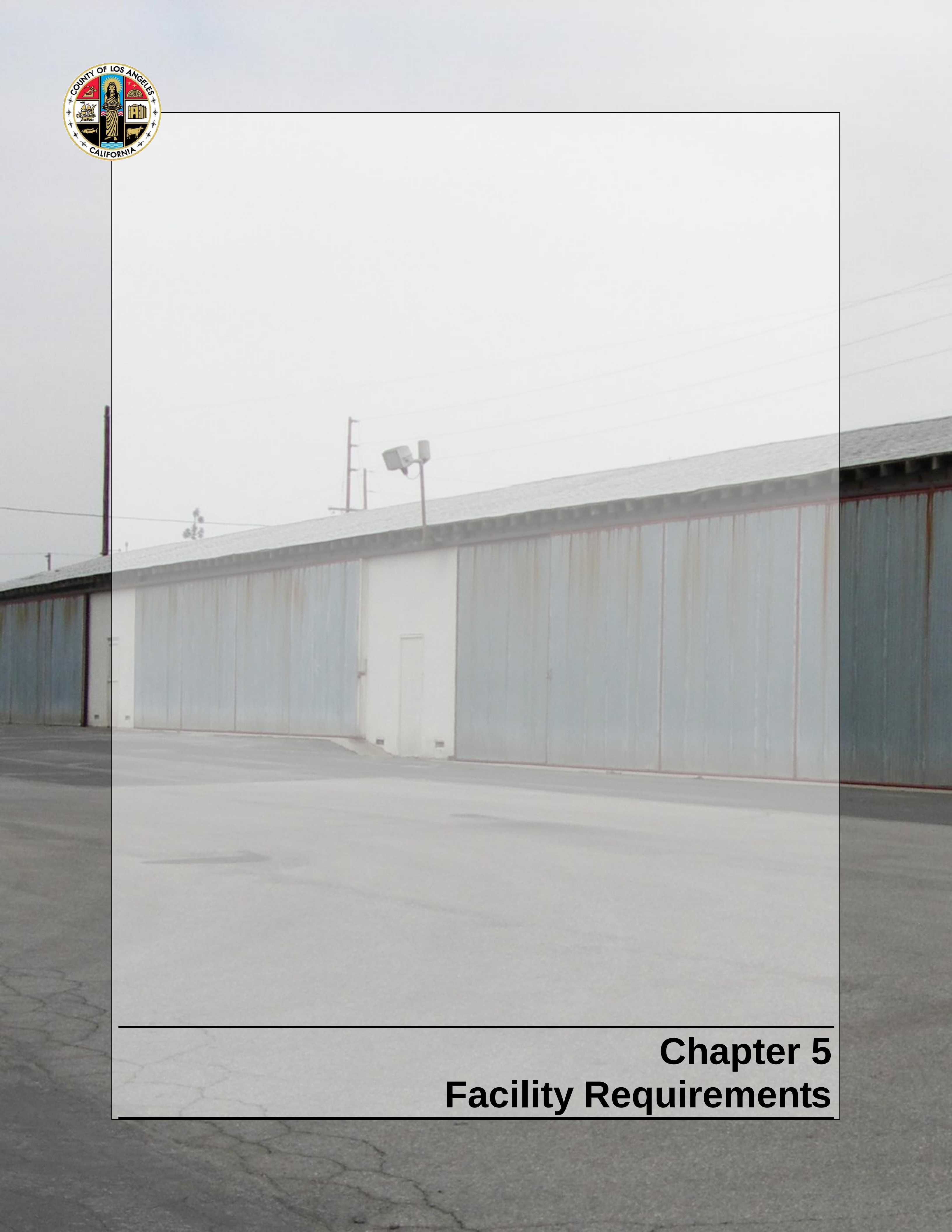

Chapter 5
Facility Requirements

Chapter 5
Facility Requirements

INTRODUCTION

Chapter 4 produced a forecast of traffic volumes estimated to be generated at the airport during the 20-year forecast period. The next step in the planning process is to determine the type and magnitude of airport facilities that will be needed during the 20-year strategic planning period to satisfactorily accommodate future traffic volumes.

The process of determining facility requirements involves the application of acceptable airport planning standards to the various forecast components to identify the needed facilities that will provide sufficient capacity to handle the expected traffic. By comparing the sizes and capacities of the future facility needs with existing facility sizes and capacities, facility deficiencies can be determined and quantified.

The deficiencies are then resolved by increasing facility capacities over a phased development program. This chapter of the report addresses the calculation of theoretical airport facility requirements as discussed above. The facilities developed through this planning process must be considered theoretical until they have been related to existing facilities. In Chapter 6, Concept Development, the recommended improvements derived from the facility requirements will be delineated in a series of plans and drawings.

The uncertainty of long-range forecasting was noted in Chapter 4, and a range of forecasts was provided. In the interest of preparing a reasonable plan that can be used as a development guide for the 20-year master planning period, the analysis of facility requirements used the Reconciled Forecast presented in Chapter 4. However, to create a more flexible plan, facilities are provided which would accommodate the most demanding forecast levels – the TAF forecast, when practical. While forecasts appear to be on the conservative (high) side, this is done to help guide the County should demand at Whiteman exceed the forecasted levels.

It cannot be overemphasized that it will be ***actual*** demand that dictates the eventual development of facilities and not forecast demand. Should traffic actually materialize faster than forecast, then facility improvements should be accelerated. Should demand actually lag the forecast, then facility improvements may be deferred. Thus, the use of the Reconciled Forecast does not commit the County to construct the facilities associated with projected demand, but it provides an assumed schedule for planning purposes. Airport facility requirements are grouped into the two main operating elements - airside facilities and landside facilities. Before addressing the facility requirements, a brief discussion of airport classification is presented.

AIRPORT CLASSIFICATION

Whiteman Airport functions in several roles as defined by FAA and explained in Chapter 3. The airport is contained in the National Plan of Integrated Airport Systems (NPIAS) and is classified as a Reliever Airport. Reliever airports are defined as general aviation airports that provide general aviation access to the surrounding area and have 100 or more based aircraft or 25,000 annual itinerant operations. The airport is also contained in the California Aviation System Plan (CASP) and is classified as a Metropolitan-Business/Corporate Airport.

Metropolitan-Business/Corporate Airports, as defined by the CASP, are airports that serve the same activities as regional airports; are located in urbanized areas; provide for the same flying activities as regional airports with an emphasis on business, charter and corporate flying; accommodate all business jet and turboprop aircraft with a higher level or activity than regional airports; provide full services for pilots and aircraft, including jet fuel; has a published instrument approach and a control tower; provides flight planning facilities. While this is a system planning classification it is noted that Whiteman is unable to accommodate all business jet and turboprop aircraft.

Business/Corporate is defined as the use of an airport by aircraft by an individual for transportation required by a business in which the individual is engaged (the pilot is not compensated); or the use of an airport by aircraft owned or leased by a company to transport its employees and/or property (professional pilot is compensated). Business/Corporate designation is a subcategory to designate prevalent service at a regional or metropolitan airport.

Airport Reference Code

The FAA in its current Advisory Circular (AC) 150/5300-13, Airport Design, has developed an airport reference code (ARC) which is a coding system that relates airport design criteria and planning standards to two components: the operational and physical characteristics of aircraft operating at or expected to operate at the airport. It is an alphanumeric code with the numeric component consisting of a Roman numeral. The letter element of the code is the aircraft approach category and thus relates to operational characteristics. The aircraft approach category is a grouping of aircraft that is based on 1.3 times the stalling speed as follows:

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

The second component of the ARC is the airplane design group and relates to the wingspan and tail height of aircraft and is a physical characteristic. The grouping of aircraft by airplane design group is as follows:

Airplane Design Group	Wingspan	Tail Height
I	Up to but not including 49 feet	Up to but not including 20 feet
II	49 feet up to but not including 79 feet	20 feet up to but not including 30 feet
III	79 feet up to but not including 118 feet	30 feet up to but not including 45 feet
IV	118 feet up to but not including 171 feet	45 feet up to but not Including 60 feet
V	171 feet up to but not including 214 feet	60 feet up to but not including 66 feet
VI	214 feet up to but not including 262 feet	66 feet up to but not including 80 feet

The aircraft approach speed element of the ARC will generally deal with runways and runway related facilities whereas the airplane design group relates to separations required between airfield elements, i.e., runway-taxiway separations, taxilane, and apron clearances, etc.

Critical Aircraft and Associated Airport Reference Code

The ARC to be used for airport master planning, as well as airport layout plans, is the ARC category applicable to the most demanding class of aircraft estimated to fly at least 500 annual operations at the airport. The current Airport Layout Plan (ALP) indicates an existing ARC of B-I, small airplanes exclusively for the airport. This is appropriate for future planning and includes aircraft such as a Beech King Air B100 and Cessna Citation CJ1 aircraft.

ARC B-I, small airplanes exclusively will be used for existing and future planning purposes. Application of planning and design standards for ARC B-I, small airplanes exclusively ensures that all general aviation aircraft that use the airport will be provided facilities that are designed to appropriate standards, in accordance with the planning standards contained in FAA AC 150/5300-13, Airport Design. The existing constraints, namely Osborne and Pierce Streets, prevent the frequent (more than 500 annual operations) accommodation of larger aircraft and more demanding airport design standards. However, larger aircraft can occasionally use the airport at the pilot's discretion. Table 5-1 presents the airport planning standards for Airport Reference Code B-I, small airplanes exclusively.

Table 5-1:
AIRPORT PLANNING STANDARDS
FOR AIRPORT REFERENCE CODE B-I, SMALL AIRPLANES EXCLUSIVELY

AIRPORT DESIGN AIRPLANE AND AIRPORT DATA

Aircraft Approach Category B
Airplane Design Group I, Small Airplanes Exclusively
Airplane wingspan .... 48.99 feet
Primary runway end approach visibility minimums are not lower than 1 mile
Other runway end approach visibility minimums are not lower than 1 mile
Airplane undercarriage width (1.15 x main gear track) .... 15.00 feet
Airport elevation .... 1,003 feet
Airplane tail height .... 19.99 feet

SEPARATION STANDARDS

Runway centerline to parallel runway centerline .... 700 feet
wider runway separation may be required for capacity (See AC 150/5060-5)
Runway centerline to parallel taxiway/taxilane centerline .... 150 feet
Runway centerline to edge of aircraft parking .... 125 feet
Taxiway centerline to parallel taxiway/taxilane centerline .... 69 feet
Taxiway centerline to fixed or movable object .... 44.5 feet
Taxilane centerline to parallel taxilane centerline .... 64 feet
Taxilane centerline to fixed or movable object .... 39.5 feet

RUNWAY PROTECTION ZONE

Runway protection zone: (Runway 12-30)
Length .... 1,000 feet
Width 200 feet from runway end .... 250 feet
Width 1,200 feet from runway end .... 450 feet

Table 5-1 (cont'd)
AIRPORT PLANNING STANDARDS
FOR AIRPORT REFERENCE CODE B-I, SMALL AIRPLANES EXCLUSIVELY

OBSTACLE FREE ZONES

Runway obstacle free zone (OFZ) width	250 feet
Runway obstacle free zone length beyond each runway end	200 feet
Inner-approach obstacle free zone width	250 feet
Inner-approach obstacle free zone length beyond approach light system	200 feet
Inner-approach obstacle free zone slope from 200 feet beyond threshold	50:1
Inner-transitional obstacle free zone slope	0:1

RUNWAY DESIGN STANDARDS

Runway width	60 feet
Runway shoulder width	10 feet
Runway blast pad width	80 feet
Runway blast pad length	60 feet
Runway safety area width	120 feet
Runway safety area length beyond each runway end or stopway end, whichever is greater	240 feet
Runway object free area width	250 feet
Runway object free area length beyond each runway end or stopway end, whichever is greater	240 feet
Clearway width	500 feet
Stopway width	60 feet

THRESHOLD SITING SURFACE

Threshold siting surface: (Runway 12-30)	
Distance out from threshold to start of surface	200 feet
Width of surface at start of trapezoidal section	400 feet
Width of surface at end of trapezoidal section	3,400 feet
Length of trapezoidal section	10,000 feet
Length of rectangular section	0 feet
Slope of section	20:1

TAXIWAY DESIGN STANDARDS

Taxiway width	25 feet
Taxiway edge safety margin	5 feet
Taxiway shoulder width	10 feet
Taxiway safety area width	49 feet
Taxiway object free area width	88.9 feet
Taxilane object free area width	79 feet
Taxiway wingtip clearance	20 feet
Taxilane wingtip clearance	15 feet

Source: FAA Advisory Circular 150/5300-13, Airport Design, Change 13 dated June 18, 2008.

AIRFIELD CAPACITY REQUIREMENTS

Hourly runway capacities and annual service volume (ASV) estimates are needed to design and evaluate airfield development and improvement projects. The method for computing airport capacity is the throughput method described in FAA AC 150/5060-5, Airport Capacity and Delay.

Definition of Terms

The terms used in analyzing airport capacity are defined below:

Aircraft Mix - is the relative percentage of operations conducted by each of four classes of aircraft according to size (A, B, C and D). Table 5-2 identifies the physical characteristics of the four aircraft size classifications and their relationship to terms used in the wake turbulence standards.

Annual Service Volume (ASV) - is a reasonable estimate of an airport's annual capacity. It accounts for differences in runway use, aircraft mix, weather conditions, etc., that would be encountered over a year's time.

Capacity - (throughput capacity) is a measure of the maximum number of aircraft operations (takeoffs and landings) which can be accommodated on the airport or airport component in an hour. Since the capacity of an airport component is independent of the capacity of other components, it can be calculated separately.

Ceiling and Visibility - for purposes of capacity calculations, the following terms are used as measures of ceiling and visibility conditions:

> ***VFR*** - Visual flight rule conditions occur whenever the cloud ceiling is at least 1,000 feet above ground level and the visibility is at least three statute miles.
>
> ***IFR*** - Instrument flight rule conditions occur whenever the cloud ceiling is at least 1,840 feet but less than three statute miles.
>
> ***PVC*** - Poor visibility and ceiling conditions exist whenever the cloud ceiling is less than 1,840 feet and/or the visibility is less than 1 ¼ statute mile.

Table 5-2:
AIRPORT CLASSIFICATIONS

Aircraft Class	Max. Cert. T.O. Weight (lbs.)	Numer of Engines	Wake Turbulence Classification
A, B	12,500 or less	Single	Small (S)
C	12,500 - 300,000	Multi	Large (L)
D	Over 300,000	Multi	Heavy (H)

Source: FAA AC 150/5060-5, Airport Capacity and Delay.

Delay - is the difference between constrained and unconstrained operating time.

Demand - is the magnitude of aircraft operations to be accommodated in a specified time period.

Mix Index - is a mathematical expression. It is the percent of Class C aircraft plus three times the percent of Class D aircraft, and is written % (C+3D).

Percent Arrivals (PA) - is the ratio of arrivals to total operations and is computed as follows:

$$PA = \frac{A + \frac{1}{2}(T\&G)}{A + DA + (T\&G)} \times 100 \text{ where:}$$

A = number of arriving aircraft in the hour

DA = number of departing aircraft in the hour

T&G = number of touch and go's in the hour

Percent Touch and Go's (T&G) - is the ratio of landings with an immediate take-off to total operations and is computed as follows:

$$T\&G = \frac{(T\&G)}{A + DA + (T\&G)} \times 100 \text{ where:}$$

A = number of arriving aircraft in the hour

DA = number of departing aircraft in the hour

T&G = number of touch and go's in the hour

Touch and go operations are normally associated with training. The number of these operations usually decrease as the number of air carrier operations increase, as demand for service approaches runway capacity, or as weather conditions deteriorate.

Runway Use Configuration - is the number, location and orientation of the active runway(s), the type and direction of operations, and the flight rules in effect at a particular time.

Having established the definitions of terms used in the capacity analysis, the balance of this subsection deals with the calculation of runway hourly capacities and the annual service volume.

Annual and Hourly Capacity

Runway hourly capacity is calculated for the different configurations under which the Airport will operate. Since the airfield configuration of Whiteman is basic, symmetric layout (single runway with parallel taxiway, midfield turnoff, and two large fillet taxiways) the different operating configurations are:

- **VFR**
- **IFR**
- **Airport closed** - those periods when weather conditions are below published landing minimums.

The hourly capacity estimates were carried out in accordance with instructions and capacity curves set forth in FAA AC 150/5060-5, Chapter 3. The basic steps followed were:

1. From Figure 3-1 of the AC, the appropriate graph for determining **VFR** hourly capacity is identified.
2. Use Figure 3-3 for **VFR** capacity.
3. Mix Index % (C+3D) = (1+3[0]) = 1%. (Based on forecast fleet mix).
4. Percent Arrivals - 50%. (Arrivals are assumed to equal departures).
5. From Figure 3-3 Hourly **VFR** Base Capacity - 96 operations.
6. Tough-and-go operations are estimated at 5% of total operations. This translates into a touch-and-go factor of 1.04 during **VFR**.
7. Since two runway exits (turnoffs) exists for the exit range determined by FAA (2,000-4,000 feet) an exit factor of 0.94 is obtained from Figure 3-3.
8. **VFR** Capacity = 96*1.04*0.94 = ***94 Operations.***

IFR hourly capacities are lower than VFR capacities as more spacing is needed between operations. The basic following steps as outlined in FAA AC 150/5060-5 were followed:

1. From Figure 3-1 of the AC, the appropriate graph for determining **IFR** hourly capacity is identified.
2. Use Figure 3-43 for **IFR** capacity.
3. Mix Index % (C+3D) = (3+3[0]) = 3%. (Based on forecast fleet mix).
4. Percent Arrivals - 50%. (Arrivals are assumed to equal departures).
5. From Figure 4-15 Hourly **IFR** Base Capacity - 27 operations.
6. Tough-and-go operations are estimated at 0% of total operations. This translates into a touch-and-go factor of 1.00 during **IFR**.
7. Since two runway exits (turnoffs) exists for the exit range determined by FAA (2,000-4,000 feet) an exit factor of 0.99 is obtained from Figure 3-43.
8. **IFR** Capacity = 27*1.00*0.99 = ***27 Operations.***

For the purposes of capacity estimates, the hourly capacity is assumed to be the same for both operating directions (east and west, or Runway 12 or 30) due to the symmetry of the airfield layout.

ANNUAL SERVICE VOLUME (ASV)

The hourly capacities determined in the preceding steps together with the percent of operating conditions are used to calculate a weighted hourly capacity (C_w). For the estimate of **ASV** it was assumed that **IFR** conditions occur 4 percent of the time. The airport was closed 4 percent of the time due to **IFR** conditions below the published minimums for the instrument approach procedures. When not closed, the conditions were assumed to be **VFR** (92 percent of the time).

Based on the above and procedures contained in the AC a weighted hourly capacity of 84 operations is obtained for the airport and is used for estimating **ASV**.

Annual service volume is calculated as:

$$ASV = (C_w)*(D)*(H)$$

where:

C_w = weighted hourly capacity

D = ratio of annual to average day of the peak month (ADPM) demand

H = ratio of ADPM to peak hour demand

Average demand ratios were developed from historical data obtained from the ATCT and used in the projection of peak hour forecasts for the years 2007 and 2008. The ratios derived were a daily demand ratio (D) of 290 and an hourly ratio (H) of 16.2. These were then compared for reasonableness with typical demand ratios provided in the AC. The derived daily ratio represented a reasonable number and fell within the lower end of the range (280-310) contained in the AC and the hourly ratio proved to be higher than the range of 7-11. In order to provide a more conservative estimate of capacity the peaking factors assumed in the AC for long range planning estimates were adopted (D = 290, H = 9).

The **ASV** is then calculated at approximately 219,000 operations. This was then checked against long range planning **ASV** estimates contained in AC 150/5060-5 for the airport configuration and fleet mix. The long range estimate provided in the AC is 230,000 operations. The difference appears to lie in the fact that a Whiteman has recently experienced lower amount of touch-and-go activity than it historically has and than reflected in the long range planning contained within the AC. Since the variance of the **ASV** is due to the recent decline in touch-and-go activity, and touch-and-go activity at the airport will likely increase at the airport within the planning period, it will be assumed that that annual capacity for the airport is 230,000 operations.

It should be noted that the above calculated **ASV** represents the capacity of the present airport. It is also important to note the capacity of an airport is not constant and may vary over time depending upon airfield improvements, airfield or airspace geometry, ATC procedures, weather and mix of aircraft operating at the airport. The capacity of an airport can change with or without airfield improvements.

Demand Versus Capacity

By comparing ASV and hourly capacities with the forecast annual and peak hour demand, the relationship between demand and capacity can be determined. Table 5-3 presents the comparisons of demand versus capacity and as seen it appears that the present airfield will accommodate demand through the planning period.

Table 5-3:
DEMAND VERSUS CAPACITY

	2007	2013	2018	2030
ANNUAL:				
Demand	93,219	113,000	121,900	143,500
Capacity	230,000	230,000	230,000	230,000
Capacity Utilized	41%	49%	53%	62%
WEIGHTED HOURLY				
Demand	47	57	61	72
Capacity	84	84	84	84
Capacity Utilized	56%	68%	73%	86%

Source: DMJM Aviation analysis.

Throughout the twenty year planning period, capacity is adequate, but the relationship of demand and capacity reaches a threshold when capacity requirements are usually considered. Generally, capacity improvements should be recommended when demand is forecast to utilize 60 percent of capacity. This allows sufficient lead time to develop the improvement before the airport becomes saturated. Airport activity levels warranting capacity improvements are contained in FAA Order 5090.3B. As seen in Table 5-3, the forecast demand utilizes more than 60 percent of annual capacity in the 20-year planning period. The hourly capacity is forecasted to utilize more than 60 percent of capacity in the short-term planning period. In the comparison of demand and capacity, the hourly basis will be used due to the lower degree of precision inherent in the **ASV** calculations through application of a range of peaking factors. For example, with a weighted capacity of 84, the **ASV** can be estimated between 164,600 and 286,400 based on typical GA airport demand ratios specified in AD 150/5060-5.

From the preceding demand/capacity analysis it is concluded that airfield (runway/taxiway) improvements may be warranted based upon capacity reasons in the short-term. It is noted that 80 percent of operations on an average day in the peak month occur from 12:00 pm to 6:00 pm. Shifting flight school operations to off peak hours (the morning) would temporarily lower the peak hour demand currently experienced at the airport. This demand management strategy is a temporary measure to relieve peak hour demands at the airport. More permanent capacity measures will be required in the long term, such as additional runway exits.

AIRSIDE FACILITY REQUIREMENTS

As discussed earlier, the airside operating element as used in this report includes the runway and taxiway system, the runway approach areas and the associated appurtenances such as airfield lighting, visual aids, and navigation aids. With the exception of aircraft aprons which, due to their interface with terminal facilities, are analyzed as a landside element, airside refers to those airport areas where aircraft operations are conducted. The ability of the present airside facilities to accommodate existing and future traffic loads and the facilities required through the year 2030 are examined in the following subsections.

Runway System

The existing runway system was described in Chapter 3. This section deals with runway requirements needed to satisfy the forecast demand in terms of runway length, pavement strength requirement, crosswind coverage, and safety areas. Planning and design standards set forth in FAA AC 150/5300-13, Airport Design, for airport reference code B-I, small airplanes exclusively are the basis of this analysis. This will provide satisfactory facilities for the variety of aircraft expected to use the airport.

When determining runway requirements it is important to account for the type of approach the airport has or can be expected to have. Runways with lower visibility minimums have more restrictive requirements. Currently Runways 12 and 30 are equipped for non-precision instrument approaches with visibility minimums not lower than 1 mile. For the purpose of this master plan, these instrument approach capabilities are assumed in the future.

Crosswind Runway

The existing runway system provides 99.42 percent coverage for a 10.5 knot (12 mph) crosswind. FAA states in AC 150/5300-13 that the allowable crosswind is 10.5 knots for Airport Reference Codes A-I and B-I. The coverage provided by the existing runway alignment meets the FAA recommendation of 95 percent crosswind coverage, thus additional runways for improved crosswind coverage are not required.

Runway Length

This subsection deals with the runway length requirements for the existing runway at Whiteman. Runway length is a critical consideration in airport planning and design. Aircraft need specified runway lengths to operate safely under varying conditions of wind, temperature, and takeoff weight.

FAA Advisory Circular 150/5325-4A contains criteria used in developing runway lengths required for various general aviation utility and transport airports. The recommended runway lengths are based on performance information from manufacturer's flight manuals in accordance with provisions in FAR (Federal Aviation Regulations) Part 23, Airworthiness Standards: Normal, Utility, and Acrobatic Category Airplanes, and FAR 91, General Operating and Flight Rules.

Aircraft performance combined with significant site characteristics are considered in analyzing runway length. The site characteristics that are evaluated include: airport elevation, temperature (mean maximum temperature of the hottest month), runway gradient, and wind conditions.

The FAA Airport Design (Version 4.2d) software package contains a program to calculate typical runway requirements for various classes of aircraft. This model was applied and the results are presented in Table 5-4. The airport site characteristics used in the runway length analysis were:

- Elevation – 1,003 feet MSL
- Temperature – 89.3°F
- Maximum Difference in Runway Centerline Elevation – 42.9 feet
- Surface Winds – Calm

Table 5-4:
FAA RECOMMENDED RUNWAY LENGTHS
FOR WHITEMAN AIRPORT

AIRPORT AND RUNWAY DATA

Airport elevation	1,003 feet
Mean daily maximum temperature of the hottest month	89.3° F
Maximum difference in runway centerline elevation	42.9 feet

RUNWAY LENGTHS RECOMMENDED FOR AIRPORT DESIGN

Small airplanes with approach speeds of less than 30 knots	330 feet
Small airplanes with approach speeds of less than 50 knots	880 feet
Small airplanes with less than 10 passenger seats	
75 percent of these small airplanes	2,850 feet
95 percent of these small airplanes	3,380 feet
100 percent of these small airplanes	4,000 feet
Small airplanes with 10 or more passenger seats	4,450 feet
Large airplanes of 60,000 pounds or less	
75 percent of these large airplanes at 60 percent useful load	5,240 feet
75 percent of these large airplanes at 90 percent useful load	7,160 feet
100 percent of these large airplanes at 60 percent useful load	6,100 feet
100 percent of these large airplanes at 90 percent useful load	9,100 feet
Airplanes of more than 60,000 pounds	approx. 5,360 feet

Sources: FAA Advisory Circular 150/5325-4A, Runway Length Requirements for Airport Design.
DMJM Aviation application of FAA Airport Design (Version 4.2d).

The critical aircraft for Whiteman Airport are single engine and multi-engine aircraft which primarily weigh less than 12,500 pounds. As seen in Table 5-4, the recommended runway lengths for small airplanes with less than 10 passenger seats is 2,850 to 4,000 feet.

The present length of Runway 12-30 is 4,120 feet which is estimated to satisfy the requirements for 100 percent of small airplanes with less than 10 passenger seats.

Runway Width

Runway width is a dimensional standard that is based upon the physical and performance characteristics of aircraft using the airport (or runway). The characteristics of importance are wingspan and approach speeds. In this case, FAA Airplane Design Group I, small aircraft exclusively (wingspans up to but not including 49 feet) and approach category B are used and will provide adequate width and separation for current and anticipated aircraft operations. FAA AC 150/5300-13 specifies a runway width of 60 feet for an airport reference code of B-I, small aircraft exclusively. The present runway is 75 feet wide and exceeds the standard.

Runway Grades

The maximum longitudinal grade is 2.0 percent for runways serving aircraft approach category B aircraft. The existing maximum longitudinal runway grade is 2.0 percent and therefore longitudinal grade for the runway is within acceptable limits. The runway should have adequate transverse slopes to prevent the accumulation of water on the surface. A maximum transverse grade of 1.0 to 1.5 percent is recommended for the airport by FAA. Based on inspection of digital topographical mapping obtained for this study, it appears the runway complies with these standards.

Pavement Strength

As mentioned in Chapter 3, based on information contained in the latest U.S. Government Flight Information Publication/Facility Directory the runway pavement strength is 12,500 pounds for single wheel landing gears. The pavement strength is determined by the design aircraft (Beech King Air) weight and gear configuration. Dual-wheel configuration is approximately double the single-wheel configuration pavement strength (approximately 25,000 pounds). This is adequate to accommodate aircraft expected to use the airport in the future. Therefore strengthening of the runway pavement is not required. The runway is capable of accommodating heavier aircraft on an infrequent basis. However, regular operations by heavier aircraft will damage the runway pavement. The runway and taxiway were rehabilitated in 2006 and pavement maintenance should occur throughout the planning period. The County has a slurry seal project planned for the apron in the short-term.

Runway Signage

Whiteman Airport has signs on the airfield including exit signs for both runway directions to all taxiways, holding position signs along with taxiway location signs on all taxiways that intersect the runway. Signage at Whiteman Airport meets standards.

Runway Blast Pads

A runway blast pad provides blast erosion protection beyond runway ends. Runway 12-30 requires blast pads that are 80 feet wide and 60 feet long in accordance with airport reference code B-I, small aircraft exclusively criteria. The end of Runway 30 has a blast pad that is 77 feet wide and 68 feet long. The end of Runway 12’s blast pad is 78 feet wide and 48 feet long. These do not meet FAA requirements. There is a quasi blast fence on Runway 12. Consideration should be given to provide enhanced blast protection if it can be practicably provided and remain clear of FAR Part 77 surfaces.

Runway Safety Area

A runway safety area (RSA) is defined as a rectangular area centered about the runway that is cleared, drained, graded, and usually turfed. Under normal conditions, this area should be capable of accommodating occasional aircraft that may veer off the runway, as well as fire fighting equipment. For Whiteman Airport, the existing and future requirement for Runway 12-30 to accommodate airport reference code B-I, small aircraft exclusively is an area 120 feet wide centered on the runway centerline, and extending 240 feet beyond each runway end. Of the 240 feet required as extended RSA, only 55 feet is provided at Runway 12 and 73 feet at Runway 30. Runway 12 RSA is traversed by Pierce Street and Sutter Avenue and encompasses three buildings. Runway 30 RSA is traversed by Osborne Street. Figure 5-1 shows the Whiteman Airport safety areas. Full RSA is provided at Whiteman through the application of declared distances.

Runway Object Free Areas

The runway object free area (ROFA) is a two dimensional ground area surrounding the runway and its clearing standard precludes parked aircraft, agricultural operations, and objects, except those fixed by function. The criterion replaces the former design standard of the aircraft parking limit line and is designed with the intention of providing adequate wing-tip clearance. The design standards for an ARC of B-I, small aircraft exclusively call for a ROFA extending 125 feet on either side the runway centerline and extending 240 feet beyond the end of the runway. Object free areas also exist for taxiways and are 89 feet wide (44.5 feet on either side of centerline) for Airplane Design Group I.

As noted in Chapter 3, the required ROFA extended beyond Runways 12 and 30 is not available. The ROFA is traversed by the perimeter fence, local roads, and includes neighboring residential areas. Same as the RSA, only 55 feet of unobstructed ROFA exist at the end of Runway 12 and 73 feet beyond Runway 30. Runway 12 ROFA is traversed by Pierce Street and Sutter Avenue and includes approximately five buildings and at least one light pole. Runway 30 ROFA is traversed by Osborne Street and within it are at least three power line poles and a building. Figure 5-1 shows safety areas and surrounding land uses. Full ROFA is provided through the application of declared distances.

Runway Obstacle Free Zone

The runway obstacle free zone (OFZ) is a two dimensional ground area surrounding the runway. The OFZ clearing standard precludes taxiing and parked airplanes and object penetrations, except for frangible visual NAVAIDs that need to be located in the OFZ because of their function. The design standards for an ARC of B-I call for an OFZ extending 200 feet beyond each of the runway ends. For runways serving small airplanes with approach speeds of 50 knots or more the width of the OFZ is 250 feet, or 125 feet on either side of the runway centerline. Of the required 200 feet, 55 feet and 73 feet respectively are traversed by the perimeter fence. In addition, Runway 12 OFZ includes Pierce Street, Sutter Avenue, and approximately three buildings. Runway 30 OFZ is traversed by Osborne Street and two buildings (see Figure 5-1). Similar to the RSA and ROFA, full OFZ is provided through the application of declared distances.

Declared Distances

Declared distances are applied when standard safety areas beyond the runway threshold are not met. Deviations from the runway safety area, runway obstacle free zone, and runway object free area may be mitigated through the application of declared distances as an alternative to constructing full safety areas. As detailed in Chapter 3, four distances are declared for each runway end: takeoff run available (TORA); takeoff distance available (TODA); accelerate stop distance available (ASDA); and, landing distance available (LDA).

As noted in Chapter 3, declared distances are currently applied to Whiteman Airport because full RSA, OFZ, and ROFA are not provided. The existing declared distances, were established sometime in the 1990s. Table 5-5 contains the published declared distances for the airport. A preliminary review was conducted of the declared distances. This review recognized two factors: 1) more accurate topographic data which was obtained for this study and 2) removal of obstacles near Runway 30. The review concluded that ASDA and LDA for both runways could be slightly increased. However, the use of declared distances at general aviation airports is uncommon and alternatives should be considered to provide full safety areas without applying declared distances.

Table 5-5:
PUBLISHED DECLARED DISTANCES

Distance	Runway 12	Runway 30
Takeoff Run Available (feet)	3,442’	3,191’
Takeoff Distance Available (feet)	4,120’	4,120’
Accelerate Stop Distance Available (feet)	3,910’	3,940’
Landing Distance Available (feet)	3,181’	3,462’

Source: FAA Form 5010.

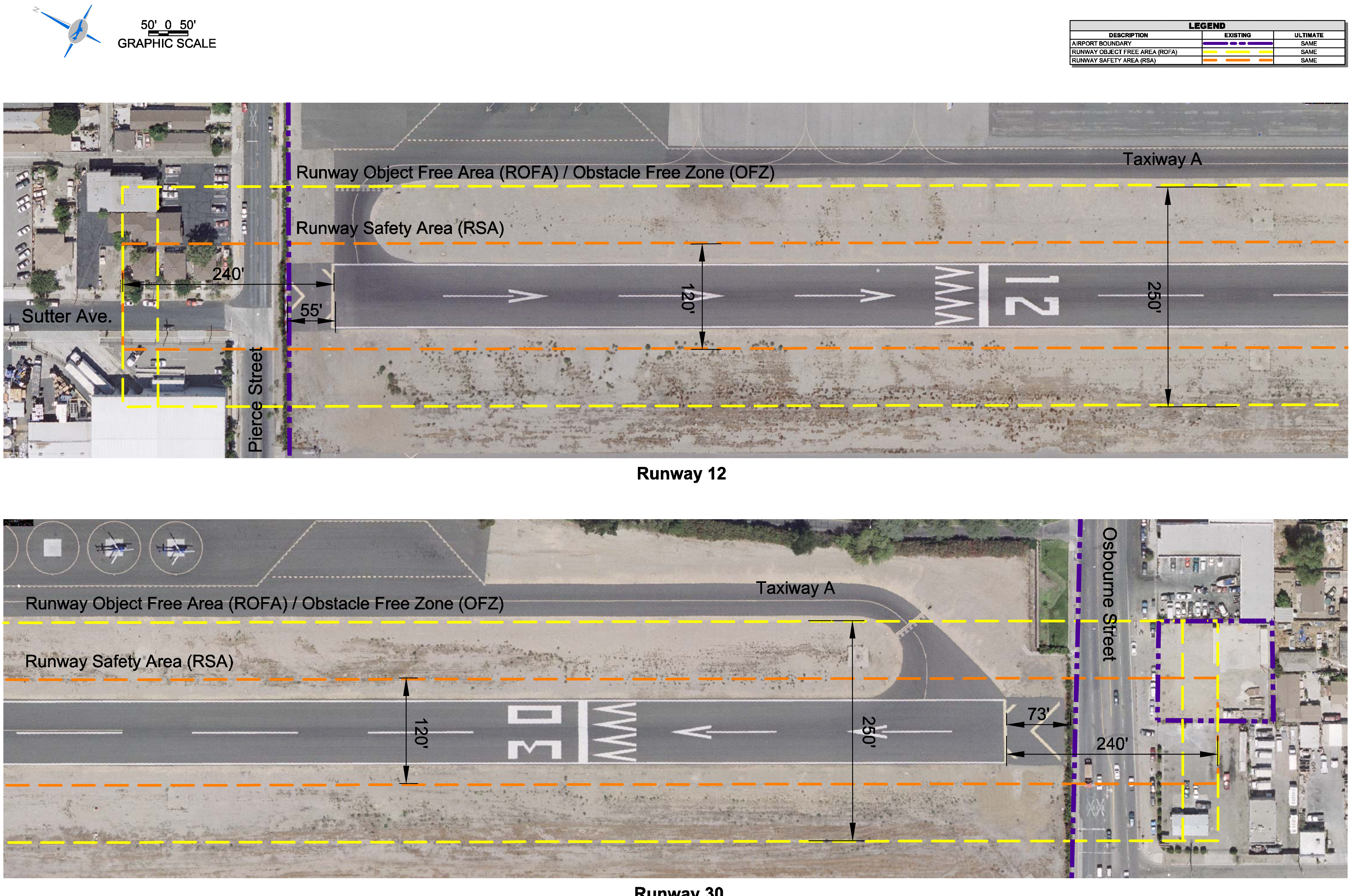

Figure 5-1
Runway 12-30 Safety Zones

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Threshold Siting Surface

Appendix 2 of FAA Advisory Circular 150/5300-13, Airport Design, contains guidance on locating runway thresholds to meet approach obstacle clearance requirements using threshold siting surfaces. If an object penetrates a threshold siting surface, one or more of the following actions is required: 1) the object is removed or lowered to preclude the penetration; 2) the threshold is displaced to preclude the object penetration; 3) visibility minimums are raised; 4) night operations are prohibited; or 5) raising the threshold crossing height.

The shape, dimensions and slope of a threshold siting surface are dependent upon the type of aircraft operations, landing visibility minimums and types of instrumentation available. For the purpose of this analysis, a threshold siting surface for the following type of runway is assumed: "Approach end of runways expected to support instrument night circling."

The applicable threshold siting surface is described as follows. The centerline of the surface extends 10,000 feet along the extended runway centerline. The surface extends laterally on each side of the centerline 200 feet from the runway threshold and increases to a width of 1,700 feet on each side of the runway centerline at the end of the surface. The beginning of the elevation is 200 feet from the runway threshold, and the surface extends outward and upward at a slope of 20 to 1.

Based on a review of the obstacles in the vicinity of the airport and current threshold siting criteria, displaced thresholds for Runway 12 and 30 are properly located. As noted in Chapter 3, the approach slopes to both runways is higher than standard, due to obstacles. Should a standard approach slope be desired, the displaced thresholds would need to be relocated.

Approach Surfaces and Runway Protection Zones

The approach surface and the runway protection zone (formerly called clear zone) are important elements in the design of runways which help to ensure the safe operations of aircraft. A brief description of these two areas follows:

- **The Approach Surface** is an imaginary inclined plane beginning at the end of the primary surface and extending outward to distances up to 10 miles depending on runway use (i.e., instrument or visual approaches). The width and slope of the approach surface are also dependent on runway use. The approach surface governs the height of objects on or near the airport. Objects should not penetrate or extend above the approach surface. If they do, they are classified as obstructions and must be either marked or removed.

- **The Runway Protection Zone (formerly Clear Zone)** is an area at ground level that provides for the unobstructed passage of landing aircraft through the above airspace and is used to enhance the protection of people and property on the ground. The clear zone has evolved into the runway protection zone (RPZ). This evolution is noticed in the location, size, and permissible uses within the zone. The RPZ, as applied according to current FAA design standards, begins at the end of the primary surface and has a size which varies with the designated use of the runway. Land uses specifically prohibited from the RPZ are residences and places of public assembly (churches, schools, hospitals, office buildings, shopping centers, and other uses with similar concentrations of persons typify places of public assembly). Fuel storage facilities also should not be located in the RPZ.

Federal Aviation Regulations Part 77 indicates that the approach surface should be kept free of obstructions to permit the unrestricted flight of aircraft in the vicinity of the airport. As the type of instrument approach to a runway becomes more precise, the approach surface increases in size and the required approach slope becomes more restrictive.

The runway protection zone is the most critical safety area under the approach path and should be kept free of all obstructions. No structure should be permitted nor the congregation of people allowed within the runway protection zone. Control of the runway protection zone by the airport owner is preferred. The airport owner should acquire adequate property interests, preferably in fee title, in the runway protection zone to ensure compliance with the above when practicable. However, at a developed airport, such as Whiteman, avigation easements present a more realistic approach than acquiring property.

As indicated above, the approach and runway protection zone dimensions are dependent on the type of approach being made to a runway. Presented in Table 5-6 are runway protection zone dimensions for various type runways. As previously noted, visibility minimums for Runways 12 and 30 are not lower than 1 mile. Runway 12 RPZ is completely off airport property. Runway 30 RPZ is mostly off airport property except for a 0.3 acre (approximately) rectangle. Runway 12 RPZ encompasses approximately 39 buildings and is traversed by Sutter Avenue, Jouett Street, Carl Street, and Hoyt Street. Runway 30 RPZ encompasses approximately 53 residences and is traversed by San Fernando Road, Correnti Street, Wingo Street, Bromwich Street, and Osborne Street (see Figure 5-2). Residential development is not a compatible land use within an RPZ.

Table 5-6:
RUNWAY PROTECTION ZONE DIMENSIONS

Approach Visibility Minimums	Facilities Expected To Serve	Runway Protection Zone Dimensions			
		Length (Feet)	Inner Width (Feet)	Outer Width (Feet)	Area (Acres)
Visual and Not lower than 1 mile	Small Aircraft Exclusively	1,000	250	450	8.035
	Aircraft Approach Categories A & B	1,000	500	700	13.770
	Aircraft Approach Categories C & D	1,700	500	1,010	29.465
Not lower than ¾ mile	All Aircraft	1,700	1,000	1,510	48.978
Lower than ¾ mile	All Aircraft	2,500	1,000	1,750	78.914

Source: FAA Advisory Circular 150/5300-13, Airport Design.

Control of the runway protection zone may be acquired in fee or through easement and is an eligible item under the FAA Airport Improvement Program. These land uses at Whiteman have existed within the RPZ for many years and are likely to remain.

Building Restriction Line

According to AC 150/5300-13, the building restriction line (BRL) is defined as a line identifying suitable building area locations on airports. It encompasses runway protection zones, runway object free areas,

100' 0 100'
GRAPHIC SCALE

LEGEND		
DESCRIPTION	EXISTING	ULTIMATE
AIRPORT BOUNDARY		SAME
RUNWAY PROTECTION ZONE (RPZ)		SAME

Runway 12

Runway 30

Figure 5-2
Runway 12-30 Runway Protection Zones

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runway and taxiway visibility zone critical areas, areas required for terminal instrument procedures, and airport traffic control tower clear line of sight.

In the case of Whiteman, the BRL should be located 125 feet from the runway centerline on the southwest side and 194 feet on the northeast side. This marks the outline of the TOFA on the northeast side and the ROFA on the southwest side of Runway 12-30. The BRL also includes the air traffic control tower line of sight, which is defined as a line from the control tower to the furthest midpoint of both RPZs.

Taxiways

Runway 12-30 has a centerline-to-centerline separation from Taxiway A of 150 feet, which meets requirements contained in FAA AC 150/5300-13, Airport Design (Change 13 dated June 19, 2008), for airport reference code B-I, small aircraft exclusively. The FAA runway to parallel taxiway standard precludes any part of an airplane (tail, wingtip, nose, etc.) on a parallel taxiway centerline from being within the runway safety area or penetrating the OFZ.

Airspace and Navigational Aids

There are no special use airspace areas such as restricted, prohibited or warning areas that influence the airport. Whiteman is Class C airspace. The airspace in the immediate vicinity of Whiteman is Class E (starting at the surface) northwest, Class E (starting at 700 feet above the surface) north and northeast, and Class C south, east, and west. Whiteman is also within 30 nautical miles of the LAX Class B airspace south of the airport and is within the Mode C veil for LAX. Aircraft departing at Whiteman are required to fly with automatic pressure altitude reporting equipment having Mode C capability. Aircraft climbing above 3,000 feet or flying south or east of Whiteman must establish two-way radio communication with Burbank before entering its Class C airspace. Below 3,000 feet, pilots must establish two-way radio communication with Van Nuys before entering its Class D airspace west of the airport. As it was described in Chapter 3, the airport has two instrument approaches, and is a controlled airport with various visual aids.

The airport is served by a GPS and a VOR approach. These approaches permit landings with visibilities as low as one mile and a 1,840-foot minimum descent height. Runway 12-30 is also equipped with a two-box precision approach path indicator (PAPI) on either runway end with a 3.8 degree glide path. This glide path is steeper than standard due to obstacles in the vicinity of the airport. Both runways are also equipped with runway end identifier lights (REIL).

The County expressed an interest in installation of an automated weather observation station (AWOS) / automated surface observing system (ASOS). It is suggested that the County pursue a WAAS (Wide Area Augmentation System)/LPV (Lateral Precision Performance with Vertical Guidance) approach to the airport. WAAS/LPV approaches are enhanced GPS based approaches, and precision approaches (approaches with lateral and vertical guidance) can be developed using this technology. The County has expressed interest in pursuing development of a WAAS approach at Whiteman. In order for the approach to be developed, new obstruction data is required, which is an AIP eligible project.

LANDSIDE FACILITY REQUIREMENTS

The airport landside system is comprised of all facilities supporting the movement of goods between the community's ground transportation system and the airport's airside system, and also any facilities used in the maintenance or protection of those facilities. For Whiteman, these include general aviation terminal/administration building, aircraft storage and services, automobile parking, and airport support facilities. The landside elements, together with the previously discussed airside elements, form all of the airport development facilities required to accommodate the forecast level of traffic.

Since the airfield development program has been based upon an ultimate level of some 143,500 operations and 874 based aircraft, the planning of landside facilities should be based upon striking a balance of airside and landside capacity. The determination of general aviation and support area facilities has been accomplished for the three future planning periods of 2013 (short term), 2018 (intermediate term), and 2030 (long term).

The following subsections present the rationale for determining future landside facility requirements to serve the general aviation role of the airport.

General Aviation Terminal

Terminal facilities at Whiteman relate to those required to support general aviation operations. The existing terminal building is approximately 2,800 square feet.

The amount of general aviation terminal space required is based upon the expected demand, i.e., the peak hourly volume of pilots and passengers who will use the facilities. A planning standard of 44 square feet per peak hour pilot/passengers is used to determine the required area. Table 5-7 shows the breakdown of the planning standard. An estimated 2.5 pilot/passengers are assumed per peak hour operation. Table 5-8 shows the building requirements that were calculated using the above approach.

Table 5-7:
DERIVATION OF REQUIREMENTS FOR GENERAL AVIATION TERMINAL BUILDINGS

Operational Use	Area Required (SF) Per Peak Hour Pilot/Passenger
Waiting Area/Pilot's Lounge	15
Management Operations	3
Public Conveniences	1.5
Circulation, Mechanical, Maintenance	24.5
Total	44

Note: Space requirements for circulation, mechanical and maintenance should be allocated equally among other terminal building uses in calculating total building requirements.

Table 5-8:
GENERAL AVIATION TERMINAL AREA REQUIREMENTS

Item	2013	2018	2030
Peak Hour Operations	57	61	72
Total Peak Hour Occupants	143	153	180
Area/Occupant (SF)	44	44	44
Total Building Area (SF)	6,270	6,710	7,920

Source: DMJM Aviation.

As Table 5-8 indicates, a terminal area requirement of approximately 8,000 square feet is required in 2030. Currently the 1,250 square feet terminal building is used for offices and a conference room. A 360 square feet pilot lounge with computer, internet, printer, cable television, planning area, and telephone is provided at the terminal/building. The equipment shed consists of two storage areas (435 and 320 square feet, respectively) and the pilot supply shop is approximately 415 square feet. To accommodate future traffic, an additional 5,120 square feet general aviation terminal should be built. There has also been interest by the County and airport management to have meeting rooms and office spaces that can be leased. Approximately 3,200 square feet (in 2030) is assumed to accommodate meeting rooms and office space resulting in an additional 1,950 square feet needed for the main building. In addition, it is suggested to accommodate 4,000 square feet of restaurant area by 2030. Currently, the restaurant area is 2,730 square feet. Demand in 2013, 2018, and 2030 is forecast at 3,000 square feet, 3,500 square feet, and 4,000 square feet respectively.

Transient Aircraft Parking Apron

The overall requirements for facilities are driven by the desires of the market. Aircraft parking apron is required primarily for visiting transient aircraft as most based aircraft are stored in hangars. These are aircraft that land at Whiteman, but are based elsewhere. A busy itinerant day is derived from the average day of the peak month forecasts (ADPM) of aircraft activity and forms the basis of estimating transient parking apron requirements. Currently transient aircraft park on the transient apron east of the runway. Summarized in Table 5-9 are the transient apron requirements.

Transient aircraft parking apron requirements were determined by applying the following assumptions to itinerant movements performed by transient aircraft on an ADPM.

- Transient operations are approximately 50 percent of itinerant aircraft operations.
- The majority of transient aircraft will arrive and depart on the same day, thus it is assumed that the actual number of aircraft utilizing the parking apron is one-half (50 percent) of the transient movements being performed on the average day of the peak month.
- During the planning period, 50 percent of the transient aircraft will be on the ground at any given time.
- Thus, 25 percent of transient operations (during ADPM) will be temporarily parked on the transient apron.

Table 5-9:
TRANSIENT AIRCRAFT TO BE ACCOMMODATED ON TRANSIENT AIRCRAFT APRON

Number of Aircraft to be Accommodated	2013	2018	2030
Annual Transient Operations	30,500	33,550	40,200
Peak Month Transient Operations	3,050	3,355	4,020
ADPM Transient Operations	102	112	134
Number of Aircraft Parked	25	28	34
Size of Transient Aircraft Apron			
Single Engine: Number of Aircraft [a]	22	24	28
Area/Aircraft (SY)	300	300	300
Apron Area (SY)	6,600	7,200	8,400
Multi- Engine/Helicopter: Number of Aircraft [a]	2	3	4
Multi-Engline/Helicopter: Area/Aircraft (SY)	625	625	625
Apron Area (SY)	625	1,250	1,250
Turboprop/Small Jet: Number of Aircraft [a]	1	1	2
Turboprop/Small Jet: Area/Aircraft (SY)	1,600	1,600	1,600
Apron Area (SY)	1,600	1,600	3,200
Total Aircraft	25	28	34
Total Apron Area (SY)	8,825	10,050	12,850

Source: DMJM Aviation.
[a] Based upon estimated mix of transient aircraft

Consistent with the forecast for 2030, 81,405 square feet (9,054 square yards) of apron space will be required for all single engine transient aircraft; all multi-engine aircraft and helicopters will require 11,250 square feet (1,250 square yards); and all turboprops and small jets will require 28,800 square feet (3,200 square yards) of apron for parking and maneuvering.

The analysis concludes that roughly 13,500 square yards of apron for 34 aircraft are required to accommodate transient demand in 2030. Currently eight of approximately 212 existing tie-down areas are reserved for transient aircraft, which does not meet current demand. There are approximately 238,674 square yards of aircraft apron, of which approximately 1,200 square yards are the transient tie-downs. By 2030, if operations increase as forecast, 26 new transient tie-downs should be allocated or built, for a total area of approximately 13,500 square yards. On the airport there are derelict aircraft using tie-downs. Consideration should be taken to locating these derelict aircraft to less remote locations to provide parking spaces for active aircraft.

Based Aircraft Storage

Aircraft based at the airport can be stored either by occupying a paved tie-down parking space or by storage within a hangar. The number of aircraft stored in hangars varies according to the desire for hangar space versus apron storage, the economics of providing hangars, and the severity of weather conditions prevailing at the airport location. The number of based aircraft at Whiteman may increase from the present level of approximately 612 to 874 aircraft in the year 2030. Adequate storage facilities should be provided to accommodate forecast based aircraft. In determining the demand for the various types of storage, the following assumptions were made:

- Approximately two-thirds of the present aircraft at Whiteman Airport are stored in hangars.
- All turboprops and small jets will be stored in small conventional/large box hangars.
- It is assumed that 70 percent of single engine and multi-engine aircraft will be stored in T-hangars. Multi-engine aircraft will require a larger size T-hangar.
- Approximately 50 percent of based helicopters will be stored in rectangular or conventional hangars with each helicopter requiring 1,620 square feet of floor space.

For the purpose of this analysis of facility requirements, hangars are generally categorized into two basic types, "conventional", bay or community type hangars and "individual" hangars. Conventional hangars are large structures that will accommodate several aircraft of different sizes in an open bay, while individual hangars are sized to accommodate one aircraft. Individual hangars may be portable hangars, T-hangars, or rectangular ("box") hangars. Conventional hangars can serve a variety of aircraft including turboprops and small jets and individual hangars primarily serve personal use aircraft and smaller business use aircraft. Individual hangars can be combined to create an apparently larger structure. Figure 5-3 presents the different types of individual hangars and a typical conventional hangar.

For the purpose of this analysis, individual hangar requirements are determined as number of spaces, or units and may be provided through a mix of rectangular, T-hangar, and portable hangars. Table 5-10 summarizes the storage hangar requirements for based aircraft determined in this analysis.

Table 5-10:
BASED AIRCRAFT STORAGE HANGAR REQUIREMENTS BASED TAF RECONCILED

	2013	2018	2030
Single Engine Piston			
Number of Based Aircraft	611	658	783
Number of Aircraft in Individual Hangars*	407	439	522
Multi-Engine Piston			
Number of Based Aircraft	37	40	48
Number of Aircraft in Individual Hangars*	25	27	32
Turboprop/Small Jets			
Number of Based Aircraft	17	19	24
Number of Aircraft in Individual Hangars*	17	19	24
Area/Aircraft (SF)	1,600	1,600	1,600
Conventional Hangar Floor Area (SF)	27,200	30,400	38,400
Helicopters			
Number of Based Aircraft	15	15	18
Number of Aircraft in Individual Hangars*	8	8	9
Area/Aircraft (SF)	1,620	1,620	1,620
Rectangular/Conventional Hangar Floor Area (SF)	12,150	12,150	14,580
Other			
Number of Based Aircraft	0	0	0
Number of Aircraft in Individual Hangars*	0	0	0
Total Based Aircraft	680	732	873
Total Aircraft Hangared	457	492	587
Required Individual Hangar (Spaces)*	432	465	554
Required Conventional Hangar Area (SF)	39,350	42,550	52,980

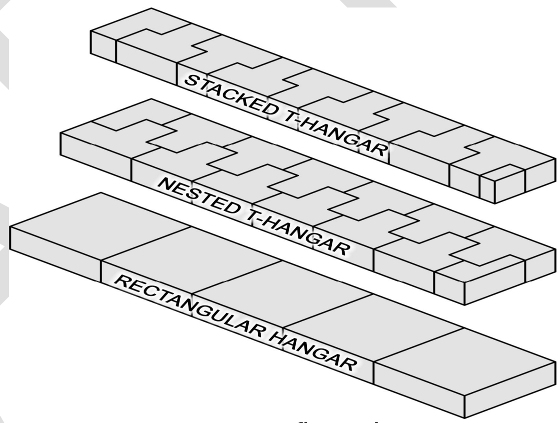
*May be rectangular, T-hangar, or portable hangar.
Source: DMJM Aviation analysis.

INDIVIDUAL HANGARS

Portable Hangar

T-Hangar

Rectangular Hangar



Hangar Configurations

CONVENTIONAL HANGARS

Conventional Hangars

Figure 5-3
Hangar Types

Table 5-11:
BASED AIRCRAFT STORAGE
HANGAR COMPARISON

Item	Existing	Deficiency 2009-2013	2014-2019	2020-2030
Individual Hangar (Spaces)	407	25	58	147
Rectangular/Conventional Hangar (SF) (helicopter)	8,100	4,050	4,050	6,480
Conventional Hangar (SF) (fixed wing)	36,865	0	0	8,825

Source: DMJM Aviation analysis.

Table 5-11 shows that if based aircraft increase as forecasted, 147 new individual hangars will be needed in 2030. In addition, the replacement of old hangars (primarily the County hangars) should be anticipated in the 20 year planning study. As maintenance costs of the older hangars continue to rise, it will become less economical for the County to continue maintaining these hangars. Based on forecasted based helicopters, approximately 6,500 square feet of conventional hangar space will be needed. Fixed wing aircraft will require approximately 8,800 square feet of additional hangar space to accommodate 2030 traffic.

The Reconciled Terminal Area Forecast projects 786 single engine and 48 multi-engine aircraft in the year 2030. These are assumed to be stored in individual hangars and tie-downs. As it can be seen from the previous summary table, an additional 147 individual hangars are required in 2030. By 2030, a total of 18 helicopters are forecast at the airport, half of which are expected to be stored in hangars. This is an additional four helicopters in individual hangars.

Three approaches are available to the County in providing hangars. The first would involve leasing land to aircraft owners and allowing them to construct their own hangars. To assure uniformity in construction as well as visually pleasing results, the airport owner (the County) could control the type of hangar built by a clause in the land lease. An alternative to the above would be for the airport owner to construct the hangars and then rent or lease them to aircraft owners. If this approach is followed, firm commitments for their use should be made before construction of the hangars are undertaken. A third approach is to have a complex of hangars built by a private party on property leased by the airport. The County prefers to lease land to private parties to develop a complex of hangars.

An alternative to aircraft storage hangars is to provide space on the parking apron with tie-down facilities to secure the aircraft during severe weather or periods of high winds (Table 5-12). For planning purposes, an allowance of 300 square yards for single engine and 625 square yards for multi-engine and helicopters can be used to calculate the size of the based aircraft tie-down area. For the purposes of establishing an overall facility program of the master plan, an area suitable for an additional 115 single engine aircraft will be provided. It is noted that the County currently operates approximately 212 aircraft tie-downs which is adequate to satisfy based needs. As previously stated, transient aircraft parking needs in 2030 require approximately 26 additional tie-downs.

Table 5-12:
WHITEMAN TIE-DOWN FACILITIES

Item	Existing	2013	2018	2030	Deficiency
Based Aircraft (Spaces)	212	227	244	290	78
Single Engine	N/A	204	219	261	
Multi-Engine	N/A	12	13	16	
Helicopter	N/A	11	11	13	
Transient Aircraft (Spaces)	8	25	28	34	26
Total	220	252	272	324	104

Source: DMJM Aviation analysis.

Table 5-12 breaks down the need for additional tie-downs. Since there is a deficiency of transient tie-downs, an additional 17 transient and 15 based aircraft tie-downs should be built by 2013. Once transient tie-down demand is met, each year the demand will increase by approximately four tie-downs. By 2030 it is assumed that a rehabilitation of apron pavement will be required.

Aircraft Maintenance Facilities

Fixed Base Operators at Whiteman Airport provide major airframe repair and major power plant repairs services. Aircraft maintenance provided at the airport include general repair, structural maintenance, preventative maintenance, modifications, annual inspections, interior services, helicopter repair, and aircraft restoration. Adequate space for anticipated demand is provided.

Automobile Parking

For general aviation users, the parking areas are designed to accommodate peak activity periods. A generally accepted value for computing the amount of general aviation parking space needed is 1.3 spaces per peak hour general aviation pilot/passenger. This factor takes into account airport employees, rental car spaces, and visitors as well as pilots/passengers. The area required per automobile is 350 square feet, which includes circulation routes and other necessary clearances within the parking area. The projected general aviation auto parking requirements are summarized in Table 5-13.

Table 5-13:

Item	2013	2018	2030
Peak Hour Operations	57	61	72
Total Occupants	143	153	180
Spaces/Occupant	1.3	1.3	1.3
Total Parking Spaces (Each)	186	199	234
Area/Parking Space (SF)	350	350	350
Total Parking Area (SF)	65,065	69,615	81,900

AUTOMOBILE PARKING REQUIREMENTS FOR GENERAL AVIATION USERS

Source: DMJM Aviation.

There are approximately 100 existing parking spaces provided for general aviation at the terminal building, with additional parking available in the hangars. The existing auto parking facilities were documented in Chapter 3. As seen in Table 5-13 a requirement of 234 spaces is identified. Some based aircraft owners will park their cars in hangar or tie-down space, but there is a need for more parking spaces. Currently there are no designated parking spots in the hangar areas. Designated automobile parking areas and spaces should be defined. Additional parking facilities should be constructed as part of individual hangar developments. In addition, segregation of vehicle and air traffic is recommended.

Aircraft Rescue and Fire Fighting (ARFF) Facilities

The FAA requires Aircraft Rescue and Fire Fighting (ARFF) facilities for airports 14 CFR Part 139 certification. Part 139 certification is required for airports having scheduled air carrier operations. General aviation airports like Whiteman are not required to obtain Part 139 certification and therefore are not required to have ARFF facilities at the airport. Rescue and fire fighting response is provided by the local available Fire Departments/ Agencies. As such, responders typically are not trained in aircraft rescue and fire fighting techniques. However, airport staff are trained to be first responders. The nearest fire station to potentially respond is immediately adjacent to the airport.

Airport Maintenance

The airport has a tool shed next to the terminal/administrative building and multiple vehicles as needed to conduct routine maintenance. Vehicles are stored near the terminal building on an approximately 1,000 square foot outdoor parking/maintenance area. The tool shed itself is approximately 435 square feet with an attached 406 square foot covered storage area. An additional 320 square feet of area is available in a storage container for tools and equipment. Consideration should be given to providing an airport maintenance facility able to accommodate storage, a small shop and a yard to park maintenance vehicles. A 1,000 square foot maintenance building, situated on about a half acre of land should be adequate for the planning period.

Aviation Fuel Storage

Fuel storage requirements were determined for the airport based upon the forecast of 100 Octane and Jet A flowage contained in Chapter 4. The storage requirements for both types of gas are determined on the following basis:

- Peak month flowage is 10 percent of annual flowage.
- Peak month is divided by 30 to determine the average day flowage in the peak month.
- A 14-day supply is provided.

Table 5-14 summarizes the fuel storage requirements. Currently there are two 20,000 gallon tanks installed at the airport. One holds 100 Octane, the other Jet A. As seen in Table 5-14, both 100 Octane and Jet A 14-day storage needs are below 20,000 gallons. While the current tanks meet the long-term requirement there may be consideration for a new fuel facility within the planning period.

Table 5-14:
AVIATION FUEL STORAGE REQUIREMENTS

Item	2013	2018	2030
100 Octane			
Annual Flowage	294,000	317,100	372,600
Peak Month Flowage	29,400	31,710	37,260
Average Day Flowage in Peak Month	980	1,057	1,242
Storage Capacity (14-day reserve)	13,720	14,798	17,388
Jet A			
Annual Flowage	162,000	178,000	221,000
Peak Month Flowage	16,200	17,800	22,100
Average Day Flowage in Peak Month	540	593	737
Storage Capacity (14-day reserve)	7,560	8,307	10,313

Source: DMJM Aviation analysis.

Oil Recycling Center

Presently, there are two oil recycling centers on the airfield. A third may be considered, depending on the ultimate landside configuration.

Summary of Landside Requirements

Table 5-15 summarizes existing facilities and planning requirements for Whiteman Airport. These requirements accommodate the forecasted 874 based aircraft and 143,500 operations of the TAF Reconciled Forecast that was assumed for facility planning purposes. As previously stated, the commitment to build and provide facilities will depend on the actual demand that materializes, and not forecasted demand.

GROUND ACCESS

Access to the airport is primarily provided by Osborne Street to Airport Drive. Osborne Street connects to Interstate 5 (I-5) and San Fernando Road. San Fernando Road connects to State Road 118. Since two major roads provide access to Whiteman Airport and there is direct access to I-5, needs for ground access is assumed to be adequate throughout the planning period.

Table 5-15: SUMMARY OF LANDSIDE REQUIREMENTS

Item	Existing	2013	2018	2030	Additional Facilities (2030)
GA Terminal (SF)	2,800	6,270	6,710	7,920	5,120*
Transient Apron (number of aircraft/area in SY)					
Single engine/Multi-engine	8/5,340	24/7,737	27/8,299	32/10,295	24/5,045
Turboprops/Small jets	1 acft.	1/1,600	1/1,600	2/3,200	1/1,600
Individual hangars (spaces)	407	432	465	554	147
Conventional Hangar Space (SF) (fixed wing)	36,865	33,275	36,475	45,690	8,825
Conventional Hangar Space (SF) (helos)	0	6,075	6,075	7,290	7,290
Based Aircraft Tie-downs (number of aircraft)	212	227	244	290	78
Auto Parking (spaces)	152	186	199	234	82
Airport Maintenance (acres)	0.5	0.5	0.5	0.5	0
Fuel Storage (gallons)					
Avgas	20,000	20,000	20,000	20,000	0
Jet A	20,000	20,000	20,000	20,000	0

* Including meeting rooms and office spaces
SF = square feet, SY = square yards
Source: DMJM Aviation.

AIRPORT SECURITY

The Transportation Security Administration (TSA), in cooperation with the general aviation community, has developed guidelines to enhance security at general aviation airports. To evaluate security needs at a specific airport, TSA has developed an Airport Characteristics Measurement Tool along with Whiteman's ranking. Table 5-16 displays the Airport Characteristics Measurement Tool along with Whiteman's ranking. Overall risk is measured on a scale of 0 to 55 (highest risk), and grouped into four levels. Suggested security enhancements are given for each level (see Figure 5-4).

Whiteman Airport falls into the second highest level of risk, with 28 points. Figure 5-4 displays the suggested security measures for this risk level and are summarized below.

- **Access Controls.** Physical barriers, such as fences, should be constructed around the airport perimeter securing it from unauthorized access. Physical barriers can also be in the form of natural barriers. Whiteman Airport has a perimeter fence including gate access policies and procedures. A perimeter fencing project is planned for 2011 and 2012.

- **Lighting System.** Security lighting provides a means to deter theft, vandalism, or other illegal activity at night. Security lighting should not interfere with aircraft operations. Whiteman has a lighting system installed. Airport tenants at Whiteman responded to a survey indicating a need for an improved lighting system and surveillance.

- **Personnel ID System.** Airport operators may wish to implement a method to badge employees and other authorized tenants, granting access to various areas of the airport. Whiteman Airport tenants are required to fill out personal information and reading policies and procedures before obtaining access to the gate entrances.

Table 5-16:
AIRPORT CHARACTERISTICS MEASUREMENT TOOL

Security Characteristics	Assessment Scale [a]	Whiteman Airport
Location		
Within 30 nm of mass population areas [b]	5	5
Within 30 nm of a sensitive site [c]	4	4
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	3
26-100 based aircraft	2	-
11-25 based aircraft	1	-
10 or fewer based aircraft	-	-
Based aircraft over 12,500 pounds	3	0
Runways [d]		
Runway length equal to or greater than 5,000 feet	5	-
Runway length less than 5,000 feet, greater than 2,001 feet	4	4
Runway length 2,000 feet or less	2	-
Asphalt or concrete runway	1	1
Operations		
Over 50,000 annual operations	4	4
Part 135 operations	3	0
Part 137 operations	3	0
Part 125 operations	3	0
Flight training	3	3
Flight training in aircraft over 12,500 pounds	4	0
Rental aircraft	4	4
Maintenance, repair, and overhaul facilities conducting long term storage of aircraft over 12,500 pounds	4	0
Total	**55**	**28**

[a] Assess points for every characteristic that applies to the airport.
[b] Mass population area – area with total metropolitan population of at least 100,000 people.
[c] Sensitive sites – areas which would be considered key assets or critical infrastructure of the United States. Sensitive sites can include certain military installations, nuclear and chemical plants, centers of government, monuments and iconic structures, and/or international ports.
[d] Facilities with multiple runways should only consider the longest runway on the airport.

<table>
<tr><th colspan="4">Points/Suggested Guidelines</th></tr>
<tr><th>>45</th><th>25-44</th><th>15-24</th><th>0-14</th></tr>
<tr><td>Fencing
Hangars
Closed Circuit TV
Intrusion Detection System</td><td></td><td></td><td></td></tr>
<tr><td colspan="2">Access Controls
Lighting System
Personnel ID System
Vehicle ID System
Challenge Procedures</td><td></td><td></td></tr>
<tr><td colspan="3">Law Enforcement Officer Support
Security Committee
Transient Pilot Sign-In/Out Procedures</td><td></td></tr>
<tr><td colspan="4">Signs
Documented Security Procedures
Positive Passenger/Cargo/Baggage ID
All Aircraft Secured
Community Watch Program
Contact List</td></tr>
</table>

Figure 5-4
Risk Level and
Suggested Airport Security Enhancements

- **Vehicle ID System.** Vehicles can be identified through the use of decals, stickers, or tags, aiding airport personnel and law enforcement in identifying authorized vehicles. All vehicles on airport property are required to have a hanging tag on the rearview mirror at Whiteman.

- **Challenge Procedures.** Challenge procedures include a developing community watch program, and encouraging airport tenants to challenge unfamiliar people at the airport. Tenants are encouraged to challenge strangers or people performing suspicious activities. In addition, tenants are asked to wait at the access gate until it is closed to prevent “piggy-backing” – allowing multiple vehicles on to the airport. The based aircraft owner’s survey indicated “piggy-backing” was a security-issue at the airport.

- **Law Enforcement Officer Support.** Airport operators are encouraged to have regular patrols of the airport by local law enforcement. Airport staff regularly patrols the airport. County Sheriff previously provided airport patrols. The contract was cancelled in 2008 and the County should investigate methods to provide law enforcement officer support.

- **Security Committee.** An airport security committee is composed of airport tenants and users drawn from all segments of the airport community. The main goal of the group is to involve airport stakeholders in developing effective and reasonable security measures and disseminating timely security information. Whiteman Airport is starting a security committee. The first meeting is scheduled for March 1, 2009.

- **Transient Pilot Sign-In/Out Procedures**. Sign in and out procedures can help identify non-based (transient) pilots and aircraft using the airport. Such procedures exist at Whiteman.

- **Signs.** Signs should be posted to warn against unlawful activity. Signs are posted at Whiteman to deter people from unlawfully entering the airport.

- **Documented Security Procedures.** Written procedures to guide airport operators on security guidelines, protocols, and procedures. Prior to receiving access to airport gates, tenants are required to read policies and procedures at Whiteman.

- **Positive Passenger/Cargo/Baggage ID.** Prior to boarding the pilot should ensure that the identify of all passengers are verified and all baggage and cargo is known to the occupants.

- **All Aircraft Secured.** All aircraft secured in locked hangar facilities or locked on the apron.

- **Contact List.** Including law enforcement and other emergency contacts.

LAND AREA REQUIREMENTS

The land use on an airport will vary depending on the role and volume of traffic. For Whiteman Airport, the on-airport land uses can be broadly categorized into four categories described herein.

The ***aircraft operating area (AOA)*** is defined as that area on-airport that lies within the building restriction lines (BRL) and runway protection zones (formerly clear zones). It includes the runways, taxiways, associated safety areas and lateral clearances, and runway approaches. The FAA defines the BRL as a line which identifies suitable building area locations and encompasses the runway protection zones, the runway object free area, the runway visibility zone, NAVAID critical areas, areas required for terminal instrument procedures (TERPS), and areas required for clear line of sight from the control tower (when applicable).

As previously mentioned, based on the existing taxiway location the existing building restriction line should be located 194 feet from the runway centerline on the northeast side and 125 feet on the southwest side of Runway 12-30. As seen above and as defined by FAA, runway protection zones (RPZs) are also encompassed within the BRL (if they are located on airport property). Therefore, the BRL is assumed to be the general boundary of the AOA.

Areas of the airport serving landside aviation facilities can be categorized as ***aeronautical use area***. This would include general aviation uses such as storage hangars, tie-downs and transient aprons, terminal and administration building, potential FBO sites, aircraft maintenance, and auto parking.

The use of airport property for non-aviation purposes can enhance the revenue generating potential, and often can ensure the economic subsistence of the airport. Such land uses can be indicated on airport layout plans as ***airport compatible use areas***. It is important that it be determined that accommodation of all anticipated requirements for aviation facilities be provided before consideration of non-aviation uses of airport property. Airport compatible uses would include business and office parks, industrial and light manufacturing, commercial, and research and development uses. The extent of airport area to be allocated for airport compatible uses depends on the extent of aviation facilities needed to accommodate forecast demand, and the demand for the non-aviation land uses.

The current airport is approximately 187 acres. The breakdown of current airport property is shown on Table 5-17 and graphically presented on Figure 5-5. Areas classified as open space reflect undeveloped and vacant areas on the airport including the hill and vacant area west of the runway. It should be noted that runway protection zones, except for a small rectangle, are not within the airport property line.

Table 5-17:
LAND AREAS AT WHITEMAN AIRPORT

Category	Acreage	Percent
Aircraft Operating Area (AOA)	32	17
Aeronautical Use Areas	84	45
Airport Compatible Use Areas	8	4
Open Space	63	34
Total	187	100

Note: Other reflects undeveloped, vacant area on the airport.
Source: DMJM Aviation.

As seen in Table 5-16, roughly one-fifth of the airport is aircraft operating area (AOA) category. Almost half of the airport is aeronautical use area. Aeronautical use area includes all apron and hangar area. Four percent are revenue support areas, which are industries that are non-airport related on airport property. Open space, which includes the hill and the empty space adjacent to San Fernando Road, covers a third of airport property.

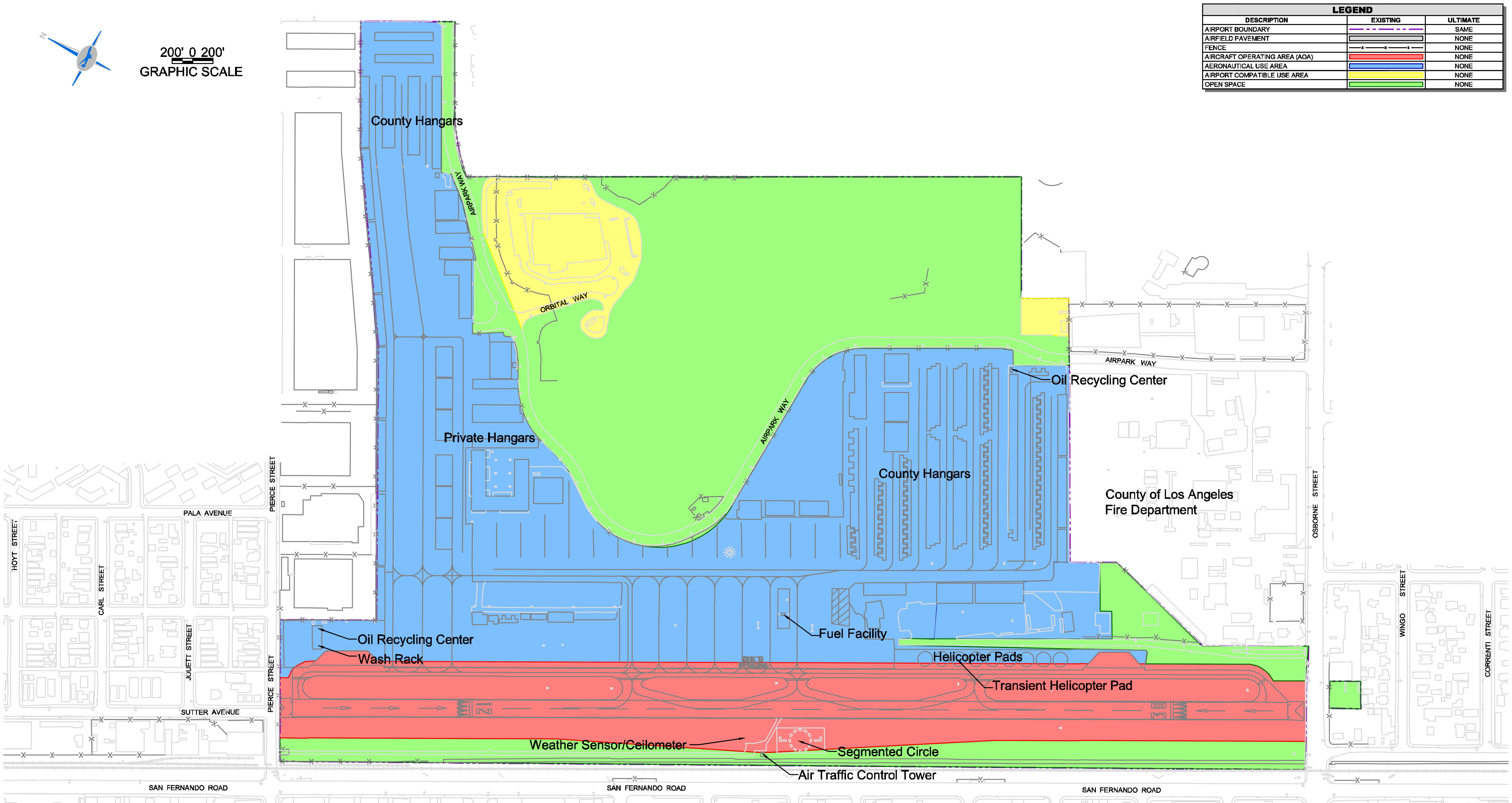


Figure 5-5
Existing Airport Land Uses

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