Coolidge Municipal Airport

Coolidge, Arizona

CHAPTER 3

Facility Requirements

AIRPORT MASTER PLAN

To properly plan for the future of Coolidge Municipal Airport, it is necessary to translate forecast aviation demand into the specific types and quantities of facilities that can adequately serve this identified demand. This chapter uses the results of the forecasts conducted in Chapter Two, as well as established planning criteria, to determine the airside (i.e., runways, taxiways, navigational aids, marking and lighting) and landside (i.e., terminal building, 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, 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 to determine the most cost-effective and efficient means for implementation.

PLANNING HORIZONS

The 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 that is demand-based rather than time-based, a series of planning horizon milestones have been established for Coolidge Municipal Airport that take into consideration the reasonable range of aviation demand projections prepared in the previous chapter.

It is important to consider that the actual activity at the airport may be higher or lower than projected activity levels. By planning according to activity milestones, the resulting plan can accommodate unexpected shifts, or changes, in the area's aviation demand. It is important that the plan accommodate these changes so that airport staff can respond to unexpected changes in a timely fashion. These milestones provide flexibility, while potentially extending this plan's useful life if aviation trends slow over time.

The most important reason for utilizing milestones is that they allow the airport to develop facilities according to need generated by actual demand levels. The demand-based schedule provides flexibility in development, as development schedules can be slowed or expedited according to actual demand at any given time during the planning period. The resulting plan provides airport officials with a financially responsible and need-based program. **Table 3A** presents the planning horizon milestones for each aircraft activity category. The planning milestones of short, intermediate, and long term generally correlate to the five, ten, and 20-year periods used in the previous chapter.

TABLE 3A
Planning Horizon Activity Levels
Coolidge Municipal Airport

	2009	Short Term	Intermediate Term	Long Term
Itinerant Operations				
General Aviation	6,200	7,500	8,900	12,500
Military	100	100	100	100
Total Itinerant	6,300	7,600	9,000	12,600
Local Operations				
General Aviation	14,500	16,800	19,900	25,300
Total Local	14,500	16,800	19,900	25,300
TOTAL OPERATIONS	**20,800**	**24,400**	**28,900**	**37,900**
TOTAL BASED AIRCRAFT	**38**	**50**	**65**	**90**

AIRFIELD PLANNING CRITERIA

The selection of appropriate Federal Aviation Administration (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. The critical design aircraft is defined as the most demanding category of aircraft, or family of aircraft, which conducts at least 500 operations per year at the airport. Planning for future aircraft use is of particular importance since design standards are used to plan many airside and landside components. These future standards must be considered now to en-

sure that short term development does not preclude the long range potential needs of the airport.

The FAA has established a coding system to relate airport design criteria to the operational and physical characteristics of aircraft expected to use the airport. This airport reference code (ARC) has two components. The first component, depicted by a letter, is the aircraft approach category and relates to aircraft approach speed (operational characteristic); the second component, depicted by a Roman numeral, is the airplane design group and relates to aircraft wingspan and tail height (physical characteristics). Generally, aircraft approach speed applies to runways and runway-related facilities, while aircraft wingspan and tail height primarily relates to separation criteria involving taxiways, taxilanes, and landside facilities. **Exhibit 3A** summarizes representative aircraft by ARC.

According to FAA Advisory Circular (AC) 150/5300-13, Change 14, *Airport Design*, an aircraft's approach category is based upon 1.3 times its stall speed in landing configuration at that aircraft's maximum certificated weight. The five approach categories used in airport planning are as follows:

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

The airplane design group (ADG) is based upon either the aircraft's wingspan or tail height, whichever is greater. For example, an aircraft may fall in ADG II for wingspan at 70 feet, but ADG III for tail height at 33 feet. This aircraft would be classified under ADG III. **Table 3B** describes the six ADGs used in airport planning.

TABLE 3B
Airplane Design Groups

Airplane Design Group	Tail Height (feet)	Wingspan (feet)
I	Less than 20	Less than 49
II	Greater than 20, but less than30	Greater than 49 but less than 79
III	Greater than 30 but less than 45	Greater than 79 but less than 118
IV	Greater than 45 but less than 60	Greater than 118 but less than 171
V	Greater than 60 but less than 66	Greater than 171 but less than 214
VI	Greater than 66 but less than 80	Greater than 214 but less than 262

Source: FAA AC 150/5300-13, Change 14, *Airport Design*

The FAA recommends designing airport functional elements to meet the requirements for the most demanding ARC for that airport. The majority of aircraft currently operating at the airport are small single engine aircraft weighing less than 12,500 pounds. The airport also has recorded a num-

ber of turboprop and jet aircraft operations to include the King Air 100 and Cessna Citation family. In addition, larger aircraft to include the Lockheed C-130 utilize the airport on a regular basis in association with aviation activities conducted by International Air Response, a specialty business operator located at Coolidge Municipal Airport.

In order to determine airfield design requirements, the critical aircraft and critical ARC should first be determined, and then appropriate airport design criteria can be applied. This process begins with a review of aircraft currently using the airport and those expected to use the airport through the long term planning period.

CRITICAL AIRCRAFT

As previously discussed, the critical design aircraft is defined as the most demanding category or family of aircraft which conducts at least 500 annual operations at the airport. In some cases, more than one specific make and model of aircraft comprises the airport's critical design aircraft. For example, one category of aircraft may be the most critical in terms of approach speed, while another is most critical in terms of wingspan. Smaller general aviation piston-powered aircraft within approach categories A and B and ADG I conduct the majority of operations at Coolidge Municipal Airport. Turboprops and jets with longer wingspans and higher approach speeds also utilize the airport, but less frequently. While the airport is also utilized by helicopters, they are not included in this determination as they are not assigned an ARC.

There are currently 38 based aircraft at Coolidge Municipal Airport. The majority of these are single engine piston-powered aircraft which fall within approach category A and ADG I. There are eight turboprop aircraft which are also based at the airport. They include a Cessna 210, King Air 100, TBM 700, and five Lockheed C-130s. These aircraft range from ARC A-I through C-IV. In addition, four jets are based at the airport to include a Cessna 525, L-29, A-37, and Mig 17. These aircraft belong in ARCs B-II, B-I, B-I, and C-I, respectively. Before making a final determination of the critical aircraft family, an examination of the transient turboprop and jet aircraft using the airport should also be considered.

A wide range of transient turboprop and jet aircraft operate at the airport. In order to discern the number and type of turboprop and jet operations at Coolidge Municipal Airport, an analysis of instrument flight plan data was conducted. Flight plan data was acquired for this study from the subscription service, *Airport IQ*. The data available includes documentation of flight plans that are opened or closed on the ground at the airport. Flight plans that are opened or closed from the air are not credited to the airport. Therefore, it is likely that there are more turboprop and jet operations at the airport that are not captured by this methodology. Additionally, some turboprops and jets may conduct operations within the traffic pattern at the

06MP12-3A-8/19/09

A-I

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

B-I *less than 12.500 lbs.*

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

B-II *less than 12.500 lbs.*

- **Super King Air 200**
- Cessna 441
- DHC Twin Otter

B-I, B-II *over 12,500 lbs.*

- Super King Air 350
- Beech 1900
- Jetstream 31
- Falcon 10, 20, 50
- Falcon 200, 900
- **Citation II**, III, IV, V
- Saab 340
- 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 25, 31, 35, 45, 55, 60**
- Israeli Westwind
- HS 125-400, 700

C-II, D-II

- Cessna Citation III, VI, VIII, X
- **Gulfstream II, III, IV**
- Canadair 600
- ERJ-135, 140, 145
- CRJ-200, 700, 900
- Embraer Regional Jet
- Lockheed JetStar

C-III, D-III

- ERJ-170, 190
- Boeing Business Jet
- B 727-200
- **B 737-300 Series**
- MD-80, DC-9
- Fokker 70, 100
- A319, A320
- Gulfstream V
- Global Express

C-IV, D-IV

- **B-757**
- B-767
- C-130
- DC-8-70
- DC-10
- MD-11
- L1011

D-V

- **B-747** Series
- B-777

Note: Aircraft pictured is identified in bold type.

COOLIDGE MUNICIPAL AIRPORT

Exhibit 3A
AIRPORT REFERENCE CODES

airport. These local operations are also not captured on instrument flight plans. From these records, approximately 50 combined operations by turboprop and jet aircraft in ARCs B-I and B-II were conducted at Coolidge Municipal Airport during a one-year timeframe from August 2008 to August 2009. The ARC B-I classification included the King Air 100 and Eclipse 500. The lone ARC B-II aircraft that was reported at the airport was a Cessna Citation 525.

Another segment of corporate aviation users operate under Federal Aviation Regulation (F.A.R.) Part 135 (air taxi) rules for hire and through fractional-ownership programs. Air taxi operators are governed by the FAA rules which are more stringent than those required for private aircraft owners. For example, aircraft operating under Part 135 rules must increase their calculated landing length requirements by 20 percent for safety factors. Fractional-ownership operators are actual aircraft owners who acquire a portion of an aircraft with the ability to use any aircraft in the program's fleet. These programs have become quite popular over the last several years, especially since 9/11. Some of the most notable fractional ownership programs include NetJets, Bombardier Flexjet, Citation Shares, and Flight Options. During the one-year timeframe from August 2008 to August 2009, *Airport IQ* recorded no air taxi operations at Coolidge Municipal Airport. As previously discussed, it is possible that these types of operations did occur at the airport during this time and were not recorded due to the fact that an aircraft may not have opened or closed a flight plan while on the ground at the airport.

Critical Aircraft Design Conclusion

Coolidge Municipal Airport is currently utilized by all types of general aviation aircraft ranging from small single engine piston-powered aircraft up to large turboprop and business jet aircraft. The largest based aircraft in terms of ARC will often account for the design standard to be applied to the airport. The largest aircraft currently based at Coolidge Municipal Airport is the Lockheed C-130, which is categorized as an ARC C-IV aircraft. As previously discussed, there are five C-130s currently based at the airport, all of which are associated with International Air Response. According to company management, there is an average of ten C-130 operations conducted at the airport on a weekly basis. As a result, annual operations by C-130 aircraft would exceed the 500 annual operations threshold as determined by the FAA to define the critical aircraft.

The analysis also examined the itinerant aircraft operating at the airport. At non-towered airports, determining a reasonable operational count by aircraft type can be difficult. Data provided by *Airport IQ* gives a good representation of the types of aircraft utilizing the airport. As previously discussed, this database recorded several transient operations by turboprop and jet aircraft in ARC B-I and B-II; however, not to the magnitude of 500 operations during the one-year time-

frame. In addition, none of the aircraft recorded were as demanding as the C-130 aircraft that are currently based at the airport. Given these considerations, the current critical aircraft at Coolidge Municipal Airport is the Lockheed C-130 that falls into ARC C-IV design criteria.

The aviation demand forecasts indicate the potential for continued growth in business jet and turboprop aircraft activity at the airport. This includes the addition of four based turboprops and four based jets through the long term planning period. Itinerant business jet and turboprop activity can also be expected to increase at the airport due to the types of specialty aviation business operators based on the field and the potential for increased support of aviation use in the airport's service area to include the City of Coolidge and Town of Florence.

Coolidge Municipal Airport is capable of serving the full breadth of piston-powered and turboprop general aviation aircraft. The airport is also capable of serving a large percentage of business jet aircraft in the fleet today. Future business jet and turboprop aircraft which could base and/or operate at the airport will likely mirror current conditions, however, in higher volumes. Furthermore, higher levels of aircraft operations by larger and more sophisticated aircraft such as the Cessna 650 and 750 (Citation X), Challenger 600, and Gulfstream family could utilize the airport on a more frequent basis in the future. These aircraft are included in approach categories C and D.

In addition, it is expected that International Air Response will continue to conduct business at the airport that will involve the Lockheed C-130 turboprop aircraft. According to the company, future aircraft including the Douglas DC-8, an ARC C-IV design aircraft, could also utilize the airport in the event that additional runway length was provided. Considering the based aircraft fleet mix forecast as well as the future transient aircraft mix, ultimate planning should continue to conform to ARC C-IV design standards.

While the airport in general should be positioned to meet ARC C-IV standards, each runway should be individually considered based on function. Primary Runway 5-23 is the airport's longest runway and is served by two non-precision instrument approaches. As such, Runway 5-23 should be planned to conform to all applicable ARC C-IV design standards. Runway 17-35 serves to accommodate small aircraft, especially when crosswinds prohibit the use of Runway 5-23. It can also provide a vital role of serving all aircraft operations when the primary runway is closed for maintenance or emergencies. As such, crosswind Runway 17-35 should be designed to conform to full ARC B-II design standards.

The airfield facility requirements outlined in this chapter correspond to the design standards described in FAA's AC 150/5300-13, Change 14, *Airport Design*. The following airfield facilities are outlined to describe the scope of facilities that would be necessary to accommodate the airport's role throughout the planning period.

AIRFIELD CAPACITY

Airfield capacity is measured in a variety of different ways. The **hourly capacity** of a runway measures the maximum number of aircraft operations that can take place in an hour. The **annual service volume (ASV)** is an annual level of service that may be used to define airfield capacity needs. **Aircraft delay** is the total delay incurred by aircraft using the airfield during a given timeframe. FAA Advisory Circular 150/5060-5, *Airport Capacity and Delay*, provides a methodology for examining the operational capacity of an airfield for planning purposes. This analysis takes into account specific factors about the airfield.

- **Runway Configuration** – The existing airfield configuration consists of a crosswind runway system with taxiways serving both runways. Primary Runway 5-23 is 5,562 feet long by 150 feet wide, while crosswind Runway 17-35 is 3,871 feet long by 75 feet wide.

- **Runway Use** – Runway use in capacity conditions will be controlled by wind and/or airspace conditions. For Coolidge Municipal Airport, the direction of take-offs and landings are generally determined by the speed and direction of the wind. It is generally safest for aircraft to take-off and land into the wind, avoiding a crosswind (wind that is blowing perpendicular to the travel of the aircraft) or tailwind components during these operations. Based upon information received from wind data obtained for the area, Runway 5-23 is more favorably oriented for predominant winds. Runway 5-23 is also served by published instrument approach procedures. Crosswind Runway 17-35 is primarily utilized by small aircraft during times when high crosswind components dictate.

- **Exit Taxiways** – Exit taxiways have a significant impact on airfield capacity since the number and location of exits directly determines the occupancy time of an aircraft on the runway. Based upon mix, only taxiways between 2,000 feet and 4,000 feet from the landing threshold count in the exit rating. Runways 5-23 and 17-35 are credited for one exit in each direction under this analysis.

- **Weather Conditions** – The airport operates under visual meteorological conditions (VMC) a large majority of the time. For purposes of this study, it was determined that VMC conditions prevailed approximately 99 percent of the time. As a result, instrument meteorological conditions (IMC) and poor visibility conditions (PVC) combined occur one percent of the time.

- **Aircraft Mix** – Aircraft mix for the capacity analysis is defined in terms of four aircraft classes. Classes A and B consist of small and medium-sized propeller and some jet aircraft, all weighing 12,500 pounds or less. These aircraft are associated primarily with general aviation activity, but do include some air taxi, air cargo, and commuter aircraft. Class C consists

of aircraft weighing between 12,500 pounds and 300,000 pounds. These aircraft include most business jets and some turboprop aircraft. Class D aircraft consists of large aircraft weighing more than 300,000 pounds. The airport does not experience operations by Class D aircraft; however, Class C operations are estimated to be about five percent of total annual operations. The remainder is operations by Class A and B aircraft.

- **Percent Arrivals** – Percent arrivals generally follow the typical 50/50 percent split.

- **Touch-and-Go Activity** – Current local operations account for approximately 70 percent of total annual operations. This figure will likely decrease through the planning period due to a projected increase in itinerant operations. Local activity is projected to decrease as a percentage of total airport operations to 65 percent by the long term planning period.

- **Peak Period Operations** – For the airfield capacity analysis, average daily operations and average peak hour operations during the peak month, as calculated in the previous section, are utilized. Typical operations activity is important in the calculation of an airport's annual service volume as "peak demand" levels occur sporadically. The peak periods used in the capacity analysis are representative of normal operational activity and can be exceeded at various times throughout the year.

CAPACITY ANALYSIS CONCLUSIONS

Given the factors outlined above, the airfield ASV will range between 150,000 and 200,000 annual operations. The ASV does not indicate a point of absolute gridlock for the airfield; however, it does represent the point at which operational delay for each aircraft operation will increase exponentially. The current operation level estimated for the airport represents 12 percent of the airfield's ASV, if the ASV is considered at the low end of the typical range of 150,000 annual operations. By the end of the planning period, total annual operations are expected to represent only 23 percent of the airfield's ASV.

FAA Order 5090.3B, *Field Formulation of the National Plan of Integrated Airport Systems* (NPIAS), indicates that improvements for airfield capacity purposes should begin to be considered once operations reach 60 to 75 percent of the annual service volume. This is an approximate level to begin the detailed planning of capacity improvements. At the 80 percent level, the planned improvements should be made. Based on current and projected operations developed for this study, improvements specifically designed to enhance capacity should not be needed.

AIRSIDE REQUIREMENTS

Airside requirements include the need for those facilities related to the arrival and departure of aircraft. The adequacy of existing airside facilities at

Coolidge Municipal Airport has been analyzed from a number of perspectives, including:

- Runways
- Safety Area Design Standards
- Taxiways
- Airfield Lighting, Marking, and Signage
- Navigational Aids and Instrument Approach Procedures
- Weather Reporting Aids
- Air Traffic Control

RUNWAYS

Runway conditions such as orientation, length, pavement strength, and width at Coolidge Municipal Airport were analyzed. From this information, requirements for runway improvements were determined for the airport.

Runway Orientation

The airport is served by primary Runway 5-23, orientated in a northeast/southwest manner, while crosswind Runway 17-35 is orientated in a north/south manner. For the operational safety and efficiency of an airport, it is desirable for the primary runway to be orientated as close as possible to the direction of the prevailing wind. This reduces the impact of wind components perpendicular to the direction of travel of an aircraft that is landing or taking off (defined as a crosswind).

FAA Advisory Circular 150/5300-13, Change 14, *Airport Design*, recommends that a crosswind runway should be made available when the primary runway orientation provides for less than 95 percent wind coverage for specific crosswind conditions. The 95 percent wind coverage is computed on the basis of the crosswind component not exceeding 10.5 knots (12 mph) for ARC A-I and B-I; 13 knots (15 mph) for ARC A-II and B-II; 16 knots (18 mph) for ARC C-I through D-II; and 20 knots for ARC A-IV through D-VI.

Wind data necessary for this analysis specific to Coolidge Municipal Airport was not available. Therefore, data was obtained from an Arizona Meteorological Network (AZMET) site located approximately ten miles northwest of the airport, within the City of Coolidge. This data is graphically depicted on the wind rose on **Exhibit 3B**.

As depicted on the exhibit, primary Runway 5-23 provides 98.65 percent wind coverage for 10.5 knot crosswinds, 99.38 percent at 13 knots, 99.86 percent at 16 knots, and 99.97 percent at 20 knots. Crosswind Runway 17-35 provides 96.36 percent wind coverage at 10.5 knots, 97.96 percent at 13 knots, 99.42 percent at 16 knots, and 99.87 percent at 20 knots.

The combined runway system provides 99.50 percent wind coverage for 10.5-knot crosswinds, 99.88 percent wind coverage at 13 knots, 99.98 percent coverage at 16 knots, and 100.00 per-

cent coverage at 20 knots. As evidenced on the exhibit, the combination of Runways 5-23 and 17-35 provide greater than 95 percent wind coverage for the current and future critical design aircraft. Therefore, no additional runway orientations should be planned at the airport.

Runway Length

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

- Mean maximum temperature of the hottest month
- Airport elevation
- Runway gradient
- Critical aircraft type expected to use the airport
- Stage length of the longest nonstop destination (specific to larger aircraft)

The mean maximum daily temperature of the hottest month for Coolidge Municipal Airport is 105 degrees Fahrenheit (F). The airport elevation is 1,574 feet above mean sea level (MSL). The runway end elevation difference is 26 feet for Runway 5-23 and eight feet for Runway 17-35. Runway 5-23 has a longitudinal gradient of 0.5 percent, while Runway 17-35 has a 0.3 percent longitudinal gradient, both of which conform to FAA design standards. For aircraft in approach categories A and B, the runway longitudinal gradient cannot exceed two percent. For aircraft in approach categories C and D, the maximum allowable longitudinal runway gradient is 1.5 percent.

The first step in evaluating runway length requirements is to determine general runway length requirements for the majority of aircraft operating at the airport. The overwhelming majority of operations at Coolidge Municipal Airport consist of small aircraft weighing less than 12,500 pounds. According to runway length adjustment charts in AC 150/5325-4B, *Runway Length Requirements for Airport Design*, when adjusting for the elevation and temperature at Coolidge Municipal Airport, 100 percent of small aircraft can operate on a 4,500-foot long runway. At 5,562 feet, Runway 5-23 exceeds this length requirement. Crosswind Runway 17-35, at a length of 3,871 feet, falls short of meeting 100 percent of small aircraft; however, it can accommodate 95 percent of small airplanes. This includes all single engine and a large majority of smaller multi-engine aircraft in the national fleet. **Table 3C** outlines the runway length requirements for various classifications of aircraft that utilize Coolidge Municipal Airport.

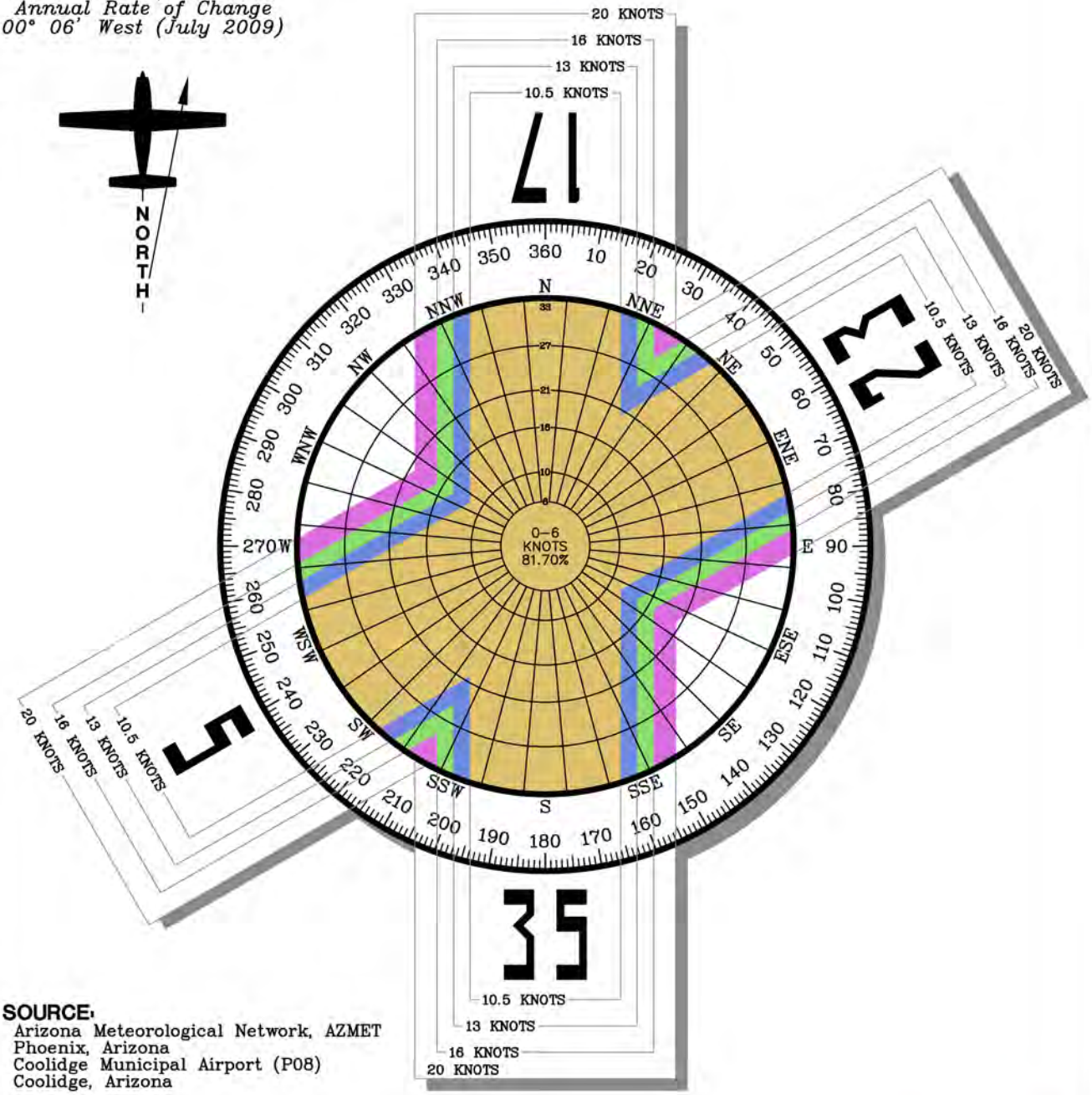
Based upon the forecast of aircraft fleet mix through the long range planning period, Coolidge Municipal Airport should be designed to accommodate current aircraft using the airport, including the Lockheed C-130, as well as a large majority of business jets for the future. Primary Runway 5-23's length of 5,562 feet satisfies the needs of the C-130 aircraft and the majority of business jet aircraft currently using the airport.

06MP12-3B-08/28/09

ALL WEATHER WIND COVERAGE

Runways	10.5 Knots	13 Knots	16 Knots	20 Knots
Runway 5-23	*98.65%*	*99.38%*	*99.86%*	*99.97%*
Runway 17-35	*96.36%*	*97.96%*	*99.42%*	*99.87%*
Combined	*99.50%*	*99.88%*	*99.98%*	*100.00%*

Magnetic Variance
10° 53' East (July 2009)
Annual Rate of Change
00° 06' West (July 2009)



SOURCE:
Arizona Meteorological Network, AZMET
Phoenix, Arizona
Coolidge Municipal Airport (P08)
Coolidge, Arizona

OBSERVATIONS:
193,253 All Weather Observations
01/1987-06/2009

COOLIDGE MUNICIPAL AIRPORT

Exhibit 3B
WINDROSE

TABLE 3C Runway Length Requirements Coolidge Municipal Airport	
Airport and Runway Data	
Airport elevation	1,574
Mean daily maximum temperature of the hottest month	105 degrees F
Maximum difference in runway centerline elevation	26 feet
Runway Length Recommended for Airport Design	
Small airplanes with less than 10 passenger seats	
95 percent of these small airplanes	3,800 feet
100 percent of these small airplanes	4,500 feet
Small airplanes with 10 or more passenger seats	4,800 feet
Large airplanes of 60,000 pounds or less	
75 percent of business jets at 60 percent useful load	5,500 feet
75 percent of business jets at 90 percent useful load	8,100 feet
100 percent of business jets at 60 percent useful load	7,000 feet
100 percent of business jets at 90 percent useful load	10,700 feet
Airplanes of more than 60,000 pounds	7,000 feet

Source: Chapters Two and Three of AC 150/5325-4B, *Runway Length Requirements for Airport Design*

The majority of business jets fall within ADG I and II and range between approach categories B through D. According to the analysis presented in **Table 3C**, 75 percent of large airplanes weighing less than 60,000 pounds with 60 percent useful load require 5,500 feet of runway length. To accommodate 100 percent of business jets at 60 percent useful load, the runway should be at least 7,000 feet long. Aircraft types that make up this category include the Cessna 650 and 750, Challenger 600, and several models of Lear jets, which fall into approach categories C and D. In addition, aircraft weighing more than 60,000 pounds, including the Gulfstream family of aircraft, also would require approximately 7,000 feet of runway length.

As previously discussed, International Air Response operates Douglas DC-8 jets in addition to the Lockheed C-130 aircraft. Company personnel have indicated a desire to ultimately operate DC-8 aircraft at Coolidge Municipal Airport. In order to accommodate this aircraft, a runway length of approximately 7,500 feet is needed.

While a longer runway could be desirable for some aircraft operators, it is not needed for the majority of aircraft operations at Coolidge Municipal Airport at the current time. Future operations are projected to include a larger share of business jets in approach categories C and D. These aircraft are typically larger and heavier, requiring longer runways, especially during hot days when jet engines are less effi-

cient. Given these considerations in addition to proposed aircraft operations related to International Air Response, analysis in the following chapter will examine the potential for extending Runway 5-23. It should be clearly understood, however, that any runway extension will require specific aircraft operational justification prior to FAA funding assistance.

As previously discussed, crosswind Runway 17-35 is currently 3,871 feet long. This length could limit some aircraft in ARC B-I and B-II on hot days, however, would likely accommodate most of these aircraft operations on typical days. The crosswind runway functions to primarily serve the needs of small aircraft, for times when crosswinds prohibit the use of the primary runway, and when the primary runway is closed for maintenance or emergencies. In this capacity, the existing length of Runway 17-35 should be adequate for the planning period and no extension options will be pursued as a part of this study.

Runway Width

Primary Runway 5-23 is currently 150 feet wide. FAA design criteria stipulate a runway width of 150 feet to meet standards for ADG IV aircraft. As such, the current width of primary Runway 5-23 should be maintained in the future.

Crosswind Runway 17-35 is currently 75 feet wide. FAA design standards call for a runway width of at least 75 feet to serve aircraft up to ARC B-II, as long as the instrument approach minimums are not lower than three-quarters of a mile. This existing width of the crosswind runway should be maintained throughout the planning period.

Runway Strength

The officially published pavement strength rating for Runway 5-23 is 80,000 pounds single wheel loading (SWL), 115,000 pounds dual wheel loading (DWL), and 210,000 pounds dual tandem wheel loading (DTWL). As previously mentioned, SWL refers to the aircraft weight based upon the landing gear configuration with a single wheel on each landing strut. DWL includes the design of aircraft landing gear with additional wheels on each landing gear strut which distributes more of the aircraft weight on the runway and taxiway surfaces; thus, the surface itself can support a greater total aircraft weight.

The strength rating of a runway does not preclude aircraft weighing more than the published strength rating from using the runway. All federally obligated airports must remain open to the public, and it is typically up to the pilot of the aircraft to determine if a runway can support their aircraft safely. An airport sponsor cannot restrict an aircraft from using the runway simply because its weight exceeds the published strength rating. On the other hand, the airport sponsor has an obligation to properly maintain the runway and protect the useful life of the runway, typically for 20 years.

According to the FAA publication, *Airport/Facility Directory*, "Runway strength-rating is not intended as a maximum allowable weight or as an operating limitation. Many airport pavements are capable of supporting limited operations with gross weights in excess of the published figures." The directory goes on to say that those aircraft exceeding the pavement strength should contact the airport sponsor for permission to operate at the airport.

The strength rating of a runway can change over time. Regular usage by heavier aircraft can decrease the strength rating, while periodic runway resurfacing can increase the strength rating. The current strength rating of Runway 5-23 should be adequate to serve the existing and ultimate mix of aircraft through the planning period.

Crosswind Runway 17-35 functions to primarily serve small aircraft and larger aircraft on an infrequent basis. It is currently strength-rated at 17,000 pounds SWL. It is recommended that the pavement strength be increased to at least 30,000 pounds SWL in the future to better accommodate the full range of small aircraft.

SAFETY AREA DESIGN STANDARDS

The FAA has established several safety surfaces to protect aircraft operational areas and keep them free from obstructions that could affect the safe operation of aircraft. These include the runway safety area (RSA), object free area (OFA), obstacle free zone (OFZ), and runway protection zone (RPZ). The dimensions of these safety areas are dependent upon the critical aircraft and, thus, the ARC of the runway. The current critical aircraft is in ARC C-IV, as previously determined. Ultimate planning should continue to conform to ARC C-IV design standards.

Runway Safety Area

The RSA is defined in FAA Advisory Circular 150/5300-13, Change 14, *Airport Design*, as a "surface surrounding the runway prepared or suitable for reducing the risk of damage to airplanes in the event of an undershoot, overshoot, or excursion from the runway." The RSA is centered on the runway, dimensioned in accordance to the approach speed of the critical 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.

The FAA has placed a higher significance on maintaining adequate RSAs at all airports due to recent aircraft accidents. Under Order 5200.8, effective October 1, 1999, the FAA established a *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. As previously mentioned, the current and ultimate critical aircraft for Runway 5-23 is ARC C-IV. For crosswind Runway 17-35, existing and ultimate design standards should conform to ARC B-II.

ARC C-IV standards for runways require RSAs to be 500 feet wide, extending 1,000 feet beyond the runway end. For ARC B-II runways with not lower than three-quarters of a mile visibility minimums, as is the case with Runway 17-35, the RSA is 150 feet wide, extending 300 feet beyond each runway end. As depicted on **Exhibit 3C**, no objects appear to obstruct the existing and ultimate RSA for both runways. Analysis in the next chapter will further examine the RSAs associated with each runway.

Object Free Area

The runway OFA 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 OFA is centered on the runway, extending out in accordance to the critical aircraft design category utilizing the runway.

FAA standards for ARC C-IV OFAs regarding runways call for the OFA to be 800 feet wide and extend 1,000 feet beyond each runway end, matching the length of the RSA, only wider. For Runway 17-35, the OFA is 500 feet wide extending 300 feet beyond the runway ends. This criterion meets ARC B-II design standards.

Exhibit 3C depicts the OFA requirements for each runway at Coolidge Municipal Airport. Runway 17-35 does not appear to have any obstructions within the existing and ultimate OFA. The majority of the OFA on Runway 5-23 conforms to ARC C-IV standards; however, it appears that the southwestern-most portion of the OFA is obstructed, as it extends beyond airport property into areas controlled by the Central Arizona Project Canal.

It should be noted that the aerial photography provides a good base for comparison; however, more detailed topographic information will be used in the following chapter to determine if the OFA is truly obstructed.

Obstacle Free Zone

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

The FAA's criterion for runways utilized by small airplanes (those weighing less than 12,500 pounds) with ap-

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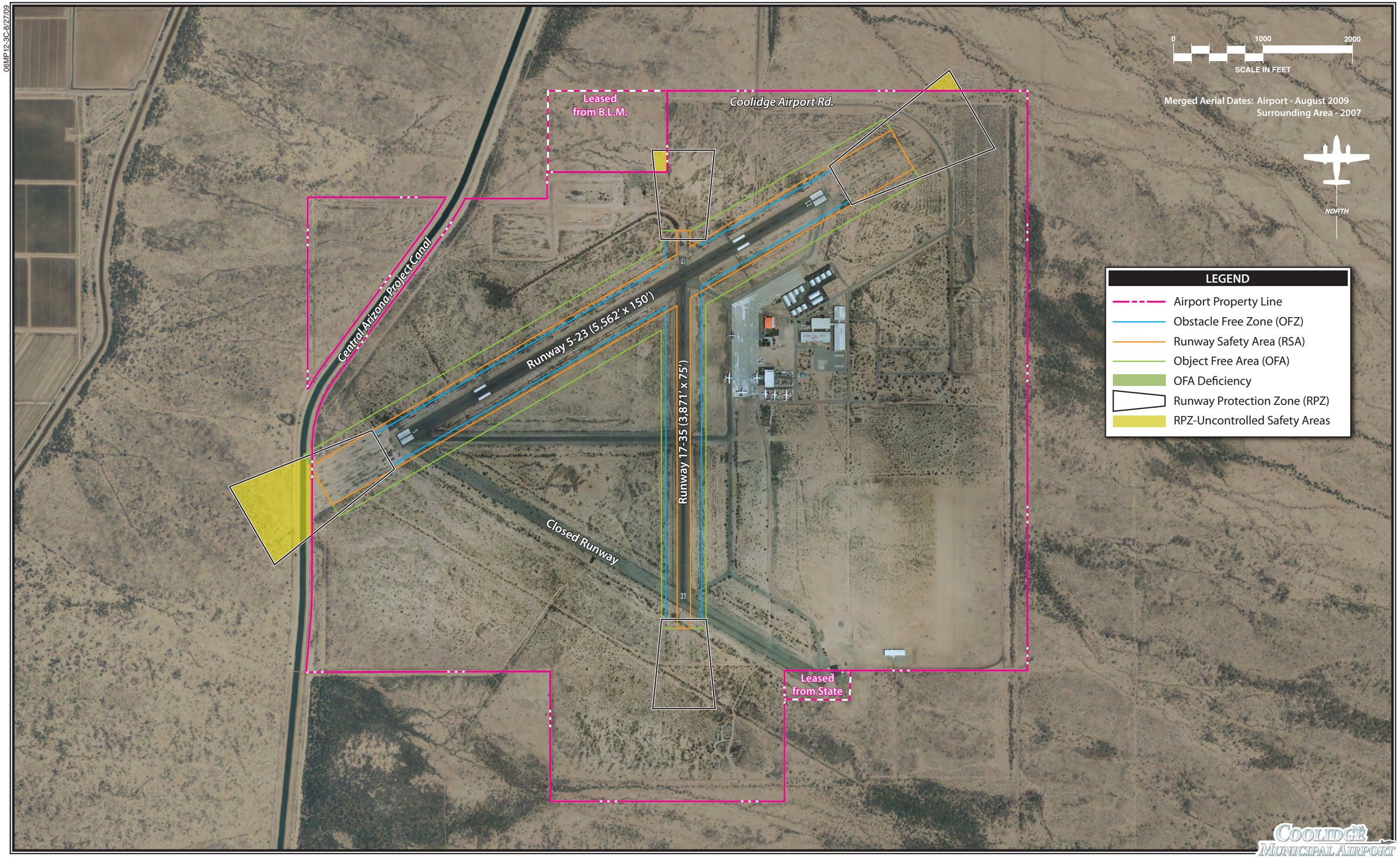


Exhibit 3C
EXISTING AND ULTIMATE SAFETY AREAS

proach speeds greater than 50 knots requires a clear OFZ to extend 200 feet beyond the runway ends, by 250 feet wide (125 feet on either side of the runway centerline). The OFZ width increases to 400 feet (200 feet on either side of the runway centerline) for runways serving aircraft over 12,500 pounds. Currently, both runways meet the 400-foot width to accommodate aircraft weighing more than 12,500 pounds.

Runway Protection Zone

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 approaching aircraft, as well as people and property on the ground. The dimensions of the RPZ vary according to the visibility requirements serving the runway and the type of aircraft operating on the runway.

The lowest existing visibility minimums for Coolidge Municipal Airport are one mile on Runway 5-23. The corresponding RPZ dimension calls for a 500-foot inner width, extending outward 1,700 feet to a 1,010-foot outer width on each runway end. For Runway 17-35, the existing and ultimate RPZs have an inner width of 500 feet, overall length of 1,000 feet, and an outer width of 700 feet. **Exhibit 3C** depicts the RPZs for both runways.

The majority of the existing RPZs for Runway 5-23 are fully contained on existing airport property. A portion of the northeast RPZ associated with Runway 23 extends beyond airport property over areas of vacant land, while a larger portion of the Runway 5 RPZ extends southwest outside airport property and over the Central Arizona Project Canal. If a lower than one mile visibility approach was implemented on either end of Runway 5-23 in the future, the corresponding RPZ would widen and encompass additional area outside existing airport property. The existing RPZs for both ends of Runway 17-35 are contained within current airport bounds, except for a small portion of the Runway 17 RPZ that extends over an area of vacant land that is currently leased by the airport.

Whenever possible, the airport should maintain positive control over the RPZ through fee simple acquisition; however, avigation easements (acquiring control of designated airspace rights within the RPZ) can be pursued if fee simple acquisition is not feasible. According to records, there are no avigation easements controlling areas of the existing RPZs that extend outside airport property. **Table 3D** presents existing and ultimate RPZ dimension data as well as other airfield requirements discussed in the previous sections.

TABLE 3D
Airfield Design Standards
Coolidge Municipal Airport

	Existing/Ultimate Runway 5-23	Existing/Ultimate Runway 17-35
Airport Reference Code (ARC)	C-IV	B-II
Approach Visibility Minimums	One mile	Visual / One mile
Runway Length (feet)	5,562	3,871
Runway Width (feet)	150	75
Runway Safety Area		
Width (feet)	500	150
Length Beyond Runway End (feet)	1,000	300
Object Free Area		
Width (feet)	800	500
Length Beyond Runway End (feet)	1,000	300
Obstacle Free Zone		
Width (feet)	400	400
Length Beyond Runway End (feet)	200	200
Runway Protection Zone	Both Ends	Both Ends
Inner Width (feet)	500	500
Outer Width (feet)	1,010	700
Length (feet)	1,700	1,000
Runway Centerline to:		
Holding Positions (feet)	250	125 / 200
Parallel Taxiway Centerline (feet)	400	240
Taxiways		
Width (feet)	40-50 / 75	40-50
Object Free Area Width (feet)	259	131
Centerline to Fixed or Moveable Object (feet)	129.5	65.5

Source: FAA AC 150/5300-13, Change 14, *Airport Design*

TAXIWAYS

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

As detailed in Chapter One, the taxiway system at Coolidge Municipal Airport consists of a partial-parallel taxiway and entrance/exit taxiways serving Runway 17-35, in addition to entrance/exit taxiways serving Runway 5-23. All existing taxiways range in width from 40 to 50 feet.

Consideration should be given to the addition of taxiways, as needed, to improve airfield circulation, efficiency, and safety. If Runway 5-23 were to be extended, additional taxiway pavement should be constructed and another exit taxiway added. In addition, further analysis will be given to extending the partial parallel taxiway

serving Runway 17-35 farther south in order to prevent aircraft from having to "back-taxi" on the crosswind runway in order to take-off on Runway 35.

Taxiway width is determined by the ADG of the most demanding aircraft to use the taxiway. As mentioned previously, the current critical aircraft for the airport falls within ADG IV. FAA criteria call for a width of 75 feet for taxiways serving aircraft within ADG IV. As previously discussed, all taxiways on the airfield currently range between 40 and 50 feet in width. Further study in the next chapter will analyze the possibilities of additional taxiways as well as those taxiways that would need to conform to ADG IV standards.

FAA AC 150/5300-13, Change 14, *Airport Design*, also discusses separation distances between aircraft and various areas on the airport. The separation distances are a function of the approaches approved for the airport and the runway's designated ARC. Under current and ultimate conditions for Runway 5-23 (ARC C-IV and approaches not lower than one mile), parallel taxiways would need to be at least 400 feet from the Runway 5-23 centerline. Aircraft parking areas are required to be at least 500 feet from the runway centerline. Taxiway 5 (as identified in Chapter One) is located 500 feet southeast of the runway centerline. The aircraft parking apron is located even farther southeast. These distances meet the appropriate FAA standards.

Crosswind Runway 17-35 is served by partial parallel Taxiway 1 (as identified in Chapter One). This taxiway is situated 525 feet east of the runway centerline and the aircraft parking apron is located farther east. As with Runway 5-23, these taxiway clearances meet the appropriate FAA standards for Runway 17-35.

AIRFIELD LIGHTING, MARKING, AND SIGNAGE

There are a number of lighting and pavement marking aids serving pilots using the airport. These aids assist pilots in locating the airport and runway at night or in poor visibility conditions. They also assist in the ground movement of aircraft.

Airport Identification Lighting

The location of the airport at night is universally indicated by a rotating beacon. For civil airports, a rotating beacon projects two beams of light, one white and one green, 180 degrees apart. The existing beacon is sufficient and should be maintained through the planning period.

Runway and Taxiway Lighting

Runway identification lighting provides the pilot with a rapid and positive identification of the runway and its alignment. Primary Runway 5-23 is equipped with medium intensity runway lighting (MIRL). The MIRL system will be adequate to serve the runway and should be maintained through the planning period. Crosswind Runway 17-35 is currently not equipped with runway lighting. Plan-

ning will consider providing MIRL on this runway.

Medium intensity taxiway lighting (MITL) is provided on Taxiways 3 and 5 (as identified in Chapter One). During the course of the planning period, MITL should be applied to all taxiways. This system is vital for safe and efficient ground movements of aircraft during nighttime and/or poor weather conditions.

Visual Approach Lighting

In most instances, the landing phase of any flight must be conducted in visual conditions. To provide pilots with visual guidance information during landings to the runway, electronic visual approach aids are commonly provided at airports. Currently, Runway 5-23 is served by a two-box precision approach path indicator (PAPI-2). In the future, consideration should be given to upgrading the two-box systems on Runway 5-23 to four-box systems. The four-box systems are better to serve faster aircraft because they are more visible.

Runway 17-35 is currently not served by any type of visual approach lighting system. Future planning will call for implementing a PAPI-2 on each runway end.

Runway End Identification Lighting

Runway end identification lights (REILs) are flashing lights located at each runway end that facilitate identification of the runway end at night and during poor visibility conditions. REILs provide pilots with the ability to identify the runway ends and distinguish the runway end lighting from other lighting on the airport and in the approach areas. The FAA indicates that REILs should be considered for all lighted runway ends not planned for a more sophisticated approach lighting system. REILs should also be planned for each end of Runway 5-23 in the short term planning period. In the event that MIRL is installed on Runway 17-35, REILs should also be planned for this runway.

Pilot-Controlled Lighting

Coolidge Municipal Airport is equipped with pilot-controlled lighting (PCL). With PCL, a pilot can control the intensity of airfield lights from their aircraft through a series of clicks with their radio transmitter. PCL also provides for more efficient use of energy. This system should be maintained through the planning period.

Airfield Signage

Airfield identification signs assist pilots in identifying their location on the airfield and directing them to their desired location. Signs located at intersections of taxiways provide crucial information to avoid conflicts between moving aircraft and potential runway incursions. Directional signage also instructs pilots as to the location of taxiways and apron areas. Currently, signage referring to runway and tax-

iway designations, holding positions, routing/directional, and runway exits is not available. Future planning should consider implementing these airfield signs to better accommodate aircraft movement on the airfield.

Consideration should be given to designating all taxiways in conformance with FAA AC 150/5340-18D, *Standards for Airport Sign Systems*. This AC specifies that taxiway designations should start from one side of the airport and move to the other. Stub taxiways, such as the connecting taxiways between the runway and parallel taxiway, should be designated alphanumerically. Under the recommendations of this AC, the taxiway identification for the existing taxiways at Coolidge Municipal Airport could be as follows:

Taxiways 1 and 5 – Taxiway A
Taxiway 2 – Taxiway A1
Taxiway 3 – Taxiway A2
Connecting taxiway (Runway 23 end – Taxiway A3
Taxiway 4 – Taxiway A1

Distance Remaining Signs

Distance remaining signage should be planned for Runway 5-23. These lighted signs are placed in 1,000-foot increments along the runway to notify pilots of the length of runway remaining.

Pavement Markings

Runway markings are designed according to the type of instrument approach available on the runway. FAA AC 150/5340-1F, *Marking of Paved Areas on Airports*, provides guidance necessary to design airport markings. Runway 5-23 is served by non-precision markings. Runway 17-35 currently has basic runway markings. In the future, non-precision markings should be planned for this runway.

The current hold positions associated with primary Runway 5-23 are marked 250 feet from the runway centerline. The current hold position markings for Runway 5-23 meet the FAA standard for ARC C-IV aircraft and should be maintained throughout the planning period. The hold position markings for Runway 17-35 are set at 125 feet and fall short of the FAA standard for ARC B-II which calls for 200 feet. Future planning will consider relocating the hold position markings associated with the crosswind runway.

Helicopter Parking

The airport does not have a designated helicopter parking area. Helicopters utilize the same areas as fixed-wing aircraft. Helicopter and fixed-wing aircraft should be segregated to the extent possible. Facility planning should include establishing a designated transient helicopter hardstand parking area.

NAVIGATIONAL AIDS AND INSTRUMENT APPROACH PROCEDURES

Airport and runway navigational aids are based on FAA recommendations, as defined in DOT/FAA Handbook 7031.2B, *Airway Planning Standard Number One*, and FAA AC 150/5300-2D, *Airport Design Standards, Site Requirements for Terminal Navigation Facilities*.

Navigational Aids

Navigational aids are electronic devices that transmit radio frequencies, which properly equipped aircraft and pilots translate into point-to-point guidance and position information. The very high frequency omnidirectional range (VOR), global positioning system (GPS), and LORAN-C are available for pilots to navigate to and from Coolidge Municipal Airport. These systems are sufficient for navigation to and from the airport; therefore, no other navigational aids are needed at the airport.

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 during low visibility and cloud ceilings. At Coolidge Municipal Airport, there are two published straight-in non-precision approaches with one mile visibility minimums. Only on rare occasions does the visibility drop below three miles and/or cloud ceilings fall below 1,000 feet above ground level (AGL) resulting in the need for an instrument approach.

A GPS modernization effort is underway by the FAA and focuses on augmenting the GPS signal to satisfy requirements for accuracy, coverage, availability, and integrity. For civil aviation use, this includes the continued development of the Wide Area Augmentation System (WAAS), which was initially launched in 2003. The WAAS uses a system of reference stations to correct signals from the GPS satellites for improved navigation and approach capabilities. Where the non-WAAS GPS signal provides for enroute navigation and limited instrument approach (lateral navigation) capabilities, WAAS provides for approaches with both course and vertical navigation. This capability was historically only provided by an ILS, which requires extensive on-airport facilities. After 2015, the WAAS upgrades are expected to allow for the development of approaches to most airports with cloud ceilings as low as 200 feet above the ground and visibilities restricted to one-half mile.

Nearly all new instrument approach procedures in the United States are being developed with GPS. GPS approaches are currently categorized as to whether they provide only lateral (course) guidance or a combination of lateral and vertical (descent) guidance. An approach procedure with vertical guidance (APV) GPS approach provides both course and descent guidance. A lateral navigation (LNAV) approach only provides course

guidance. In the future, as WAAS is upgraded, precision approaches similar in capability to an instrument landing system (ILS) approach will become available. These approaches are currently categorized as the Global Navigation Satellite System Landing System (GLS). A GLS approach may be able to provide for approaches with one-half mile visibility and 200-foot cloud ceilings.

Both course guidance and descent information is desirable for an instrument approach to each end of primary Runway 5-23 at Coolidge Municipal Airport. The GPS APV approach does not require the installation of costly navigation equipment at the airport and will provide the airport with adequate instrument approach capabilities. In addition, an approach procedure providing for at least course guidance should be considered serving each end of crosswind Runway 17-35.

WEATHER REPORTING AIDS

Coolidge Municipal Airport has a wind cone and segmented circle as well as three supplemental wind cones. The wind cones provide information to pilots regarding wind conditions, such as direction and speed. The segmented circle consists of a system of visual indicators designed to provide traffic pattern information to pilots. A wind cone and segmented circle are required since the airport is not served by an airport traffic control tower (ATCT). These should be maintained throughout the planning period.

Two types of automated weather observing systems are currently deployed at airports across the country. Automated Surface Observation Systems (ASOS) and Automated Weather Observation Systems (AWOS) both measure and process surface weather observations 24 hours per day, with reporting varying from one minute to hourly. These systems provide near real-time measurements of atmospheric conditions.

ASOS systems are typically commissioned by the National Weather Service, while AWOS systems are often commissioned by the FAA. Future consideration should be given to the installation of an AWOS at Coolidge Municipal Airport in order to provide current weather conditions at the airport.

AIR TRAFFIC CONTROL

As previously mentioned, Coolidge Municipal Airport is not served by an ATCT. Forecast operational levels are not expected to approach the level necessary to justify federal funding for the construction and/or operation of an ATCT. Generally, airports must experience more than 100,000 operations to be considered for an ATCT facility. Most airports do not qualify for a federally funded ATCT until operations exceed 150,000. As such, the development of an ATCT will not be considered as a part of this study.

LANDSIDE FACILITIES

Landside facilities are those necessary for handling general aviation aircraft and passengers while on the ground. This section is devoted to identifying future landside facility needs during the planning period for the following types of facilities normally associated with general aviation service areas:

- Aircraft Storage Hangars
- Aircraft Parking Apron
- General Aviation Services
- Support Requirements

AIRCRAFT STORAGE HANGARS

The demand for hangar facilities typically depends on the number and type of aircraft expected to be based at the airport. Hangar facilities are generally classified as T-hangars and conventional hangars. T-hangars are typically nested single aircraft storage units which provide a more economical aircraft storage solution for aircraft owners. Conventional hangars can include standard individual box hangars or multi-aircraft hangars. These different types of hangars offer varying levels of privacy, security, and protection from the elements. While multi-aircraft storage hangars make up all aircraft storage units at Coolidge Municipal Airport presently, future hangar development may be a mixture of conventional hangars or T-hangars depending on demand.

Demand for hangars varies with the number of aircraft based at the airport. Another important factor is the type of based aircraft. Smaller single-engine aircraft usually prefer T-hangars, while larger, more expensive and sophisticated aircraft will prefer conventional hangars. The weather also plays a role in the demand for hangar facilities. The hot summers that are experienced in the Coolidge area create a high demand for enclosed or shaded parking spaces. Rental costs will also be a factor in the choice.

Coolidge Aviation owns 17 storage hangars that provide a total of 61,200 square feet of aircraft storage space and the company leases a single 12,000 square-foot conventional hangar. The hangars are currently fully occupied with anywhere from one to four aircraft being stored in a single unit. Taking into account each aircraft currently stored in the hangars results in 23 aircraft storage positions. A 2,000 square-foot portion of the 12,000 square-foot conventional hangar is used as office space resulting in 10,000 square feet of aircraft storage space. There are three aircraft stored in the conventional hangar currently. Coolidge Aviation has indicated that there is an aircraft hangar waiting list for storage space at the airport.

An analysis of future aircraft storage hangar requirements examined the number of storage units and the size of storage units typical for the future aircraft fleet mix of Coolidge Municipal Airport. The planning standards for future stored aircraft include 1,200 square feet per single engine aircraft, 2,500 square feet per multi-engine and

turbine aircraft, and 1,500 square feet per rotorcraft. The future aircraft storage hangar requirements analysis is summarized on **Table 3E**.

TABLE 3E
Hangar Storage Requirements
Coolidge Municipal Airport

	Available	Current Need	Short Term	Intermediate Term	Long Term
BASED AIRCRAFT					
Piston (Single & Multi-Engine	24		33	43	61
Turbine (Turboprop & Jet)	12		14	18	24
Rotor	1		2	3	4
Other	1		1	1	1
Total	38		50	65	90
AIRCRAFT TO BE HANGARED					
Piston		22	28	37	52
Turbine		8	9	13	19
Rotor		1	2	3	4
Other		1	1	1	1
Total		32	40	54	76
HANGAR POSITIONS					
Total Hangar Positions		32	40	54	76
HANGAR AREA REQUIREMENTS (s.f.)					
Total Hangar Area	71,200	40,400	60,300	82,600	117,100
Maintenance Area	18,000	5,425	8,750	11,375	15,750

The analysis shows that existing hangar storage space of 71,200 square feet exceeds the short term demand; however, this is the result of either underutilized storage space due to single aircraft stored in hangars that could potentially be used for the storage of multiple aircraft or hangar space being used for the storage of materials other than aircraft.

The airport has a single business that conducts aircraft maintenance for its own aircraft. International Air Response occupies an 18,000 square-foot hangar, which it uses for the regular maintenance of its Lockheed C-130 aircraft and other services. The airport does not currently have an operator that provides general aviation maintenance services. Requirements for maintenance area were estimated at 175 square feet per based aircraft resulting in a long term need for 15,750 square feet of general aviation maintenance service hangar area. Due to the available 18,000 square feet of maintenance area being dedicated to activities related to International Air Response, additional hangar area could be required to satisfy the needs of other general aviation aircraft maintenance.

AIRCRAFT PARKING APRON

A parking apron should be provided for at least the number of locally based aircraft that are not stored in hangars, as well as be capable of accommodating transient aircraft during the busy day of the peak month. The 50,000

square-yard apron at Coolidge Municipal Airport does not have marked aircraft tiedowns but has tiedown ropes for up to five aircraft.

TABLE 3F
General Aviation Apron Requirements
Coolidge Municipal Airport

	Available	Current Need	Short Term	Intermediate Term	Long Term
Based Aircraft in Tiedowns		5	6	7	11
Busy Day Itinerant Operations		32	38	45	63
Local Apron Positions	--	6	10	11	14
International Air Response Apron Positions	--	4	4	4	5
Transient Apron Positions	--	5	7	8	11
Total Apron Positions	5	10	21	23	30
Apron Area (s.y.)	50,000	12,400	13,300	14,500	17,400

FAA Advisory Circular 150/5300-13, *Airport Design*, suggests a methodology by which transient apron requirements can be determined from knowledge of busy-day itinerant operations. At Coolidge Municipal Airport, the number of transient spaces required was determined to be approximately 17.5 percent of busy-day itinerant operations. International Air Response operates and bases four Lockheed C-130 aircraft that are presently stored on the apron. The company has indicated its plan to expand its based aircraft fleet in the future by another aircraft. The apron requirements analysis projects an estimated 1,350 square yards of apron space per International Air Response based aircraft through the planning period. A planning criterion of 360 square yards per small local aircraft parking space and 500 square yards per transient parking space was used to determine future apron requirements. The number of local and itinerant tiedowns and apron space for the planning period is presented in **Table 3F**.

While this analysis indicates that Coolidge Municipal Airport has adequate apron area, additional marked apron positions will be needed in the long term planning horizon.

GENERAL AVIATION SERVICES

General aviation service facilities are often the first impression of the community that air travelers or tourists will encounter. General aviation service facilities at an airport provide space for passenger waiting, a pilots' lounge and flight planning, concessions, management, storage, and various other needs. At Coolidge Municipal Airport, much of these services are accommodated by Coolidge Aviation in its 2,000 square-foot facility located adjacent to the World War II conventional hangar.

The methodology used in estimating terminal facility needs was based upon the number of airport users expected to utilize the terminal facilities

during the design hour, as well as FAA guidelines. Space requirements for terminal facilities were based on providing 90 square feet per design hour itinerant passenger. **Table 3G** outlines the space requirements for terminal services at Coolidge Municipal Airport through the long term planning horizon.

TABLE 3G
General Aviation Terminal Area Facilities
Coolidge Municipal Airport

	Available	Current Need	Short Term	Intermediate Term	Long Term
General Aviation Services Building Area (s.f.)	2,000	650	700	850	1,200
Design Hour Itinerant Passengers	--	6	7	9	13
Auto Parking Spaces	+10	19	23	29	42

Automobile parking at Coolidge Municipal Airport is made up of a large gravel parking lot adjacent to the Coolidge Aviation and Complete Parachute Solutions facilities. A paved parking lot containing ten marked automobile parking spaces is provided adjacent to the International Air Response facilities. Vehicle parking requirements were examined based on an evaluation of existing airport use, as well as industry standards. Vehicle parking spaces were calculated at 25 percent of based aircraft, plus the product of design hour itinerant passengers and the industry standard of 1.8. Automobile parking requirements are summarized in **Table 3G**.

SUPPORT REQUIREMENTS

Various facilities that do not logically fall within classifications of airfield or general aviation facilities have been identified for inclusion in this Master Plan. Facility requirements have been identified for these remaining facilities:

- Airport Access
- Interior Access
- Aviation Fuel Storage
- Aircraft Wash Facility
- Parachute Landing Area
- Perimeter Fencing
- Aircraft Rescue and Firefighting
- Airport Maintenance Building
- Utilities
- Revenue Support Facilities
- Security

Airport Access

In airport facility planning, both on- and off-airport vehicle access is important. For the convenience of the user (and to provide maximum capacity), access to the airport should include (to the extent practical) connections to the major arterial roadways near the airport.

Access to Coolidge Municipal Airport is available via Coolidge Airport Road, a two-lane roadway extending north from the airport. This roadway pro-

vides access from downtown Coolidge and the neighboring Town of Florence.

The capacity of a roadway is the maximum number of vehicles that can pass over a given section of roadway during a given time period. It is normally preferred that a roadway operate below capacity to provide reasonable flow and minimize delay to the vehicles using it.

As with the airfield, the means of describing the operational efficiency of a given roadway segment is defined in terms of six descriptive service levels. These various levels of service (LOS) range from A to F and are defined as follows:

- **LOS A** – Free flowing traffic with minimal delays.
- **LOS B** - A stable flow of traffic, with occasional delays due to the noticeable presence of others in the traffic stream.
- **LOS C** – Still stable flow, but operations become more significantly affected by the traffic stream. Periodic delays are experienced.
- **LOS D** – Flow becomes more high density, and speed and freedom to maneuver become severely restricted. Regular delays are experienced.
- **LOS E** – Maximum capacity operating conditions. Delays are extended and speeds are reduced to a low, relatively uniform level.
- **LOS F** – Forced flow with excessive delays. A condition where more traffic is approaching a point than can traverse the point.

Level of Service "D" is generally considered as the threshold of acceptable traffic conditions during peak periods in an urban area, and is commonly used by Pinal County in transportation planning.

According to information included in the *Coolidge-Florence Regional Transportation Plan*, Coolidge Airport Road will not exceed LOS A through 2025. The long-range recommended development plan for Coolidge Airport Road includes extending it to the south and widening it from two to six lanes to accommodate anticipated traffic increases.

Interior Access

Occasionally, private vehicles use the apron and taxilanes for movement as there is no dedicated interior access road. The segregation of vehicle and aircraft operational areas is supported by FAA guidance established in June 2002. FAA AC 50/5210-20, *Ground Vehicle Operations on Airports*, states, "The control of vehicular activity on the airside of an airport is of the highest importance." The AC further states, "An airport operator should limit vehicle operations on the movement areas of the airport to only those vehicles necessary to support the operational activity of the airport."

Service roads are typically used to segregate vehicles from the aircraft operational areas. The alternatives analysis will examine options for interior access roads to serve hangar facil-

ities as well as a service road extending around the runway and airport perimeter for airport maintenance vehicles.

Aviation Fuel Storage

The City of Coolidge leases two fuel storage facilities to Coolidge Aviation. These storage facilities consist of a 10,000-gallon 100LL Avgas storage tank and a 10,000-gallon Jet A fuel storage tank.

Fuel storage requirements are typically based upon keeping a two-week supply of fuel during an average month; however, more frequent deliveries can reduce the fuel storage capacity requirement. Based on historical fuel sales from Coolidge Municipal Airport and similar general aviation airports, an average of 2.6 gallons per piston operation was used to project Avgas fuel storage requirements.

Turbine aircraft operations at Coolidge Municipal Airport have been comprised of turboprop fixed wing aircraft, such as the Lockheed C-130 and jet aircraft that utilize the airport. As the Phoenix metropolitan area continues to develop towards the City of Coolidge and surrounding areas, and with the shift in the active general aviation aircraft fleet mix towards a greater increase of turbine aircraft, additional activity from turbine aircraft can be expected.

Projections of future Jet A fuel storage requirements were based upon a ratio of 160 gallons per turbine operation. Turbine operations were estimated at 5.4 percent of annual operations currently, increasing to approximately 5.8 percent of the annual operations in the long term planning horizon.

100LL Avgas and Jet A fuel storage requirements are summarized in **Table 3H**. Available fuel storage meets the current demand at Coolidge Municipal Airport, but will need to be expanded over the planning horizon.

TABLE 3H
Fuel Storage Requirements
Coolidge Municipal Airport

	Available	Current Need	Short Term	Intermediate Term	Long Term
Two-Week Fuel Storage Requirements					
100LL Avgas (gal)	10,000	2,900	3,400	4,000	5,200
Jet A (gal)	10,000	10,000	12,200	14,800	19,600

Aircraft Wash Facility

Presently, there is not a designated aircraft wash facility on the airport. Consideration should be given to establishing an aircraft wash facility at the airport to collect aircraft cleaning fluids used during the cleaning process.

Parachute Landing Area

An active parachute landing area is currently located on the airport and used in relation to operations conducted by Complete Parachute Solutions and International Air Response. The airport recently improved areas adjacent to the existing landing area that included burying electric power lines. In an effort to better segregate parachuting activities from aircraft operating on the runway and taxiway system, future analysis will consider relocating the parachute landing area farther south and east. This area would be closer to facilities operated by Complete Parachute Solutions.

Perimeter Fencing

Perimeter fencing is used at airports to primarily secure the aircraft operations area. The physical barrier of perimeter fencing provides the following functions:

- Gives notice of the legal boundary of the outermost limits of a facility or security-sensitive area.
- Assists in controlling and screening authorized entries into a secured area by deterring entry elsewhere along the boundary.
- Supports surveillance, detection, assessment, and other security functions by providing a zone for installing intrusion-detection equipment and closed-circuit television (CCTV). It should be noted that these security systems and equipment are not eligible for FAA funding.
- Deters casual intruders from penetrating a secured area by presenting a barrier that requires an overt action to enter.
- Demonstrates the intent of an intruder by their overt action of gaining entry.
- Causes a delay to obtain access to a facility, thereby increasing the possibility of detection.
- Creates a psychological deterrent.
- Optimizes the use of security personnel, while enhancing the capabilities for detection and apprehension of unauthorized individuals.
- Demonstrates a corporate concern for facility security.
- Provides a cost-effective method of protecting facilities.
- Limits inadvertent access to the aircraft operations area by wildlife.

Portions of the airport perimeter are equipped with barbed-wire fencing. Six-foot perimeter security fencing with three-strand barbed-wire should be considered around the airport's perimeter in the future. Access gates throughout the perimeter and in the apron area should be provided to allow access to emergency service and maintenance personnel. Consideration should be given to installing perimeter fencing around the airport in order to

provide better security and to help prevent runway incursions. Furthermore, airport perimeter fencing is eligible for FAA funding.

Aircraft Rescue And Firefighting

Coolidge Municipal Airport is not currently served by a dedicated aircraft rescue and firefighting facility (ARFF). The airport is provided with rescue and fire assistance from the City of Coolidge, which is located approximately nine miles northwest of the airport. Federal regulations do not require ARFF services to be located on the airport. ARFF services are required only at FAA-certified airports providing scheduled passenger service with greater than nine passenger seats. Unless federal regulations change, there will not be a regulatory requirement for ARFF facilities on the airport. Emergency services will continue to be met with off-airport vehicles. Therefore, no additional requirements for ARFF services are needed at Coolidge Municipal Airport.

Airport Maintenance Building

Presently, there is not a dedicated airport maintenance facility at the airport. Consideration should be given to developing a maintenance facility for the storage of maintenance equipment and to provide work areas for maintenance personnel.

Utilities

Electrical, water, sanitary sewer, telephone, and internet services are available at the airport. Information collected during the inventory revealed deficiencies in water supply and pressure at the airport. Further analysis will be considered to provide improved utility services to the airport. Utility extensions to new hangar areas will be needed through the planning period.

Revenue Support Facilities

Revenue support facilities refer to areas of non-aviation uses on airport property. Non-aviation uses assist in expanding and diversifying the income stream at Coolidge Municipal Airport. Existing non-aviation land uses at the airport include approximately 8.8 acres of land immediately east of the FBO facilities that are utilized for industrial and manufacturing purposes.

FAA policy requires that all airport property be used for aeronautical activities prior to being used for non-aviation uses. The FAA must release any land that would be used for non-aviation uses. Areas for non-aviation uses will be considered during the alternatives analysis and development of the recommended Master Plan concept. A full understanding of the area to be reserved for aeronautical activities must be considered before defining areas that may be available for non-aviation development. Further analysis of aviation and non-aviation land uses will be examined in the next chapter.

Security

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 over 12,500 pounds warrant greater security.

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 3J 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.

Table 3J also ranks Coolidge Municipal Airport according to this scale. As shown in the table, the Coolidge Municipal Airport ranking on this scale is 15. Points are assessed for the airport having more than 26 based aircraft, having based aircraft over 12,500 pounds, having a runway greater than 5,001 feet in length, having a paved runway surface, and for conducting maintenance and repair on large aircraft.

As shown in **Table 3K**, a rating of 15 points places Coolidge Municipal Airport in the second tier ranking of security measures by the TSA. This rating clearly illustrates that emerging security needs are recommended at Coolidge Municipal Airport as the activity at the airport grows. The Coolidge

Municipal Airport ranking could easily extend into the third tier with the addition of aircraft flight training, rental, charter, or aerial application services. Several of these activities could be expected to occur during the planning period of this study.

TABLE 3J
Airport Characteristics Measurement Tool

Security Characteristics	Assessment Scale: Public Use Airport	Assessment Scale: Coolidge Airport
Location		
Within 20 nm of mass population areas[1]	5	0
Within 30 nm 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	3
Runways		
Runway length greater than 5,001 feet	5	5
Runway length less than 5,000 feet, greater than 2,001 feet	4	0
Runway length 2,000 feet or less	2	0
Asphalt or concrete runway	1	1
Operations		
Over 50,000 annual operations	4	0
Part 135 operations	3	0
Part 137 operations	3	0
Part 125 operations	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	4
Totals		**15**

Source: *Security Guidelines for General Aviation Airports*
[1] An area with a total population over 100,000
[2] Sensitive sites include military installations, nuclear and chemical plants, centers of government, national monuments, and/or international ports

Based upon the results of the security assessment, the TSA recommends 13 potential security enhancements for Coolidge Municipal Airport should the airport ultimately fall within the third tier. These enhancements are shown in **Table 3K**.

A review of each recommended security procedure is below.

Access Controls: To delineate and adequately protect security areas from unauthorized access, it is important to consider boundary measures such as

fencing, walls, or other physical barriers, electronic boundaries (e.g., sensor lines, alarms), and/or natural barriers. Physical barriers can be used to deter and delay the access of unauthorized persons onto sensitive areas of airports. Such structures are usually permanent and are designed to be a visual and psychological deterrent as well as a physical barrier.

Lighting System: Protective lighting provides a means of continuing a degree of protection from theft, vandalism, or other illegal activity at night. Security lighting systems should be connected to an emergency power source, if available.

TABLE 3K
Recommended Security Enhancements Based on Airport Characteristics Assessment Results

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

Source: *Security Guidelines for General Aviation Airports*

Personal ID System: This refers to a method of identifying airport employees or authorized tenant access to various areas of the airport through badges or biometric controls.

Vehicle ID System: This refers to an identification system which can assist airport personnel and law enforcement in identifying authorized vehicles. Vehicles can be identified through use of decals, stickers, or hang tags.

Challenge Procedures: This involves an airport watch program which is implemented in cooperation with airport users and tenants to be on guard for unauthorized and potentially illegal activities at Coolidge Municipal Airport.

Law Enforcement Support: This involves establishing and maintaining a liaison with appropriate law enforcement agencies at the local, state, and federal levels. These organizations can better serve the airport when they are familiar with airport operating procedures, facilities, and normal activities. Procedures may be developed to have local law enforcement personnel regularly or randomly patrol ramps and aircraft hangar areas, with increased patrols during periods of heightened security.

Security Committee: This committee should be composed of airport tenants and users drawn from all segments of the airport community. The main goal of this group is to involve airport stakeholders in developing effective and reasonable security measures and disseminating timely security information.

Transient Pilot Sign-in/Sign-Out Procedures: This involves establishing procedures to identify non-based pilots and aircraft using their facilities, and implementing sign-in/sign-out procedures for all transient operators and associating them with their parked aircraft. Having assigned spots for transient parking areas can help to easily identify transient aircraft on an apron.

Signs: The use of signs provides a deterrent by warning of facility boundaries as well as notifying of the consequences for violation.

Documented Security Procedures: This refers to having a written security plan. This plan would include documenting the security initiatives already in place at Coolidge Municipal Airport, as well as any new enhancements. This document could consist of, but not be limited to, airport and local law enforcement contact information, including alternates when available, and 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 on board 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 terrorist 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; 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.

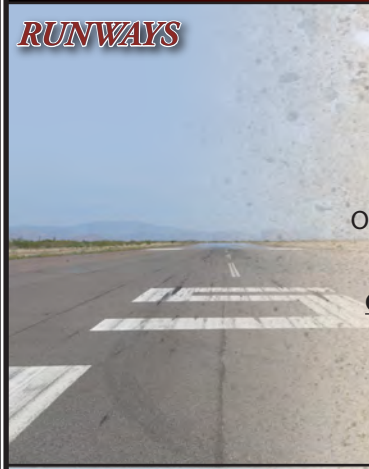
Contact List: This involves the development of a comprehensive list of responsible personnel/agencies to be contacted in the event of an emergency procedure. The list should be distributed to all appropriate individuals. Additionally, in the event of a security incident, it is essential that first responders 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.

SUMMARY

The intent of this chapter has been to outline the facilities required to meet potential aviation demands projected for Coolidge Municipal Airport through the planning horizon. A summary of the airside and landside requirements is presented on **Exhibits 3D** and **3E**.

Following the facility requirements determination, the next step is to determine a direction of development which best meets these projected needs through a series of airport development alternatives. The remainder of the Master Plan will be devoted to outlining this direction, its schedule, and its cost.

06MP12-3D-8/28/09

	AVAILABLE	SHORT TERM NEED	LONG TERM NEED
RUNWAYS 	**Primary Runway 5-23** ARC C-IV 5,562' x 150', Asphalt 80,000 lbs. SWL 115,000 lbs. DWL 210,000 lbs. DTWL One-mile Visibility Approach (both ends) **Crosswind Runway 17-35** ARC B-II 3,871' x 75', Asphalt 17,000 lbs. SWL Visual Approach	**Primary Runway 5-23** Improve GPS Approaches Improve OFA **Crosswind Runway 17-35** 30,000 lbs. SWL One-Mile Visibility Approach (both ends)	**Primary Runway 5-23** Consider Runway Extension to at Least 7,000' **Crosswind Runway 17-35** Same
TAXIWAYS	**Primary Runway 5-23** Three Exit Taxiways 500' Separation 40'-50' Wide **Crosswind Runway 17-35** Partial Parallel Taxiway Two Exit Taxiways 525' Separation 40'-50' Wide	**Primary Runway 5-23** Four Exit Taxiways 75' Wide Designate Taxiway Identifiers **Crosswind Runway 17-35** Full-length Parallel Taxiway Three Exit Taxiways	**Primary Runway 5-23** Consider West Side Parallel Taxiway **Crosswind Runway 17-35** Same
NAVIGATIONAL AIDS	**Primary Runway 5-23** VOR/DME (5) GPS (23) LORAN-C **Crosswind Runway 17-35** LORAN-C	**Primary Runway 5-23** GPS APV Approach with One-Mile Visibility (both ends) **Crosswind Runway 17-35** GPS LNAV Approach with One Mile Visibility (both ends)	**Primary Runway 5-23** Same **Crosswind Runway 17-35** Same
LIGHTING, MARKING, AND WEATHER	Rotating Beacon Four Wind Cones Segmented Circle Limited MITL PCL **Primary Runway 5-23** Non-precision Markings MIRL, PAPI-2 (both ends) Hold Positions - 250' **Crosswind Runway 17-35** Basic Markings Hold Positions - 125'	Install AWOS Add MITL on all Taxiways **Primary Runway 5-23** Add REILs (both ends) **Crosswind Runway 17-35** Non-precision Markings Add MIRL Hold Positions - 200'	Add Distance Remaining Signs **Primary Runway 5-23** Upgrade to PAPI-4 (both ends) **Crosswind Runway 17-35** Add PAPI-2 (both ends) Add REIL (both ends)

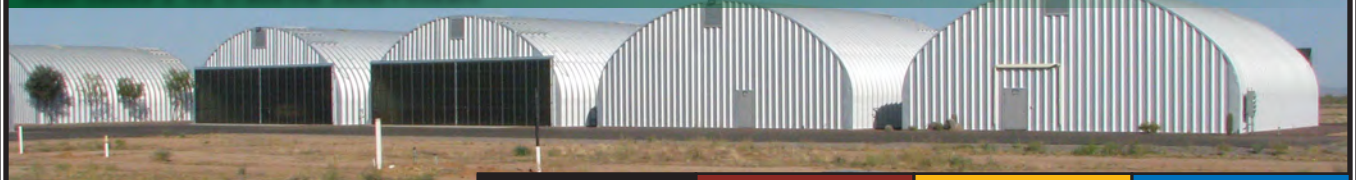
APV: approach procedure with vertical guidance
ARC: airport reference code
AWOS: automated weather observation station
DWL: aircraft with dual-wheel type landing gear
DTWL: aircraft with dual-tandem type landing gear
GPS: global positioning system
LNAV: lateral navigation
MIRL: medium intensity runway lighting
MITL: medium intensity taxiway lighting
OFA: object free area
PAPI: precision approach path indicator
PCL: pilot-controlled lighting
REIL: runway end identifier lighting
SWL: aircraft with single-wheel tandem type landing gear
VOR/DME: very high frequency omni-directional range with distance measuring equipment

COOLIDGE MUNICIPAL AIRPORT

Exhibit 3D
AIRSIDE FACILITY REQUIREMENTS

06MP12-3E-8/26/09

AIRCRAFT STORAGE HANGARS

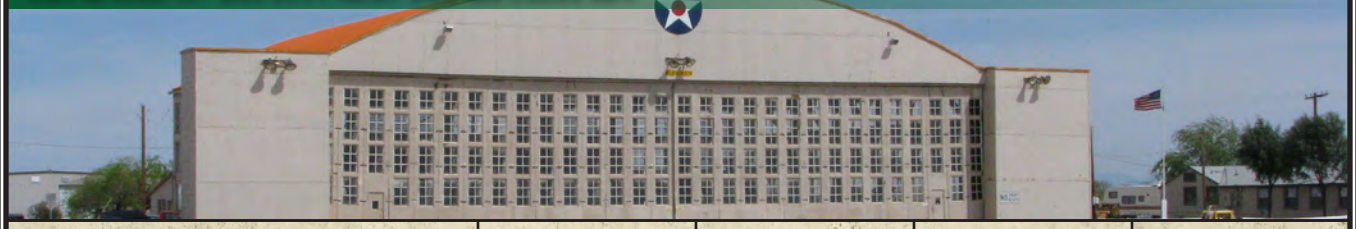


	Available	Short Term	Intermediate Term	Long Term
Total Hangar Positions	32	40	54	76
Total Hangar Storage Area (s.f.)	71,200	60,300	82,600	117,100
Maintenance Area (s.f.)	18,000	8,750	11,375	15,750

AIRCRAFT PARKING APRON

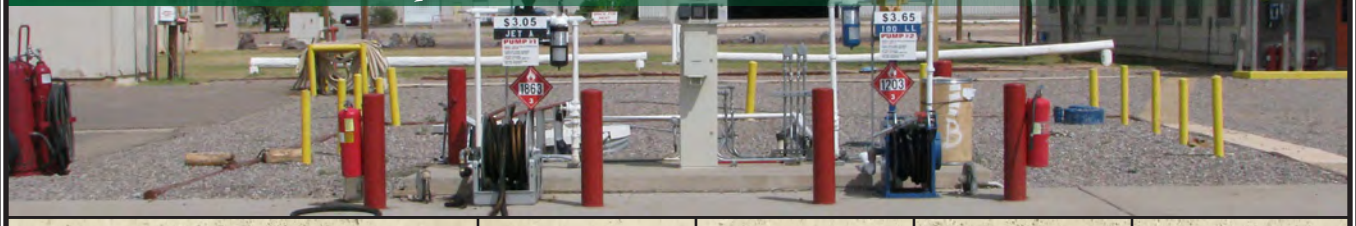
Transient Ramp Positions		7	8	11
Local Ramp Positions		14	15	19
Total Ramp Positions	***5***	***21***	***23***	***30***
Apron Area (s.y.)	50,000	13,300	14,500	17,400

GENERAL AVIATION SERVICE FACILITIES



General Aviation Services Area (s.f.)	2,000	700	850	1,200
Automobile Parking Spaces	NA	23	29	42

FUEL STORAGE (two-week requirements)



100LL Avgas (gal.)	10,000	3,400	4,000	5,200
Jet A (gal.)	10,000	12,200	14,800	19,600

OTHER FACILITIES

	None	Wash Rack, Helicopter Hardstand	Wash Rack, Helicopter Hardstand	Wash Rack, Helicopter Hardstand

COOLIDGE MUNICIPAL AIRPORT

Exhibit 3E
LANDSIDE FACILITY REQUIREMENTS

Chapter Four

AIRPORT ALTERNATIVES