY.

LEGEND

EXISTING	ULTIMATE	DESCRIPTION
		AIRPORT PROPERTY LINE
		SECTION CORNERS
	SAME	AIRPORT REFERENCE POINT (ARP)
	SAME	AIRPORT ROTATING BEACON
		AVIGATION EASEMENT
N/A		RSA IMPROVEMENT AREA
50'/30' BRL		30' BUILDING RESTRICTION LINE
		STRUCTURES ON AIRPORT
N/A		ABANDON/REMOVE BUILDING
		STRUCTURE OFF AIRPORT
	SAME	AUTOMATED WEATHER OBSERVATION STATION
		AIRPORT PAVEMENT
N/A		ABANDON/REMOVE PAVEMENT
		FENCE LINE
		HOLD MARKING
OFA	SAME	OBJECT FREE AREA
RSA	SAME	RUNWAY SAFETY AREA
OFZ	SAME	OBSTACLE FREE ZONE
RPZ		RUNWAY PROTECTION ZONE
TSA	SAME	TAXIWAY OBJECT FREE AREA
TSA	SAME	TAXIWAY SAFETY AREA
		RUNWAY APPROACH SURFACE
	SAME	THRESHOLD SITING SURFACE
	SAME	DEPARTURE SURFACE
	SAME	TIE-DOWNS
		PAPI-4
		RUNWAY END IDENTIFIER LIGHTS (REILS)
		WINDSOCK
	SAME	TOPOGRAPHIC CONTOURS
	SAME	PACs and SACs

FAA APPROVAL STAMP

Approved conditionally April 17, 2017
Subject to comments contained in our letter dated: 4-17-2017
FEDERAL AVIATION ADMINISTRATION
Western-Pacific Region
By _____
Manager, Assistant Manager – Phoenix ADO

SUBMITTED BY:
Coffman Associates
FOR APPROVAL BY:
APPROVED BY: _____ ON THE DATE OF: 3/15/17
Bump Wallen
Public Works Director

No.	REVISIONS	DATE	BY	APP'D
	MASTER PLAN	2/17	CA	--
	TAXIWAY "A" EXTENTION ADDED	12/07	Z&H	--
	RUNWAY WIDENING "AS BUILT" UPDATE	05/06	Z&H	--

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 OF 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 THE APPROPRIATE PUBLIC LAWS.

SEDONA AIRPORT

AIRPORT LAYOUT DRAWING

SEDONA, ARIZONA

PLANNED BY: Eric Pfeifer
DETAILED BY: Maggie Beaver
APPROVED BY: Jim Harris P.E.

FEBRUARY 2017 — SHEET 2 OF 10

Coffman Associates
Airport Consultants
www.coffmanassociates.com

EXISTING AIRPORT FACILITIES

NO.	DESCRIPTION	ELEV. (MSL)	NO.	DESCRIPTION	ELEV. (MSL)
1	TERMINAL	4808.72'	30	SKY RANCH LODGE BUILDING	4808.85'
2	MAINTENANCE EQUIPMENT HUT	4787.27'	31	SKY RANCH LODGE BUILDING	4809.67'
3	FUEL FARM (TO BE RELOCATED)	4787.27'	32	SKY RANCH LODGE BUILDING	4811.10'
4	MESA GRILL	4811.98'	33	SKY RANCH LODGE BUILDING	4802.93'
5	ARIZONA HELICOPTER ADV.	4807.01'	34	SKY RANCH LODGE BUILDING	4803.95'
6	SKY SAFARI	4805.72'	35	SKY RANCH LODGE BUILDING	4805.51'
7	CORPORATE HANGARS	4817.96'	36	SKY RANCH LODGE BUILDING	4804.83'
8	CORPORATE HANGARS	4824.06'	37	SKY RANCH LODGE BUILDING	4803.81'
9	T-HANGARS	4816.08'	38	SKY RANCH LODGE BUILDING	4799.18'
10	T-HANGARS	4820.11'	39	SKY RANCH LODGE BUILDING	4794.42'
11	T-HANGARS	4815.86'	40	SKY RANCH LODGE BUILDING	4799.46'
12	T-HANGARS	4819.10'	41	SKY RANCH LODGE BUILDING	4803.61'
13	T-HANGARS	4820.98'	42	SKY RANCH LODGE BUILDING	4804.29'
14	T-HANGARS	4819.53'	43	SKY RANCH LODGE BUILDING	4803.58'
15	T-HANGARS	4822.42'	44	SKY RANCH LODGE BUILDING	4804.56'
16	CIVIL AIR PATROL	4822.64'	45	SKY RANCH LODGE BUILDING	4803.68'
17	T-HANGARS	4822.40'	46	SKY RANCH LODGE BUILDING	4802.65'
18	T-HANGARS	4824.02'	47	SKY RANCH LODGE BUILDING	4799.46'
19	CORPORATE HANGARS	4837.67'	48	SKY RANCH LODGE BUILDING	4798.77'
20	CORPORATE HANGARS	4844.17'	49	SKY RANCH LODGE BUILDING	4799.52'
21	CORPORATE HANGARS	4837.98'	50	SKY RANCH LODGE BUILDING	4800.68'
22	OFFICE BUILDING	4837.98'	51	SKY RANCH LODGE BUILDING	4802.11'
23	WATER TANKS	4831.38'	52	SKY RANCH LODGE BUILDING	4803.61'
24	MASONIC LODGE	4829.68'	53	SKY RANCH LODGE BUILDING	4805.04'
25	YAVAPAI COUNTY SHERIFFS	4882.64'	54	SKY RANCH LODGE BUILDING	4804.76'
26	FIRE DEPARTMENT	4822.67'	55	SCENIC OVERLOOK	4791.00'
27	COMMUNICATIONS TOWER	4902.44'	56	AWOS	--
28	WATER TANK	4800.41'	57	WEATHER STATION	±4756.00'
29	SKY RANCH LODGE BUILDING	4807.15'			

ULTIMATE AIRPORT FACILITIES

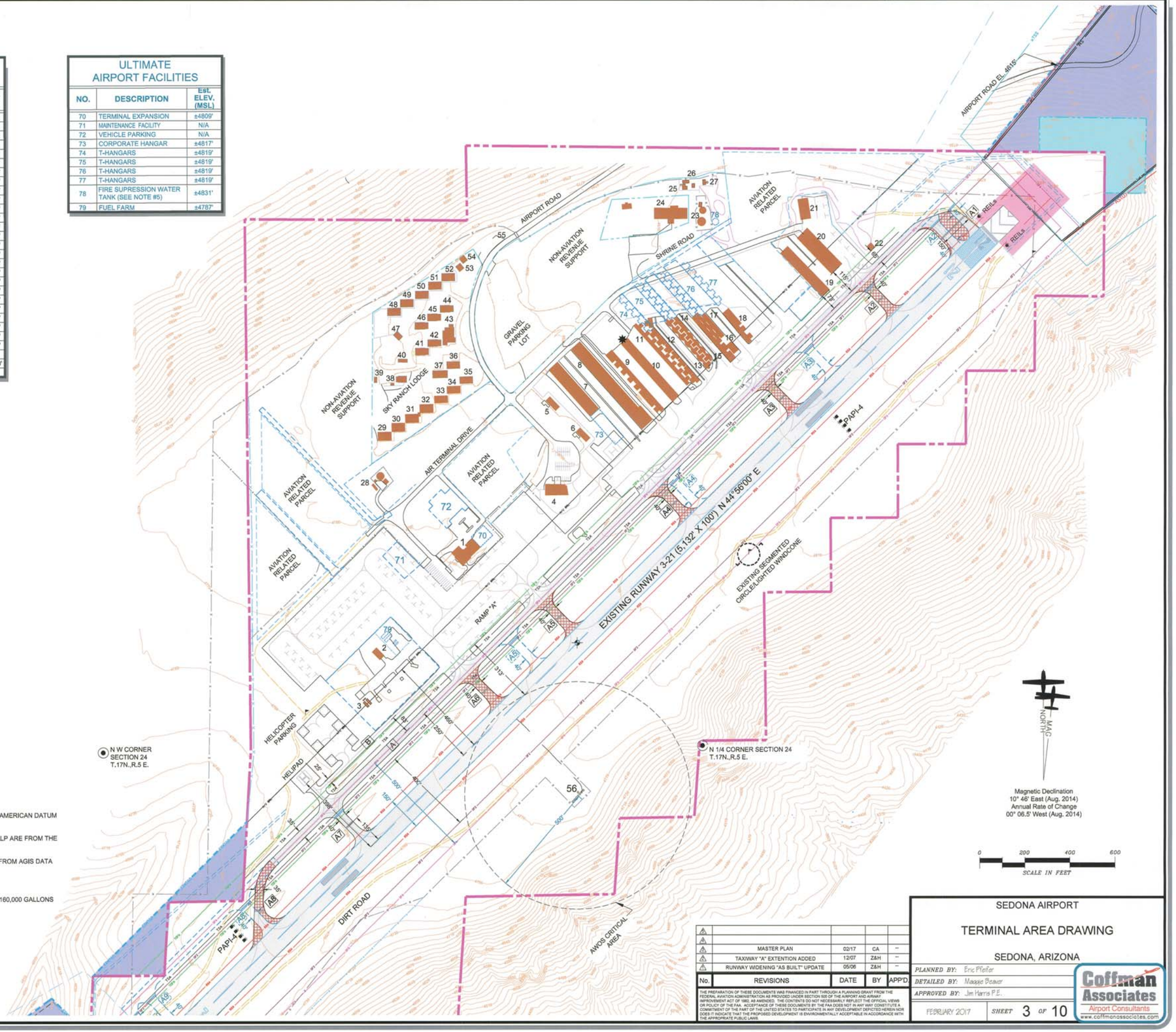
NO.	DESCRIPTION	Est. ELEV. (MSL)
70	TERMINAL EXPANSION	±4809'
71	MAINTENANCE FACILITY	N/A
72	VEHICLE PARKING	N/A
73	CORPORATE HANGAR	±4817'
74	T-HANGARS	±4819'
75	T-HANGARS	±4819'
76	T-HANGARS	±4819'
77	T-HANGARS	±4819'
78	FIRE SUPRESSION WATER TANK (SEE NOTE #5)	±4831'
79	FUEL FARM	±4787'

LEGEND

EXISTING	ULTIMATE	DESCRIPTION
		AIRPORT PROPERTY LINE
		SECTION CORNERS
	SAME	AIRPORT REFERENCE POINT (ARP)
	SAME	AIRPORT ROTATING BEACON
		AVIGATION EASEMENT
N/A		RSA IMPROVEMENT AREA
XU BRL		30' BUILDING RESTRICTION LINE
		STRUCTURES ON AIRPORT
N/A		ABANDON/REMOVE BUILDING
		STRUCTURE OFF AIRPORT
	SAME	AUTOMATED WEATHER OBSERVATION STATION
		AIRPORT PAVEMENT
N/A		ABANDON/REMOVE PAVEMENT
		FENCE LINE
		HOLD MARKING
OFA	SAME	OBJECT FREE AREA
RSA	SAME	RUNWAY SAFETY AREA
OFZ	SAME	OBSTACLE FREE ZONE
RPZ		RUNWAY PROTECTION ZONE
TOFA	SAME	TAXIWAY OBJECT FREE AREA
TSA	SAME	TAXIWAY SAFETY AREA
AS		RUNWAY APPROACH SURFACE
ATSS	SAME	THRESHOLD SITING SURFACE
	SAME	DEPARTURE SURFACE
	SAME	TIE-DOWNS
		PAPI-4
		RUNWAY END IDENTIFIER LIGHTS (REILS)
		WINDSOCK
	SAME	TOPOGRAPHIC CONTOURS
	SAME	PACs AND SACs

NOTES:

1. HORIZONTAL DATUM: NORTH AMERICAN DATUM 1983-NAD83:VERTICAL DATUM : NORTH AMERICAN DATUM 1988 - NAVD88.
2. RUNWAY END ELEVATIONS, COORDINATES, DISTANCES, AND BEARING NOTED IN THIS ALP ARE FROM THE AVN DATASHEET.
3. UNLESS NOTED OTHERWISE, EXISTING BUILDING ELEVATIONS NOTED IN THIS ALP ARE FROM AGIS DATA PREPARED BY WOOLPERT, BOTHELL, WA.
4. SEE AIRPORT PROPERTY MAP FOR PROPERTY OWNERSHIP DETAILS.
5. FIRE SUPRESSION SYSTEM EXPANSION IN THIS LOCATION TO INCLUDE AN ADDITIONAL 160,000 GALLONS OF WATER STORAGE CAPACITY AND A 2500 GALLON PER MINUTE PUMP.
6. PAVEMENT DATA IS LOCATED ON PAGE 4 OF THIS DRAWING SET.



No.	REVISIONS	DATE	BY	APP'D
1				
2				
3	MASTER PLAN	02/17	CA	--
4	TAXIWAY "A" EXTENTION ADDED	12/07	Z&H	--
5	RUNWAY WIDENING "AS BUILT" UPDATE	05/06	Z&H	--

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SEDONA AIRPORT

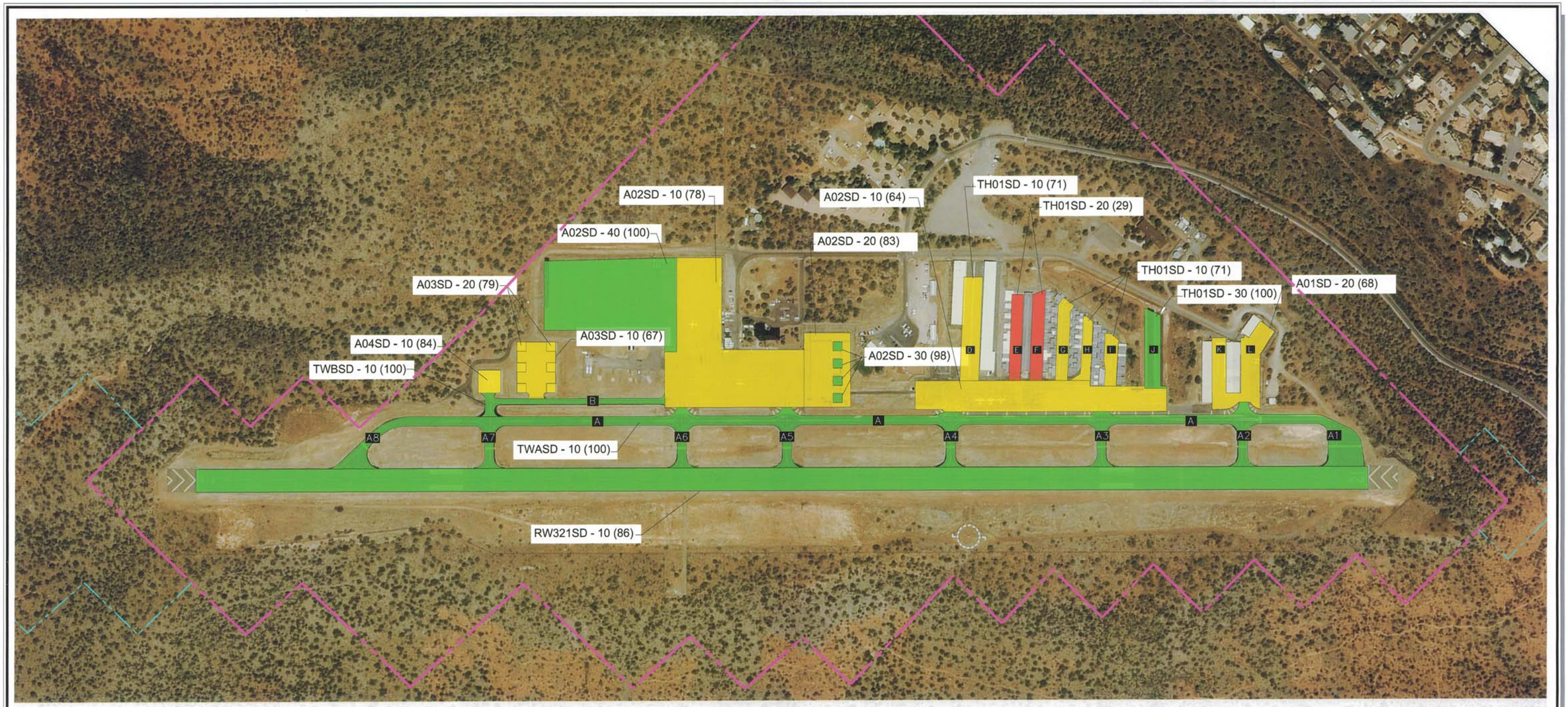
TERMINAL AREA DRAWING

SEDONA, ARIZONA

PLANNED BY: Eric Pfeifer
DETAILED BY: Maggie Beaver
APPROVED BY: Jim Harris P.E.

FEBRUARY 2017 | SHEET 3 OF 10

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PAVEMENT DATA

PAVEMENT SECTION	PCI	AREA (SF)	SURFACE
RW321SD-10	86	513,000 SF	AAC
TWASD-10	100	273,990 SF	AAC
TWBSD-10	100	23,476 SF	AAC
A04SD-10	84	10,000 SF	PCC
A03SD-20	79	9,600 SF	PCC
A03SD-10	67	29,380 SF	AC
A02SD-40	100	183,337 SF	AC
A02SD-10	78	230,864 SF	AAC
A02SD-20	83	58,966 SF	AC
A02SD-30	98	6,400 SF	PCC
TH01SD-10	71	80,875 SF	AC
TH01SD-20	29	39,978 SF	PCC
TH01SD-30	100	23,605 SF	AC
A01SD-20	68	53,896 SF	AC
TH01SD-10	71	80,875 SF	AC
TH01SD-20	29	39,978 SF	PCC
A01SD-10	64	127,903 SF	AAC

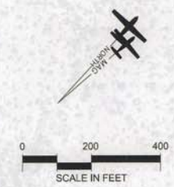
NOTES:
1. PAVEMENT DATA SOURCE, ARIZONA AIRPORT PAVEMENT MANAGEMENT SYSTEM, INSPECTION DATE JUNE 7, 2013. https://apps.azdot.gov/Airports/APTech_DAP

LEGEND

- AIRPORT PROPERTY LINE
- EXSITING EASMENT
- A5 TAXIWAY DESIGNATION
- D TAXILANE DESIGNATION



Acronym	Definition
AAC	Asphalt over Asphalt Concrete
AC	Asphalt Concrete
ADOT	Arizona Department of Transportation
PCC	Portland Cement Concrete
PCI	Pavement Condition Index
SF	Square Foot



No.	REVISIONS	DATE	BY	APP'D
1	MASTER PLAN	02/17	CA	--
2	TAXIWAY "A" EXTENTION ADDED	12/07	Z&H	--
3	RUNWAY WIDENING "AS BUILT" UPDATE	05/06	Z&H	--

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SEDONA AIRPORT

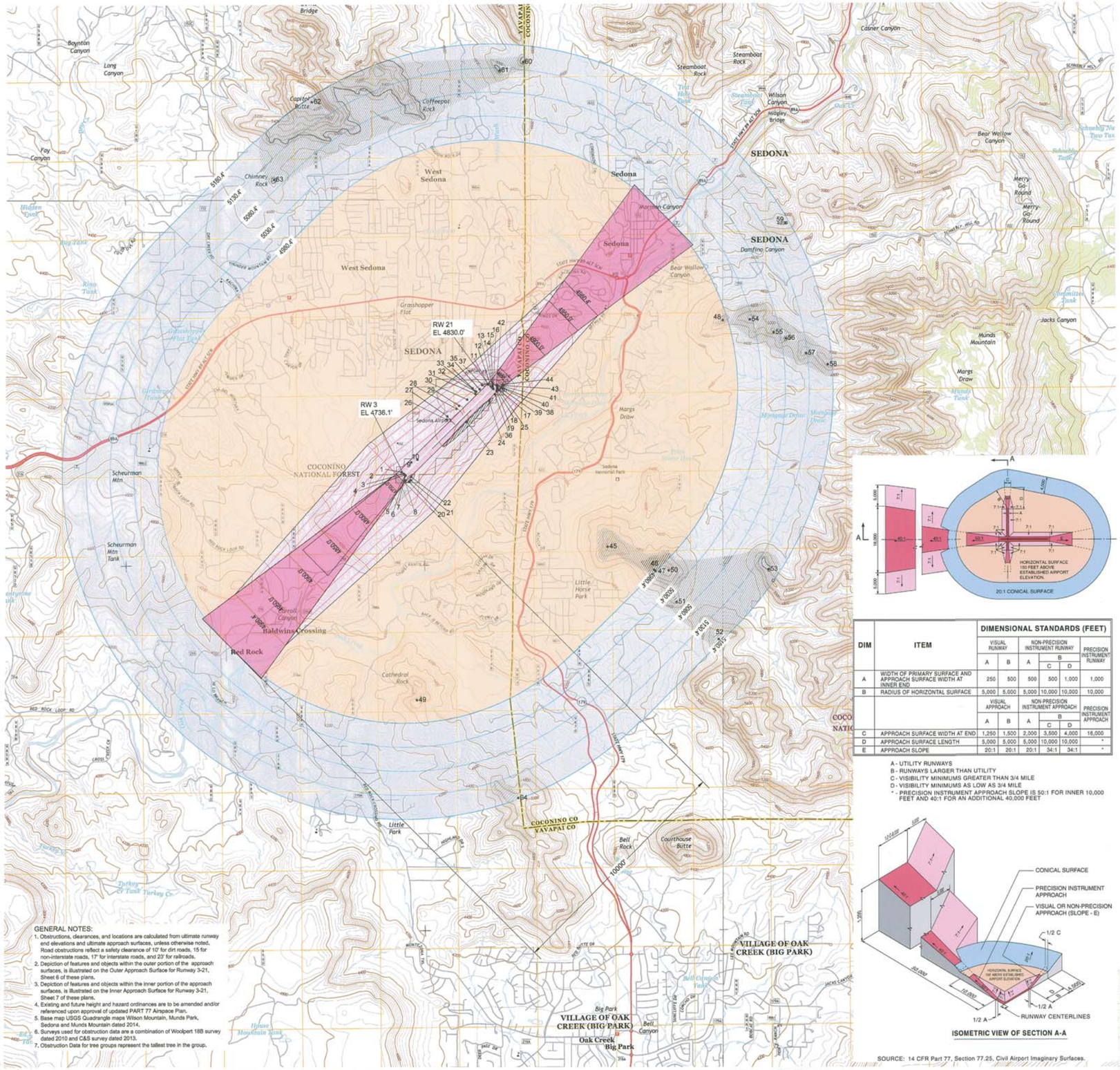
AIRPORT PAVEMENT DATA

SEDONA, ARIZONA

PLANNED BY: Eric Pfeifer
DETAILED BY: Maggie Beaver
APPROVED BY: Jim Harris P.E.

FEBRUARY 2017 | SHEET 4 OF 10

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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. Road obstructions reflect a safety clearance of 10' for dirt roads, 15 for non-interstate roads, 17' for Interstate roads, and 23' for railroads.
2. Depiction of features and objects within the outer portion of the approach surfaces, is illustrated on the Outer Approach Surface for Runway 3-21, Sheet 6 of these plans.
3. Depiction of features and objects within the inner portion of the approach surfaces, is illustrated on the Inner Approach Surface for Runway 3-21, Sheet 7 of these plans.
4. Existing and future height and hazard ordinances are to be amended and/or referenced upon approval of updated PART 77 Airspace Plan.
5. Base map USGS Quadrangle maps Wilson Mountain, Munds Park, Sedona and Munds Mountain dated 2014.
6. Surveys used for obstruction data are a combination of Woolpert 18B survey dated 2010 and C&S survey dated 2013.
7. Obstruction Data for tree groups represent the tallest tree in the group.

DIM	ITEM	DIMENSIONAL STANDARDS (FEET)					
		VISUAL RUNWAY		NON-PRECISION INSTRUMENT RUNWAY			PRECISION INSTRUMENT RUNWAY
		A	B	A	B C	B D	
A	WIDTH OF PRIMARY SURFACE AND APPROACH SURFACE WIDTH AT INNER END	250	500	500	500	1,000	1,000
B	RADIUS OF HORIZONTAL SURFACE	5,000	5,000	5,000	10,000	10,000	10,000
		VISUAL APPROACH		NON-PRECISION INSTRUMENT APPROACH			PRECISION INSTRUMENT APPROACH
		A	B	A	B C	B D	
C	APPROACH SURFACE WIDTH AT END	1,250	1,500	2,000	3,500	4,000	16,000
D	APPROACH SURFACE LENGTH	5,000	5,000	5,000	10,000	10,000	*
E	APPROACH SLOPE	20:1	20:1	20:1	34:1	34:1	*

A - UTILITY RUNWAYS
B - RUNWAYS LARGER THAN UTILITY
C - VISIBILITY MINIMUMS GREATER THAN 3/4 MILE
D - VISIBILITY MINIMUMS AS LOW AS 3/4 MILE
* - PRECISION INSTRUMENT APPROACH SLOPE IS 50:1 FOR INNER 10,000 FEET AND 40:1 FOR AN ADDITIONAL 40,000 FEET

ISOMETRIC VIEW OF SECTION A-A

SOURCE: 14 CFR Part 77, Section 77.25, Civil Airport Imaginary Surfaces.

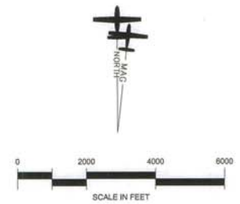
OBSTRUCTION TABLE

	Object Description	Top Object Elevation	Obstructed Part 77 Surface	Surface Elevation	Object Penetration	Proposed Object Disposition
1	WINDSOCK	4743.0' MSL	Primary	4736.1' MSL	6.9'	Fixed by Function
2	GROUND	4736.29' MSL	Primary	4736.1' MSL	0.19'	Grade
3	GROUND	4736.37' MSL	Primary	4736.1' MSL	0.28'	Grade
4	GROUND	4736.81' MSL	Primary	4736.1' MSL	0.71'	Grade
5	GROUND	4736.98' MSL	Primary	4736.1' MSL	0.89'	Grade
6	GROUND	4737.02' MSL	Primary	4736.1' MSL	0.93'	Grade
7	GROUND	4736.59' MSL	Primary	4736.1' MSL	0.5'	Grade
8	FENCE	4742.0' MSL	Primary	4736.1' MSL	5.9'	Relocate
9	GENERAL UTILITY	4747.0' MSL	Primary	4746.2' MSL	0.77'	Lower/Relocate
10	SIGN	4754.0' MSL	Primary	4751.09' MSL	2.91'	Lower/Relocate
11	POLE	4834.0' MSL	Primary	4830.4' MSL	3.6'	Lower/Relocate
12	GENERAL UTILITY	4831.0' MSL	Primary	4830.4' MSL	0.6'	Lower/Relocate
13	GROUND	4830.6' MSL	Primary	4830.4' MSL	0.2'	Grade
14	GROUND	4830.5' MSL	Primary	4830.4' MSL	0.16'	Grade
15	GROUND	4830.76' MSL	Primary	4830.4' MSL	0.37'	Grade
16	GROUND	4830.7' MSL	Primary	4830.4' MSL	0.31'	Grade
17	FENCE	4844.0' MSL	Primary	4830.4' MSL	13.6'	Relocate
18	FENCE	4846.0' MSL	Primary	4830.4' MSL	15.6'	Relocate
19	WIND SOCK	4853.0' MSL	Primary	4830.4' MSL	22.6'	Lower/Relocate
20	FENCE	4752.0' MSL	Transitional	4751.8' MSL	0.2'	Relocate
21	TREE GROUP	4761.98' MSL	Transitional	4756.49' MSL	5.49'	Remove
22	WIND SOCK	4763.0' MSL	Transitional	4745.66' MSL	17.34'	Lower/Relocate
23	STRUCTURE-POST	4824.0' MSL	Transitional	4799.87' MSL	24.13'	Equip with Obstruction Light
24	TREE GROUP	4841.57' MSL	Transitional	4829.25' MSL	12.35'	Remove
25	TREE GROUP	4848.39' MSL	Transitional	4833.59' MSL	15.35'	Remove
26	POLE	4816.0' MSL	Transitional	4812.01' MSL	3.99'	Equip with Obstruction Light
27	TREE GROUP	4828.36' MSL	Transitional	4822.64' MSL	5.72'	Remove
28	POLE	4829.0' MSL	Transitional	4826.25' MSL	2.75'	Equip with Obstruction Light
29	TOWER	4841.0' MSL	Transitional	4830.6' MSL	10.4'	Equip with Obstruction Light
30	POLE	4841.0' MSL	Transitional	4830.73' MSL	10.27'	Equip with Obstruction Light
31	BUILDING	4837.67' MSL	Transitional	4826.92' MSL	10.75'	Equip with Obstruction Light
32	BUILDING	4846.0' MSL	Transitional	4840.75' MSL	5.25'	Equip with Obstruction Light
33	BUILDING	4844.17' MSL	Transitional	4834.66' MSL	9.51'	Equip with Obstruction Light
34	TOWER	4868.0' MSL	Transitional	4863.91' MSL	4.08'	Equip with Obstruction Light
35	BUILDING	4837.98" MSL	Transitional	4833.59' MSL	4.39'	Equip with Obstruction Light
36	FENCE	4835.0' MSL	Transitional	4827.55' MSL	7.45'	Relocate
37	TREE GROUP	4843.22' MSL	Transitional	4842.08' MSL	1.14'	Remove
38	GROUND	4838.42" MSL	RWY. 21 Approach	4833.47' MSL	4.96'	Grade
39	FENCE	4838.0' MSL	RWY. 21 Approach	4830.73' MSL	7.27'	Relocate
40	FENCE	4836.0' MSL	RWY. 21 Approach	4831.14' MSL	4.86'	Relocate
41	FENCE	4835.0' MSL	RWY. 21 Approach	4830.4' MSL	3.65'	Relocate
42	TREE GROUP	4840.09' MSL	RWY. 21 Approach	4831.71' MSL	8.38'	Remove
43	TREE GROUP	4855.57' MSL	RWY. 21 Approach	4836.75' MSL	18.82'	Remove
44	TREE GROUP	4844.39' MSL	RWY. 21 Approach	4837.93' MSL	6.46"	Remove
45	TERRAIN	5342.1' MSL	Horizontal	4980.4' MSL	361.7'	No Action
46	TREE GROUP	5406.59' MSL	Horizontal	4980.4' MSL	426.19'	Remove
47	TERRAIN	5398.94' MSL	Horizontal	4980.4' MSL	418.54'	No Action
48	TERRAIN	5184.23' MSL	Horizontal	4980.4' MSL	203.83'	No Action
49	TERRAIN	5010.29' MSL	Horizontal	4980.4' MSL	29.89'	No Action
50	TERRAIN	5541.01" MSL	Conical	4997.51' MSL	543.5'	No Action
51	TERRAIN	5119.61' MSL	Conical	5055.74' MSL	63.87'	No Action
52	TERRAIN	5396.99" MSL	Conical	5172.84' MSL	224.15'	No Action
53	TERRAIN	5218.82" MSL	Conical	5156.95' MSL	61.87"	No Action
54	TERRAIN	5287.78' MSL	Conical	5023.54' MSL	264.24'	No Action
55	TERRAIN	5285.88' MSL	Conical	5065.78' MSL	220.1'	No Action
56	TERRAIN	5239.31' MSL	Conical	5088.63' MSL	150.68'	No Action
57	TERRAIN	4361.45' MSL	Conical	5126.15' MSL	245.3'	No Action
58	TERRAIN	5404.99' MSL	Conical	5169.31' MSL	235.68'	No Action
59	TERRAIN	5208.12' MSL	Conical	5171.04' MSL	37.08'	No Action
60	TERRAIN	5293.79' MSL	Conical	5145.27' MSL	148.52'	No Action
61	TERRAIN	5226.45' MSL	Conical	5124.8' MSL	101.65'	No Action
62	TERRAIN	6359.81 MSL	Conical	5170.72' MSL	1189.09'	No Action
63	TERRAIN	5159.52' MSL	Conical	5096.52' MSL	63.0'	No Action
64	TERRAIN	5189.87' MSL	Conical	5178.34' MSL	11.53'	No Action

OBSTRUCTION LEGEND

1● OBSTRUCTION HIGH POINT

●1/ GROUP or MULTIPLE OBSTRUCTIONS



No.	REVISIONS	DATE	BY	APP'D
	MASTER PLAN	02/17	CA	–
	TAXIWAY "A" EXTENSION ADDED	12/07	Z&H	–
	RUNWAY WIDENING "AS BUILT" UPDATE	05/06	Z&H	–

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SEDONA AIRPORT

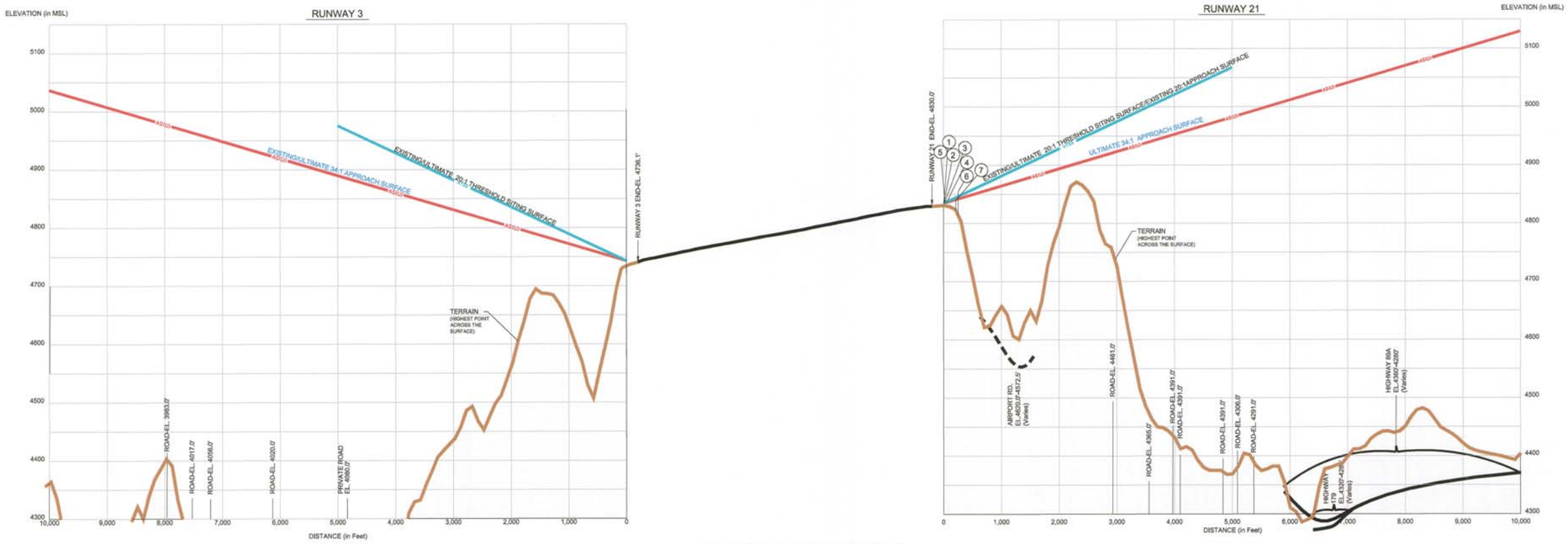
AIRPORT AIRSPACE DRAWING

SEDONA, ARIZONA

PLANNED BY: Eric Pfeifer
DETAILED BY: Maggie Beaver
APPROVED BY: Jim Harris P.E.

FEBRUARY 2017 | SHEET 5 OF 10

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RUNWAY 3-21 OUTER APPROACH PROFILES

RUNWAY 3 APPROACH OBSTRUCTION TABLE

	Object Description	Top Object Elevation	Obstructed Part 77 Surface	Surface Elevation	Object Penetration	Proposed Object Disposition
1	NONE	--	--	--	--	--

RUNWAY 3 TSS OBSTRUCTION TABLE

	Object Description	Top Object Elevation	Obstructed Surface	Surface Elevation	Object Penetration	Proposed Object Disposition
1	NONE	--	--	--	--	--

RUNWAY 21 APPROACH OBSTRUCTION TABLE

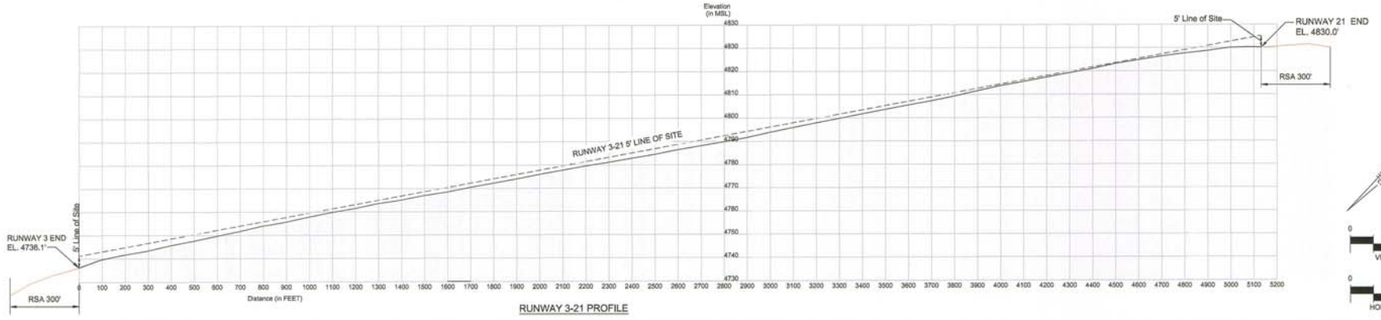
	Object Description	Top Object Elevation	Obstructed Part 77 Surface	Surface Elevation	Object Penetration	Proposed Object Disposition
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2	FENCE	4838.0' MSL	RWY. 21 Approach	4830.73' MSL	7.27'	Relocate
3	FENCE	4836.0' MSL	RWY. 21 Approach	4831.14' MSL	4.86'	Relocate
4	FENCE	4835.0' MSL	RWY. 21 Approach	4830.4' MSL	3.65'	Relocate
5	TREE GROUP	4840.09' MSL	RWY. 21 Approach	4831.71' MSL	8.38'	Remove
6	TREE GROUP	4855.57' MSL	RWY. 21 Approach	4836.75' MSL	18.82'	Remove
7	TREE GROUP	4844.39' MSL	RWY. 21 Approach	4837.93' MSL	6.46"	Remove

RUNWAY 21 TSS OBSTRUCTION TABLE

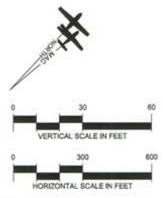
	Object Description	Top Object Elevation	Obstructed Surface	Surface Elevation	Object Penetration	Proposed Object Disposition
1	GROUND	4838.42" MSL	Threshold Siting Surface	4835.62' MSL	2.81"	Grade
2	FENCE	4838.0' MSL	Threshold Siting Surface	4830.96' MSL	7.04'	Relocate
3	FENCE	4836.0' MSL	Threshold Siting Surface	4831.66' MSL	4.34'	Relocate
4	FENCE	4835.0' MSL	Threshold Siting Surface	4832.01' MSL	2.99'	Relocate
5	TREE GROUP	4840.09' MSL	Threshold Siting Surface	4832.63' MSL	7.46'	Remove
6	TREE GROUP	4855.57' MSL	Threshold Siting Surface	4841.2' MSL	14.37'	Remove

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4. Surveys used for obstruction data are a combination of Woolpert 18B survey dated 2010 and C&S survey dated 2013.
5. Obstruction Data for tree groups represent the tallest tree within the group.



RUNWAY 3-21 PROFILE



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	MASTER PLAN	02/17	CA	--
	TAXIWAY "A" EXTENTION ADDED	12/07	Z&H	--
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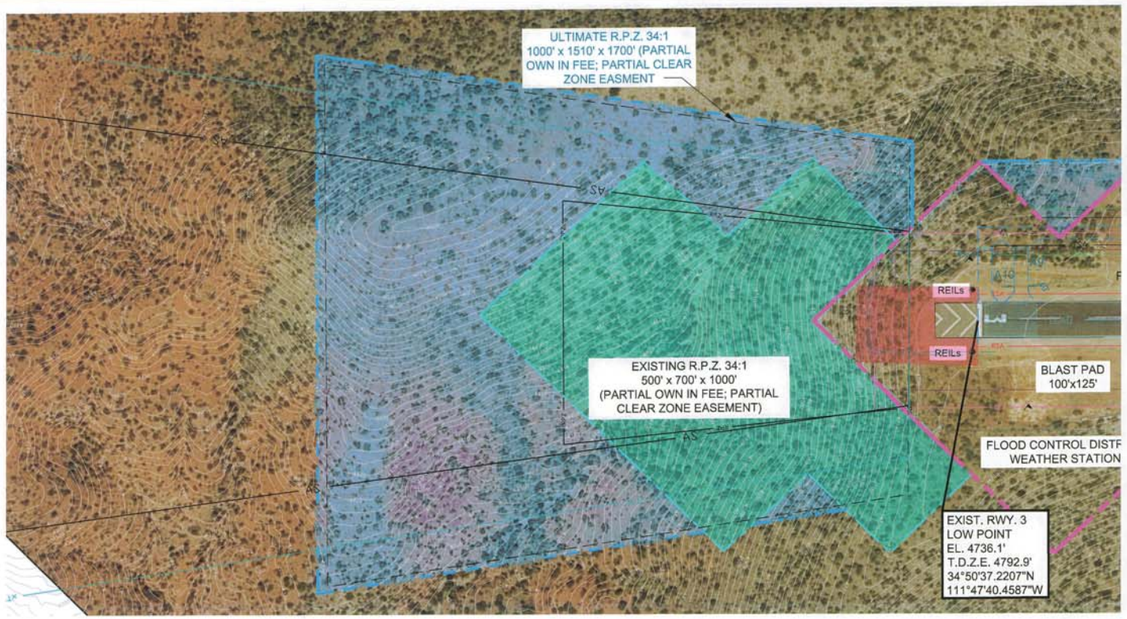
OUTER APPROACH SURFACE FOR RUNWAY 3-21

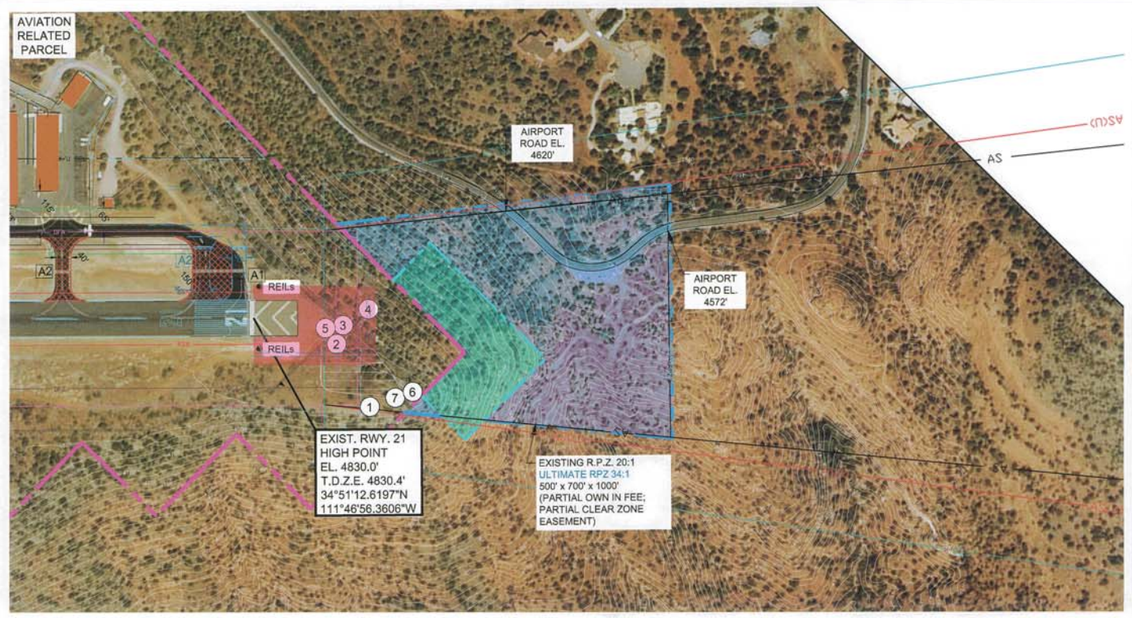
SEDONA, ARIZONA

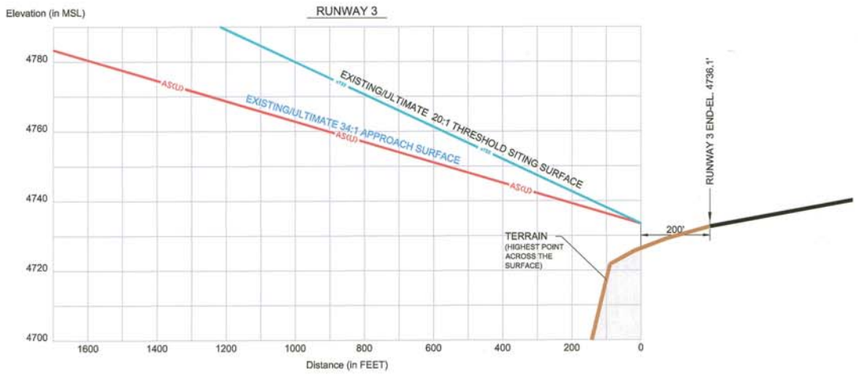
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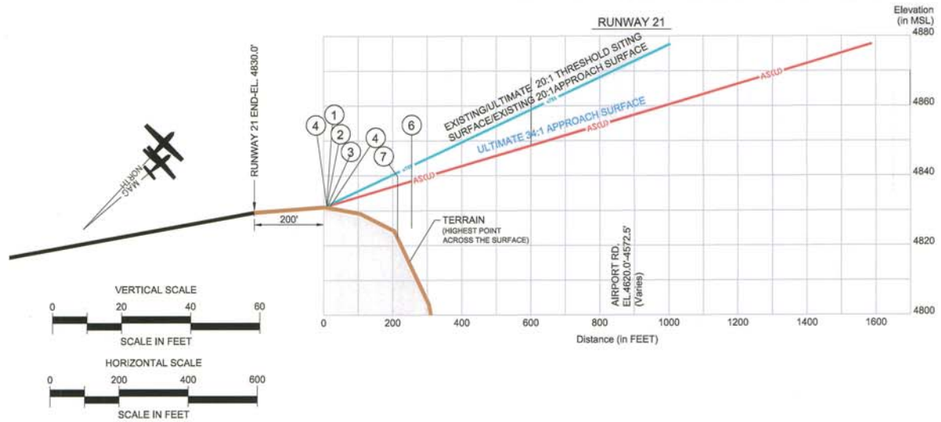
FEBRUARY 2017

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RUNWAY 3 APPROACH OBSTRUCTION TABLE

	Object Description	Top Object Elevation	Obstructed Part 77 Surface	Surface Elevation	Object Penetration	Proposed Object Disposition
1	NONE	--	--	--	--	--

RUNWAY 3 TSS OBSTRUCTION TABLE

	Object Description	Top Object Elevation	Obstructed Surface	Surface Elevation	Object Penetration	Proposed Object Disposition
1	NONE	--	--	--	--	--

RUNWAY 21 APPROACH OBSTRUCTION TABLE

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1	GROUND	4838.42' MSL	RWY. 21 Approach	4833.47' MSL	4.96'	Grade
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6	TREE GROUP	4855.57' MSL	RWY. 21 Approach	4836.75' MSL	18.82'	Remove
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RUNWAY 21 TSS OBSTRUCTION TABLE

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1	GROUND	4838.42" MSL	Threshold Siting Surface	4835.62' MSL	2.81"	Grade
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	TAXIWAY "A" EXTENTION ADDED	12/07	Z&H	--
	RUNWAY WIDENING "AS BUILT" UPDATE	05/06	Z&H	--

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SEDONA AIRPORT

INNER APPROACH SURFACE FOR RUNWAY 3-21

SEDONA, ARIZONA

PLANNED BY: Eric Pfeifer
DETAILED BY: Maggie Beaver
APPROVED BY: Jim Harris P.E.

FEBRUARY 2017 | SHEET 7 OF 10

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LEGEND

- Airfield Operations
- Aviation Related Development
- Non-Aviation Revenue Support
- Open Space
- Existing Easment
- Ultimate Easment
- Existing Airport Property Line
- National Forest Boundry
- Sedona City Limits
- DNL Noise Contour

SUNSET PARK

SEVENTH-DAY ADVETIST CHURCH

NATIONAL FOREST

NATIONAL FOREST

NATIONAL FOREST

NATIONAL FOREST

SEDONA CITY LIMITS

SEDONA CITY LIMITS

AIRPORT ROAD

SHRINE ROAD

SKY RANCH LODGE

GRAVEL PARKING LOT

AIRPORT ROAD EL. 4586'

EXISTING R.P.Z. 2011
ULTIMATE R.P.Z. 2041
35% ALT. & 100% FEE
PARTIAL OWN IN FEE
EASEMENT, CLEAR ZONE

EXIST. RWY. 21
HIGH POINT
EL. 4830.0'
T.D.Z.E. 4830.4'
34°51'12.6197"N
111°46'56.3606"W

NON-AVIATION REVENUE SUPPORT

AVIATION RELATED PARCEL

3RD TERMINAL DRIVE

RAMP "A"

HELICOPTER PARKING

TIEDOWN

EXISTING/ULTIMATE ARP
34°50'54.9000"N
111°47'18.4000"W

N 1/4 CORNER SECTION 24 T.17N.,R.5 E.

N IV CORNER SECTION 24 T.17N.,R.5 E.

EXISTING SEGMENTED CIRCLE/LIGHTED WINDCONE

RWY. 3-21 X 100'/ N 44°56'00" E

PAPI-4

65

70

100

RWY. 3-21 X 75'

BLAST PAD 100'x100'

REIL

REIL

FLOOD CONTROL DISTRICT WEATHERS STATION

ULTIMATE R.P.Z. 3411
1000' x 800' x 450'
OWN IN FEE & PARTIAL CLEAR ZONE EASEMENT

EXISTING R.P.Z. 3411
800' x 600' x 1000'
(PARTIAL OWN IN FEE, PARTIAL CLEAR ZONE EASEMENT)

EXIST. RWY. 3
LOW POINT
EL. 4736.1'
T.D.Z.E. 4736.5'
34°50'37.4207"N
111°47'40.4587"W

MAG NORTH

0 300 600
SCALE IN FEET

Magnetic Declination
10° 46' East (Aug. 2014)
Annual Rate of Change
00° 06.5' West (Aug. 2014)

LEGEND		
EXISTING	ULTIMATE	DESCRIPTION
		AIRPORT PROPERTY LINE
		SECTION CORNERS
	SAME	AIRPORT REFERENCE POINT (ARP)
	SAME	AIRPORT ROTATING BEACON
		AVIGATION EASEMENT
N/A		RSA IMPROVEMENT AREA
		"35' BUILDING RESTRICTION LINE
		STRUCTURES ON AIRPORT
N/A		ABANDON/REMOVE BUILDING
		STRUCTURE OFF AIRPORT
	SAME	AUTOMATED WEATHER OBSERVATION STATION
		AIRPORT PAVEMENT
N/A		ABANDON/REMOVE PAVEMENT
		FENCE LINE
		HOLD MARKING
	SAME	OBJECT FREE AREA
	SAME	RUNWAY SAFETY AREA
	SAME	OBSTACLE FREE ZONE
		RUNWAY PROTECTION ZONE
	SAME	TAXIWAY OBJECT FREE AREA
	SAME	TAXIWAY SAFETY AREA
		RUNWAY APPROACH SURFACE
	SAME	THRESHOLD SITING SURFACE
	SAME	DEPARTURE SURFACE
	SAME	TIE-DOWNS
		PAPI-4
		RUNWAY END IDENTIFIER LIGHTS (REILS)
		WINDSOCK
	SAME	TOPOGRAPHIC CONTOURS
	SAME	PACs AND SACs

No.	REVISIONS	DATE	BY	APP'D
	MASTER PLAN	02/17	CA	--
	TAXIWAY "A" EXTENTION ADDED	12/07	Z&H	--
	RUNWAY WIDENING "AS BUILT" UPDATE	05/06	Z&H	--

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SEDONA AIRPORT

AIRPORT LAND USE DRAWING

SEDONA, ARIZONA

PLANNED BY: Eric Pfeifer
DETAILED BY: Maggie Beaver
APPROVED BY: Jim Harris P.E.

FEBRUARY 2017 SHEET 8 OF 10

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EXISTING PROPERTY DATA

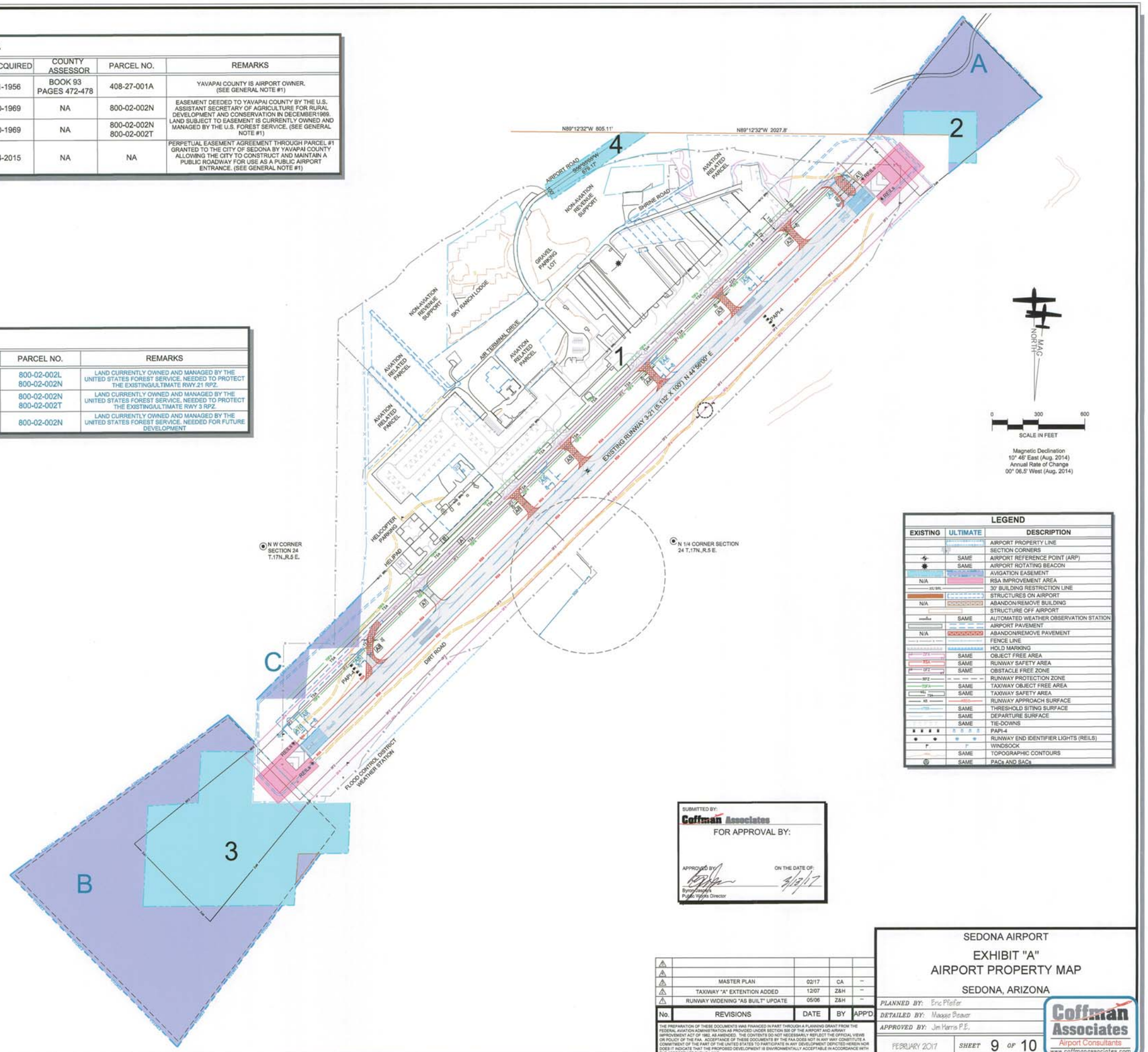
DESIGNATION	ACREAGE	ACQUISITION	UPC #	GRANTOR	GRANTEE	DATE ACQUIRED	COUNTY ASSESSOR	PARCEL NO.	REMARKS
1	±232.6	FEE SIMPLE	NA	UNITED STATES OF AMERICA	YAVAPAI COUNTY	10-31-1956	BOOK 93 PAGES 472-478	408-27-001A	YAVAPAI COUNTY IS AIRPORT OWNER. (SEE GENERAL NOTE #1)
2	±2.39	CLEAR ZONE EASEMENT	NA	UNITED STATES OF AMERICA	YAVAPAI COUNTY	12-10-1969	NA	800-02-002N	EASEMENT DEEDED TO YAVAPAI COUNTY BY THE U.S. ASSISTANT SECRETARY OF AGRICULTURE FOR RURAL DEVELOPMENT AND CONSERVATION IN DECEMBER1969. LAND SUBJECT TO EASEMENT IS CURRENTLY OWNED AND MANAGED BY THE U.S. FOREST SERVICE. (SEE GENERAL NOTE #1)
3	±19.84	CLEAR ZONE EASEMENT	NA	UNITED STATES OF AMERICA	YAVAPAI COUNTY	12-10-1969	NA	800-02-002N 800-02-002T	
4	±1.56	EASEMENT	NA	UNITED STATES OF AMERICA	YAVAPAI COUNTY	11-24-2015	NA	NA	PERPETUAL EASEMENT AGREEMENT THROUGH PARCEL #1 GRANTED TO THE CITY OF SEDONA BY YAVAPAI COUNTY ALLOWING THE CITY TO CONSTRUCT AND MAINTAIN A PUBLIC ROADWAY FOR USE AS A PUBLIC AIRPORT ENTRANCE. (SEE GENERAL NOTE #1)

GENERAL NOTE:

1. Airport Property owned by Yavapai County is subject to an Amended Airport Lease Agreement dated February 1, 2003 between the County and Sedona-Oak Creek Airport Authority, recorded February 19, 2003 at Book 4003, Page 592, Official Records of Yavapai County, Airport ("Airport Lease")

ULTIMATE PROPERTY DATA

DESIGNATION	ACREAGE	ACQUISITION	UPC #	DATE ACQUIRED	PARCEL NO.	REMARKS
A	±8.00	EASEMENT	NA	NA	800-02-002L 800-02-002N	LAND CURRENTLY OWNED AND MANAGED BY THE UNITED STATES FOREST SERVICE. NEEDED TO PROTECT THE EXISTING/ULTIMATE RWY.21 RPZ.
B	±28.2	EASEMENT	NA	NA	800-02-002N 800-02-002T	LAND CURRENTLY OWNED AND MANAGED BY THE UNITED STATES FOREST SERVICE. NEEDED TO PROTECT THE EXISTING/ULTIMATE RWY 3 RPZ.
C	±2.6	EASEMENT	NA	NA	800-02-002N	LAND CURRENTLY OWNED AND MANAGED BY THE UNITED STATES FOREST SERVICE. NEEDED FOR FUTURE DEVELOPMENT



Magnetic Declination
10° 46' East (Aug. 2014)
Annual Rate of Change
00° 06.5' West (Aug. 2014)

PROPERTY LEGEND

- Existing Property Line
- Existing Airport Property
- Existing Airport Easement
- Existing Airport Easement
- Ultimate Airport Easment
- Ultimate Airport Easment

LEGEND

EXISTING	ULTIMATE	DESCRIPTION
		AIRPORT PROPERTY LINE
		SECTION CORNERS
	SAME	AIRPORT REFERENCE POINT (ARP)
	SAME	AIRPORT ROTATING BEACON
		AVIGATION EASEMENT
N/A		RSA IMPROVEMENT AREA
40' BRL		30' BUILDING RESTRICTION LINE
		STRUCTURES ON AIRPORT
N/A		ABANDON/REMOVE BUILDING
		STRUCTURE OFF AIRPORT
	SAME	AUTOMATED WEATHER OBSERVATION STATION
		AIRPORT PAVEMENT
N/A		ABANDON/REMOVE PAVEMENT
		FENCE LINE
		HOLD MARKING
OFA	SAME	OBJECT FREE AREA
RSA	SAME	RUNWAY SAFETY AREA
OFZ	SAME	OBSTACLE FREE ZONE
RPZ		RUNWAY PROTECTION ZONE
TOFA	SAME	TAXIWAY OBJECT FREE AREA
TSA	SAME	TAXIWAY SAFETY AREA
		RUNWAY APPROACH SURFACE
	SAME	THRESHOLD SITING SURFACE
	SAME	DEPARTURE SURFACE
	SAME	TIE-DOWNS
		PAPI-4
		RUNWAY END IDENTIFIER LIGHTS (REILS)
		WINDSOCK
	SAME	TOPOGRAPHIC CONTOURS
	SAME	PACs AND SACs

SUBMITTED BY:
Coffman Associates

FOR APPROVAL BY:

APPROVED BY: _____ ON THE DATE OF: 3/13/17
Byron Gessaris
Public Works Director

No.	REVISIONS	DATE	BY	APP'D
5				
4				
3	MASTER PLAN	02/17	CA	--
2	TAXIWAY "A" EXTENTION ADDED	12/07	Z&H	--
1	RUNWAY WIDENING "AS BUILT" UPDATE	05/06	Z&H	--

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SEDONA AIRPORT

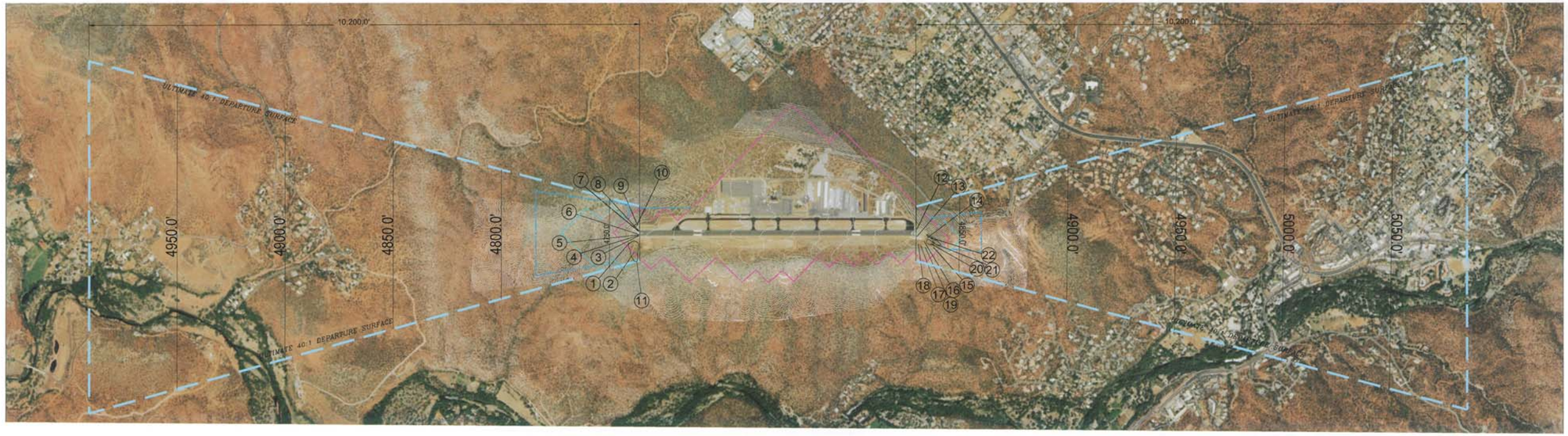
EXHIBIT "A"
AIRPORT PROPERTY MAP

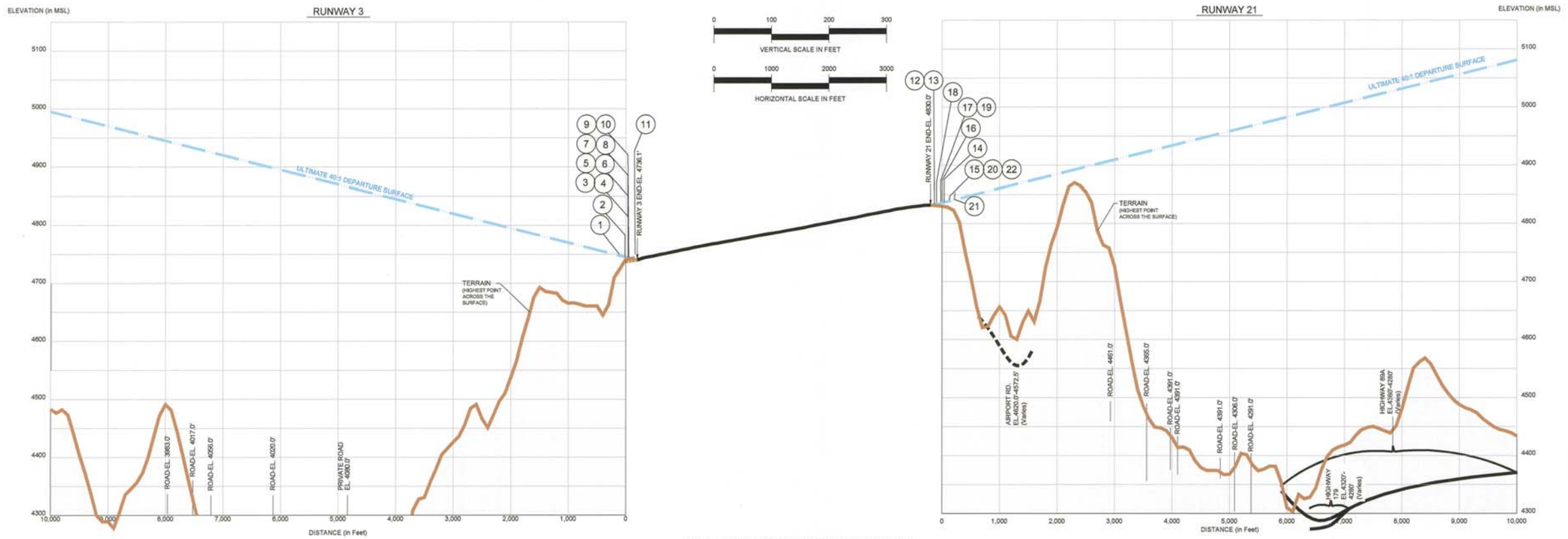
SEDONA, ARIZONA

PLANNED BY: Eric Pfeifer
DETAILED BY: Maggie Beaver
APPROVED BY: Jim Harris P.E.

FEBRUARY 2017 SHEET 9 OF 10

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RUNWAY 3-21 DEPARTURE SURFACE PROFILES

RUNWAY 3 OBSTRUCTION TABLE

Object Description/Elevation	40:1 Departure Surface		Obstacle Clearance Requirements (Remove, Relocate, or Lower Object)
	Elevation	Penetrations	
1. FENCE	4752'	13.89'	RELOCATE
2. FENCE	4742'	4.78'	RELOCATE
3. GROUND	4736.59'	0.34'	LOWER
4. GROUND	4737.02'	0.77'	LOWER
5. GROUND	4736.98'	0.72'	LOWER
6. GROUND	4736.81'	0.55'	LOWER
7. GROUND	4736.37'	0.12'	LOWER
8. GROUND	4736.29'	0.03'	LOWER
9. POLE	4743'	6.24'	RELOCATE
10. TREE GROUP	4736.77'	6.7'	REMOVE
11. TREE GROUP	4759.29'	22.4'	REMOVE

RUNWAY 21 OBSTRUCTION TABLE

Object Description/Elevation	40:1 Departure Surface		Obstacle Clearance Requirements (Remove, Relocate, or Lower Object)
	Elevation	Penetrations	
12. GENERAL UTILITIES	4831'	0.33'	RELOCATE
13. GROUND	4830.76'	0.04'	LOWER
14. FENCE	4838'	2.32'	RELOCATE
15. GROUND	4838.42'	0.42'	LOWER
16. FENCE	4844'	9.91'	RELOCATE
17. FENCE	4846'	13.64'	RELOCATE
18. POLE	4853'	21.5'	RELOCATE
19. TREE GROUP	4838.39'	13.67'	REMOVE
20. TREE GROUP	4850.64'	13.26'	REMOVE
21 TREE GROUP	4855.57'	14.79'	REMOVE
22. TREE GROUP	4845.27'	7.94'	REMOVE

GENERAL NOTES:

1. Obstructions, clearances, and locations are calculated from ultimate runway end elevations and ultimate approach surfaces, unless otherwise noted. Road obstructions reflect a safety clearance of 10' for dirt roads, 15' for non-interstate roads, 17' for interstate roads, and 23' for railroads.
2. Roads and buildings clearance of more than 50 feet AGL are not are not detailed in the Departure Surface Profiles.
3. Surveys used for obstruction data are a combination of Woolpert 18B survey dated 2010 and C&S survey dated 2013.
4. Obstruction Data for tree groups represent the tallest tree within the group.

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SEDONA AIRPORT

DEPARTURE SURFACE DRAWING

SEDONA, ARIZONA

PLANNED BY: Eric Pfeifer
DETAILED BY: Maggie Beaver
APPROVED BY: Jim Harris P.E.

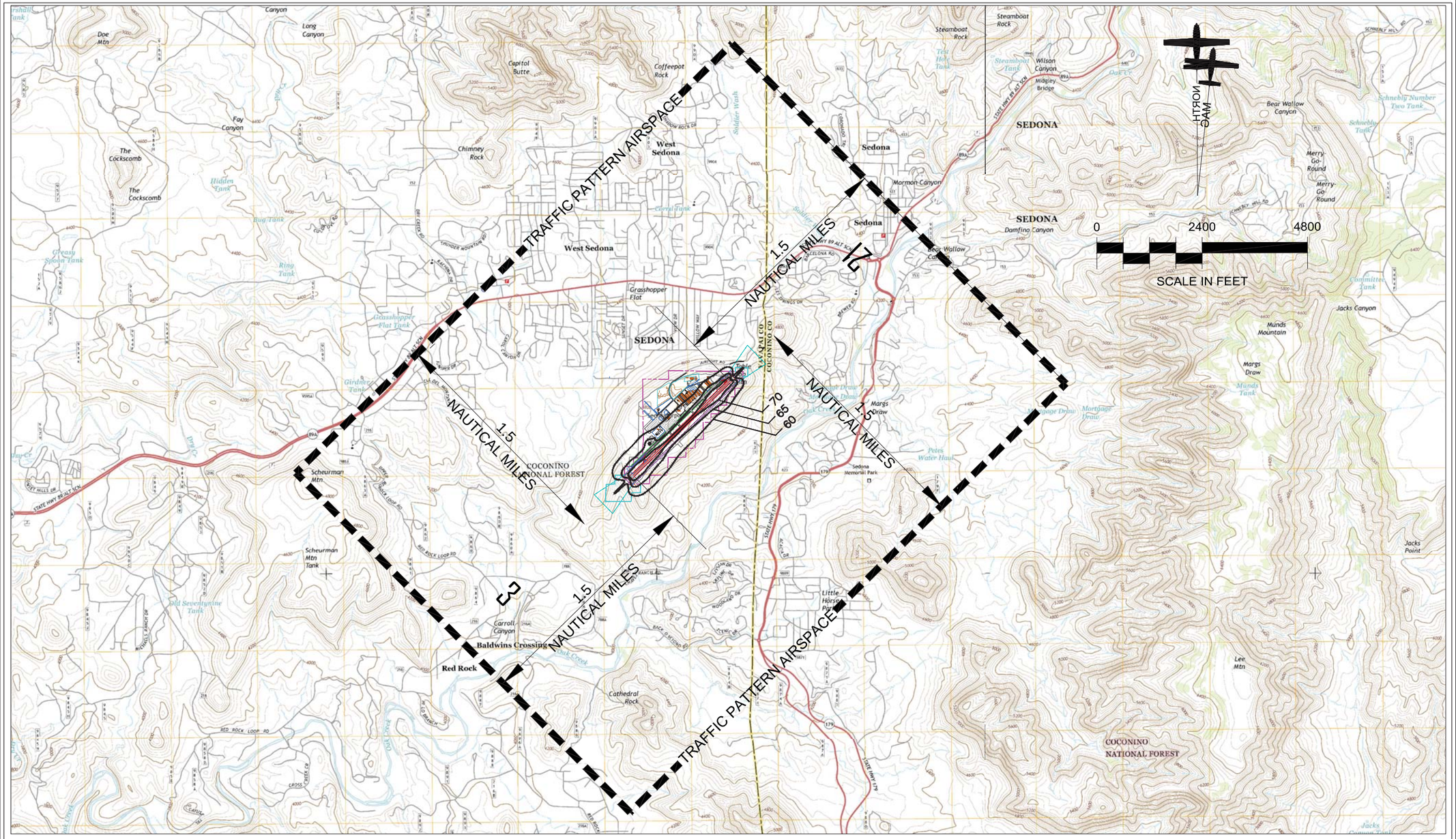
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Appendix C

PUBLIC AIRPORT DISCLOSURE MAP



NOTES:

1. This map has been prepared in accordance with the Arizona Revised Statutes, Section 28-8486, relating to Public Airport Disclosure.
2. Traffic Pattern Airspace Boundaries have been established in accordance with the guidelines provided in the FAA Order JO 7400.2G.
3. The Airport Noise Contours have been developed with the Integrated Noise Model (Version 7.0d) and are based on the Total Annual Operations (Take-offs and Landings) of 4,400.
4. 1 Nautical mile = 6,080 feet or 1.151 statute miles.
5. Base map derived from electronic USGS quadrangles Wilson Mountain, Munds Park, AZ., Munds Mountain, Sedona, AZ.

LEGEND:

- TRAFFIC PATTERN AIRSPACE
- 65 — NOISE CONTOURS DAY NIGHT LEVEL (DNL)
- EXISTING AIRPORT PROPERTY LINE
- EXTENDED RUNWAY CENTERLINE

SEDONA AIRPORT

PUBLIC AIRPORT DISCLOSURE MAP

SEDONA, ARIZONA

PLANNED BY:	Eric Pfeifer
DETAILED BY:	Maggie Beaver
APPROVED BY:	James M. Harris, P.E.
JANUARY 2016	SHEET 1 OF 1

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