Chapter Three
Facility Requirements

Colorado City Municipal Airport
Airport Master Plan

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Facility Requirements

INTRODUCTION

One of the primary objectives of this planning study is to determine the size and configuration of airport facilities needed to accommodate the types and volume of aircraft expected to utilize the airport. Data from Chapter 1 and forecasts from Chapter 2 are coupled with established planning criteria to determine what improvements are necessary to airside and landside areas. Then, having established the facility requirements, alternatives for providing these facilities are provided in Chapter 4 to determine the viability of meeting the facility needs.

The time frame for addressing development needs usually involves short-term (0-5 years), medium-term (6-10 years) and long-term (11-20 year) periods. Long range planning primarily focuses on the ultimate role of the airport and is related to development. Medium-term planning focuses on a more detailed assessment of needs, while the short-term analysis focuses on immediate action items and may include details not geared towards long-term development.

AIRPORT REFERENCE CODE

The Airport Reference Code (ARC) is a system established by the FAA that is used to relate airport design criteria to the operational and physical characteristics of the aircraft currently operating and/or intended to operate at the airport. The ARC has two components relating to the airport design aircraft. The first component, depicted by a letter, is the Aircraft Approach Category and relates to aircraft approach speed (operational characteristics). The second component, depicted by a Roman numeral, is the Aircraft Design Group and relates to aircraft wingspan and tail height (physical characteristic). Generally, aircraft approach speed applies to runway dimensional criteria and safety zones prior to and beyond the end of the runway. Aircraft wingspan is primarily associated with separation criteria involving taxiways and taxilanes. Table 3-1 has been included to provide a definition of both Aircraft Approach Categories and Aircraft Design Groups. Figure 3-1 shows examples of aircraft and their Airport Reference Codes.

TABLE 3-1 AIRPORT REFERENCE CODE

Approach Category	Approach Speed (knots)
Category A	less than 91
Category B	91 to 120
Category C	121 to 140
Category D	141 to 165
Category E	166 or more

Design Group	Wingspan (ft)	Tail Height (ft)
Group I	less than 49	Less than 20
Group II	49 to 78	20 to 29
Group III	79 to 117	30 to 44
Group IV	118 to 170	45 to 59
Group V	171 to 213	60 to 65
Group VI	214 to 261	66 to 79

AI

Primarily Single-Engine Propeller Aircraft, some light twins

Example Type: Cessna 172 Skyhawk

BI

Primarily Light Twin-Engine Propeller Aircraft

Example Type: Piper Navajo

BII

(<12,500 lbs)
Primarily Light Turboprops

Example Type: Beechcraft King Air

BII

(>12,500 lbs)
Mid-sized corporate jets and commuter airliners

Example Type: Cessna Citation II

A/BIII

Primarily large commuter-type aircraft

Example Type: De Havilland Dash 8

CI, DI

Primarily small and fast corporate jets

Example Type: Lear Jet 36

C/DII

Large corporate jets and regional-type commuter jets

Example Type: Gulfstream IV

C/DIII

Commercial airliners (approx. 100-200 seats)

Example Type: Boeing 737

C/DIV

Large commercial airliners (approx. 200-350 seats)

Example Type: Boeing 767

DV

Jumbo commercial airliners (approx. 350+ seats)

Example Type: Boeing 747

FIGURE 3-1 AIRCRAFT REFERENCE CODES

To ensure that all airport facilities are designed to accommodate the expected air traffic and to meet FAA criteria, the specific ARC for the airport must be determined. In order to designate a specific ARC for an airport, aircraft in that ARC should perform a minimum of 500 annual itinerant operations. The majority of aircraft currently using the Colorado City Municipal Airport have an ARC of A-I, B-I and B-II. Airport users and fleet mix were discussed in Chapter 2. Examples of aircraft with an ARC of A-I and B-I are listed in Table 3-2. Examples of aircraft with an ARC of A-II and B-II are listed in Table 3-3. Examples of aircraft with an ARC of C-II and D-II are listed in Table 3-4. Aircraft with an ARC of A-I through B-II are expected to utilize the airport in the short, medium and long-term time frames. A small number of operations by C-I and C-II aircraft occur at Colorado City Municipal Airport. Given the available runway length and the existing non-precision instrument approach, 500 annual operations of these types of aircraft are not anticipated to occur during the planning period.

This information indicates that fundamental development items should be based on an ARC of B-II for aircraft weighing up to 45,000 pounds. It is also anticipated that occasional operations will occur by C-I, D-I, C-II and C-III aircraft weighing up to 65,000 pounds. It is recommended that wherever feasible the airport should configure facilities, setbacks and separations to minimize constraints for a potential upgrade to an ARC of C-II in the event Category C aircraft operations exceed forecasts.

TABLE 3-2 EXAMPLE AIRCRAFT HAVING AN ARC OF A-I OR B-I

Aircraft	Approach Speed (knots)	Wingspan (feet)	Max T.O. Weight (pounds)
Beech Baron 58P	101	37.8	6,200
Beech Bonanza V35B	70	33.5	3,400
Beech King Air B100	111	45.9	11,799
Cessna 150	55	33.3	1,670
Cessna 172	60	36.0	2,200
Cessna 177	64	35.5	2,500
Cessna 182	64	36.0	2,950
Cessna 340	92	38.1	5,990
Cessna 414	94	44.1	6,750
Cessna Citation I	108	47.1	11,850
Gates Learjet 28/29	120	42.2	15,000
Mitsubishi MU-2	119	39.1	10,800
Piper Archer II	86	35.0	2,500
Piper Cheyenne	110	47.6	12,050
Rockwell Sabre 40	120	44.4	18,650
Swearingen Merlin	105	46.3	12,500
Raytheon Beechjet	105	43.5	16,100

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

TABLE 3-3 EXAMPLE AIRCRAFT HAVING AN ARC OF A-II OR B-II

Aircraft	Approach Speed (knots)	Wingspan (feet)	Max T.O. Weight (pounds)
Air Tractor 802F	105	58.0	16,000
Beech King C90-1	100	50.3	9,650
Beech Super King Air B200	103	54.5	12,500
Cessna 441	100	49.3	9,925
Cessna Citation II	108	51.6	13,300
Cessna Citation III	114	50.6	17,000
Dassault Falcon 50	113	61.9	37,480
Dassault Falcon 200	114	53.5	30,650
Dassault Falcon 900	100	63.4	45,500
DHC-6 Twin Otter	75	65.0	12,500
Grumman Gulfstream I	113	78.5	35,100
Pilatus PC-12	85	52.3	9,920

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

TABLE 3-4 EXAMPLE AIRCRAFT HAVING AN ARC OF C-II OR D-II

Aircraft	Approach Speed (knots)	Wingspan (feet)	Max T.O. Weight (pounds)
Canadair CL-600	125	61.8	41,250
Gulfstream-III	136	77.8	68,700
1329 JetStar	132	54.5	43,750
Sabre 80	128	50.4	24,500
Gulfstream-II	141	68.8	65,300
Gulfstream-IV	145	77.8	71,780
Rockwell 980	121	52.1	10,325
Cessna Citation 650	126	53.6	23,000
Cessna Citation 750 X	131	63.6	36,100
Astra 1125	126	52.5	23,500
Hawker 125-1000	130	61.9	36,000
Falcon 900 EX	126	63.5	48,300

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

AIRSIDE FACILITY REQUIREMENTS

The airside facilities of an airport are described as the runway configuration, the associated taxiway system, the ramp and aircraft parking area and any visual or electronic approach aids.

RUNWAY REQUIREMENTS

Annual Service Volume: The Annual Service Volume (ASV) is a calculated reasonable estimate of an airport's annual capacity; taking into account differences in runway utilization, weather conditions and aircraft mix that would be encountered in one year. When compared to the forecasts or existing operations of an airport, the ASV will give an indication of the adequacy of a facility in relationship to its activity level. The ASV is determined by reference to the charts contained in FAA Advisory Circular (AC) 150/5060-5, Airport Capacity and Delay.

The FAA Airport Design Program was used to calculate the ASV for a two-runway airport with the forecasted operation levels determined in Chapter 2. Annual Service Volume for the runway configuration is 230,000 operations per year. Under these conditions, the existing runway facilities will adequately meet the demand within the time frame of this study.

Runway Length: FAA Advisory Circular 150/5325-4B, Runway Length Requirements for Airport Design, provides guidance for determining runway length requirements. Furthermore, the FAA has developed a computer software program entitled "Airport Design." The program provides the user with recommended runway lengths and other facilities on an airport according to FAA design standards. The information required to execute the program for recommended runway lengths, includes airfield elevation, mean maximum temperature of the hottest month and the effective gradient for the runway. This specific information for the Colorado City Municipal Airport that was used for the purposes of this portion of the study for Runway 11/29:

Field Elevation: 4,871' MSL
Mean Maximum Temperature of Hottest Month: 92.8° F
Effective Gradient: 7 Feet

(Note: The actual difference in feet from runway end to runway end is required to run the FAA software program and is listed as the effective gradient. However, the effective gradient is usually shown as a percent.)

With this data, the Airport Design program provides several runway length recommendations for both small and large aircraft according to varying percentages of aircraft fleet and associated takeoff weights. A summary of the data provided by the program is listed in Table 3-5.

TABLE 3-5 RECOMMENDED RUNWAY LENGTH

Description	Runway Length
Existing Runway Length	6,300'
Recommended to accommodate:	
Small Aircraft (<12,500 lbs.)	
Less than 10 passenger seats	
75 percent of these small airplanes	4,590'
95 percent of these small airplanes	6,110'
100 percent of these small airplanes	6,320'
10 or more passenger seats	6,320'
Large Aircraft (>12,500 lbs., <60,000 lbs.)	
75 percent of these planes at 60 percent useful load	6,780'
75 percent of these planes at 90 percent useful load	8,670'
100 percent of these planes at 60 percent useful load	11,070'
100 percent of these planes at 90 percent useful load	11,070'

Source: FAA Computer Software Program, Airport Design Version 4.2d

Using the results of the FAA's software program, it would be fair to suggest that the runway should have a minimum length of 7,500 feet. This would accommodate 75 percent of the large aircraft fleet at 80 percent useful load. However, it is important to identify the runway length requirements for the specific aircraft that are expected to operate at the airport.

Takeoff Distance Requirements: When determining runway length requirements for any airport it is necessary to consider the types of aircraft (aircraft design group and critical aircraft) that will be using the airport and their respective takeoff distance requirements. Figure 3-2 gives examples of takeoff distance requirements for the aircraft currently using the Colorado City Municipal Airport and aircraft that are anticipated to use the airport in the future.

Based on the required runway lengths for these categories of aircraft, the existing runway length of 6,300 feet provides adequate takeoff distance for the current fleet; however, as operations by large aircraft increase an increased length to 7,500 feet is recommended.

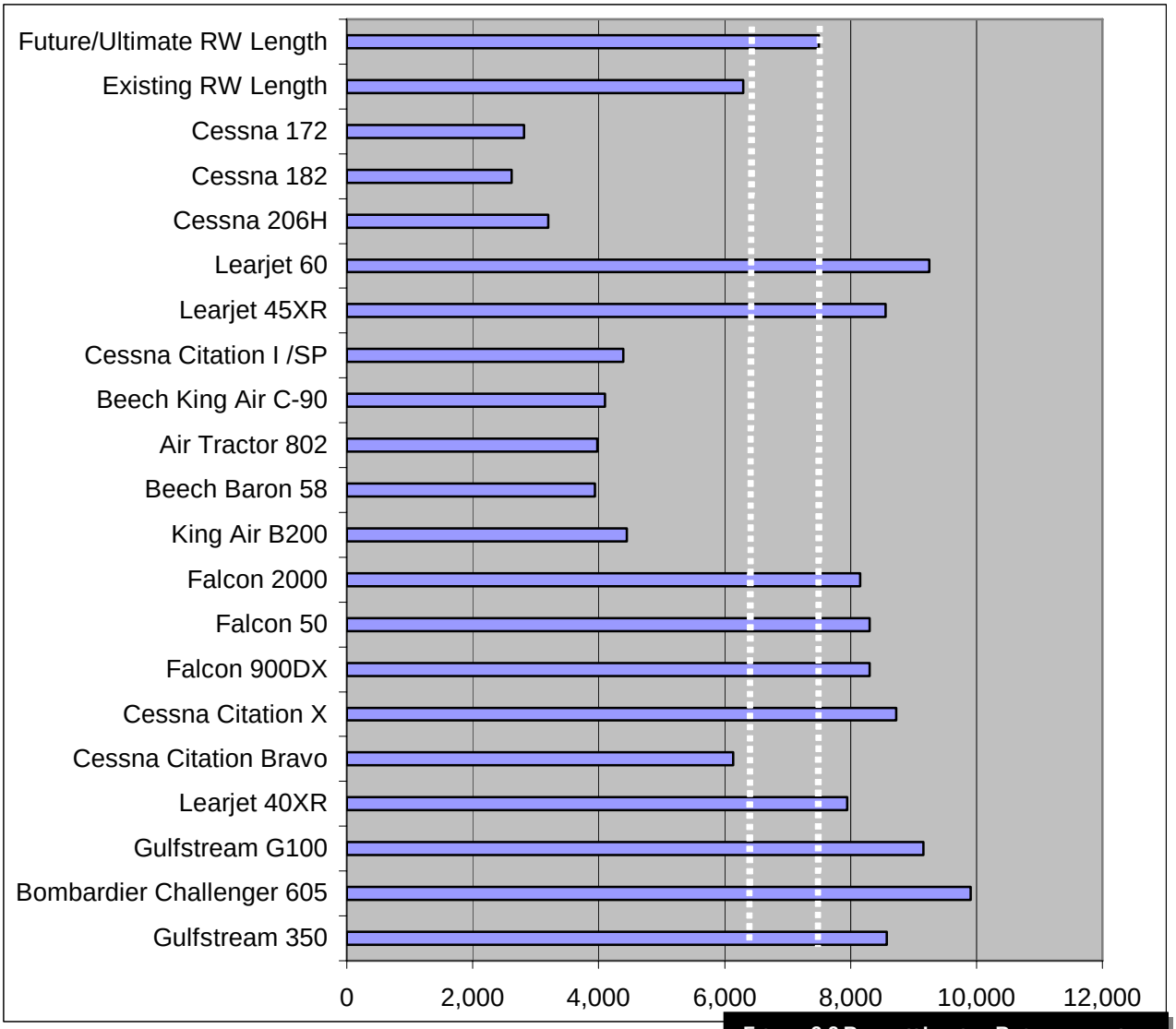


FIGURE 3-2 RUNWAY LENGTH REQUIREMENTS

SOURCE: AIRCRAFT MANUFACTURER'S DATA

**Aircraft performance data based on a mean maximum temperature of the hottest month of 92.8° F and an airport elevation of 4,871 feet mean sea level (MSL).*

Runway Strength and Width: Runway strength requirements are normally based upon the design aircraft that may be expected to use the airport on a regular basis. The existing strength of Runway 11/29 is 12,500 pounds and the existing strength of Runway 2/20 is 12,500 pounds. The existing pavement strengths are considered adequate for the planning period. Should Approach Category C operations exceed 500 annually the pavement strength should be increased to 45,000 SWG/ 68,000 DWG.

FAA design standards for runways serving aircraft having an ARC of B-II require a minimum runway width of 75 feet. The existing Runway 11/29 meets this standard. Runways serving aircraft with an ARC of C-II require a minimum width of 100 feet. A runway widening to 100 feet should be accomplished if operations by aircraft in Approach Category C exceed 500 annually on Runway 11/29.

CROSSWIND RUNWAY REQUIREMENTS

The FAA recommends that a runway's orientation provide at least 95 percent crosswind coverage. If the wind coverage of the runway does not meet this 95 percent minimum for the appropriate ARC, then a crosswind runway should be considered. Crosswind coverage for Runway 11/29 is 86.3 percent for a 10.5 knot crosswind and 89.4 percent for a 13.0 knot crosswind; therefore a B-I crosswind is justified.

The wind study analysis described in Chapter 1 indicated the combined crosswind coverage of Runways 11/29 and 2/20 at the Colorado City Municipal Airport meet the FAA standard of at least 95 percent. The existing width of the crosswind runway is 60 feet, which meets the FAA requirement for a B-I runway. The existing dimensions of the crosswind runway are considered adequate.

RUNWAY INCURSIONS

There are currently no runway incursion mitigation measures in place at the Colorado City Municipal Airport. Perimeter wildlife fencing is planned and an electric vehicle access gate has been installed to minimize the potential for wildlife and vehicle incursions. The airport has lighted holding position signs to increase awareness of runways.

TAXIWAY REQUIREMENTS

Length and Width: The primary function of a taxiway system is to provide access between runways and the terminal area. The taxiways should be located so that aircraft exiting the runway will have minimal interference with aircraft entering the runway or remaining in the traffic pattern. Taxiways expedite aircraft departures from the runway and increase operational safety and efficiency.

According to FAA Advisory Circular 150/5300-13, Airport Design, the minimum recommended runway to taxiway centerline separation for a runway with an ARC of B-II is 240 feet and the minimum recommended width is 35 feet. The minimum recommended runway to taxiway separation for an airport with an ARC of C-II or B-II with an instrument approach with visibility minimums lower than ¾-mile is 300 feet. There is currently a partial parallel taxiway for Runway 2/20, Taxiway B and a partial parallel taxiway to Runway 11/29, Taxiway A. Both taxiways are currently 35 feet wide. Taxiway B is located 225 feet from the runway centerline and Taxiway A is located 300 feet from runway centerline. It is recommended that the taxiways on both runways be extended to full length parallel taxiways. This will eliminate the need for aircraft to back taxi and enhance safety and utility of the airport.

Strength: The strength of the taxiway should be maintained at a strength equal to that of the associated runway pavement.

AIRCRAFT APRON

The apron space requirements as shown in this planning document were developed according to recommendations given in AC 150/5300-13, Airport Design. Consideration must be made in the overall apron requirements for aircraft parking and tiedown requirements, taxilanes, adjacent taxiways and proximity to all aircraft expected to use the airport, including turboprops and business jets.

Future apron square yardage should be planned for both transient and based aircraft. The existing aircraft parking apron occasionally becomes filled to capacity during peak periods in the summertime. An apron expansion is recommended to accommodate based and transient aircraft including business jets. Any future development of the apron should be done outside of

the Runway Visibility Zone (RVZ) in order to meet recommended design standards. Options for clearing the RVZ are included in the development alternatives in Chapter 4.

Tiedown Requirements: Aircraft tiedowns should be provided for those small and medium sized aircraft utilizing the airport. These aircraft risk being damaged or may cause damage or injury in sudden wind gusts if not properly secured. A number of tiedowns are required to accommodate the peak daily transient aircraft and overnight transient aircraft, plus based aircraft that are not hangared. Tiedown requirements for the 20-year planning period are listed in Table 3-6. The current tiedown layout is based on Group II taxilane OFAs. The future apron layout should be planned to provide for Group II taxilane OFAs. Typically large aircraft, including business jets, are not tied down and can usually be parked overtop multiple tiedowns.

FIGURE 3-3 AIRCRAFT APRON

Apron Requirements:
Generally speaking, an apron tiedown area should allow approximately 360 square yards per transient aircraft and 300 square yards per based aircraft. This square yardage per aircraft provides adequate space for tiedowns, circulation and fuel truck movement. Colorado City should plan for additional apron expansion and taxilane expansion to hangar development areas.

NAVIGATIONAL AIDS

A Navigational Aid (NAVAID) is any ground based visual or electronic device used to provide course or altitude information to pilots. NAVAIDs include Very High Omnidirectional Range (VORs), Very High Frequency Omnidirectional Range with Tactical Information (VOR-TACs), Nondirectional Beacons (NDBs) and Tactical Air Navigational Aids (TACANs), as examples. There is an existing NDB located at Colorado City Municipal Airport, no new ground navigational aids are recommended.

APPROACH PROCEDURES

Non-precision Global Positioning System (GPS) approaches do not require ground-based facilities on or near the airport for navigation. The GPS receiver uses satellites for navigation. Therefore, it involves little or no cost for the Airport Sponsor. GPS was developed by the United States Department of Defense for military use and is now available for civilian use. GPS approaches are rapidly being commissioned at airports across the United States, approach minimums as low as 350-foot ceilings and 1-mile visibility are typical for this type of approach. An instrument approach will increase the utility of the airport by providing for the capability to operate in inclement weather conditions. This is especially important for air medivac/air ambulance, physician transport and business flights. It is also useful for conducting training and maintaining instrument currency and proficiency requirements.

The existing approach procedure at the airport includes a non-precision instrument NDB/GPS circle-to-land approach. The minimums for this approach are 829-foot ceiling and 1-mile visibility. A future potential approach that should be considered is a Localizer Performance with

Vertical Guidance (LPV) approach procedure using the Wide Area Augmentation System (WAAS). This approach could potentially provide instrument minimums as low as 200-foot ceilings and less than ¾-mile visibility. The LPV approach with visibility minimums less than 1-mile would increase the FAR Part 77 Primary Surface from 500 feet wide to 1,000 feet wide.

AIRFIELD LIGHTING, SIGNAGE, MARKING AND VISUAL AIDS

Airport lighting enhances safety during periods of inclement weather and nighttime operations by providing visual guidance to pilots in the air and on the ground. Lighting and visual aids can consist of a variety of equipment or a combination thereof as described in Chapter 1. The airport's existing inventory of lighting and visual aids includes two-box precision approach path indicators, a rotating beacon, medium intensity runway lights (MIRLs), runway end identifier lights (REILs), 6-light runway threshold lights, visual runway markings, a segmented circle and taxiway reflectors. The airport terminal area is also equipped with area lighting. The majority of the airfield lighting and visual aids is in good condition and should be maintained in their present condition. An approach lighting system (ALS) such as ODALS, MALS, MALSF, SSALS or SALS would be necessary to obtain ¾-mile or less visibility minimums. The ALS is designed to provide earlier visual acquisition of the runway approach in visibility limiting Instrument Meteorological Conditions (IMC). The lighting of the taxiways with medium intensity taxiway lights (MITLs) is also recommended.

Runway 11/29 and Runway 2/20 are currently marked as visual runways on all ends. Runway markings on all runways are in poor condition and should be remarked as soon as possible. If the approach minimums are lowered to ¾ mile and a straight in approach were developed the change of marking on Runway 29 to precision approach markings is recommended.

LANDSIDE FACILITY REQUIREMENTS

Landside facilities are another important aspect of the airport. Landside facilities serve as the processing interface between the surrounding community and the airport operating environment. Likewise, it offers the traveler the first impression of the airport and the local area. Landside facilities house the support infrastructure for airside operations and often generate substantial revenues for the airport.

FIGURE 3-4 EXISTING TERMINAL BUILDING

TERMINAL BUILDING

The construction of a terminal building at any airport offers many amenities to passengers, local and transient pilots and airport management. Terminal buildings (often called pilot lounges at general aviation airports) most often house public restrooms, public telephones, a pilot's lounge and information regarding airport services. The terminal building includes a lobby area, restrooms, telephone, a flight planning room and airport management offices. The terminal building is well maintained and provides adequate space and amenities to accommodate existing and long term demand. It is recommended that the RVZ clear the terminal building in the future to eliminate the existing nonstandard condition.

Options for clearing the RVZ are presented in the development alternatives in Chapter 4. All future development must remain clear of the RVZ.

HANGAR FACILITIES

Hangars are typically classified as either T-hangars, small multi-unit storage complexes that usually accommodate one single engine aircraft in each unit or conventional hangars, small to very large units, which accommodate a variety of aircraft types or corporate fleets. The number of aircraft that each conventional hangar can hold varies according to the manufacturer and the specifications of the airport owner or operators. The existing hangars at the Colorado City Municipal Airport include the 80-foot by 70-foot FBO maintenance hangar and one T-hangar unit located northeast of the apron area.

FIGURE 3-5 EXISTING T-HANGAR UNIT

Based Aircraft Hangar Requirements: The facility requirements for based aircraft typically determine the number of tiedown locations, number of shaded spaces, number of T-hangars and number of conventional type hangars required for the future. Development areas will be identified on the ALP for a mix of T-hangars, box hangars and larger corporate hangars.

Transient Aircraft Hangar Requirements: Transient single-engine aircraft operators generally do not require aircraft storage facilities unless there is inclement weather expected (such as hail or snow) or if the operator is planning an extended stay. Some higher performance single-engine and multi-engine aircraft operators may desire overnight aircraft storage or a heated hangar in the winter.

General: The airport sponsor should consider providing long-term land leases to interested parties for the construction of aircraft storage hangars. Allowing the tenant to retain ownership of the hangar while leasing the ground reduces capital outlay requirements for Colorado City. The tenant ownership also enables Colorado City to collect property taxes on the hangar and other improvements. The tenant ownership also provides motivation for the tenant to maintain the hangar in good condition to maximize resale value at the end of the lease period. Legislation has made aircraft hangars an eligible cost under the Airport Improvement Program (AIP). While this creates an opportunity for airport sponsors willing to build hangars to meet existing demand, hangars are considered very a low priority. Colorado City should charge a standard annual, monthly and overnight tiedown fee for use of the open apron.

AVIATION FUEL FACILITIES

Fuel is available during normal business hours at the Colorado City Municipal Airport. Westwing Aviation offers 100-Low Lead avgas and Jet A to based and transient aircraft owners. It is recommended that a self-serve credit card reader fueling system be installed to provide 24-hour fuel access at the airport along with a 10,000 gallon Jet A tank. Fuel storage at the airport consists of one 10,000 gallon 100-Low Lead tank, one 2,500 gallon Jet A truck and one 1,000

gallon 100-Low Lead truck. The fuel tank is owned by Colorado City and operated by Westwing Aviation. The fuel trucks are owned and operated by Westwing Aviation.

AIRPORT ACCESS AND VEHICLE PARKING

The Colorado City Municipal Airport is accessed via Airport Avenue, which is a two lane, paved road. Airport Avenue enters the airport from the east side of the airport. Access to the airport is considered adequate for the planning period. There are currently approximately 15 automobile parking spaces available adjacent to the existing terminal building which is considered adequate for the short-term time frame, approximately 35 automobile parking spaces should be made available for the medium and long-term time frames to accommodate airport users and visitors.

FENCING

The Colorado City Municipal Airport is currently fenced with 5-strand barbed wire fencing that follows the existing airport property line. The terminal area is surrounded by a six-foot chain link fence with an electric vehicle access gate. The primary purpose of this fencing is to restrict inadvertent access to the airport by wildlife and persons. Recently the airport has reported that persons have been gaining access to the runway through the existing fence by cutting the existing fence and joy riding out into the airport. Therefore it is recommended that the airport be completely encompassed by wildlife fencing to prevent access to the airport by wildlife and persons and increase security at the airport. The airport management keeps a regular check of the existing fence line to ensure no breaks which would allow cattle and other animals access to the runway.

AIRPORT RESCUE AND FIRE FIGHTING (ARFF) EQUIPMENT & STORAGE BUILDING

Airport Rescue and Fire Fighting (ARFF) equipment is not required at airports that do not serve scheduled passenger service with aircraft having 10 or more passenger seats. Local municipal or volunteer fire departments typically provide fire protection to general aviation airports in their district. Mutual aid agreements may also be provided for nearby fire departments to assist in emergency situations. In any case, procedures should be in place to ensure emergency response in case of an accident or emergency at the airport. Although statistically very safe, the most likely emergency situations at general aviation airports are an aircraft accident, fuel or aircraft fire or hazardous material (fuel) spill. The level of protection recommended in FAA Advisory Circular 150/5210-6D, Aircraft Fire and Rescue Facilities and Extinguisher Agents, for small general aviation airports is 190 gallons of aqueous film forming foam (AFFF) supplemented with 300 pounds of dry chemical. Proximity suits should be utilized for fire fighter protection. Aviation rated fire extinguishers should be immediately available in the vicinity of the aircraft apron and fueling facilities. Adequate facilities should be provided to store any ARFF vehicle(s) or equipment that is acquired.

Currently, aviation fire extinguishers are available at the Colorado City Municipal Airport and the Colorado City Fire District responds to emergencies at the airport. The Colorado City Fire District has 48 volunteers, six fire trucks, a rescue truck and 5,000 gallon water tender. Estimated response time to the airport is eight minutes. It is recommended that the Colorado City Fire District meet the recommendations in FAA Advisory Circular 150/5210-6D. However, these are only recommendations as ARFF equipment is technically not required at the Colorado City Municipal Airport.

SNOW REMOVAL EQUIPMENT

Colorado City currently provides snow removal services at the airport. Colorado City has only a minimal amount of snow removal equipment therefore the airport is a low priority during snow

conditions. It is recommended that the airport obtain its own snow removal equipment (SRE) and SRE storage building.

INFRASTRUCTURE NEEDS

UTILITIES

Available utilities at the airport have been designed and sized to meet the typical needs of a general aviation airport. The existing electrical power is 3-phase 112.5 KVA line. Power is provided by Twin City Power. The airport also has a back up generator on the field to provide power in the event of any power disruptions. Gas in the area is propane and is provided by Standard Supply Company. The airport also has 3 septic tanks located on the field and a non potable water well. Telephone service is provided by South Central Utah Telephone. Water and sewer services are provided on site by a well and septic tanks. The existing utilities are considered adequate for the short to mid term planning period with the exception of the existing septic tanks. It is recommended an upgraded septic system be installed to accommodate existing and future demand in the short term and ultimately the sewer be connected to the Town of Colorado City's sewer system. During the intermediate to long term time frame it is recommended that the electrical power and the water system be upgraded to accommodate additional landside development. It is recommended that the water system be treated to provide potable water to the airport.

WEATHER REPORTING

Weather information is available to pilots through the Automated Weather Observation System (AWOS) located at the airport. AWOS uses various sensors, a voice synthesizer and a radio transmitter to provide real-time weather data. There are four types of AWOS. An AWOS-A only reports altimeter setting while an AWOS-1 also measures and reports wind speed, direction, gusts, temperature and dew point. AWOS-2 provides visibility information in addition to everything reported by an AWOS-1. The most capable system, the AWOS-3 also includes cloud and ceiling data. The Colorado City Municipal Airport AWOS is an AWOS-3. The AWOS transmits over a VHF frequency or the voice portion of a navaid. The transmission can be received within 25 nautical miles of the site or above 3,000 feet above ground level (AGL). The frequency for the AWOS is 118.375 and is published on Aeronautical charts as well as in the airport facilities directory. The AWOS is connected to the telephone service allowing pilots to check current weather conditions at the airport at (928) 875-8045. It is recommended that the Town of Colorado City connect the AWOS to the National Airspace Data Interchange Network (NADIN). This will allow national dissemination of the AWOS observations and allow the National Oceanic and Atmospheric Administration (NOAA) to digitally record the hourly observations and disseminate real-time weather information to Flight Service Stations and other sources.

No buildings/structures may be built within 100 feet of the AWOS. Structures located between 100 feet and 500 feet from the AWOS must have a maximum height no greater than 15 feet below the maximum height of the AWOS. Structures located between 500 feet and 1,000 feet from the AWOS must have a maximum height no greater than 10 feet below the maximum height of the AWOS. Objects of greater height than those referenced above may be constructed within 1,000 feet to 100 feet of the AWOS; however, they must occupy no more than a 10 degree penetration from the AWOS. If multiple objects exceed the height restrictions they must be placed at least 20 degrees apart. This will ensure the accuracy of wind and weather information provided by the AWOS.

LAND USE COMPATIBILITY AND CONTROL

AIRPORT PROPERTY

The existing airport property line encompasses 204 acres according to the airport legal description. Colorado City is the process of an environmental assessment to obtain additional land from the BLM and private land owners for approach protection.

COMPATIBILITY WITH STATE/REGIONAL PLANS

The Master Plan for the Colorado City Municipal Airport should conform to all additional state and regional transportation plans. There is not a current ADOT Highway Plan for the area. According to the ADOT Transportation Planning Division, Colorado City is included in the Grand Canyon Study Area of the Regional Transportation Profile. The Transportation Profile for the Grand Canyon Study Area began in early 2006 and is expected to conclude by December 2007. The Mohave County, Arizona General Plan states that Mohave County should promote increased industrial development in the vicinity of the Colorado City Municipal Airport, which would be considered compatible with the airport.

The Bureau of Land Management (BLM) Resource Management Plan for the Arizona Strip identifies some land surrounding the Colorado City Municipal Airport as lands identified for disposal. Therefore the development of the airport or may be considered compatible with the BLM plan.

ZONING

Development around airports can pose certain hazards to air navigation if appropriate steps are not taken to ensure that buildings and other structures do not penetrate the FAR Part 77 Airspace Surfaces (described in the following section). The FAA, therefore, recommends that all Airport Sponsors implement height restrictions in the vicinity of the airport to protect these Part 77 Surfaces. A draft height restriction zoning ordinance is included as part of this Master Plan project.

COMPATIBLE LAND USE

In addition to ensuring that obstructions to Part 77 Surfaces are avoided or appropriately marked and lighted, it is recommended that the Airport Sponsor make reasonable efforts to prevent incompatible land uses from the immediate area of the airport. For example, the FAA states in FAA Advisory Circular 150/5200-33A, Hazardous Wildlife Attractants On or Near Airports, that landfills and/or transfer stations are incompatible land uses with airports. Therefore, these types of facilities should be located at least 5,000 feet from any point on a runway that serves piston type aircraft and 10,000 feet from any point on a runway that serves turbine type aircraft. Furthermore, any facility which may attract wildlife (especially birds) such as sewage treatment ponds and wastewater treatment plants should also be located this same distance from any point on the runway. Development proposals should also be reviewed to ensure compatibility in the vicinity of the airport.

In 1995, the Town approved the Colorado City Municipal Airport Zoning Ordinance to regulate land uses and the height of objects near the airport. The ordinance established the Airport Development – Mixed Use (AD-MU) district to define appropriate land uses near the airport. The AD-MU district is shown in Figure 3-6. The AD-MU district extends for 5,000 feet from each runway. The Airport Approach (AA) Overlay District is used to define appropriate land uses for properties within the approaches to the airport. The ordinance also defines the imaginary

surfaces used to restrict the height of structures in the vicinity of the airport. An updated draft compatible land use zoning ordinance is included as part of this Airport Master Plan. The updated compatible land use zoning ordinance will include new requirements from the Arizona State Statues. It is recommended that the updated overlay be adopted to continue to protect the airport from incompatible development.

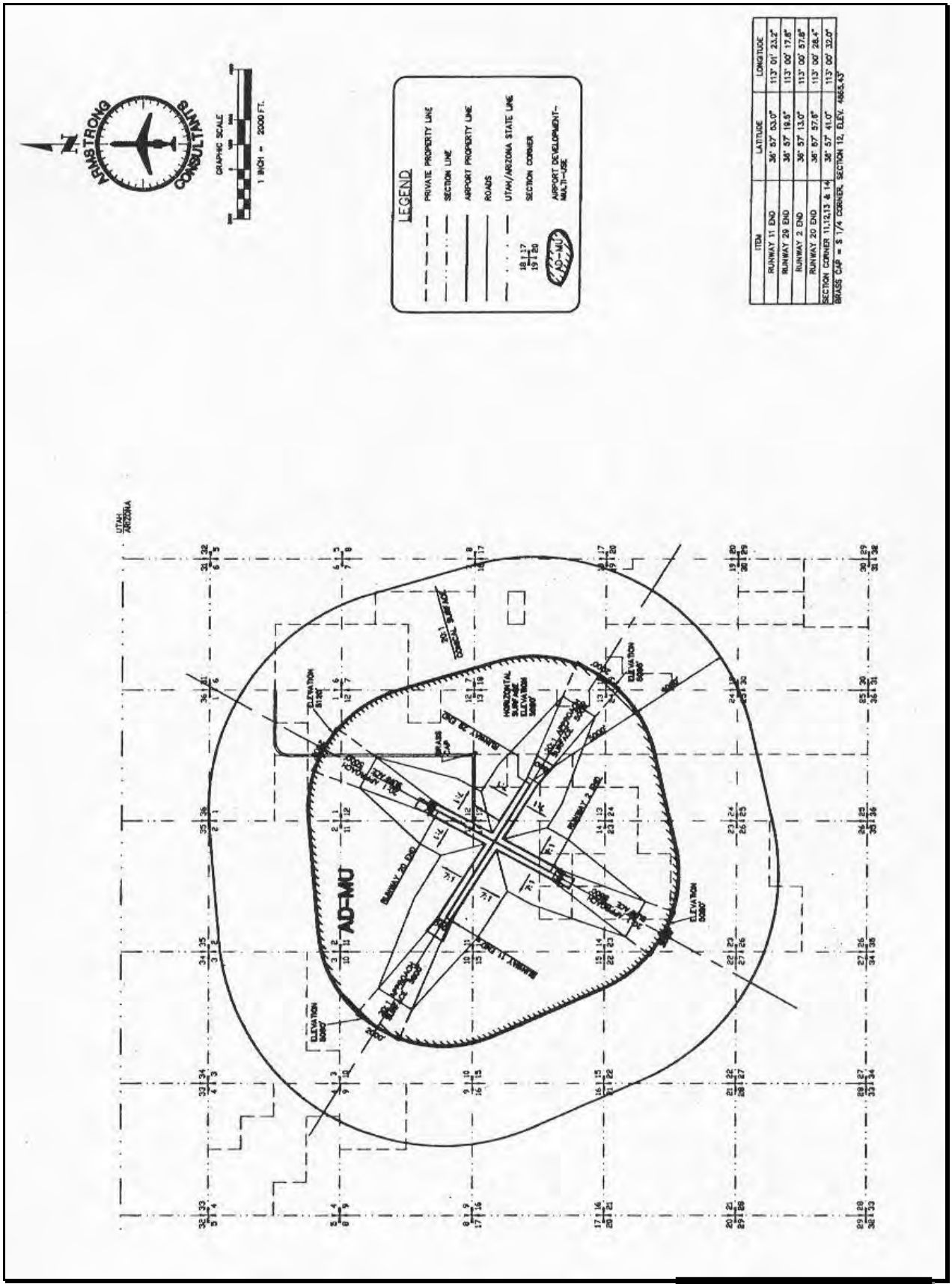


FIGURE 3-6 AD-MU DISTRICT

STATE OF ARIZONA LAND USE PLANNING

Arizona State Statutes 28-8485 and 28-8486 states that airport sponsors can develop Airport Influence Area (AIA) maps, however the State Statutes require the development of airport disclosure maps. These documents are included as part of the Airport Layout Plan portion of this study and will be sent to the Arizona Real Estate Department.

AIRPORT MANAGEMENT STRUCTURE

The management structure for the Colorado City Municipal Airport is City Council to Town Manager to Airport Manager. This management structure is considered adequate for the safe and efficient operation of the Colorado City Municipal Airport.

In order to aid the Colorado City Municipal Airport in the daily operation of the airport, an Airport Operations Manual including minimum standards, rules and regulations, standard lease agreements, an emergency plan with a crash/rescue grid map, airport self inspection procedures and an airport security plan are included in this Master Plan. Colorado City also participates in the Aeronautics Division's Pavement Management Plan program. There is currently no runway incursion program. Although a formal runway incursion plan is not deemed necessary, the installation of a wildlife fence along the airport perimeter would contribute towards incursion minimization.

SUMMARY OF FACILITY REQUIREMENTS

In summary, the facility requirements for the Colorado City Municipal Airport are based on the types and volume of aircraft expected to use the airport in the short and long-term timeframes. These facilities will enable the airport to serve its users in a safe and efficient manner. The recommended airside and landside facilities are summarized in Table 3-6.

TABLE 3-6 SUMMARY OF AIRPORT FACILITY REQUIREMENTS

Facility		Existing	Future
Runways			
11/29	Length (feet)	6,300’	7,500’
	Width (feet)	75’	75’
	Strength (pounds)	12,500 (SWG)	45,000 (SWG), 68,000 (DWG)
2/20	Length (feet)	5,100’	5,100’
	Width (feet)	60’	60’
	Strength (pounds)	12,500 (SWG)	12,500 (SWG)
Marking	Runway 29	Visual	Precision
	Runway 11	Visual	Visual
	Runway 2	Visual	Visual
	Runway 20	Visual	Visual
Taxiways			
	Parallel	Yes	Yes
	Bypass Taxiways/Turnarounds	Yes	Yes
	Width (feet)	35	35
	Strength (pounds)	12,500 (SWG)	45,000 (SWG), 68,000 (DWG)
Apron			
	Tie Downs	14	30*
NAVAID			
	Approaches	NPI (Circling)	NPI (Straight-in)
	Minimums	1-Mile	¾-mile
Lighting & Visual Aids			
	Runway Edge	MIRL	MIRL
	Taxiway/Apron Edge	Reflectors	MITL
	Threshold Lights	Yes	Yes
	REILs	Yes	Yes
	Approach Slope Indicator	PAPI-2	PAPI-2
	Segmented Circle/Wind Cone	Yes	Yes
	Rotating Beacon	Yes	Yes
	Approach Lighting System	No	No
Access & Parking			
	Automobile	15	35*
Hangar Facilities			
	T-Hangars or Small Box Hangars	6	10
	Conventional-Small	0	5
	Conventional-Medium/Large	1	2
Fuel Storage			
	100 LL (gallons)	10,000 Tank and 1,000 Truck	10,000 Tank and Truck
	Jet-A (gallons)	2,500 Truck	10,000 Tank and Truck
Other			
	AWOS	Yes (AWOS III)	Yes (AWOS III)
	Unicom	Yes	Yes
	Terminal Building	Yes	Yes

**As required based on demand*

FEDERAL AVIATION REGULATION (FAR) PART 77 AIRSPACE SURFACES

Federal Aviation Regulations (FAR) Part 77 establishes several Imaginary Surfaces that are used as a guide to provide a safe, unobstructed operating environment for aviation. These surfaces, which are typical for civilian airports, are shown in Figure 3-7. The Primary, Approach, Transitional, Horizontal and Conical Surfaces identified in FAR Part 77 are applied to each runway. For the purpose of this section, a visual/utility runway is a runway that is intended to be used by propeller driven aircraft of 12,500 pound maximum gross weight and less. A non-precision instrument/utility runway is a runway that is intended to be used by aircraft of 12,500 pounds maximum gross weight and less with a straight-in instrument approach procedure and instrument designation indicated on an FAA approved airport layout plan, a military service approved military airport layout plan or by any planning document submitted to the FAA by competent authority. A non-precision instrument/larger-than-utility runway is a runway intended for the operation of aircraft weighing more than 12,500 pounds that also has a straight-in instrument approach procedure.

As described previously, the Colorado City Municipal Airport currently has a non-precision instrument circle-to-land approach to the airport. Runway 11/29 is utility runway since the pavement strength is 12,500 pounds. Runway 2/20 is a utility runway since the pavement strength is 12,500 pounds. The FAR Part 77 Airspace Surfaces for these classifications are described in the following paragraphs. While it is desirable to eliminate penetrations of FAR Part 77 airspace surfaces, in some cases, penetrations (also known as obstructions) may be mitigated with appropriate marking and/or lighting. The surfaces are described below and the dimensions are listed in Table 3-7.

PRIMARY SURFACE

The Primary Surface is an imaginary surface of specific width longitudinally centered on a runway. Primary Surfaces extend 200 feet beyond each end of the paved surface of runways, but do not extend past the end of non-paved runways. The elevation of any point on the Primary Surface is the same as the elevation of the nearest point on the runway centerline. The width of the Primary Surface varies from 250, 500 or 1,000 feet depending on the type of approach and approach visibility minimums.

The current primary surface width for Runway 11/29 is 250 feet. This will increase to 1,000 feet if the approach minimums are lowered to ¾-mile and the pavement is strengthened. Although the wider primary surface would likely result in primary and transitional surface penetrations, the OFZ would remain clear. Marking and lighting of all Part 77 obstructions is recommended.

APPROACH SURFACE

The Approach Surface is a surface longitudinally centered on the extended runway centerline and extending outward and upward from each end of the Primary Surface. An Approach Surface is applied to each end of the runway based upon the type of approach available or planned for that runway, either 20:1, 34:1 or 50:1. The inner edge of the surface is the same width as the Primary Surface. It expands uniformly to a width corresponding to the FAR Part 77 runway classification criteria.

TRANSITIONAL SURFACE

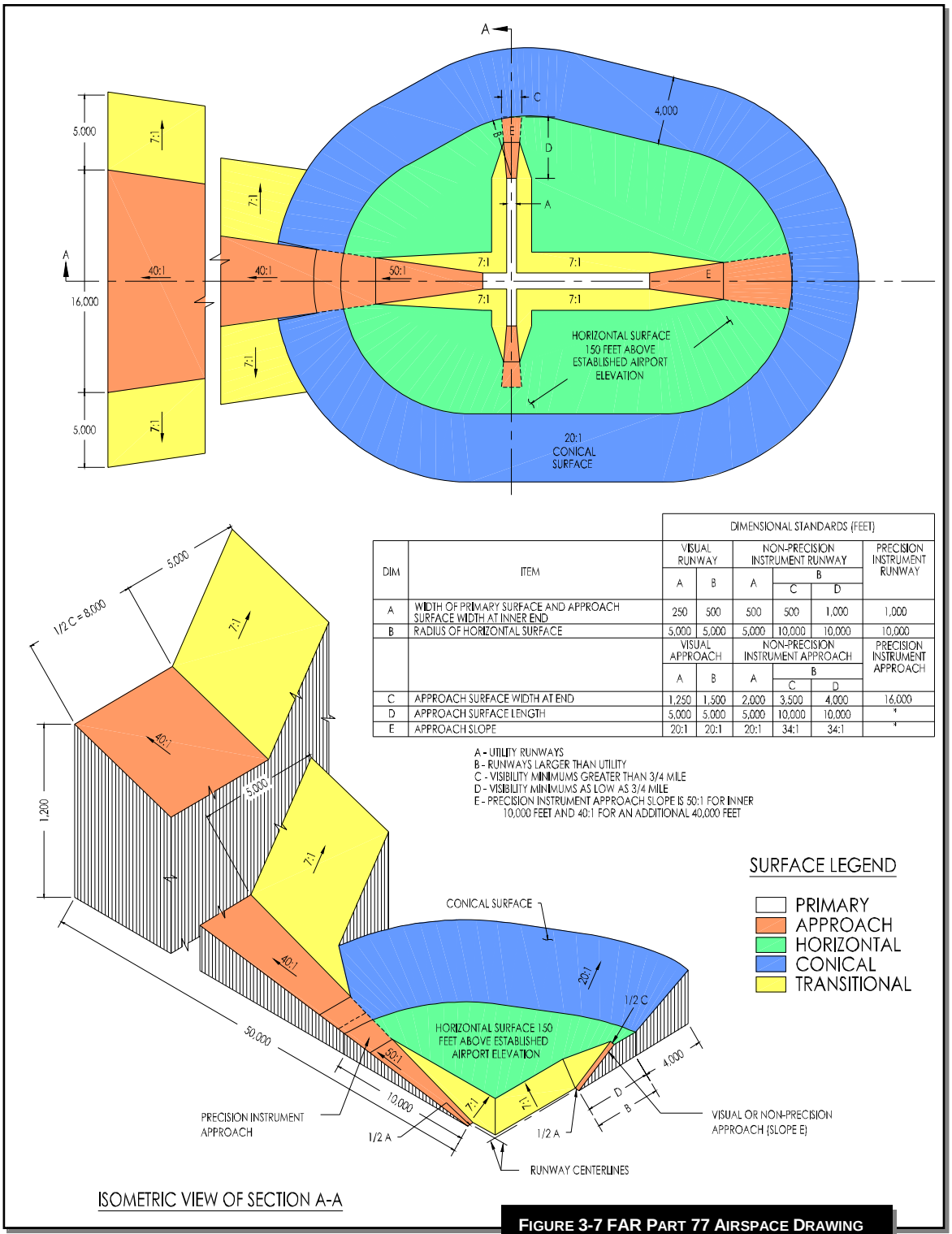
The Transitional Surfaces extend outward and upward at right angles to the runway centerlines from the sides of the Primary and Approach Surfaces at a slope of 7:1 and end at the Horizontal Surface.

HORIZONTAL SURFACE

The Horizontal Surface is considered necessary for the safe and efficient operation of aircraft in the vicinity of an airport. As specified in FAR Part 77, the Horizontal Surface is a horizontal plane 150 feet above the established airport elevation. The airport elevation is defined as the highest point of an airport's useable runways, measured in feet above mean sea level. The perimeter is constructed by arcs of specified radius from the center of each end of the Primary Surface of each runway. The radius of each arc is 5,000 feet for runways designated as utility or visual and 10,000 feet for all other runways.

CONICAL SURFACE

The Conical Surface extends outward and upward from the periphery of the Horizontal Surface at a slope of 20:1 for a horizontal distance of 4,000 feet.



DIM	ITEM	DIMENSIONAL STANDARDS (FEET)					
		VISUAL RUNWAY		NON-PRECISION INSTRUMENT RUNWAY			PRECISION INSTRUMENT RUNWAY
		A	B	A	B		
					C	D	
A	WIDTH OF PRIMARY SURFACE AND APPROACH SURFACE WIDTH AT INNER END	250	500	500	500	1,000	1,000
B	RADIUS OF HORIZONTAL SURFACE	5,000	5,000	5,000	10,000	10,000	10,000
		VISUAL APPROACH		NON-PRECISION INSTRUMENT APPROACH			PRECISION INSTRUMENT APPROACH
		A	B	A	B		
					C	D	
C	APPROACH SURFACE WIDTH AT END	1,250	1,500	2,000	3,500	4,000	16,000
D	APPROACH SURFACE LENGTH	5,000	5,000	5,000	10,000	10,000	*
E	APPROACH SLOPE	20:1	20:1	20:1	34:1	34:1	*

A - UTILITY RUNWAYS
B - RUNWAYS LARGER THAN UTILITY
C - VISIBILITY MINIMUMS GREATER THAN 3/4 MILE
D - VISIBILITY MINIMUMS AS LOW AS 3/4 MILE
E - PRECISION INSTRUMENT APPROACH SLOPE IS 50:1 FOR INNER 10,000 FEET AND 40:1 FOR AN ADDITIONAL 40,000 FEET

FIGURE 3-7 FAR PART 77 AIRSPACE DRAWING

SOURCE: FAR PART 77

SUMMARY OF DESIGN STANDARDS

Table 3-7 summarizes the FAA design standards (described in Chapter 1) for the recommended airport facilities.

TABLE 3-7 SUMMARY OF DIMENSIONAL CRITERIA

Design Criteria	Existing	Future	Post-Planning Potential
Airport Reference Code	B-II	B-II	C-II
Approach Type	Visual (Circling) Utility, 1-mile visibility minimums	NPI >Utility, ¾ mile visibility minimums	NPI >Utility, ¾ mile visibility minimums
FAA Airport Design Standards (AC 150/5300-13 Change 11)			
Runway centerline to parallel taxiway centerline	240' (300' actual)	240' (300' planned)	300'
Runway centerline to edge of aircraft parking apron	250' (590' actual)	250' (500' planned)	500'
Runway width	75'	75'	100'
Runway shoulder width	10'	10'	10'
Runway Safety Area width	150'	150'	500'
Runway Safety Area length beyond runway end	300'	300'	1,000'
Runway Object Free Area width	500'	500'	800'
Runway Object Free Area length beyond runway end	300'	300'	1,000
Runway Obstacle Free Zone width	400'	400'	400'
Runway Obstacle Free Zone length beyond runway end	200'	200'	250'
Runway Protection Zone	1,000'x500'x700'	1,700'x1,000'x1,510'	1,700'x1,000'x1,510'
Taxiway width	35'	35'	35'
Taxiway Safety Area width	79'	79'	79'
Taxiway Object Free Area width	131'	131'	131'
Taxilane Object Free Area width	115'	115'	115'
Runway centerline to aircraft hold lines	200'	200'	200'
Airspace Surfaces (Part 77)			
Primary Surface width	250'	1,000'	1,000'
Primary Surface length beyond runway ends	200'	200'	200'
Approach Surface dimensions RW 11	250'x1,250'x5,000'	1,000'x3,500'x10,000'	1,000'x3,500'x10,000'
Approach Surface dimensions RW 29	250'x1,250'x5,000'	1,000'x4,000'x10,000'	1,000'x4,000'x10,000'
Approach Surface dimensions RW 2	250'x1,250'x5,000'	250'x1,250'x5,000'	250'x1,250'x5,000'
Approach Surface dimensions RW 20	250'x1,250'x5,000'	250'x1,250'x5,000'	250'x1,250'x5,000'
Approach Surface slope RW 11	20:1	20:1	20:1
Approach Surface slope RW 29	20:1	34:1	34:1
Approach Surface slope RW 2	20:1	20:1	20:1
Approach Surface slope RW 20	20:1	20:1	20:1
Transitional Surface slope	7:1	7:1	7:1
Horizontal Surface radius from runway	5,000'	10,000'	10,000'
Conical Surface width	4,000'	4,000'	4,000'

SOURCE: FAA AC 150/5300, AIRPORT DESIGN; FAR PART 77, OBJECTS AFFECTING NAVIGABLE AIRSPACE