COLONEL JAMES JABARA AIRPORT

AIRPORT MASTER PLAN

AIRPORT MASTER PLAN

for

COLONEL JAMES JABARA AIRPORT
Wichita, Kansas

Final Technical Report

Prepared For
THE CITY OF WICHITA
WICHITA AIRPORT AUTHORITY

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Wichita, Kansas

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INVENTORY

INVENTORY

CITY OF WICHITA
Wichita Airport Authority

The initial step in the preparation of the airport master plan update for Colonel James Jabara Airport is the collection of information pertaining to the airport and the area it serves. This chapter assembles collected information which will be used in subsequent analyses in this study. Within this chapter is an inventory of existing airport facilities, area airspace, and air traffic control. Additionally, background information regarding the City of Wichita and the regional area is collected. This includes information regarding the airport's role in regional, state, and national aviation systems, surface transportation, and the socioeconomic profile.

The information outlined in this chapter provides a foundation, or starting point, for all subsequent chapters. Therefore, it is essential that a complete and accurate inventory is conducted since the findings and assumptions made in this plan are dependent on information collected. The information outlined in this chapter was obtained through on-site inspections of the airport, interviews with Wichita Airport Authority (WAA) staff and airport tenants, and documents provided by the WAA, and the Federal Aviation Administration (FAA).

AIRPORT SETTING

As depicted on **Exhibit 1A**, Colonel James Jabara Airport is located in the northeast portion of the City of Wichita in Sedgwick County, approximately seven miles northeast of Wichita's central business district. Wichita serves as the county seat and is the

regional and economic hub of south central Kansas and northern Oklahoma.

Regionally, the airport is located 145 statute miles southwest of Topeka, Kansas; 145 miles northeast of Oklahoma City, Oklahoma; 204 miles southwest of Kansas City, Missouri; and 285miles south of Lincoln, Nebraska. Access to the airport includes Highway K-96, which connects with Interstate 35 (The Kansas Turnpike) and Interstate 135, which runs through central Wichita. The airport's main access from Highway K-96 is Webb Road, which bounds the airport on the west. The airport is also accessible from secondary roads such as 21st Street North, 29th Street North, and 37th Street North. On-airport access is provided by Jabara Road, which was the original paved runway at the airport.

AIRPORT HISTORY AND ADMINISTRATION

Colonel James Jabara Airport was a private airport (previously named Comotara Airpark) purchased by the Wichita Airport Authority to function as a general aviation reliever airport to Wichita Mid-Continent Airport. The Airport was renamed in honor of Colonel James Jabara, a decorated combat pilot who served in World War II and the Korean War.

Midwest Corporate Aviation is the only fixed base operator (FBO) at the airport. Services offered by this FBO include fuel, parking (hangars and tie-downs), flight training, aircraft rental, aircraft charters, maintenance, avionics, aircraft modifications, and a passenger lounge.

Colonel James Jabara Airport, which currently occupies approximately 600 acres, is owned by the Wichita Airport Authority and operated by the City of Wichita, pursuant to 1975 legislation by the State of Kansas. The thirteen-member airport advisory board is responsible for providing overall guidance. Final decision-making power rests with the Wichita City Council, doing business as the Wichita Airport Authority. The Wichita Airport Authority also maintains jurisdiction over Wichita Mid-Continent Airport. The Authority is funded by leases entered into with the various airport tenants.

AIRPORT SYSTEM PLANNING ROLE

Airport planning exists at local, regional, and national levels. Each level has a different emphasis and purpose. The update of the Colonel James Jabara Airport Master Plan provides planning at the local level. At the regional level, it is the responsibility of the Tri-County Airport System Plan to identify airports in Sedgwick, Harvey, and Butler counties that make up the airport system that provides for aviation needs in this region. The five public airports that make up the Tri-County Airport System include Wichita Mid-Continent, Augusta Municipal, Colonel James Jabara, Newton City-County, and El Dorado Airports. The Plan has further confirmed that three of these airports (Augusta Mu-

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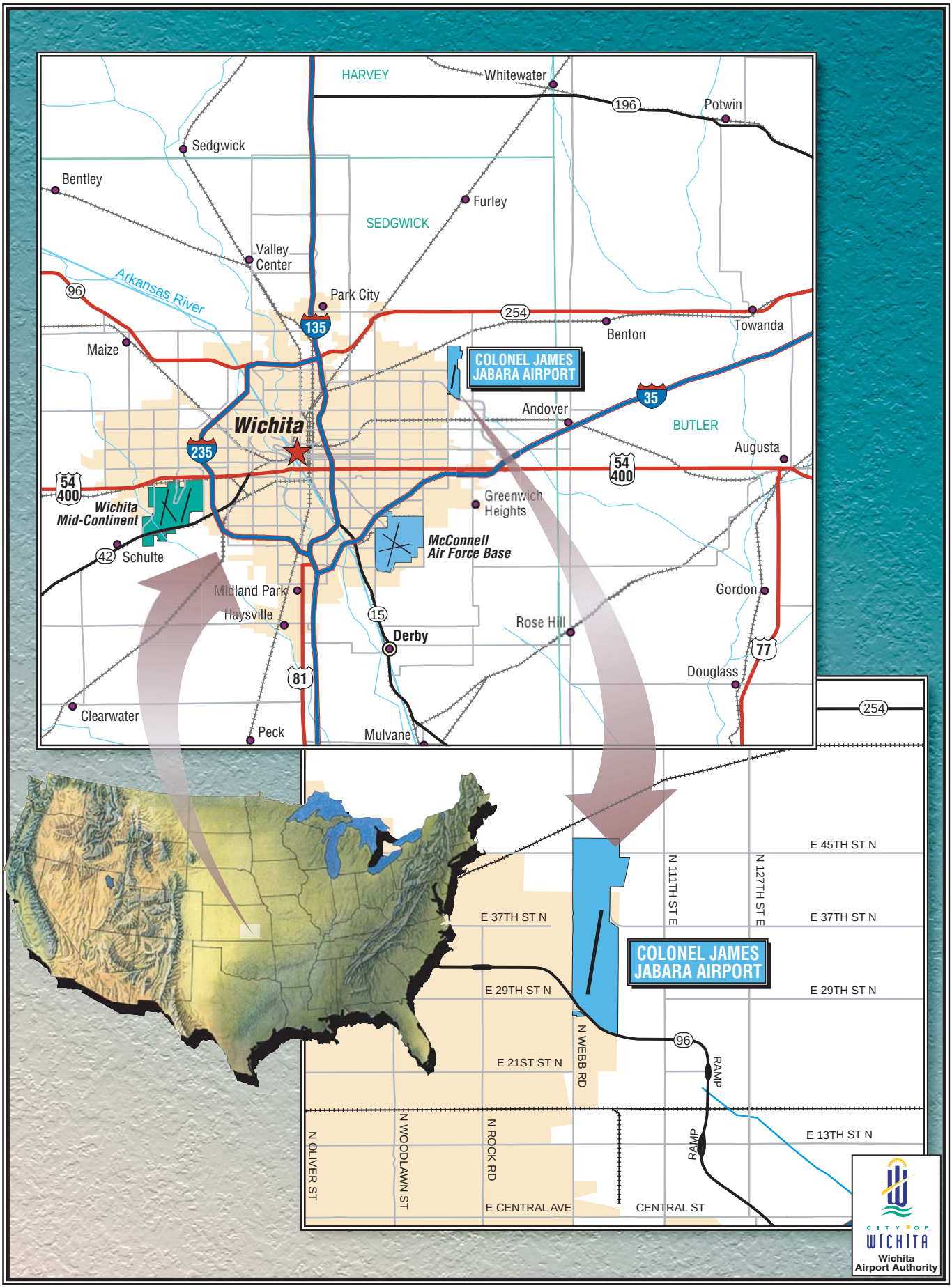

Exhibit 1A
AIRPORT VICINITY MAP

nicipal, Colonel James Jabara, and Newton City-County Airports) are suited to serve as relievers to Wichita Mid-Continent Airport.

At the national level, the airport is included in the *National Plan of Integrated Airport Systems* (NPIAS). This plan identifies 3,344 existing airports which are significant to national air transportation, as well as airport development necessary to meet the present and future requirements in support of civil needs. An airport must be included in the NPIAS to be eligible for federal funding assistance. Colonel James Jabara Airport is classified as a reliever airport in the NPIAS.

AIRPORT FACILITIES

Airport facilities can be functionally classified into two broad categories: airside and landside. The airside category includes those facilities directly associated with aircraft operations. The landside category includes those facilities necessary to provide a safe transition from surface to air transportation and support aircraft servicing, storage, maintenance, and operational safety.

AIRSIDE FACILITIES

Airside facilities include runways, taxiways, airfield lighting, and navigational aids. Airside facilities are identified on **Exhibit 1B**. **Table 1A** summarizes airside facility data.

Runways

As depicted on **Exhibit 1B**, Colonel James Jabara Airport is currently served by a single concrete runway oriented in a north-south direction. Runway 18-36 measures 6,100 feet in length by 100 feet in width.

The load bearing strengths for Runway 18-36 are as follows: 40,000 pounds SWL and 62,000 pounds DWL. Single wheel loading (SWL) refers to the design of certain aircraft landing gears which have a single wheel on each main landing gear strut. Dual wheel loading (DWL) refers to the design of certain aircraft landing gears which have two wheels on each main landing gear strut.

Helipad

The airport is also equipped with a lighted helicopter landing area. This concrete helipad, which measures 50 feet x 50 feet, is located south of the FBO facilities.

Taxiways

Taxiways serve to transition aircraft safely from air to ground facilities. The runway is served by a full-length parallel taxiway, as well as a series of adjoining taxiways. All taxiways are 40 feet wide, with the exception of the Taxiway L (which is 35 feet wide) and the T-hangar taxiways (which are 20 feet or 25 feet wide). The taxiway system at the airport is depicted on **Exhibit 1B**.

TABLE 1A
Airside Facility Data
Colonel James Jabara Airport

	Runway 18-36
Runway Length (feet)	6,100
Runway Width (feet)	100
Runway Surface Material	Concrete/Grooved
Condition	Good
Pavement Markings	Precision Instrument (18) Nonprecision Instrument (36)
Runway Load Bearing Strength (lbs.)	
Single Wheel Loading (SWL)	40,000
Dual Wheel Loading (DWL)	62,000
Runway Lighting	High Intensity
Taxiway Lighting	Medium Intensity
Approach Aids	PAPI-4 (Runway 18) PAPI-4 (Runway 36) REILs – MALSR (18)
Instrument Approach Procedures	GPS VOR VOR/DME RNAV (Runway 18) ILS-18 (pending)
Weather or Navigational Aids	Automated Surface Observation System (ASOS) Segmented Circle Lighted Wind Cone

Source: *Airport Facility Directory*; North Central U.S. (January 23, 2003). Updated January 2005.

Airfield Lighting

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

Identification Lighting: The location of the airport at night is universally identified by a rotating beacon. A rotating beacon projects two beams of light, one white and one green, 180 degrees apart. The rotating beacon at Colonel James Jabara Airport is located mid-field, east of Webb Road.

Pavement Edge Lighting: Pavement edge lighting utilizes light fixtures placed near the edge of the pavement to define the lateral limits of the pavement. This lighting is essential for safe operations during night and/or times of low visibility in order to maintain safe and efficient access to and from the runway and aircraft parking areas. At Colonel James Jabara Airport, Runway 18-36 is equipped with high intensity runway lighting (HIRL). All taxiways

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Exhibit 1B
EXISTING AIRSIDE FACILITIES

at the airport are equipped with medium intensity taxiway lighting (MITL).

Visual Approach Lighting: A precision approach path indicator (PAPI-4) is located at both ends of Runway 18-36. A PAPI consists of a system of lights located at a given distance from the runway threshold. When interpreted by the pilot, these lights give him or her an indication of being above, below, or on the designed descent path of the runway.

The approach end of Runway 18 is equipped with a medium intensity approach lighting system with runway alignment indicator lights (MALSR). A MALSR provides visual guidance to landing aircraft by radiating light beams in a directional pattern by which the pilot aligns the aircraft with the extended centerline of the runway (updated January 2005).

Runway End Identification Lighting: Runway end identification lights (REILs) provide rapid and positive identification of the approach end of the runway. The REIL system consists of two synchronized flashing lights, located laterally on each side of the runway threshold, facing the approaching aircraft. REILs are installed on each end of Runway 18-36.

Airfield Signs: Airfield identification signs assist pilots in identifying their location on the airfield and directing them to their desired location. Lighted signs are installed at all taxiway and runway intersections.

Pilot-Controlled Lighting: The airfield lighting systems are controlled by a photocell (on/off) or manual switch and a pilot-controlled system (PCL). The PCL allows pilots to increase the intensity of the airfield lighting systems from the aircraft with the use of the aircraft's radio transmitter.

Pavement Markings

Pavement markings aid in the movement of aircraft along airport surfaces and identify closed or hazardous areas on the airport. The precision markings on Runway 18-36 identify the runway centerline, designation, touchdown point, threshold, aircraft holding positions, and pavement edge.

Taxiway and apron centerline markings are provided to assist aircraft using these airport surfaces. Taxiway centerline markings assist pilots in maintaining proper clearance from pavement edges and objects near the taxiway/taxilane edges. Pavement edge markings also identify aircraft parking and aircraft holding positions.

Weather and Communication Aids

Colonel James Jabara Airport is equipped with an automated surface observation system (ASOS). The ASOS provides automated aviation weather observations 24 hours a day. The system updates weather observations every minute, continuously reporting significant weather changes as they occur. The ASOS system reports

cloud ceiling, visibility, temperature, dew point, wind direction, wind speed, altimeter setting (barometric pressure), and density altitude (airfield elevation corrected for temperature).

The airport is also equipped with a lighted wind cone and segmented circle, which provides pilots information about wind conditions. A segmented circle provides traffic pattern information to pilots. The lighted wind cone and segmented circle are located east of the runway at midfield. An additional wind cone is located near the end of Runway 36.

LANDSIDE FACILITIES

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

General Aviation Facilities

Midwest Corporate Aviation (MCA) is the only fixed-base operator (FBO) at Colonel James Jabara Airport. MCA leases all of the buildings at the airport, including four 10-unit T-hangars and seven conventional hangars. MCA also operates the administration building and apron areas. Their services include aircraft charters, aircraft sales, flight instruction, aircraft maintenance and modification, avionics, a passenger lounge, fuel, hangars, and parking.

Hangar Storage Facilities

Conventional and T-hangar space is available to general aviation users of Colonel James Jabara Airport. Conventional hangar space is provided in MCA's main hangar (approximately 22,000 square feet), six storage hangars located next to the FBO (79,000 square feet total), and an additional 15,000 square-foot storage hangar located south of Taxiway C. T-hangar space at the airport includes four 10-unit T-hangars ranging in size from 9,000 square feet to 16,000 square feet. These four T-hangars are located on the north end of the airfield. The hangar facilities at Colonel James Jabara Airport are identified on **Exhibit 1C**.

Aircraft Parking Apron

The aircraft parking apron at Jabara Airport is located along the west side of Taxiway A and extends between the FBO and Taxiway E. The apron has approximately 54,200 square yards of concrete in the area between Taxiways D and E (excluding pavement in front of hangars) and is used for parking based and transient aircraft.

Aircraft Rescue and Firefighting Facilities

There are no aircraft rescue and firefighting (ARFF) facilities located at

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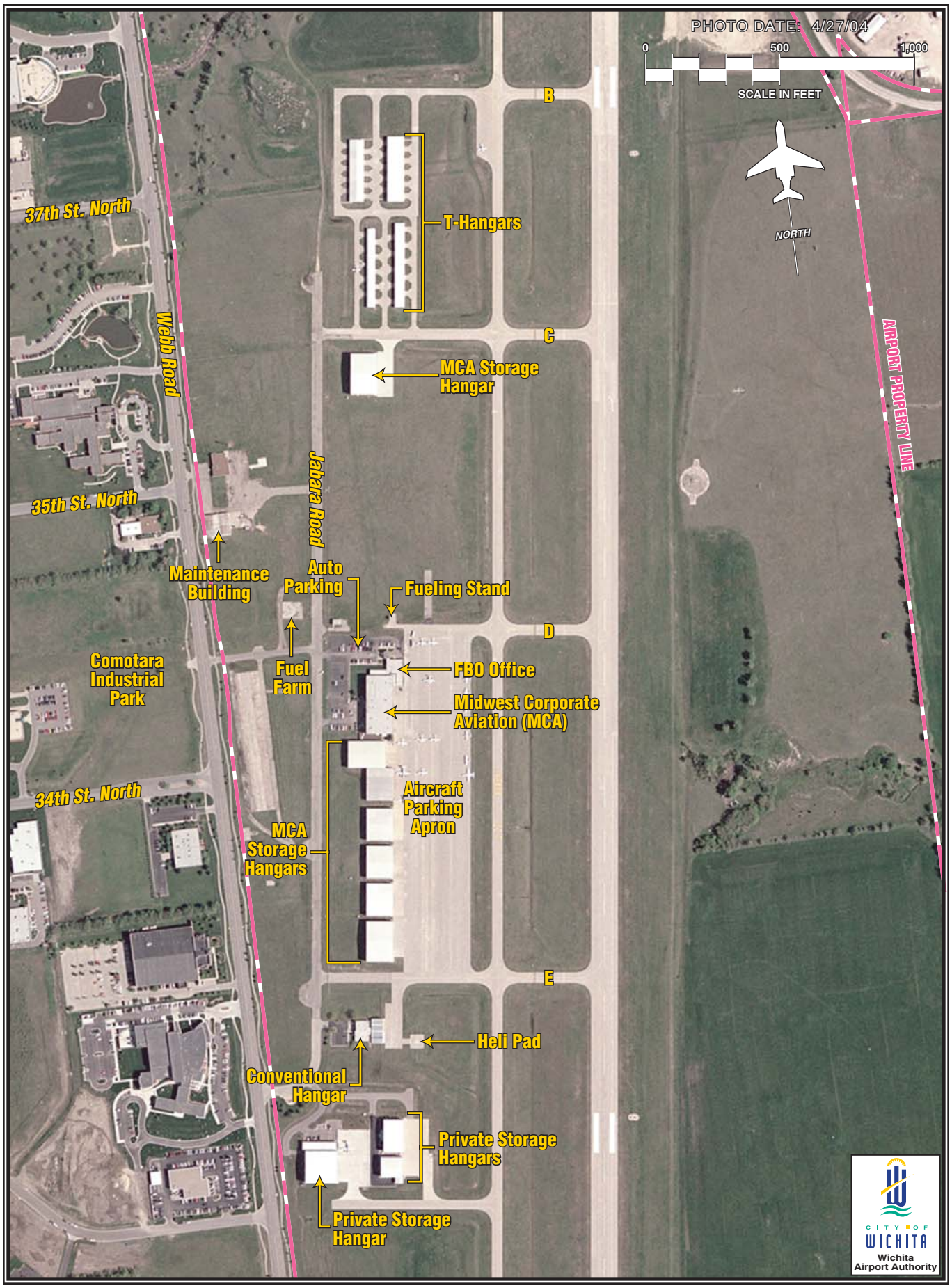

Exhibit 1C
EXISTING LANDSIDE FACILITIES

Colonel James Jabara Airport. ARFF services are provided by the City of Wichita with a fire station located one mile south of the airport on Webb Road.

Fuel Farm

Midwest Corporate Aviation operates five underground fuel storage tanks with a total capacity of 52,000 gallons. Three of the tanks are used to store Jet A fuel, while the other two are used to store 100 LL fuel. Fuel is distributed by fuel transport trucks.

Maintenance Facilities

The airport's maintenance facility is located on the far west side of the airfield. The building encompasses approximately 9,000 square feet.

Automobile Parking

A total of approximately 88 public parking spaces are available on the airport's property. The majority are located near the FBO facilities.

Utilities

Utility companies serving the airport include Westar, the electric company which supplies bulk electricity to the airport. All services are buried on airport property. Gas services are tapped into a pipeline owned by Kansas Gas Service. The airport's water supply and sanitary sewer system is furnished by the City's municipal system. The major water supply sources are reservoirs supplied by local rivers and deep wells. Sewage treatment is supplied by facilities on the airport connecting it with municipal sanitary sewer lines west of Webb Road.

ENROUTE NAVIGATION AND AIRSPACE

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

The VOR provides azimuth readings to pilots of properly equipped aircraft by transmitting a signal at every degree to provide 360 individual navigational courses. Frequently, distance measuring equipment (DME) is combined with a VOR facility to provide distance as well as direction information to the pilot. Military tactical air navigation aids (TACANS) and civil VORs are commonly combined to form a VORTAC. A VORTAC provides distance and direction information to civil and military pilots. Pilots flying to or from the airport can utilize the Wichita VORTAC, which is located approximately 17 nautical miles west of the airport. The Hutchison VOR/DME, located approximately 37 nautical miles northwest of the airport, can also be utilized by pilots fly-

ing to or from Colonel James Jabara Airport. These facilities are identified on **Exhibit 1D**.

The NDB transmits radio signals which pilots of properly equipped aircraft can determine the bearing to or from the NDB facility and then track to or from the station. Colonel James Jabara Airport does not have an NDB located on the field. However, pilots can utilize the Newton NDB (located approximately 19 nautical miles north), the El Dorado NDB (located approximately 19 nautical miles east), or the Wellington NDB (located approximately 27 nautical miles south-southwest). These facilities are identified on **Exhibit 1D**.

GPS is an additional navigational aid for pilots enroute to the airport. GPS was initially developed by the United States Department of Defense for military navigation around the world. Increasingly, GPS has been utilized more in civilian aircraft. GPS uses satellites placed in orbit around the globe to transmit electronic radio signals, which pilots of properly equipped aircraft use to determine altitude, speed, and navigational information. The FAA is proceeding with a program to gradually replace all traditional enroute navigational aids with GPS over the next 20 years.

Instrument Approach Procedures

Instrument approach procedures are a series of predetermined maneuvers established by the FAA, using electronic navigational aids, that assist pilots in locating and landing at an airport during low visibility and cloud ceiling conditions. There are currently four published instrument approaches to Colonel James Jabara Airport: VOR/DME RNAV Runway 18, VOR or GPS-A, GPS Runway 18, and GPS Runway 36. Approaches to Runway 18-36 are nonprecision instrument approaches. A non-precision approach provides only course guidance information to the pilot.

The capability of an instrument approach is defined by the visibility and cloud ceiling minimums associated with the approach. Visibility minimums define the horizontal distance that the pilot must be able to see in order to complete the approach. Cloud ceilings define the lowest level a cloud layer (defined in feet above the ground) can be situated for the pilot to complete the approach. If the observed visibility or cloud ceilings are below the minimums prescribed for the approach, the pilot cannot complete the instrument approach. The different minimum requirements for visibility and cloud ceilings are varied dependent on the approach speed of the aircraft.

The VOR/DME RNAV Runway 18 and GPS Runway 18 approaches provide the airport with the lowest minimums. Utilizing these approaches, a properly equipped aircraft can land at the airport with 400-foot cloud ceilings and one mile visibility for aircraft in categories A and B. Both approaches can also be utilized as a localizer only or circling approaches. When using only the localizer portion of these two approaches (for course guidance only), the cloud ceilings remain at 400 feet for all aircraft categories, while the visibility minimums increase to one and one-fourth miles for aircraft in categories C and D.

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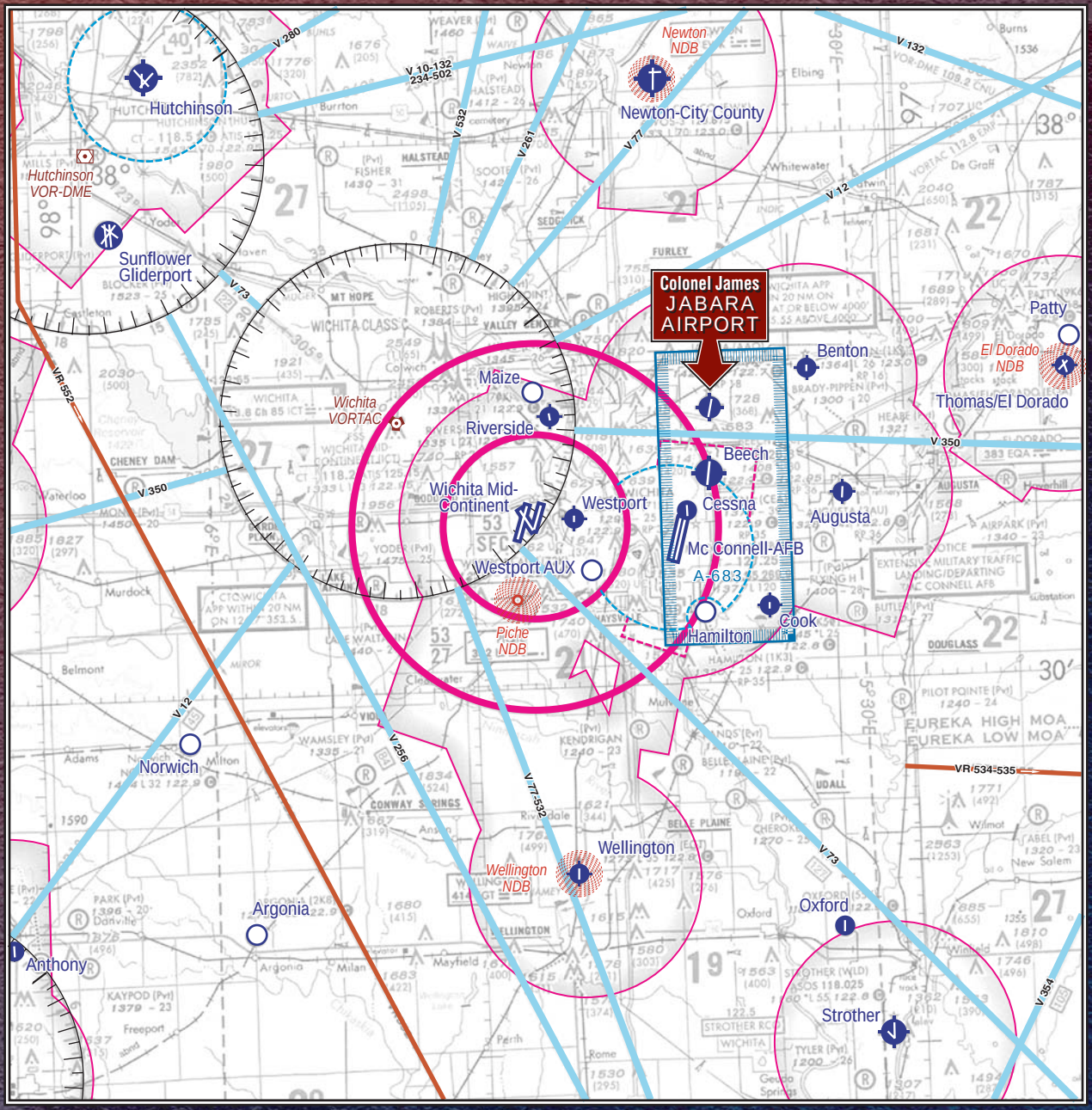


LEGEND

- Airport with other than hard-surfaced runways
- Airport with hard-surfaced runways 1,500' to 8,069' in length
- Airports with hard-surfaced runways greater than 8,069' or some multiple runways less than 8,069'
- Non-Directional Radiobeacon (NDB)
- VORTAC
- VHF Omni Range (VOR)
- VOR-DME
- Compass Rose
- Class C Airspace
- Class D Airspace
- Class E Airspace
- Class E Airspace with floor 700 ft. above surface
- Victor Airways
- Military Training Routes
- Prohibited, Restricted, Warning and Alert Area

Source: Wichita Sectional Chart, US Department of Commerce, National Oceanic and Atmospheric Administration January 23, 2003

CITY OF WICHITA
Wichita Airport Authority

Exhibit 1D
VICINITY AIRSPACE

AIRSPACE, AIR TRAFFIC CONTROL, AND AREA AIRPORTS

VICINITY AIRSPACE

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

Class A airspace is controlled airspace and includes all airspace from 18,000 feet MSL to Flight Level 600 (approximately 60,000 feet MSL). Class B airspace is controlled airspace surrounding high capacity commercial service airports (i.e. Kansas City International Airport). Class C airspace is controlled airspace surrounding lower activity commercial service airports (i.e. Wichita Mid-Continent Airport) and some military airports. Class D airspace is controlled airspace surrounding airports with an airport traffic control tower. All aircraft operating within Classes A, B, C, and D airspace must be in contact with the air traffic control facility responsible for that particular airspace. Class E airspace is controlled airspace that encompasses all instrument approach procedures and low altitude federal airways. Only aircraft conducting instrument flights are required to be in contact with air traffic control when operating in Class E airspace. Aircraft conducting visual flights in Class E airspace are not required to be in radio communications with air traffic control facilities. Visual flight can only be conducted if minimum visibility and cloud ceilings exist. Class G airspace is uncontrolled airspace that does not require contact with an air traffic control facility.

As shown on **Exhibit 1D**, Colonel James Jabara Airport is located in Class E airspace, with the floor beginning at 700 feet above the surface. All aircraft operating under instrument flight rules (IFR) are required to maintain contact with Wichita radar approach control (TRACON) for approach vectoring.

The airspace around Colonel James Jabara Airport is generally occupied with military and general aviation activity. The airport is located beneath an alert airspace area due to the location of McConnell AFB (approximately eight nautical miles southwest). The proximity of McConnell AFB to civilian-use airports in the area has led to the development of special airspace use agreements outlining the specific traffic patterns and flight paths in the area. Operations are conducted from 8:00 a.m. to 7:00 p.m. (Monday through Friday) up to 4,500 feet mean sea level (MSL).

Located approximately 28 nautical miles southeast of Colonel James Jabara Airport is a special-use airspace designated as a Military Operations Area (MOA). As shown on **Exhibit 1D**, it is divided into two separate sectors (Eureka High MOA and Eureka Low MOA). While civilian operations within MOAs are not prohibited, civilian aircraft are cautioned to remain alert for military aircraft while operating in MOAs. Military operations in

both sectors of the MOA are from sunrise to sunset Monday through Friday and occasionally on Saturday and Sunday. Operations are conducted at an altitude of 6,000 feet MSL for the Eureka High MOA and between 2,500 feet MSL and up to, but not including, 6,000 feet MSL.

For aircraft arriving or departing the regional area using VOR facilities, a system of Federal Airways, referred to as Victor Airways, has been established. Victor Airways are corridors of airspace eight miles wide that extend upward from 1,200 feet AGL to 18,000 feet MSL and extend between VOR navigational facilities. As shown on **Exhibit 1D**, Victor Airways in the area emanate from the Wichita VORTAC.

AIR TRAFFIC CONTROL

Colonel James Jabara Airport does not have an airport traffic control tower (ATCT). Therefore, no formal terminal air services are available. Aircraft operating under Visual Flight Rules (VFR) in the vicinity of the airport are not required to file any type of flight plan or contact any air traffic control facility unless they are entering airspace where contact is mandatory. Air traffic advisories and certain weather information can be obtained using the common traffic advisory frequency (CTAF) channel 122.7 Mhz, also known as UNICOM. Enroute air traffic control services are provided by the Kansas City Air Route Traffic Control Center (ARTCC), and approach and departure control services are provided by Wichita Airport Traffic Control Tower (ATCT).

The Wichita Flight Service Station (FSS) provides additional traffic service to pilots operating in the vicinity of the airport. This FSS provides pilots with weather information, airport advisory service, flight planning processing, and communication with other air traffic control facilities.

AREA AIRPORTS

A review of the airports within 30 nautical miles of Colonel James Jabara Airport has been made to identify and distinguish the type of air service provided in the area surrounding the airport. There are 16 public-use airports within 30 nautical miles. The following paragraphs provide a review of the five nearest airports. Information pertaining to each airport was obtained from FAA 5010 Forms.

Beech Factory Airport is located approximately three nautical miles south of Colonel James Jabara Airport. The airport is supported by a single 8,000-foot runway. Five published instrument approaches are available and a total of 77 aircraft are based at Beech Factory Airport. Services available include aircraft manufacturing, maintenance, fuel (100 LL and Jet A), and aircraft tie-downs.

Benton Airport is located approximately five nautical miles northeast of Colonel James Jabara Airport. A single runway, 2,613 feet in length, serves the airport. Benton Airport has 36 based aircraft and one published instrument approach. Services available at the airport include aircraft rental, flight training, a pilots' lounge, fuel (100 LL and Mogas), and aircraft hangaring and tie-downs.

Cessna Aircraft Field Airport is located approximately six nautical miles southwest of Colonel James Jabara Airport. The airport has a single runway 3,873 feet in length, nine based aircraft, and one published instrument approach. No services are available at this airport.

Augusta Municipal Airport is located approximately eight nautical miles southeast of Colonel James Jabara Airport. The airport is served by a single runway, 4,199 feet in length. Three published instrument approaches are available at Augusta Municipal Airport. There are 94 aircraft based at the airport. Services include aircraft rental, flight training, aerial tours, aircraft charters, major airframe and powerplant services, maintenance, fuel (100 LL and Jet A), aircraft hangaring and tie-downs.

Riverside Airport is located approximately nine nautical miles west of Colonel James Jabara Airport. A single runway, 3,200 feet in length, serves Riverside Airport. There are no published instrument approaches available at the airport. A total of 30 aircraft are based at the airport. Services include aircraft rental, major airframe and powerplant services, fuel (100 LL), and aircraft hangars and tie-downs.

CLIMATE

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

The climate of Wichita is typical of the Midwest. Summers vary from dry weather with low relative humidity and southerly winds to periods of high precipitation. Temperatures in the summer typically range from 60 to 100 degrees. Winters average about 50 degrees cooler than summers, with cold fronts accompanied by strong north/northwesterly winds. Annual precipitation averages 31 inches, the majority of which falls during the months of April through September. **Table 1B** summarizes climatic data for Colonel James Jabara Airport.

GENERALIZED LAND USE

The environs in which the airport is located are defined by existing land uses as well as projected future land uses. Colonel James Jabara Airport is located nine miles northeast of the Wichita central business district on 822 acres. The area west of the airport consists primarily of commercial and industrial uses. Area east of the airport consists mainly of agricultural/vacant land use, which includes rural and agricultural use and undeveloped areas. The area southwest of Highway K-96 is primarily residential, with some interspersed multi-family dwellings and some mobile home parks. Area northwest of the airport consists primarily of recreational uses, including golf clubs and other sports clubs.

TABLE 1B
Climatological Summary

	Monthly Averages		Precipitation
Month	**Maximum**	**Minimum**	**Mean (inches)**
January	40° F	20° F	0.84
February	47° F	25° F	1.02
March	57° F	34° F	2.71
April	67° F	44° F	2.57
May	76° F	54° F	4.16
June	87° F	64° F	4.25
July	93° F	69° F	3.31
August	92° F	68° F	2.94
September	82° F	59° F	2.96
October	70° F	47° F	2.45
November	55° F	34° F	1.82
December	43° F	24° F	1.35
Annual	67° F	45° F	31.00

Source: www.weather.com
* Averages are based on a 30-year period.

The Wichita and Sedgwick County land use guides identify a few areas in the vicinity of the airport which are potentially viable areas for development. The *1993 Wichita-Sedgwick County Comprehensive Plan* predicts that urban density will grow east of the airport. Residential expansion is also expected to occur southeast of the airport (between 29th Street and 13th Street), and northwest of the airport (between Webb Road and Woodlawn Avenue). The land use guide also indicates that the area immediately west of the airport is planned primarily for commercial and industrial type uses.

The *1999 Wichita-Sedgwick County Comprehensive Plan Update* supplements the original 1993 Plan and provides a general idea of the county's expected growth. The 1999 Plan states that the bulk of the county's population growth is expected to take place at the edges of Wichita. This growth would follow the same directions and densities as today's trends. Substantial growth is also proposed for most of the small cities and for large residential lots in rural areas. For the near future, Wichita's predominantly east-west growth pattern is expected to continue, resulting in a possible need to develop about 14 square miles of undeveloped land.

HEIGHT AND HAZARD ZONING

Height and hazard zoning establishes height limits for new construction near the airport and within the runway approaches. It is based upon an approach plan which describes artificial surfaces defining the edges of airspace which are to remain free of obstructions for the purpose of safe air navigation. It requires that anyone who is proposing to construct or alter an object that affects airspace, must notify the Federal Aviation Admini-

stration prior to its construction. Colonel James Jabara Airport's rules and regulations regarding height and hazard zoning are found in the *Wichita City Code*, Chapter 28, Section 08.070. The dimensional standards can be found on the *Wichita-Sedgwick County Airport Hazard Zoning Map*.

An additional level of zoning requirements for the airport overlay district specify land use controls that will ensure a compatible relationship between air force base operations and other land uses in the vicinity of these operations. To ensure this, an extra layer of protection is provided for those parcels of land within the accidental potential zone (APZ). The APZ can be defined as the land area identified as being in significant danger of aircraft accidents by being beneath airspace (takeoff and approach paths) where the potential for aircraft accidents is likely to occur. Currently the airport overlay districts are applicable to McConnell Air Force Base only and are identified in the *Wichita City Code*, Chapter 28, Section 07.040.

SOCIOECONOMIC CHARACTERISTICS

For an airport master plan, socioeconomic characteristics are collected and examined to derive an understanding of the dynamics of growth within the study area. This information is essential in determining aviation service level requirements, as well as forecasting the number of based aircraft and aircraft activity at the airport. Aviation forecasts are typically related to the population base, economic strength of the region, and the ability of the region to sustain a strong economic base over an extended period of time.

POPULATION

The size and structure of the local communities and the service area that the airport supports are important factors to consider when planning airport facilities. These factors provide an understanding of the economic base that is needed to determine future airport require-ments.

According to the U.S. Census Bureau, the population of Kansas reached nearly 2.7 million in 2000. Over 1.1 million of those people live within 100 miles of Wichita and about 665,000 reside within 50 miles. The Wichita Metropolitan Statistical Area (MSA), which consists of Sedgwick, Butler, and Harvey counties, had a population of 545,220 in 2000. It is estimated that more than four-fifths of MSA residents live within Sedgwick County and approximately 327,000 live within the Wichita city limits.

Historical population totals and annual growth rates for the City of Wichita, Sedgwick County, the Wichita MSA, and the State of Kansas are presented in **Table 1C**. As shown in the table, Wichita had an average annual growth rate of 1.3 percent between 1990 and 2000, which is nearly double the growth rate of Kansas (0.8 percent). The growth rates of the county and the MSA were identical at 1.2 percent.

TABLE 1C
Historical and Forecast Population

	HISTORICAL			FORECAST			
Area	1990	2000	Avg. Ann. Growth Rate 1990-2000	2008	2013	2023	Avg. Ann. Growth Rate 2000-2023
Wichita	304,011	344,284	1.3%	355,200	365,700	392,000	0.6%
Sedgwick Co.	403,662	452,869	1.2%	477,500	495,400	534,700	0.7%
Wichita MSA	485,270	545,220	1.2%	580,300	604,300	655,500	0.8%
Kansas	2,477,574	2,688,418	0.8%	2,858,900	2,965,700	3,179,400	0.7%

Source: Historical – U.S. Census Bureau; Forecasts – Interpolated from forecasts by the Kansas Water Office (1999).

Population projections were interpolated from the Kansas Water Office, which provides projections through the year 2040. These projections have been endorsed as the official Kansas population projections by the Kansas Division of the Budget. As shown in the table, Kansas' population is expected to reach over 3.1 million by the end of the planning period. Sedgwick County is expected to remain the most populated county in the state, with a projection of 534,700 residents by the year 2023.

EMPLOYMENT

Analysis of a community's employment base can be valuable in determining the overall well-being of that community. In most cases, the community make-up and health is significantly impacted by the number of jobs, variety of employment opportunities, and types of wages provided by local employers. **Table 1D** provides historical employment characteristics for the Wichita MSA.

Wichita area unemployment seldom exceeds the national level, usually averaging nearly two percent lower than the national rate. As shown in the table, there were 15,940 unemployed in the Wichita MSA in 1992, which represented a 5.5 percent unemployment rate. The unemploy-ment rate fell over the next few years, reaching a low of 3.3 percent in 1996. In 2000, the area's unemployment rate reached a high of 6.4 percent. This number has since decreased, falling to 4.2 percent for 2002.

TABLE 1D
Employment Characteristics
Wichita MSA

	1992	1994	1996	1998	2000	2002
Civilian Labor Force	290,580	284,460	288,320	268,040	268,120	268,180
Total Employment	274,640	272,490	278,870	256,430	251,060	256,930
Unemployment	15,940	11,970	9,450	11,610	17,060	11,250
Unemployment Rate	5.5%	4.2%	3.3%	4.3%	6.4%	4.2%

Source: Center for Economic Development and Business Research.

Employment by economic sectors, both historical and forecast data, has been reviewed for Sedgwick County and is presented in **Table 1E**. This information was obtained from the *Complete Economic and Demographic Data Source* (CEDDS) 2002.

TABLE 1E
Employment by Economic Sector
Sedgwick County

Economic Sector	2000	% of Total Employment 2000	2023	Average Annual Growth Rate (2000-2023)
Total Employment	**313,570**	**100.0%**	**397,220**	**1.0%**
Mining	3,680	1.2%	4,730	1.1%
Construction	17,660	5.6%	20,610	0.7%
Manufacturing	69,770	22.3%	80,150	0.6%
Transportation & Public Utilities	11,670	3.7%	11,520	-0.1%
Wholesale Trade	15,420	4.9%	18,150	0.7%
Retail Trade	50,770	16.2%	64,080	1.0%
Finance, Insurance, & Real Estate	19,320	6.2%	23,220	0.8%
Services	92,320	29.4%	133,680	1.6%
Government	32,960	10.5%	41,080	1.0%

Source: CEDDS Woods and Poole (2002), Forecasts Interpolated by Coffman Associates.

As shown in the table, the services, manufacturing, and retail trade industries dominated the county's total employment in 2000. Services accounted for the largest share (92,320 jobs), capturing nearly 30 percent of all employment. Manufacturing, dominated by the aviation industry, accounted for the second largest sector of employment in the county (69,770 jobs), capturing more than 22 percent of total employment. Retail trade contributed 16 percent (50,770) of the total. The current industry projections for Sedgwick County, for the period 2000-2023, indicate that total employment will increase by at least 83,650 jobs or 1.0 percent. The services, manufacturing, and retail trade industries will continue to dominate employment, accounting for nearly 70 percent of all employment in Sedgwick County by 2023.

Wichita's employment includes a broad mix of business types, with a strong base of relatively high paying manufacturing jobs. According to a recent study by the American Cities Business Journals Research, the Wichita area has the second highest concentration of manufacturing jobs and skilled labor in the country.

Table 1F presents the 15 largest employers (private industry) in Wichita. As shown in the table, four of the top five employers in Wichita are aircraft manufacturers. Combined, these four employers (Boeing, Cessna, Raytheon, and Bombardier/Learjet) supply more than half of the world's general aviation and military aircraft. As shown in the table, the healthcare industry is also significant to Wichita's economy. This is evidenced by the fact that three of the city's top 10 employers are healthcare-related.

TABLE 1F
Major Employers in Wichita (2002)

Employer Name	Type of Business	# of Full-Time Employees
Boeing Aircraft Wichita	Aircraft Manufacturing	13,650
Cessna Aircraft Company	Aircraft Manufacturing	11,400
Raytheon Aircraft Company	Aircraft Manufacturing	8,100
Via Christi Regional Medical Center	Hospital/Medical	3,415
Bombardier Aerospace Learjet	Aircraft Manufacturing	3,152
Koch Industries, Inc.	Oil Equipment	1,972
Wesley Medical Center	Hospital/Medical	1,755
The Coleman Company, Inc.	Outdoor Supplies	1,355
Catholic Diocese of Wichita	Church	1,343
Wichita Clinic	Hospital/Medical	1,133

Source: Wichita Area Chamber of Commerce.

A more detailed analysis of Wichita's four main aircraft manufacturers was also examined. This information was obtained from the Center for Economic Development and Business Research. As previously mentioned, aircraft manufacturing represents the largest sector of employment in Wichita. However, following the events of September 11th, 2001, all four of these aircraft manufacturers experienced immediate and continuing order cancellations, resulting in reduced production schedules in 2002, as well as reduced employment levels.

Boeing laid off approximately 5,200 employees beginning in December 2001, based on expectations of deliveries falling from 538 to 500 for 2001 and projections of less than 300 aircraft deliveries for 2002 and 2003. Raytheon delivered 411 airplanes in 2001, compared with 525 in 2000. In late October 2002, Raytheon lowered its delivery forecast to 339 aircraft for 2003. However, approval by the U.S. Air Force in December 2001 will provide funding for 615 airplanes. Cessna maintained a full staff until late in 2002, when they downsized by 1,000 employees through attrition and early retirements. And in September of 2002, Cessna announced plans to lay off approximately 400 workers, based on projected deliveries 15 percent below earlier projections. Bombardier laid off a total of 700 workers in 2002 and announced plans to interrupt production of the Learjet 45 and 60 models. However, plans still continue for full production of the new Challenger 300 upon its certification. Further reductions by all four aircraft manufacturers are expected during 2003, but at a much lower level as the economy improves.

However, not all the news in 2002 was bad for the aircraft manufacturers in Wichita. The city won the opportunity to be home for Airbus Industrie of France's wing design facility. The design facility opened in the spring, hiring approximately 60 engineers and 15 to 20 administrative staff. Airbus also announced plans to expand, hiring an additional 80 employees by June 2003. Cessna proceeded with its plans to build a Citation Service Center, which will employ up to 800 people.

INCOME

Table 1G compares per capita personal income (PCPI), adjusted for 1996 dollars, for Sedgwick County, the Wichita MSA, the State of Kansas, and the United States. As shown in the table, PCPIs for both Sedgwick County and the Wichita MSA have remained slightly below the national average since 1990. Although Kansas had the most significant growth rate of the four areas (1.9%) between 1990 and 2000, their PCPI remains the lowest. However, forecasts project the highest growth rate (1.3%) for the state through 2023, raising Kansas' PCPI above that of the Wichita MSA.

TABLE 1G
Personal Income Per Capita (1996 $)

	HISTORICAL			FORECAST			
Area	1990	2000	Annual Increase 1990-2000	2008	2013	2023	Annual Increase 2000-2023
Sedgwick Co.	$22,960	$26,610	1.5%	$28,720	$30,200	$33,430	1.0%
Wichita MSA	$22,450	$26,340	1.6%	$28,450	$29,920	$33,160	1.0%
Kansas	$21,230	$25,680	1.9%	$28,570	$30,430	$34,340	1.3%
United States	$22,870	$27,000	1.7%	$29,560	$31,250	$34,890	1.1%

Source: CEDDS Woods and Poole (2002), Forecasts Interpolated by Coffman Associates.

SUMMARY

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

DOCUMENT SOURCES

As mentioned earlier, a variety of different sources were utilized in the inventory process. The following listing reflects a partial compilation of these sources. This does not include data provided by airport management as part of their records, nor does it include airport drawings and photographs which were referenced for information. On-site inventory and interviews with staff tenants also contributed to the inventory effort.

Airport/Facility Directory, North-central U.S., U.S. Department of Transportation, Federal Aviation Administration, National Aeronautical Charting Office, January 23, 2003 Edition.

National Plan of Integrated Airport Systems (NPIAS), U.S. Department of Transportation, Federal Aviation Administration, 1998-2002.

U.S. Terminal Procedures, North-central U.S., U.S. Department of Transportation, Federal Aviation Administration, National Aeronautical Charting Office, January 23, 2003 Edition.

Wichita Aeronautical Chart, U.S. Department of Transportation, Federal Aviation Administration, National Aeronautical Charting Office, 70th Edition, January 23, 2003.

1998 Airport Master Plan Update, PB Aviation, Inc., Vivian Llambi & Associates, Inc.

A number of Internet sites were also used to collect information for the inventory chapter. These include the following:

FAA 5010 Data
http://www.airnav.com

Kansas Department of Transportation, Division of Aviation:
http://kdot1.ksdot.org/public/kdot/diva viation/

Kansas Labor Market Information:
http://laborstats.hr.state.ks.us/

Kansas Water Office (Homepage):
http://www.kwo.org/

U.S. Census Bureau:
http://www.census.gov/

Wichita Area Chamber of Commerce:
http://www.wacc.org/fastwichitahome.html

Wichita State University (Center for Economic Development and Business Research):
http://www.wichita.edu/online/centers.asp

Chapter Two
AVIATION DEMAND FORECASTS

AVIATION DEMAND FORECASTS

CITY OF WICHITA
Wichita Airport Authority

Facility planning must begin with a definition of the demand that may reasonably be expected to occur at the airport over a specific period of time. For Colonel James Jabara Airport, this involves forecasts of aviation activity through the year 2023. In this master plan, forecasts of based aircraft, based aircraft fleet mix, and annual aircraft operations will serve as the basis for facility planning.

It is virtually impossible to predict, with any certainty, year-to-year fluctuations of activity when looking 20 years into the future. Because aviation activity can be affected by many influences at the local, regional, and national levels, it is important to remember that forecasts are to serve only as guidelines and planning must remain flexible enough to respond to unforeseen facility needs.

The following forecast analysis examines recent developments, historical information, and current aviation trends to provide an updated set of aviation demand projections for Colonel James Jabara Airport. The intent is to permit the City of Wichita and the Wichita Airport Authority to make planning adjustments necessary to ensure that the facility meets projected demands in an efficient and cost-effective manner.

The demand-based manner in which this master plan is being prepared is intended to accommodate variations in demand at the airport. Demand-based planning relates capital improvements

to demand factors, such as based aircraft or passengers, instead of points in time. This allows the airport to address capital improvement needs according to actual demand occurring at the airport. Therefore, should growth in aircraft operations or based aircraft slow or decline, it may not be necessary to implement some improvement projects. However, should the airport experience accelerated growth, the plan will have accounted for that growth and will be flexible enough to respond accordingly.

NATIONAL AVIATION TRENDS

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

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

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

At the end of 2001, the total pilot population, including student, private, commercial, and airline transport, was estimated at 649,957. This is an increase of 3.9 percent, or 24,000 pilots, from 2000. Student pilots were the only group to experience a decrease in 2001, down 6.6 percent from 2000. The number of student pilots is projected to decline by 4.5 percent in 2002, and an additional 1.2 percent the following year. After 2004, the number of student pilots is expected to increase at an average annual rate of 1.0 percent, totaling 90,000 in 2013,

which is less than the number recorded in 2000 (93,064).

The increased security measures placed on commercial flights has increased interest in fractional and corporate aircraft ownership, as well as on-demand charter flights for short-haul routes. This is reflected in the forecast of active general aviation pilots, excluding air transport pilots, to increase by 54,000 (0.8 percent annually) over the forecast period.

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

In 2000, there was an estimated 217,533 active general aviation aircraft, representing a decrease of 0.9 percent from the previous year, and the first decline in five years. **Exhibit 2A** depicts the FAA forecast for active general aviation aircraft in the United States. The FAA forecasts general aviation aircraft to increase at an average annual rate of 0.3 percent over the 13-year forecast period. Single-engine piston aircraft are expected to decrease from 149,422 in the short-term, and then begin a period of slow growth after 2004, reaching 152,000 in 2013. Multi-engine piston aircraft are expected to remain relatively flat throughout the forecast period. Turbine-powered aircraft are expected to grow at an average annual rate of 2.1 percent over the forecast period, faster than all other segments of the national fleet. Turbojet aircraft are expected to provide the largest portion of this growth, with an annual average growth rate of 3.4 percent. This strong growth projected for the turbojet aircraft can be attributed to the growth in the fractional ownership industry, new product offerings (which include new entry level aircraft and long-range global jets), and a shift from commercial travel by many travelers and corporations. Turboprop aircraft, on the other hand, are projected to grow at an average annual rate of only 0.2 percent over the forecast period.

Manufacturer and industry programs and initiatives continue to revitalize the general aviation industry with a variety of programs. For example, Piper Aircraft Company has created Piper Financial Services (PFS) to offer competitive interest rates and/or leasing of Piper aircraft. Manufacturer and industry programs include the "No Plane, No Gain" program promoted jointly by the General Aviation Manufacturers Association (GAMA) and the National Business Aircraft Association (NBAA). This program was designed to promote the use of general aviation aircraft as an essential, cost-effective tool for businesses. Other programs are intended to promote growth in new pilot starts and to introduce people to general aviation.

These include "Project Pilot," sponsored by the Aircraft Owners and Pilots Association (AOPA), "Flying Start," sponsored by the Experimental Aircraft Association (EAA), "Be a Pilot," jointly sponsored and supported by more than 100 industry organizations, and "Av Kids," sponsored by the NBAA. Over the years, programs such as these have played an important role in the success of general aviation, and will continue to be vital to its growth in the future.

FORECASTING APPROACH

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

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

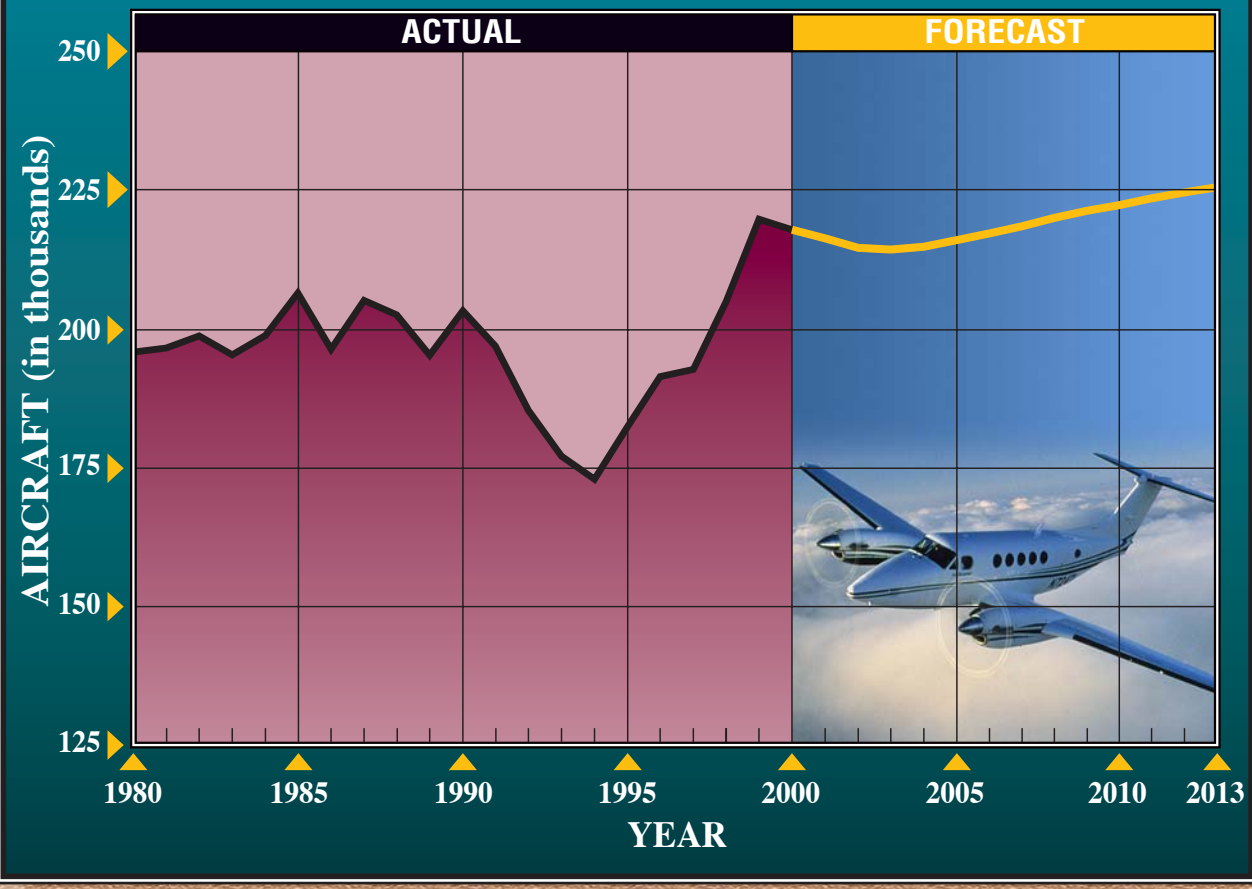
A wide range of factors are known to influence the aviation industry and can have significant impacts on the extent and nature of air service provided in both the local and national markets. Technological advances in aviation have historically altered, and will continue to change, the growth rates in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

AVIATION ACTIVITY FORECASTS

The following forecast analysis examines each of the aviation demand categories expected at Colonel James Jabara Airport over the next 20 years. Each segment will be examined individually, and then collectively, to provide an understanding of the overall aviation activity at the airport through 2023.

The need for airport facilities at Colonel James Jabara Airport can best be determined by accounting for forecasts of future aviation demand. Therefore, the remainder of this chapter presents the forecasts for airport users, and includes the following:

ACTIVE GENERAL AVIATION AIRCRAFT



U.S. ACTIVE GENERAL AVIATION AIRCRAFT (in thousands)

As of December 31	FIXED WING				ROTORCRAFT		Experimental	Other	Total
	PISTON		TURBINE						
	Single Engine	Multi-Engine	Turboprop	Turbojet	Piston	Turbine			
2000	149.4	21.1	5.8	7.0	2.7	4.5	20.4	6.7	217.6
2003	146.0	20.7	5.7	7.5	2.6	4.3	20.4	6.7	213.9
2008	148.7	20.7	5.8	9.6	2.8	4.5	20.8	6.8	219.7
2013	152.0	20.7	5.9	10.9	2.9	4.6	21.4	6.9	225.3

Sources: FAA General Aviation and Air Taxi Activity (and Avionics) Surveys.
FAA Aerospace Forecasts, Fiscal Years 2002-2013.

Notes: An active aircraft is one that has a current registration and was flown at least one hour during the calendar year.

CITY OF WICHITA
Wichita Airport Authority

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

- GENERAL AVIATION
  - -Based Aircraft
  - -Based Aircraft Fleet Mix
  - -Local and Itinerant Operations
  - -Peak Activity
  - -Annual Instrument Approaches

GENERAL AVIATION FORECASTS

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

Based Aircraft

The number of based aircraft at the airport is the most basic indicator of general aviation demand. By first developing a forecast of based aircraft, the growth of other general aviation activities and demands can be projected. Currently, there are 153 aircraft based at Colonel James Jabara Airport. According to the *1998 Airport Master Plan Update*, there were 71 aircraft based at Colonel James Jabara Airport in 1993. Limited information was available for the years in-between. Therefore, time-series and regression analyses were not performed, as they would not provide useful projections of based aircraft. Instead, other means of comparison were used to develop forecasts of based aircraft at Colonel James Jabara Airport.

The first method used to project based aircraft examined registered aircraft in Sedgwick County, which is the local service area for Colonel James Jabara Airport. There were a reported 2,212 aircraft registered in the county in 2003, as compared to 1,698 registered in 1993. Of the total, 46 percent (1,025) were registered to aircraft manufacturers in 2003, which was a slight increase from the 55 percent registered to manufacturers in 1993. While the actual increase over the past decade (discounting manufacturers) reflects an average growth rate of 4.5 percent for forecasting purposes, a more moderate rate of growth is anticipated based upon FAA projections of future general aviation demand. An average annual growth rate of 2.0 percent was applied to the forecast years, yielding 2,490 registered aircraft by 2008; 2,750 registered aircraft by 2013; and 3,350 registered aircraft by 2023.

Based on the registered aircraft projections for Sedgwick County and the airport's market share for 2003 (6.9 percent), two market share forecasts were then developed. The first forecast developed used a constant market share of 6.9 percent. This forecast yields 172 based aircraft by 2008; 190 based aircraft by 2013; and 231 based aircraft by 2023. The second forecast developed considers the airport will capture an increasing market share (7.0% - 7.3%) of aircraft registered in Sedgwick County, consistent with historical trends. The increasing market share forecast yields 174 based air-

craft by 2008; 195 based aircraft by 2013; and 245 based aircraft by 2023. These market share forecasts are presented in **Table 2A**.

TABLE 2A
Based Aircraft Market Share of Registered Aircraft (Sedgwick County)
Colonel James Jabara Airport

Year	Based Aircraft At Jabara	Sedgwick County Registered Aircraft	% of Registered Aircraft
1993	71	1,698	4.2%
2003	153	2,212	6.9%
Constant Share Projection			
2008	172	2,490[1]	6.9%
2013	190	2,750[1]	6.9%
2023	231	3,350[1]	6.9%
Increasing Share Projection			
2008	174	2,490[1]	7.0%
2013	195	2,750[1]	7.1%
2023	245	3,350[1]	7.3%

Source: Based aircraft - 1993 - Master Plan Update (1998), 2003 - FAA 5010 Form; Historical registered aircraft - U.S. Census of Civil Aircraft (1993), FAA (2003).
[1] Based on 2.0% average annual growth rate.

Forecasts of based aircraft were also made in comparison to the percent of U.S. active general aviation aircraft based at Colonel James Jabara Airport. In 1993, based aircraft at the airport represented 0.04 percent of U.S. active general aviation aircraft. This percentage has since increased, with the airport capturing 0.07 percent of U.S. active general aviation aircraft in 2003. Based upon this historical data, two forecasts were then developed. The first forecast assumes a constant market share forecast of 0.07 percent and yields 165 based aircraft by 2023. The increasing market share forecast (0.08%-0.11%) yields 259 based aircraft by 2023. These two market share forecasts are presented in **Table 2B**.

Another forecast examined the airport's historical based aircraft as a ratio of 1,000 residents in Sedgwick County. The 2003 estimated population of Sedgwick County is 457,700, which equals 0.33 based aircraft per 1,000 residents. Assuming a constant share projection of 0.33 based aircraft per 1,000 residents yields 176 based aircraft by 2023. An increasing share projection was also developed to reflect the historical trend and yields 225 based aircraft at the airport by 2023. Both of these forecasts are presented in **Table 2C**.

TABLE 2B
Based Aircraft Market Share of U.S. Active General Aviation Aircraft
Colonel James Jabara Airport

Year	Based Aircraft At Jabara	U.S. Active General Aviation Aircraft	% of U.S. Active GA Aircraft
1993	71	177,100	0.04%
2003	153	216,200	0.07%
Constant Share Projection			
2008	154	219,800	0.07%
2013	158	225,300	0.07%
2023	165	235,100[1]	0.07%
Increasing Share Projection			
2008	176	219,800	0.08%
2013	203	225,300	0.09%
2023	259	235,100[1]	0.11%

Source: Based aircraft - 1993 - Master Plan Update (1998), 2002 - FAA 5010 Form; Historical and forecast U.S. Active General Aviation Aircraft from FAA *Aerospace Forecasts, Fiscal Years 2002-2013*.
[1] Extrapolated by Coffman Associates.

TABLE 2C
Based Aircraft Per 1,000 Residents (Sedgwick County)
Colonel James Jabara Airport

Year	Based Aircraft at Jabara	Sedgwick County Population	Aircraft Per 1,000 Residents
1993	71	417,800	0.17
2003	153	457,700	0.33
Constant Share Projection			
2008	158	477,500	0.33
2013	163	495,400	0.33
2023	176	534,700	0.33
Increasing Share Projection			
2008	167	477,500	0.35
2013	183	495,400	0.37
2023	225	534,700	0.42

Source: Based aircraft - 1993 - Master Plan Update (1998), 2002 - FAA 5010 Form; Historical population – Interpolated from U.S. Census Bureau, Forecast population – Interpolated from Kansas Water Office.

The historical growth rate of based aircraft between 1993 and 2003 was also examined. As previously mentioned, there were 71 aircraft based at Colonel James Jabara Airport in 1993. The number of based aircraft in 2003, as reported on the FAA 5010 Form, stands at 153. An average annual growth rate of 2.0 percent was applied to based aircraft, yielding 172 based

aircraft by 2008; 190 based aircraft by 2013; and 232 based aircraft by 2023.

Several additional forecasts were also examined, including the previous master plan, the state's aviation system plan, and the FAA's *Terminal Area Forecast* (TAF). The most recent forecast is included in the *1998 Airport Master Plan Update*. This plan, which provides forecasts through the year 2015, used 1993's total of 71 based aircraft as the base year. Extrapolation of this forecast yields 109 based aircraft at Colonel James Jabara Airport by the year 2023. The *1996 Kansas Aviation System Plan* (KASP) was also examined. This plan, which also used 1993 as the base year for its projections, expected based aircraft to remain near 70 through 2010. However, with the number of based aircraft reported at 153 for 2002, these forecasts are no longer relevant.

As previously mentioned, the FAA TAF was also examined. The FAA TAF projects based aircraft for all commercial service airports in the United States. The FAA TAF used the year 2001 as the basis for it's forecast, with a reported 153 based aircraft, and projects this number to remain stagnant through 2020.

For planning purposes, a mid-range forecast is generally chosen. Therefore, the preferred planning forecast is one that is an average of the relevant forecasts and is as follows: 170 based aircraft by 2008; 185 based aircraft by 2013; and 225 based aircraft by 2023. **Table 2D** and **Exhibit 2B** summarize the based aircraft forecasts developed for Colonel James Jabara Airport.

TABLE 2D
Summary of Based Aircraft Forecasts
Colonel James Jabara Airport

	2008	2013	2023
Market Share of Registered Aircraft (Sedgwick Co.)			
Constant Market Share (6.9%)	172	190	231
Increasing Market Share (7.0% - 7.3%)	174	195	245
Market Share of U.S. Active GA Aircraft			
Constant Market Share (0.07%)	154	158	165
Increasing Market Share (0.08% - 0.11%)	176	203	259
Per 1,000 Population (Sedgwick Co.)			
Constant Ratio Projection (0.33)	158	163	176
Increasing Ratio Projection (0.35 - 0.42)	167	183	225
2.0 Percent Growth Rate	172	190	232
1998 Airport Master Plan Update	86[1]	94[1]	109[2]
1996 Kansas Aviation System Plan	70[1]	70[2]	-
FAA *Terminal Area Forecast*	153[1]	153[1]	153[2]
Preferred Planning Forecast	**170**	**185**	**220**

[1]Interpolated by Coffman Associates/[2]Extrapolated by Coffman Associates.

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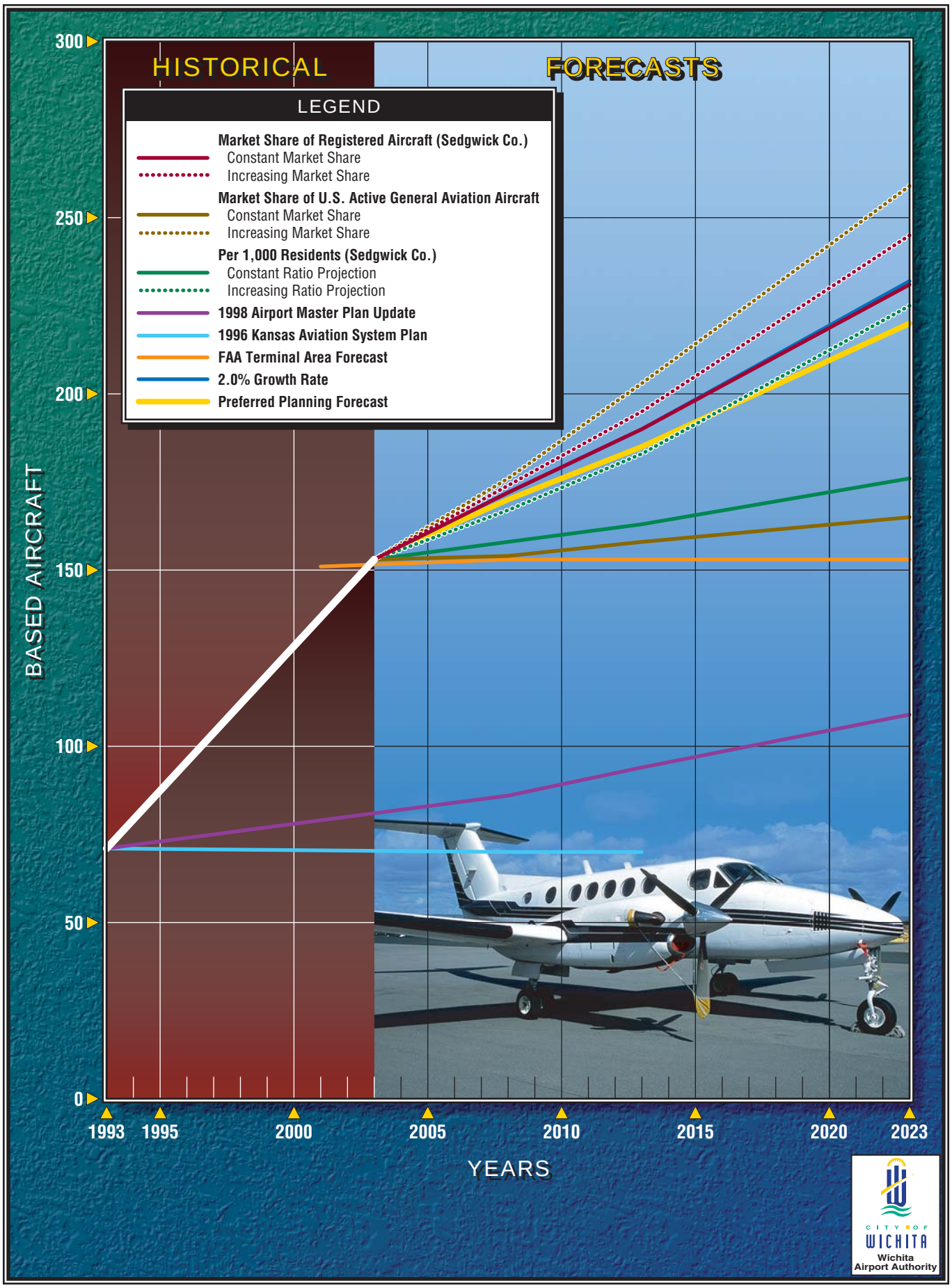


Exhibit 2B
BASED AIRCRAFT FORECAST SUMMARY

BASED AIRCRAFT FLEET MIX

While the number of general aviation aircraft basing at Colonel James Jabara Airport is projected to increase, it is important to know the fleet mix of the aircraft expected to use the airport. This will ensure the proper facilities in the future.

According to the FAA 5010 Form, the fleet mix at the airport consists of the following: 81 single-engine aircraft, 62 multi-engine aircraft, six jets, two helicopters, and two gliders. The forecast mix of based aircraft was determined by comparing existing and forecast U.S. general aviation trends. The trend in general aviation is toward a greater percentage of larger, more sophisticated aircraft as part of the national fleet. While an increase in single-engine aircraft can be expected, their percentage of the total fleet mix will likely decrease. On the other hand, the percentage of multi-engine aircraft is expected to increase, consistent with national trends. An increase in helicopters can also be expected at the airport. The general aviation fleet mix projections for Colonel James Jabara Airport are presented in **Table 2E**.

TABLE 2E
General Aviation Fleet Mix Forecast
Colonel James Jabara Airport

	EXISTING		FORECAST					
Type	**2003**	**%**	**2008**	**%**	**2013**	**%**	**2023**	**%**
Single-Engine	81	52.94%	86	50.50%	87	47.00%	95	43.00%
Multi-Engine	62	40.52%	69	41.00%	77	42.00%	96	44.00%
Jets	6	3.92%	9	5.00%	11	6.00%	15	7.00%
Helicopters	2	1.31%	3	1.75%	5	2.50%	7	3.00%
Gliders/Other	2	1.31%	3	1.75%	5	2.50%	7	3.00%
Totals	**153**	**100.0%**	**170**	**100.0%**	**185**	**100.0%**	**220**	**100.0%**

*Multi-engine category includes turboprop aircraft.

OPERATIONS PROJECTIONS

General aviation operations are classified by the airport traffic control tower (ATCT) as either local or itinerant. A local operation is a take-off or landing performed by an aircraft that operates within sight of the airport, or which executes simulated approaches or touch-and-go operations at the airport. Itinerant operations are those performed by an aircraft with a specific origin or destination away from the airport. Generally, local operations are characterized by training operations. Typically, itinerant operations increase with business and commercial use, since business aircraft are operated on a higher frequency.

Previous forecasts were first examined, including the *1998 Airport Master Plan Update*, the *1996 Kansas Aviation System Plan* (KASP), and the FAA *Terminal Area Forecast* (TAF).

Forecasts included in the 1998 Plan used a base number of 35,100 estimated annual operations in 1994, which was derived by using a RENS acoustical counter. This plan provided projections of annual operations through the year 2015. Extrapolation of this forecast yields 60,820 annual operations by 2023. The 1996 KASP, which used a base number of 24,000 estimated annual operations in 1993, provided projections through the year 2010. Extrapolation of this forecast yields 31,690 annual operations by 2023. Forecasts included in the FAA TAF used 2001 as the base year for their projections, with an estimated 38,800 operations. Projections included in the TAF indicate no growth in operations through 2020. A summary of each of these projections is presented in **Table 2F**.

TABLE 2F
Summary of Annual Operations Forecasts
Colonel James Jabara Airport

	2008	2013	2023
1998 Airport Master Plan Update	45,190[1]	49,890[1]	60,820[2]
1996 Kansas Aviation System Plan	26,790[1]	28,340[2]	31,690[2]
FAA *Terminal Area Forecast*	38,800	38,800	38,800[2]

[1] Interpolated by Coffman Associates.
[2] Extrapolated by Coffman Associates.

Projections of annual operations, based upon the number of operations per based aircraft, were also examined. The airport performed acoustical counts between August 20th, 2002 and August 26th, 2002. Accurate data for estimating annual aircraft activity was obtained using this week of recordings. Operations were extrapolated from this one week of recordings and compared to fuel sales to arrive at an estimated total of 38,700 annual operations. The estimate of 38,700 annual operations, which is nearly identical to the number of annual operations estimated on the FAA 5010 Form (38,800), was used as a base number of annual operations for 2003. This equates to approximately 253 operations per based aircraft, from which two forecasts were then prepared.

The first forecast assumes the ratio of operations per based aircraft will remain constant at 253, yielding 55,660 annual operations by 2023. Since the FAA has projected growth in annual hours flown by general aviation aircraft and air taxi aircraft in their annual forecasts, the second forecast assumes that the ratio of operations per based aircraft should be expected to increase over time. The second projection assumes that the number of operations per based aircraft will increase and yields 60,500 annual operations by 2023.

For Colonel James Jabara Airport, the growth rate for aircraft operations was projected to be higher than the growth rate for based aircraft for the duration of the planning period. This assumption is supported by recent increases

in fuel flowage volumes reported by the FBO at the airport. Total combined fuel flowage for 2001 and 2002 was approximately 1,462,356 gallons for Avgas and Jet A fuel combined. Therefore, the increasing ratio projection was chosen as the preferred planning forecast.

The constant and increasing ratio projections are presented in **Table 2G**. It is expected that local operations will continue to account for 46 percent of total operations and itinerant operations 54 percent, as they have historically. Furthermore, air taxi and military operations are expected to account for three percent and one percent of itinerant operations, respectively, through the planning period.

TABLE 2G
Operations Per Based Aircraft Forecasts
Colonel James Jabara Airport

Year	Based Aircraft	Itinerant Operations	Local Operations	Total Operations	Operations Per Based Aircraft
1993	71	12,960	11,040	24,000	338
2003	153	20,800	18,000	38,700*	253
Constant Ratio Projection					
2008	170	23,230	19,790	43,020	253
2013	185	25,280	21,530	46,810	253
2023	220	30,060	25,600	55,660	253
Increasing Ratio Projection (Preferred Planning Forecast)					
2008	170	23,870	20,330	44,200	260
2013	185	26,450	22,550	49,000	265
2023	220	32,670	27,830	60,500	275

*2002 annual operations are estimated from acoustical counts.

PEAKING CHARACTERISTICS

Most facility planning relates to levels of peak activity. The following planning definitions apply to the peak periods:

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

The design day is normally derived by dividing the peak month operations by the number of days in the month. However, commercial activity is often heavier on weekdays, which may require an adjustment to reflect peak weekday activity.

It is important to realize that only the peak month is an absolute peak within the year. Each of the other periods will be exceeded at various times during the year. However, each provides reasonable planning standards that can be applied without overbuilding or being too restrictive.

The peak month for general aviation operations was estimated at 10.0 percent of annual operations, which equates to 3,870 operations. Forecasts of peak month activity have been developed by applying this percentage to the forecasts of annual operations. Design day operations were calculated by dividing the total number of operations in the peak month by the number of days in the month. The design hour is projected as 12.0 percent of the design day operations. Busy day operations were calculated as 1.25 times the design day activity. **Table 2H** summarizes the general aviation peak activity forecasts.

TABLE 2H
Peak Period Forecasts
Colonel James Jabara Airport

		FORECASTS		
	2003	**2008**	**2013**	**2023**
General Aviation Operations				
Annual	38,700	44,200	49,000	60,500
Peak Month (10.0%)	3,870	4,420	4,900	6,050
Design Day	129	147	163	202
Busy Day	161	184	204	252
Design Hour (12.0%)	15	18	20	24

ANNUAL INSTRUMENT APPROACHES

Forecasts of annual instrument approaches (AIAs) provide guidance in determining an airport's requirements for navigational aid facilities. An instrument approach is defined by the FAA as "an approach to an airport with the intent to land by an aircraft in accordance with an instrument flight rule (IFR) plan, when visibility is less than three miles and/or when the ceiling is at or below the minimum initial approach altitude."

Historical instrument approach data for Colonel James Jabara Airport is summarized in **Table 2J**. Since the year 2000, AIAs have increased annually. And, while AIAs as a percentage of itinerant operations decreased in 2001, they rebounded the following year, accounting for 2.5 percent in 2002.

While annual variations in recorded AIAs can be partially attributed to weather, they may be expected to increase as transient operations and operations by more sophisticated aircraft increase throughout the planning period. Therefore, AIAs as a percentage of itinerant operations are expected to increase throughout the planning period, along with the expected increase

in more sophisticated aircraft. The projections of AIAs for Colonel James Jabara Airport are summarized in **Table 2J**.

TABLE 2J
Annual Instrument Approaches (AIAs)
Colonel James Jabara Airport

Year	AIAs	Itinerant Operations	AIAs % of Itinerant Ops.
2000	329	20,800	1.6%
2001	152	20,800	0.7%
2002	526	21,000	2.5%
Forecast			
2008	620	23,870	2.6%
2013	710	26,450	2.7%
2023	980	32,670	3.0%

Source: FAA/APO.

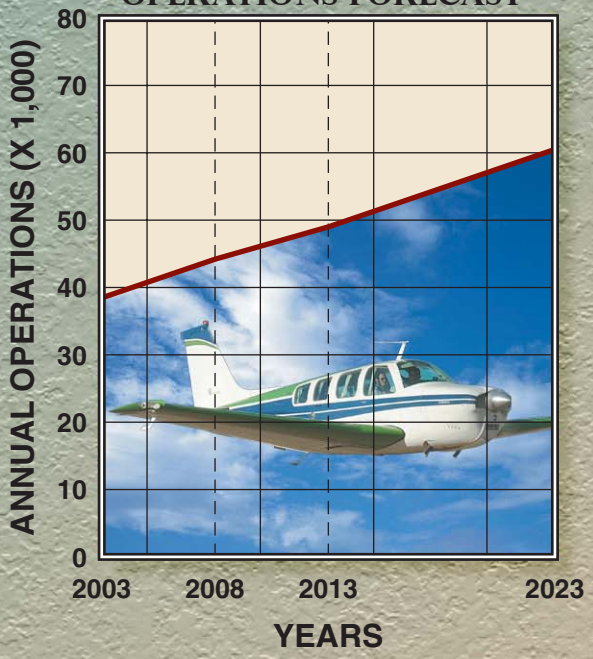
SUMMARY

This chapter has provided forecasts for each sector of aviation demand anticipated over the planning period. **Exhibit 2C** presents a summary of the aviation forecasts developed for Colonel James Jabara Airport. The airport is expected to experience an increase in total based aircraft, annual operations, as well as an increase in turbine-powered aircraft through the planning period. The next step in this study is to assess the capacity of the existing facilities to accommodate forecast demand and determine what types of facilities will be needed to meet these demands.

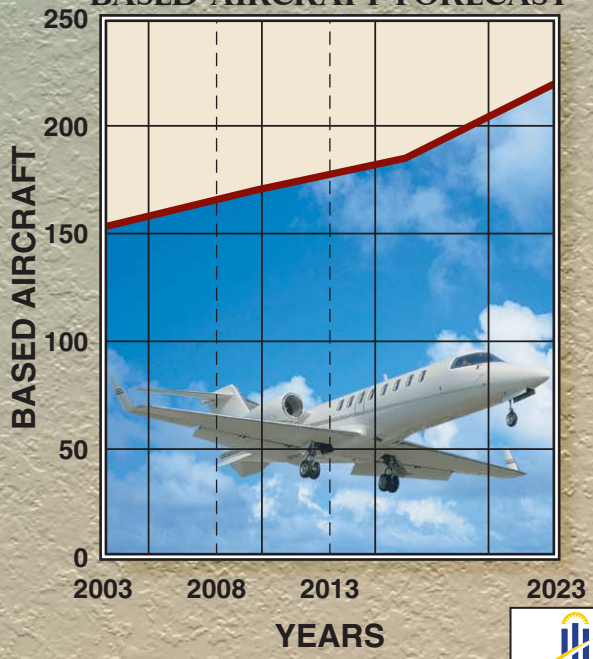
SUMMARY OF AVIATION ACTIVITY FORECASTS

CATEGORY	Current 2003	Forecasts 2008	2013	2023
ANNUAL OPERATIONS				
Itinerant				
General Aviation	19,870	22,915	25,390	31,365
Air Taxi	620	715	795	980
Military	210	240	265	325
Total Itinerant	**20,700**	**23,870**	**26,450**	**32,670**
Local				
General Aviation	18,000	20,330	22,550	27,830
Total Operations	**38,700**	**44,200**	**49,000**	**60,500**
BASED AIRCRAFT				
Single Engine	81	86	87	95
Multi-Engine	62	69	77	96
Jet	6	9	11	15
Helicopter	2	3	5	7
Glider/Other	2	3	5	7
Total Based Aircraft	**153**	**170**	**185**	**220**

OPERATIONS FORECAST



BASED AIRCRAFT FORECAST



CITY OF WICHITA
Wichita Airport Authority

Exhibit 2C
FORECAST SUMMARY

Chapter Three
FACILITY REQUIREMENTS

FACILITY REQUIREMENTS

Wichita Airport Authority

To properly plan for the future of Colonel James Jabara Airport, it is necessary to translate forecast aviation demand into the specific types and quantities of facilities that can adequately serve this identified demand. This chapter uses the results of the forecasts conducted in Chapter Two, as well as established planning criteria, to determine the airfield (i.e., runways, taxiways, navigational aids, marking and lighting), and landside (i.e., hangars, terminal building, aircraft parking apron) facility requirements.

The airport does not qualify for an airport traffic control tower (ATCT) based upon Phase I criteria, which specifies that the establishment ratio must be greater than 1.0. The forecasts, summarized in Exhibit 2C, provide a ratio of 0.31 by 2023.

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

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

that is demand-based rather than time-based, a series of planning horizon milestones have been established for Colonel James Jabara Airport that take into consideration the reasonable range of aviation demand projections prepared in Chapter Two.

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

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

TABLE 3A
Planning Horizon Activity Levels
Colonel James Jabara Airport

	Current Levels	Short-Term	Intermediate Term	Long-Term
Based Aircraft	153	170	185	220
Annual Operations	38,700	44,200	49,000	60,500

AIRFIELD REQUIREMENTS

Airfield requirements include the need for those facilities related to the arrival and departure of aircraft. These facilities are comprised of the following items:

- Runways (including safety areas)
- Taxiways
- Navigational Aids
- Airfield Lighting and Marking

The following airfield facilities are outlined to describe the scope of facilities that would be necessary to accommodate the airport's role throughout the planning period.

AIRFIELD DESIGN STANDARDS

The selection of appropriate Federal Aviation Administration (FAA) design standards for the development and location of airport facilities is based primarily upon the characteristics of the aircraft which are currently using, or are expected to use, the airport. Planning for future aircraft use is of particular importance since design standards are used to plan separation distances between facilities. These standards must be determined now since the relocation of these facilities will likely be extremely expensive at a later date.

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

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

Category A: Speed less than 91 knots.

Category B: Speed 91 knots or more, but less than 121 knots.

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

Category E: Speed greater than 166 knots.

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

Group I: Up to but not including 49 feet.

Group II: 49 feet up to but not including 79 feet.

Group III: 79 feet up to but not including 118 feet.

Group IV: 118 feet up to but not including 171 feet.

Group V: 171 feet up to but not including 214 feet.

Group VI: 214 feet or greater.

In order to determine facility requirements, an ARC should first be determined, and then appropriate airport design criteria can be applied. This

begins with a review of the type of aircraft using and expected to use Colonel James Jabara Airport. **Exhibit 3A** summarizes representative aircraft by ARC.

The FAA recommends designing airport functional elements to meet the requirements of the most demanding ARC for that airport (minimum of 250 annual departures). Colonel James Jabara Airport currently accommodates a wide variety of civilian and business jet aircraft. Aircraft using the airport include small single and multi-engine aircraft (which fall within approach categories A and B and airplane design group I) and business turboprop and jet aircraft (which fall within approach categories B, C, and D and airplane design groups I and II). The existing ARC for Runway 18-36 (and the facility) is D-II. The forecasts anticipate increasing utilization by corporate aircraft throughout the planning period, which will continue to place the airport in the ARC D-II.

The FAA has established object clearing criteria to protect aircraft operational areas and keep them free from obstructions that could affect the safe operation of aircraft. These include the runway safety area (RSA), object free area (OFA), obstacle free zone (OFZ), and runway protection zones (RPZ). Obstructions to 14 CFR Part 77 are regulated under height and hazard zoning found in the Wichita City Code, Chapter 28, Section 08.070.

The RSA is "a defined surface surrounding the runway prepared or suitable for reducing the risk of damage to airplanes in the event of an undershoot, overshoot, or an excursion from the runway." An object free area is an area on the ground centered on the runway, taxiway, or centerline provided to enhance the safety of aircraft operations, except for objects that need to be located in the OFA for air navigation or aircraft ground maneuvering purposes. An obstacle free zone is a volume of airspace that is required to be clear of objects, except for frangible items required for navigation of aircraft. It is centered along the runway and extended runway centerline. The RPZ is defined as an area off the runway end to enhance the protection of people and property on the ground. The RPZ is trapezoidal in shape and centered about the extended runway centerline. The dimensions of an RPZ are a function of the runway ARC and approach visibility minimums.

Table 3B summarizes the current design requirements of these safety areas by airport reference code for Colonel James Jabara Airport. The design requirements for an ILS approach with one half-mile visibility are applicable to Runway 18 upon certification of the approach. The one-mile visibility standards apply to Runway 36. A printout of the ARC D-II standards is presented in the appendix.

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A-I

Beech Baron 55
Beech Bonanza
Cessna 150
Cessna 172
Piper Archer
Piper Seneca

B-I
less than 12,500 lbs.

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

B-II
less than 12,500 lbs.

Super King Air 200
Cessna 441
DHC Twin Otter

B-I, II
over 12,500 lbs.

Super King Air 300
Beech 1900
Jetstream 31
Falcon 10, 20, 50
Falcon 200, 900
Citation II, III, IV, V
Saab 340
Embraer 120

A-III, B-III

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

C-I, D-I

Lear 25, 35, **55**
Israeli Westwind
HS 125

C-II, D-II

Gulfstream II, **III**, IV
Canadair 600
Canadair Regional Jet
Lockheed JetStar
Super King Air 350

C-III, D-III

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

C-IV, D-IV

B-757
B-767
DC-8-70
DC-10
MD-11
L1011

D-V

B-747 Series
B-777

Note: Aircraft pictured is identified in bold type.

CITY OF WICHITA
Wichita Airport Authority

Exhibit 3A
AIRPORT REFERENCE CODES

TABLE 3B
Airfield Safety Area Dimensional Standards (feet)

	ARC D-II STANDARDS Runway 18 (1/2-Mile Visibility)	ARC D-II STANDARDS Runway 36 (1 Mile Visibility)
Runway Safety Area (RSA)		
Width	500	500
Length Beyond Runway End	1,000	1,000
Runway Object Free Area (OFA)		
Width	800	800
Length Beyond Runway End	1,000	1,000
Runway Obstacle Free Zone (OFZ)		
Width	400	400
Length Beyond Runway End	200	200
Runway Protection Zone (RPZ)		
Inner Width	1,000	500
Outer Width	1,750	1,010
Length	2,500	1,700

Source: FAA Airport Design Computer Program Version 4.2D.

RUNWAYS

The adequacy of the existing runway system was analyzed from a number of perspectives, including airfield capacity, runway orientation, runway length, runway width, and pavement strength. From this information, requirements for runway improvements were determined for the airport.

Airfield Capacity

A demand/capacity analysis measures the capacity of the airfield facilities (i.e. runways and taxiways) in order to identify and plan for additional development needs. Annual capacity of a single runway configuration normally exceeds 150,000 operations with a suitable parallel taxiway available. Since the forecasts for Colonel James Jabara Airport indicate the activity throughout the planning period will remain below 100,000 operations, the capacity of the existing runway and taxiway system will not be reached, and the airfield will be able to meet operational demands.

Runway Orientation

The airport is presently served by a single 6,100-foot runway, oriented in a north-south manner. For the operational safety and efficiency of an airport, it is desirable for the principal runway of an airport's runway system to be oriented as close as possible to the direction of the prevailing wind.

This reduces the impact of wind components perpendicular to the direction of travel of an aircraft that is landing or taking off (defined as a crosswind).

FAA design standards recommend additional runway configurations when the primary runway configuration provides less than 95 percent wind coverage at specific crosswind components. The 95 percent wind coverage is computed on the basis of crosswinds not exceeding 10.5 knots for small aircraft weighing less than 12,500 pounds and from 13 to 20 knots for aircraft weighing over 12,500 pounds.

According to wind data summarized between 1990 and 1999, the existing runway configuration provides 91.30 percent wind coverage in 10.5 knot crosswind conditions, 95.76 percent wind coverage in 13 knot crosswind conditions, 98.69 percent wind coverage in 16 knot crosswind conditions, and 99.65 percent wind coverage in 20 knot crosswind conditions. **Table 3C** and **Exhibit 3B** summarize the wind coverage for Runway 18-36 in all-weather conditions.

Runway Length

The determination of runway length requirements for an airport is based on five primary factors: airport elevation; mean maximum temperature of the hottest month; runway gradient (difference in runway elevation of each runway end); critical aircraft type expected to use the airport; and stage length of the longest nonstop trip destination. Aircraft performance declines as each of these factors increase. Summertime temperatures and stage lengths are the primary factors in determining runway length requirements.

TABLE 3C
Wind Coverage Summary
All-Weather Conditions

	10.5 knots	13 knots	16 knots	20 knots
Runway 18-36	91.30%	95.76%	98.69%	99.65%

Source: NOAA, Wichita Mid-Continent Airport, Wichita, Kansas. Observation Period: 1990-1999.

For calculating runway length requirements, airport elevation is 1,420 feet above mean sea level (MSL) and the mean maximum temperature of the hottest month is 91.7 degrees Fahrenheit (F). Runway end elevations vary by 19.7 feet across the airfield.

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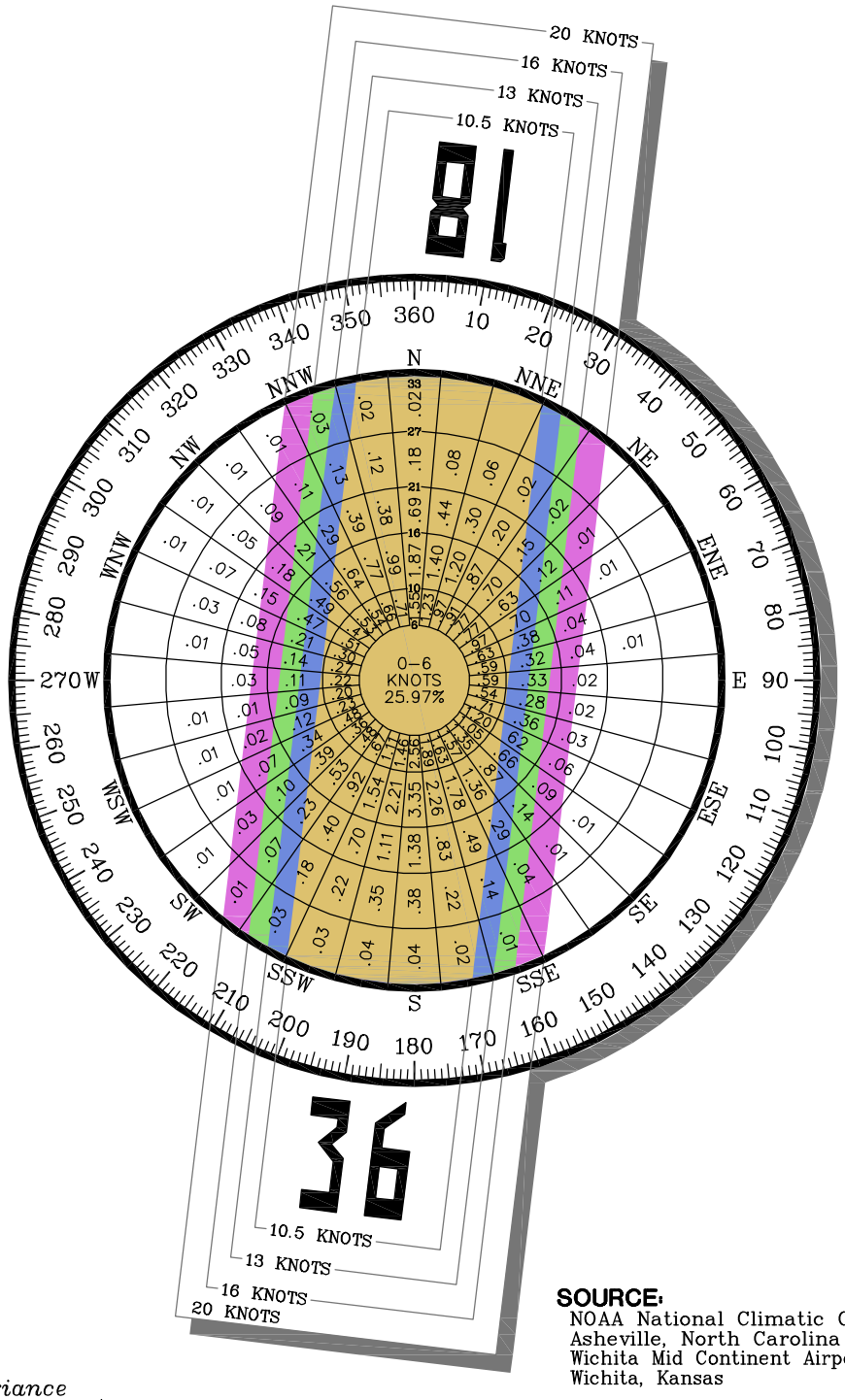
ALL WEATHER WIND COVERAGE

Runways	10.5 Knots	13 Knots	16 Knots	20 Knots
Runway 18–36	*91.30%*	*95.76%*	*98.69%*	*99.65%*



NORTH

Magnetic Variance
5° 23' East (May 2003)
Annual Rate of Change
6.93' West (May 2003)

SOURCE:
NOAA National Climatic Center
Asheville, North Carolina
Wichita Mid Continent Airport
Wichita, Kansas

OBSERVATIONS:
84,241 All Weather Observations
1990–1999

CITY OF WICHITA
Wichita Airport Authority

Exhibit 3B
ALL WEATHER WIND ROSE

The current mix of aircraft operating at Colonel James Jabara Airport includes multi-engine aircraft such as the Beech Baron 58 and the Beech King Air. Business jets which currently use the airport include aircraft such as the Lear 24D and Lear 35A.

The FAA's design software (Version 4.2D) was used to verify runway length requirements, which are summarized in **Table 3D**. The appropriate FAA runway length planning category for Runway 18-36 is "75 percent of large aircraft at 60 percent useful load." As shown in the table, the FAA recommends a minimum runway length of 5,500 feet for this runway length category. At the existing length of 6,100 feet, Runway 18-36 meets the FAA's recommended runway length for aircraft which currently operate, and those which can be expected to operate at the airport in the future. However, certain aircraft may require greater distances when operating with a full load during the summer months.

TABLE 3D **Runway Lengths, FAA Design Software**	
Airport Elevation	1,420 feet
Mean daily maximum temperature of the hottest month	91.70 F
Maximum difference in runway centerline elevation	20 feet
RUNWAY LENGTHS RECOMMENDED FOR AIRPORT DESIGN	
Small planes with less than 10 passenger seats	
75 percent of these small airplanes	3,000 feet
95 percent of these small airplanes	3,600 feet
100 percent of these small airplanes	4,200 feet
Large airplanes of 60,000 pounds or less	
75 percent of these large airplanes at 60 percent useful load	**5,500 feet**
75 percent of these large airplanes at 90 percent useful load	7,200 feet
100 percent of these large airplanes at 60 percent useful load	6,200 feet
100 percent of these large airplanes at 60 percent useful load	9,200 feet
Reference: Chapter 2 of *AC 150/5325-4A,* Runway Length Requirements for Airport Design, Change 4 included.	

Runway Width

The width of the existing runway was also examined to determine the need for facility improvements. Currently, Runway 18-36 is 100 feet wide, which is adequate for aircraft through ADG III. Therefore, no additional runway width is required to serve aircraft expected to operate at the airport throughout the planning period.

Pavement Strength

The most important feature of airfield pavement is its ability to withstand repeated use by aircraft of significant weight. The current strength rating on Runway 18-36 is 40,000 pounds single wheel loading (SWL) and 62,000 pounds dual wheel loading (DWL). The current strength rating on the runway may need to be evaluated based upon annual operations by aircraft currently exceeding this wheel loading.

TAXIWAYS

Taxiways are constructed primarily to facilitate aircraft movements to and from the runway system. Some taxiways are necessary simply to provide access between the aprons and the runways, whereas other taxiways become necessary as activity increases at an airport to provide safe and efficient use of the airfield. Presently, a combination of connecting taxiways and a full-length parallel taxiway provide access between the general aviation facilities and the runways. The existing airfield appears to be adequately served. However, as facilities are constructed in new areas on the airfield, it will be necessary to add connecting taxiways. A parallel taxiway on the east side of the runway will also be necessary if new hangars are developed in this area.

AIRFIELD MARKING, LIGHTING AND SIGNAGE

In order to facilitate the safe movement of aircraft about the field, airports use pavement markings, lighting, and signage to direct pilots to their destinations. Runway markings are designed according to the type of instrument approach available on the runway. FAA Advisory Circular 150/5340-1H, *Marking of Paved Areas on Airports*, provides the guidance necessary to design airport markings. Runway 36 has the necessary markings for the nonprecision approach which is available to the runway. Runway 18 has precision markings in order to accommodate the instrument landing system (ILS) approach to Runway 18. Precision markings include threshold, runway designation, centerline, aiming point, and touchdown zone markings.

Taxiway and apron areas also require marking. Yellow centerline stripes are currently painted on all taxiway surfaces at the airport to provide this guidance to pilots. The aircraft parking apron also has centerline markings to indicate the alignment of taxilanes within these areas. Besides routine maintenance of the taxiway striping, these markings will be sufficient through the planning period.

Airport lighting systems provide critical guidance to pilots during nighttime and low visibility operations. Runway

18-36 is equipped with high intensity runway lighting (HIRL).

Effective ground movement of aircraft at night is enhanced by the availability of taxiway lighting. Medium intensity taxiway lighting (MITL) is installed on all taxiways, with edge lighting or reflectors in use on taxilanes. The existing airfield lighting systems, while adequate in intensity, will require routine maintenance and upgrades during the planning period.

Airfield signage provides another means of notifying pilots as to their location on the airport. A system of signs placed at several airfield intersections on the airport is the best method available to provide this guidance. Signs located at intersections of taxiways provide crucial information to avoid conflicts between moving aircraft. Directional signage instructs pilots as to the location of taxiways and terminal aprons. At Colonel James Jabara Airport, lighted signs are installed at all taxiway and runway intersections. Precision hold signs are installed to accommodate the ILS approach to Runway 18.

NAVIGATIONAL AND APPROACH AIDS

Electronic and visual guidance to arriving aircraft enhance the safety and capacity of the airfield. Such facilities are vital to the success of the airport, and provide additional safety to passengers using the air transportation system. While instrument approach aids are especially helpful during poor weather, they are often used by commercial pilots when visibility is good. There are currently four published instrument approaches to Colonel James Jabara Airport.

Instrument approaches are categorized as either precision or nonprecision. Precision instrument approach aids provide an exact alignment and descent path for an aircraft on final approach to a runway, while nonprecision instrument approach aids provide only runway alignment information. Most existing precision instrument approaches in the United States are instrument landing systems (ILS). At Colonel James Jabara Airport, Runway 18 is precision instrument, while Runway 36 is non-precision.

With the advent of the Global Positioning System (GPS), stand-alone instrument assisted approaches that provide vertical guidance down to visibility minimums currently associated with precision runways, will eventually be established. As a result, airport design standards that formerly were associated with a type of instrument procedure (precision/ nonprecision) are now revised, to relate instead to the designated or planned approach visibility minimums.

Existing Instrument Approaches

As previously mentioned, non-precision instrument approaches are only available on Runway 18-36. The VOR/DME approach to Runway 18 allows aircraft to land in IFR weather with ceilings as low as 400 feet and visibility reduced to one mile (this will drop to 200 feet/one-half mile with the ILS). The other approaches range from 500 feet and one mile to 600 feet and two miles.

Global Positioning System

The advent of technology has been one of the most important contributing factors in the growth of the aviation industry. Much of civil aviation and aerospace technology has been derived and enhanced from the initial development of technological improvements for military purposes. The use of orbiting satellites to confirm an aircraft's location is the latest military development to be made available to the civil aviation community.

The FAA has already approved the publication of thousands of "overlay" GPS instrument approach procedures. Stand-alone GPS approaches using the Wide-Area Augmentation System (WAAS) will gradually be phased in to provide Category I approaches (estimated 2015-2020 timeframe), while Local Area Augmentation Systems (LAAS) will provide Category I/II/III approaches. Approach lighting and runway lighting systems in use today will continue to be required for the desired approaches.

Visual Approach Aids

In most instances, the landing phase of any flight must be conducted in visual conditions. To provide pilots with visual guidance information during landings to the runway, electronic visual approach aids are commonly provided at airports. Currently, Runway 18-36 is equipped with a four-light precision approach path indicator (PAPI-4) system on each end of the runway.

Approach Lighting

Approach lighting systems provide the basic means to transition from instrument flight to visual flight for landing. Runway 18-36 is equipped with runway end identification lights (REILs). REILs are flashing lights that facilitate identification of the runway end. The airport is installing a medium intensity approach lighting system (MALS) with runway alignment indicator lights (RAIL) or (MALSR) for the instrument approach on Runway 18.

LANDSIDE REQUIREMENTS

Landside facilities are those necessary for handling aircraft, passengers, and freight while on the ground. These facilities provide the essential inter-

face between the air and ground transportation modes. The capacities of the various components of each area were examined in relation to projected demand to identify future landside facility needs.

GENERAL AVIATION TERMINAL COMPLEX

General aviation terminal facilities have several functions. Space is required for passenger waiting, pilot's lounge and flight planning, airport management, storage, and various other needs. Existing facilities provide approximately 6,000 square feet.

Table 3E outlines the space requirements for general aviation terminal facilities at Colonel James Jabara Airport. A planning average of 2.5 passengers per flight throughout the planning period was multiplied by the number of design hour itinerant operations. Space requirements were then based upon providing a planning criterion of 90 square feet per design hour itinerant passenger. As shown in the table, the existing general aviation terminal (currently provided with FBO) facilities will be sufficient throughout the planning period for projected design hour passengers.

TABLE 3E
General Aviation Terminal Facilities (provided at FBO)
Colonel James Jabara Airport

	Available	Short Term	Intermediate Term	Long Term
General Aviation Design Hour Itinerant Passengers	N/A	46	54	71
General Aviation Building Space (s.f.)	6,000	4,200	4,900	6,400

GENERAL AVIATION REQUIREMENTS

The purpose of this section is to determine the landside space requirements for general aviation hangar and apron parking facilities during the planning period. In addition, the total surface area needed to accommodate general aviation activities throughout the planning period is estimated.

HANGARS

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

The demand for aircraft storage hangars is dependent upon the number and type of aircraft expected to be based at the airport in the future. For planning purposes, it is necessary to estimate hangar requirements based upon forecast operational activity. However, hangar development should be based upon actual demand trends and financial investment conditions. While a majority of aircraft owners prefer enclosed aircraft storage, a number of based aircraft will still tie-down outside (due to the lack of hangar availability, hangar rental rates, and/or operational needs). Therefore, enclosed hangar facilities should not be planned for each based aircraft. At Colonel James Jabara Airport, approximately 75 percent of the based aircraft are currently stored in enclosed hangar facilities. It is estimated that the percentage of based aircraft stored in hangars will remain near 75 percent through the planning period.

Approximately 35 percent of hangared aircraft at the airport are currently stored in T-hangars. The majority of aircraft currently stored in these hangars are single-engine. A planning standard of 1,200 square feet per based aircraft stored in T-hangars has been used to determine future T-hangar requirements.

Approximately 60 percent of hangared aircraft are stored in conventional hangars, while approximately five percent are stored in executive hangars. Each of these types of hangars is designed for multiple aircraft storage. As the trend towards more sophisticated aircraft continues throughout the planning period, it is important to determine the need for more conventional and executive hangars. For conventional hangars, a planning standard of 1,200 square feet was used for single-engine aircraft, while a planning standard of 3,000 square feet was used for multi-engine, jet, and helicopters. These planning standards recognize that some of the larger business jets require a greater amount of space.

Since portions of conventional hangars are also used for aircraft maintenance and servicing, requirements for maintenance/service hangar area were estimated using a planning standard of approximately 15 percent of the total hangar space needs.

Future hangar requirements for the airport are summarized in **Table 3F**. As shown in the table, additional hangar space is currently needed at the airport. Chapter Four, Airport Development Alternatives, will examine the options available for hangar develop-

ment at the airport and determine the best location for each type of hangar facility.

AIRCRAFT PARKING APRON

A parking apron should provide for the number of locally-based aircraft that are not stored in hangars, and for those aircraft used for air taxi and training activity. Parking should be provided for itinerant aircraft (passenger and air freight) as well. As mentioned in the previous section, approximately 75 percent of based aircraft at Colonel James Jabara Airport are currently stored in hangars, and that percentage is expected to continue throughout the planning period.

TABLE 3F
Aircraft Storage Requirements
Colonel James Jabara Airport

			FUTURE REQUIREMENTS		
	Currently Available	**Current Need**	**Short Term**	**Inter-mediate Term**	**Long Term**
Aircraft to be Hangared	107	118	128	139	165
T-Hangar Positions	40	45	50	57	73
Executive Hangar Positions	7	8	9	11	14
Conventional Hangar Positions	60	65	68	71	78
Hangar Area Requirements (s.f.)					
T-hangar Area	48,800	50,000	60,000	66,000	78,000
Executive Hangar Area	14,800	17,400	21,600	25,800	33,000
Conventional Hangar Area	126,000	189,600	194,400	202,200	225,000
Maintenance Area	9,000	36,500	41,400	44,100	50,400
Total Hangar Area (s.f.)	**198,600**	**293,500**	**317,400**	**338,100**	**386,400**

For planning purposes, 15 percent of the based aircraft total will be used to determine the parking apron requirements of local aircraft, due to some aircraft requiring both hangar storage and parking apron. Since the majority of locally-based aircraft are stored in hangars, the area requirement for parking of locally-based aircraft is smaller than for transient aircraft. Therefore, a planning criterion of 650 square yards per aircraft was used to determine the apron requirements for local aircraft.

Along with based aircraft parking needs, transient aircraft parking needs must also be considered when determining apron requirements. A planning criterion of 800 square yards was used for single and multi-engine itinerant aircraft, and 1,600 square yards for itinerant jets. Currently, there is one parking apron available for aircraft tie-downs at Colonel James Jabara Airport. This apron, which is used by itinerant and based aircraft, is approximately 54,200 square yards and has approximately 70 tie-downs.

Total aircraft parking apron requirements are presented in **Table 3G**. As shown in the table, no additional apron area will be required throughout the planning period.

SUPPORT REQUIREMENTS

Various facilities that do not logically fall within classifications of airfield, terminal building, or general aviation areas have also been identified. These other areas provide certain functions related to the overall operation of the airport, and include: aircraft rescue and firefighting, fuel storage, and airport maintenance facilities.

TABLE 3G
Aircraft Parking Apron Requirements
Colonel James Jabara Airport

	Currently Available	Short Term	Intermediate Term	Long Term
Single, Multi-Engine Transient Aircraft				
Positions		19	21	25
Apron Area (s.y.)		14,900	16,500	20,400
Transient Jet Aircraft Positions		3	4	4
Apron Area (s.y.)		5,200	5,800	7,200
Locally-Based Aircraft Positions		26	28	33
Apron Area (s.y.)		16,600	18,000	21,500
Total Positions	**70**	**48**	**53**	**62**
Total Apron Area (s.y.)	**54,200**	**36,700**	**40,300**	**49,100**

AIRCRAFT RESCUE AND FIREFIGHTING

Currently, there is no aircraft rescue and firefighting (ARFF) facility located on the field at Colonel James Jabara Airport. ARFF services are provided by the City of Wichita from a fire station a mile south of the airfield. This will be sufficient through the planning period.

AIRPORT MAINTENANCE/ STORAGE FACILITIES

Currently, Colonel James Jabara Airport has a 9,000 square-foot maintenance/storage building, which is located south of Midwest Life Team's facilities. Adequate area needs to be reserved for expansion and upgrade of this facility.

FUEL STORAGE

Fuel storage facilities for Colonel James Jabara Airport are located at mid-field, west of Jabara Road. Fuel storage at the airport includes five underground storage tanks with a total capacity of 52,000 gallons. Three of these tanks are used to store Jet A fuel, while the other two are used to store 100 LL fuel. Aircraft refueling is provided from fueling trucks.

Area should be reserved to allow for expansion of the fuel farm, should their demands change throughout the planning period. Planning standards usually recommend a two-week minimum supply.

VEHICLE PARKING

Vehicle parking demands have been determined for Colonel James Jabara Airport. Space determinations were based on an evaluation of existing airport use as well as industry standards. Automobile parking spaces required to meet general aviation demand were calculated by adding the hangar and terminal areas for short term, intermediate term, and long term. The standard of 400 square feet per vehicle space needed was applied. Parking requirements are summarized in **Table 3H**. As evidenced in the table, additional vehicle parking area will be required in the short term.

TABLE 3H
Vehicle Parking Requirements
Colonel James Jabara Airport

		FUTURE REQUIREMENTS		
	Currently Available	**Short Term**	**Intermediate Term**	**Long Term**
Design Hour Passengers		17	19	23
Terminal Vehicle Spaces		23	25	30
Parking Area (s.f.)		9,100	10,100	12,100
General Aviation Spaces		85	93	110
Parking Area (s.f.)		34,000	37,000	44,000
Total Parking Spaces	88	108	118	140
Total Parking Area (s.f.)	35,000	43,100	47,100	56,100

ACCESS

Primary access to the existing facilities is via Webb Road, with internal circulation on Jabara Road, (which was the original runway). Jabara Road is currently in poor condition and should be reconstructed (assuming it remains as the primary internal access road after evaluation of development alternatives).

SUMMARY

The intent of this chapter has been to outline the facilities required to meet

potential aviation demands projected for the airport through the planning horizon. The next step is to develop a direction for implementation that will best meet these projected needs. The remainder of the master plan will be devoted to outlining this direction, its schedule, and costs.

Chapter Four
AIRPORT DEVELOPMENT ALTERNATIVES

CHAPTER FOUR

AIRPORT DEVELOPMENT ALTERNATIVES

CITY OF WICHITA
Wichita Airport Authority

Prior to defining the development program for Colonel James Jabara Airport, it is important to consider development potential and constraints at the airport. The purpose of this chapter is to consider the actual physical facilities that are needed to accommodate projected demand and meet the program requirements as defined in Chapter Three, Airport Facility Requirements.

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

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

The number of potential alternatives that can be considered can be endless. Therefore, some judgment must be applied to identify the alternatives that have the greatest potential for implementation. The alternatives presented in this chapter have been identified as such.

The alternatives have been developed to meet the overall development objectives for the airport in a balanced manner. Through coordination with the Planning Advisory Committee (PAC) and the Wichita Airport Authority (WAA), the alternatives will be refined and modified as necessary to produce the recommended development program. Therefore, the alternatives presented in this chapter can be considered a beginning point in the development of the recommended master plan development program, and input will be necessary to define the resultant program.

When landside capacity has the potential to accommodate facility demand in excess of project demand, alternative configurations to accommodate facility needs beyond the planning period will be identified. This allows maximum flexibility in marketing and developing the airport as all available parcels of land at the airport will have a designated use and/or configuration.

In his chapter, configurations to provide for demand beyond the planning period are considered. In some cases, this will define land acquisition opportunities. A proactive approach to facility planning in this manner assures the most economical land acquisitions and options for the use and development of the airport.

While the focus of the analysis summarized in this chapter is identifying future development options for Colonel James Jabara Airport, it is also important to consider the impacts of alternatives to developing Colonel James Jabara Airport to meet future demands. These include 1) no future development at the airport (no action alternative), and 2) transferring aviation demand to another airport.

The “no action” alternative essentially considers keeping the airport in its present condition and not providing for any type of improvement to the existing facilities to accommodate future demand. The primary results of this alternative would be the inability of the airport to satisfy the projected aviation demands of the airport service area, as well as experience additional economic growth through the development of viable parcels of land on the airport.

The airport’s aviation forecasts and the analysis of facility requirements indicated a potential need for the establishment of an instrument approach procedure, new taxiways, expanded hangar facilities and additional general aviation services. Without these improvements to the airport facilities, regular and potential users of the airport will be constrained from taking maximum advantage of the airport’s air transportation capabilities. The unavoidable consequences of the “no action” alternative would involve the airports inability to attract potential airport users. If the airport does not have the capability to meet hangar, apron, or airfield needs of the potential users, the airport’s capabilities to accommodate businesses that rely on air transporta-

tion will be diminished. To propose no further development at the airport would be inconsistent with local community goals to expand the economic development in the region.

Transferring aviation services to another airport essentially considers limiting development at Colonel James Jabara Airport and relying on other airports to serve aviation demand for the local area. Of the six public-use airports within 10 nautical miles of Colonel James Jabara Airport, only Beech Factory Airport has the necessary runway length to serve the mix of aircraft using Colonel James Jabara Airport. The remaining airports could serve the recreational users and some sport users of Colonel James Jabara Airport, but not the full-range of business aircraft. Considering the current capability of the five airports, only one airport is presently configured to serve the existing mix of aircraft using Colonel James Jabara Airport, without significant investments. While the airports could theoretically accommodate a portion of the demand from Colonel James Jabara Airport, each of the airports has a role to fill in the regional and national aviation system. Accommodating demand from Colonel James Jabara Airport could potentially reduce the long-term ability of these airports to meet their future demand levels.

The relocation of aviation services to a new facility is another option. However, the development of a new reliever airport is complex and expensive. The replacement cost of the existing facility is estimated at $35-$50 million.

Furthermore, Colonel James Jabara Airport is designated as a reliever airport for Wichita Mid-Continent Airport. In this role, Colonel James Jabara Airport accommodates general aviation demand that otherwise might use Wichita Mid-Continent Airport. This increases safety and capacity at Wichita Mid-Continent Airport by segregating general aviation users from the commercial airline and air cargo users at Wichita Mid-Continent Airport. Colonel James Jabara Airport needs to be developed to meet general aviations demands for the area to ensure the long term viability of Wichita Mid-Continent Airport.

AIRPORT DEVELOPMENT OBJECTIVES

It is the overall objective of this effort to produce a balanced airside and landside complex to serve forecast aviation demands. However, before defining and evaluating specific alternatives, airport development objectives should be considered. As owner and operator, the WAA provides the overall guidance for the operation and development of the Colonel James Jabara Airport. It is of primary concern that the airport is developed, and operated for the betterment of the community and its users. With this in mind, the following development objectives have been defined for this planning effort:

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

2. Identify facilities to efficiently serve all types of general aviation users.

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

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

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

AIRFIELD CONSIDERATIONS

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

The primary planning issues related to the airfield at Colonel James Jabara Airport are summarized at the top of **Exhibit 4A**. These issues are the result of the analyses conducted previously in Chapter Two, Aviation Demand Forecasts, and Chapter Three, Aviation Facility Requirements.

ASSESSMENT OF AIRFIELD SAFETY AREA COMPLIANCE

Of particular importance for Colonel James Jabara Airport is providing an airfield facility capable of accommodating the full range of general aviation aircraft, including business class aircraft. Colonel James Jabara Airport is expected to accommodate general aviation aircraft operations that would otherwise choose to operate at Wichita Mid-Continent Airport. In this manner, Colonel James Jabara Airport increases capacity at Wichita Mid-Continent Airport for larger commercial aircraft operations by reducing the number of general aviation operations at the airport. Capacity at Wichita Mid-Continent Airport is maximized when Colonel James Jabara Airport can serve the full range of general aviation aircraft.

To serve the full range of general aviation aircraft, the facility requirements analysis indicated that Colonel James Jabara Airport should conform to Fed-

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SCALE IN FEET

NORTH

LEGEND

- Existing Airport Property Line
- Ultimate Airport Property Line
- Potential Airfield Pavement
- Runway Protection Zone (RPZ)
- Object Free Area (OFA)
- Runway Safety Area (RSA)
- Building Restriction Line (BRL)
- Precision Object Free Area (POFA)

AIRFIELD CONSIDERATIONS

- Conform to Airport Reference Code (ARC) D-II design standards
- Provide for a full-length parallel taxiway east of Runway 18-36
- Provide for holding aprons at each runway end
- Provide for a precision instrument approach to Runway 18
- Provide for a MALSR to Runway 18
- Provide for blast pads at each runway end

PROPERTY CONSIDERATIONS

- Acquire property in Runway 18 approach for protection
- Acquire property on east side for future landside development

ULTIMATE RPZ

GLIDESLOPE ANTENNA

County Maintenance Yard

RELOCATED SEGMENTED CIRCLE/LIGHTED WINDCONE

HOLDING APRON

EXISTING/ULTIMATE RPZ

Runway 18-36 (6,100' x 100')

A B C D E F

Taxiway A

L

MALSR

BLAST PAD

BLAST PAD

Dry Creek

37th Street N.

Greenwich Road

Lindberg Avenue

Jabara Road

Webb Road

45th Street N.

43rd Street N.

39th Street N.

37th Street N.

35th Street N.

34th Street N.

Highway K96

E. Greenbriar St.

Shannon Woods

29th Street N.

Railroad

CITY OF WICHITA
Wichita Airport Authority

Exhibit 4A
AIRFIELD/PROPERTY CONSIDERATIONS

eral Aviation Administration (FAA) airport reference code (ARC) D-II design standards. The airport reference code (ARC) system relates airport design requirements to the physical (wingspan) and operational (approach speed) characteristics of the largest and fastest aircraft conducting 500 or more operations annually at the airport. While this can at times be represented by one specific make and model of aircraft, most often the airport's ARC is represented by several different aircraft which collectively conduct more than 500 annual operations at the airport. The FAA uses the 500 annual operations threshold when evaluating the need to develop and/or upgrade airport facilities to ensure that an airport is cost-effectively constructed to meet the needs of those aircraft that are using, or have the potential to use, the airport on a regular basis. In some cases, aircraft operate at airports even though they may exceed the ARC designation for the airport. This is due to these aircraft not meeting the 500 annual operations threshold.

The ARC design standards not only define the characteristics of the pavement areas to accommodate landing and ground operations of aircraft, but also both physical and imaginary safety areas to protect aircraft operational areas and keep them free of obstructions that could affect the safe operation of aircraft at the airport. The physical safety areas include the runway safety area (RSA), while the imaginary safety areas include the object free area (OFA) and runway protection zone (RPZ).

The RSA is "a defined surface surrounding the runway prepared or suitable for reducing the risk of damage to airplanes in the event of an undershoot, overshoot, or excursion from the runway." For Colonel James Jabara Airport, the RSA must extend 1,000 feet beyond the runway end and 250 feet each side of the runway centerline. The outline of an ARC D-II RSA at Colonel James Jabara Airport is shown with a light blue line on **Exhibit 4A**. As shown on the exhibit, the airport fully complies with RSA standards as the RSA is not obstructed and the RSA is fully graded according to standard.

The FAA defines the OFA as "a two-dimensional ground area surrounding runways, taxiways, and taxilanes which is clear of objects except for objects whose location is fixed by function (i.e., airfield lighting)." The OFA is an imaginary surface that prevents the location of permanent objects within its boundaries. The OFA for Colonel James Jabara Airport extends 1,000 feet beyond each runway end and 400 feet each side of the runway centerline. The OFA is shown by a green line on **Exhibit 4A**. Similar to the RSA, an ARC D-II OFA is not obstructed at the airport.

Change 6 to FAA Advisory Circular (AC) 150/5300-13 established the precision OFA (POFA). The POFA extends 400 feet each side of the extended centerline and 200 feet beyond the runway end. The POFA applies to all runways with instrument approach procedures that provide approach visibility minimums less than ¾-mile. For Colonel James Jabara Airport, the Runway 18 end must comply with POFA requirements as this is the runway end planned for a precision instrument approach. The POFA for Runway 18 is

shown with an orange/white dashed line on **Exhibit 4A**. As shown on the exhibit, an ARC D-II POFA is not obstructed at Colonel James Jabara Airport.

The RPZ is a trapezoidal area centered on the extended runway centerline to protect people and property on the ground. The RPZ is a two-dimensional area and has no associated approach surface. FAA design standards limit the types of development within the RPZ, to development that is compatible to aircraft operations. FAA design standards limit residential and other types of development that can cause the congregation of people on the ground. Typically, compatible development includes agricultural land uses, golf courses (although consideration is being given to limiting golf course development due to bird strike considerations), or surface parking lots and roadways.

Standards for the dimensions of the RPZ are based on the ARC and planned approach visibility minimums. For Colonel James Jabara Airport, a precision instrument approach with ½-mile visibility minimums is planned for Runway 18, while one-mile visibility minimums are planned for Runway 36. The ARC D-II RPZ for each runway based on these planned approach visibility minimums is shown on **Exhibit 4A**.

As shown on the exhibit, the airport currently controls the Runway 36 RPZ through fee simple ownership where the RPZ extends outside the limits of the Highway 96 right-of-way. For Runway 18, the airport currently owns in fee simple the precision instrument approach RPZ outside the 43rd Street North/Lindberg Avenue right-of-way. As shown on **Exhibit 4A**, current acquisition plans include acquiring additional property north of 43rd Street North.

PRECISION INSTRUMENT APPROACH

The installation of an instrument landing system (ILS) approach was completed for Runway 18 in 2004. The ILS is a precision instrument approach that will provide both vertical and course guidance to pilots. Besides providing for the protection of the RPZ, the airport currently meets all design requirements for the installation of the ILS. The FAA will determine the approach and visibility minimums based upon an airspace analysis.

An ILS has the capability to provide for landings when visibility is restricted to one-half mile and cloud ceilings fall to 200 feet above the ground when a medium intensity approach lighting system with runway alignment indicator lights (MALSR) is installed. A MALSR has also been installed with the ILS equipment, but will not be completed until 2005.

The MALSR is an approach lighting system that begins 200 feet from the landing threshold and extends 2,400 feet into the approach area. The location and configuration of the MALSR is shown on **Exhibit 4A**. FAA standards prefer that the land surrounding the MALSR be owned fee simple. As shown on the exhibit, the area for the installa-

tion of the MALSR is entirely owned in fee (with the exception of the last light tower, which falls on street right-of-way).

EAST PARALLEL TAXIWAY

To facilitate long term development east of Runway 18-36, the facility requirements indicated the need for a parallel taxiway east of Runway 18-36. This taxiway will need to be located 400 feet from the runway centerline to conform to ARC D-II design standards for the ILS precision instrument approach to Runway 18. At the north end of the runway it will need to flare around the critical area for the glide slope antenna. **Exhibit 4A** depicts the alignment of a parallel taxiway and connecting taxiways to Runway 18-36. The connecting taxiways on the east side of the runway will logically be extensions of the same connecting taxiways on the west side of the runway. A holding apron is provided at the Runway 36 end.

The extension of the parallel taxiway to the Runway 18 end is limited by the location of the Runway 18 ILS glideslope antenna. The glideslope antenna is used to establish the aircraft descent path on the ILS approach until visual contact confirms the runway alignment and location. Since the glideslope uses the ground in front of the antenna to develop the signal, this area needs to be graded and free of obstructions. The glideslope antenna for the Runway 18 ILS approach is located 400 feet east of the runway centerline and 750 feet from the runway threshold. This places the ILS along the parallel taxiway centerline.

In situations where the glideslope antenna will be located along the alignment of the parallel taxiway, the parallel taxiway is routed around the glideslope antenna so that taxiing aircraft do not interfere with the antenna. However, this requires that the parallel taxiway be placed at a greater separation from the runway centerline in the area surrounding the glideslope antenna. Presently, the alignment of Lindberg Avenue prevents locating a portion of the east parallel taxiway at the proper distance from the runway centerline. Therefore, the only means available to extend a full-length parallel taxiway on the east side of Runway 18-36 will be to realign Lindberg Avenue.

BLAST PADS

To prevent soil erosion at the end of a runway from the break-away thrust of aircraft departures, blast pads are commonly provided beyond each runway end. Blast pads are simply paved areas at the runway end. Colonel James Jabara Airport is presently without any type of blast pads. **Exhibit 4A** depicts the configuration of blast pads at each runway end in accordance with ARC D-II design standards.

PROPERTY CONSIDERATIONS

The acquisition of land for Colonel James Jabara Airport is anticipated for approach protection, future landside

development, and to ensure compatible development near the airport. **Exhibit 4A** depicts areas for acquisition to meet these requirements.

The area for approach protection extends approximately 875 feet each side of the extended runway centerline, 5,000 feet from the Runway 18 end. The land west of the area needed for approach protection (to Webb Road) is proposed for land use compatibility. This ensures that incompatible uses, such as residential development, are not developed adjacent to the operational areas of the airport.

Future property acquisitions should proceed on an opportunity basis, consistent with Federal acquisition guidelines to ensure reimbursement under federal assistance programs.

The acquisition of approximately 118+/- acres of land east of Runway 18-36 is anticipated for long term landside development needs. This land acquisition area would be served by the future east parallel taxiway, as shown on the exhibit.

LANDSIDE ALTERNATIVES

The primary general aviation functions to be accommodated at Colonel James Jabara Airport include aircraft storage hangars, aircraft parking aprons, commercial general aviation activities, and other aviation related development. The interrelationship of these functions is important to defining a long-range landside layout for general aviation uses at the airport. Runway frontage should be reserved for those uses with a high level of airfield interface, or need of exposure. Other uses with lower levels of aircraft movements or little need for runway exposure can be planned in more isolated locations. While the relationship between hangar area, apron, and automobile parking will vary based upon usage, a general rule-of-thumb is to provide 1,000 square feet of apron with each 1,000 square feet of hangar, and 400 square feet of auto parking for each 1,000 square feet of hangar area. The following briefly describes landside facility requirements.

Commercial General Aviation Facilities: This essentially relates to providing areas for the development of facilities associated with aviation businesses providing services to general aviation pilots, passengers, and users. This typically includes businesses involved with (but not limited to) aircraft rental and flight training, aircraft charters, aircraft maintenance, line service, and aircraft fueling. High levels of activity characterize businesses such as these, with a need for apron space for the storage and circulation of aircraft. These facilities are best placed along ample apron frontage with good visibility from the runway system for transient aircraft. The facilities commonly associated with businesses such as these include large conventional (clear-span) hangars that hold several aircraft. Utility services are needed for these types of facilities, as well as automobile parking areas and public access road.

Planning for the future development of facilities associated with commercial general aviation operators is important for this Master Plan. The western portion of the existing apron is fully developed with facilities used in providing general aviation services. Presently, there are no development parcels available with apron frontage. This alternatives analysis will examine areas for the future development of active commercial general aviation operators and associated apron areas.

Aviation-Related Commercial / Industrial Facilities: Aviation-related commercial/industrial facilities are distinguished from commercial general aviation facilities in that these types of uses are associated with non-service providers to the general aviation industry. This can include, but is not limited to, aircraft manufacturing, aircraft component manufacturing, aviation trade organizations, or aircraft financial services. While aircraft manufacturers may need access to the airfield, many aviation-related businesses do not need airfield access. Both users with a need for airfield access and those without a need for airfield access will be considered in the alternatives. These types of users need all utility services as well as public access roads.

Corporate/Executive Hangars: Corporate/executive aviation facilities are characterized by co-located clearspan hangar and office complexes for individually-owned or corporate-owned aircraft storage, maintenance, and administration. Corporate/executive aviation facilities are different from commercial general aviation facilities, as corporate/executive aviation facilities generally have lower levels of activity that do not require visibility from the runways or taxiways for transient aircraft identification and location as these facilities generally do not provide services to the public. Utility services are needed for these types of facilities, as well as automobile parking areas and a public access road.

Several corporate/executive facilities have been developed south of the main apron along Taxiway E and Taxiway L. Corporate and executive facility development is well-suited for this area as it is segregated from the main apron area which is better suited for higher activity uses and transient users.

T-hangars: The facility requirements analysis indicated the need for additional T-hangar facilities at the airport. T-hangars are specifically designed hangar facilities that provide for segregated individual storage areas within a single hangar complex. This is in contrast with clearspan hangars described above which allow for multiple aircraft storage in the same area. There are 40 T-hangars at the airport located west of Runway 18-36 at the north end of Jabara Road. Electrical utilities are needed for these facilities; however, other utilities are optional as these facilities are typically designed only for aircraft storage and there are no associated office facilities. Public access roads and vehicle parking is also not essential as access to this area should be limited to only those individuals storing aircraft. Public access is not needed as services to the public are not typically provided from a T-hangar. A vehicle

parking area can be located nearby for leaving private vehicles of aircraft owners in the T-hangars.

Segregated Vehicular Access/Airfield Security: A planning consideration for any Master Plan is the segregation of vehicles and aircraft operational areas. This is both a safety and security consideration for the airport. Aircraft safety is reduced and accident potential increased when vehicles and aircraft share the same pavement surfaces. Vehicles contribute to the accumulation of debris on aircraft operational surfaces, which increases the potential for Foreign Object Damage (FOD), especially for turbine-powered aircraft. The potential for runway incursions is increased as vehicles may inadvertently access active runway or taxiway areas if they become disoriented once on the aircraft operational area (AOA). Finally, airfield security is compromised as there is loss of control over the vehicles as they enter the secure AOA. The greatest concern is for public vehicles such as delivery vehicles and visitors, which may not fully understand the operational characteristics of aircraft and the markings in place to control vehicle access. The best solution is to provide dedicated vehicle access roads to each landside facility that is separated from the aircraft operational areas with security fencing.

Security of general aviation airports is coming under greater scrutiny since the events of September 11, 2001. The *Aviation and Transportation Security Act*, passed in November 2001, created the Transportation Security Administration (TSA) to administer the security of public-use airports across the country. The TSA is in the process of establishing a general aviation security director position. The TSA has not defined any new regulatory requirements for airports as of August 2003. In anticipation of expected rulemaking by the TSA, the American Association of Airport Executives (AAAE) created a task force to make recommendations on the future of GA airport security. The task force consisted of airport officials from general aviation facilities, as well as representatives of the National Association of State Aviation Officials and the National Business Aviation Association. This task force submitted a series of recommendations to the TSA on June 3, 2002. In making their recommendations, the task force defined the most probable terrorist threat to general aviation aircraft as the possible theft or hijacking of an aircraft.

While only recommendations to the TSA, the results of the task force are the most comprehensive assessment of threats to general aviation facilities and potential security measures, to date. Therefore, a brief overview of the task force recommendations applicable to Colonel James Jabara Airport is made to summarize current industry consensus on how to effectively secure general aviation facilities in the future.

The task force recommended the establishment of four different categories of general aviation airports based upon the airport's location relative to potential terrorist targets, runway length, and number of based aircraft. Based upon their suggested criteria, Colonel James Jabara Airport would be classified as either a Category I or Category

II airport. Under the recommended plan, Colonel James Jabara Airport would need to develop a security plan, and a criminal record background check would be required for all airport commercial general aviation operators and airport tenant employees with unescorted access to the aircraft operating area.

The segregation of vehicle and aircraft operational areas is further supported by new FAA guidance established in June 2002. FAA AC 150/5210-20, *Ground Vehicle Operations on Airports*, states, "The control of vehicular activity on the airside of an airport is of the highest importance." The AC further states, "An airport operator should limit vehicle operations on the movement areas of the airport to only those vehicles necessary to support the operational activity of the airport." The landside alternatives for Colonel James Jabara Airport have been developed to reduce the need for vehicles to cross an apron or taxiway area. Special attention is within the alternatives given to ensure public access routes to commercial general aviation operators' facilities. Commercial general aviation operators' facilities are focal points for users who are not familiar with aircraft operations (i.e., delivery vehicles, charter passengers, etc.).

The landside alternatives for Colonel James Jabara Airport focus separately on the west and east sides of the airport. Two alternatives have been developed for the west side of the airport. This includes the area west of Taxiway A to Webb Road from Taxiway F north to Taxiway B. The east side alternative considers development potential on a portion of the 118 acres of land designated for acquisition east of Runway 18-36, south of 37th Street North.

THROUGH-THE-FENCE AIRPORT ACCESS

There are instances when the owner of a public airport proposed to enter into an agreement which permits access to the public landing area by aircraft based on land adjacent to, but not part of, the airport property. This type of an arrangement is commonly called a through-the-fence operation, whether the perimeter fence is imaginary or real. It is Federal Aviation Administration (FAA) policy to strongly discourage through-the-fence agreements.

The obligation to make an airport available for the use and benefit of the public does <u>not</u> impose any requirement to permit access by aircraft from adjacent property. On the contrary, the existence of such an arrangement has been recognized as an encumbrance upon the airport property itself. Airport obligations arising from federal grant agreements and conveyance instruments apply to dedicated airport land and facilities and not to private property adjacent to the airport, even when the property owner is granted a through-the-fence privilege.

The owner of a public airport is entitled to seek recovery of the initial and continuing costs of providing a public use landing area. The owners of airports receiving federal funds have been required to establish a fee and rental structure designed to make the airports

as self-sustaining as possible. Most public airports seek to recover a substantial part of airfield operating costs indirectly through various arrangements affecting commercial activities on the airport. The development of aeronautical businesses on land uncontrolled by the airport owner may give the through-the-fence operation a competitive advantage that will be detrimental to the on-airport operators on whom the airport owner relies for revenue and service to the public. To avoid a potential imbalance, the airport owner may refuse to authorize a through-the-fence operation. In an effort to equalize an imbalance of existing through-the-fence operations, the airport owner should obtain a fair return from off-airport operators in exchange for continuing access to the airport and use of the landing area.

Although airports do not need and should avoid through-the-fence arrangements, circumstances may arise which compel an airport owner to contemplate a through-the-fence operation. In this situation, the airport owner must plan ahead to formulate a prudent through-the-fence agreement and obtain just compensation for granting access to the airport because the airport is enfranchising a special class of airport users who will be permitted to exercise an exclusive through-the-fence privilege.

In making airport facilities available for public use, the airport owner must make the airport as self-sustaining as possible under the particular circumstances at the airport. The FAA has interpreted the self-sustaining assurance to require airport owners to charge fair market value (FMV) commercial rates for nonaeronautical uses of the airport. In conformity with the self-sustaining principle, it would be appropriate to charge FMV rates to off-airport users for the exclusive privilege of accessing the airport through-the-fence. In formulating a through-the-fence agreement, the airport owner should endeavor to establish terms that are beneficial to the airport. For example, the adjacent developer or landowner should be made to finance the necessary improvements and maintenance of the facilities and infrastructure connecting the adjacent land to the airport's landing area. Recurring payments should be based on use rather than on flat rates. Agreements should contain provisions allowing the airport to terminate through-the-fence access permits for cause.

In addition, the airport owner must restrict the uses that may be made of the adjacent land as a condition for granting a through-the-fence privilege. Private property owners must be asked to enter into agreements that prohibit public aeronautical commercial operations. Simply stated, they should not be allowed to operate as fixed base operators (FBO) offering aeronautical services to the public. Such FBO operations, if allowed, would give private property operators an advantage over on-airport operators. Allowing private property owners to gain a competitive advantage will jeopardize the economic vitality of the airport and impede its ability to remain self-sustaining. Additionally, any economic advantage gained by adjacent property owners will diminish the economic viability of the airport's own aeronautical commercial operators.

Arrangements that permit aircraft to gain access to a public landing area from off-site property introduce safety considerations along with additional hazards that complicate the control of vehicular and aircraft traffic. Airport improvements designed to accommodate access to the airport and landing areas from an off-site location for the sole benefit and convenience of an off-airport neighbor present a substantial and continuing burden to the airport owner. In addition, the airport must contend with legal, insurance, and management implications represented by increased costs, liability, and administrative and operational controls. For the airport owner, it may become an unexpected challenge to balance airport needs with the increasing demands on the airport by off-airport users.

It is FAA policy to strongly discourage any agreement that grants access to public landing areas by aircraft normally stored on adjacent property. Airport owners must guard against any through-the-fence operation that can become detrimental to the airport and threaten its economic viability. Any agreement for a through-the-fence operation must include provisions making such operations subject to the same federal obligations as tenants on airport property. Furthermore, the airport owner must ensure that the through-the-fence operators contribute a fair share toward the cost of the operation, maintenance, and improvement of the airport and that they do not gain an unfair economic advantage over on-airport operators.

WEST LANDSIDE ALTERNATIVES

The west landside alternatives consider future development potential along Taxiway A. This includes development potential north of Taxiway F to Taxiway B, west to Webb Road. Development west of Runway 18-36, north of Taxiway B is reserved for aviation related commercial industrial uses without a need for airfield access. The terrain in this area prevents economical taxiway access to the runways.

West Landside Alternative A

West landside Alternative A is shown on **Exhibit 4B**. This alternative provides for the development of commercial general aviation facilities north of the existing apron in the area between Taxiway C and Taxiway D. This area is well-suited for this type of development as it visible from the runway and taxiway for transient users and has ample area for apron development.

T-hangar development is focused west of the existing T-hangars. The potential expansion of two of the existing 10-unit T-hangars by four additional T-hangar units is shown. Expansion to the west with up to four new 14-unit T-hangars is shown along an already designed access taxiway system. West and south of the T-hangars are six corporate/executive hangar parcels. These parcels would be served by a new public access road from Jabara Road. Corpo-

rate/executive hangar development is reserved south of Taxiway L and from a new stub taxiway extending west from Taxiway A. Public vehicle access would be via a new access road west of the parcels.

In this alternative, the area between Jabara Road and Webb Road is designated for aviation-related commercial/industrial users without a need for airfield access. The need to maintain Jabara Road to provide segregated public access to the commercial general aviation facilities along the apron areas prevents the extension of access taxiways into this area; thus preventing this area from being used for users with a need for airfield access.

As described above, aviation-related commercial/industrial users may include a variety of businesses such as aircraft component manufacturing, aviation trade organizations, or aircraft financial services. While this area of the airport offers good visibility and access from Webb Road and could be considered for non-aviation type development, the State of Kansas Statues (K.S.A. 3-162) and City of Wichita Ordinance 2.12.1040 prohibit non-aviation development on airports such as a Colonel James Jabara Airport that were not previous military facilities. Therefore, only aviation-related development can be considered for this area. Development parcels in this area range in size from approximately one acre to three acres. A new main entrance to the airport would be developed at 34th Street North for optimal signalization.

West Landside
Alternative B

West landside Alternative B is shown on **Exhibit 4C**. In contrast with Alternative A, this alternative reserves the area north of the main apron for aviation-related commercial/industrial uses with a need for airfield access. A typical user could include an aircraft manufacturer or component manufacturer. Future commercial general aviation facilities are reserved along a new apron area south of Taxiway L in this alternative to accommodate growth in these uses on the west side of the airport. Without providing this area for commercial general aviation development in this alternative, the east side of the airport may need to be developed sooner.

Similar to Alternative A, this alternative continues T-hangar development in the existing T-hangar area. In contrast with Alternative A, this alternative removes the two oldest T-hangars on the airport and replaces them with 14-unit nested T-hangars. A new access taxiway design provides for up to six new 14-unit T-hangars. The potential development of four 2,500 square-foot executive hangars is shown north of the two existing northern-most 10-unit T-hangars.

This alternative provides for corporate/executive hangars along the T-hangar access taxiways and via a taxiway stub extending south, west of Jabara Road. This taxiway stub also provides access to two small aviation-related commercial/industrial parcels for potential users that need for airfield

Jabara-00MP14-4B-1/20/05

PHOTO DATE: 4/27/04

0 400 800

SCALE IN FEET

NORTH

Lindberg Ave.

Segmented Circle with Lighted Wind Cone

Runway 18-36 (6,100' x 100')

A B C D E F

500'

400'

745'

Taxiway A

APRON

L M

4 T-HANGAR EXPANSION

14 UNIT T-HANGARS

Jabara Road

±3.0 ac. ±2.9 ac. ±2.5 ac. ±2.0 ac. ±1.5 ac. ±1.5 ac. ±1.0 ac. ±1.0 ac.

Jabara Rd.

Webb Road

39th Street N.

37th Street N.

35th Street N.

34th Street N.

Highway K96

LEGEND

- Existing Airport Property Line
- Proposed Airport Property Line
- Building Restriction Line
- Potential Apron/Taxilanes
- Potential Vehicle Access
- Commercial General Aviation Services
- Aviation-Related Commercial/Industrial No Airfield Access
- Aviation-Related Commercial/Industrial Airfield Access
- Corporate/Executive Hangar

CITY OF WICHITA
Wichita Airport Authority

Exhibit 4B
WEST LANDSIDE ALTERNATIVE A

Jabara-00MP14-4C-1/20/05

PHOTO DATE: 4/27/04

0 400 800

SCALE IN FEET

NORTH

Lindberg Ave.

Segmented Circle with Lighted Wind Cone

Runway 18-36 (6,100' x 100')

400'

745'

A B C D E F

Taxiway A

L

14 UNIT T-HANGARS

EXECUTIVE HANGARS

14 UNIT T-HANGARS

±1.7 ac. ±1.7 ac.

±.75 ac. ±.70 ac. ±.75 ac.

±.75 ac. ±.70 ac. ±.75 ac.

Jabara Road

±3.4 ac. ±2.0 ac. ±1.1 ac. ±1.0 ac.

Webb Road

39th Street N.

37th Street N.

35th Street N.

34th Street N.

Highway K96

LEGEND

- Existing Airport Property Line
- Proposed Airport Property Line
- Building Restriction Line
- Potential Apron/Taxilanes
- Potential Vehicle Access
- Building to be Removed
- Commercial General Aviation Services
- Aviation-Related Commercial/Industrial Airfield Access
- Aviation-Related Commercial/Industrial No Airfield Access
- Corporate/Executive Hangar

CITY OF WICHITA
Wichita Airport Authority

Exhibit 4C
WEST LANDSIDE ALTERNATIVE B

access. Vehicle access to these parcels is via a new on-airport access road parallel with Webb Road. Similar to Alternative A, the area between Jabara Road and Webb Road is reserved for aviation-related commercial/industrial users without a need for airfield access. A variety of parcels ranging in size from approximately .70 acres to 3.4 acres are provided. This alternative retains the existing access road between Jabara Road and Webb Road.

EAST LANDSIDE DEVELOPMENT

Development on the east side of Runway 18-36 will require significant infrastructure improvements. As noted previously, this area is without access to the airfield. The most efficient access would be via a partial parallel taxiway as a partial parallel taxiway would limit the number of runway crossings. Secondly, this area will need the installation of utility services and a public access road. Considering these infrastructure needs, development on the west side of the airport should continue until available parcels on the west side of the airport are either developed or can no longer meet user's needs.

The development on the east side of the airport is expected to closely mirror west side development. Development is designated along the 118+/- acres of land shown for acquisition previously on **Exhibit 4A**.

As shown on **Exhibit 4D**, the area east of Runway 18-36 is shown for the development of a large apron area to support commercial general aviation facilities. T-hangars and corporate/executive hangars are reserved to south, along with aviation-related commercial/industrial users with a need for airfield access. Public access is via 37th Street North.

SUMMARY

Upon review of this report by the City of Wichita, the WAA, and the PAC, a final Master Plan concept can be formed. The resultant plan will represent an airside facility that fulfills safety and design standards and a landside complex that can be developed as demand dictates.

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

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

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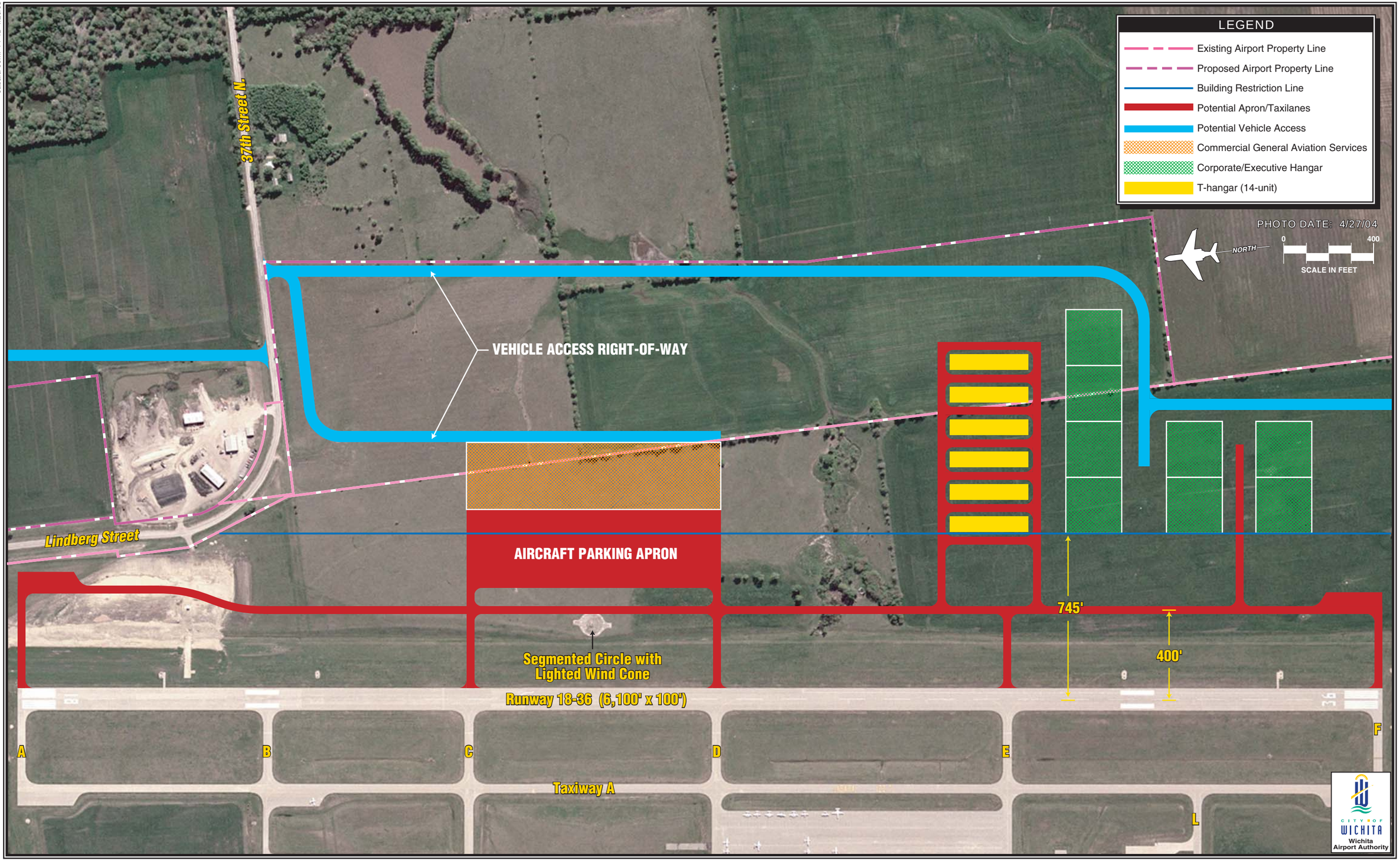

Exhibit 4D
POTENTIAL EAST LANDSIDE DEVELOPMENT

Chapter Five
AIRPORT PLANS

AIRPORT PLANS

CITY OF WICHITA
Wichita Airport Authority

The planning process for the Colonel James Jabara Airport Master Plan has included several analytic efforts in the previous chapters, intended to project potential aviation demand, establish airside and landside facility needs, and evaluate options for improving the airport to meet those airside and landside facility needs. The planning process, thus far, has included the presentation of four draft working papers to the Planning Advisory Committee (PAC) and Wichita Airport Advisory Board (WAAB). A plan for the use of Colonel James Jabara Airport has evolved considering their input. The purpose of this chapter is to describe in narrative and graphic form, the plan for the future use of Colonel James Jabara Airport.

The implementation of the *Aviation and Transportation Security Act of 2001* will need to be closely monitored by the WAA throughout the implementation of this Master Plan. This law established the Transportation Security Administration (TSA) to administer transportation security nationally, including general aviation security. Industry groups have made a series of recommendations to the TSA for general aviation threat assessment and security standards for general aviation airports. This Master Plan has anticipated the potential for greater security scrutiny in the future at general aviation airports, especially those general aviation airports serving aircraft greater than 12,500 pounds, such as Colonel James Jabara Airport.

The TSA has already implemented security provisions for air charter operations with aircraft over 12,500 pounds.

For Colonel James Jabara Airport, the Master Plan security enhancements focus on limiting vehicle and pedestrian access to the apron areas and aircraft operational areas.

AIRFIELD PLAN

Exhibit 5A graphically depicts the proposed airfield improvements at Colonel James Jabara Airport. The following text summarizes the elements of the airfield plan.

AIRFIELD DESIGN STANDARDS

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

Colonel James Jabara Airport is currently used by a wide range of general aviation piston-powered and turbine powered aircraft. These aircraft range from ARC A-I to ARC D-II, and D-III on occasion. General aviation business jets are the most demanding aircraft to operate at the airport, due to their larger wingspans and higher approach speeds when compared with the remaining types of aircraft operating at the airport. For the Master Plan, business jets within Approach Category D and ADG II are expected to comprise the critical design aircraft through the planning period. **Table 5A** summarizes the ultimate ARC D-II airfield safety and facility dimensions for Colonel James Jabara Airport. These standards were considered in the planned improvements of the existing airport site, to be discussed in greater detail later within this chapter.

AIRFIELD DEVELOPMENT

The airfield plan for Colonel James Jabara Airport reflects current instrument approach and visual navigational aid improvements planned by the FAA. The FAA Airways and Facilities Division has recently installed an Instrument Landing System (ILS) to Runway 18 and precision approach path indicators (PAPIs) for both Runway 18 and Runway 36.

TABLE 5A
Planned Airfield Safety and Facility Dimensions (in feet)

	Runway 18-36
Airport Reference Code (ARC)	D-II
Approach Visibility Minimums	½ mile
Runway	
Width	100
Length	6,100
Runway Safety Area (RSA)	
Width	500
Length Beyond Runway End	1,000
Object Free Area (OFA)	
Width	800
Length Beyond Runway End	1,000
Precision Object Free Area (POFA) [1]	
Width	800
Length Beyond Runway End	200
Obstacle Free Zone (OFZ)	
Width	400
Length Beyond Runway End	200
Runway Centerline To:	
Hold Line	250
Parallel Taxiway Centerline	400
Edge of Aircraft Parking	500
Runway 18 Runway Protection Zone (RPZ)	
Inner Width	1,000
Outer Width	1,750
Length	2,500
Approach Obstacle Clearance	50:1
Runway 18 Runway Protection Zone (RPZ)	
Inner Width	500
Outer Width	1,010
Length	1,700
Approach Obstacle Clearance	34:1
Taxiways	
Width	35
Safety Area Width	118
Object Free Area Width	186
Taxiway Centerline To:	
Parallel Taxiway/Taxilane	152
Fixed or Moveable Object	93
Taxilanes	
Taxilane Centerline To:	
Parallel Taxilane Centerline	140
Fixed or Moveable Object	81
Taxilane Object Free Area	162

Source: FAA Advisory Circular 150/5300-13, *Airport Design,* Change 7, FAR Part 77, *Objects Affecting Navigable Airspace*, FAA Advisory Circular 150/5340-1F, *Marking Of Paved Areas On Airports*

[1] Runway 18 Only

The ILS approach to Runway 18 is a precision instrument approach with Category I (CAT I) minimums. Category I standards provide for landings when visibility is restricted to one-half mile visibility and cloud ceilings are as low as 200 feet above the ground. The FAA is installing a medium intensity approach lighting system with runway alignment indicator lights (MALSR) to Runway 18. The MALSR is required to achieve CAT I standards. **Exhibit 5A** depicts the location and configuration of the MALSR that is being installed on Runway 18.

The ILS equipment includes both a glideslope antenna for vertical guidance and a localizer antenna for lateral guidance. The localizer is located on the extended centerline behind the Runway 36 end. The glideslope antenna is east of Runway 18-36.

The Master Plan retains the existing Global Positioning System (GPS) approach to Runway 36. The FAA is implementing the Wide Area Augmentation System (WAAS) to enhance the standard GPS signal for both vertical and lateral navigational approach capabilities. Future GPS approaches and existing GPS approaches are expected to become lateral/vertical navigation (LNAV) approaches, with the potential for 400-foot cloud ceiling and 1.5-statute-mile visibility minimums. Besides the expectation that the Runway 36 approach would be upgraded to a LNAV approach, no other upgrades to Runway 36 instrument approach capability are planned. This is due to the location of McConnell Air Force Base and Beech Factory Airport along the extended Runway 36 approach path.

The CAT I precision approach to Runway 18 has required a larger runway protection zone (RPZ). As shown on **Exhibit 5A**, the RPZ extends across Lindberg Avenue. Approximately 118+/- acres of land is proposed for acquisition south of 43rd Street North.

A full-length parallel taxiway is planned east of Runway 18-36, to support long term facility development on the east side of the airport. To ensure that aircraft using the east parallel taxiway in the future do not interfere with the glideslope antenna, the east parallel taxiway is routed around the glideslope antenna critical area at the Runway 18 end. To allow for the taxiway development, Lindberg Avenue must be rerouted. **Exhibit 5A** depicts a relocation option for Lindberg Avenue. This relocation maintains the existing location of the Sedgwick County road maintenance facility, while retaining the existing connection between 43rd Street North and 37th Street North via Lindberg Avenue. The acquisition of approximately 28.21 acres of land between the existing Lindberg Avenue alignment and proposed realignment is proposed to ensure that this property is developed with land uses compatible to the airport.

The existing segmented circle and lighted wind cone are planned for relocation since they are located within the future alignment of the east parallel taxiway.

Jabara-00MP14-5A-11/19/04

LEGEND

- Existing Airport Property Line
- Ultimate Airport Property Line
- Potential Airfield Pavement
- Potential Roadways
- General Aviation
- Aviation-Related-Airfield Access
- Aviation-Related-No Airfield Access
- Airfield, Approach Protection, Open Space
- Commercial General Aviation Services
- Corporate/Executive Hangars
- Airport Maintenance/Administration
- T-hangar
- Access Control
- Runway Protection Zone (RPZ)
- Object Free Area (OFA)
- Runway Safety Area (RSA)
- Building Restriction Line (BRL)
- Precision Object Free Area (POFA)

0 1,000 2,000
SCALE IN FEET

NORTH

Aerial Date: 4/27/04

45th Street N.
37th Street N.
Greenwich Road
ROAD TO BE CLOSED
HOLDING APRON
County Maintenance Yard
ULTIMATE RPZ
Lindberg Avenue
GLIDESLOPE ANTENNA
EXISTING/ULTIMATE RPZ
HOLDING APRON
PAPI-4
Runway 18-36 (6,100' x 100')
A B C D E F
PAPI-4
LOCALIZER ANTENNA
MALSR
Taxiway A
L
E. Greenbriar St.
Shannon Woods
AVIATION-RELATED AIRFIELD ACCESS
Jabara Road
Webb Road
45th Street N.
45rd Street N.
39th Street N.
37th Street N.
35th Street N.
34th Street N.
Highway K96
29th Street N.
Railroad

CITY OF WICHITA
Wichita Airport Authority

Exhibit 5A
MASTER PLAN CONCEPT

LANDSIDE PLAN

The landside plan for Colonel James Jabara Airport has been devised to safely, securely, and efficiently accommodate potential aviation demand. The landside plans provide for the development of new commercial general aviation facilities, aircraft storage facilities, expanded fuel storage, and aviation-related uses.

With the exception of the T-hangar facilities, most structural improvements are anticipated to be developed privately, as has been done historically in the past at Colonel James Jabara Airport. The capital improvement program identifies the infrastructure improvements needed at the airport to support development and the federal funding assistance available to Wichita Airport Authority to make those improvements.

The west apron is planned to be expanded to the north. This apron will support future commercial general aviation development along the west side of the apron, between the apron and Jabara Road. Commercial general aviation development includes buildings where services such as aircraft fueling, maintenance, and charter are provided.

T-hangar development is retained in its existing location between Taxiways B and C, west of Runway 18-36. A taxiway plan provides for the replacement of two of the oldest T-hangar units with new 14-unit nested T-hangars and four additional 14-unit nested T-hangars. With the expansion of two existing T-hangars by four units each to the north, there is the capability for 112 T-hangar units in this area.

Seven corporate/executive hangar parcels are reserved along the western and southern edges of the T-hangars. These parcels are for the private development of conventional hangars, similar to the existing hangars developed along Taxiway L. The Master Plan provides for three corporate/executive hangar parcels on the south side of Taxiway L and six parcels along a new taxiway south of Taxiway L.

The Master Plan includes provisions for securing undeveloped property east of Runway 18-36 for long term facility needs. The property east of Runway 18-36 is presently undeveloped, but included in local land use planning for future industrial development. Approximately 118+/- acres of land are proposed for acquisition east of Runway 18-36, south of 43rd Street North.

Commercial general aviation and corporate/executive hangar development is reserved east of Runway 18-36. The commercial general aviation parcels are along a new apron planned between Taxiways C and D. This area would be served by a new road from 37th Street North. The corporate/executive hangar area would be located between Taxiways E and F and be served by a separate access road, also from 37th Street North. Nine parcels are planned.

The land use plan for Colonel James Jabara Airport is also shown on **Exhibit 5A**. Besides reserving areas for the general aviation development de-

scribed above, the plan provides for the protection of the airfield operational area. This includes all the property within the building restriction line (BRL), the RPZs, and within 5,000 feet of the Runway 18 end.

Aviation-related development is also provided by the land use plan. This includes aviation-related development areas with airfield access and aviation-related development area without airfield access. Aviation-related development includes (but is not limited to) potential land uses such as aircraft manufacturing, aircraft component manufacturing, aviation trade organizations, or aircraft financial services. Aviation related airfield access is reserved west of Runway 18-36, north of Taxiway B and along the southwestern airport boundary along Webb Road. Aviation-related development without airfield access is reserved in the remaining portions of the airport. These parcels of land do not have the potential for taxiway access, either due to their distance from the runway or location of physical barriers such as roads which prevent secure airfield access.

ENVIRONMENTAL EVALUATION

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

Once the airport begins receiving federal funding, improvements planned for Colonel James Jabara Airport, as depicted on the Airport Layout Plan (ALP), will require compliance with the *National Environmental Policy ACT (NEPA) of 1969,* as amended. Many of the improvements will be categorically excluded and will not require further NEPA documentation; however, some improvements may require further analysis and NEPA documentation. As detailed in *FAA Order 5050.4A, Airport Environmental Handbook,* compliance with NEPA is generally satisfied with the preparation of an Environmental Assessment (EA). In cases where a categorical exclusion is issued, environmental issues such as wetlands, threatened or endangered species, and cultural resources are further evaluated during the federal, state, and/or local permitting processes. The following pages consider the environmental resources as outlined in *FAA Order 5050.4A*.

ENVIRONMENTAL CONSEQUENCES - SPECIFIC IMPACTS

This environmental evaluation has been prepared using *FAA Order 1050.1D, Policies and Procedures for Considering Environmental Impacts,* and *FAA Order 5050.4A, Airport Environmental Handbook* as guidelines. Several factors are considered in a formal environmental document, such as an EA or an EIS, which are not included in an environ-

mental evaluation. These factors include details regarding the project location, alternatives analyses, existing conditions at the airport, and the purpose and need for the project. This information is available within the Master Plan document. A formal environmental document also includes the resolution of issues/impacts identified as significant during the environmental process.

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

TABLE 5B
Review of Environmental Resources
Proposed Facility Improvements

Environmental Resource	Resources Potentially Affected
Noise. The Yearly Day-Night Average Sound Level (DNL) is used in this study to assess aircraft noise. DNL is the metric currently accepted by the Federal Aviation Administration (FAA), Environmental Protection Agency (EPA), and Department of Housing and Urban Development (HUD) as an appropriate measure of cumulative noise exposure. These three federal agencies have each identified the 65 DNL noise contour as the threshold of incompatibility.	• New noise exposure contours were developed for the airport and are included on the Land Use Drawing. The 65 DNL contour remains on the airport property.
Compatible Land Use. F.A.R. Part 150 recommends guidelines for planning land use compatibility within various levels of aircraft noise exposure. In addition, Advisory Circular 150/5200-33 identifies land uses that are incompatible with safe airport operations because of their propensity for attracting birds or other wildlife, which in turn results in an increased risk of aircraft strikes and damage. Finally, F.A.R. Part 77 regulates the height of structures within the vicinity of the airport.	• No noise impacts within the 65 DNL contour. • There is currently a pond located approximately 3,200 feet off the Runway 18 end. The FAA recommends that the aircraft movement areas and any wildlife attractant area be separated 5,000 feet for piston-powered aircraft and 10,000 feet for turbine-powered aircraft. The majority of aircraft operating at the airport are piston-powered. The existing pond has not been an issue in the past and proposed projects will not increase the likelihood of wildlife strikes. No additional projects that could be considered attractants are proposed as part of the airport development. • Airport improvements will not result in the introduction of any new F.A.R. Part 77 surface obstructions.

TABLE 5B (Continued)
Review of Environmental Resources
Proposed Facility Improvements

Environmental Resource	Resources Potentially Affected
Social Impacts. These impacts are often associated with the relocation of residents or businesses or other community disruptions.	• Implementation of this project will require acquisition of approximately 118+/- acres of farmland to the north and east of the existing property. • Compliance with the *Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970* (URAUPAPA) will be required during property acquisition. FAA Order 5050.4A provides that where the relocation or purchase of a residence, business, or farmland is involved, the provisions of the URARPAPA must be met. The Act requires that landowners, whose property is to be purchased, be compensated fair market value for their property. • Lindberg Avenue is proposed to be relocated east of its present alignment to allow the construction of the proposed east parallel taxiway. The existing Lindberg Avenue will remain open during the construction of the new Lindberg Avenue; therefore, existing vehicular access will not be impacted. Future access roads to the proposed general aviation areas will be completed on a demand-based schedule.
Induced Socioeconomic Impacts. These impacts address those secondary impacts to surrounding communities resulting from the proposed development, including shifts in patterns of population growth, public service demands, and changes in business and economic activity to the extent influenced by the airport development.	• Significant shifts in patterns of population movement or growth, or public service demands are not anticipated as a result of the proposed development. It could be expected, however, that the proposed development would potentially induce positive socioeconomic impacts for the community over a period of years. The airport, with expanded facilities and services, would be expected to attract additional users. It is also expected to encourage tourism, industry and trade, and to enhance the future growth and expansion of the community's economic base. Future socioeconomic impacts resulting from the proposed development would be primarily positive in nature.

TABLE 5B (Continued)
Review of Environmental Resources
Proposed Facility Improvements

Environmental Resource	Resources Potentially Affected
Air Quality. The U.S. Environmental Protection Agency (EPA) has adopted air quality standards that specify the maximum permissible short-term and long-term concentrations of various air contaminants. The National Ambient Air Quality Standards (NAAQS) consist of primary and secondary standards for six criteria pollutants which include: Ozone (O3), Carbon Monoxide (CO), Sulfur Dioxide (SO2), Nitrogen Oxide (NO), Particulate matter (PM10), and Lead (Pb). Various levels of review apply within both NEPA and permitting requirements. For example, an air quality analysis is typically required during the preparation of a NEPA document if enplanement levels exceed 3.2 million enplanements or general aviation operations exceed 180,000.	• Colonel James Jabara Airport is located in Sedgwick County, which is designated as being in attainment for all criteria pollutants. • The requirement of an air quality analysis is not anticipated as part of a NEPA assessment, as forecasted general aviation operations do not exceed 180,000 operations. • Air quality impacts during construction of airport improvements are anticipated to be less-than-significant with the use of best management practices (BMPs).
Water Quality. Water quality concerns associated with airport expansion most often relate to domestic sewage disposal, increased surface runoff and soil erosion, and the storage and handling of fuel, petroleum, solvents, etc.	• Construction of the proposed improvements will result in an increase in impermeable surfaces and a resulting increase in stormwater runoff. During the construction phase, the proposed development may result in short-term impacts on water quality. Temporary measures to control water pollution, soil erosion, and siltation through the use of best management practices (BMPs) should be used. • The airport will need to continue to comply with its current NPDES operations permit requirements. • With regard to construction activities, the airport and all applicable contractors will need to obtain and comply with the requirements and procedures of the construction-related NPDES General Permit, including the preparation of a *Notice of Intent* and a *Stormwater Pollution Prevention Plan*, prior to the initiation of product construction activities.
Section 4(f) Lands. These include publicly-owned land from a public park, recreation area, or wildlife and waterfowl refuge of national, state, or local significance, or any land from a historic site of national, state, or local significance.	• No impacts anticipated. The proposed development will not require the use of Section 4(f) lands.

TABLE 5B (Continued)
Review of Environmental Resources
Proposed Facility Improvements

Environmental Resource	Resources Potentially Affected
Historical and Cultural Resources	• An online search of the National Register of Historic Places did not identify any historic resources that would be affected by the proposed airport improvements. • The relocation of existing roads, construction of new roads to the west, and the addition of airfield pavement will disturb previously undisturbed land. Coordination with the State Historic Preservation Officer will be required to determine potential impacts to cultural resources.
Threatened or Endangered Species and Biological Resources	• An online search of the U.S. Fish and Wildlife Service database listed four threatened or endangered species in Sedgwick County. All of these species' critical habitat is found in riparian habitats. There are no riparian habitats on airport property; therefore, impacts to threatened and endangered species are not anticipated.
Waters of the U.S. Including Wetlands	• A preliminary jurisdictional determination (PJD) was completed in December 2003 and January 2004. As a result of the PJD, four areas were determined to contain Waters of the U.S. These areas consist of ephemeral streams; portions of which contain attributes qualifying them as jurisdictional Waters of the U.S. **Exhibit 5B** depicts the following areas determined to contain Waters of the U.S: 1. Area 1. Approximately 0.06 acres. The jurisdictional portion of the ephemeral streambed is located below the lower pond, extending from the discharge point of the pond, to the box culvert directing flow into the detention area. 2. Area 2. Approximately 0.23 acres. The jurisdictional portion of the ephemeral streambed is contained within an impoundment area. 3. Area 3. Approximately 0.02 acres. The jurisdictional portion of the ephemeral streambed is located immediately below the outlet structure. 4. Area 4. Approximately 0.10 acres. The jurisdictional portion of the ephemeral streambed is located in the lower half of the project site, extending to the eastern property boundary.

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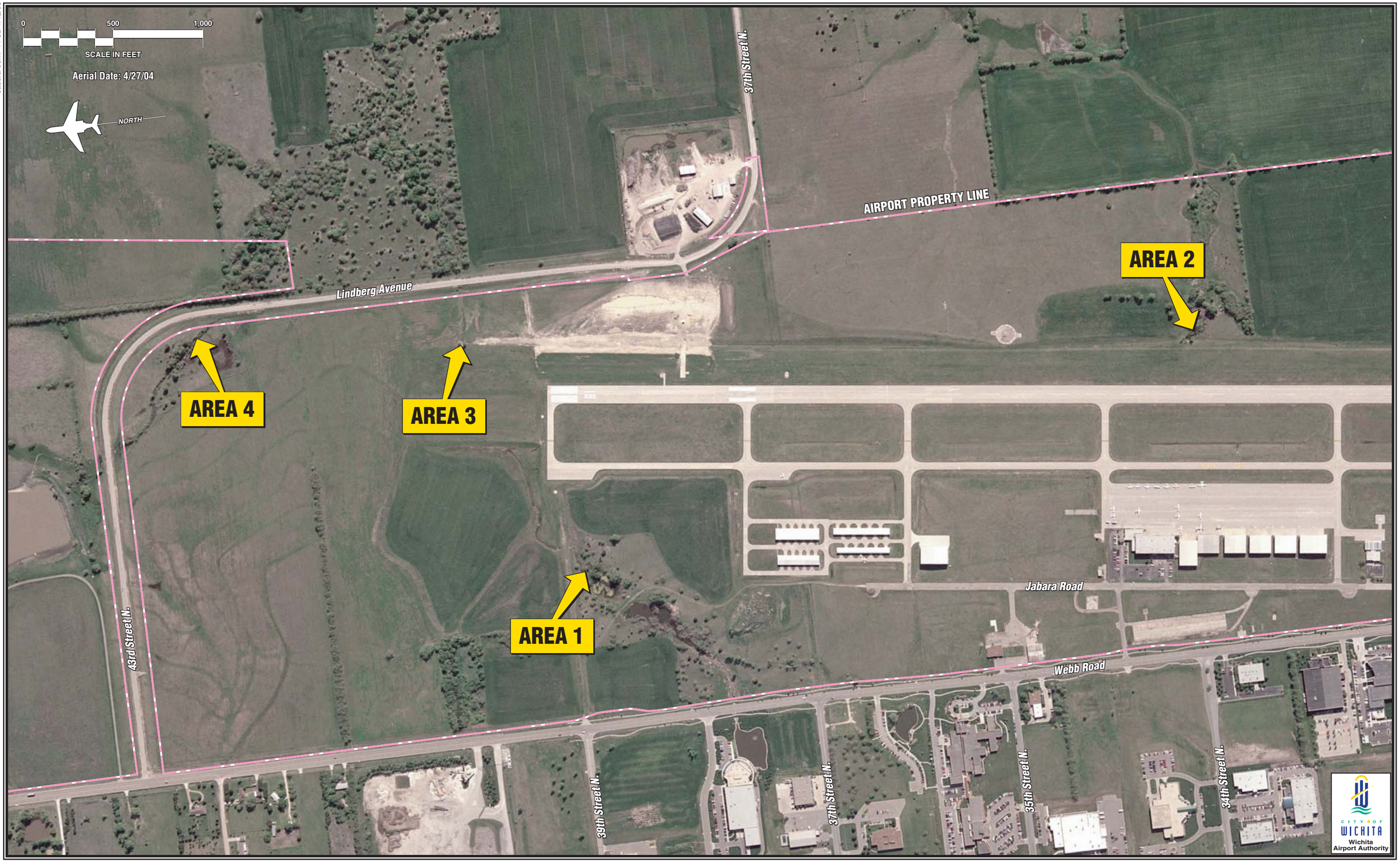


Exhibit 5B
WETLANDS AND WATERS OF THE U.S.

TABLE 5B (Continued)
Review of Environmental Resources
Proposed Facility Improvements

Environmental Resource	Resources Potentially Affected
Waters of the U.S. Including Wetlands (Continued)	It is recommended that the U.S. Army Corps of Engineers is contacted for their concurrence on these areas prior to development of the project site. It is anticipated that these areas are subject to the permitting requirements of Section 404 of the Clean Water Act.
Floodplains	• Proposed airport improvements have been designed to avoid the 100-year floodplain when possible. The existing floodplain boundary, obtained from the Federal Emergency Management Agency, Federal Insurance Rate Maps dated June 6, 1986 and May 15, 1986, is depicted on the Land Use Drawing and Airport Property Map contained in **Appendix C** of this document. In areas where development in the 100-year floodplain is unavoidable, the project has been designed to minimize potential harm to or within the base floodplain. Further analysis will be required prior to development in these areas.
Coastal Zone Management Program and Coastal Barriers	• No impacts. The airport is not located within a Coastal Management zone.
Wild and Scenic Rivers	• No impacts. The airport is not near any designated wild and scenic rivers.
Farmland	• According to the Natural Resource Conservation Service (NRCS), the majority of the soil surrounding the airport qualifies as prime or unique farmland under the Farmland Protection Policy Act (FPPA); however, this land is already committed to urban development. Therefore, compliance with the FPPA may not be required.
Energy Supply and Natural Resources	• The proposed alternative will result in a less-than-significant impact to energy supply and natural resources. Impacts are a result of increased operations and upgraded facilities.
Light Emissions	• The proposed alternative will result in a less-than-significant impact to light emissions. Impacts are a result of increased operations and upgrade facilities.
Solid Waste	• As a result in an increase of operations at the airport, solid waste will slightly increase. These impacts are expected to be less-than-significant.

SUMMARY

The Master Plan for Colonel James Jabara Airport has been developed in cooperation with the Planning Advisory Committee, interested citizens, and Wichita Airport Authority. It is designed to assist the City in making decisions relative to the future use of Colonel James Jabara Airport as it is maintained to meet general aviation needs for the City of Wichita and surrounding communities.

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

Chapter Six
CAPITAL IMPROVEMENT PROGRAM

CITY OF WICHITA
Wichita Airport Authority

CAPITAL IMPROVEMENT PROGRAM

The analyses conducted in the previous chapters evaluated airport development needs based upon safety, security, potential aviation activity, and operational efficiency. Through this analysis, a plan for the use and development of the airport was defined. The purpose of this chapter is to identify the projects to implement the proposed plan for the use and development of Colonel James Jabara Airport and those capital needs required to maintain the airport in a safe and environmentally acceptable manner.

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

DEMAND-BASED PLAN

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

Master Plan is that the facility improvements needed to serve new levels of demand should only be implemented when the levels of demand experienced at the airport justify their implementation.

For example, the aviation demand forecasts projected that based aircraft could be expected to grow through the year 2023. This forecast was supported by the local community's growing economy, and population and historical trends showing growing based aircraft levels.

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

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

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

CAPITAL NEEDS AND COST SUMMARIES

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

Each year, the Wichita Airport Authority will need to reexamine the priorities for funding in the short-term period,

adding or removing projects on the capital programming lists. **Table 6A** summarizes the key activity milestones for each planning horizon.

TABLE 6A
Planning Horizon Activity Levels

	Existing (2003)	Short Term Planning Horizon	Intermediate Term Planning Horizon	Long Term Planning Horizon
Based Aircraft	153	170	185	220
Annual Operations	38,700	44,200	49,000	60,500

Exhibit 6A summarizes capital needs for Colonel James Jabara Airport through the planning period of this Master Plan. An estimate has been included with each project of federal funding eligibility, although none of those amounts are guaranteed. Federal participation rate is 95 percent through 2007 (based upon current legislation). For intermediate and long-term projects, it has been assumed at 90 percent.

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

SHORT TERM CAPITAL NEEDS

The Short Term Planning Horizon capital needs presented on **Exhibit 6A** are estimated at $11.9 million, less land acquisition costs. This planning horizon includes the acquisition of approximately 118+/- acres of land to the east of the airport. The purchase price for this land will be determined by appraisal, according to FAA guidance. These appraisals have not been completed at this time.

Projects included in the Short Term Planning Horizon focus on supporting aviation demand. This includes improvements at Taxiway L to support development in the three parcels planned along the south side of the taxiway. Expansion of the west apron to the north will support future commercial general aviation development along Jabara Road. Initially, a taxiway may be extended between Taxiways C and D to connect existing ramp and hangers. The development of the T-hangar access taxilanes and replace-

ment of two of the oldest T-hangar units are also programmed. The oldest hangers will be replaced with 14-unit hangars. The construction of an additional 10-unit T-hangar is also planned to support projected based aircraft demand. The construction of a vehicle access road and utility extensions is programmed to support development in the seven corporate/executive hangar parcels located on the western and southern T-hangar taxilanes. This roadway would also provide access for the aviation-related parcel located north of Taxiway B, west of Runway 18-36.

Maintenance projects include the WAA funded airport administration building remodel and roof replacement, improving drainage in the northwest quadrant of the airport, and reconstructing Jabara Road, 35th Street North, and the terminal building parking lot. The airfield generator is also planned to be replaced. Other projects programmed for the Short Term Planning Horizon include the construction of a new airport maintenance building and installation of perimeter fencing.

INTERMEDIATE TERM AND LONG TERM CAPITAL NEEDS

Intermediate Term and Long Term Planning Horizon development needs support future aviation demand in the southwest and eastern quadrants of the airport. Programmed projects include developing roadway and taxiway access for six corporate/executive hangar development parcels south of Taxiway L, and the construction of 28 T-hangars.

The projects necessary to support development east of Runway 18-36 are also programmed. This includes relocating Lindberg Avenue and the segmented circle/lighted wind cone to allow for the construction of the full-length east parallel taxiway. The roadway and utilities extensions to the commercial general aviation hangar development area and corporate/ executive hangar areas are also identified. The development of the east apron between Taxiways C and D is also programmed.

A final project includes the development of blast pads at each runway end. Blast pads reduce erosion from the takeaway thrust of aircraft departures.

Exhibit 6B graphically depicts development staging. The draft final report will include any runway reconstruction and maintenance projects resulting from the pavement condition analysis currently being conducted as a separate study.

CAPITAL IMPROVEMENTS FUNDING

Financing capital improvements at the airport will not rely exclusively upon the financial resources of Wichita Airport Authority. Capital improvement funding is available at the federal level for many airport projects. The following discussion outlines the key sources for capital improvement funding.

No.	Description	Total	Federally Eligible	WAA Share
SHORT TERM PLANNING HORIZON (0-5 years)				
1	Airfield Pavement Rehabilitation	$ 210,000	$ 105,000	$ 105,000
2	Fuel Farm Upgrade	200,000	-	200,000
3	Land Acquisition (East Side)	815,000	-	815,000
3a	Land Acquisition	3,000,000	-	3,000,000
4	T-Hangar Construction (32 units)	1,120,000	-	1,120,000
5	Taxiway L Site Development (Phase II)	300,000	285,000	15,000
6	Administration Building Roof Replacement and Remodel	180,000	-	180,000
7	Jabara Road/35th Street North Reconstruction	1,400,000	-	1,400,000
8	Airfield Cable and Generator Replacement	60,000	52,250	7,750
9	Apron Expansion	2,950,000	2,802,500	147,500
10	T-Hangar Replacement (28 Units)	700,000	-	700,000
11	T-Hangar Construction (8 Units)	200,000	-	200,000
12	Perimeter Fence	300,000	285,000	15,000
13	Northwest Access Road and Utility Extension	560,000	532,000	28,000
Subtotal Short Term Planning Horizon		**$ 11,995,000**	**$ 4,061,750**	**$ 7,933,250**
INTERMEDIATE AND LONG TERM PLANNING HORIZONS (6-20 Years)				
1	Blast Pad Construction	$ 93,000	$ 83,700	$ 9,300
2	Southwest Hangar Access Road and Utility Extension	290,000	261,000	29,000
3	Southwest Hangar Access Taxiway Construction	233,000	209,700	23,300
4	T-Hangar Construction (28 Units)	560,000	504,000	56,000
5	Lindberg Avenue Relocation	1,900,000	1,710,000	190,000
6	Segmented Circle and Lighted Wind Cone Relocation	50,000	45,000	5,000
7	East Parallel Taxiway and Holding Apron Construction	3,430,000	3,087,000	343,000
8	East Apron Construction	2,950,000	2,655,000	295,000
9	East FBO Access Road Construction and Utility Extension	470,000	423,000	47,000
10	East Hangar Parcels Access Road Construction and Utility Extension	1,370,000	1,233,000	137,000
11	East Hangar Access Taxiway Construction	1,470,000	1,323,000	147,000
Subtotal Intermediate/Long Term Planning Horizons		**$ 12,816,000**	**$ 11,534,400**	**$ 1,281,600**
OTHER CAPITAL PROJECTS (Multi-Year Implementation)				
1	Tenant Facility Improvements	1,000,000	-	1,000,000
2	Environmental Compliance	300,000	-	300,000
3	Pavement Condition Inventories	75,000	67,500	7,500
4	Master Plan Updates	200,000	180,000	20,000
5	Utility Improvements	1,200,000	-	1,200,000
6	Airport Development	3,000,000	-	3,000,000
Subtotal Other Capital Projects		**$ 5,775,000**	**$ 247,500**	**$ 5,527,500**
Total All Development		**$ 30,586,000**	**$ 15,843,650**	**$ 14,742,350**

Exhibit 6A
CAPITAL IMPROVEMENT PROGRAM

Jabara-00MP14-5A-1/20/05

SHORT TERM IMPROVEMENTS

1. Land Acquisition (East Side) - Acquired Partial
2. Construct T-Hangars (32 Units)
3. Taxiway L Site Development
4. Jabara Road/35th Street North Reconstruction
5. Apron Expansion
6. Replace T-Hangars (28 Units)
7. Construct T-Hangar (8 Units)
8. Construct Northwest Access Road/Extend Utilities

INTERMEDIATE AND LONG TERM IMPROVEMENTS

1. Construct Blast Pads
2. Construct Southwest Hangar Access Road/Extend Utilities
3. Construct Southwest Hangar Access Taxiway
4. Construct T-Hangars (28 Units)
5. Relocate Lindberg Avenue
6. Relocate Segmented Circle/Lighted Wind Cone
7. Construct East Parallel Taxiway and Holding Aprons
8. Construct East Apron
9. Construct East FBO Access Road/Extend Utilities
10. Construct East Hangar Parcel Access Roads/Extend Utilities
11. Construct East Hangar Access Taxiway

LEGEND

- Existing Airport Property Line
- Ultimate Airport Property Line
- Land Acquisition
- Short Term Improvements
- Intermediate and Long Term Improvements
- Access Control
- Runway Protection Zone (RPZ)
- Object Free Area (OFA)
- Runway Safety Area (RSA)
- Building Restriction Line (BRL)
- Precision Object Free Area (POFA)

NORTH

0 1,000
SCALE IN FEET

Aerial Date: 4/27/04

Greenwich Road
37th Street N.
45th Street N.
County Maintenance Yard
GLIDESLOPE ANTENNA
ROAD TO BE CLOSED
Lindberg Avenue
EXISTING/ULTIMATE RPZ
HOLDING APRON
PAPI-4
Runway 18-36 (6,100' x 100')
LOCALIZER ANTENNA
MALSR
Taxiway A
EXISTING RPZ
AVIATION-RELATED AIRFIELD ACCESS
Jabara Road
Webb Road
43rd Street N.
39th Street N.
37th Street N.
35th Street N.
34th Street N.
Highway K96
29th Street N.
E. Greenbriar St.
Shannon Woods
Railroad

CITY OF WICHITA
Wichita Airport Authority

Exhibit 6B
CAPITAL PROJECTS

FEDERAL GRANTS

Through federal legislation over the years, various grants-in-aid programs have been established to develop and maintain a system of public airports throughout the United States. The purpose of this system and its federally-based funding is to maintain national defense and promote interstate commerce. The most recent legislation is the *Vision 100 – Century of Aviation Reauthorization Act*, passed by both houses of Congress in October 2003.

Vision 100 is a four-year bill covering FAA fiscal years 2004, 2005, 2006, and 2007. *Vision 100* provides funding levels of $3.4 billion in 2004, increasing $1 billion annually until reaching $3.7 billion in 2007.

The source for federal funding of airports is the Aviation Trust Fund. The Aviation Trust Fund was established in 1970 to provide funding for aviation capital investment programs (aviation development, facilities and equipment, and research and development). The Trust Fund also finances the operation of the FAA. It is funded by user fees, taxes on airline tickets, aviation fuel, and various aircraft parts.

Proceeds from the Aviation Trust Fund are distributed each year by the FAA, from appropriations by Congress. A portion of the annual distribution is to primary commercial service airports, based upon enplanement levels. Commercial service airports enplaning more than 10,000 passengers annually are provided a $1,000,000 annual entitlement. For eligible general aviation airports, *Vision 100* provides up to $150,000 of funding each year. As a reliever airport, Colonel James Jabara Airport does not qualify for the commercial service entitlement; however, it does qualify for the annual $150,000 entitlement.

After meeting entitlement obligations, the remaining Airport Improvement Program (AIP) funds are distributed by the FAA, based upon the priority of the project for which they have requested federal assistance through discretionary apportionments. A national priority ranking system is used to evaluate and rank each airport project. Those projects with the highest priority are given preference in funding. Each project for Colonel James Jabara Airport is required to follow this procedure and compete with other airport projects in the State for AIP State Apportionment dollars, and across the country for other Federal AIP funds. An important point to consider is that most funding for Colonel James Jabara Airport is not guaranteed, as the airport is currently only eligible for the $150,000 annual entitlement. As evident from the airport development schedule and cost summaries, the Wichita Airport Authority could benefit significantly from federal discretionary funding.

Airport development that meets the FAA's eligibility requirements can receive 95 percent federal funding. However, since this rate was only increased under *Vision 100*, it has been assumed in this plan that the participation rate will revert to 90 percent after 2007. Property acquisition, airfield improvements, aprons, perimeter service roads,

and access road improvements are examples of eligible items. General aviation terminal buildings are not generally eligible. *Vision 100* does provide for the Secretary of Transportation to decide to fund revenue-generating developments such as hangars and fuel facilities, which have historically not been eligible for federal funding. *Vision 100* limits this funding eligibility to non-primary airports such as Colonel James Jabara Airport. *Vision 100* also requires the Secretary of Transportation to determine that adequate provisions have been made to finance airside needs at the airport, prior to an airport receiving funding for revenue generating development.

FAA FACILITIES AND EQUIPMENT PROGRAM

The Airway Facilities Division of the FAA administers the national Facilities and Equipment (F&E) Program. This annual program provides funding for the installation and maintenance of various navigational aids and equipment for the national airspace system and airports. Under the F&E program, funding is provided for FAA airport traffic control towers, enroute navigational aids, and on-airport navigational aids such as approach lighting systems. The Runway 18 Instrument Landing System (ILS), Medium Intensity Approach Lighting System with Runway Alignment Indicator Lights (MALSR), and Runway 18 and Runway 36 Precision Approach Path Indicators (PAPIs) will be installed under this program at no cost to the Wichita Airport Authority. As activity levels and other development warrants, the airport may be considered by the FAA Airways Facilities Division for the installation and maintenance of additional navigational aids through the F&E program.

LOCAL FUNDING

The balance of project costs, after consideration has been given to grants, must be funded through local resources. Assuming federal funding, this essentially equates to 10 percent of the project costs if all eligible FAA funds are available.

There are several alternatives for local finance options for future development at the airport, including airport revenues, direct funding from the WAA, issuing bonds, and leasehold financing. These strategies could be used to fund the local matching share, or complete the project if grant funding cannot be arranged.

The capital improvement program has assumed that some landside facility development would be completed privately. Under this type of development, the Wichita Airport Authority would complete the necessary infrastructure improvements, as this development is grant-eligible.

There are several municipal bonding options available to Wichita Airport Authority through the City of Wichita including: general obligation bonds, limited obligation bonds, and revenue bonds. General obligation bonds are a common form of municipal bonds which are issued by voter approval and se-

cured by the full faith and credit of the City of Wichita. City of Wichita tax revenues are pledged to retire the debt. As instruments of credit, and because the community secures the bonds, general obligation bonds reduce the available debt level of the community. Due to the community pledge to secure and pay general obligation bonds, they are the most secure type of municipal bond and are generally issued at lower interest rates and carry lower costs of issuance. The primary disadvantage of general obligation bonds is that they require voter approval and are subject to statutory debt limits. This requires that they be used for projects that have broad support among the voters, and that they are reserved for projects that have highest public priorities.

In contrast to general obligation bonds, limited obligation bonds (sometimes referred to as Self-Liquidating Bonds) are secured by revenues from a local source. While neither general fund revenues nor the taxing power of the local community is pledged to pay the debt service, these sources may be required to retire the debt if pledged revenues are insufficient to make interest and principal payments on the bonds. These bonds still carry the full faith and credit pledge of the local community and, therefore, are considered, for the purpose of financial analysis, as part of the debt burden of the local community. The overall debt burden of the local community is a factor in determining interest rates on municipal bonds.

There are several types of revenue bonds, but in general they are a form of a municipal bond which is payable solely from the revenue derived from the operation of a facility that was constructed or acquired with the proceeds of the bonds. For example, a Lease Revenue Bond is secured with the income from a lease assigned to the repayment of the bonds. Revenue bonds have become a common form of financing airport improvements. Revenue bonds present the opportunity to provide those improvements without direct burden to the taxpayer. Revenue bonds normally carry a higher interest rate because they lack the guarantees of general and limited obligation bonds.

Leasehold financing refers to a developer or tenant financing improvements under a long term ground lease. The obvious advantage of such an arrangement is that it relieves the community of all responsibility for raising the capital funds for improvements. However, the private development of facilities on a ground lease, particularly on property owned by a municipal agency, produces a unique set of problems. Companies that want to own their property as a matter of financial policy may not locate where land is only available for lease. The Wichita Airport Authority has used long term lease arrangements successfully to finance capital improvements at the airport in the past. Most hangar facilities were developed with private funds under a long term ground lease with the WAA.

The WAA is financially stable and has a low level of indebtedness. The City of Wichita's general tax revenues are not used to support the airport.

PLAN IMPLEMENTATION

The successful implementation of the Colonel James Jabara Airport Master Plan will require sound judgment on the part of the WAA with regard to the implementation of projects to meet future activity demands, while maintaining the existing infrastructure and improving this infrastructure to support new development. While the projects included in the capital improvement program have been broken into short, intermediate, and long term planning periods, the WAA will need to consider the scheduling of projects in a flexible manner based upon the availability of federal grants, and add new projects from time-to-time to satisfy safety or design standards, or newly created demands. The master plan presents a financially viable plan for the WAA to implement over an extended time frame.

In summary, the planning process requires that the WAA continually monitor the need for new or rehabilitated facilities, since applications (for eligible projects) must be submitted to the FAA each year. The WAA should continually monitor, with the FAA, the projects which are required for safety and security.

Appendix A
GLOSSARY OF TERMS AND ABBREVIATIONS

Appendix A

GLOSSARY OF TERMS

ACCELERATE-STOP DISTANCE AVAILABLE (ASDA): see declared distances.

AIR CARRIER: an operator which: (1) performs at least five round trips per week between two or more points and publishes flight schedules which specify the times, days of the week, and places between which such flights are performed; or (2) transport mail by air pursuant to a current contract with the U.S. Postal Service. Certified in accordance with Federal Aviation Regulation (FAR) Parts 121 and 127.

AIRPORT REFERENCE CODE (ARC): a coding system used to relate airport design criteria to the operational (Aircraft Approach Category) to the physical characteristics (Airplane Design Group) of the airplanes intended to operate at the airport.

AIRPORT REFERENCE POINT (ARP): The latitude and longitude of the approximate center of the airport.

AIRPORT ELEVATION: The highest point on an airport's usable runway expressed in feet above mean sea level (MSL).

AIRPORT LAYOUT DRAWING (ALD): The drawing of the airport showing the layout of existing and proposed airport facilities.

AIRCRAFT APPROACH CATEGORY: a grouping of aircraft based on 1.3 times the stall speed in their landing configuration at their maximum certificated landing weight. The categories are as follows:

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

AIRPLANE DESIGN GROUP (ADG): a grouping of aircraft based upon wingspan. The groups are as follows:

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

AIR TAXI: An air carrier certificated in accordance with FAR Part 135 and authorized to provide, on demand, public transportation of persons and property by aircraft. Generally operates small aircraft "for hire" for specific trips.

AIRPORT TRAFFIC CONTROL TOWER (ATCT): a central operations facility in the terminal air traffic control system, consisting of a tower, including an associated instrument flight rule (IFR) room if radar equipped, using air/ground communications and/or radar, visual signaling, and other devices to provide safe and expeditious movement of terminal air traffic.

AIR ROUTE TRAFFIC CONTROL CENTER (ARTCC): a facility established to provide air traffic control service to aircraft operating on an IFR flight plan within controlled airspace and principally during the enroute phase of flight.

ALERT AREA: see special-use airspace.

ANNUAL INSTRUMENT APPROACH (AIA): an approach to an airport with the intent to land by an aircraft in accordance with an IFR flight plan when visibility is less than three miles and/or when the ceiling is at or below the minimum initial approach altitude.

APPROACH LIGHTING SYSTEM (ALS): an airport lighting facility which provides visual guidance to landing aircraft by radiating light beams by which the pilot aligns the aircraft with the extended centerline of the runway on his final approach and landing.

APPROACH MINIMUMS: the altitude below which an aircraft may not descend while on an IFR approach unless the pilot has the runway in sight.

AUTOMATIC DIRECTION FINDER (ADF): an aircraft radio navigation system which senses and indicates the direction to a non-directional radio beacon (NDB) ground transmitter.

AUTOMATED WEATHER OBSERVATION STATION (AWOS): equipment used to automatically record weather conditions (i.e. cloud height, visibility, wind speed and direction, temperature, dewpoint, etc...)

AUTOMATED TERMINAL INFORMATION SERVICE (ATIS): the continuous broadcast of recorded non-control information at towered airports. Information typically includes wind speed, direction, and runway in use.

AZIMUTH: Horizontal direction expressed as the angular distance between true north and the direction of a fixed point (as the observer's heading).

BASE LEG: A flight path at right angles to the landing runway off its approach end. The base leg normally extends from the downwind leg to the intersection of the extended runway centerline. See "traffic pattern."

BEARING: the horizontal direction to or from any point, usually measured clockwise from true north or magnetic north.

BLAST FENCE: a barrier used to divert or dissipate jet blast or propeller wash.

BUILDING RESTRICTION LINE (BRL): A line which identifies suitable building area locations on the airport.

CIRCLING APPROACH: a maneuver initiated by the pilot to align the aircraft with the runway for landing when flying

a predetermined circling instrument approach under IFR.

CLASS A AIRSPACE: see Controlled Airspace.

CLASS B AIRSPACE: see Controlled Airspace.

CLASS C AIRSPACE: see Controlled Airspace.

CLASS D AIRSPACE: see Controlled Airspace.

CLASS E AIRSPACE: see Controlled Airspace.

CLASS G AIRSPACE: see Controlled Airspace.

CLEAR ZONE: see Runway Protection Zone.

CROSSWIND: wind flow that is not parallel to the runway of the flight path of an aircraft.

COMPASS LOCATOR (LOM): a low power, low/medium frequency radiobeacon installed in conjunction with the instrument landing system at one or two of the marker sites.

CONTROLLED AIRSPACE: airspace of defined dimensions within which air traffic control services are provided to instrument flight rules (IFR) and visual flight rules (VFR) flights in accordance with the airspace classification. Controlled airspace in the United States is designated as follows:

- *CLASS A:* generally, the airspace from 18,000 feet mean sea level (MSL) up to but not including flight level FL600. All persons must operate their aircraft under IFR.

- *CLASS B:* generally, the airspace from the surface to 10,000 feet MSL surrounding the nation's busiest airports. The configuration of Class B airspace is unique to each airport, but typically consists of two or more layers of air space and is designed to contain all published instrument approach procedures to the airport. An air traffic control clearance is required for all aircraft to operate in the area.

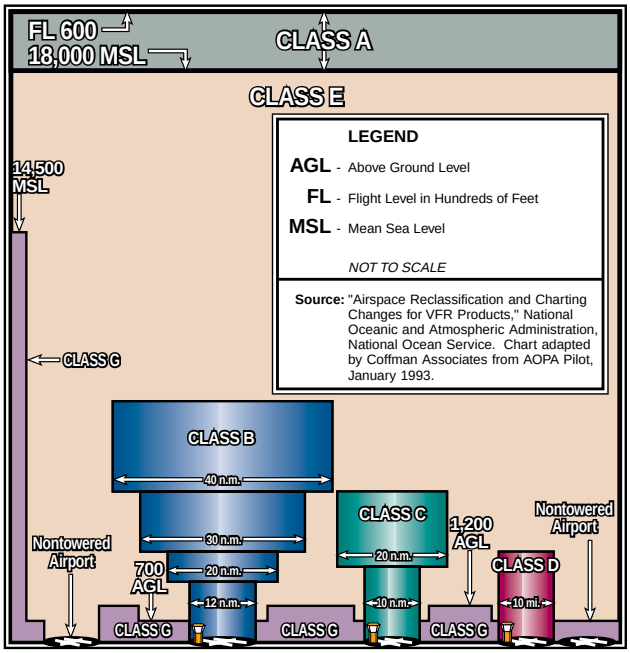
- *CLASS C:* generally, the airspace from the surface to 4,000 feet above the air port elevation (charted as MSL) surrounding those airports that have an operational control tower and radar approach control and are served by a qualifying number of IFR operations or passenger enplanements. Although individually tailored for each airport, Class C airspace typically consists of a surface area with a five nautical mile (nm) radius and an outer area with a 10 nautical mile radius that extends from 1,200 feet to 4,000 feet above the airport elevation. Two-way radio communication is required for all aircraft.

- *CLASS D:* generally, that airspace from the surface to 2,500 feet above the air port elevation (charted as MSL) surrounding those airport that have an operational control tower. Class D air space is individually tailored and configured to encompass published instrument approach procedures. Unless otherwise authorized, all

persons must establish two-way radio communication.

- *CLASS E:* generally, controlled airspace that is not classified as Class A, B, C, or D. Class E airspace extends upward from either the surface or a designated altitude to the overlying or adjacent controlled airspace. When designated as a surface area, the airspace will be configured to contain all instrument procedures. Class E airspace encompasses all Victor Airways. Only aircraft following instrument flight rules are required to establish two-way radio communication with air traffic control.

- *CLASS G:* generally, that airspace not classified as Class A, B, C, D, or E. Class G airspace is uncontrolled for all aircraft. Class G airspace extends from the surface to the overlying Class E airspace.



CONTROLLED FIRING AREA: see special-use airspace.

CROSSWIND LEG: A flight path at right angles to the landing runway off its upwind end. See "traffic pattern."

DECLARED DISTANCES: The distances declared available for the airplane's takeoff runway, takeoff distance, accelerate-stop distance, and landing distance requirements. The distances are:

- *TAKEOFF RUNWAY AVAILABLE (TORA):* The runway length declared available and suitable for the ground run of an airplane taking off;

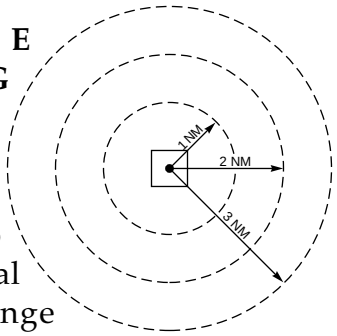
- *TAKEOFF DISTANCE AVAILABLE (TODA):* The TORA plus the length of any remaining runway and/or clear way beyond the far end of the TORA;

- *ACCELERATE-STOP DISTANCE AVAILABLE (ASDA):* The runway plus stopway length declared available for the acceleration and deceleration of an aircraft aborting a takeoff; and

- *LANDING DISTANCE AVAILABLE (LDA):* The runway length declared available and suitable for landing.

DISPLACED THRESHOLD: a threshold that is located at a point on the runway other than the designated beginning of the runway.

DISTANCE MEASURING EQUIPMENT (DME): Equipment (airborne and ground) used to measure, in nautical miles, the slant range



distance of an aircraft from the DME navigational aid.

DNL: The 24-hour average sound level, in A-weighted decibels, obtained after the addition of ten decibels to sound levels for the periods between 10 p.m. and 7 a.m. as averaged over a span of one year. It is the FAA standard metric for determining the cumulative exposure of individuals to noise.

DOWNWIND LEG: A flight path parallel to the landing runway in the direction opposite to landing. The downwind leg normally extends between the crosswind leg and the base leg. Also see "traffic pattern."

EASEMENT: The legal right of one party to use a portion of the total rights in real estate owned by another party. This may include the right of passage over, on, or below the property; certain air rights above the property, including view rights; and the rights to any specified form of development or activity, as well as any other legal rights in the property that may be specified in the easement document.

ENPLANED PASSENGERS: the total number of revenue passengers boarding aircraft, including originating, stop-over, and transfer passengers, in scheduled and non-scheduled services.

FINAL APPROACH: A flight path in the direction of landing along the extended runway centerline. The final approach normally extends from the base leg to the runway. See "traffic pattern."

FIXED BASE OPERATOR (FBO): A provider of services to users of an airport. Such services include, but are not limited to, hangaring, fueling, flight training, repair, and maintenance.

FRANGIBLE NAVAID: a navigational aid which retains its structural integrity and stiffness up to a designated maximum load, but on impact from a greater load, breaks, distorts, or yields in such a manner as to present the minimum hazard to aircraft.

GENERAL AVIATION: that portion of civil aviation which encompasses all facets of aviation except air carriers holding a certificate of convenience and necessity, and large aircraft commercial operators.

GLIDESLOPE (GS): Provides vertical guidance for aircraft during approach and landing. The glideslope consists of the following:

1. Electronic components emitting signals which provide vertical guidance by reference to airborne instruments during instrument approaches such as ILS; or

2. Visual ground aids, such as VASI, which provide vertical guidance for VFR approach or for the visual portion of an instrument approach and landing.

GLOBAL POSITIONING SYSTEM: See "GPS."

GPS - GLOBAL POSITIONING SYSTEM: A system of 24 satellites

used as reference points to enable navigators equipped with GPS receivers to determine their latitude, longitude, and altitude.

HELIPAD: a designated area for the takeoff, landing, and parking of helicopters.

HIGH-SPEED EXIT TAXIWAY: a long radius taxiway designed to expedite aircraft turning off the runway after landing (at speeds to 60 knots), thus reducing runway occupancy time.

INSTRUMENT APPROACH: A series of predetermined maneuvers for the orderly transfer of an aircraft under instrument flight conditions from the beginning of the initial approach to a landing, or to a point from which a landing may be made visually.

INSTRUMENT FLIGHT RULES (IFR): Rules governing the procedures for conducting instrument flight. Also a term used by pilots and controllers to indicate type of flight plan.

INSTRUMENT LANDING SYSTEM (ILS): A precision instrument approach system which normally consists of the following electronic components and visual aids:

1. Localizer.
2. Glide Slope.
3. Outer Marker.
4. Middle Marker.
5. Approach Lights.

LANDING DISTANCE AVAILABLE (LDA): see declared distances.

LOCAL TRAFFIC: aircraft operating in the traffic pattern or within sight of the tower, or aircraft known to be departing or arriving from the local practice areas, or aircraft executing practice instrument approach procedures. Typically, this includes touch-and-go training operations.

LOCALIZER: The component of an ILS which provides course guidance to the runway.

LOCALIZER TYPE DIRECTIONAL AID (LDA): a facility of comparable utility and accuracy to a localizer, but is not part of a complete ILS and is not aligned with the runway.

LORAN: long range navigation, an electronic navigational aid which determines aircraft position and speed by measuring the difference in the time of reception of synchronized pulse signals from two fixed transmitters. Loran is used for enroute navigation.

MICROWAVE LANDING SYSTEM (MLS): an instrument approach and landing system that provides precision guidance in azimuth, elevation, and distance measurement.

MILITARY OPERATIONS AREA (MOA): see special-use airspace.

MISSED APPROACH COURSE (MAC): The flight route to be followed if, after an instrument approach, a landing is not effected, and occurring normally:

1. When the aircraft has descended to the decision height and has not established visual contact; or

2. When directed by air traffic control to pull up or to go around again.

MOVEMENT AREA: the runways, taxiways, and other areas of an airport which are utilized for taxiing/hover taxiing, air taxiing, takeoff, and landing of aircraft, exclusive of loading ramps and parking areas. At those airports with a tower, air traffic control clearance is required for entry onto the movement area.

NAVAID: a term used to describe any electrical or visual air navigational aids, lights, signs, and associated supporting equipment (i.e. PAPI, VASI, ILS, etc..)

NOISE CONTOUR: A continuous line on a map of the airport vicinity connecting all points of the same noise exposure level.

NONDIRECTIONAL BEACON (NDB): A beacon transmitting nondirectional signals whereby the pilot of an aircraft equipped with direction finding equipment can determine his or her bearing to and from the radio beacon and home on, or track to, the station. When the radio beacon is installed in conjunction with the Instrument Landing System marker, it is normally called a Compass Locator.

NONPRECISION APPROACH PROCEDURE: a standard instrument approach procedure in which no electronic glide slope is provided, such as VOR, TACAN, NDB, or LOC.

OBJECT FREE AREA (OFA): an area on the ground centered on a runway, taxiway, or taxilane centerline provided to enhance the safety of aircraft operations by having the area free of objects, except for objects that need to be located in the OFA for air navigation or aircraft ground maneuvering purposes.

OBSTACLE FREE ZONE (OFZ): the airspace below 150 feet above the established airport elevation and along the runway and extended runway centerline that is required to be kept clear of all objects, except for frangible visual NAVAIDs that need to be located in the OFZ because of their function, in order to provide clearance for aircraft landing or taking off from the runway, and for missed approaches.

OPERATION: a take-off or a landing.

OUTER MARKER (OM): an ILS navigation facility in the terminal area navigation system located four to seven miles from the runway edge on the extended centerline indicating to the pilot, that he/she is passing over the facility and can begin final approach.

PRECISION APPROACH: a standard instrument approach procedure which provides runway alignment and glide slope (descent) information. It is categorized as follows:

- *CATEGORY I (CAT I):* a precision approach which provides for approaches with a decision height of not less than 200 feet and visibility not less than 1/2 mile or Runway Visual Range (RVR) 2400 (RVR 1800) with operative touchdown zone and runway centerline lights.

- *CATEGORY II (CAT II):* a precision approach which provides for approaches with a decision height of not less than 100 feet and visibility not less than 1200 feet RVR.

- *CATEGORY III (CAT III):* a precision approach which provides for approaches with minima less than Category II.

PRECISION APPROACH PATH INDICATOR (PAPI): A lighting system providing visual approach slope guidance to aircraft during a landing approach. It is similar to a VASI but provides a sharper transition between the colored indicator lights.

PRECISION OBJECT FREE AREA (POFA): an area centered on the extended runway centerline, beginning at the runway threshold and extending behind the runway threshold that is 200 feet long by 800 feet wide. The POFA is a clearing standard which requires the POFA to be kept clear of above ground objects protruding above the runway safety area edge elevation (except for frangible NAVAIDS). The POFA applies to all new authorized instrument approach procedures with less than 3/4 mile visibility.

PROHIBITED AREA: see special-use airspace.

REMOTE COMMUNICATIONS OUTLET (RCO): an unstaffed transmitter receiver/facility remotely controlled by air traffic personnel. RCOs serve flight service stations (FSSs). RCOs were established to provide ground-to-ground communications between air traffic control specialists and pilots at satellite airports for delivering enroute clearances, issuing departure authorizations, and acknowledging instrument flight rules cancellations or departure/landing times.

REMOTE TRANSMITTER/RECEIVER (RTR): see remote communications outlet. RTRs serve ARTCCs.

RELIEVER AIRPORT: an airport to serve general aviation aircraft which might otherwise use a congested air-carrier served airport.

RESTRICTED AREA: see special-use airspace.

RNAV: area navigation - airborne equipment which permits flights over determined tracks within prescribed accuracy tolerances without the need to overfly ground-based navigation facilities. Used enroute and for approaches to an airport.

RUNWAY: a defined rectangular area on an airport prepared for aircraft landing and takeoff. Runways are normally numbered in relation to their magnetic direction, rounded off to the nearest 10 degrees. For example, a runway with a magnetic heading of 180 would be designated Runway 18. The runway heading on the opposite end of the runway is 180 degrees from that runway end. For example, the opposite runway heading for Runway 18 would be Runway 36 (magnetic heading of 360). Aircraft can takeoff or land from either end of a runway, depending upon wind direction.

RUNWAY BLAST PAD: a surface adjacent to the ends of runways provided to reduce the erosive effect of jet blast and propeller wash.

RUNWAY END IDENTIFIER LIGHTS (REIL): Two synchronized flashing lights, one on each side of the runway threshold, which provide rapid and positive identification of the approach end of a particular runway.

RUNWAY GRADIENT: the average slope, measured in percent, between the two ends of a runway.

RUNWAY PROTECTION ZONE (RPZ): An area off the runway end to enhance the protection of people and property on the ground. The RPZ is trapezoidal in shape. Its dimensions are determined by the aircraft approach speed and runway approach type and minima.

RUNWAY SAFETY AREA (RSA): a defined surface surrounding the runway prepared or suitable for reducing the risk of damage to airplanes in the event of an undershoot, overshoot, or excursion from the runway.

RUNWAY VISUAL RANGE (RVR): an instrumentally derived value, in feet, representing the horizontal distance a pilot can see down the runway from the runway end.

RUNWAY VISIBILITY ZONE (RVZ): an area on the airport to be kept clear of permanent objects so that there is an unobstructed line-of-site from any point five feet above the runway centerline to any point five feet above an intersecting runway centerline.

SEGMENTED CIRCLE: a system of visual indicators designed to provide traffic pattern information at airports without operating control towers.

SHOULDER: an area adjacent to the edge of paved runways, taxiways or aprons providing a transition between the pavement and the adjacent surface; support for aircraft running off the pavement; enhanced drainage; and blast protection. The shoulder does not necessarily need to be paved.

SLANT-RANGE DISTANCE: The straight line distance between an aircraft and a point on the ground.

SPECIAL-USE AIRSPACE: airspace of defined dimensions identified by a surface area wherein activities must be confined because of their nature and/or wherein limitations may be imposed upon aircraft operations that are not a part of those activities. Special-use airspace classifications include:

- *ALERT AREA:* airspace which may contain a high volume of pilot training activities or an unusual type of aerial activity, neither of which is hazardous to aircraft.

- *CONTROLLED FIRING AREA:* airspace wherein activities are conducted under conditions so controlled as to eliminate hazards to nonparticipating aircraft and to ensure the safety of persons or property on the ground.

- *MILITARY OPERATIONS AREA (MOA):* designated airspace with defined vertical and lateral dimensions established outside Class A airspace to separate/segregate certain military activities from instrument flight rule (IFR) traffic and to identify for visual flight rule (VFR) traffic where these activities are conducted.

- *PROHIBITED AREA:* designated airspace within which the flight of aircraft is prohibited.

- *RESTRICTED AREA:* airspace designated under Federal Aviation Regulation (FAR) 73, within which the flight of aircraft, while not wholly prohibited, is subject to restriction. Most restricted areas are designated joint use. When not in use by the using agency, IFR/VFR operations can be authorized by the controlling air traffic control facility.

- *WARNING AREA:* airspace which may contain hazards to nonparticipating aircraft.

STANDARD INSTRUMENT DEPARTURE (SID): a preplanned coded air traffic control IFR departure routing, preprinted for pilot use in graphic and textual form only.

STANDARD TERMINAL ARRIVAL (STAR): a preplanned coded air traffic control IFR arrival routing, preprinted for pilot use in graphic and textual or textual form only.

STOP-AND-GO: a procedure wherein an aircraft will land, make a complete stop on the runway, and then commence a takeoff from that point. A stop-and-go is recorded as two operations: one operation for the landing and one operation for the takeoff.

STRAIGHT-IN LANDING/APPROACH: a landing made on a runway aligned within 30 degrees of the final approach course following completion of an instrument approach.

TACTICAL AIR NAVIGATION (TACAN): An ultra-high frequency electronic air navigation system which provides suitably-equipped aircraft a continuous indication of bearing and distance to the TACAN station.

TAKEOFF RUNWAY AVAILABLE (TORA): see declared distances.

TAKEOFF DISTANCE AVAILABLE (TODA): see declared distances.

TAXILANE: the portion of the aircraft parking area used for access between taxiways and aircraft parking positions.

TAXIWAY: a defined path established for the taxiing of aircraft from one part of an airport to another.

TAXIWAY SAFETY AREA (TSA): a defined surface alongside the taxiway prepared or suitable for reducing the risk of damage to an airplane unintentionally departing the taxiway.

TETRAHEDRON: a device used as a landing direction indicator. The small end of the tetrahedron points in the direction of landing.

THRESHOLD: the beginning of that portion of the runway available for landing. In some instances the landing threshold may be displaced.

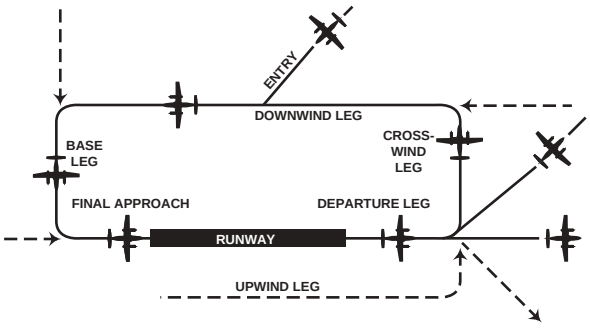
TOUCH-AND-GO: an operation by an aircraft that lands and departs on a runway without stopping or exiting the runway. A touch-and-go is recorded as two operations: one operation for the landing and one operation for the takeoff.

TOUCHDOWN ZONE (TDZ): The first 3,000 feet of the runway beginning at the threshold.

TOUCHDOWN ZONE ELEVATION (TDZE): The highest elevation in the touchdown zone.

TOUCHDOWN ZONE (TDZ) LIGHTING: Two rows of transverse light bars located symmetrically about the runway centerline normally at 100-foot intervals. The basic system extends 3,000 feet along the runway.

TRAFFIC PATTERN: The traffic flow that is prescribed for aircraft landing at or taking off from an airport. The components of a typical traffic pattern are the upwind leg, crosswind leg, downwind leg, base leg, and final approach.

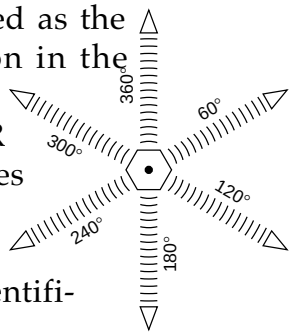


UNICOM: A nongovernment communication facility which may provide airport information at certain airports. Locations and frequencies of UNICOM's are shown on aeronautical charts and publications.

UPWIND LEG: A flight path parallel to the landing runway in the direction of landing. See "traffic pattern."

VECTOR: A heading issued to an aircraft to provide navigational guidance by radar.

VERY HIGH FREQUENCY/ OMNIDIRECTIONAL RANGE STATION (VOR): A ground-based electronic navigation aid transmitting very high frequency navigation signals, 360 degrees in azimuth, oriented from magnetic north. Used as the basis for navigation in the national airspace system. The VOR periodically identifies itself by Morse Code and may have an additional voice identification feature.



VERY HIGH FREQUENCY OMNIDIRECTIONAL RANGE STATION/ TACTICAL AIR NAVIGATION (VORTAC): A navigation aid providing VOR azimuth, TACAN azimuth, and TACAN distance-measuring equipment (DME) at one site.

VICTOR AIRWAY: A control area or portion thereof established in the form of a corridor, the centerline of which is defined by radio navigational aids.

VISUAL APPROACH: An approach wherein an aircraft on an IFR flight plan, operating in VFR conditions under the control of an air traffic control facility and having an air traffic control authorization, may proceed to the airport of destination in VFR conditions.

VISUAL APPROACH SLOPE INDICATOR (VASI): An airport lighting facility providing vertical visual approach slope guidance to aircraft during approach to landing by radiating a directional pattern of high intensity red and white focused light beams which indicate to the pilot that he is on path if he sees red/white, above path if white/white, and below path if red/red. Some airports serving large aircraft have three-bar VASI's which provide two visual guide paths to the same runway.

VISUAL FLIGHT RULES (VFR): Rules that govern the procedures for conducting flight under visual conditions. The term VFR is also used in the United States to indicate weather conditions that are equal to or greater than minimum VFR requirements. In addition, it is used by pilots and controllers to indicate type of flight plan.

VOR: See "Very High Frequency Omnidirectional Range Station."

VORTAC: See "Very High Frequency Omnidirectional Range Station/Tactical Air Navigation."

WARNING AREA: see special-use airspace.

ABBREVIATIONS

AC: advisory circular

ADF: automatic direction finder

ADG: airplane design group

AFSS: automated flight service station

AGL: above ground level

AIA: annual instrument approach

AIP: Airport Improvement Program

AIR-21: Wendell H. Ford Aviation Investment and Reform Act for the 21st Century

ALS: approach lighting system

ALSF-1: standard 2,400-foot high intensity approach lighting system with sequenced flashers (CAT I configuration)

ALSF-2: standard 2,400-foot high intensity approach light ing system with sequenced flashers (CAT II configuration)

APV: instrument approach procedure with vertical guidance

ARC: airport reference code

ARFF: aircraft rescue and firefighting

ARP: airport reference point

ARTCC: air route traffic control center

ASDA: accelerate-stop distance available

ASR: airport surveillance radar

ASOS: automated surface observation station

ATCT: airport traffic control tower

ATIS: automated terminal information service

AVGAS: aviation gasoline - typically 100 low lead (100LL)

AWOS: automated weather observation station

BRL: building restriction line

CFR: Code of Federal Regulations

CIP: capital improvement program

DME: distance measuring equipment

DNL: day-night noise level

DWL: runway weight bearing capacity for aircraft with dual-wheel type landing gear

DTWL: runway weight bearing capacity for aircraft with dual-tandem type landing gear

FAA: Federal Aviation Administration

FAR: Federal Aviation Regulation

FBO: fixed base operator

FY: fiscal year

GPS: global positioning system

GS: glide slope

HIRL: high intensity runway edge lighting

IFR: instrument flight rules (FAR Part 91)

ILS: instrument landing system

IM: inner marker

LDA: localizer type directional aid

LDA: landing distance available

LIRL: low intensity runway edge lighting

LMM: compass locator at middle marker

LOC: ILS localizer

LOM: compass locator at ILS outer marker

LORAN: long range navigation

MALS: medium intensity approach lighting system

MALSR: medium intensity approach lighting system with runway alignment indicator lights

MIRL: medium intensity runway edge lighting

MITL: medium intensity taxiway edge lighting

MLS: microwave landing system

MM: middle marker

MOA: military operations area

MSL: mean sea level

NAVAID: navigational aid

NDB: nondirectional radio beacon

NM: nautical mile (6,076 .1 feet)

NPES: National Pollutant Discharge Elimination System

NPIAS: National Plan of Integrated Airport Systems

NPRM: notice of proposed rule-making

ODALS: omnidirectional approach lighting system

OFA: object free area

OFZ: obstacle free zone

OM: outer marker

PAC: planning advisory committee

PAPI: precision approach path indicator

PFC: porous friction course

PFC: passenger facility charge

PCL: pilot-controlled lighting

PIW: public information workshop

PLASI: pulsating visual approach slope indicator

POFA: precision object free area

PVASI: pulsating/steady visual approach slope indicator

RCO: remote communications outlet

REIL: runway end identifier lighting

RNAV: area navigation

RPZ: runway protection zone

RSA: Runway Safety Area

RTR: remote transmitter/receiver

RVR: runway visibility range

RVZ: runway visibility zone

SALS: short approach lighting system

SASP: state aviation system plan

SEL: sound exposure level

SID: standard instrument departure

SM: statute mile (5,280 feet)

SRE: snow removal equipment

SSALF: simplified short approach lighting system with sequenced flashers

SSALR: simplified short approach lighting system with runway alignment indicator lights

STAR: standard terminal arrival route

SWL: runway weight bearing capacity for aircraft with single-wheel type landing gear

STWL: runway weight bearing capacity for aircraft with single-wheel tandem type landing gear

TACAN: tactical air navigational aid

TDZ: touchdown zone

TDZE: touchdown zone elevation

TAF: Federal Aviation Administration (FAA) Terminal Area Forecast

TODA: takeoff distance available

TORA: takeoff runway available

TRACON: terminal radar approach control

VASI: visual approach slope indicator

VFR: visual flight rules (FAR Part 91)

VHF: very high frequency

VOR: very high frequency omni-directional range

VORTAC: VOR and TACAN collocated

Appendix B
AIRPORT AND RUNWAY DATA

AIRPORT AND RUNWAY DATA

Airport elevation	1420 feet
Mean daily maximum temperature of the hottest month	91.70 F.
Maximum difference in runway centerline elevation	20 feet
Length of haul for airplanes of more than 60,000 pounds	1000 miles
Wet and slippery runways	

RUNWAY LENGTHS RECOMMENDED FOR AIRPORT DESIGN

Small airplanes with approach speeds of less than 30 knots	340 feet
Small airplanes with approach speeds of less than 50 knots	910 feet
Small airplanes with less than 10 passenger seats	
75 percent of these small airplanes	3010 feet
95 percent of these small airplanes	3580 feet
100 percent of these small airplanes	4220 feet
Small airplanes with 10 or more passenger seats	4570 feet
Large airplanes of 60,000 pounds or less	
75 percent of these large airplanes at 60 percent useful load	5500 feet
75 percent of these large airplanes at 90 percent useful load	7140 feet
100 percent of these large airplanes at 60 percent useful load	6170 feet
100 percent of these large airplanes at 90 percent useful load	9220 feet
Airplanes of more than 60,000 pounds	Approximately 6540 feet

REFERENCE: Chapter 2 of AC 150/5325-4A, Runway Length Requirements for Airport Design, no Changes included.

AIRPORT DESIGN AIRPLANE AND AIRPORT DATA

Aircraft Approach Category D or E
Airplane Design Group II
Airplane wingspan . . . . . 78.99 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) . . . 9.00 feet
Airport elevation . . . . . 1420 feet

RUNWAY AND TAXIWAY WIDTH AND CLEARANCE STANDARD DIMENSIONS

	Airplane	Group/ARC
Runway centerline to parallel runway centerline simultaneous operations when wake turbulence is not treated as a factor:		
VFR operations with no intervening taxiway		700 feet
VFR operations with one intervening taxiway		700 feet
VFR operations with two intervening taxiways		705 feet
IFR approach and departure with approach to near threshold		2500 feet less 100 ft for each 500 ft of threshold stagger to a minimum of 1000 feet.
Runway centerline to parallel runway centerline simultaneous operations when wake turbulence is treated as a factor:		
VFR operations		2500 feet
IFR departures		2500 feet
IFR approach and departure with approach to near threshold		2500 feet
IFR approach and departure with approach to far threshold		2500 feet plus 100 feet for each 500 feet of threshold stagger.
IFR approaches		3400 feet
Runway centerline to parallel taxiway/taxilane centerline	299.5	300 feet
Runway centerline to edge of aircraft parking	400.0	400 feet
Runway width		100 feet
Runway shoulder width		10 feet
Runway blast pad width		120 feet
Runway blast pad length		150 feet
Runway safety area width		520 feet
Runway safety area length beyond each runway end or stopway end, whichever is greater		1000 feet
Runway object free area width		800 feet
Runway object free area length beyond each runway end or stopway end, whichever is greater		1000 feet
Clearway width		500 feet
Stopway width		100 feet
Obstacle free zone (OFZ):		
Runway OFZ width		400 feet
Runway OFZ length beyond each runway end		200 feet
Inner-approach OFZ width		400 feet
Inner-approach OFZ length beyond approach light system		200 feet
Inner-approach OFZ slope from 200 feet beyond threshold		50:1
Inner-transitional OFZ slope		0:1
Runway protection zone at the primary runway end:		
Width 200 feet from runway end		500 feet
Width 1900 feet from runway end		1010 feet

Length		1700 feet
Runway protection zone at other runway end:		
Width 200 feet from runway end		500 feet
Width 1900 feet from runway end		1010 feet
Length		700 feet
Departure runway protection zone:		
Width 200 feet from the far end of TORA		500 feet
Width 1900 feet from the far end of TORA		1010 feet
Length		1700 feet
Threshold surface at primary runway end:		
Distance out from threshold to start of surface		0 feet
Width of surface at start of trapezoidal section		400 feet
Width of surface at end of trapezoidal section		1000 feet
Length of trapezoidal section		1500 feet
Length of rectangular section		8500 feet
Slope of surface		20:1
Threshold surface at other runway end:		
Distance out from threshold to start of surface		0 feet
Width of surface at start of trapezoidal section		400 feet
Width of surface at end of trapezoidal section		1000 feet
Length of trapezoidal section		1500 feet
Length of rectangular section		8500 feet
Slope of surface		20:1
Taxiway centerline to parallel taxiway/taxilane centerline	104.8	105 feet
Taxiway centerline to fixed or movable object	65.3	65.5 feet
Taxilane centerline to parallel taxilane centerline	96.9	97 feet
Taxilane centerline to fixed or movable object	57.4	57.5 feet
Taxiway width	24.0	35 feet
Taxiway shoulder width		10 feet
Taxiway safety area width	79.0	79 feet
Taxiway object free area width	130.6	131 feet
Taxilane object free area width	114.8	115 feet
Taxiway edge safety margin		7.5 feet
Taxiway wingtip clearance	25.8	26 feet
Taxilane wingtip clearance	17.9	18 feet

REFERENCE: AC 150/5300-13, Airport Design, including Changes 1 through 4.

AIRPORT DESIGN AIRPLANE AND AIRPORT DATA

Aircraft Approach Category D or E
Airplane Design Group II
Airplane wingspan . . . . . 78.99 feet
Primary runway end approach visibility minimums are not lower than CAT I
Other runway end approach visibility minimums are not lower than 1 mile
Airplane undercarriage width (1.15 x main gear track) . . . 9.00 feet
Airport elevation . . . . . 1420 feet
Airplane tail height . . . . . 24.02 feet

RUNWAY AND TAXIWAY WIDTH AND CLEARANCE STANDARD DIMENSIONS

	Airplane	Group/ARC
Runway centerline to parallel runway centerline simultaneous operations when wake turbulence is not treated as a factor:		
VFR operations with no intervening taxiway		700 feet
VFR operations with one intervening taxiway		800 feet
VFR operations with two intervening taxiways		905 feet
IFR approach and departure with approach to near threshold		2500 feet less 100 ft for each 500 ft of threshold stagger to a minimum of 1000 feet.
Runway centerline to parallel runway centerline simultaneous operations when wake turbulence is treated as a factor:		
VFR operations		2500 feet
IFR departures		2500 feet
IFR approach and departure with approach to near threshold . .		2500 feet
IFR approach and departure with approach to far threshold		2500 feet plus 100 feet for each 500 feet of threshold stagger.
IFR approaches		3400 feet
Runway centerline to parallel taxiway/taxilane centerline .	299.5	400 feet
Runway centerline to edge of aircraft parking	400.0	500 feet
Runway width		100 feet
Runway shoulder width		10 feet
Runway blast pad width		120 feet
Runway blast pad length		150 feet
Runway safety area width		520 feet
Runway safety area length beyond each runway end or stopway end, whichever is greater		1000 feet
Runway object free area width		800 feet
Runway object free area length beyond each runway end or stopway end, whichever is greater		1000 feet
Clearway width		500 feet
Stopway width		100 feet
Obstacle free zone (OFZ):		
Runway OFZ width		400 feet
Runway OFZ length beyond each runway end		200 feet
Inner-approach OFZ width		400 feet
Inner-approach OFZ length beyond approach light system		200 feet
Inner-approach OFZ slope from 200 feet beyond threshold . . .		50:1
Inner-transitional OFZ height H	49.3	49.3 feet
Inner-transitional OFZ slope		6:1
Runway protection zone at the primary runway end:		

Width 200 feet from runway end		1000 feet
Width 2700 feet from runway end		1750 feet
Length		2500 feet

Runway protection zone at other runway end:

Width 200 feet from runway end		500 feet
Width 1900 feet from runway end		1010 feet
Length		1700 feet

Departure runway protection zone:

Width 200 feet from the far end of TORA		500 feet
Width 1900 feet from the far end of TORA		1010 feet
Length		1700 feet

Threshold surface at primary runway end:

Distance out from threshold to start of surface		200 feet
Width of surface at start of trapezoidal section		1000 feet
Width of surface at end of trapezoidal section		4000 feet
Length of trapezoidal section		10000 feet
Length of rectangular section		0 feet
Slope of surface		34:1

Threshold surface at other runway end:

Distance out from threshold to start of surface		0 feet
Width of surface at start of trapezoidal section		400 feet
Width of surface at end of trapezoidal section		1000 feet
Length of trapezoidal section		1500 feet
Length of rectangular section		8500 feet
Slope of surface		20:1

Taxiway centerline to parallel taxiway/taxilane centerline	104.8	105 feet
Taxiway centerline to fixed or movable object	65.3	65.5 feet
Taxilane centerline to parallel taxilane centerline	96.9	97 feet
Taxilane centerline to fixed or movable object	57.4	57.5 feet
Taxiway width	24.0	35 feet
Taxiway shoulder width		10 feet
Taxiway safety area width	79.0	79 feet
Taxiway object free area width	130.6	131 feet
Taxilane object free area width	114.8	115 feet
Taxiway edge safety margin		7.5 feet
Taxiway wingtip clearance	25.8	26 feet
Taxilane wingtip clearance	17.9	18 feet

REFERENCE: AC 150/5300-13, Airport Design, including Changes 1 through 4.

Appendix C
AIRPORT LAYOUT PLAN DRAWINGS

Appendix C
AIRPORT LAYOUT PLAN DRAWINGS

Per Federal Aviation Administration (FAA) requirements, an official Airport Layout Drawing (ALD) has been developed for Colonel James Jabara Airport. The ALD graphically presents the existing and ultimate airport layout. The ALD is used, in part by the FAA, to determine funding eligibility for future development projects.

The ALD was prepared on a computer-aided drafting system for future ease of use. The computerized plan set provides detailed information of existing and future facility layout on multiple layers that permit the user to focus in on any section of the airport at a desirable scale. The plan can be used as base information for design, and can be easily updated in the future to reflect new development and more detail concerning existing conditions, as made available through design surveys.

A number of related drawings which depict the ultimate airspace and landside development are included with the ALD. The following provides a brief discussion of the additional drawings included with the ALD:

Terminal Area Drawings - The terminal area drawing provides greater detail concerning landside improvements west of Runway 18-36. Two drawings provide a detailed view of the northern and southern portions of this development area.

Airport Airspace Drawing - The Airport Airspace Drawing is a graphic depiction of Federal Aviation Regulations (F.A.R.) Part 77, *Objects Affecting Navigable Airspace*, regulatory criterion. The Airport Airspace Drawing is intended to aid local authorities in determining if proposed development could present a hazard to the airport and obstruct the approach path to a runway end. This plan should be coordinated with local land use planners.

Approach Zone Profiles and Runway Profile Drawings - These drawings provide both plan and profile views of the F.A.R. Part 77 approach surface for each runway end. A composite profile of the extended ground line is depicted. Obstructions and clearances over roads and railroads are shown as appropriate.

Inner Portion of the Approach Surface Drawings - The Inner Portion of the Approach Surface Drawings are scaled drawings of the runway protection zone (RPZ), runway safety area (RSA), obstacle free zone (OFZ), and object free area (OFA) for each runway end. A plan and profile view of each RPZ is provided to facilitate identification of obstructions that lie within these safety areas. Detailed obstruction and facility data is provided to identify planned improvements and the disposition of obstructions (as appropriate).

On-Airport Land Use Drawing - The On-Airport Land Use Drawing is a graphic depiction of the land use recommendations. When development is proposed, it should be directed to the appropriate land use area depicted on this plan.

Airport Property Map - The Property Map provides information on the acquisition and identification of all land tracts under the control of the airport. Both existing and future property holdings are identified on the Property Map.

AIRPORT LAYOUT PLANS

FOR

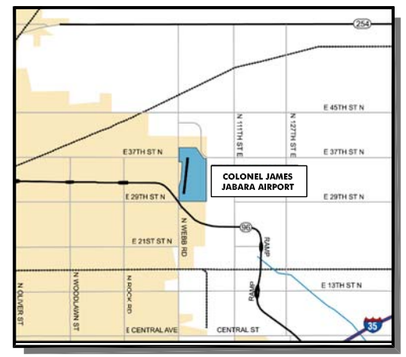
COLONEL JAMES JABARA AIRPORT

Wichita, Kansas

VICINITY MAP

CITY OF WICHITA
Wichita Airport Authority

LOCATION MAP



Prepared for the

THE CITY OF WICHITA
WICHITA AIRPORT AUTHORITY
BAILIS F. BELL, DIRECTOR OF AIRPORTS
JOHN M. OSWALD, P.E., DIRECTOR OF AIRPORT ENGINEERING AND PLANNING

INDEX OF DRAWINGS

October 2004

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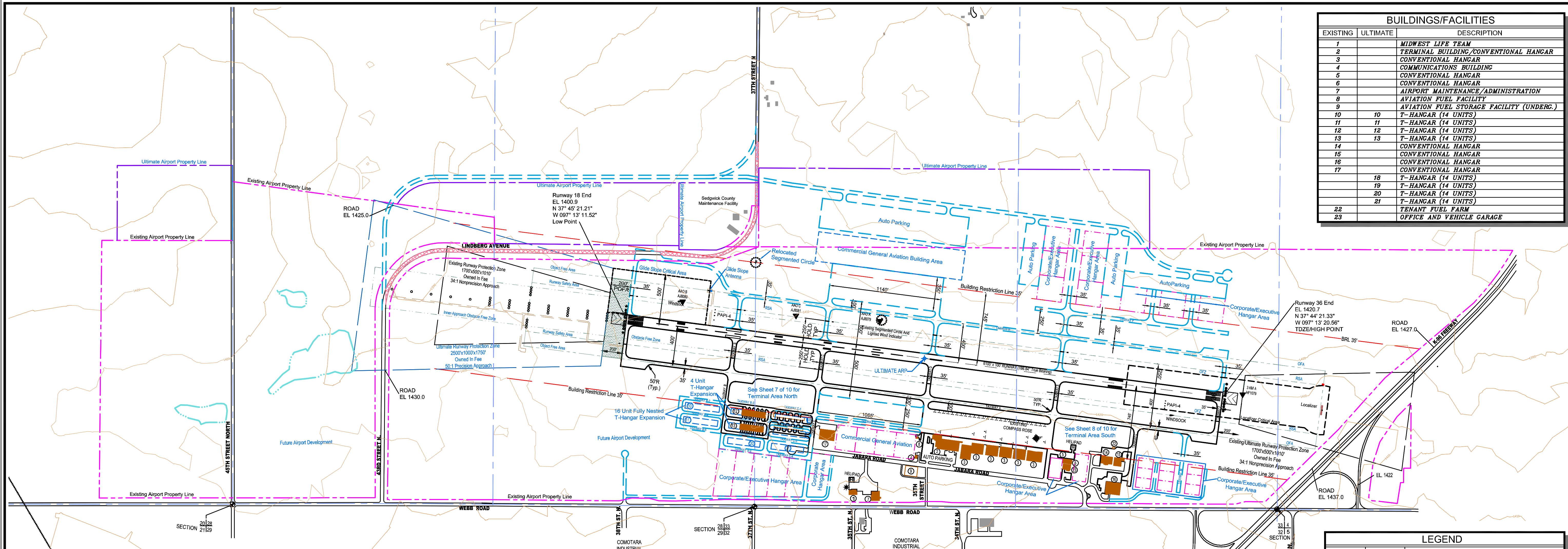
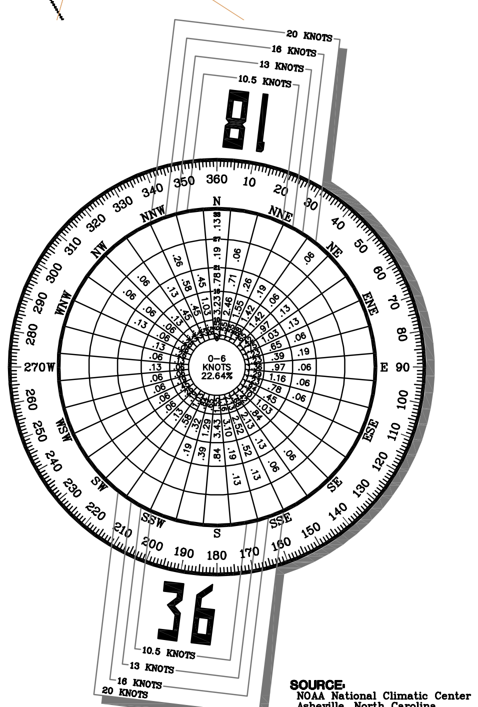
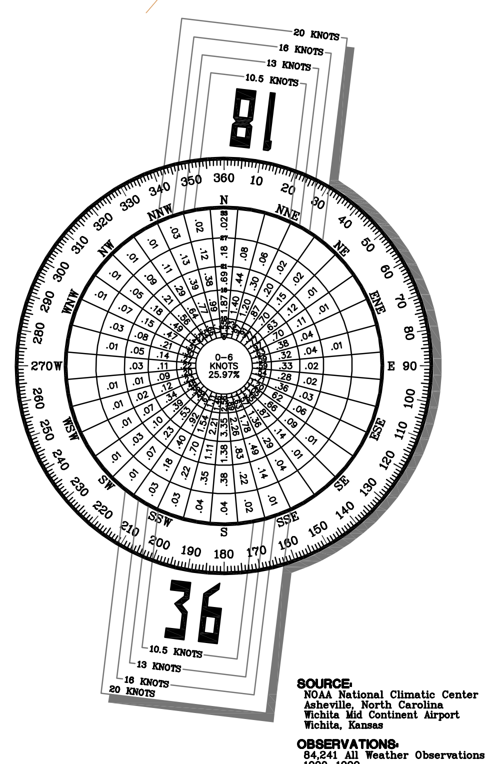


BUILDINGS/FACILITIES		
EXISTING	ULTIMATE	DESCRIPTION
1		MIDWEST LIFE TEAM
2		TERMINAL BUILDING/CONVENTIONAL HANGAR
3		CONVENTIONAL HANGAR
4		COMMUNICATIONS BUILDING
5		CONVENTIONAL HANGAR
6		CONVENTIONAL HANGAR
7		AIRPORT MAINTENANCE/ADMINISTRATION
8		AVIATION FUEL FACILITY
9		AVIATION FUEL STORAGE FACILITY (UNDERG.)
10	10	T-HANGAR (14 UNITS)
11	11	T-HANGAR (14 UNITS)
12	12	T-HANGAR (14 UNITS)
13	13	T-HANGAR (14 UNITS)
14		CONVENTIONAL HANGAR
15		CONVENTIONAL HANGAR
16		CONVENTIONAL HANGAR
17		CONVENTIONAL HANGAR
	18	T-HANGAR (14 UNITS)
	19	T-HANGAR (14 UNITS)
	20	T-HANGAR (14 UNITS)
	21	T-HANGAR (14 UNITS)
22		TENANT FUEL FARM
23		OFFICE AND VEHICLE GARAGE



SOURCE:
NOAA National Climatic Center
Asheville, North Carolina
Wichita Mid Continent Airport
Wichita, Kansas

OBSERVATIONS:
1,546 IFR Observations
1990-1999



SOURCE:
NOAA National Climatic Center
Asheville, North Carolina
Wichita Mid Continent Airport
Wichita, Kansas

OBSERVATIONS:
84,241 All Weather Observations
1990-1999

IFR WIND COVERAGE				
Runways	10.5 Knots	13 Knots	16 Knots	20 Knots
Runway 18-36	91.44%	95.72%	98.88%	99.80%

ALL WEATHER WIND COVERAGE				
Runways	10.5 Knots	13 Knots	16 Knots	**20 Knots**
Runway 18-36	91.30%	95.76%	98.69%	99.65%

RUNWAY DATA	RUNWAY 18-36			
	EXISTING		ULTIMATE	
	18	36	18	36
AIRCRAFT APPROACH CATEGORY-DESIGN GROUP	D-II		D-II	
RUNWAY LENGTH & WIDTH	6,100' x 100'		6,100' x 100'	
RUNWAY INSTRUMENTATION	Nonprecision	Nonprecision	Precision	Nonprecision
RUNWAY APPROACH SURFACE SLOPE	34:1	34:1	50:1	34:1
APPROACH VISIBILITY MINIMUM	1 Mile	1 Mile	1/2 Mile	1 Mile
RUNWAY BEARING (TRUE)	186.84°		186.84°	
MAXIMUM RUNWAY ELEVATION (Above MSL)	1,420.7'		1,420.7'	
RUNWAY OBJECT FREE AREA (OFA) LENGTH	8,100'		8,100'	
RUNWAY OBJECT FREE AREA WIDTH	800'		800'	
RUNWAY SAFETY AREA (RSA) LENGTH	8,100'		8,100'	
RUNWAY SAFETY AREA WIDTH	500'		500'	
RUNWAY OBSTACLE FREE ZONE (OFZ) LENGTH	6,500		6,500	
RUNWAY OBSTACLE FREE ZONE WIDTH	400'		400'	
RUNWAY PAVEMENT MATERIAL	Concrete		Concrete	
RUNWAY PAVEMENT SURFACE TREATMENT	Grooved		Grooved	
RUNWAY PAVEMENT DESIGN STRENGTH (in thousand lbs.)	40 (S), 62 (D)		40 (S), 62 (D)	
RUNWAY EFFECTIVE GRADIENT	.2%		.2%	
RUNWAY TOUCHDOWN ZONE ELEVATION (MSL)	1416.5	1420.7'	1416.5	1420.7'
RUNWAY MARKING	Nonprecision	Nonprecision	Precision	Nonprecision
RUNWAY LIGHTING	MIRL		HIRL	
RUNWAY/TAXIWAY HOLDING POSITION MARKING	250'		250'	
TAXIWAY WIDTH	Varies		35'	
TAXIWAY LIGHTING	MITL		MITL	
TAXIWAY MARKING	Centerline/Signage		Centerline/Signage	
TAXIWAY SAFETY AREA WIDTH	79'		79'	
TAXIWAY OBJECT FREE AREA WIDTH	131'		131'	
RUNWAY ELECTRONIC NAVIGATIONAL AIDS	GPS VOR/DME		ILS GPS VOR/DME	
RUNWAY VISUAL NAVIGATIONAL AIDS	Airport Beacon PAPI-4 (18,36) REIL (18,36) Segmented Circle Lighted Wind Cone		Airport Beacon MALSR (18) REIL (36) PAPI-4 (18, 36) Segmented Circle Lighted Wind Cone	

All horizontal data NAD 83; all vertical data is NAVD 88.
Pavement strengths are expressed in Single (S) and Dual Wheel (D) loading capacities.

RUNWAY END COORDINATES (NAD 83)			
RUNWAY		EXISTING	ULTIMATE
RUNWAY 18	Latitude	37° 45' 21.210" N	37° 45' 21.210" N
	Longitude	97° 13' 11.520" W	97° 13' 11.520" W
RUNWAY 36	Latitude	37° 44' 21.330" N	37° 44' 21.330" N
	Longitude	97° 13' 20.560" W	97° 13' 20.560" W

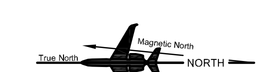
GENERAL NOTES:

1. Survey Monument locations per National Geodetic Survey Data Sheet, http:www.ngs.noaa.gov/cgi-bin/ds_radius.prl.
2. The reference datum used for all horizontal coordinates is North American Datum 1983 - NAD 83.
3. NGVD 29 runway end, touch down zone, high, and low point elevation datum, from ASIS Data Sheet Systems, http://avnwww.jccbi.gov/datasheet, converted to NAVD 88 using the National Geodetic Survey Program VERTCON, Version 2.10, http://www.ngs.noaa.gov/cgi-bin/VERTCON/vert_con.prl.
4. No modifications to airport design standards required.
5. No obstacle free zone penetrations.
6. No threshold siting surface object penetrations.

AIRPORT DATA			
OWNER: Wichita Airport Authority	AIRPORT NPIAS CODE: Reliever		
CITY: Wichita, Kansas	COUNTY: Sedgwick		
		EXISTING	ULTIMATE
AIRPORT REFERENCE CODE		D-II	D-II
AIRPORT ELEVATION (MSL)		1420.7	1420.7
MEAN MAXIMUM TEMPERATURE OF HOTTEST MONTH		91.7° F	91.7° F
AIRPORT REFERENCE POINT (ARP) COORDINATES (NAD 83)	Latitude	37° 44' 51.20" N	37° 44' 51.20" N
	Longitude	97° 13' 16.10" W	97° 13' 16.10" W
AIRPORT ELECTRONIC AIDS		GPS VOR/DME	GPS ILS VOR/DME
VISUAL NAVIGATION AIDS		Airport Beacon REIL (18,36) VASI-4L (18) VASI-4R (36) Segmented Circle Lighted Wind Cone	Airport Beacon MALSR (18) REIL (36) PAPI-4 (18, 36) Segmented Circle Lighted Wind Cone

All horizontal data NAD 83, vertical NAVD 88

LEGEND		
EXISTING	ULTIMATE	DESCRIPTION
N/A		ABANDONED PAVEMENT
		AIRPORT PROPERTY LINE
N/A		AIRPORT REFERENCE POINT (ARP)
	N/A	AIRPORT ROTATING BEACON
N/A		ABANDONED BUILDING
		BUILDING
BRL	BRL	BUILDING RESTRICTION LINE (BRL)
		CRITICAL AREA
		PAVEMENT
VASI-4	PAPI-4	NAVIGATION AID
N/A		OBJECT FREE AREA (OFA)
N/A		OBSTACLE FREE ZONE (OFZ)
N/A		RUNWAY SAFETY AREA (RSA)
N/A		PARCEL BOUNDARIES
	N/A	RUNWAY THRESHOLD LIGHTS and REIL
	N/A	SURVEY MONUMENT
		HOLDING POSITION MARKING
	N/A	SEGMENTED CIRCLE/WIND INDICATOR
	N/A	WIND INDICATOR (Lighted)
1400	N/A	CONTOURS



Magnetic Declination
5° 2' East (January 2005)
Annual Rate of Change
6.97' West (January 2005)

0 500 1000
SCALE IN FEET

APPROVAL BLOCK	
APPROVED BY:	DATE
Bailis Bell, Director of Airports	

No.	REVISIONS	DATE	BY	APP'D.

"THE PREPARATION OF THESE DOCUMENTS WAS FINANCED IN PART THROUGH A PLANNING GRANT FROM THE FEDERAL AVIATION ADMINISTRATION AS PROVIDED UNDER SECTION 505 OF THE AIRPORT AND AIRWAY IMPROVEMENT ACT OF 1982, AS AMENDED. THE CONTENTS DO NOT NECESSARILY REFLECT THE OFFICAL VIEWS OR POLICY OF THE FAA. ACCEPTANCE OF THESE DOCUMENTS BY THE FAA DOES NOT IN ANY WAY CONSTITUTE A COMMITMENT ON THE PART OF THE UNITED STATES TO PARTICIPATE IN ANY DEVELOPMENT DEPICTED HEREIN, NOR DOES IT INDICATE THAT THE PROPOSED DEVELOPMENT IS ENVIRONMENTALLY ACCEPTABLE IN ACCORDANCE WITH APPROPRIATE PUBLIC LAWS."

COLONEL JAMES JABARA AIRPORT

AIRPORT LAYOUT DRAWING

Wichita, Kansas

PLANNED BY: Christopher M. Hugunin
DETAILED BY: Diana L. Hopkins
APPROVED BY: Stephen C. Wagner

October 18, 2004 | SHEET 1 OF 10

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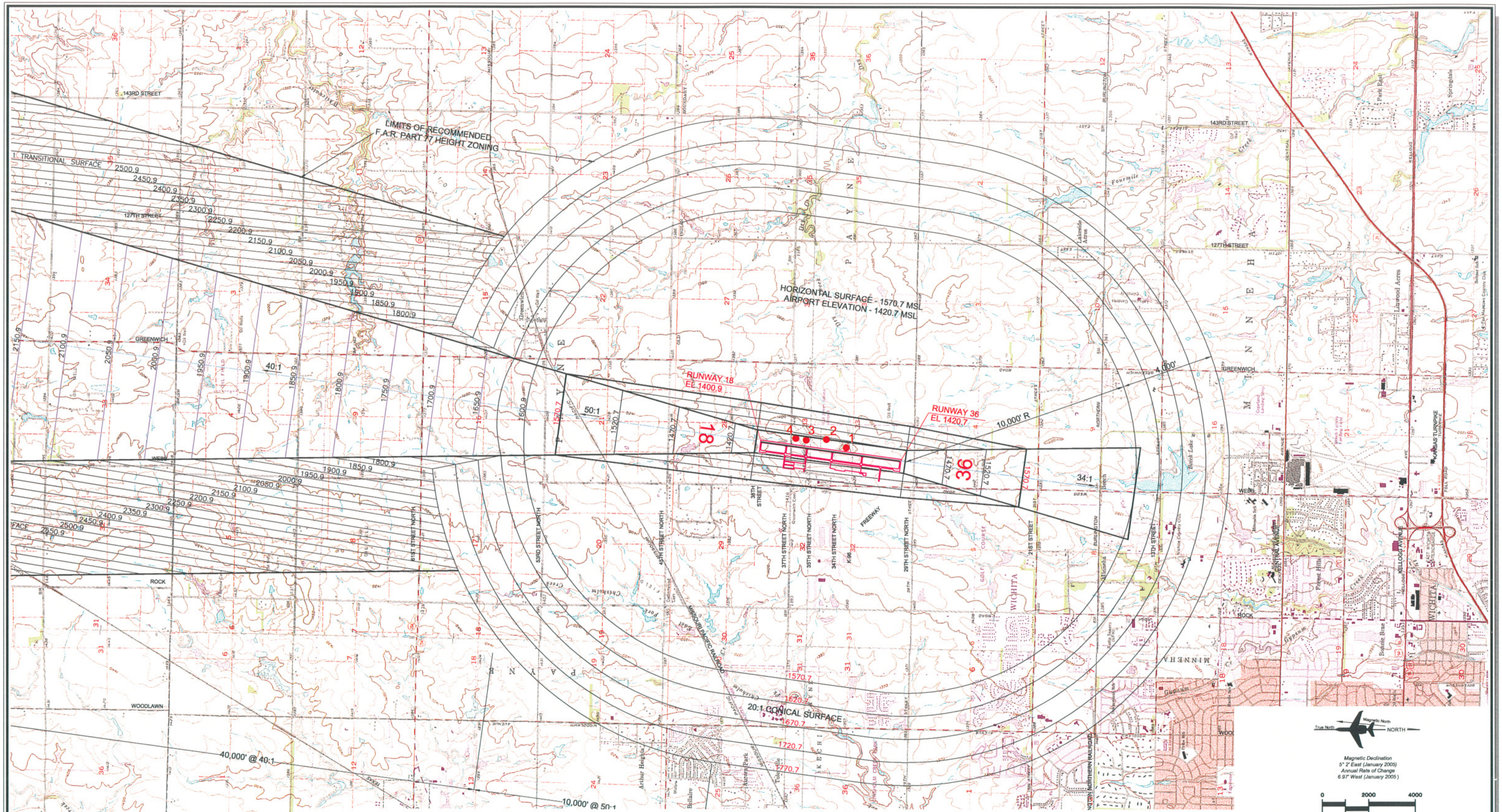

Magnetic Declination
5° 2' East (January 2005)
Annual Rate of Change
6.97' West (January 2005)

0 2000 4000
SCALE IN FEET

GENERAL NOTES:

1. No obstructions found to exist within any approach surface.
2. NGVD 29 runway end and airfield elevation datum from ASIS Data Sheet Systems, http://avnwww.jccbi.gov/datasheet, converted to NAVD 88 using the National Geodetic Survey Program VERTCON, Version 2.10.
3. Obstruction elevations and locations from the Airport Obstruction Chart for Colonel James Jabara Airport, OC 6234, published May 1989.
4. Features and objects were located using the following Kansas USGS quad maps, Andover, Greenwich, Sedgwick NE, Valley Center Whitewater, and Wichita East, published by the Geological Survey, and photo revised in 1978, 1980, and 1982.
5. Obstruction location and clearances are calculated from ultimate runway end elevations unless noted otherwise.
6. See the inner portion of the approach surface plan view detail for close-in obstructions, sheets 5 and 6.
7. All contour mapping elevation data provided by Sedgwick County Geographic Information Services, (SCGIS).

OBSTRUCTION TABLE

No.	Object Description	Distance From RW End	Offset From RW Centerline	Top Elevation (MSL)	Surface Penetrated	Penetration in Feet	Remediation
1	Ground	-3681' (18 End)	238' L	1419.49'	Primary	2.49	GRADE TO BELOW SURFACE
2	Tree	-2794' (18 End)	471' L	1435.49'	Primary	25.49	REMOVE
3	Ground	-1933 (18 End)	315' L	1420.49'	Primary	7.49	GRADE TO BELOW SURFACE
4	OL Windsock	-1469 (18 End)	335' L	1437.49'	Primary	25.49	TO REMAIN

Obstruction data obtained from U.S. Department of Commerce National Oceanic and Atmospheric Administration National Ocean Service, last surveyed November 1988. All vertical datum adjusted to NAVD 88 from NGVD 29 using the National Geodetic Survey Vertcon software, http://www.ngs.noaa.gov/cgi-bin/VERTCON/vert_con.prl. Datum shift from NGVD 29 TO NAVD 88 equals positive 0.492 feet.

No.	REVISIONS	DATE	BY	APP'D.

"THE PREPARATION OF THESE DOCUMENTS WAS FINANCED IN PART THROUGH A PLANNING GRANT FROM THE FEDERAL AVIATION ADMINISTRATION AS PROVIDED UNDER SECTION 505 OF THE AIRPORT AND AIRWAY IMPROVEMENT ACT OF 1982, AS AMENDED. THE CONTENTS DO NOT NECESSARILY REFLECT THE OFFICAL VIEWS OR POLICY OF THE FAA. ACCEPTANCE OF THESE DOCUMENTS BY THE FAA DOES NOT IN ANY WAY CONSTITUTE A COMMITMENT ON THE PART OF THE UNITED STATES TO PARTICIPATE IN ANY DEVELOPMENT DEPICTED HEREIN, NOR DOES IT INDICATE THAT THE PROPOSED DEVELOPMENT IS ENVIRONMENTALLY ACCEPTABLE IN ACCORDANCE WITH APPROPRIATE PUBLIC LAWS."

COLONEL JAMES JABARA AIRPORT

AIRPORT AIRSPACE DRAWING I

Wichita, Kansas

PLANNED BY: *Christopher M. Hugunin*
DETAILED BY: *Diana L. Hopkins*
APPROVED BY: *Stephen C. Wagner*

October 18, 2004 SHEET 2 OF 10

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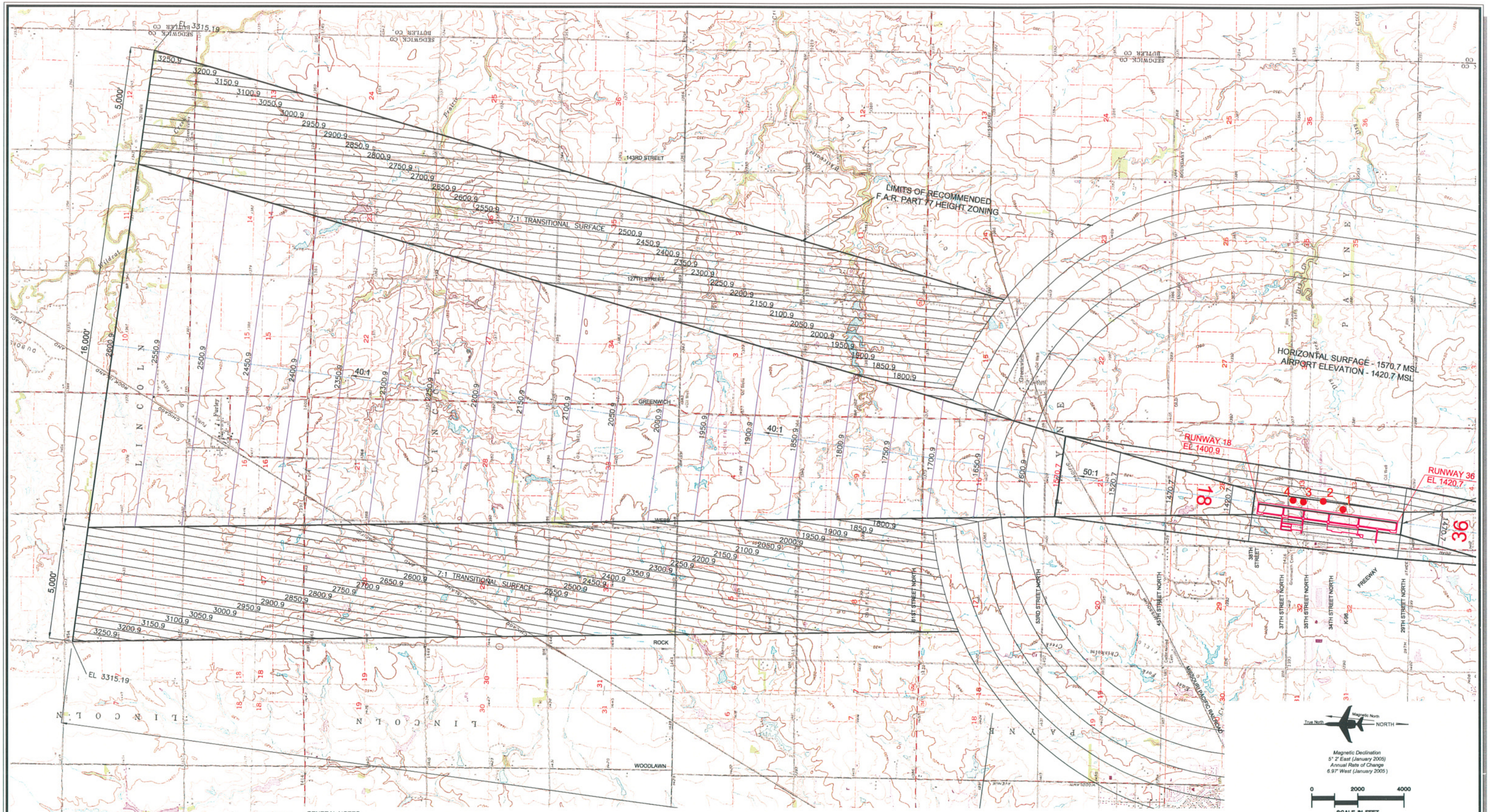

GENERAL NOTES:

1. No obstructions found to exist within any approach surface.
2. NGVD 29 runway end and airfield elevation datum, from ASIS Data Sheet Systems, http://avnwww.jccbi.gov/datasheet, converted to NAVD 88 using the National Geodetic Survey Program VERTCON, Version 2.10.
3. Obstruction elevations and locations from the Airport Obstruction Chart for Colonel James Jabara Airport, OC 6234, published May 1989.
4. Features and objects were located using the following Kansas USGS quad maps, Andover, Greenwich, Sedgwick NE, Valley Center Whitewater, and Wichita East, published by the Geological Survey, and photo revised in 1978, 1980, and 1982.
5. Obstruction location and clearances are calculated from ultimate runway end elevations unless noted otherwise.
6. See the inner portion of the approach surface plan view detail for close-in obstructions, sheets 5 and 6.
7. All contour mapping elevation data provided by Sedgwick County Geographic Information Services, (SCGIS).

OBSTRUCTION TABLE

No.	Object Description	Distance From RW End	Offset From RW Centerline	Top Elevation (MSL)	Surface Penetrated	Penetration In Feet	Remediation
1	Ground	-3681' (18 End)	238' L	1419.49'	Primary	2.49	GRADE TO BELOW SURFACE
2	Tree	-2794' (18 End)	471' L	1435.49'	Primary	25.49	REMOVE
3	Ground	-1933 (18 End)	315' L	1420.49'	Primary	7.49	GRADE TO BELOW SURFACE
4	OL Windsock	-1469 (18 End)	335' L	1437.49'	Primary	25.49	TO REMAIN

Obstruction data obtained from U.S. Department of Commerce National Oceanic and Atmospheric Administration National Ocean Service, last surveyed November 1988. All vertical datum adjusted to NAVD 88 from NGVD 29 using the National Geodetic Survey Vertcon software, http://www.ngs.noaa.gov/cgi-bin/VERTCON/vert_con.prl. Datum shift from NGVD 29 TO NAVD 88 equals positive 0.492 feet.

No.	REVISIONS	DATE	BY	APP'D.

COLONEL JAMES JABARA AIRPORT

AIRPORT AIRSPACE DRAWING II

Wichita, Kansas

PLANNED BY: Christopher M. Meguire
DETAILED BY: Diana L. Hopkins
APPROVED BY: Stephen B. Wagner
October 18, 2004
SHEET 3 OF 10

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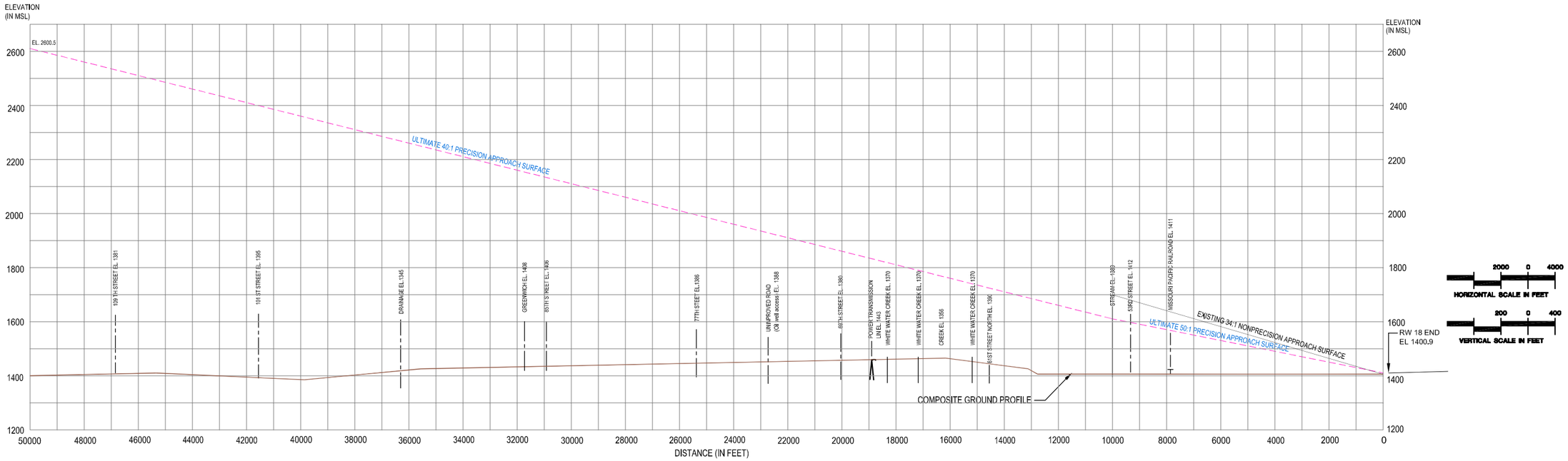
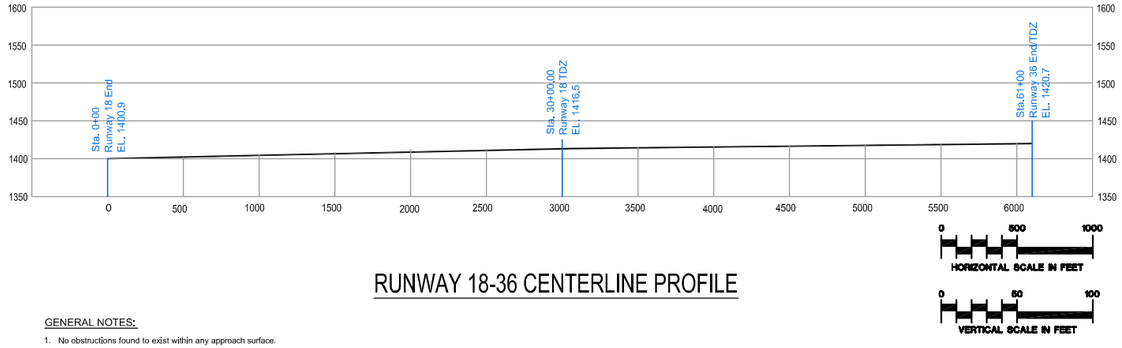
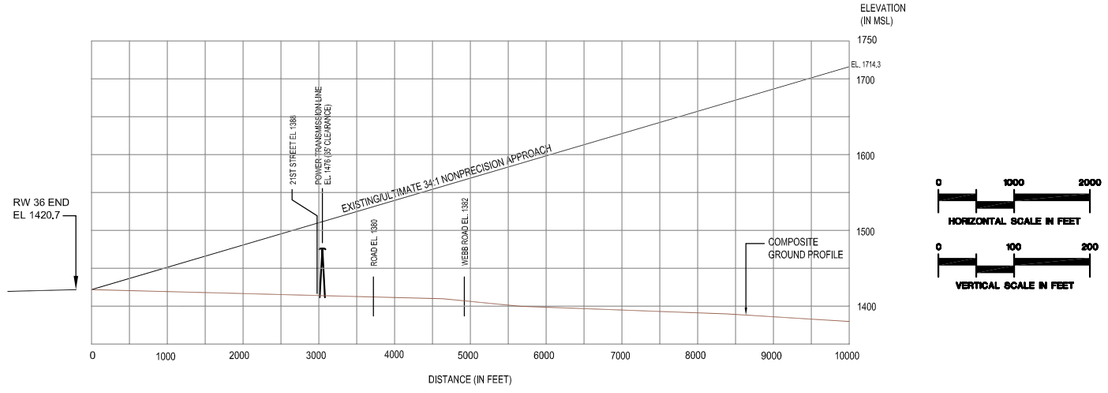


RUNWAY 18 APPROACH PROFILE



RUNWAY 18-36 CENTERLINE PROFILE



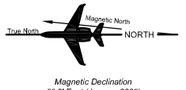
RUNWAY 36 APPROACH PROFILE

GENERAL NOTES:

1. No obstructions found to exist within any approach surface.
2. NGVD 29 runway end, touch down zone, high, and low point elevation datum, from ASIS Data Sheet Systems, http://avnwww.jccbi.gov/datasheet, converted to NAVD 88 usIng the National Geodetic Survey Progrem VERTCON, Version 2.10.
3. Obstruction elevations and locations from the Airport Obstruction Chart for Colonel James Jabara Airport, OC 6234, publlshed May 1989.
4. Features and objects were located usIng the followIng Kansas USGS quad maps, Andover, Greenwlch, Sedgwlck NE, Valley Center Whltewater, and Wichita East, publlshed by the Geological Survey, and photo revlsed In 1978, 1980, and 1982.
5. Obstruction locatlon and clearances are calculated from ultimate runway end elevations unless noted otherwise.
6. See the inner portion of the approach surface plan view detail for close-in obstructions, sheets 5 and 6.
7. All contour mappIng elevation data provlded by Sedgwlck County Geographic Information Servlces, (SCGIS).

RUNWAY 18-36 APPROACH SURFACE PENETRATION TABLE

Object Description	Distance From RW End	Offset From RW Centerline	Top Elevation	PT 77 App Penetration	Remediation
NONE FOUND					



Magnetic Declination
5° 2' East (January 2005)
Annual Rate of Change
6.97' West (January 2005)

No.	REVISIONS	DATE	BY	APP'D.

"THE PREPARATION OF THESE DOCUMENTS WAS FINANCED IN PART THROUGH A PLANNING GRANT FROM THE FEDERAL AVIATION ADMINISTRATION AS PROVIDED UNDER SECTION 505 OF THE AIRPORT AND AIRWAY IMPROVEMENT ACT OF 1982, AS AMENDED. THE CONTENTS DO NOT NECESSARILY REFLECT THE OFFICIAL VIEWS OR POLICY OF THE FAA. ACCEPTANCE OF THESE DOCUMENTS BY THE FAA DOES NOT IN ANY WAY CONSTITUTE A COMMITMENT ON THE PART OF THE UNITED STATES TO PARTICIPATE IN ANY DEVELOPMENT DEPICTED HEREIN, NOR DOES IT INDICATE THAT THE PROPOSED DEVELOPMENT IS ENVIRONMENTALLY ACCEPTABLE IN ACCORDANCE WITH APPROPRIATE PUBLIC LAWS."

COLONEL JAMES JABARA AIRPORT

AIRPORT AIRSPACE APPROACH PROFILES

Wichita, Kansas

PLANNED BY: Christopher M. Kuguniu
DETAILED BY: Diana L. Hopkins
APPROVED BY: Stephen C. Wagner

October 18, 2004

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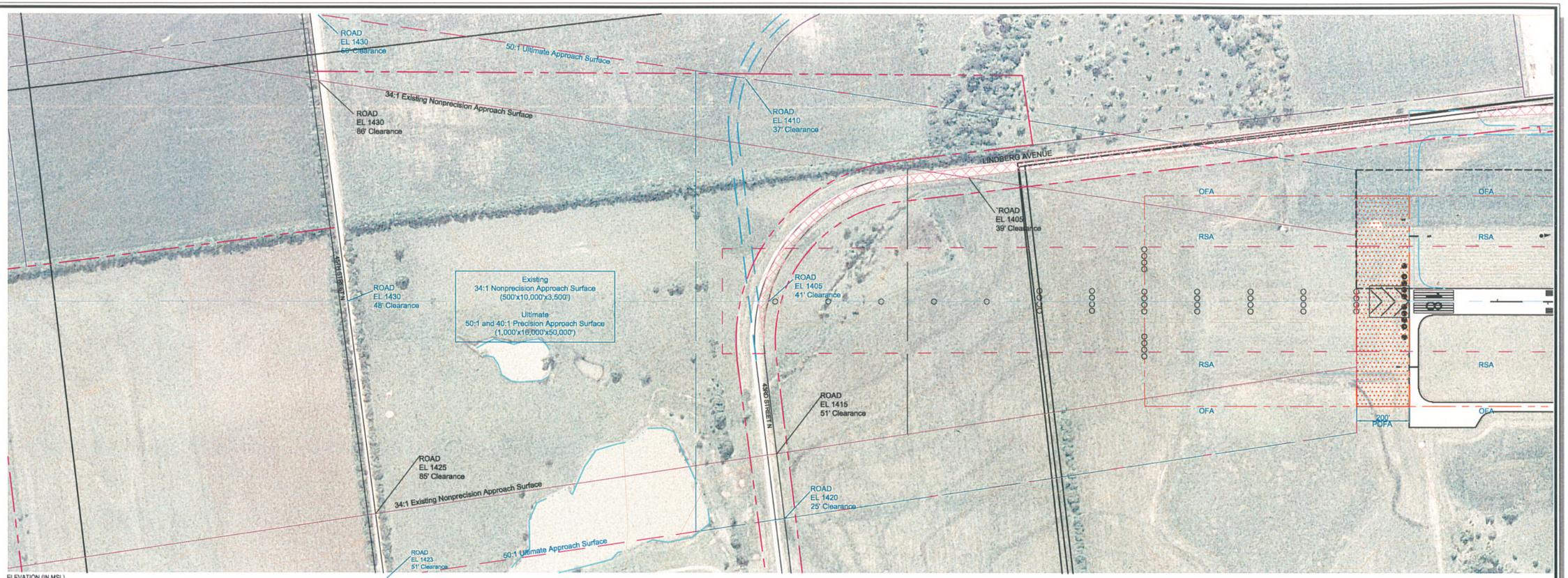
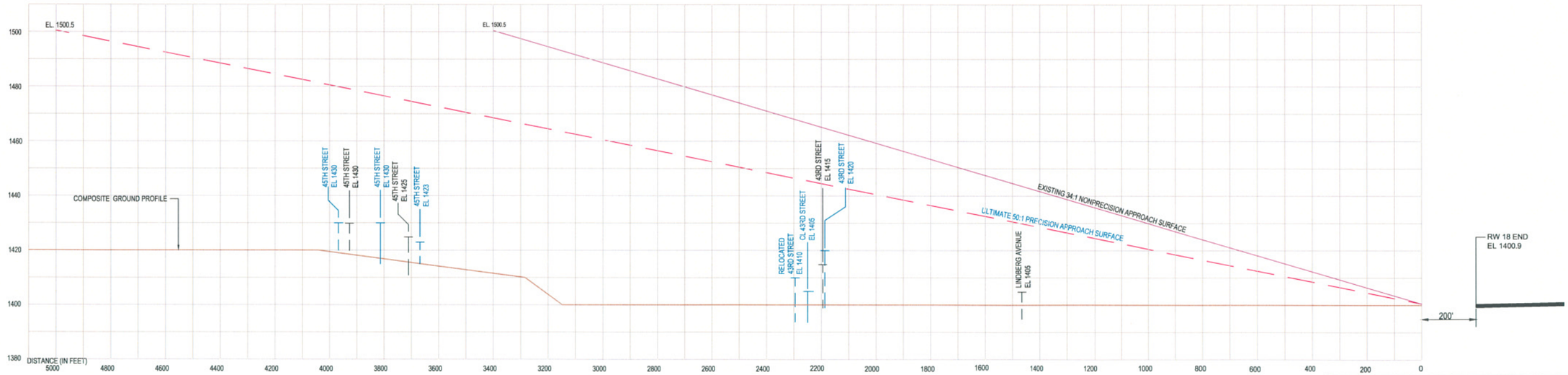


ELEVATION (IN MSL)



GENERAL NOTES:

1. No obstructions found within approach surfaces.
2. The reference datum used for horizontal coordinates is North American Datum 1983 - NAD 83.
3. NGVD 29 runway end, touch down zone, high, and low point elevation datum, from ASIS Data Sheet Systems, http://ewnwww.jccbi.gov/datasheet, converted to NAVD 88 using the National Geodetic Survey Program VERTCON, Version 2.10.
4. Features and objects were located using an aerial photograph, and the following Kansas USGS quad maps, Andover, Greenwich, Sedgwick NE, Valley Center Whitewater, and Wichita East, published by the Geological Survey, and photo revised in 1978, 1980, and 1982.
5. Traverse way locations and elevations derived from aerial photograph and USGS Maps and are depicted where the intersect the approach surface edges and extended runway centerline per AC 150/5300-13. Clearances are calculated from ultimate runway end elevations unless noted otherwise.
6. Road elevations were estimated from Sedgwick County contour mapping, provided by Sedgwick County Geographic Information Services,(SCGIS).
7. Road elevations include a safety clearance of 10' for dirt or private roads, 15' for noninterstate roads, 17' for interstate roads and 23' for railroad per Section 77.23, Part 77--Objects Affecting Navigable Airspace.

RUNWAY 18 APPROACH SURFACE PENETRATION TABLE

Object Description	Distance From RW End	Offset From RW Centerline	Top Elevation	PT 77 App Penetration	Remediation
NONE FOUND					

RUNWAY 18 PROFILE

0 200 400
HORIZONTAL SCALE IN FEET

0 20 20
VERTICAL SCALE IN FEET

Magnetic Declination
5° 2' East (January 2005)
Annual Rate of Change
6.97' West (January 2005)

No.	REVISIONS	DATE	BY	APP'D.

COLONEL JAMES JABARA AIRPORT

INNER PORTION OF RUNWAY 18 APPROACH SURFACE DRAWING

Wichita, Kansas

PLANNED BY: Christopher M. Huguenin
DETAILED BY: Dianna L. Hopkins
APPROVED BY: Stephen B. Wagner

October 18, 2004 SHEET 5 OF 10

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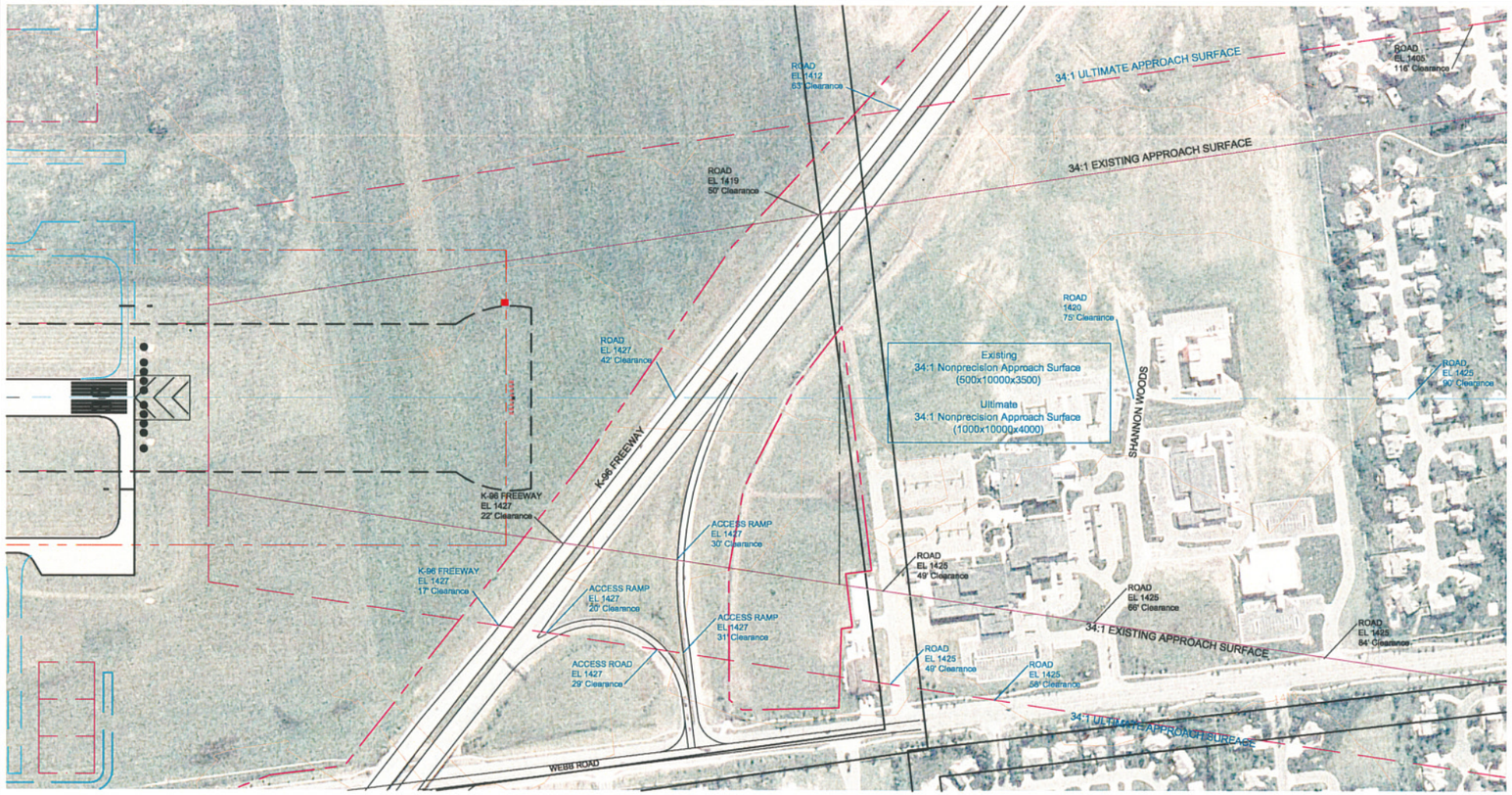

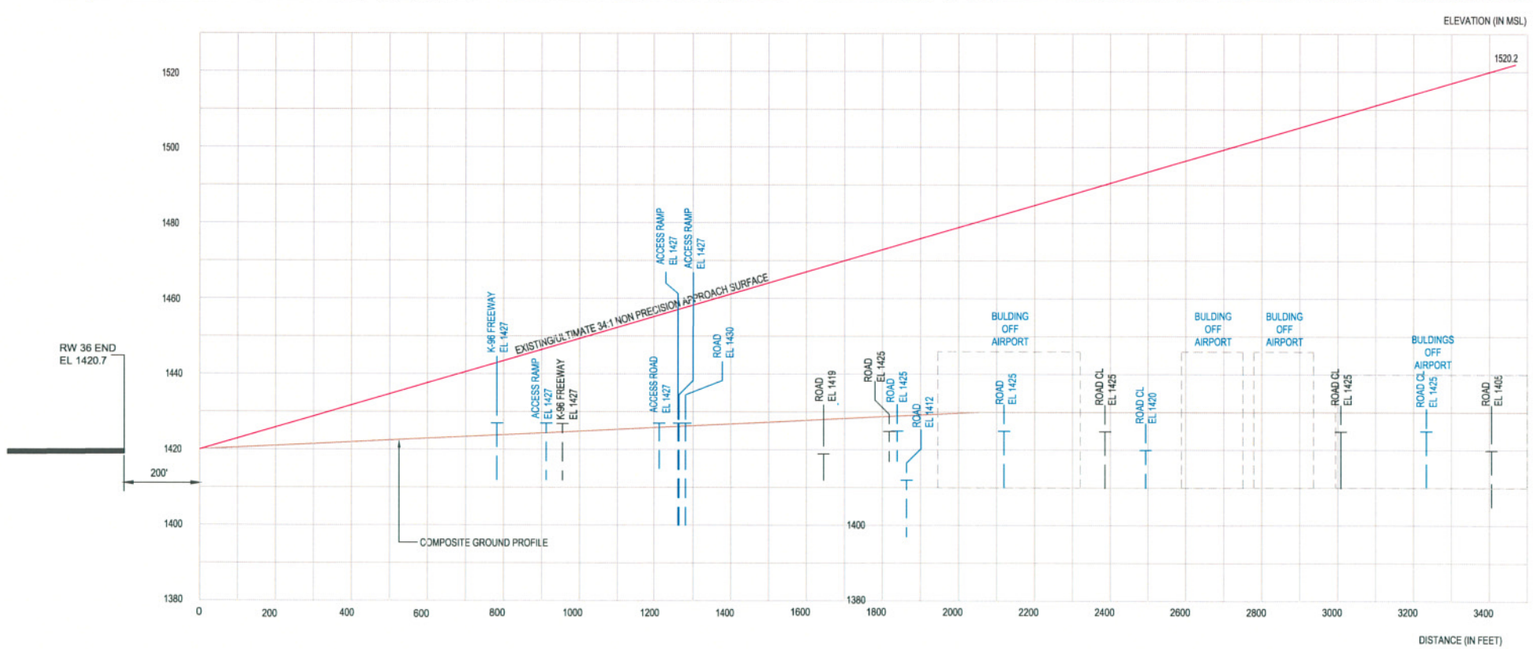

RUNWAY 36 PROFILE

RUNWAY 17L APPROACH SURFACE PENETRATION TABLE

Object Description	Distance From RW End	Offset From RW Centerline	Top Elevation	PT 77 App Penetration	Remediation
NONE FOUND					

GENERAL NOTES:

1. No obstructions found within approach surfaces.
2. The reference datum used for horizontal coordinates is North American Datum 1983 - NAD 83.
3. NGVD 29 runway end, touch down zone, high, and low point elevation datum, from ASIS Data Sheet Systems, http://avnwww.jccbi.gov/datasheet, converted to NAVD 88 using the National Geodetic Survey Program VERTCON, Version 2.10.
4. Features and objects were located using an aerial photograph, and the following Kansas USGS quad maps, Andover, Greenwich, Sedgwick NE, Valley Center Whitewater, and Wichita East, published by the Geological Survey, and photo revised in 1978, 1980, and 1982.
5. Traverse way locations and elevations derived from aerial photograph and USGS Maps and are depicted where the intersect the approach surface edges and extended runway centerline per AC 150/5300-13. Clearances are calculated from ultimate runway end elevations unless noted otherwise.
6. Road elevations were estimated from Sedgwick County contour mapping, provided by Sedgwick County Geographic Information Services, (SCGIS).
7. Road elevations include a safety clearance of 10' for dirt or private roads, 15' for noninterstate roads, 17' for interstate roads and 23' for railroad per Section 77.23 Part 77--Objects Affecting Navigable Airspace.

0 200 400
HORIZONTAL SCALE IN FEET

0 20 20
VERTICAL SCALE IN FEET

Magnetic Declination
5° 2' East (January 2005)
Annual Rate of Change
6.9' West (January 2005)

No.	REVISIONS	DATE	BY	APP'D.

"THE PREPARATION OF THESE DOCUMENTS WAS FINANCED IN PART THROUGH A PLANNING GRANT FROM THE FEDERAL AVIATION ADMINISTRATION AS PROVIDED UNDER SECTION 505 OF THE AIRPORT AND AIRWAY IMPROVEMENT ACT OF 1982, AS AMENDED. THE CONTENTS DO NOT NECESSARILY REFLECT THE OFFICIAL VIEWS OR POLICY OF THE FAA. ACCEPTANCE OF THESE DOCUMENTS BY THE FAA DOES NOT IN ANY WAY CONSTITUTE A COMMITMENT ON THE PART OF THE UNITED STATES TO PARTICIPATE IN ANY DEVELOPMENT DEPICTED HEREIN, NOR DOES IT INDICATE THAT THE PROPOSED DEVELOPMENT IS ENVIRONMENTALLY ACCEPTABLE IN ACCORDANCE WITH APPROPRIATE PUBLIC LAWS."

COLONEL JAMES JABARA AIRPORT

INNER PORTION OF RUNWAY 36 APPROACH SURFACE DRAWING

Wichita, Kansas

PLANNED BY: Christopher M. Huguenin
DETAILED BY: Diana L. Hopkins
APPROVED BY: Stephen S. Wagner
October 18, 2004
SHEET 6 OF 10

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Airport Consultants
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BUILDINGS/FACILITIES

EXISTING	ULTIMATE	DESCRIPTION
1		FORMER ADMINISTRATION BUILDING
4		COMMUNICATIONS BUILDING
7		AIRPORT MAINTENANCE
8		AVIATION FUEL FACILITY
9		AVIATION FUEL STORAGE FACILITY (UNDERG.)
10	10	T-HANGAR (14 UNITS)
11	11	T-HANGAR (14 UNITS)
12	12	T-HANGAR (14 UNITS)
13	13	T-HANGAR (14 UNITS)
17		CONVENTIONAL HANGAR
	18	T-HANGAR (14 UNITS)
	19	T-HANGAR (14 UNITS)
	20	T-HANGAR (14 UNITS)
	21	T-HANGAR (14 UNITS)

LEGEND

EXISTING	ULTIMATE	DESCRIPTION
N/A		ABANDONED PAVEMENT
		AIRPORT PROPERTY LINE
N/A		AIRPORT REFERENCE POINT (ARP)
	N/A	AIRPORT ROTATING BEACON
N/A		ABANDONED BUILDING
		BUILDING
BRL	BRL	BUILDING RESTRICTION LINE (BRL)
		PAVEMENT
N/A		OBJECT FREE AREA (OFA)
N/A		OBSTACLE FREE ZONE (OFZ)
N/A		RUNWAY SAFETY AREA (RSA)
N/A		PARCEL BOUNDARIES
		HOLDING POSITION MARKING
	N/A	CONTOURS

6,499' x 100' RUNWAY
184.8º TRUE BEARING
1410
OFZ
RSA
OFA
35' TYP
TAXIWAY B
250' TYP
35'
TAXIWAY C
ULTIMATE ARP
TAXIWAY A
TAXIWAY D
500'
25'
4 UNIT FULL NESTED T-HANGAR EXPANSION
BRL-35'
TAXIWAY B2
10
14 UNIT FULL NESTED T-HANGAR
TAXIWAY B4
11
14 UNIT FULL NESTED T-HANGAR
330' TYP
50' TYP
TAXIWAY B6
TAXIWAY B
TAXIWAY B3
12
TAXIWAY B5
13
TAXIWAY B7
TAXIWAY B1
TAXIWAY C1
14 UNIT FULL NESTED T-HANGAR
18
TAXIWAY C2
14 UNIT FULL NESTED T-HANGAR
19
TAXIWAY C3
14 UNIT FULL NESTED T-HANGAR
20
35' TYP
21
TAXIWAY B9
TAXIWAY C4
ULTIMATE APRON
1065'
TAXIWAY G
BRL-35'
CORPORATE/EXECUTIVE HANGAR AREA
17
8
4
JABARA ROAD
9
FUTURE AIRPORT DEVELOPMENT
CORPORATE/EXECUTIVE HANGAR AREA
35TH STREET
1
7
R.O.W.
WEBB ROAD
37TH STREET
Magnetic North
True North
NORTH
Magnetic Declination
5° 2' East (January 2005)
Annual Rate of Change
6.97' West (January 2005)
0 100 200
SCALE IN FEET

No.	REVISIONS	DATE	BY	APP'D.

*THE PREPARATION OF THESE DOCUMENTS WAS FINANCED IN PART THROUGH A PLANNING GRANT FROM THE FEDERAL AVIATION ADMINISTRATION AS PROVIDED UNDER SECTION 505 OF THE AIRPORT AND AIRWAY IMPROVEMENT ACT OF 1982, AS AMENDED. THE CONTENTS DO NOT NECESSARILY REFLECT THE OFFICIAL VIEWS OR POLICY OF THE FAA. ACCEPTANCE OF THESE DOCUMENTS BY THE FAA DOES NOT IN ANY WAY CONSTITUTE A COMMITMENT ON THE PART OF THE UNITED STATES TO PARTICIPATE IN ANY DEVELOPMENT DEPICTED HEREIN, NOR DOES IT INDICATE THAT THE PROPOSED DEVELOPMENT IS ENVIRONMENTALLY ACCEPTABLE IN ACCORDANCE WITH APPROPRIATE PUBLIC LAWS.

COLONEL JAMES JABARA AIRPORT

TERMINAL AREA DRAWING NORTH

Wichita, Kansas

PLANNED BY: Christopher M. Huguenin
DETAILED BY: Diana L. Hopkins
APPROVED BY: Stephen C. Wagner
October 18, 2004
SHEET 7 OF 10

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Coffman Associates R:\CAD\Hopkins\[MP\AMO\ALP Set\AMO ALP.dwg Printed Date: 2-15-05 12:09:58 PM DHopkins

BUILDINGS/FACILITIES

EXISTING	ULTIMATE	DESCRIPTION
2		TERMINAL BUILDING/CONVENTIONAL HANGAR
3		CONVENTIONAL HANGAR
4		COMMUNICATIONS BUILDING
5		CONVENTIONAL HANGAR
6		CONVENTIONAL HANGAR
14		CONVENTIONAL HANGAR
15		CONVENTIONAL HANGAR
16		CONVENTIONAL HANGAR
22		TENANT FUEL FARM
23		OFFICE AND VEHICLE GARAGE

LEGEND

EXISTING	ULTIMATE	DESCRIPTION
N/A		ABANDONED PAVEMENT
		AIRPORT PROPERTY LINE
N/A		AIRPORT REFERENCE POINT (ARP)
N/A	N/A	AIRPORT ROTATING BEACON
N/A		ABANDONED BUILDING
		BUILDING
BRL	BRL	BUILDING RESTRICTION LINE (BRL)
		PAVEMENT
N/A		OBJECT FREE AREA (OFA)
N/A		OBSTACLE FREE ZONE (OFZ)
N/A		RUNWAY SAFETY AREA (RSA)
N/A		PARCEL BOUNDARIES
		HOLDING POSITION MARKING
	N/A	SEGMENTED CIRCLE/WIND INDICATOR
1420	N/A	CONTOURS

TAXIWAY N
TAXIWAY E
35'
400'
Localizer Critical Area
Existing VASI
6,100' x 100' RUNWAY
184.86° TRUE BEARING
OFZ
RSA
500'
TAXIWAY E
35'
Existing VASI
Localizer Critical Area
Ultimate PAPI
OFA
TAXIWAY A
35'
100'
250'
1340'
35'
1420
35'
TAXIWAY F
EXISTING AIRCRAFT PARKING APRON
EXISTING COMPASS ROSE
BUILDING RESTRICTION LINE 35'
AUTO PARKING
2
3
3
3
3
3
3
Helipad
H
5
6
23
22
14
15
16
Corporate/Executive Hangar Area
Corporate/Executive Hangar Area
TAXIWAY L
35'
Corporate/Executive Hangar Area
Corporate/Executive Hangar Area
TAXIWAY M
Corporate/Executive Hangar Area
BUILDING RESTRICTION LINE 35'
Future Jabara Road
JABARRA ROAD
COLONEL JAMES JABARA MEMORIAL
R.O.W.
WEBB ROAD

Magnetic North
True North
NORTH

Magnetic Declination
5° 2' East (January 2005)
Annual Rate of Change
6.9' West (January 2005)

0 100 200
SCALE IN FEET

No.	REVISIONS	DATE	BY	APP'D.

"THE PREPARATION OF THESE DOCUMENTS WAS FINANCED IN PART THROUGH A PLANNING GRANT FROM THE FEDERAL AVIATION ADMINISTRATION AS PROVIDED UNDER SECTION 505 OF THE AIRPORT AND AIRWAY IMPROVEMENT ACT OF 1982, AS AMENDED. THE CONTENTS DO NOT NECESSARILY REFLECT THE OFFICIAL VIEWS OR POLICY OF THE FAA. ACCEPTANCE OF THESE DOCUMENTS BY THE FAA DOES NOT IN ANY WAY CONSTITUTE A COMMITMENT ON THE PART OF THE UNITED STATES TO PARTICIPATE IN ANY DEVELOPMENT DEPICTED HEREIN, NOR DOES IT INDICATE THAT THE PROPOSED DEVELOPMENT IS ENVIRONMENTALLY ACCEPTABLE IN ACCORDANCE WITH APPROPRIATE PUBLIC LAWS."

COLONEL JAMES JABARA AIRPORT

TERMINAL AREA DRAWING SOUTH

Wichita, Kansas

PLANNED BY: Christopher M. Huguenin
DETAILED BY: Diana L. Hopkins
APPROVED BY: Stephen C. Wagner

October 18, 2004 | SHEET 8 OF 10

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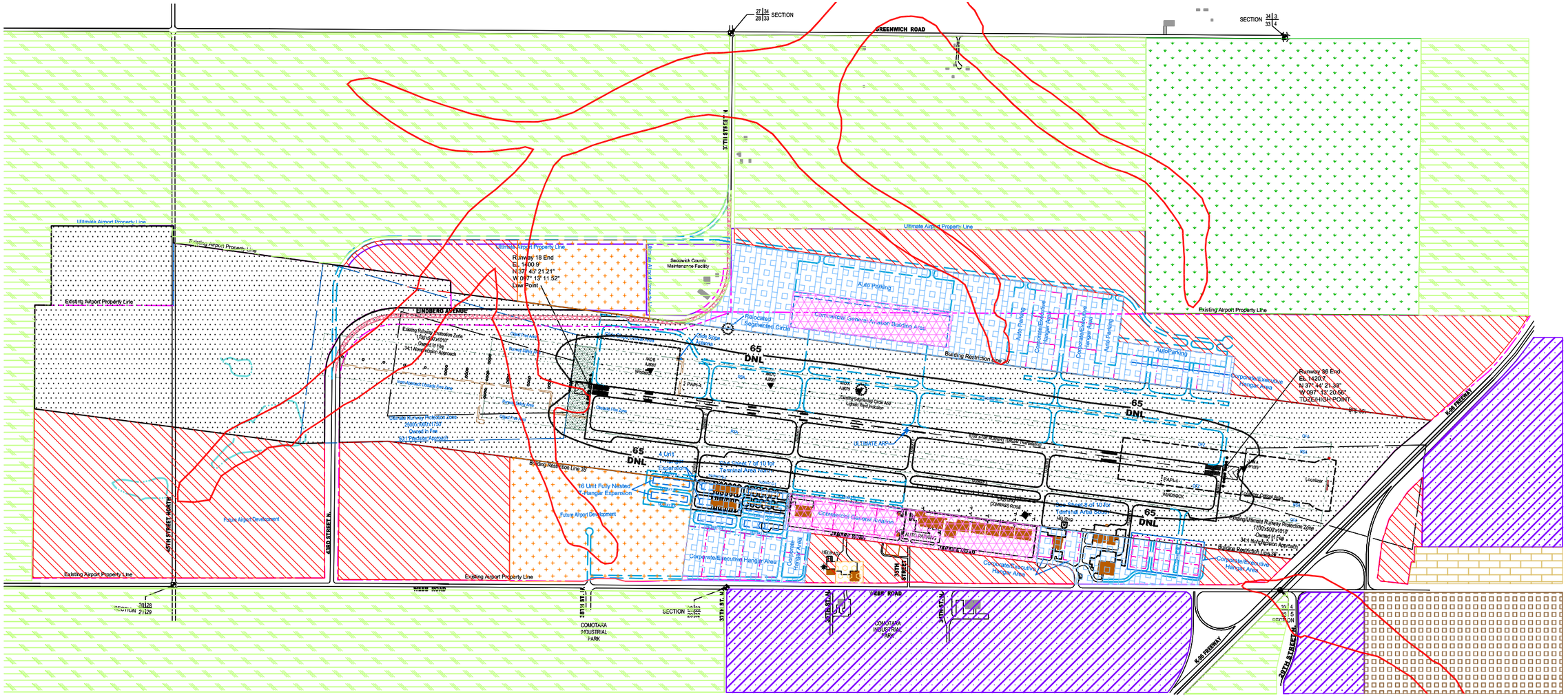

Off-Airport Land Use Legend

- Commercial Off Airport
- Industrial/Transportation/Utility/Communication
- Public/Institutional
- Recreational
- Residential

On-Airport Land Use Legend

- Airfield Operations
- Aviation Related - Airfield Access
- Aviation Related - No Airfield Access
- Commercial General Aviation
- General Aviation
- Airport Support

Areas of 100-Year Flood Plain

Magnetic Declination
5° 2' East (January 2005)
Annual Rate of Change
6.97' West (January 2005)

SCALE IN FEET: 0 500 1000

GENERAL NOTES:

1. Flood Plains Identified and located using FEMA Flood Insurance Rate Map, Community-Panel Number 200328 0015 B, Effective Date May 15, 1986, and two panels each numbered 200321 0150 A, both with the Effective Date of June 3, 1986.

No.	REVISIONS	DATE	BY	APP'D.

"THE PREPARATION OF THESE DOCUMENTS WAS FINANCED IN PART THROUGH A PLANNING GRANT FROM THE FEDERAL AVIATION ADMINISTRATION AS PROVIDED UNDER SECTION 505 OF THE AIRPORT AND AIRWAY IMPROVEMENT ACT OF 1982, AS AMENDED. THE CONTENTS DO NOT NECESSARILY REFLECT THE OFFICIAL VIEWS OR POLICY OF THE FAA. ACCEPTANCE OF THESE DOCUMENTS BY THE FAA DOES NOT IN ANY WAY CONSTITUTE A COMMITMENT ON THE PART OF THE UNITED STATES TO PARTICIPATE IN ANY DEVELOPMENT DEPICTED HEREIN, NOR DOES IT INDICATE THAT THE PROPOSED DEVELOPMENT IS ENVIRONMENTALLY ACCEPTABLE IN ACCORDANCE WITH APPROPRIATE PUBLIC LAWS."

COLONEL JAMES JABARA AIRPORT

LAND USE DRAWING

Wichita, Kansas

PLANNED BY: Christopher M. Huguenin
DETAILED BY: Diana L. Hopkins
APPROVED BY: Stephen C. Wagner

October 18, 2004 | SHEET 9 OF 10

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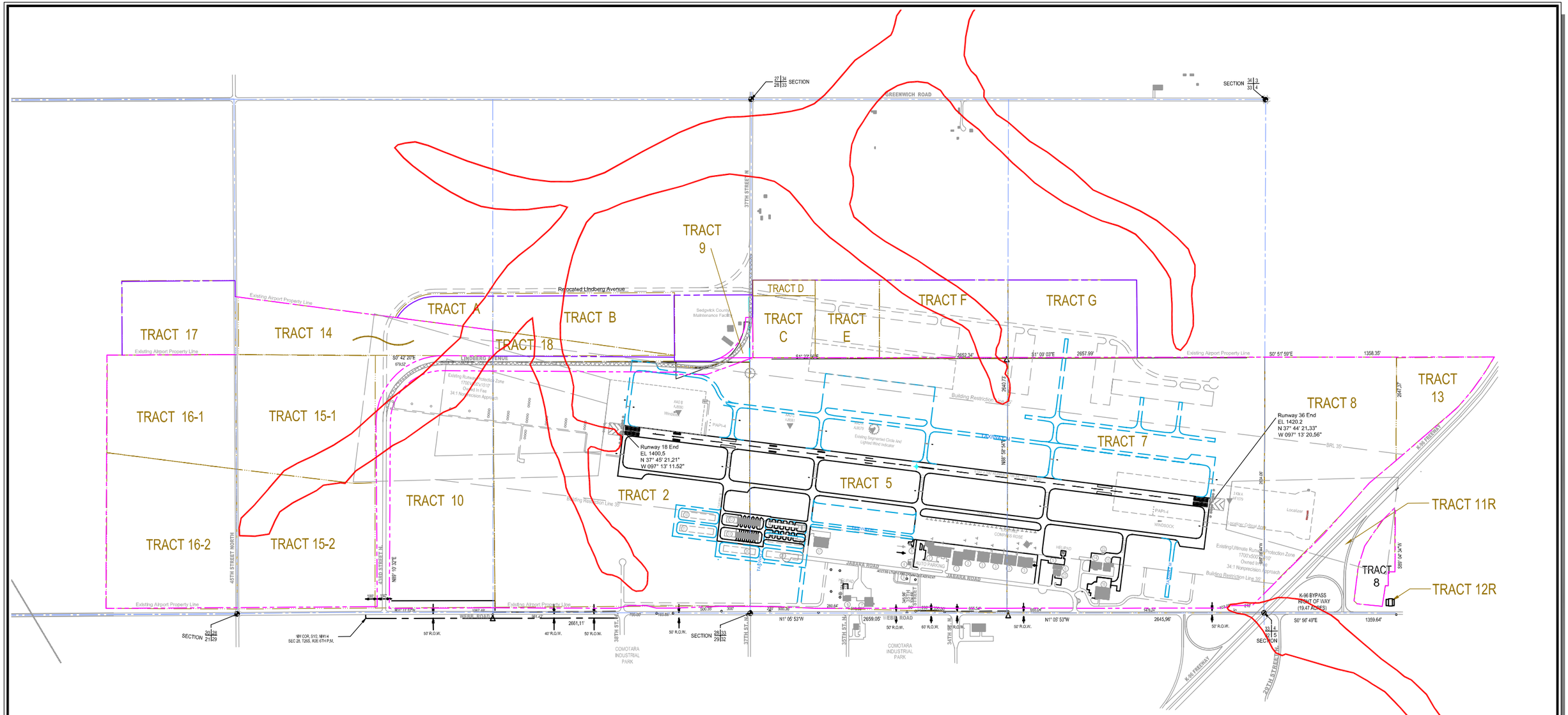

EXISTING PROPERTY DATA TABLE				
TRACT NO.	PROPERTY INTEREST	ACREAGE	DATE OF ACQUISITION	PROJECT NO.
2	FEE SIMPLE	146.11	8-12-1980	ADAP 5-20-0089-01
5	FEE SIMPLE	156.91	8-12-1980	ADAP 5-20-0089-01
7	FEE SIMPLE	155.05	8-12-1980	ADAP 5-20-0089-01
8	FEE SIMPLE	80.21	8-12-1980	ADAP 5-20-0089-01
9	FEE SIMPLE	0.86	8-12-1980	ADAP 5-20-0089-01
10	FEE SIMPLE	73.04	4-1991	AIP 3-20-0089-06 AIP 3-20-0089-09
11R	K-96 R.O.W.	19.47		
12R	FIRE STATION	0.81	SOLD TO THE CITY OF WICHITA	
13	FEE SIMPLE	13.40	8-1997	AIRPORT REVENUES
14	FEE SIMPLE	26.568	5-2003	AIP 3-20-0089-13
15-1	FEE SIMPLE	40.810	11-24-03	AIP FUTURE
15-2	FEE SIMPLE	43.490	11-24-03	AIRPORT REVENUES
16-1	FEE SIMPLE	30.538	12-15-03	AIP FUTURE
16-2	FEE SIMPLE	47.600	12-15-03	AIRPORT REVENUES
17	FEE SIMPLE	20.14	PENDING	AIP FUTURE
18	FEE SIMPLE	7.449	PENDING	AIP FUTURE

FUTURE PROPERTY DATA TABLE			
TRACT NO.	FUTURE PROPERTY INTEREST	ACREAGE	OWNER
A	FEE SIMPLE	11.47±	WELLS
B	FEE SIMPLE	33.30±	GREENWICH, LLC
C	FEE SIMPLE	9.41±	MURFIN
D	FEE SIMPLE	2.36±	MURFIN
E	FEE SIMPLE	12.30±	SIZZLING DOG, INC.
F	FEE SIMPLE	24.70±	T. & M. TRIMMELL
G	FEE SIMPLE	24.70±	R. & T. TRIMMELL

LEGEND

- EXISTING PROPERTY LINE
- ULTIMATE PROPERTY LINE
- FUTURE TRACT LINE
- UTILITY EASEMENT
- SECTION LINE
- AREA OF 100-YEAR FLOOD PLAIN*

* FEMA Flood Insurance Rate Maps, Community Panel Numbers 200321 0150A dated June 6, 1986, and 200328 0015B dated May 15, 1966

True North — Magnetic North — NORTH

Magnetic Declination
5° 2' East (January 2005)
Annual Rate of Change
6.97' West (January 2005)

0 500 1000
SCALE IN FEET

No.	REVISIONS	DATE	BY	APP'D.

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COLONEL JAMES JABARA AIRPORT

AIRPORT PROPERTY MAP

Wichita, Kansas

PLANNED BY: Chris M. Huguenin
DETAILED BY: Diana L. Hopkins
APPROVED BY: Steve C. Wagner
October 18, 2004
SHEET 10 OF 10

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