

HERINGTON REGIONAL AIRPORT

AIRPORT MASTER PLAN UPDATE

FINAL REPORT

DECEMBER 2006

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HERINGTON, KANSAS

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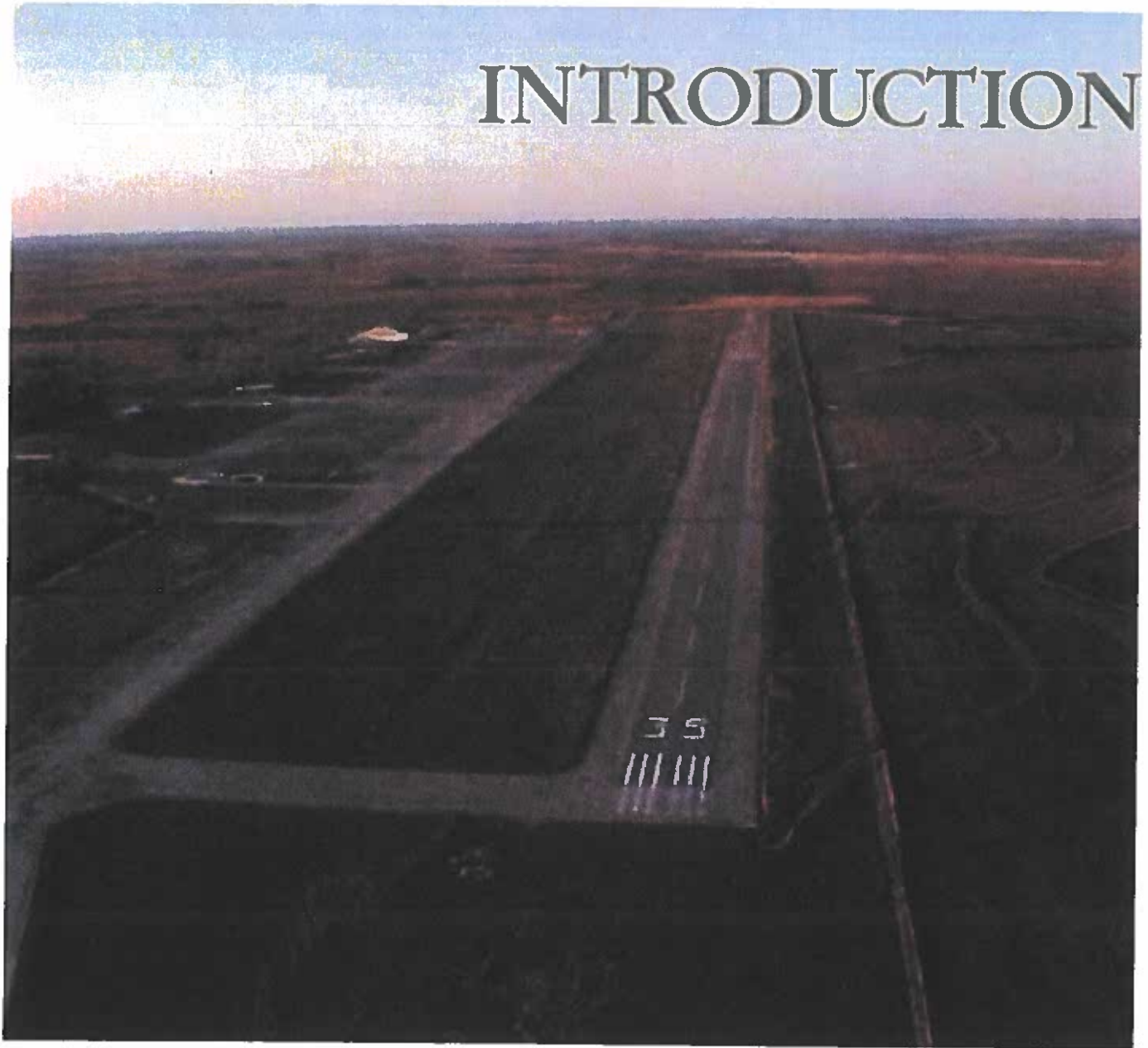
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CHAPTER ONE

INTRODUCTION



*HERINGTON REGIONAL AIRPORT
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1

INTRODUCTION

AIRPORT PLANNING STUDY PROGRAM

AIRPORT STUDY PURPOSE

The City of Herington, Kansas (Airport Sponsor) has initiated this Airport Master Plan to assess the future role of the Herington Regional Airport, and to provide direction and guidance regarding future airport development priorities. The preparation of the Airport Master Plan is evidence that the City recognizes the value of aviation in the overall concept of community and transportation planning.

STUDY GOALS

The goal of this Master Plan is to identify improvement priorities in accordance with Federal Aviation Administration (FAA) policy standards and consistent with current design standards and airspace criteria. An approved Airport Master Plan enables the City of Herington to apply for eligible grants as identified by the updated Airport Layout Plan (ALP) drawings.

STUDY OBJECTIVES

The Airport Master Planning program provides an objective look at future airport needs based on a comprehensive review of design considerations. In addition, the plan will answer several important questions about the role and function of the Herington Regional Airport, including:

- *What is the airport's existing and future service role?*
- *What are the preferred long-term airfield, terminal area and access development strategies?*
- *What are the existing airport facilities, equipment and operating conditions?*
- *Forecast levels of aeronautical activity from current and potential users?*
- *Immediate and long-term airport facility requirements, and design alternatives?*
- *Preferred long-term airfield, terminal area and access development strategy?*
- *Estimated project costs associated with the development program?*
- *How will additional airport development affect the surrounding environment?*



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AIRPORT STUDY PHASES AND DOCUMENTATION

Table 1.1 identifies each element and task included in the Airport Master Plan Update. The study is being conducted in six stages to allow participants the opportunity for input, for the formal interim review and discussion of findings, and coordination regarding development priorities.

Table 1.1 Description of Airport Planning Program Herington Regional Airport	
ELEMENT 1 – INVENTORY <ul style="list-style-type: none"> ➤ Airport “Kick-off” Meeting #1 ➔ Assessment of Airport Facility Conditions ➔ Interview Business Firms/Major Users/Pilots ➔ Review Existing Airport Data/ Plans/Documentation ➔ Determine Existing Airport Activity Levels ➔ Establish Airport Service Area ➔ Identify Existing Critical Aircraft ➔ Conduct Wind/Meteorological Analysis ➔ Review Socio-Economic Condition for the Region 	ELEMENT 2 – DEMAND FORECASTS <ul style="list-style-type: none"> ➔ Forecast Future Based Aircraft and Operational Demand ➔ Determine Future Actual Instrument Operations ➔ Identify Activity by FAA Airport Design Categories ➔ Identify Fleet Mix/ Future Critical Aircraft 📖 City/FAA Working Paper #1 (60 Days) 🔊 PAC Meeting #2
ELEMENT 3 – FACILITY REQUIREMENTS <ul style="list-style-type: none"> ➔ Facility Requirement Standards ➔ Identification and Phasing of Needed Facilities ➔ Determine Capabilities of Existing Airport Facility ➔ Propose Airfield and Terminal Area Alternatives ➔ Establish Criteria for Alternative Analysis ➔ Prepare Airport Layout Design Concept Drawing 📖 Working Paper #2 (60 Days) 🔊 Public/PAC Meeting #3 	ELEMENT 4 – ENVIRONMENTAL REVIEW <ul style="list-style-type: none"> ➔ Environmental Coordination ➔ Affected Environmental Analysis ➔ Summary of Permits/Certifications 📖 City/FAA Working Paper #3 (60 Days) 🔊 PAC Meeting #4
ELEMENT 5 – AIRPORT LAYOUT PLANS <ul style="list-style-type: none"> ➔ Airport Layout Drawing (Change #7) ➔ Airport Airspace Drawing ➔ Inner Approach Surfaces ➔ Terminal Area Drawing ➔ Airport Land Use Plan ➔ Airport Property Map (Exhibit A) ➔ Submit for State / FAA Review (60 Days) 	ELEMENT 6 – CAPITAL IMPROVEMENT PLAN <ul style="list-style-type: none"> ➔ Project Schedule/Phasing ➔ Project Cost Estimates ➔ Financial Plan 📖 City/FAA Working Paper #4 (60 Days) 🔊 PAC Meeting #5
ELEMENT 7 – FINAL REVIEW/ DELIVERABLES <ul style="list-style-type: none"> ➔ Final Draft Report/Drawings ➔ City and FAA Final Review ➔ Deliver Final Report Copies and Drawing Documents 📖 Transmit Final Draft Report/Plans (30 Days) 🔊 PAC Meeting #6 – Presentation of Final Study 	
<ul style="list-style-type: none"> ➔ Study Task (Note: total planning project time frame is exclusive of City /FAA review). 📖 Deliver Working Paper to City and FAA for review and coordination (completion days). 🔊 Public meeting with planning advisory committee and/or public. 	

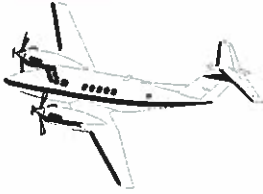
Source: BWR, Scope of Services Planning Agreement – July 2004.

CHAPTER TWO

AIRPORT INVENTORY



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2

AIRPORT INVENTORY

FACILITY INVENTORY

The inventory is a detailed data collection process to obtain background information regarding the airport and community in an effort to provide a snapshot of existing and historic aviation use at the Herington Regional Airport. This comprehensive inventory is used to develop the basis for airport recommendations throughout the master plan study and includes the following major tasks:

- ➔ An on-site inspection (conducted by the Consultant in June 2004) and itemized inventory of airport facilities, equipment, and services to assess existing physical conditions, and the identification of both on- and off-airport land uses including the heights of objects for airspace purposes;
- ➔ Meetings with City officials, on airport businesses, Airport Manager, and based aircraft owners regarding recent airport trends, existing and future airport operations, services and needs;
- ➔ Research airport activity including the Federal Aviation Administration (FAA) airfield inspection records (FAA 5010), a review of historical airport information and files, previous airport layout plans, maps, charts, photographs of airport facilities, a records search and review of local airport-related ordinances, policies, operating standards and lease agreements, plus any other aeronautical background documentation;
- ➔ Collection of surrounding airport activity to determine the airport service area characteristics;
- ➔ Obtain any planned on- and off-airport land use and development including industrial/commercial and residential development;
- ➔ Collection of regional climatic information, including predominate winds, cloud and visibility conditions, and precipitation levels;
- ➔ Distribution of an Aircraft Owner or Business Survey to local-area pilots, aircraft owners and businesses to obtain general attitudes and identify facility needs, including follow-up phone interviews with key users and patrons.



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AIRPORT HISTORY

The Herington Army Air Field (AAF) was constructed in 1942 to serve as an important staging area for overseas deployments of bombers and airmen. During its peak operation, Herington AAF had over 3,000 individuals assigned to the base supporting the war effort. The aircraft that flew here included the B-29s, B-17s and B-24s. In 1945, the Herington AAF was deactivated and in 1946 became surplus. It was eventually turned over to the City of Herington in 1948 and became the Herington Municipal Airport. In 1979, the site was transferred to the Tri-County Public Airport Authority who controlled the airfield until 1998 when ownership was transferred back to the City of Herington. The Airport is currently the site for several large industries and agricultural operations in addition to serving as the Herington Regional Airport.



AIRPORT SERVICES

Airport and aircraft provisions at the Herington Regional Airport include basic support services for most single and twin-engine, piston aircraft. The Airport is open continuously for public use but unattended unless special arrangements are made with the airport manager. The City of Herington provides the following services at the Airport:



- ◆ Aviation fuel (100LL) – cash only
- ◆ Aircraft parking apron / tie-downs
- ◆ Pilot / passenger waiting area
- ◆ Flight planning area
- ◆ Telephone



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AIRFIELD CONFIGURATION AND FACILITIES

Exhibit 2.1 shows the existing airport and facilities at the Herington Regional Airport. Table 2.2 describes the major airfield facilities and equipment along with a corresponding assessment of physical conditions based on the airport site inspection (June, 2004).

EXHIBIT 2.1: AIRPORT FACILITY MAP



Source: Terra Server, Internet Download (2004)



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Existing Taxiway System

The taxiway system serving Runway 17-35 consists of a single mid-field connector taxiway that was improved, along with the runway in 1998, with a 2-inch asphalt overlay on the original concrete surface. The length of the existing connector taxiway, between the runway and parking apron, is approximately 975 feet in length and 35 feet wide. The asphalt overlay is in fair to poor condition with a failure of the original concrete pavement underneath but has been maintained with crack sealing over the improved areas.

Airfield Lighting/Signage

Medium-intensity runway lighting (MIRL) is used along the existing usable runway and is in poor condition. Furthermore, it is in non-standard positioning along the original runway width and should be relocated to the width of the existing, usable paved runway width. The taxiway has medium-intensity taxiway lighting (MITL) along the connector between the original runway and taxiway (450 feet). The MITL's are also in poor condition and are positioned in a non-standard fashion along the taxiway at a 35-foot width instead of the existing taxiway width of 25-feet. The runway and taxiway does not currently employ the use of signage for aeronautical purposes.

Other Airfield Items

The airport beacon is located on top of the concrete water tower, located south of the existing aircraft parking area on the west side of the airport. The beacon was installed in 1978 and is in poor condition due to aging and deterioration. There is a need to relocate the airport beacon to a site that is more centrally located near the terminal area for airfield identification.

A large gray tetrahedron is located at the south end of the original aircraft parking apron and is used to identify wind direction to landing and departing aircraft. The tetrahedron is in fair condition but its color is not highly visible in the airport environment for landing aircraft.

The airport electrical vault is located south of the aircraft parking apron, inside a wooden enclosure along the old south connector taxiway. The electrical vault is in poor condition.





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TERMINAL AREA/LANDSIDE FACILITIES

The airport terminal area is located on the northeast side of the airfield. The following are major terminal area/landside facilities and are discussed below:

- ◆ Pilot lounge/flight planning area
- ◆ Aircraft tie-downs
- ◆ Aircraft fueling area
- ◆ Telephone
- ◆ 24-hour, public restrooms

Pilot Lounge

The pilot lounge, constructed in 1995, is located on the west side of the aircraft parking apron in the terminal area. The pilot lounge is accessible 24-hours and consists of a pilot and passenger waiting area, flight planning desk, restrooms, and a public telephone. The pilot lounge is in good condition.

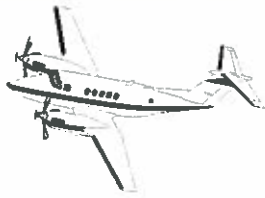


Aircraft Hangars

There are two large metal and concrete maintenance hangars remaining from the Herington Army Air Field. These hangars were constructed during the 1940's and used as aircraft maintenance hangars but are currently used by on-airport businesses for production and storage facilities and are in fair condition. The other original WWII era hangars have either been razed or have burned down since they were built.



There are a total of six aircraft storage hangars at the Herington Regional Airport - two 3-unit T-hangars and four, single-unit T-hangars. The 3-unit T-hangar (Hangar #2) located on the aircraft parking apron was converted from a maintenance building to a T-hangar for aircraft and is in fair condition. The second 3-unit T-hangar (Hangar #3) is located in the grass on the west side of the aircraft parking apron, behind the pilot lounge. This T-hangar is in fair condition however the access requires that aircraft taxi across a large, maintained grassy area. The remaining four, single-unit T-hangars are separated from each other and located south of the main airport terminal area, on a "finger" taxiway just west of the original parking apron. These separate T-hangars are privately owned and house only one aircraft each and are in fair condition. It should be noted that one 12-unit T-hangar was blown down by a tornado in 1995 and has not been replaced.



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Table 2.3 lists the existing terminal area (landside) facilities at the Herington Regional Airport.

Table 2.3 Airport Terminal Area Facilities Herington Regional Airport				
Item	Physical Characteristics			Dimension/Size
Apron	Aircraft parking and tie-downs (asphalt overlay on concrete)			2,621 S.Y.
Aviation Fuel	100 LL, self-contained fuel tank and pump			1,000 Gallon
Auto Parking	Unmarked parking area behind the Airport Office			1,277 S.Y.
Building Number	Airport Buildings	Structure Condition	Tenant(s)	Dimension/Size (S.F.)
1	Large Hangar	Fair	U.S. Stone (Ground Lease)	(188' x 230') 43,240 S.F.
4	Large Hangar	Fair	Pyrodex (Ground Lease)	(125' x 210') 26,250 S.F.
5	Airport Office	Good	City of Herington	(24' x 18') 432 S.F.
6	Maintenance Building	Good	City of Herington	(100' x 50') 5,000 S.F.
Hangar Number	Hangar Style	Structure Condition	Aircraft Storage Spaces	Total Hangar Dimension/Area (S.F.)
2	T-Hangar	Fair	3	(35' x 100') 3,500 S.F.
3	T-Hangar	Fair	3	(40' x 100') 4,000 S.F.
7	T-Hangar	Fair	1	(45' x 18') 810 S.F.
8	T-Hangar	Fair	1	(45' x 18') 810 S.F.
9	T-Hangar	Fair	1	(45' x 18') 810 S.F.
10	T-Hangar	Fair	1	(45' x 18') 810 S.F.
Total			10 Aircraft	10,740 S.F.

Note: The large hangars are leased to businesses located on the airport and do not house aircraft.

Source: BWR Airport Site Inspection – June 2004.



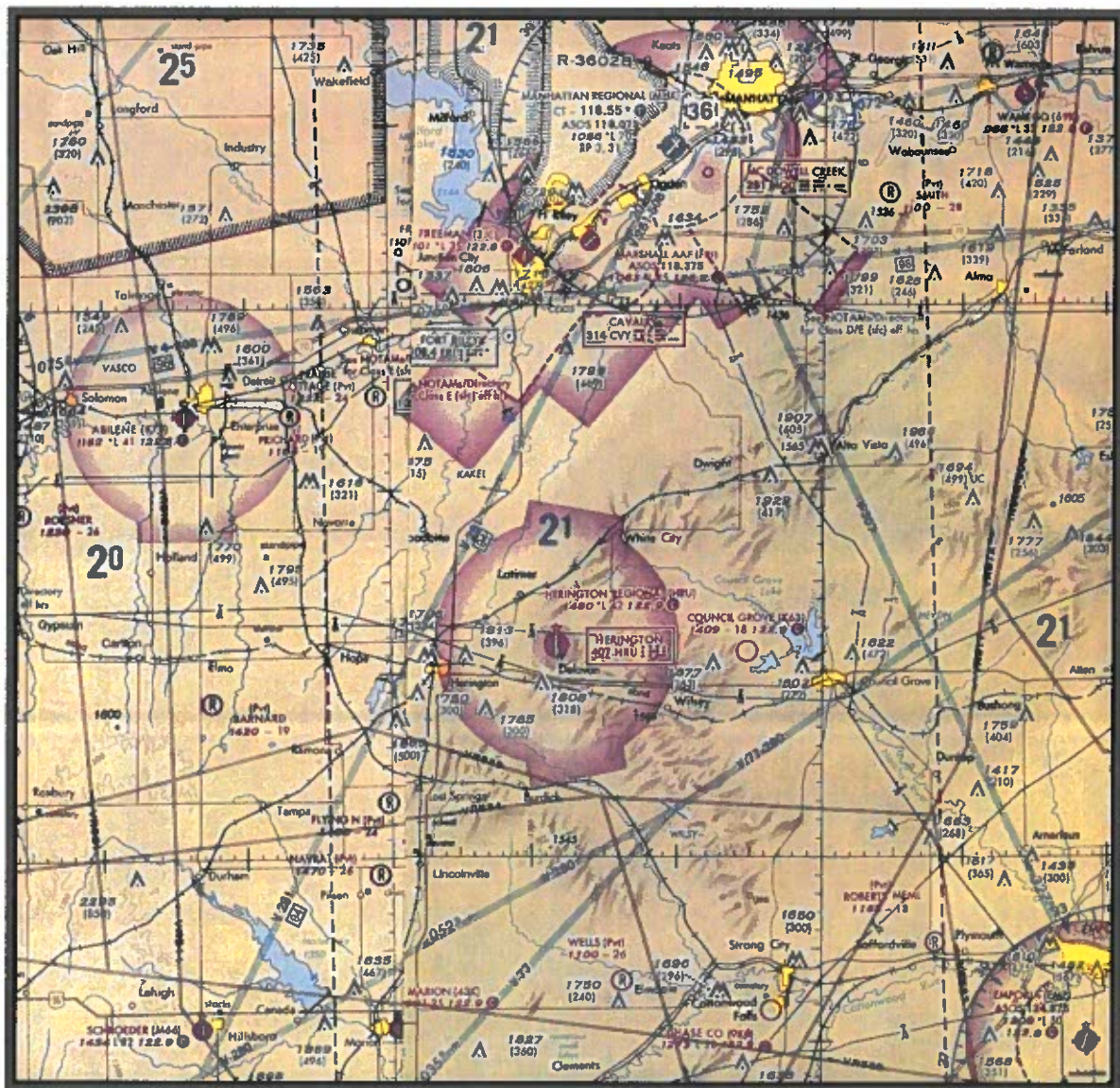
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AIRSPACE SYSTEM AND NAVIGATIONAL AIDS

The national airspace system is a network of airports, navigational aid facilities (NAVAIDS), and direct airways (victor routes). **Exhibit 2.2** illustrates the airspace immediately surrounding the Herington Regional Airport as well as the nearby NAVAID's and airports. NAVAID's are used to provide point-to-point reference throughout the national airspace system by either ground or satellite based facilities interfacing with airborne equipment and instrumentation. The NAVAID closest to Herington Regional Airport is the Herington nondirectional beacon (NDB) located on the airport.

EXHIBIT 2.2: HERINGTON REGIONAL AIRPORT AIRSPACE SYSTEM



Source: NOAA/FAA Kansas City and Wichita Aeronautical Sectionals



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AIRPORT SERVICE AREA /SURROUNDING AIRPORTS

The airport service area is created in an effort to determine the influence an airport and its services has on the surrounding community and/or region. The service area is an assessment of the subject airport in relation to: the role of the surrounding airports; which involves an evaluation of available facilities, equipment, and services; the relative distance to population centers, and; programmed expansion projects. The service area attempts to determine the aviation services available and what needs are being met. Since each airport has varying degrees of influence on the local community, judgments are made in accordance with how far the effect one airport has influence over another. It should be noted that the demand for aviation facilities does not necessarily conform to political or geographical boundaries.

The general aviation service area for the Herington Regional Airport was determined by application of the following service area models:

NPIAS Service Area: This service area is defined per *FAA Order 5090.B, Field Formulation of the National Plan of Integrated Airport Systems (NPIAS)* by means of 30-minute (25 statute mile) ground access to the originating airport. Several public-use airports and privately-owned facilities fall within this 25 statute mile range, which excludes the NPIAS criteria from realistically defining the entire service area boundary.

Airport Service Area: This service area considers the *role and service level* of surrounding civilian public-use airports, as well as ground access distance and travel times between other public-use general aviation airports and their associated population centers.

Exhibit 2.3 illustrates the NPIAS and the Standard Service Areas. The Airport Service Area includes portions of Dickinson, Morris, Marion, and Chase Counties. The population of the Airport Service Area is estimated to total about 6,337 people.



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In order to understand the role of the Herington Regional Airport, we have to consider the capacities and influence of other nearby airports. **Table 2.6** lists information regarding the role, facilities, and services offered at the nearest public-use general aviation and commercial service airports.

Table 2.6 Area Public-Use Airport Facilities Herington Regional Airport				
Airport Name Airport Sponsor/Distance From Airport (NM)	Airport Role	Runway Characteristics	Aircraft/ Operations	Airport Services
Herington Regional Airport Herington, Kansas	GA	17-35: 4,184' x 75' (P,L)	9 planes 2,250 ops	NPI Fuel Tie
Council Grove Municipal♦ Council Grove, KS 11 E	GA	13-30: 1,690' x 75' (T) 4-22: 1,845' x 120' (T)	0 planes 400 ops	Visual Tie
Freeman Field Airport♦ Junction City, KS 21 N	GA	18-36: 3,495' x 75' (P,L) 5-23: 1,927' x 200' (T) 13-31: 1,915' x 140' (T)	18 planes 28,500 ops	NPI Fuel Hangars/Tie AS/PS
Marion Municipal Airport♦ Marion, KS 23 SW	GA	17-35: 2,540' x 40' (P,L) 3-21: 2,745' x 95' (T) 13-31: 2,722' x 50' (T) 18-36: 2,310' x 67' (T)	18 planes 9,100 ops	Visual Fuel Hangars/Tie
Chase County Airport♦ Cottonwood Falls, KS 23 SE	GA	17-35: 2,300' x 155' (T)	4 planes 1,100 ops	Visual Tie
Abilene Municipal Airport♦ Abilene, KS 24 NW	GA	17-35: 4,100' x 75' (P,L)	23 planes 35,800 ops	NPI Fuel/ O ₂ AS/PS Hangars/Tie
Manhattan Regional Airport* Manhattan, KS 28 N	COMM	3-21: 7,000' x 150' (P,L) 13-31: 3,801' x 100' (P,L)	54 planes 43,500 ops	PI Fuel/O ₂ AS/PS Hangars/Tie
Alfred Schroeder Field Hillsboro, KS 28 SW	GA	17-35: 3,299' x 44' (P,L)	7 planes 5,000 ops	Visual Fuel Tie
Emporia Municipal Airport Emporia, KS 36 SE	GA	1-19: 4,999' x 100' (P,L) 6-24: 3,875' x 298' (T)	47 planes 31,400 ops	NPI Fuel Hangars/Tie AS/PS
Total Activity			180 planes 157,050 ops	
Symbols: (♦) Airport within the NPIAS service area; (P) – Paved runway surface; (T) – Turf or gravel runway surface (L) – Lighted runway; (*) – Control tower, (AS) – Airframe Service, (PS) Powerplant Service GA – General Aviation Airport – designed to serve all small single-engine and twin engine < 12,500 lbs. COMM – Commercial Service Airport – designed to serve large turboprop and turbine < 60,000 lbs. MIL – Military Airport – military aircraft only, not open to the public. Source: NOAA-FAA Sectional Aeronautical Chart, 2002 and most recent FAA 5010 Inspection Data Sheets.				



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SUMMARY OF BASED AIRCRAFT and HISTORIC ANNUAL OPERATIONS

The historic number of based aircraft, registered aircraft and annual operations (local and itinerant) at the Herington Regional Airport are outlined in **Table 2.7**. The following observations were identified at the Airport as part of the inventory of historical and existing airport activity levels.

Aircraft Activity Summary: Since 1994, based aircraft have fluctuated between 5 and 9. Since 1994, only single-engine aircraft have reportedly been based at the Airport. In 1995, a 12-unit T-hangar was blown down by a tornado and most of the hangared aircraft left Herington for other surrounding airport with available hangar space and have not returned due to lack of adequate facilities.

Operational Activity Summary: Over the past 10 years, the Airport operational activity has varied between 4,450 and 11,600 annual operations. It is estimated that the current operational level is about 2,700 annual operations by mostly single-engine aircraft with occasional visits by small cabin turbo-prop and business jet aircraft. Some of the operational activity is conducted by Kansas State University Aviation Department conducting flight training at the Airport. The airport survey questionnaires indicated that "touch and go" operations account for approximately 25 percent of the total operations. Runway 17 is used approximately 56 percent while Runway 35 is used 44 percent of the time. The average flight distance from the Airport is approximately 73 nautical miles.



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CRITICAL AIRCRAFT AND AIRPORT REFERENCE CODE (ARC) CLASSIFICATION

The FAA utilizes the airport design criteria as defined in AC 150/5300-13, Chg 7, which identifies the Airport's role and airport reference code (ARC) designation. This designation is used to provide minimum safety standards with respect to the performance and characteristics of the *critical* aircraft using the Airport. This particular aircraft, as determined with respect to approach speed and wingspan, is within a design category of airplanes that conduct at least 500 itinerant operations (combination of landings and takeoffs) per year. The critical aircraft for the Herington Regional Airport was chosen based the characteristics of a family of aircraft since one particular type of aircraft alone did not meet the minimum 500 operations requirement. **Table 2.8** identifies the existing *critical* aircraft for Herington as the Piper Arrow (PA-28R), which is an ARC A-I aircraft. This aircraft can hold three passengers plus the pilot, and has a maximum takeoff weight of approximately 2,600 lbs with a range of 880 nm.

Table 2.8
Existing Critical Aircraft Information
Herington Regional Airport

Aircraft Type & ARC	Wing Span	Aircraft Length	Aircraft Height	Pass. Seats	Max. Gross Takeoff Weight	Standard Takeoff Distance	Approach Speed (knots)
Piper Arrow (PA-28R)	35.4'	24.7'	7.9'	4	2,600	1,600'	72 Knots

Note 1: Takeoff weight indicates maximum takeoff and ramp weight, respectively.

Note 2: Takeoff distance computed for using pressure altitude, no wind, *normal* aircraft operating takeoff conditions, including; no flaps and no runway grade differential and 50 foot obstacle clearance.

Note 3: The Airport Reference Code (ARC) yields specific characteristics about the type of airplane that the airport is designed to accommodate. The current aircraft mix activity is determined in accordance with ARC design classifications in the Advisory Circular 150/5300-13, Change #7.

Source: Piper Internet Lookup and BWR, Aircraft Performance File, 2004.





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item of importance is fuel dispensing and availability. Fuel is currently available to authorized personnel who have keys to unlock the fuel pump. Access to fuel for itinerant aircraft is only available by contacting an authorized individual with a key.

The business surveys indicated that most local businesses go to other larger airports to use commercial aviation. Only a small fraction of local business owners occasionally use Herington Regional Airport for client or corporate visits, parts transportation, and emergency services.

CLIMATIC CHARACTERISTICS

Regional climate patterns can affect the ultimate design of the airport such as future operational requirements by type of aircraft as well as primary and secondary runway orientation. For example, temperature affects the runway distance (balanced field length) required for an aircraft to safely land and takeoff and the prevailing wind direction dictates the optimal runway alignment since aircraft generally takeoff and land into the wind.

The Herington Regional Airport is located in the central section of Kansas known as the Great Plains. The Great Plains cover the central and western portions of the state and can be divided into two sections, the Plains Border and the High Plains. The Herington Regional Airport is located in the Plains Border, which forms a transitional zone between the Central Lowland and the High Plains, includes several broad belts of hills. Much of this region is quite sandy. The influx of moist tropical air from the Gulf of Mexico and the semi-arid continental air from the regions to the southwest determine whether wet or dry conditions will prevail resulting in an annual average rainfall of 34.12 inches and approximately 57 days with 1/10th or more precipitation. Summer is characterized by hot days and warm nights with periods of moderate humidity levels. The warmest month is July, which sees the mean maximum temperature of 91.3° F. Fall is typically moderate with sunny days and cool nights. Winters here are fairly mild with the lowest average temperature in January at 39.3° F and the season averages 22.7 inches of snowfall. Spring brings frequent and rapid fluctuations in weather which results in the most turbulent weather with severe thunderstorms and tornadoes.

AIRPORT WIND ANALYSIS

Information was gathered from the National Oceanic and Atmospheric Administration (NOAA) weather reporting station (Forbes Field, Topeka, Kansas, 1991-2000) in order to determine the impacts of crosswinds on the existing runway alignment. All-weather wind conditions were used and expressed as the percentage of time the crosswind component is at or below an acceptable velocity. The crosswind component is determined by measuring wind speed and relative direction acting at right angles to the runway.

The *desirable* wind coverage is 95 percent, or better, for the primary runway, and is computed on the basis of the crosswind component not exceeding 10.5-knots (12 miles per hour) for ARC A-I and B-I (small) aircraft, 13.0-knots for ARC A-II and B-II aircraft, and 16.0-knots for ARC A-III to D-II



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INSTRUMENT (IFR) WIND CONDITIONS

Runway 17-35 has 96.13 percent wind coverage at 10.5 knots under IFR conditions. Table 2.9 shows the instrument wind coverage (600-foot ceilings/1-mile visibility) for the 10.5 and 13.0-knot wind velocities. A crosswind runway serving A-I and B-I aircraft is recommended for conditions less than visual meteorological conditions (VMC).

STRONG ALL-WEATHER WIND CONDITIONS

Strong wind characteristics (greater than 10.5-knots) during all-weather conditions are listed in Table 2.9. Approximately 47 percent of the strong wind conditions are within 30 degrees of Runway 17-35 centerline alignment. Runway 17 experiences 61 percent of the total strong wind activity while Runway 35 only experiences 39 percent.

Table 2.9
Percent Crosswind Runway Wind Coverage for All-Weather and IMC Wind Conditions
Herington Regional Airport

Runway Alignment (True Bearing)	Crosswind Component Wind Speed & Corresponding ARC	All-Weather Wind Coverage	IFR/IMC Wind Coverage
Runway 17-35 (357.16°/177.16°)	10.5 knots (A-I and B-I)	93.46%	96.13%
	13.0 knots (A-II and B-II)	96.70%	97.80%
	16.0 knots (A-III to D-II)	99.14%	99.28%
Total – Calm and Light Winds (0-10 Knots)		77.02%	
Total – Strong Winds		22.98%	
Optimum All-Weather Primary Runway Alignment Wind Coverage		344.0° 94.01% (10.5-knots)	
Range of All-Weather 95% Wind Coverage Alignment		95% all-weather wind coverage cannot be achieved at 10.5-knots for (ARC A-I & B-I)	

Note 1: The percentage (%) indicates the percent of time wind coverage is provided for a particular velocity. The greater the percent, the more desirable the wind coverage.

Note 2: True runway bearing(s) are used to calculate wind calculations.

Note 3: IFR/IMC Conditions measured with ceilings = 600' (AGL)/visibility = 1.0 miles.

Source: National Oceanic & Atmospheric Administration (NOAA)/ Federal Aviation Administration (FAA); First-Order Wind Observing Station (VFR/IFR Winds) – Forbes Field, Topeka, KS, 1991-2000 (10-year period).



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per capita personal income (PCPI) for the Tri-County area averaged \$22,519 in 2002 with Dickinson County leading the way with \$23,423 per person. From 1992 to 2002, the PCPI growth rate for the Tri-County area averaged 3.5 percent with a State average of 3.9 percent and national average of 4.0 percent.

POPULATION

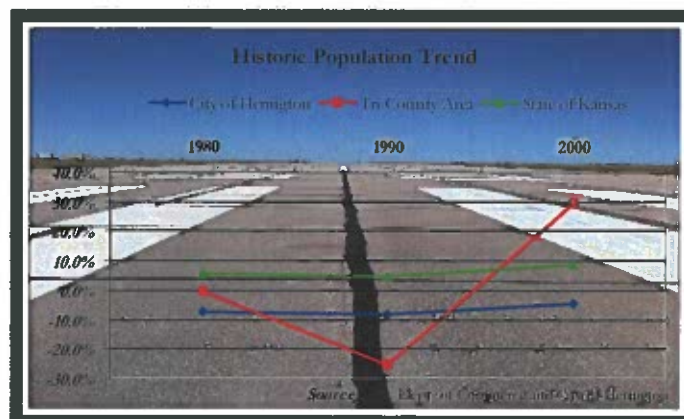
Population trends and rates of change can provide insight into a region's economic potential. Regional population information is provided in **Table 2.10** for the City of Herington, the Tri-County Area, and the State of Kansas. Past population tendencies can be compared to State and national population for comparison as an indicator of future general aviation trends. Over the past 40 years, the population of Herington and the Tri-County Area has declined as a percentage of overall State population figures. Overall, the City of Herington has seen a 19.0 percent decline while the Tri-County Area has seen a 3.6 percent drop between 1970 and 2000. Over this same period, the State of Kansas has seen an increase of nearly 20 percent. The chart below reveals that the population trends for the City of Herington and the State of Kansas have nearly paralleled each other the past 30 years. The population of the Tri-County Area was decreasing until 1990, but is rebounding in 2000.

Table 2.10
Historic and Forecast Population Levels
Herington Regional Airport

Year	City of Herington	Tri-County Area	State of Kansas	Herington to Tri-County Population Ratio	Tri-County to State Population Ratio
Historic Population Levels					
1970	3,165*	40,298	2,247,823	7.9%	1.8%
1980	2,930*	40,128	2,369,039	7.3%	1.7%
1990	2,685*	38,006	2,481,349	7.1%	1.5%
2000	2,563*	38,863	2,692,643	6.6%	1.4%

Source: U.S. Department of Commerce, Bureau of Economic Analysis

*Information obtained from the City of Herington





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INCOME DISTRIBUTION

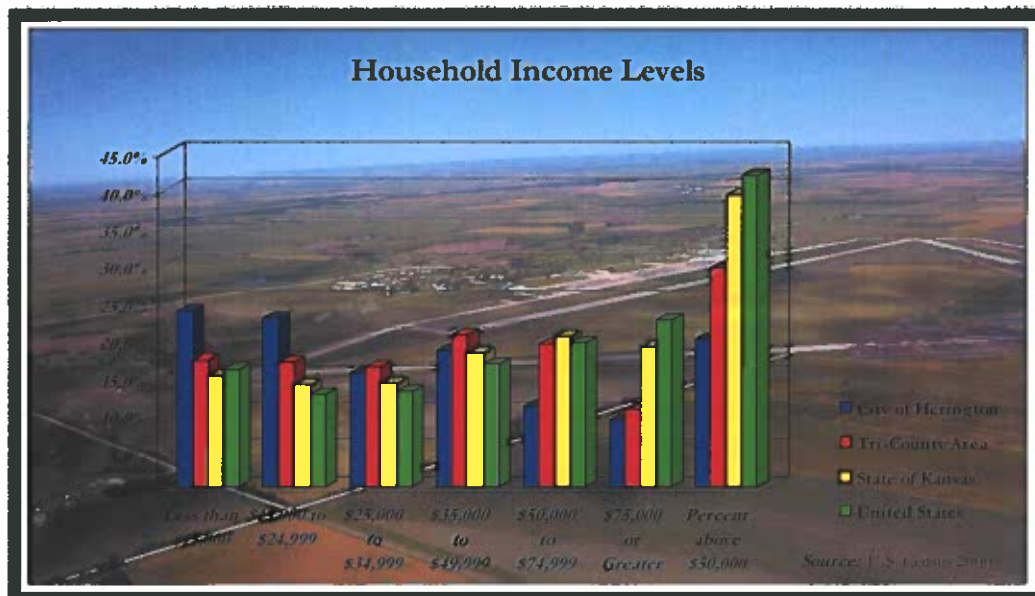
Table 2.12 displays the distribution of household income for the City of Herington, the Tri-County Area, the State of Kansas and the United States. Using income as a gauge of aviation activity, it is assumed that approximately 29.6 percent of the County households earn income of \$50,000 or more; a segment of the local population considered capable of participating in general aviation activity (rental, ownership, flight training, etc.).

Table 2.12
Household Income Distribution
Herington Regional Airport

Locale	Less Than \$15,000	\$15,000-\$24,999	\$25,000 - \$34,999	\$35,000 - \$49,999	\$50,000 - \$74,999	\$75,000 +	Percent Above \$50,000
City of Herington	23.8%	22.9%	15.4%	18.3%	10.8%	9.0%	19.7%
Tri-County Area	17.1%	16.7%	16.2%	20.5%	19.2%	10.4%	29.6%
State of Kansas	14.9%	13.8%	14.0%	18.1%	20.3%	18.9%	39.2%
United States	15.8%	12.8%	12.8%	16.5%	19.5%	22.5%	42.0%

Note: Based on the dollar value of the 2000 Census Data.

Source: U.S. Bureau of the Census, Census 2000.





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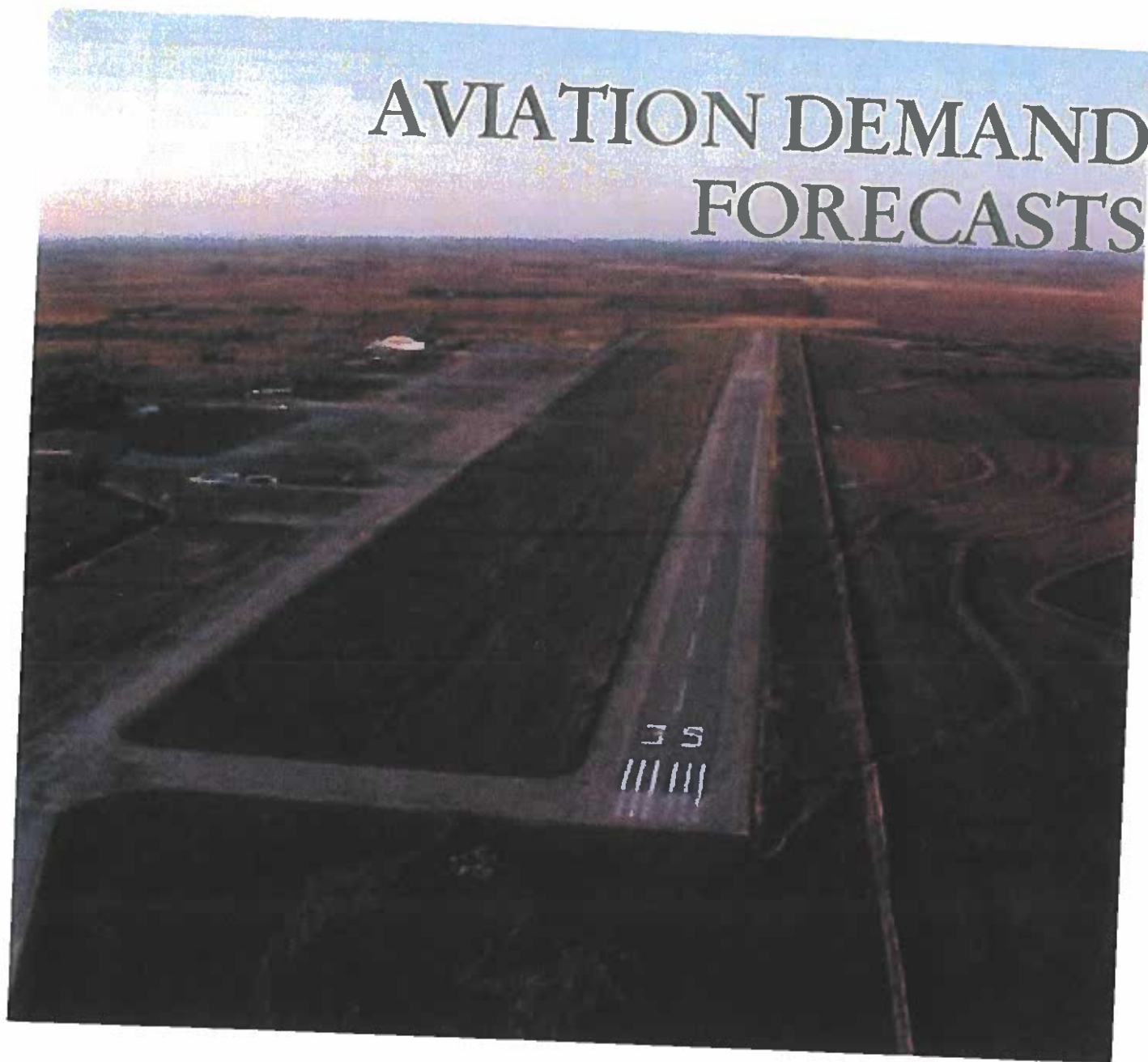
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Terminal Area/Landside/Access:

- The City provides a pilot lounge with 24-hour access to restrooms, telephone, and shelter including a flight planning area.
- There are currently four publicly-owned T-hangars and four privately-owned T-hangars on the airfield.
- Following the tornado that leveled the 12-unit T-hangar in 1995, the T-hangar was never replaced by the Tri-County Public Airport Authority. In turn, these aircraft left for aircraft storage hangars elsewhere. The current airport administration is trying to get in position to construct additional T-hangars in order to attract those displaced aircraft back to Herington.
- Over the past three years, the Airport has seen an additional three based aircraft locate at Herington.
- The Airport Beacon is located on top of the old concrete water tower and is in poor condition.
- The entire apron area contains many pavement sections with extensive cracking and surface deterioration.
- The gravel access road is in poor condition. Hazardous conditions are created when the large trucks that use it regularly produce dust clouds from the gravel surface that impair visibility along the roadway.

CHAPTER THREE

AVIATION DEMAND FORECASTS



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3

AVIATION DEMAND FORECASTS

AIRPORT FORECAST METHODOLOGY

The purpose of forecasting aviation activity is to estimate future airport facility and equipment needs. The *preferred* demand forecasts are used to identify the type, extent, and timing of aviation development. In addition, the forecasts are instrumental in identifying airport-related infrastructure and capacity needs, potential environmental effects, and estimating the financial feasibility of airport development alternatives. Aviation demand forecasts have been prepared for the following areas of activity¹:

- ◆ Based aircraft
- ◆ Aircraft operations
- ◆ Critical aircraft family
- ◆ Air taxi / charter operations
- ◆ Actual instrument approaches
- ◆ Fleet mix by aircraft type

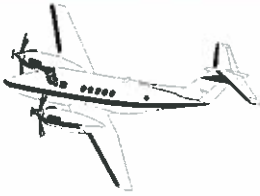
Assumptions of these forecasts are based on analysis and professional judgment to reach the highest level of forecast confidence. The general aviation demand forecasts are developed in accordance with national trends, and in context with the inventory findings, including local population and airport survey information. National general aviation trends and forecasts, which are used to provide a baseline of growth rates, are provided by the publication *FAA Aerospace Forecasts (FY 2004-2015)*.

LOCAL-AREA BASED AIRCRAFT FORECAST FACTORS AND ASSUMPTIONS

Based on business and pilot surveys, and local area information, the following factors and assumptions have been incorporated into the forecasts of based aircraft and annual operations at the Herington Regional Airport:

- Existing and future operational levels are attributed to the needs of local businesses, flight training and recreational interests. The current airport facilities will accommodate small single-engine and some medium sized twin-engine propeller-driven aircraft.

¹ Aviation activity is often influenced by the types of airport services offered for transient and based aircraft, and by the general business environment. In addition, factors such as vigorous local airport marketing or fluctuations in the national or local economy all influence aviation demand.



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GENERAL AVIATION DEMAND FORECASTS

FORECAST OF BASED AIRCRAFT

The forecast of based aircraft is summarized in **Table 3.1** for the 20-year planning period. Overall, the forecast methodologies resulted in a range of (-) five to 22 additional based aircraft by the end of the planning period (2024).

Table 3.1 Summary of Based Aircraft Forecasts – Total Aircraft Herington Regional Airport				
Year	FAA Percentage Growth Rate	FAA Growth (Modified)	FAA Growth (Unmodified)	Linear Trend
2003	9	9	9	9
2009	10	10	9	11
2014	10	17	12	15
2019	11	19	12	20
2024	12	20	13	31
Total Gain	(+) 3	(+) 11	(+) 4	(+) 22
Note: No forecasts were prepared for ultralights, gyrocopters, balloons, sailplanes.				

Source: BWR, Summary Forecast of Based Aircraft – July 2004.

The "preferred" forecast of 11 additional aircraft over the 20-year planning period is based on the "modified" FAA Forecast Growth Rate by category of aircraft and modified with information gathered from interviews and surveys of pilots and local businesses conducted as part of this Study. Growth at the Herington Regional Airport is primarily expected from the single engine aircraft market through relocation of aircraft from surrounding areas to Herington, this would result in the construction of a new 6-unit T-hangar during the 20-year planning period. During the course of the 20-year planning period based on interviews, it is expected that local, on- or off-airport businesses would likely purchase a small twin-engine aircraft for business travel purposes with one company likely to upgrade to a small twin, turbo-prop aircraft.

The various growth rates are based on the historical range of based aircraft at the Herington Regional Airport as well as FAA forecasts of aviation. The high end of the aircraft forecast reflects a growth trend between 1996 and 2003 which shows the addition of 22 aircraft. This growth rate is high for sustained activity at the Herington Regional Airport over the next 20 years. The FAA Percentage Growth Rate of three to four additional aircraft reflects the growth rate of single engine aircraft coupled with what currently exists at the airport today.



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AIRCRAFT OPERATIONS FORECAST (PREFERRED)

The operations forecast was projected using the utilization rate², which is expected to reflect FAA forecast levels for aircraft categories during the short to mid-term planning period and a linear trend for the long-range planning period. The typical local to itinerant operations relationship is normally 30 percent and 70 percent, respectively. Details regarding the forecast of annual operations can be referenced in the appendix.

Overall, the 20-year forecast is reasonable for the Herington Regional Airport and reflects its expected future growth and type of aircraft use. The forecast of total civilian operations shows an increase of 3,800 operations, which represents an annual growth rate of nearly 4.5 percent. Table 3.3 summarizes the forecast of annual aircraft operations for the Airport for each forecast period.

Table 3.3
Preferred Aircraft Operations Forecast
Herington Regional Airport

Year	Total Based Aircraft	Utilization Rate	Total Local Operations	Total Itinerant Operations			Total Civilian Forecast Operations
				Military *	Air Taxi	Other Itinerant	
2003	9	300	810	0	0	1,890	2,700
2009	10	306	918	0	0	2,142	3,060
2014	17	312	1,592	0	0	3,712	5,304
2019	19	318	1,812	0	0	4,230	6,042
2024	20	325	1,950	0	0	4,550	6,500

Note: *Other* itinerant operations include transient general aviation operations.

Note: 2004 level of based aircraft – BWR airport inspection, June 2004.

Forecasts for itinerant and local traffic were calculated as follows:

* *Military Activity*: Not included in total civilian forecast of operations.

Total Civilian Operations = Local Operations + Itinerant Operations

Source: BWR, Preferred Aircraft Operational Forecast – July 2004.

² **Utilization Rate** – Ratio of annual operations to the number of based aircraft, providing a gauge of total activity relative to the number of based aircraft.



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AIRCRAFT MIX FORECAST

The forecast of aircraft mix is used to determine future airfield design, structural and material needs and the configuration of terminal area facilities. These forecasts are developed by applying the future activity levels to aircraft use patterns and trends obtained during the inventory analysis. **Table 3.5** displays the aircraft fleet mix forecast at the Herington Regional Airport throughout the 20-year planning period.

Two main categories of aircraft are forecast to use the Airport in the future: 1) light single-engine aircraft weighing less than 12,500 pounds, and 2) small twin-piston and twin-turbine business aircraft weighing less than 12,500 pounds. Currently, only single engine aircraft utilize the Airport; however the forecasts provide for the increase in light to medium twin engine aircraft activity.

Table 3.5
Forecast Aircraft Mix by FAA Design Groups
Herington Regional Airport

Aircraft Approach Category (AAC) - This grouping is based on 1.3 times the stall speed of the aircraft at the maximum certified landing weight in the landing configuration.

Aircraft Approach Category	Existing	Phase 1 Short-Term	Phase 2 Mid-Term	Phase 3 Long-Term
Category A (Less than 91 Knots)	2,700	3,000	5,200	5,720
Category B (92 – 120 Knots)	0	60	104	780
Category C (121 – 140 Knots)	0	0	0	0
Category D (141 – 165 Knots)	0	0	0	0

Airplane Design Group (ADG) - A grouping of aircraft based on wingspan dimension (feet).

Airplane Design Group	Existing	Phase 1 Short-Term	Phase 2 Mid-Term	Phase 3 Long-Term
Group I (Less than 49')	2,700	3,000	5,200	5,720
Group II (49' to 78')	0	60	104	780

Note 1: The aircraft approach category (AAC) is classified from A to E, and the airplane design group (ADG) is classified from I to IV. Combined, the two classifications produce an Airport Reference Code (ARC) which yields specific characteristics about the type of airplane (family) that the airport is designed to accommodate.

Source: FAA Advisory Circular 150/5300-13 (Change #7), *Airport Design*, BWR Aircraft Mix Forecast – July 2004.



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FORECAST SUMMARY

The forecasts, combined with the inventory data, will be used to identify and develop the facility requirements for the Herington Regional Airport. The following chapter, Facility Requirements, will identify the types and extent of facilities required to adequately accommodate the demand levels identified in this chapter. The various forecast elements are displayed in **Table 3.7**.

Table 3.7
Aviation Forecast Summary
Herington Regional Airport

	Existing (2003)	2009 (5 year)	2014 (10 year)	2019 (15 year)	2024 (20 year)
Total Based Aircraft					
Single-Engine Aircraft (A-I & B-I)	9	10	16	16	17
Piston Multi-Engine Aircraft (B-I)	0	0	1	2	2
Turbine Multi-Engine Aircraft (B-II)	0	0	0	1	1
Business Jet Aircraft (B-II to C-II)	0	0	0	0	0
Helicopters/Rotorcraft	0	0	0	0	0
Total Based Aircraft	9	10	17	19	20
Other (Sailplanes and Ultralights)	1	1	1	1	1
Total Annual Aircraft Operations					
Local Operations	810	918	1,592	1,812	1,950
Itinerant Operations	1,890	2,142	3,712	4,230	4,550
Air Taxi Operations	0	0	0	0	0
Military Operations	0	0	0	0	0
Total Annual Civilian Operations	2,700	3,060	5,304	6,042	6,500
Total Annual Operations	2,700	3,060	5,304	6,042	6,500
Annual Instrument Approaches	15	17	32	40	53

Note: Annual instrument operations are counted as part of total annual operations; instrument operations include local and itinerant operations, but not military operations. The AIs include only a projection of actual instrument approaches during IMC.

Note: Civilian operations do not include military activity levels.

Source: BWR, Forecast Summary – July 2004.

CHAPTER FOUR

FACILITY REQUIREMENTS



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4

AIRPORT FACILITY REQUIREMENTS

AIRPORT DESIGN FACTORS

The Facility Requirements chapter outlines the future needs at the Herington Regional Airport based on the condition of the existing facilities with consideration to the forecast of aviation demand over the 20-year planning period. Once these future requirements have been identified, FAA airport design standards will be applied in order to maintain minimum safe separation distances and object heights between airport facilities as well as the surrounding natural and man-made structures. It should be pointed out that recommendation of facilities does not necessarily constitute a “requirement” in terms of design standards or goals; however, this chapter merely provides an “option” for facility improvements to resolve various types of facility and operational inadequacies and to accommodate future aviation activity.

In order to organize the future needs of the airport, this chapter is divided into two sections – *Airfield* and *Terminal Area*. *Airfield* facility components include runways, taxiways, navigational aids, airfield marking/ signage, and lighting. *Terminal Area* facilities include hangars, terminal building, aircraft parking apron, fuel quantity and dispensing units, public vehicle parking, and airport access requirements.

FUTURE CRITICAL AIRCRAFT

The first step to determine the needs of the ultimate facilities at Herington Regional Airport is to identify the future critical aircraft that the airfield will need to accommodate. The critical aircraft is typically the most demanding airplane within a composite family of aircraft conducting at least 500 itinerant operations (combination of takeoffs and landings) per year at the Herington Regional Airport. Since the future critical aircraft is evaluated with respect to size, speed and weight, it will be an integral part for determining airport design, as well as structural and equipment needs for the airfield and terminal area facilities.

The future critical aircraft selected for the Airport is the **Beechcraft King Air B200**, which is a medium cabin business turboprop aircraft capable of carrying up to 13 passengers and classified as an ARC B-II+10 aircraft. This aircraft was chosen based on survey information collected during this study, and interviews with local businesses in the region. Aircraft of this type and size currently operate at the Herington Regional Airport. Furthermore, this type and size of aircraft is a logical transition from a light twin-engine aircraft that is used for the types of businesses located on the airport and surrounding areas. **Table 4.1** provides information about the ultimate critical aircraft for the Airport.



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AIRFIELD REQUIREMENTS

RUNWAY LENGTH STANDARDS

FAA Advisory Circular 150/5325-4A, *Runway Length Requirements, Computer Program Version 4.1.*, was used to determine the recommended runway length requirements for the Herington Regional Airport. From a planning standpoint, the primary runway has the longest length, most favorable wind coverage, greatest pavement strength, and lowest straight-in instrument approach minimums. Since the critical aircraft weighs less than 60,000 pounds, the runway design length is determined from the greater of the takeoff or landing performance characteristics required by the composite family of airplanes, as represented by the critical aircraft's airport reference code (ARC). For aircraft weighing more than 60,000 pounds, the runway length is based on the design characteristics of a specific aircraft.

Runway design lengths are based on normal local weather conditions and illustrated in **Table 4.2**. These conditions were considered as follows: **1)** the airport elevation (1,480 feet mean sea level - compensating for the affects of density altitude¹ and no wind); **2)** the average mean maximum daily temperature (91.3°F) for the hottest month (July); **3)** the effective runway gradient between runway ends (2.0' elevation difference between runway ends); **4)** dry versus wet runway pavement (utility runway); and **5)** the corresponding critical aircraft family of airplanes forecast to use the runway.

¹ Density Altitude – is the adjusted altitude for non-standard air density caused by the effects of increased altitude, temperature and humidity. In other words, density altitude reduces aircraft operating performance.



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AIRPORT REFERENCE CODE (ARC) CLASSIFICATION

Table 4.3 illustrates the airport reference code (ARC) for the Herington Regional Airport during each of the planning periods. The FAA has established airport design criteria appropriate to an airport's role and ARC designation. This criterion provides minimum safety standards with respect to the performance characteristics represented by the airport's *critical* aircraft.

Table 4.3 Existing and Ultimate Airport Reference Code (ARC) Herington Regional Airport				
Runway	Existing ARC	Phase 1 ARC (0-5 Years)	Phase 2 ARC (6-10 Years)	Phase 3 ARC (11-20 Years)
Primary Runway	B-II	B-II	B-II	B-II+10
<p>Note 1: The most demanding (greatest) runway ARC per planning phase indicates the airport's ARC.</p> <p>Note 2: Aircraft Approach Category groups have the following performance characteristics: <i>Aircraft Approach Category A</i> = approach speed less than 91 knots. <i>Aircraft Approach Category B</i> = approach speed of 91 knots or more, but less than 121 knots. <i>Aircraft Approach Category C</i> = approach speed of 122 knots or more, but less than 141 knots. Airplane Design Groups are based on aircraft wingspans as follows: <i>Airplane Design Group I</i> = wingspan up to but not including 49 feet. <i>Airplane Design Group II</i> = wingspan of 49 feet up to but not including 79 feet.</p> <p>Note 3: The designation "+10" refers to aircraft that have 10 or more passenger seats.</p>				

Source: BWR, Designated Airport Reference Code (ARC) Forecast, December, 2004.

Taxiway Requirements

Taxiways provide airfield and terminal area access and enhance airport operational safety and capacity (delay) by minimizing the time an aircraft is on an active runway. Requirements for a parallel taxiway system are 10,000 annual operations for a partial-parallel and 20,000 annual operations for a full-parallel taxiway system. Existing and planned taxiway systems are shown on the Airport Layout and Terminal Area Drawings.

Primary Taxiway System: The existing taxiway system consists of a mid-field connector taxiway connecting the runway to the terminal and aircraft parking apron. Ultimate operational levels currently do not justify the construction of a partial, or full-parallel taxiway. However, since pavement already exists, it is recommended that a partial-parallel taxiway, between the mid-field connector and south end, be re-opened. A pavement evaluation should occur to determine the viability of the existing pavement surface and the extent of preparation for this section of taxiway to become useful for safe aircraft operations once again.



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Aircraft Pavement Strength Demands

Pavements, designed in accordance with the standards set forth in FAA AC 150/5320-6D, are intended to provide a structural life of 20 years without major maintenance, if aviation demand is not significantly greater than forecast levels. At a minimum, the design pavement strength should accommodate the existing and future mix of aircraft expected to use the Airport. The existing pavement strength at the Herington Regional Airport is 36,000 lbs. single wheel gear (SWG) 58,000 lbs. dual wheel gear (DWG). This pavement strength is sufficient for the type and size of aircraft currently using the Airport.

Runway and Taxiway Surface Gradient Requirements

Table 4.4 displays the runway grade standards for Aircraft Approach Category B-II+10 aircraft. This criterion is an important planning aspect with regard to the extension of runway and taxiway systems.

Table 4.4 Runway and Taxiway Surface Gradient Requirements (ARC B-II+10) Herington Regional Airport					
Surface	Maximum Allowable Longitudinal Grade Change	Maximum Allowable Grade Change	Vertical Longitudinal Change	Transverse Grade Limitations	Shoulder Grade Limitations
Runway	±2.0%	±2.0%	Not less than 300' for each 1% of change	1.0% - 2.0%	3.0% - 5.0% (4:1 Slope)
Associated Taxiway	2.0%	3.0%	100' for each 1% of change	1.0%-2.0%	1.5%-5.0% (4:1 Slope)
Apron	N/A	2% in any direction	N/A	N/A	N/A
Runway Safety Area (RSA)	No penetration of approach surface permitted	2% per 100'	0%-3.0% downward slope for first 200' beyond runway	N/A	N/A

Source: FAA Advisory Circular 150/5300-13, Change #8, Airport Design –December 2004.



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would interfere with the arrival and departure of aircraft. Aviation easements, at a minimum, should be maintained to control the use of the airspace within the RPZ when "fee simple" ownership is not possible (beyond natural and man-made barriers such as roads). Typically, aviation/aviation easements vary on the extent to which they restrict structures, control right-of-way entry, and limit electromagnetic interference.

Obstacle Free Zone (OFZ): The OFZ is airspace above a surface centered on the runway centerline, and precludes taxiing and parked airplanes, and object penetrations except for frangible post mounted NAVAIDS expressly located in the OFZ by function. Due to the facilities required, only the *Runway* OFZ is applicable.

Runway Approach Slope/Surface: The approach slope is a three-dimensional trapezoidal FAR Part 77 imaginary surface that begins at the end the primary surface of each runway end and has a defined slope requiring clearance over structures and objects beyond the runway threshold. The purpose of the approach surface/slope is to provide proper clearance for the safe approach and landing of aircraft.

Runway Visibility Zone (RVZ): The RVZ is used to establish an acceptable line-of-sight at airports with more than one runway, and permits mutually visible points to be seen from each runway centerline, based on the distances between runway ends, taxiway locations, and the nearest runway intersection. By design standards, the area within the RVZ should be owned by the airport in "fee simple." The airport sponsor should restrict or minimize crop/vegetation heights based on elevation differences, so they will not interfere with the runway line-of-sight requirements.

Runway Line of Sight: An acceptable runway profile permits any two points five (5) feet above the runway centerline to be mutually visible for the entire runway length. The sight distance along a runway from an intersecting taxiway needs to be sufficient to allow a taxiing aircraft to enter safely or cross the runway, in addition to vehicles, wildlife, and other hazardous objects. There are no line-of-sight requirements for taxiways.

Crop Restriction Line (CRL): The CRL is used to control agricultural areas on the airport in order to maintain proper safety and visibility standards. Restricting agricultural operations to areas outside the RSA, ROFA, TOFA, OFZ and RVZ will normally provide the minimum object clearances. Agricultural operations are also excluded from critical areas associated with the establishment of navigational and visual approach aids. The CRL is depicted on the Airport Land Use Drawing.

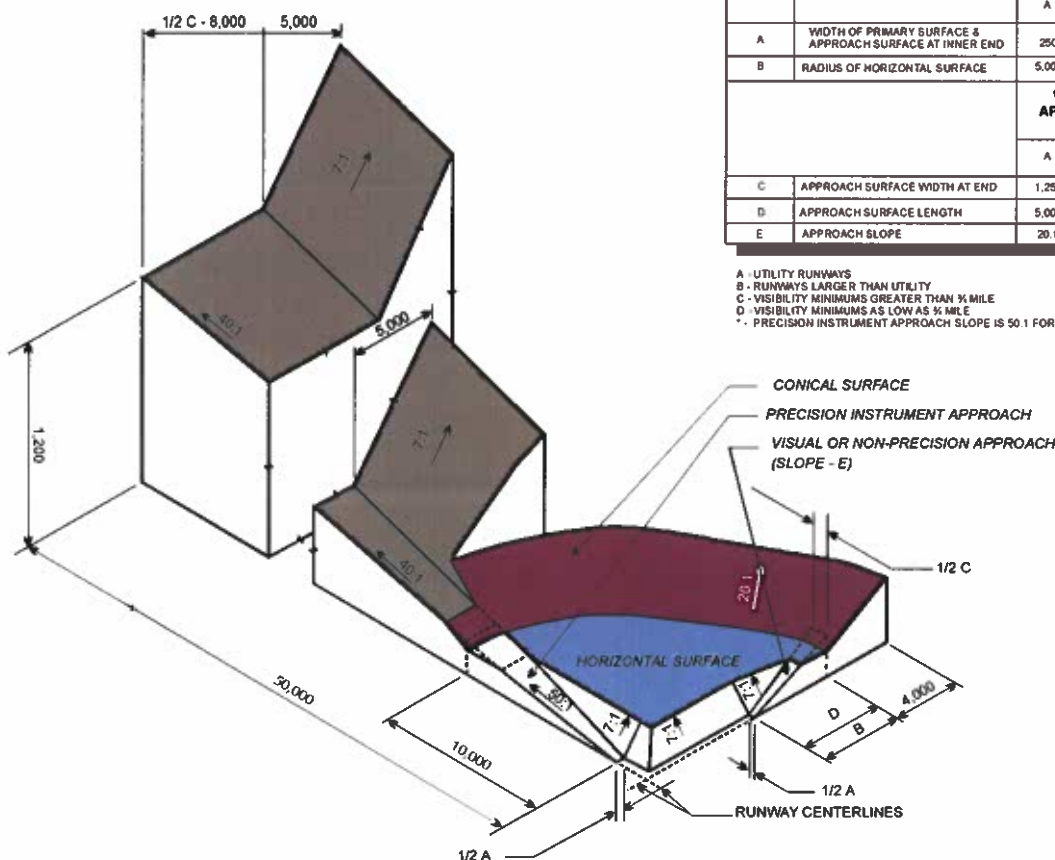
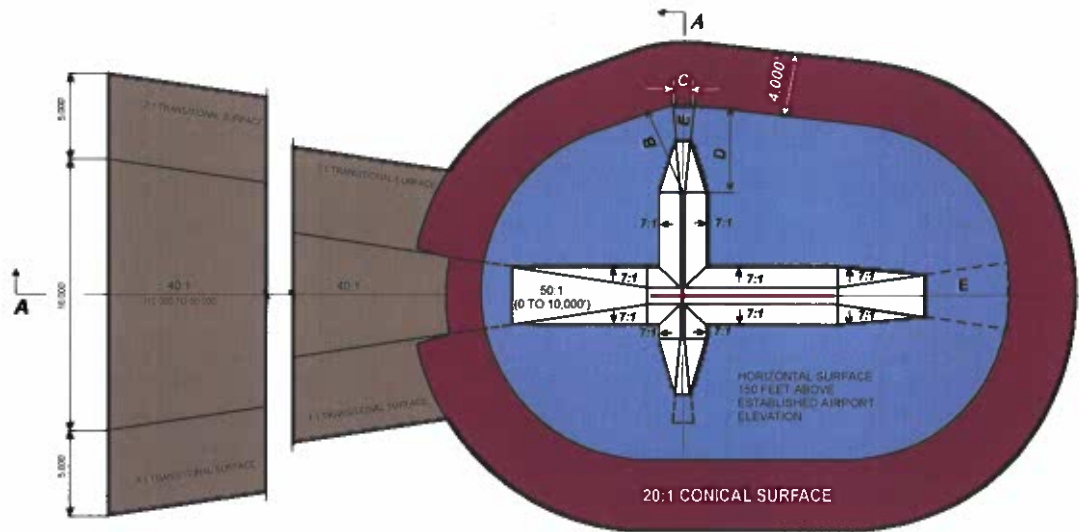
All safety areas are depicted on the Airport Layout Drawing. **Exhibit 4.1** depicts the RPZ, OFA, RSA and BRL. **Exhibit 4.2** depicts the FAR Part 77 imaginary airspace surfaces, including the primary and transitional surface and approach slopes.



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EXHIBIT 4.2: FAR PART 77 - IMAGINARY AIRPORT SURFACES



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

A - UTILITY RUNWAYS
 B - RUNWAYS LARGER THAN UTILITY
 C - VISIBILITY MINIMUMS GREATER THAN 1/2 MILE
 D - VISIBILITY MINIMUMS AS LOW AS 1/2 MILE
 * - PRECISION INSTRUMENT APPROACH SLOPE IS 50:1 FOR INNER 10,000 FEET AND 40:1 FOR AN ADDITIONAL 40,000 FEET

Source: FAA FAR Part 77, Objects Affecting Navigable Airspace, 1978



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The system normally consists of two (PAPI-2) or four (PAPI-4) lamp housing units installed 600 to 800 feet from the runway threshold and offset 50 feet to the left of the runway edge. Herington Regional Airport does not currently use any visual guidance indicators.

Airport Signs: Standard airport signs provide runway and taxiway location, direction, and mandatory instructions for aircraft movement on the ground. A standard sign system is recommended to indicate runway, taxiway, and aircraft parking destinations. FAA Advisory Circular 150/5345-44F, Specifications for Taxiway and Runway Signs and FAA Advisory Circular 150/5340-18C, Standards for Airport Sign Systems, should be followed for proper implementation of airport signs.

Wind Cone/Segmented Circle/Airport Beacon: A segmented circle with a lighted wind cone is recommended as the standard wind indicator and airport traffic pattern. The Herington Regional Airport currently has a tetrahedron located on the south end of the aircraft parking apron. The tetrahedron is gray in color and not highly visible from the air. It is recommended that visual wind indication instruments be highly visible to pilots both on the ground or flying over the airport at the traffic pattern altitude (1,000 AGL).

The airport beacon is used for visual airport identification during nighttime hours and weather that is less than VFR. The rotating beacon sits on top of the existing airport water tower located south of the aircraft parking apron. The rotating beacon is in poor condition and needs immediate replacement. It is recommended that this replacement occur somewhat more centralized to the airport terminal area, on the west side of the aircraft parking apron.

Main Ramp Lighting: The existing apron/ramp area lighting consists of a single mercury vapor light mounted on a pole near the fueling facility. This single light is inadequate for illuminating the main aircraft parking, fueling, and auto parking areas. It is recommended that additional lighting fixtures be installed. Numerous economical light fixtures are available that offer adequate lighting.

NAVIGATION SYSTEMS AND WEATHER AIDS

Airport navigation aids (NAVAIDs) are installed on or near an airport to increase the airport's reliability during night and inclement weather conditions, and to provide electronic guidance and visual references for executing an instrument approach to the airport or runway. FAA Order 7021.2C, *Airport Planning Standard Number One - Terminal Air Navigation Facilities and Air Traffic Control Services* specifies minimum activity levels to qualify for instrument approach equipment and approach procedures. At present, the Herington Regional Airport experiences approximately 24 actual instrument approaches, and is



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AIRFIELD FENCING REQUIRMENTS

Perimeter fencing, gates, and terminal fencing between airport property and public areas are recommended to discourage access by people and wildlife to the runways and taxiways. For general aviation airports such as the Herington Regional Airport, the specific location, type and height normally depend on local security requirements and fencing established by adjacent property owners; otherwise, the fence line normally follows the property line. Existing and ultimate fencing locations are shown on the Airport Layout and Terminal Area Drawings.

AIRFIELD/TERMINAL AREA DRAINAGE

The airfield design should be planned to utilize existing drainage patterns and not increase storm-water runoff onto adjacent properties. On-airport farming practices should be managed to limit the accumulation of silt and other debris in and around storm-water inlets. Storm water holding basins are not recommended because they create a waterfowl attraction, which is undesirable near an airport. Drainage around the Herington Regional Airport is adequate and does not need to be addressed at this time.

SUMMARY OF AIRSIDE FACILITY REQUIREMENTS

Table 4.4 provides a summary of runway facility requirements to accommodate the level of activity projected for the Herington Regional Airport for each of the three planning phases spanning the 20-year planning period.



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TERMINAL BUILDING REQUIREMENTS

Table 4.6 lists the existing and future terminal building space requirements over the 20-year planning period. The terminal building serves a functional and social capacity central to the operation, promotion, and visible identity of the airport. Based on an assessment of general aviation demands, the following individual terminal building components were identified to accommodate the average peak-hour activity forecast during the planning period:

- Management-administrative office area
- Fixed base operator office area
- Foyer/waiting area
- Communications area
- Concessions/restrooms
- Pilot lounge/flight planning room

AIRCRAFT HANGAR REQUIREMENTS

Table 4.6 lists the existing and future hangar space requirements for the Herington Regional Airport throughout the 20-year planning period. Future hangar development should occur to reflect future airport needs. For planning purposes, hangars should accommodate at least 95 percent of all based general aviation aircraft. Typically, single-engine aircraft demand 1,000 to 1,200 square feet, twin-propeller aircraft require 1,200 to 3,000 square feet, and small to medium cabin business jets require 4,000 to 6,000 square feet. General hangar design considerations include the following:

- Construction of aircraft hangars should occur beyond the established building restriction line (BRL) surrounding the runway and taxiway areas. Moreover, they must be built beyond the runway obstacle free zone (OFZ), runway and taxiway object free area (OFA), the runway visibility zone (RVZ), and remain clear of the FAR Part 77 Surfaces (Transitional, Approach, and Primary).
- Maintaining the minimum recommended clearance between T-hangars - 79 feet for one-way traffic, and 125 feet for two-way traffic. Taxilanes supporting T-hangars should be no less than 25 feet wide. Individual paved approaches to each hangar stall are typically less costly, but not preferred to paving the entire T-hangar access/ramp area.
- Construction of additional hangar space to accommodate existing and forecast based aircraft. Refurbishment of older existing hangar units may be a planning option to maintain the structural integrity as well as extend the functional life of each unit.
- Interior and exterior lighting and electrical connections are typically recommended on new hangar construction.



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aircraft (jets) are assumed to operate between 1.8 and 2.2 hours per operation. The following guidelines should be implemented when planning future airport fuel facilities:

- Aircraft fueling facilities should remain open continually, remain visible, and be within close proximity to the terminal building or FBO to enhance security and convenience.
- Fuel storage capacity should be sufficient for average peak-hour month activity, which normally occurs during the summer months.
- Fueling systems should permit adequate wing-tip clearance to other structures, designated aircraft parking areas (tie-downs), frequently used maneuvering areas, and object free areas (OFA) associated with taxiway and taxiway centerlines.
- The FAA recommends locating the fuel facilities beyond the runway safety areas (RSA) and the building restriction line (BRL). All fuel storage tanks should be equipped with monitors to meet current State and Federal EPA regulations, and sited in accordance with local fire codes.
- A dedicated fuel truck is typically used for Jet-A due to the liability associated with towing and maneuvering aircraft around fuel islands.

AUTO PARKING, CIRCULATION AND ACCESS REQUIREMENTS

Table 4.6 lists the existing and future auto parking requirements for the Herington Regional Airport throughout the 20-year planning period. Parking space requirements are calculated using 1.4 spaces per design hour passenger, which is typical for smaller, non-towered general aviation airports. Based aircraft owners commonly park in their individual hangars while flying. Other recommended facility planning and design considerations include:

- Expanding the dedicated public auto parking lot with close proximity to future terminal building expansion or relocation. Any future public auto parking areas should include fully paved and marked auto parking areas.
- A system of airport directional/guidance signs should be located along Highways 56 and 77 to provide additional assistance in locating the Herington Regional Airport. Signage at the entrance to identify any future based businesses and their location on the airport should be added to assist airport customers.
- A fully paved road from the Airport to Highway 56 should be completed to facilitate airport access.



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SUMMARY OF TERMINAL AREA FACILITY REQUIREMENTS

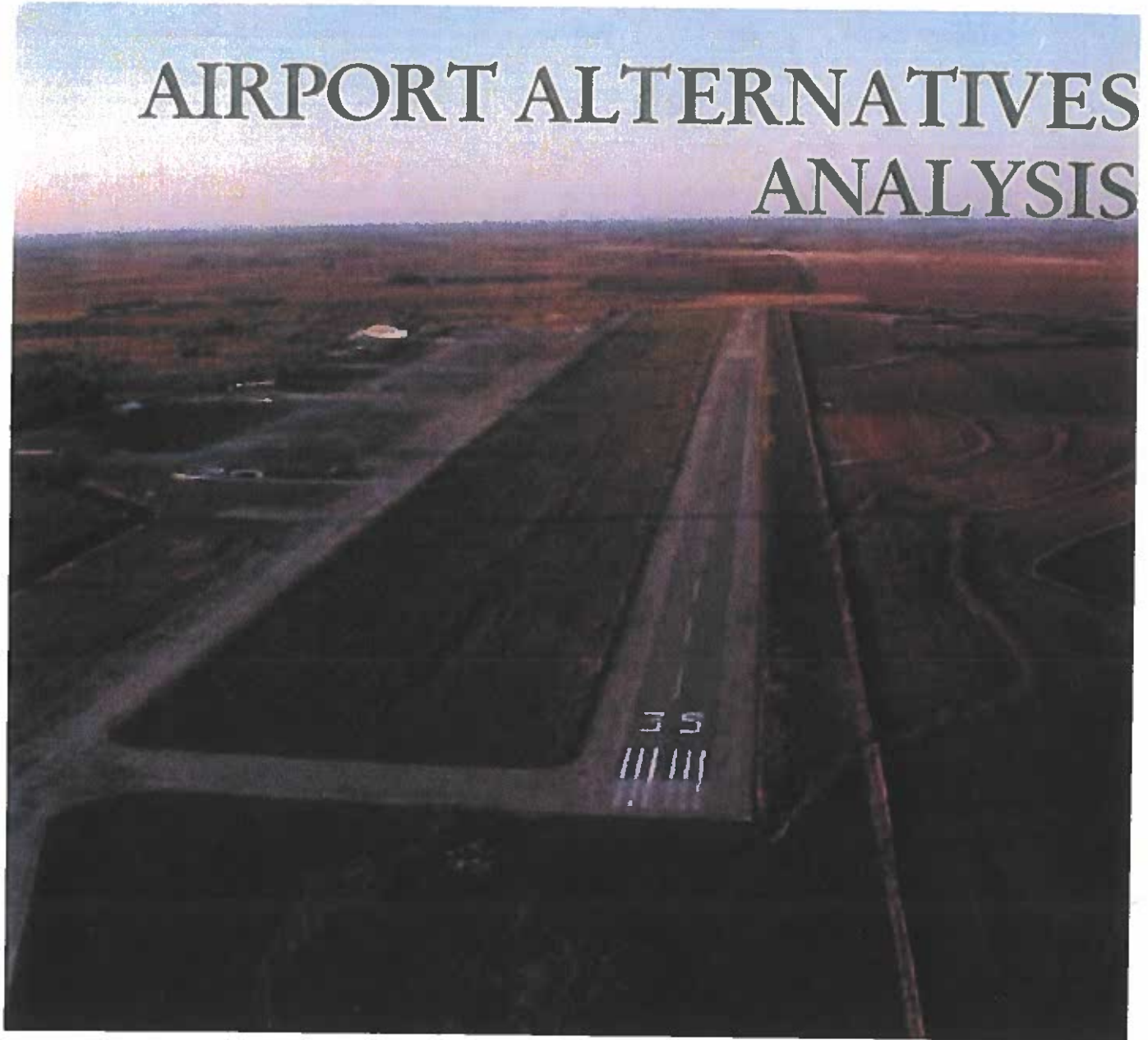
Table 4.6 summarizes terminal area facility requirements to accommodate activity projected for the Herington Regional Airport for each of the three phases spanning the 20-year planning period.

Table 4.6 Summary – Landside/Terminal Facility Requirements Herington Regional Airport				
Facility	Existing	Phase 1 (0-5) Short-Term	Phase 2 (6-10) Mid-Term	Phase 3 (11-20) Long-Term
Based Aircraft:	9	10	17	20
Annual Operations:	2,700	3,060	5,304	6,500
Peak Hour Passengers:	2.2	2.7	3.9	5.4
Apron Tie-Down Area:	2,621 S.Y.	2,579 S.Y.	4,432 S.Y.	5,338 S.Y.
Apron Tie-Downs:	6	7	11	14
T-Hangars:	10,740 S.F.	12,000 S.F.	19,200 S.F.	20,400 S.F.
Common/Corporate Hangars:	0 S.F.	3,800 S.F.	5,480 S.F.	10,760 S.F.
Maintenance Hangar:	0 S.F.	0 S.F.	0 S.F.	1,600 S.F.
Total Hangar Space:	10,740 S.F.	15,800 S.F.	24,680 S.F.	32,760 S.F.
Terminal Building Size:	432 S.F.	542 S.F.	817 S.F.	1,504 S.F.
Fuel Storage				
Total Annual Fuel Sales:	1,000 Gal.	1,260 Gal.	1,550 Gal.	2,400 Gal.
Average Monthly Fuel Sales:	83 Gal.	105 Gal.	130 Gal.	200 Gal.
Storage Volume (100LL):	1,000 Gal.	1,000 Gal.	1,000 Gal.	4,000 Gal.
Storage Volume (Jet A):	0 Gal.	0 Gal.	0 Gal.	1,000 Gal.
Total Fuel Storage Volume:	1,000 Gal.	1,000 Gal.	1,000 Gal.	5,000 Gal.
Paved Auto Parking Area:	11,578 S.F.	588 S.F.	860 S.F.	1,166 S.F.
Auto Parking Spaces:	6	3	4	5
Note: Apron tie-downs based on small aircraft (single and light twin-propeller aircraft less than 12,500 lbs). Note: Hangars assume ownership by both public and private entities. Note: Annual fuel sales rounded to the nearest '000. Monthly fuel sales rounded to nearest '00.				

Source: BWR, Facility Requirement Summary – August 2003.

CHAPTER FIVE

AIRPORT ALTERNATIVES ANALYSIS



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AIRPORT ALTERNATIVES ANALYSIS

ALTERNATIVE EVALUATION ANALYSIS

The goal of the airport alternatives chapter is to present various airfield and terminal area design options intended to meet future aviation forecast demand at the Herington Regional Airport. These alternatives are based on the facility design requirements (Chapter 4) established by the airport user surveys and interviews. Although Chapter 4 outlines the minimum design requirements to satisfy future aviation needs as forecasted, they should not be limited to a degree that would preclude protection of the airfield for ultimate airfield development beyond the 20-year scope of this Study. Each alternative, including associated impacts, will be evaluated by the Planning Advisory Committee (PAC) to determine a *preferred* alternative, or course of action. This preferred alternative will be the basis for the ultimate development strategy and shown in the Airport Layout Plan (ALP).

The Plan should be regarded as the formulation of a development policy rather than the presentation of a design recommendation. While the assessment of alternatives is based on technical judgment, the most favorable airport improvement option should conform to the local planning policies as outlined in the comprehensive plan and remain consistent with social, economic, political and environmental guidance. In order to determine the best possible course of action, the following factors are strongly considered in the development *and* evaluation of potential design options:

- *Compliance with FAA airport standards and airspace criteria - without modification;*
- *Maintain compatibility with existing and proposed on and off-airport land uses;*
- *Consider short and long-term development costs;*
- *Minimize the consequences of environmental impacts and potential mitigation.*



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Alternative A: Extend and Rehabilitate Runway 17-35. Due to the deteriorating concrete pavement, originally constructed in 1942, there is a need to rehabilitate the entire surface of the Runway. The current Runway 17-35 length is 4,184 feet. As outlined in the Facility Requirements (Chapter 4), Runway 17-35 is approximately 116 feet short of meeting the minimum design requirements for the ARC B-II length of 4,300 feet.

Option 1: Extend Runway 17-35 from 4,184 feet to 4,300 feet. This alternative option would satisfy the minimum ARC B-II design requirement for Runway 17-35, which was determined to be 4,300' x 75'. This extension would start at the south end and add 90 feet to the south of Runway 35 then and extend north to add 26 feet to Runway 17 for a total of 4,300' along the existing runway centerline.

Option 2: Extend Runway 17-35 from 4,184 feet to 4,600 feet. This alternative would satisfy the ARC B-II+10 family of aircraft expected to reach the 500 itinerant operations threshold during the 20-year planning period. Similar to Option 1, the rehabilitation would begin at the south end with an additional 90 feet to Runway 35 then extend north 4,600 feet to the north by adding an additional 326 feet to Runway 17 along the existing runway centerline. The option would assist with the protection of the Airport by reserving additional runway safety areas and local airspace.



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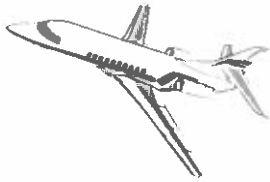
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Alternative B: Consideration should be made regarding a taxiway to serve the ultimate Runway 17-35. Although the Herington Regional Airport is not expected to meet the minimum operational levels for a partial-parallel (10,000 operations), or full-parallel (20,000 operations), these alternatives should be considered due to the fact that the pavement for a taxiway already exists approximately 560 feet from the Runway 17-35 centerline, and planning for a partial or full-parallel taxiway remains consistent with the City's goal of maintaining and preserving the Airport beyond the 20-year planning period.

This alternative involves the reconstruction of a portion of the existing concrete pavement taxiway that was constructed as part of the original Army Air Field in 1942. This pavement has deteriorated through the years and has not received any pavement maintenance. Most of the taxiway construction would involve the rehabilitation of the original pavement along the centerline of the taxiway at a design width of 35 feet. The future taxiway would include medium-intensity taxiway lights (MITL's) installed at the pavement edge. This step would include burying the lights and cables into the existing pavement.

Option 1: Construct partial parallel taxiway from Runway 35 end to the mid-field connector taxiway (2,590' x 35'). This option would require the rehabilitation the existing concrete pavement along the taxiway centerline.

Option 2: Construct a full-parallel taxiway from Runway 35 end to the ultimate Runway 17 end (3,820' x 35'). Similar to Option 1, this taxiway option would take advantage of the existing concrete pavement and would include the new construction of the end connector for the Runway 17 end. The north end of the taxiway would slant towards the runway to avoid existing leased property to the north.



“PREFERRED” ALTERNATIVE DESIGN

Following the presentation of each design alternative and option, the PAC discussed each runway and taxiway combination and decided to choose **Alternative C, Option 2** which calls for a 4,600' x 75' ARC B-II+10 runway with parallel taxiway. This design was selected based on the future design aircraft (King Air B200) which is a Category B-II+10 aircraft. Notwithstanding, the PAC chose this design with the understanding that the ultimate runway length and parallel taxiway would not be eligible for Federal and/or State funding until such time adequate justification for its need could be provided. Furthermore, this design enables the City of Herington to protect future airport safety areas and runway protection zones.

TERMINAL AREA ALTERNATIVES

Expansion of the airport terminal area involves additional aircraft T-hangars, aircraft parking apron, a new additional tie-downs.

The major components of the new terminal area expansion design are based on the following needs:

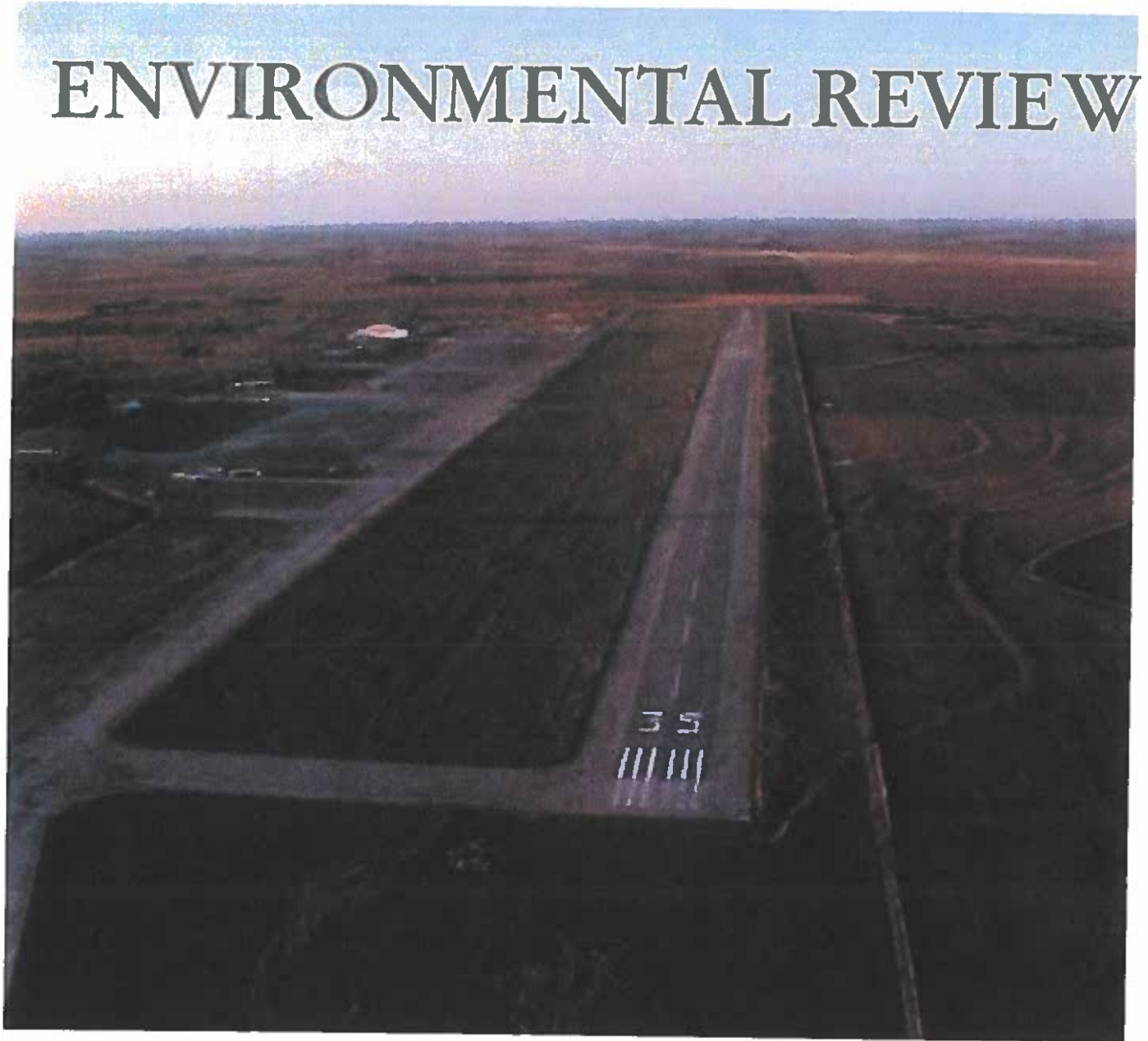
- Larger aircraft tie-down apron;
- Additional T-hangars;
- Space for corporate hangars; and
- Auto access to the terminal facilities.

The development of the terminal area focuses on the following design concepts:

- Maintaining a centralized general aviation terminal area concept;
- Adequate line-of-sight for the airfield and terminal area;
- Minimizing new pavement;
- Unobstructed and unobtrusive open-space;
- Adequate provisions for aircraft fueling (fuel system and aircraft clearance);
- Access to existing utilities and consideration of drainage patterns;
- Maintaining a linear flightline;
- Adequate public auto parking adjacent to the terminal building; and
- Providing for FBO expansion of operations and service.

CHAPTER SIX

ENVIRONMENTAL REVIEW



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ENVIRONMENTAL REVIEW

PURPOSE

The purpose of the Environmental Review (ER) is to collect and document environmental information obtained during the course of the Master Plan Update. It is intended to identify any significant environmental impacts of the proposed development that may require additional analysis, such as the need for a full Environmental Assessment prior to initiating ultimate airport improvements. In addition, copies of all response letters received from each agency listed in this chapter will be available in the appendix. The data contained in this review is primarily for informational purposes and to highlight areas of environmental concerns as expressed by local, state and federal agencies from which correspondence was received. The ER process involves two primary steps:

- ➔ Review existing conditions to establish a baseline for any subsequent environmental or permitting requirements; and
- ➔ Identify development recommendations that may require further environmental study along with possible mitigation strategies.

PROJECT NEED

The need for improvements at the Herington Regional Airport has been identified based on existing and future demand for aviation facilities. As a public transportation facility, the Airport is an integral part of the community, providing access for business travel, agricultural use, and emergency medical services, as well as flight training and recreational flying. In order to accommodate current and future aviation activity, physical improvements are needed at the Airport. The major improvements include: extension of the primary runway; construction of a parallel taxiway; construction of new aircraft hangars; paving additional aircraft parking apron; and installation of a new rotating beacon in the terminal area. It should be noted that the proposed airport improvements will occur on existing airport property. The runway extension will occur on a section of previously decommissioned runway. Parts of the parallel taxiway, aircraft parking apron and T-hangar taxilane will be placed on previously used taxiway and apron that was originally constructed in the 1940's but was abandoned due to maintenance costs and facility needs.



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- To provide reasonable opportunities for viable economic uses of the land while recognizing and establishing appropriate measures to balance the land use interests with the airport influences.

The City of Herington has indicated that the Airport Master Plan will be considered as a guide to compatible land use planning around the Airport. As part of this pledge, the City has submitted a Letter of Assurance, as required by Section 511(a)(5) of the Airport and Airway Improvement Act of 1982, to emphasize their commitment toward encouraging the continuation of compatible land use in the area around the Airport (see appendix).

The airport development plan incorporates the following land use concepts and design criteria:

- Land use is delineated by aeronautical use requirements at the Airport, including safety areas identified for both the airport user and general public;
- Land uses adjacent to the aeronautical use areas have been established to maximize airport revenue in order to offset operating costs and capital investment.

Airport Noise Attenuation: The compatibility of existing and planned land uses in the vicinity of an airport is normally associated with the extent of noise impacts caused from aircraft operations on the airfield. It should be noted that the responsibility for determining the acceptable, permissible, and compatible land use remains with local authorities in response to local needs and values.

On-Airport Agricultural Land Use: Agricultural uses can be used for buffer areas within the runway protection zones and the building restriction lines. However, these areas should be farmed in low profile, non-grain crops. Grain crops often attract birds; therefore, they should be avoided in areas directly adjacent to the runway. Crops over four feet in height should be avoided to maintain runway approach clearances and runway visibility requirements. The height of allowable vegetation is contingent on terrain features and elevation differences. Agricultural activities are not permitted within the runway safety areas, obstacle free zones, and navigational and weather aid critical and safety areas.

Property Regulation: There are many techniques for regulating development to bring about conversion or modification of existing land uses to achieve greater compatibility between the Airport and its environs, including multi-governmental jurisdictional authorities. Some regulating techniques may include controls such as zoning, development regulations, or building codes; other methods influence development through acquisition or taxing power. No single technique will satisfy all the requirements for implementing a compatible land use plan. Since each technique has its advantages and disadvantages, a combination of strategies should be evaluated. Regulations that control land use around airports consist of two sections which may be combined in a single ordinance: 1) zoning to achieve land use compatible with noise and other environmental effects of the Airport, and 2) height and hazard zoning, which controls the locations of potential obstructions



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FAA Order 5050.4A Airport Environmental Handbook outlines the criteria regarding the necessity for an air quality analysis, based on existing and forecast levels of annual airport operations. The Handbook states that “no air quality analysis is needed when the proposed project is a general aviation airport with less than 180,000 operations forecast annually.” Since the forecast annual operations (5,320) will not exceed 180,000 during the 20-year planning period, an air quality analysis is not required.

The airport development project will comply with the 40 Code of Federal Regulations, New Source Performance Standards, (CFR Part 60, Subpart K) for controlling area-wide pollution impacts. All appropriate federal and state permits required, such as open burning, fueling facilities, and concrete batch plant operations, would be obtained by the Airport Sponsor prior to the commencement of these activities. Measures will be incorporated, in accordance to FAA Advisory Circular 150/5370-10A, Standards for Specifying Construction of Airports, Item P156, to minimize adverse air quality effects including control of air pollution during construction. Additionally, dust suppression techniques will be used as necessary, including spraying disturbed areas with water periodically or using approved dust palliatives.

WATER QUALITY

FAA Order 5050.4A, Paragraph 47e (6) (b), requires a water quality certification for approval of an application project including a new airport location, a major runway extension, or major runway relocation. Water impacts from airport construction for on and off-airport water quality are usually in the form of non-point source pollution, surface runoff, alterations in natural drainage patterns, disturbance of wetland habitat, and storage of petroleum products.

The US Army Corps of Engineers, Kansas Department of Health and Environment, and Kansas Water Office are typically contacted to comment on the proposed airport development concerning water issues. However, given the circumstances surrounding this project it was not necessary to contact them since the proposed development will occur on existing airport property. Section 401 of the Federal Clean Water Act (CWA) states that “a proposed CWA Section 404 Permit will not violate water quality standards.”

Direct contamination of water sources near the Airport is a possibility based on the proposed development plan. The following actions should be followed for FAA compliance:

- All waste materials produced by the construction project shall be disposed of in accordance with the provisions of the FAA AC 150/5370-10A;
- Following the completion of the project, including equipment staging, disturbed areas shall be expeditiously stabilized with re-vegetation of native grass or other appropriate non-polluting material.



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site. In the mean time, work may continue in the project area where no cultural materials have been encountered.

BIOTIC COMMUNITIES

Consideration of endangered and threatened species is required under the Endangered Species Act of 1973 to determine potential biotic impacts on wildlife resources from the proposed development at the Airport. The US Fish and Wildlife Service and Kansas Department of Wildlife and Parks were contacted for comments and information regarding potential impacts regarding the population and location of wildlife, waterfowl resources, and aquatic life in the vicinity of the Herington Regional Airport.

The US Fish and Wildlife Service reply indicated “there should be no adverse impacts to fish and wildlife resources, including threatened and endangered species.” Additionally they stated that the project will occur within the previously developed airport perimeter and conclude that no threatened and endangered species are likely to be present in the project area. The Kansas Wildlife and Parks Department response indicated the project should not impact any of the named resources and no special mitigation measures are necessary. Furthermore, no Department of Wildlife and Parks permits or special authorizations are needed.

Overall, based on the information received, further investigation will not be necessary to ensure no significant negative impacts to biological resources are encountered by the proposed airport development plan at the Herington Regional Airport.

ENDANGERED and THREATENED SPECIES

The Endangered Species Act of 1973 protects listed species against killing, harming, harassment, or any other action that may damage their habitat. FAA Order 5050.4A, Paragraph 47e (10) describes the procedures to determine the impacts on endangered or threatened species. The US Fish and Wildlife Service, and Kansas Wildlife and Parks Department were contacted regarding impacts to threatened or endangered species due to the proposed airport development plan. The US Fish and Wildlife Service correspondence indicated that there should be no adverse impacts to threatened and endangered species. The State of Kansas Wildlife and Parks Department response verified the fact that no threatened or endangered species or their habitat occur in the project area. The project does not require any special permitting from either the US Fish and Wildlife Service or the Kansas Wildlife and Parks Department.

WETLANDS

The US Army Corps of Engineers has regulatory jurisdiction over wetlands and waters of the United States pursuant to the provisions of Section 404 of the Clean Water Act (33 USC 1344). The National Resource Conservation Service (NRCS) is the lead agency responsible for wetland



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A search of the FEMA website indicated that a FIRM map is not available for the Herington Regional Airport in Morris County, Kansas.

PRIME and UNIQUE FARMLANDS

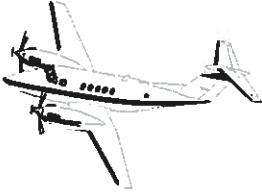
The Farmland Protection Policy Act (FPPA) addresses the impacts for conversion of farmland to non-agricultural use based on the proposed airport project. However, since the proposed project occurs on existing airport property and within existing airport operations area, a formal review will not be required. Typically, a formal review is completed by the United States Department of Agriculture, Natural Resource Conservation Service (USDA-NRCS) to determine whether any land to be taken out of production is protected by the FPPA. The USDA-NRCS uses the Farmland Conversion Impact Rating Form (AD-1006) for the Airport and the proposed development. Site assessment points are determined based on criteria in the Code of Federal Regulations 658.5(b) when the land immediately surrounding the Airport is primarily in agricultural production. The significance of the farmland impact is based on the values derived from the USDA-NRCS (Title 7 of the Code of Federal Regulation, Part 658 Farmland Protection Policy; Final Rule, July 5, 1984) as follows:

- ➔ Less than 160 total points - no further action is necessary
- ➔ Above 160 total points - potential adverse impact, with consideration of the following:
 - Acquire land that is not farmland protected by the Farmland Protection Policy Act.
 - Use existing airport-owned land instead of acquiring new land.
 - Alternative sites or airport layouts that would serve the proposed purpose but convert either fewer acres of farmland or other farmland with a lower relative value.

Since the proposed development does not impact any “prime and unique” farmland, no further study is required.

ENERGY SUPPLY and NATURAL RESOURCES

Additional airport development will demand more energy to operate, expand, and improve airfield and terminal area facilities, with airfield lighting constituting the primary energy demand. However, no airport equipment is recommended during the forecast period that would result in appreciable changes to energy demands consumed by the Airport. In addition, the Airport is within a reasonable distance of major transportation corridors and major utilities. Construction and maintenance projects at the Airport will require an expenditure of energy and resources that can be provided locally. Energy consumption in terms of access to the Airport and the ability of power companies to serve the Airport will be minimized. The proposed airport projects will not cause any major changes in stationary facilities or in movement of air, and will not result in ground vehicles producing measurable effects on the supply of energy or natural resources.



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soil additives and prompt reseedling will minimize potential soil erosion after construction. During construction, every effort will be made to retain natural drainage patterns on the Airport site and on-airport drainage will be rerouted to maintain existing drainage patterns on adjacent property to the greatest extent possible. Waste material generated during construction, such as cardboard package material, metal containers and paper, will be disposed of during construction and transported to the state-approved sanitary landfill.

According to AC 150/5370-10 Section 70-02, the contractor shall procure all permits and licenses, pay all charges and taxes, and give all notices necessary and incidental to the due and lawful prosecution of the work.

HAZARDOUS MATERIAL

There are no identified hazardous waste sites in the proposed development area on the National Priority List in accordance with the Comprehensive Environmental Response Compensation and Liability Act as amended by the Superfund Amendment and Reauthorization Act. However, there is a hazardous material cleanup effort currently underway west of the project area, outside of the airport operations area. This hazardous material cleanup site will not impact the proposed airport improvements and no further study is expected.

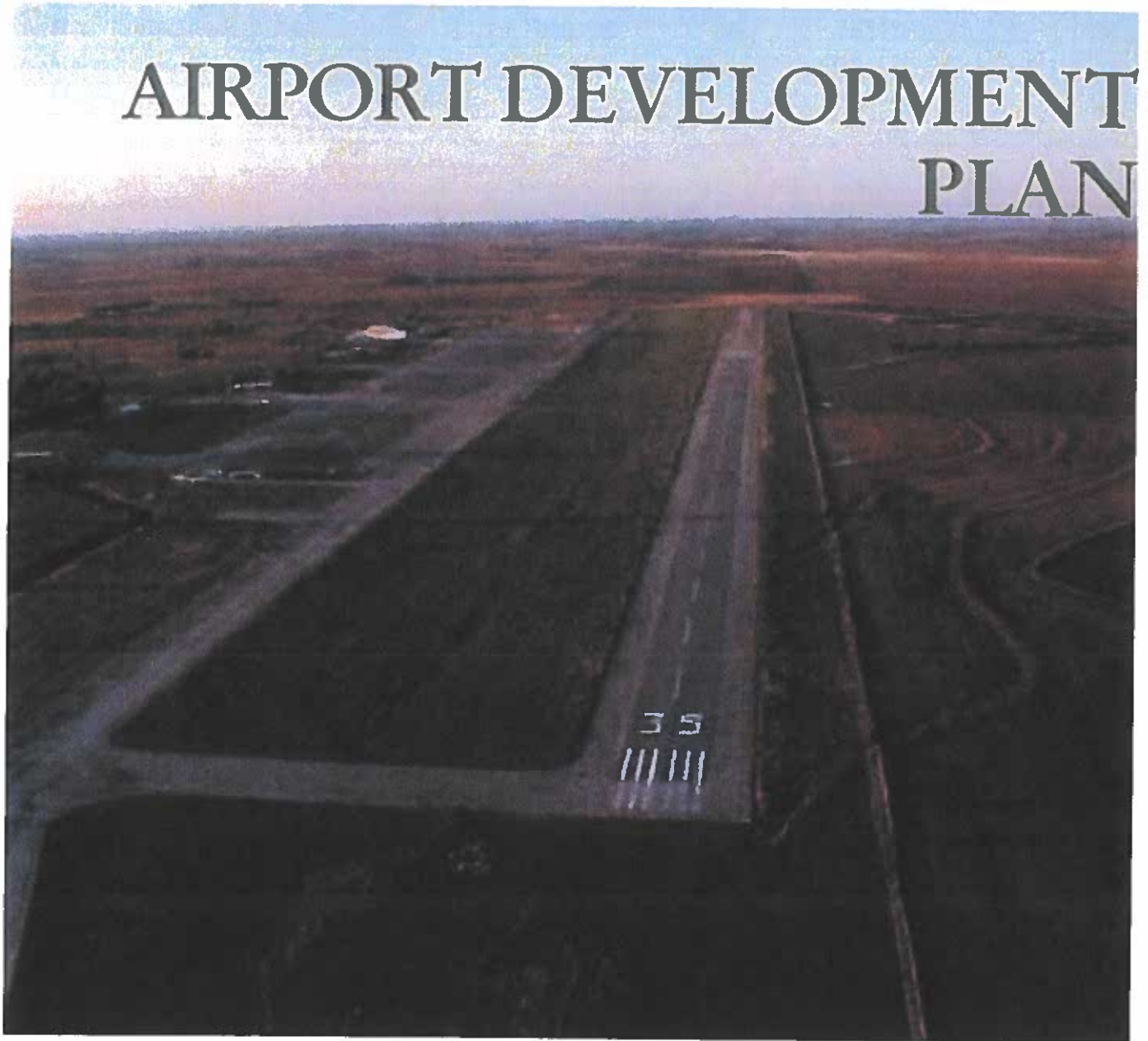
ENVIRONMENTAL JUSTICE

Environmental Justice is the fair treatment and meaningful involvement of all people regardless of race, color, national origin, or income with respect to the development, implementation, and enforcement of environmental laws, regulations, and policies. Fair treatment means that no racial, ethnic, or a socioeconomic group of people should bear a disproportionate share of the negative environmental consequences resulting from the proposed development at the Airport. Potentially affected community residents should be given an appropriate opportunity to participate in decisions about a proposed activity that will affect their environment and/or health. As a result, the public's contribution can influence the regulatory agency's decision with the concerns of all participants involved in the decision making process and with the decision makers seeking to facilitate the involvement of those potentially affected.

The overall goal of environmental justice is achieved when everyone, regardless of race, culture, or income, enjoys the same degree of protection from environmental and health hazards and equal access to the decision-making process to have a healthy environment in which to live, learn, and work. Based on the proposed development, no residents in the community are to be affected directly.

CHAPTER SEVEN

AIRPORT DEVELOPMENT PLAN



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7

AIRPORT DEVELOPMENT PLAN

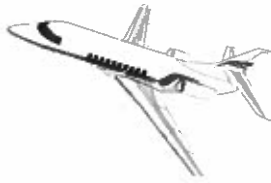
INTRODUCTION

The Airport Development Plan Chapter is used to provide a phased schedule of airport improvements based on existing conditions and ultimate facility needs. This chapter incorporates the aviation demand forecasts (Chapter 3) and facility requirements (Chapter 4) for the Herington Regional Airport into a 20-year phased development plan in based on the “preferred” future alternative discussed in Chapter 5. This development plan provides a strategic approach for implementing and continuing facility maintenance, upgrade, and expansion in accordance with the ultimate role of the Airport.

Each project has been organized in chronological order to preserve the integrity of the Airport and to meet airport design standards. Each development phase consists of a series of projects as part of the ultimate development concept. The scheduling of projects within each development phase is prioritized to permit improvements in a logical and coordinated fashion. Each project is prioritized with respect to existing and future requirements, as identified by:

- 1) airport safety-related requirements,
- 2) demand levels,
- 3) environmental compatibility,
- 4) potential revenue sources, including FAA planning projects and funding levels, and
- 5) recognition of other airport improvements and major public works programs and projects.

It should be noted that this development plan does not obligate State (KDOT), local, or federal funds, nor does it require a funding commitment without justification of need based on demand levels. Additionally, the expressed desire, intent, and ability of the City of Herington to achieve airport land use compatibility, coupled with favorable community and business support of the Airport, remains an important funding consideration.



HERINGTON REGIONAL AIRPORT

AIRPORT MASTER PLAN UPDATE

PHASE I (0-5 YEAR PERIOD)

PROPERTY AND EASEMENTS

- ◆ None Required

RUNWAY AND TAXIWAYS

- ◆ Rehabilitate Runway 17-35 4,184' x 75'; 30,000 lbs SWG)
 - ◆ Pavement Removal (36,307 S.Y.)
 - ◆ Construct Turnaround
 - ◆ Install New Electrical Equipment (Vault, Lighting and Wiring)
- ◆ Rehabilitate/Widen Taxiway Connector (978' x 35'; 30,000 lbs SWG)
- ◆ Install Runway End Identifier Lights (REIL's)
- ◆ Install Precision Approach Path Indicators (PAPI-4L)

TERMINAL AREA

- ◆ Rehabilitate Aircraft Parking Apron (2,261 S.Y.)
- ◆ Install Airport Rotating Beacon

OTHER PROJECTS (CAPITAL)

- ◆ Purchase Airport Courtesy Car

OTHER PROJECTS (NON-CAPITAL)

- ◆ Adopt Standard Airport Operating and Hangar Lease Agreements
- ◆ Adopt "Airport Height and Hazard Zoning"
- ◆ Implement Fuel Spill Prevention Plan



HERINGTON REGIONAL AIRPORT

AIRPORT MASTER PLAN UPDATE

PHASE II (6-10 YEAR PERIOD)

PROPERTY AND EASEMENTS

- ◆ None Required

RUNWAYS AND TAXIWAYS

- ◆ Construct Partial Parallel Taxiway (2,650' x 35'; 30,000 lbs SWG) and Connectors (510' x 35')
- ◆ Construct Turnaround – North End (1,749 S.Y.)
- ◆ Clean and Seal Existing Joints and Cracks (30,000 L.F.)

TERMINAL AREA

- ◆ Expand Aircraft Parking Apron and Taxilane (12,525 S.Y.)
- ◆ Construct 10-Unit T-Hangar (12,474 S.F.)
- ◆ Construct Common Hangar (4,900 S.F.)
- ◆ Install Terminal Area Fencing (4,680 L.F.)
- ◆ Install Auto Access Gates



HERINGTON REGIONAL AIRPORT

AIRPORT MASTER PLAN UPDATE

PHASE III (11-20 YEAR PERIOD)

PROPERTY AND EASEMENTS

- ◆ None Required

RUNWAYS AND TAXIWAYS

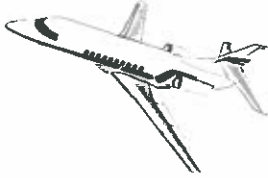
- ◆ Extend Runway 17-35 (416' x 75'; 30,000 lbs SWG)
- ◆ Extend Parallel Taxiway (1,100' x 35'; 30,000 lbs SWG)

TERMINAL AREA

- ◆ Construct 10-Unit T-Hangars (12,474 S.F.)
- ◆ Construct Common Hangar (4,900 S.F.)
- ◆ Construct Common Hangar (4,900 S.F.)
- ◆ Expand Terminal Building (1,072 S.F.)
- ◆ Install Above Ground (100 LL) AVGAS Fuel System (4,000 Gallon)
- ◆ Install Above Ground (Jet-A) Fuel System (1,000 Gallon)

OTHER AIRFIELD

- ◆ Install Automated Weather Observation System (AWOS)



HERINGTON REGIONAL AIRPORT

AIRPORT MASTER PLAN UPDATE

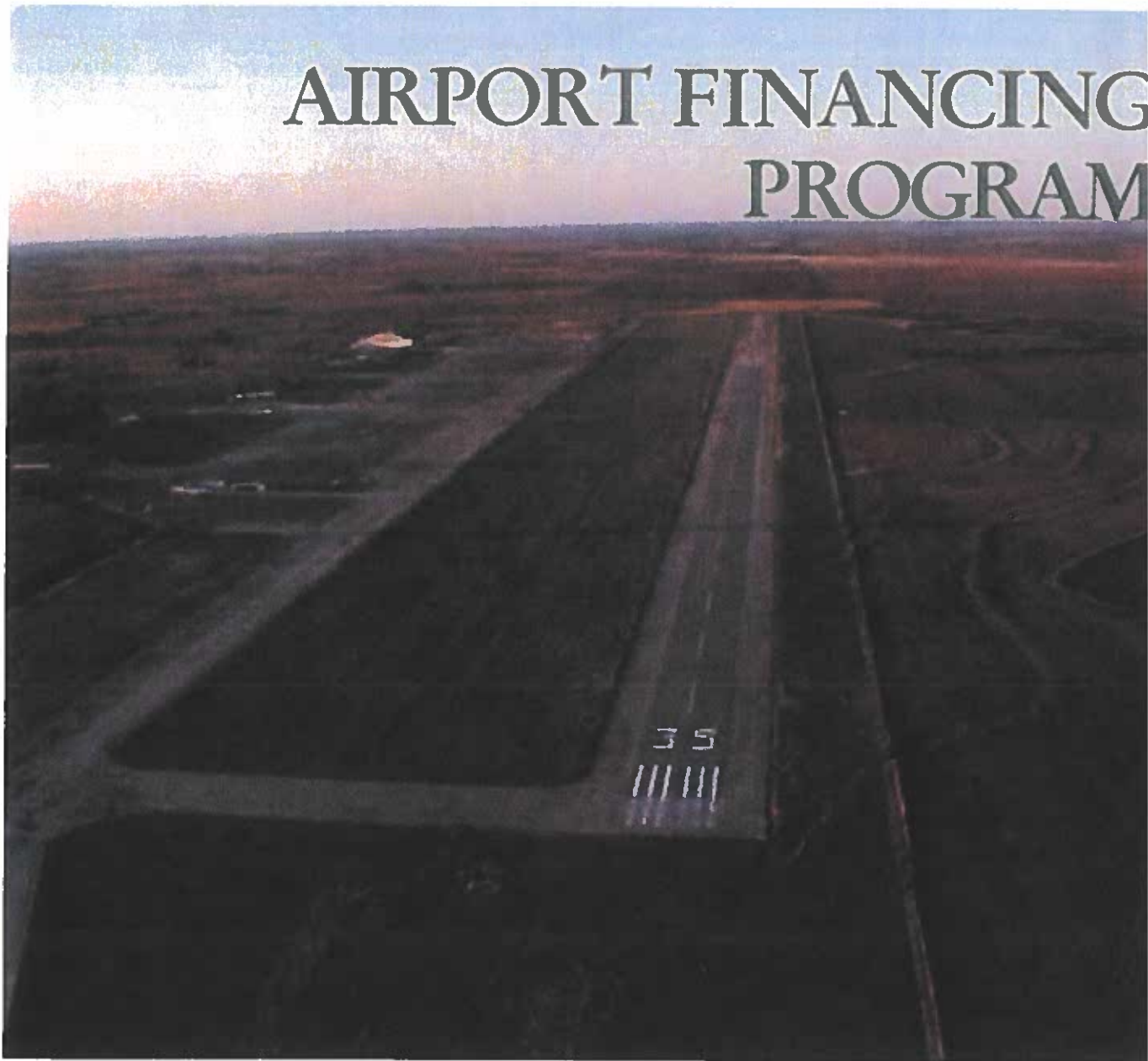
Table 7.4 shows the development costs for all three phases of the ultimate airport improvements. These costs are estimated in FY 2006 dollars and are not adjusted to show any sort of inflation over the 20-year phased development period.

Table 7.4 0-20 Year Development Plan Totals Herington Regional Airport			
Phased Development Costs	Local/Private Cost	MoDOT/FAA Cost	Total Cost
Phase I			\$3,006,116
Phase II			\$2,368,174
Phase III			\$2,981,230
Subtotal Development Costs			
Engineering, Administrative and Legal Costs			
Total Project Costs			
Note 1: Eligible projects reflect funding at 95% State / 5% Local, unless otherwise noted.			

Source: BWR Cost Estimates – January 2006.

CHAPTER EIGHT

AIRPORT FINANCING PROGRAM



*HERINGTON REGIONAL AIRPORT
MASTER PLAN UPDATE*



8

AIRPORT FINANCING PROGRAM

INTRODUCTION

The goal of this chapter is to evaluate the financial status and project the future airport budget based on historical information and planned development in order to determine the obligation for owning and operating the Herington Regional Airport. The Airport Financing Program chapter explores:

- ➔ Financial Plan / Funding Sources;
- ➔ Airport Operating Expenses;
- ➔ Airport Development Plan;
- ➔ Development Cost Estimates;
- ➔ Multi-Year Airport Capital Improvement Program

The intention of this chapter is to analyze the financial situation at the Airport in order to outline methods to assist the Airport Sponsor in the phased implementation of the Airport Capital Improvement Program (ACIP). At Herington, a combination of federal, state and local funding, in addition to private financing, would be required during the 20-year planning period to implement the proposed ACIP.

FUNDING SOURCES AND OPTIONS

Funding for general aviation airports is typically available from federal, state and local sources. The Herington Regional Airport is recognized in the FAA *National Plan of Integrated Airport Systems* (NPIAS) and included in the *Kansas State Aviation System Plan* (1992 – 1993), which qualifies it for federal and state airport funding consideration.

FEDERAL AVIATION ADMINISTRATION (FAA) FUNDING

The *Airport Improvement Program* (AIP) provides federal planning and development grants to public-use airports included in the NPIAS. The *Airport and Airway Trust Fund* is the source of AIP funds which are collected through aviation user-generated taxes (airline passenger tax, aircraft parts and fuel), and appropriated by Congress for eligible airport construction and improvement projects (none of the AIP money originates from general tax dollars). The current system of federal airport funds is distributed by formula and discretion in accordance with provisions contained in the *Airport and Airways Improvement Act of 1982*, as amended. FAA Order 5100.38A, *Airport Improvement Program (AIP) Handbook*, provides guidance and describes policies and administrative procedures for funding AIP projects.



HERINGTON REGIONAL AIRPORT

AIRPORT MASTER PLAN UPDATE

Division of Aviation will assist local sponsors with application review and coordination ensuring accuracy and timeliness.

The KAIP identifies three project categories for potential state funding: 1) maintenance projects, 2) airport improvements, and 3) facilities and equipment. The maintenance related projects, which can incorporate KDOT maintenance procedures and recommendations, involve routine improvements not involving a modification in runway length, width, or alignment. The airport improvement projects consist of any changes in length, width, alignment, line-of-sight factors, or obstruction clearances, and must comply with FAA design standards. The facilities and equipment category consists of electronic airport equipment that enhances the safety and utilization of the airport, and can include off-the-shelf FAA approved devices to be installed in accordance with FAA standards.

The Airport Sponsor's population determines the State's participation level in project funding. Sponsors with populations greater than 10,000 participate on a 50 percent state / 50 percent local basis, while sponsors with populations between 10,000 and 3,000 are funded at 75 percent state / 25 percent local. If a sponsor's population is less than 3,000 the State's participation level is 90 percent with the local sponsor responsible for the remaining 10 percent. The maximum KDOT participation in any one project is set at \$1,000,000. State funds are eligible for construction only. The Airport Sponsor will be responsible for letting the contract bids and supervision of construction as part of the KAIP.

LOCAL FUNDING

The local funding requirement for eligible AIP or State-funded projects normally requires a percentage of the total project development cost. However, funding for non-eligible airport projects typically requires 100 percent local funding, and can be a significant portion of total airport development costs. The City operates the Airport from a dedicated airport fund which derives its funds through aviation and airport income/ground lease revenues, and grants.

PRIVATE FINANCING

Additional sources of revenue and assistance have historically been used at general aviation airports to fund or finance airport improvements. These funds are sometimes generated through public agencies in the form of donations, grants, leases, or other means such as:

- | | |
|--------------------------------|--|
| ➔ Private/commercial financing | ➔ Non-profit authorizations |
| ➔ State rural/industrial bonds | ➔ Business license tax |
| ➔ Residence lease/rental | ➔ Sale of land for commercial purposes |
| ➔ Bank loans | ➔ Display/advertisement rental |



HERINGTON REGIONAL AIRPORT

AIRPORT MASTER PLAN UPDATE

- 1) Administration;
- 2) Maintenance;
- 3) Utilities; and
- 4) Supplies and miscellaneous.

Administration: Administrative costs include items such as employee salaries, benefits, liability insurance, professional/organizational dues, etc. Administrative costs should remain relatively low since the City only contracts a part-time airport maintenance person for airfield upkeep such as mowing and changing lights and various other tasks required on a day-to-day basis.

Maintenance: General maintenance costs include the day-to-day upkeep of the airfield and terminal area facilities. These costs include runway and apron crack sealing, mowing, snow removal, solid waste disposal, and repairs to all airport-owned equipment and facilities. Maintenance and repairs normally require a substantial amount of capital costs for upkeep and routine rehabilitation of existing and future pavements, equipment and structures.

Utilities: Electricity for the airfield include runway and taxiway lighting, rotating beacon, terminal building lighting, etc., will account for the primary utility expense at the airport. Other utilities for the terminal building include gas, water and telephone. Utilities to privately-owned buildings are paid by the tenants.

Supplies and Miscellaneous: This general category includes those items and commodities required for the day-to-day operation of the airport. These include office supplies, solvents, equipment, postage, etc. At general aviation airports, these costs are normally about 10 percent of total operating expenses.

Table 8-1 illustrates the projected expenses and revenues at the Herington Regional Airport. Previous budgets and expenditures were reviewed and information was incorporated in the projections. As can be seen, operating costs are covered by airport revenues. Additional revenues upon future ground leases are shown beginning after the new runway has been constructed.



HERINGTON REGIONAL AIRPORT

AIRPORT MASTER PLAN UPDATE

LEASE AGREEMENTS

Lease agreements are used by airports to make use of those areas which are not specifically required for aeronautical purposes. The primary purpose of these lease agreements is to supplement the income the airport receives to help offset annual airport operating expenses. Property leases range from ground leases for the construction of private hangars¹ on the airport, to agricultural farming leases, to renting general space in the terminal building. The following are available lease areas and suggested leasing rates based on similar role general aviation (GA) airports in the region.

Terminal Building Area – The future recommended terminal/administration building is planned to be approximately 1,500 square feet in size. On average, a terminal building at a GA airport contains approximately 40% leasable space for office space/air taxi activities. For 2005, average rent for office space would be about \$7.20 per square foot annually, including utilities. The following rental rates should be used:

2005	– \$7.20/square foot/year
2010	– \$7.50/square foot/year
2015	– \$8.00/square foot/year
2020	– \$8.50/square foot/year
2025	– \$9.00/square foot/year

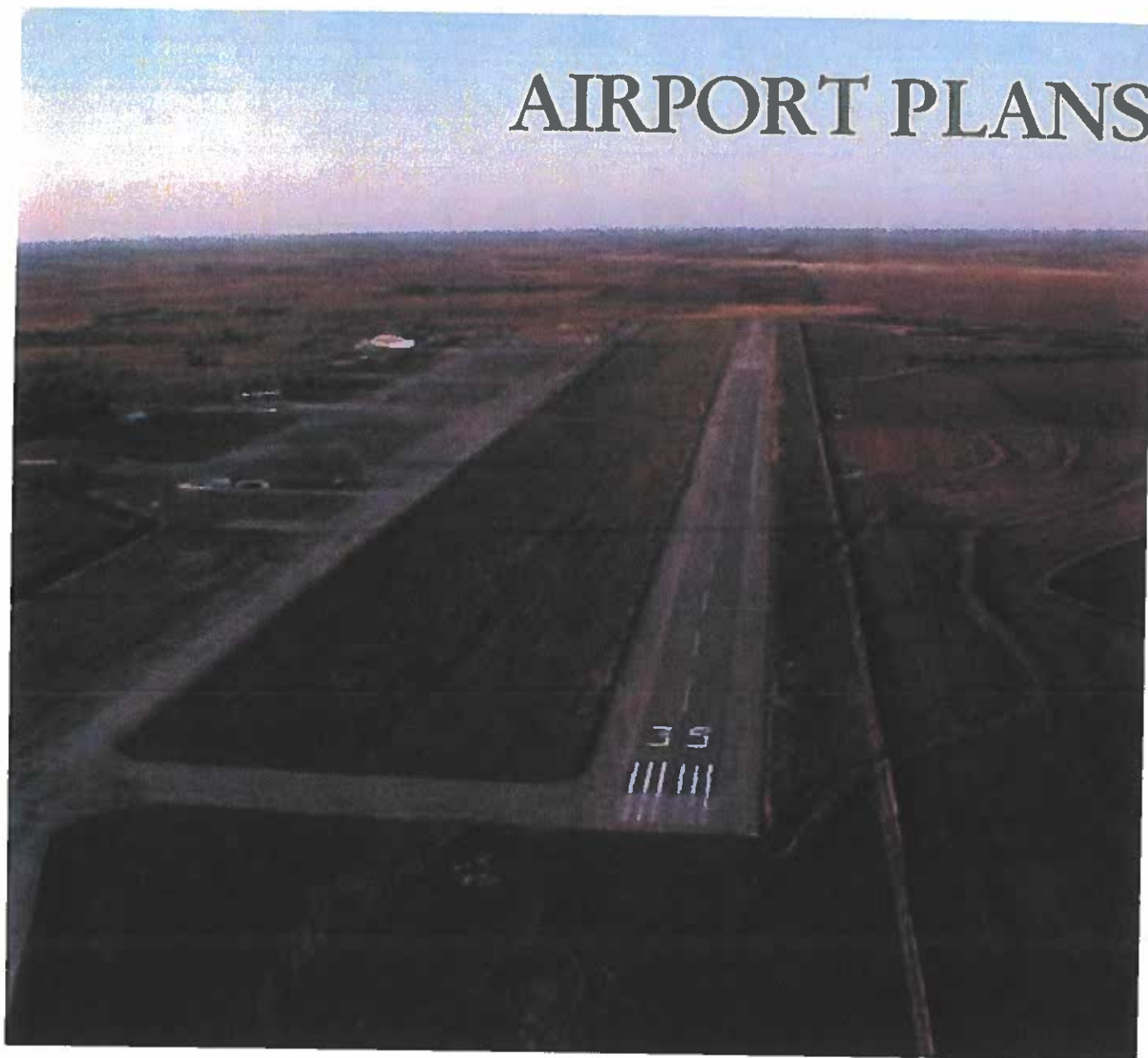
Private T-Hangar Ground Lease Areas – Future terminal area development shows the construction of additional T-hangar space for based aircraft. User rates should be lower than City-owned space to encourage private hangar development. The following suggested lease rates assume that a 3,600 square foot hangar is constructed:

2005	– \$0.25/square foot/year
2010	– \$0.30/square foot/year
2015	– \$0.35/square foot/year
2020	– \$0.40/square foot/year
2025	– \$0.45/square foot/year

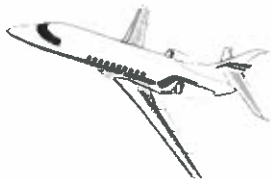
¹ Most private hangars on airport property include a “reversion clause” in the contract which stipulates the hangar becomes the property of the airport sponsor at the end of the specified agreement period, which is normally 20 years.

CHAPTER NINE

AIRPORT PLANS



*HERINGTON REGIONAL AIRPORT
MASTER PLAN UPDATE*



9

AIRPORT PLANS

AIRPORT PLANS

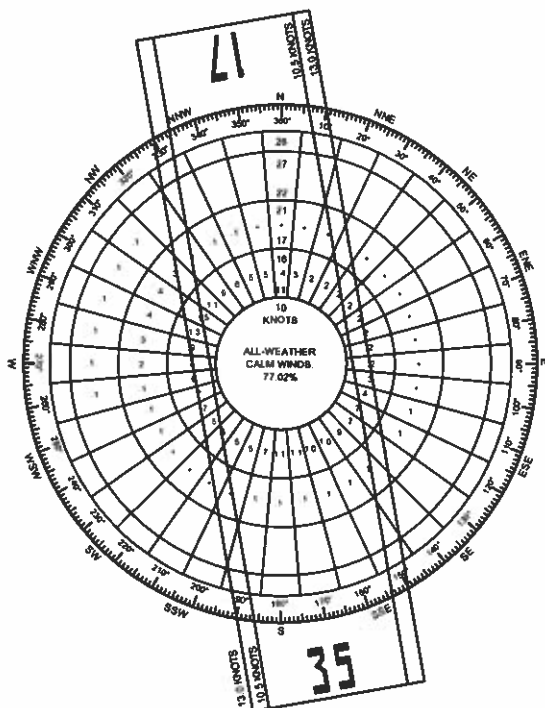
A set of *Airport Layout Plan* (ALP) drawings has been prepared for the Herington Regional Airport, which graphically depicts the proposed facilities for the Airport through the 20-year planning program. The set includes:

Airport Layout Drawing (ALD) – Is a scaled single-page drawing illustrating existing and phased airport development based on the proposed alternative approved by the Planning Advisory Committee (PAC). In addition, the ALD displays minimum clearance and separation distances in accordance with current airport design regulations for existing facilities and ultimate airport development. The ALD is the result of a series of discussions with the PAC to determine the desired course of action in an effort to create a safe and cost-effective facility. The proposed improvements include projects needed to meet the projected aviation demands of the airport service area throughout the 20 year planning period.

Airport Airspace Drawing – Includes a graphical depiction showing the imaginary airspace surfaces based on FAR Part 77 - *Objects Affecting Navigable Airspace*. This regulation is used as a guideline to determine whether existing or proposed structures represent obstructions or penetrations to the FAR Part 77 imaginary surfaces. Once approved by the FAA, the FAR Part 77 airspace is reserved for aeronautical purposes. Therefore, it is recommended that the controlling government agencies adopt *Height and Hazard* zoning to reflect the updated Airspace Drawing, and to the extent reasonable, restrict and enforce the height of structures and objects of natural growth as appropriate within the airspace boundaries.

Runway Inner Portion of the Approach Surface Drawing – This large-scale drawing shows the plan and profile views of the inner approach surfaces and runway protection zones (RPZ's). The plans are designed to identify current and potential structures (roadways, power lines, trees, etc.) in relation to the existing and ultimate runway threshold through determination of the object height (clearance or violation) along the extended runway centerline approach slope. Any violation, or obstruction, is identified with appropriate future mitigation measures.

HERINGTON



LOCATION AND VICINITY MAP



NOT TO SCALE

WIND ROSE ANALYSIS

ALIGNMENT	WIND VELOCITY	ALL-WEATHER WIND COVERAGE
RUNWAY 17-35	10-15 KNOTS (ARC A-J & B-I)	83.47%
	13-20 KNOTS (ARC A-J & B-I)	96.79%

WIND ANALYSIS SOURCE: TOPEKA - FORBES FIELD 1961 - 2000
ALL-WEATHER WIND OBSERVATIONS - 83,630

HERINGTON, KANSAS HERINGTON REGIONAL AIRPORT

TITLE SHEET

JOB NO. 2004-0253	DESIGNED BY: RWC	DATE: 08/28/05	REVISIONS:
DRAWING NO. ONE	DRAWN BY: MFL	DATE: 10/23/06	
SCALE AS SHOWN	CHECKED BY: BCW	DATE: 10/28/06	
SHEET: 1			
OF 8	7200 WARD PARKWAY KANSAS CITY, MISSOURI 64114-3221 (816) 252-3800		

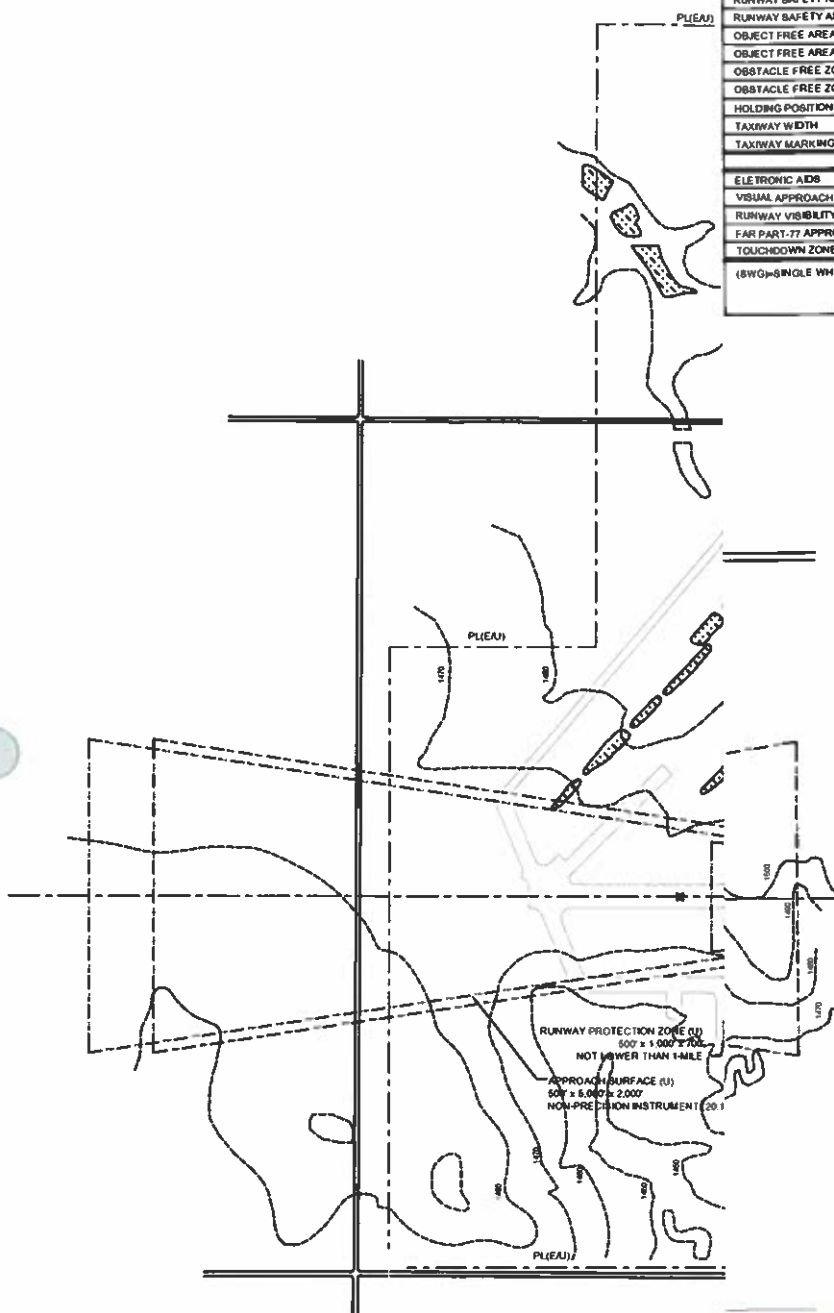
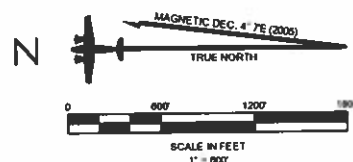
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AIRPORT LAYOUT DRAWING

RUNWAY DATA TABLE				
	RUNWAY 17-35			
	EXISTING		ULTIMATE	
APPROACH CATEGORY/DESIGN GROUP	B-II		B-II +10	
RUNWAY LENGTH/WIDTH	4,184' x 75'		4,800' x 75'	
RUNWAY LIGHTING	MIFL		MIFL	
RUNWAY TYPE/MARKINGS	NON-PRECISION (NP)		NON-PRECISION (NP)	
EFFECTIVE RUNWAY GRADIENT (%)	0.06%		0.05% (EST.)	
PAVEMENT MATERIAL	ASPHALT		ASPHALT	
PAVEMENT STRENGTH (LBS)	36.0 (SWG)58.0 (DWG)		36.0 (SWG)58.0 (DWG)	
RUNWAY SAFETY AREA (RSA) LENGTH	4,784'		5,200'	
RUNWAY SAFETY AREA (RSA) WIDTH	150'		150'	
OBJECT FREE AREA (OFA) LENGTH	4,784'		5,200'	
OBJECT FREE AREA (OFA) WIDTH	500'		500'	
OBSTACLE FREE ZONE (OFZ) LENGTH	4,584'		5,000'	
OBSTACLE FREE ZONE (OFZ) WIDTH	400'		400'	
HOLDING POSITION	125'		200'	
TAXIWAY WIDTH	20'		35'	
TAXIWAY MARKING/LIGHTING	MITL (RADIALS)		MITL	
	17	35	17	35
ELECTRONIC AIDS	NDB/GPS	NDB/GPS	NDB/GPS	NDB/GPS
VISUAL APPROACH AIDS	NONE	NONE	PAPI-4L	PAPI-4L
RUNWAY VISIBILITY MINIMUMS	1-MILE	1-MILE	1-MILE	1-MILE
FAR PART-77 APPROACH SLOPE	20.1	20.1	20.1	20.1
TOUCHDOWN ZONE ELEVATION (TDZE)	1,480.0'	1,480.0'	1,480.0'	1,480.0'

(SWG)=SINGLE WHEEL GEAR (DWG)=DUAL WHEEL GEAR


EXISTING		ULTIMATE		LEGEND
				FACILITIES
				BUILDINGS & STRUCTURES
				AIRPORT PROPERTY LINE
				AVIGATION EASEMENTS
				BUILDING RESTRICTION LINE (BRL)
				RUNWAY SAFETY AREA (RSA)
				OBJECT FREE AREA (OFA)
				RUNWAY PROTECTION ZONE (RPZ)
				OBSTACLE FREE ZONE (OFZ)
				RUNWAY VISIBILITY ZONE (RVZ)
				APPROACH SURFACE (AS)
				AIRPORT REFERENCE POINT (ARP)
				ROTATING BEACON
				PRECISION APPROACH PATH INDICATORS (PAPI-2L)
				HOLD POSITION MARKING
				LIGHTED WIND CONE & SEGMENTED CIRCLE
				RUNWAY THRESHOLD LIGHTS
				RUNWAY END IDENTIFIER LIGHTS (REIL)
				GROUND CONTOUR (USGS MAP)
				FENCING
				PAVED/GRAVEL/DIRT ROADWAY
				CREEK/INTERMITTENT DRAINAGE
				OVERHEAD POWER LINE(S) POLE(S)
				BURIED POWER LINE(S)
				POND/BODY OF WATER
				ABOVE GROUND OIL/GAS WELL/PUMP STATION



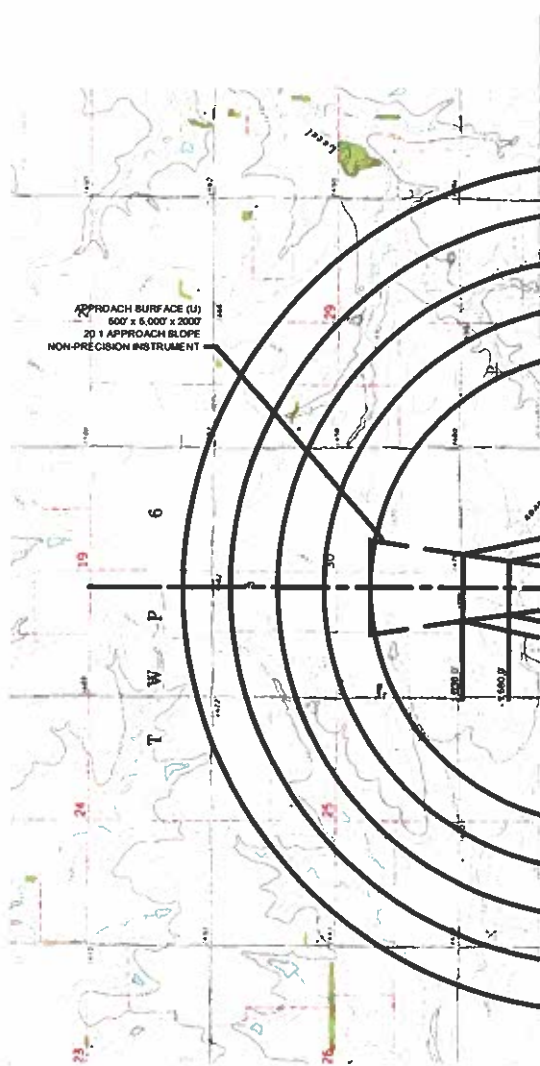
DECLARATION			
EXISTING			
RUNWAY	TORA	TODA	A/D
17	4,184'	4,184'	4,184'
36	4,184'	4,184'	4,184'

RUNWAY LENGTHS BASED ON GEOSIA COORDINATE
AMERICAN VERTICAL DATUM (NAVD 88) DECLARATION

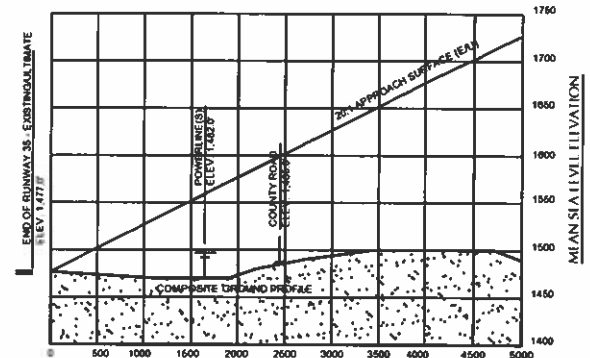
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SUBMITTED BY: <i>Julie K. Schlessener</i>		HERINGTON, KANSAS APPROVAL BLOCK
OFFICIAL TITLE: <i>Mayor</i>	DATE: <i>11-7-06</i>	
<h1>HERINGTON, KANSAS</h1> <h2>HERINGTON REGIONAL AIRPORT</h2> <h3>AIRPORT LAYOUT DRAWING</h3>		
JOB NO. 2004-253	DESIGNED BY: RWC	DATE: 06/29/05
DRAWING NO. TWO	DRAWN BY: MFL	DATE: 10/23/06
SCALE AS SHOWN	CHECKED BY: BCW	DATE: 10/26/06
SHEET: 2	 BUCHER, WILLIS & RATLIFF CORPORATION <small>ENGINEERS ARCHITECTS</small> 7029 VANDER HARBORWAY KANSAS CITY, MISSOURI 64114-3051 (816) 268-2800	
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AIRPORT AIRSPACE DRAWING



END OF RUNWAY 17 - ULTIMATE
ELEV 1470'



END OF RUNWAY 35 - EXISTING ULTIMATE
ELEV 1477'

USGS MAPS

7.5 MINUTE USGS TOPOGRAPHICAL MAPS USED FOR CONTOUR
BASEMAP (YEAR PUBLISHED OR REVISED)
• HERINGTON, KS (1971)
• DELAVAN, KS (1971)

AIRPORT DATA

AIRPORT ELEVATION (E) = 1,480'
HORIZONTAL SURFACE ELEVATION (E) = 1,830'
RUNWAY 17-35 LENGTH (E) = 4,104'
RUNWAY 17-35 LENGTH (U) = 4,000'

HEIGHT RESTRICTION ZONING ORDINANCES/STATUTES

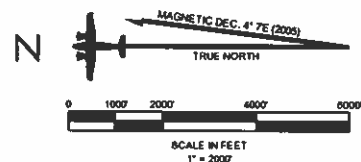
TO DATE, ZONING ORDINANCES HAVE NOT BEEN ADOPTED BY THE AIRPORT SPONSOR (CITY OF HERINGTON, KS) BASED ON FAR PART 77, MORRIS COUNTY, KANSAS WHERE THE AIRPORT IS LOCATED. CURRENTLY DOES NOT PARTICIPATE IN ZONING CONTROLS. THEREFORE, IT IS RECOMMENDED THAT THE AIRPORT SPONSOR, AT MINIMUM, ADOPT A HEIGHT AND HAZARD ZONING ORDINANCE BASED ON THE FAR PART 77 AIRSPACE DRAWING TO REGULATE AND RESTRICT THE HEIGHT OF STRUCTURES AND OBJECTS OF NATURAL GROWTH, TO ASSURE THE RIGHT-OF-FLIGHT OF AIRCRAFT, AND TO REGULATE THE USE OF PROPERTY IN THE VICINITY OF THE AIRPORT. REFER TO THE AIRPORT PROPERTY MAP FOR OWNERSHIP INFORMATION IN THE AIRPORT VICINITY.

NOTES

REFER TO THE PLAN VIEW OF THE INNER PORTION OF THE APPROACH SURFACE DRAWINGS FOR CLOSE-IN AIRPORT OBSTRUCTIONS.
ALL TREES SHOULD BE REMOVED/TOPPED WITHIN THE PRIMARY, TRANSITIONAL, AND APPROACH SURFACES IN ACCORDANCE WITH FAR PART 77. THE APPROACH SURFACE SHOULD BE CLEARED TO ESTABLISH AND MAINTAIN OBSTRUCTION FREE APPROACHES TO EACH RUNWAY END.

A FAA 406 SURVEY WAS NOT COMPLETED DURING THE DEVELOPMENT OF THIS PLANNING STUDY. ELEVATIONS HAVE BEEN OBTAINED FROM THE MOST RECENT USGS MAPPING INFORMATION AND A SURFACE SURVEY COMPLETED BY BWR PERSONNEL.

PER FAA AIRSPACE REVIEW (LETTER DATED OCTOBER 11, 2008) EITHER LOWER STRUCTURE BY 8 FEET LOCATED AT 38° 30' 17" NORTH LATITUDE / 98° 49' 14" WEST LONGITUDE / 1,808 FEET AMSL -OR- ESTABLISH TRAFFIC PATTERNS ON THE EAST SIDE OF THE RUNWAY (NONSTANDARD TURNS TO RUNWAY 17, STANDARD TURNS TO RUNWAY 35).

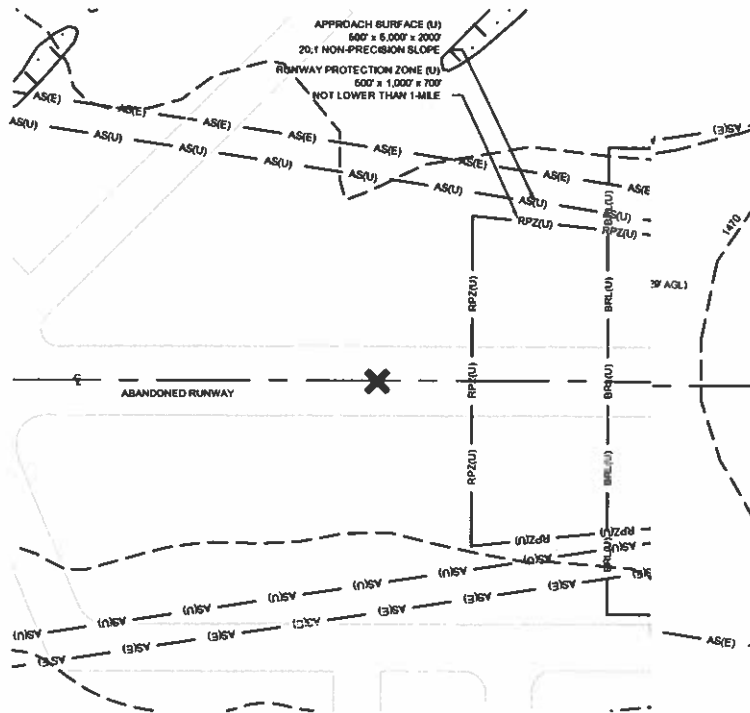


HERINGTON, KANSAS HERINGTON REGIONAL AIRPORT AIRPORT AIRSPACE DRAWING

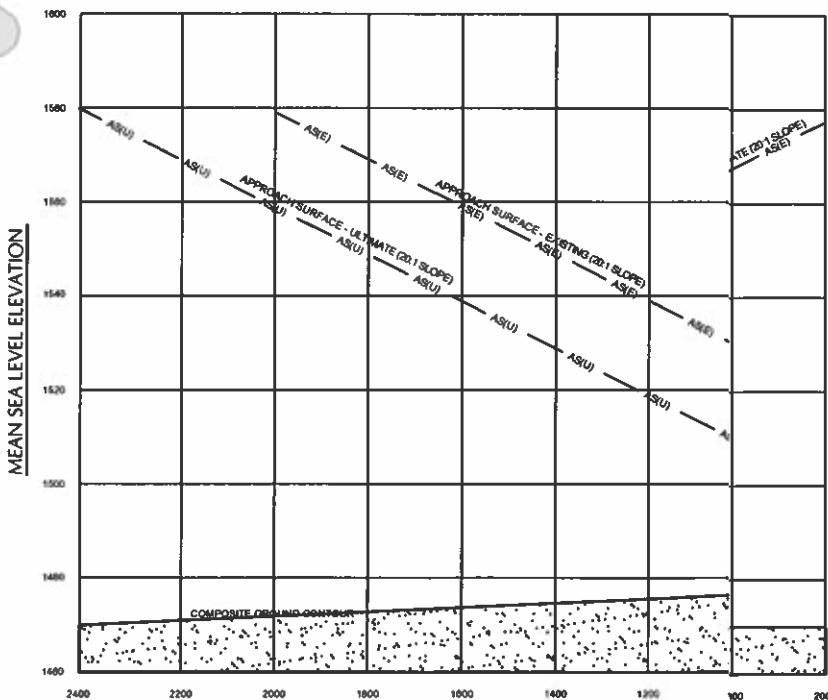
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DRAWING NO. THREE	DRAWN BY: MFL	DATE: 10/23/06	
SCALE AS SHOWN	CHECKED BY: BCW	DATE: 10/26/08	
SHEET: 3			
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RUNWAY 17-35 INNER PORT

RUNWAY 17 PLAN VIEW



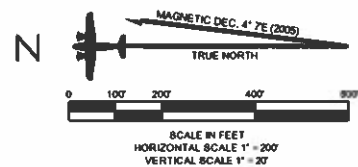
RUNWAY 17 PROFILE VIEW



LEGEND	
EXISTING	ULTIMATE
FACILITIES	

GENERAL NOTES

1. THERE ARE NO RUNWAY OBSTACLE FREE ZONE (ROFZ) OBJECT PENETRATIONS
2. THERE ARE NO THRESHOLD SITING SURFACE (TSS) OBJECT PENETRATIONS

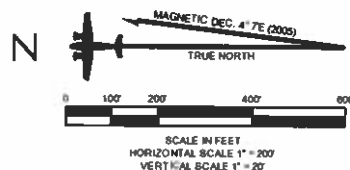
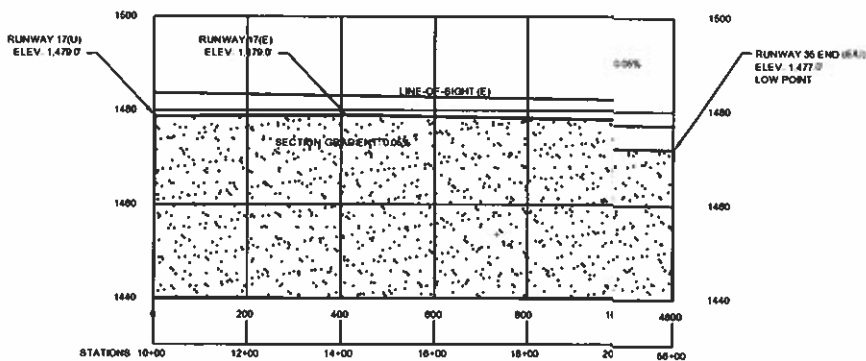
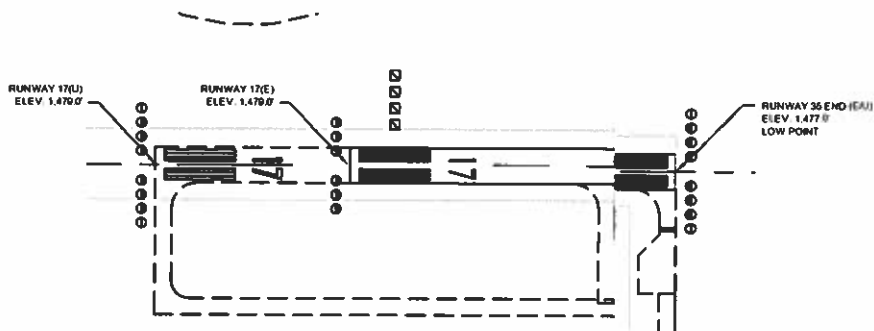


HERINGTON, KANSAS HERINGTON REGIONAL AIRPORT RUNWAY 17-35 INNER PORTION OF THE APPROACH SURFACE DRAWING

JOB NO. 2004-253	DESIGNED BY: RWC	DATE: 08/28/05	REVISIONS:
DRAWING NO. FOUR	DRAWN BY: MFL	DATE: 10/23/08	
SCALE: AS SHOWN	CHECKED BY: BCW	DATE: 10/28/08	
SHEET: 4	BUCHER, WILLIS & RATLIFF CORPORATION		
OF 8	7201 WOOD PARKWAY KANSAS CITY, MISSOURI 64114-3261 (816) 852-3888		

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RUNWAY 17-35 CENTERLINE

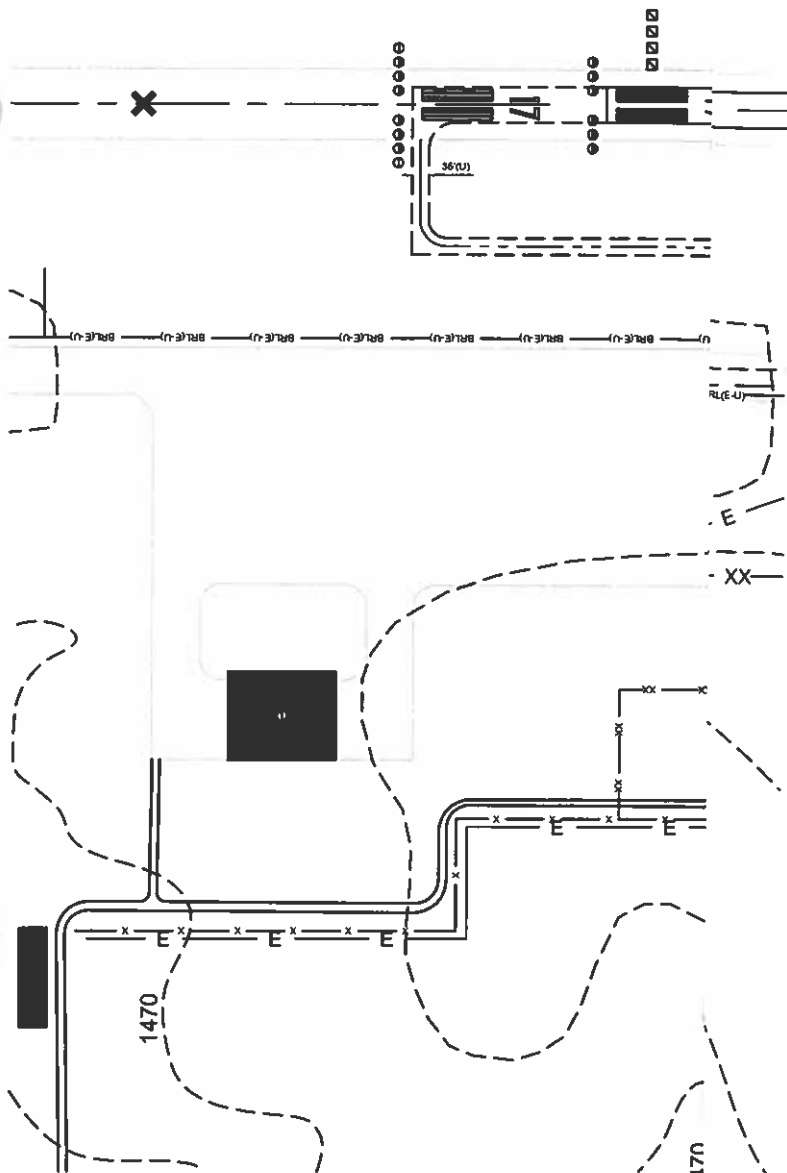


HERINGTON, KANSAS HERINGTON REGIONAL AIRPORT RUNWAY 17-35 CENTERLINE PROFILE DRAWING

JOB NO. 2004-253	DESIGNED BY: RWC	DATE: 08/26/05	REVISIONS:
DRAWING NO. FIVE	DRAWN BY: MFL	DATE: 10/23/06	
SCALE AS SHOWN	CHECKED BY: BCW	DATE: 10/26/06	
SHEET: 5	BCW BUCHER, WILLIS & RATLIFF CORPORATION 7228 WARD PARKWAY, KANSAS CITY, MISSOURI 64114-0851 (816) 933-0200		
OF 8			

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TERMINAL AREA DRAWING



BUILDINGS AND FACILITIES

EXISTING				
NO.	DESCRIPTION	TOP ELEVATION	CLEARANCE	DISPOSITION
1	HANGAR (U.S. STONE)	1,525'	93'	RETAIN
2	T-HANGAR	1,495'	81'	RETAIN
3	T-HANGAR	1,495'	144'	RETAIN
4	HANGAR (PYRODEX)	1,525'	88'	RETAIN
5	TERMINAL OFFICE	1,490'	78'	RETAIN
6	MAINTENANCE/STORAGE	1,495'	93'	RETAIN
7	T-HANGAR	1,495'	70'	RETAIN
8	T-HANGAR	1,495'	72'	RETAIN
9	T-HANGAR	1,495'	64'	RETAIN
10	T-HANGAR	1,495'	55'	RETAIN
11	NOB	1,535'	73'	RETAIN
ULTIMATE				
NO.	DESCRIPTION	TOP ELEVATION	CLEARANCE	DISPOSITION
12	T-HANGAR	1,495'	61'	BUILD
13	T-HANGAR	1,495'	61'	BUILD
14	ROTATING BEACON	1,535'	73'	BUILD
15	CORPORATE HANGAR	1,510'	50'	BUILD
16	CORPORATE HANGAR	1,510'	62'	BUILD
17	CORPORATE HANGAR	1,510'	74'	BUILD

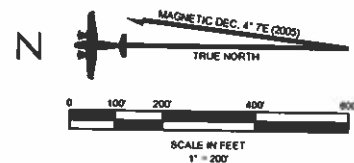
TERMINAL AREA DESIGN/SEPARATION CRITERIA

ITEM	AIRPLANE DESIGN GROUP	
	I	II
TAXIWAY WIDTH	25'	35'
TAXIWAY CENTERLINE TO PARALLEL TAXIWAY/TAXILANE CENTERLINE	60'	105'
FIXED OR MOVABLE OBJECT	44.5'	65.5'
TAXILANE CENTERLINE TO PARALLEL TAXILANE CENTERLINE	64'	97'
FIXED OR MOVABLE OBJECT	39.5'	57.5'
TAXIWAY SAFETY AREA WIDTH	45'	75'
TAXIWAY OBJECT FREE AREA WIDTH	80'	131'
TAXILANE OBJECT FREE AREA WIDTH	75'	115'

BASED ON FAA ADVISORY CIRCULAR 150/5300-13, CHANGE #0

GENERAL NOTES

1. WATER TOWER TP BE REMOVED. NEW AIRPORT ROTATING BEACON WILL BE INSTALLED ON A STANDARD POLE IN THE TERMINAL AREA.



HERINGTON, KANSAS HERINGTON REGIONAL AIRPORT

TERMINAL AREA DRAWING

JOB NO. 2004-253	DESIGNED BY: RWC	DATE: 08/26/05	REVISIONS:
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APPENDICES



*HERINGTON REGIONAL AIRPORT
MASTER PLAN UPDATE*

APPENDIX A

AIRPORT SURVEY QUESTIONNAIRE

*HERINGTON REGIONAL AIRPORT
MASTER PLAN UPDATE*



HERINGTON REGIONAL AIRPORT

AIRPORT USER/PILOT SURVEY

Dear Airport User / Aircraft Owner:

The City of Herington is preparing an Airport Study to identify improvements to the Herington Regional Airport (HRU). As a based aircraft owner, operator, or business user, you can provide helpful information concerning airport usage, current needs, and long-range improvement priorities. Your comments are appreciated, and can be returned in the enclosed postage-paid, self-addressed envelope. **We assure strict confidence in your response!**

Thank You,

BUCHER, WILLIS & RATLIFF CORPORATION

Phone: (800) 748-8276: Robert Crain, Airport Planner

Name: _____	Business Name: _____
Address: _____	
_____	Aircraft Type: _____
_____	Aircraft Type: _____
Zip Code: _____	Phone: _____

PILOT & AIRCRAFT ACTIVITY

1. Years you, or your business, have used, or based a plane at the Herington Regional Airport (HRU)?

Used: _____ Based: _____

If currently based elsewhere, and with the availability of hangars, would you base your plane at HRU?

☐ Yes ☐ No

2. Indicate the type *and* percent of your aircraft activity at HRU?

<input type="checkbox"/> Pleasure / Recreational _____%	<input type="checkbox"/> Agricultural _____%
<input type="checkbox"/> Personal Business _____%	<input type="checkbox"/> Flight Training _____%
<input type="checkbox"/> Corporate (Part 135) _____%	<input type="checkbox"/> Military _____%
<input type="checkbox"/> Cargo _____%	<input type="checkbox"/> Other: _____%

3. • Average number of flights conducted at HRU per month? _____

• Percent Runway 17 usage? _____% / Percent Runway 35 usage? _____%

• Average number of flight hours per month? _____

• Average touch & gos at HRU per month? _____

• Average instrument approaches conducted at HRU per month? _____

• Average flight distance from HRU? _____

• Average number of passengers per flight? _____

4. Projected aircraft use? ☐ Rent ☐ Keep Aircraft ☐ Purchase Larger Aircraft ☐ Sell
If "purchase larger aircraft", what type(s)? _____, _____

5. Projected airport activity at HRU? ☐ Increase ☐ Same ☐ Decline

APPENDIX B

WIND STATION DATA

***HERINGTON REGIONAL AIRPORT
MASTER PLAN UPDATE***

Wind Data

ALL-WEATHER WINDS (OBSERVATIONS)										
Type of Wind Data:	All-Weather			Revision Date:		04/30/04				
Wind Station:	Forbes Field			Period of Record:		1991-2000				
Number of Observations:	83,830			Airport:		Herington Regional Airport				
WindRose	Wind Speed Observations per Wind Speed Category (Knots)									
Direction	0-3	4-6	7-10	11-16	17-21	22-27	28-33	34-40	41+	Total
10	136	607	788	468	54	6	0	0	0	2,059
20	111	543	714	404	52	0	0	0	0	1,824
30	122	546	691	359	33	0	0	0	0	1,751
40	135	498	563	256	18	3	0	0	0	1,473
50	186	592	577	268	15	3	0	0	0	1,641
60	203	722	546	255	31	1	0	0	0	1,758
70	234	811	695	258	21	1	0	0	0	2,020
80	289	864	690	228	13	3	0	0	0	2,087
90	301	949	633	226	11	2	0	0	0	2,122
100	299	800	615	217	14	1	0	0	0	1,946
110	259	796	675	281	17	4	0	0	1	2,033
120	214	819	828	372	22	0	0	0	0	2,255
130	201	777	809	354	34	0	0	0	0	2,175
140	159	671	857	424	48	3	0	0	0	2,162
150	149	594	864	576	75	15	0	0	0	2,273
160	143	657	932	763	134	20	0	0	0	2,649
170	145	724	1213	1064	193	21	1	0	0	3,361
180	164	810	1234	1192	211	33	1	0	0	3,645
190	169	661	961	919	156	16	1	1	0	2,884
200	154	598	851	755	134	29	0	0	0	2,521
210	108	512	740	522	93	16	1	0	0	1,992
220	99	440	484	309	48	6	1	0	0	1,387
230	91	354	332	224	41	14	3	0	0	1,059
240	95	283	237	146	29	10	1	0	0	801
250	85	316	243	130	34	5	0	0	0	813
260	139	392	315	148	27	12	0	0	0	1,033
270	166	723	566	237	50	15	0	0	0	1,757
280	160	724	596	293	44	4	0	0	0	1,821
290	166	627	603	376	73	16	0	0	0	1,861
300	159	573	667	545	132	20	0	0	0	2,096
310	148	466	604	509	143	24	8	0	0	1,902
320	141	485	667	624	157	37	2	0	0	2,113
330	108	452	685	668	166	27	3	0	0	2,109
340	102	527	733	624	109	24	0	1	0	2,120
350	95	471	803	637	105	8	0	0	0	2,119
360	120	582	897	597	64	8	0	0	0	2,268
Calm	11940	0	0	0	0	0	0	0	0	11,940
Total	17,695	21,966	24,908	16,228	2,601	407	22	2	1	83,830

Calm Wind Observations (0 - 3 knots):	17,695	21.11%
Light Wind Observations (3 - 10.5 knots):	46,874	55.92%
Calm and Light Winds (0 - 10.5-knots)	64,569	77.02%
Strong Winds		22.98%

Wind Data

IMC WINDS (OBSERVATIONS)											
Type of Wind Data:	IFR		Revision Date:		04/30/04						
Wind Station:	Forbes Field		Period of Record:		1991-2000						
Number of Observations:	83,830		Airport:		Herington Regional Airport						
WindRose	Wind Speed Observations per Wind Speed Category (Knots)										
Direction	0-3	4-6	7-10	11-16	17-21	22-27	28-33	34-40	41+	Total	
10	5	20	15	7	1	0	0	0	0	48	
20	7	10	15	8	3	0	0	0	0	43	
30	6	16	12	6	1	0	0	0	0	41	
40	5	15	13	6	0	0	0	0	0	39	
50	9	16	14	4	1	0	0	0	0	44	
60	11	29	16	5	1	0	0	0	0	62	
70	12	33	30	0	1	0	0	0	0	76	
80	12	34	22	8	2	0	0	0	0	78	
90	15	39	22	11	1	0	0	0	0	88	
100	14	28	16	8	0	0	0	0	0	66	
110	11	20	23	2	0	0	0	0	0	56	
120	8	33	34	4	0	0	0	0	0	79	
130	8	25	19	4	1	0	0	0	0	57	
140	9	18	15	5	0	0	0	0	0	47	
150	7	10	9	3	0	0	0	0	0	29	
160	1	17	5	1	0	0	0	0	0	24	
170	6	14	11	1	0	0	0	0	0	32	
180	5	7	7	1	0	0	0	0	0	20	
190	2	10	6	1	0	0	0	0	0	19	
200	5	8	5	0	0	0	0	0	0	18	
210	2	8	4	0	0	0	0	0	0	14	
220	3	9	3	1	0	0	0	0	0	16	
230	3	7	0	0	0	0	0	0	0	10	
240	3	6	2	0	0	0	0	0	0	11	
250	2	5	2	0	0	0	0	0	0	9	
260	2	8	5	0	0	0	0	0	0	15	
270	4	23	8	2	0	1	0	0	0	38	
280	3	15	9	3	1	0	0	0	0	31	
290	6	17	9	2	1	1	0	0	0	36	
300	6	11	9	5	0	0	0	0	0	31	
310	9	19	10	6	1	1	1	0	0	47	
320	4	18	11	9	2	3	0	0	0	47	
330	4	18	12	4	5	2	0	0	0	45	
340	3	19	11	6	0	1	0	0	0	40	
350	5	21	25	5	2	0	0	0	0	58	
360	6	21	17	6	1	0	0	0	0	51	
Calm	527	0	0	0	0	0	0	0	0	527	
Total	750	627	446	134	25	9	1	0	0	1,992	

Calm Wind Observations (winds less than 11 knots): 1,823
Percent Calm Winds (winds less than 11 knots): 91.52%

APPENDIX C

AVIATION FORECAST WORKSHEETS

*HERINGTON REGIONAL AIRPORT
MASTER PLAN UPDATE*

Aviation Forecasts

Trend Line - Based Aircraft									
Total Airport Based Aircraft						County Registered Aircraft			
	Single Engine	Twin Prop	Twin Turbine	Jet	Total	Rotorcraft	County	Total County	% of County
1996	6	0	0	0	6		27	27	22%
1997	2	0	0	0	2		23	23	9%
1998	2	0	0	0			32	32	
1999	5	0	0	0			34	34	
2000	7	0	0	0	7		34	34	21%
2001	7	0	0	0	7		30	30	23%
2002	9	0	0	0	9		30	30	30%
2003	9	0	0	0	9		26	26	35%
Average	8.0	0.0	0.0	0.0	8.0	#DIV/0!	29.5	#DIV/0!	30.0 27%

Historical Trend Line (1996-2003 ==> 2024)						
2004	9	0	0	0	0	9
2004	10	0	0	0	0	10
2005	11	0	0	0	0	11
2006	12	0	0	0	0	12
2007	12	0	0	0	0	12
2008	13	0	0	0	0	13
2009	14	0	0	0	0	14
2010	15	0	0	0	0	15
2011	16	0	0	0	0	16
2012	17	0	0	0	0	17
2013	18	0	0	0	0	18
2014	18	1	0	0	0	19
2015	19	1	0	0	0	20
2016	20	1	0	0	0	21
2017	21	1	0	0	0	22
2018	22	1	0	0	0	23
2019	23	2	1	0	0	26
2020	24	2	1	0	0	27
2021	25	2	1	0	0	28
2022	25	2	1	0	0	28
2023	26	2	1	0	0	29
2024	27	2	1	0	0	30

Aviation Forecasts

FAA Growth Rate - Nationwide Average (Source: FAA Aerospace Forecasts FY 2004-2015)

FAA Aircraft Fleet Forecasts (Average Annual Growth Rates):

Single-Engine Piston Production/Single-Engine Experimental	0.70%
Twin Engine - Piston	-0.50%
Twin Engine - Turbine	3.50%
Turbojet	4.90%
Rotorcraft (Turbine)	0.60%

Year	Single Engine	Twin Prop	Twin Turbine	Jet	Rotorcraft	Total
2003	9	0	0	0	0	9.0
2004	9	0	0	0	0	9
2005	9	0	0	0	0	9
2006	9	0	0	0	0	9
2007	9	0	0	0	0	9
2008	9	0	0	0	0	9
2009	9	0	0	0	0	9
2010	9	0	0	0	0	9
2011	10	0	0	0	0	10
2012	10	0	0	0	0	10
2013	10	0	0	0	0	10
2014	10	1	1	0	0	12
2015	10	1	1	0	0	12
2016	10	1	1	0	0	12
2017	10	1	1	0	0	12
2018	10	1	1	0	0	12
2019	10	1	1	0	0	12
2020	10	1	1	0	0	12
2021	10	1	1	0	0	12
2022	10	1	1	0	0	12
2023	10	1	1	0	0	12
2024	10.4	1.0	1.1	0	0	12.5

Source: FAA Aerospace Forecasts - Fiscal Years 2004-2015

Percentage Growth Rate (FAA Aerospace Forecasts FY 2004-2015)

FAA General Aviation
GA Fleet Growth Rate: 1.20%
(2004-2015)

Estimated General Aviation
GA Fleet Growth Rate: 1.25%
(2015-2020)

Estimated General Aviation
GA Fleet Growth Rate: 1.30%
(2020-2025)

Year	Total Aircraft
2003	==> 9
2004	==> 9
2005	==> 9
2006	==> 9
2007	==> 9
2008	==> 10
2009	==> 10
2010	==> 10
2011	==> 10
2012	==> 10
2013	==> 10
2014	==> 10
2015	==> 10
2016	==> 11
2017	==> 11
2018	==> 11
2019	==> 11
2020	==> 11
2021	==> 11
2022	==> 11
2023	==> 12
2024	==> 12

Source: FAA Aerospace Forecasts - Fiscal Years 2004-2015

APPENDIX D

ENVIRONMENTAL AGENCY RESPONSE LETTERS

*HERINGTON REGIONAL AIRPORT
MASTER PLAN UPDATE*

KANSAS

80 No. 05-08-140

Kansas State Historical Society
Cultural Resources Division

KATHLEEN SEBELIUS, GOVERNOR

August 23, 2005

Robert Crain
Airport Planner
Bucher Willis & Ratliff
7920 Ward Parkway
Kansas City MO 64114-2021

RE: Runway Upgrade, Herington Regional Airport – 2004-0253
Morris County

Dear Mr. Crain:

The Kansas State Historic Preservation Office has reviewed its cultural resources files for the area of the above referenced project in accordance with 36 CFR 800. The project as proposed should have no effect on properties listed on the National Register of Historic Places or otherwise identified in our files. This office has no objection to implementation of the project.

Any changes to the project area that include additional ground disturbing activities will need to be reviewed by this office prior to beginning construction. If construction work uncovers buried archeological materials, work should cease in the area of the discovery and this office should be notified immediately.

This information is provided at your request to assist you in identifying historic properties, as specified in 36 CFR 800 for Section 106 consultation procedures. If you have questions or need additional information regarding these comments, please contact Tim Weston 785-272-8681 (ex. 214). Please refer to the Kansas Review & Compliance number (KSR&C#) above on all future correspondence relating to this project.

Sincerely,

Jennie Chinn
State Historic Preservation Officer


Christy Davis
Deputy State Historic Preservation Officer

CD/cg

RECEIVED

AUG 26 2005

DEPUTY BUCHER, WILLIS & RATLIFF
CORPORATION
KANSAS CITY, MO



KANSAS

DEPARTMENT OF WILDLIFE AND PARKS

KATHLEEN SEBELIUS, GOVERNOR

September 2, 2005

Mr. Robert Crain
Bucher, Willis & Ratliff
7929 Ward Parkway
Kansas City, MO 64114

Ref: D2.0100
Morris
Track: 980556

Dear Mr. Crain:

**RE: Herington Regional Airport – Extension to Runway – BWR Job Number 2004-0253
- (Sections 31 & 32, Township 15 South, Range 6 East, and Sections 5 & 6,
Township 16 South, Range 6 East) - Morris County, Kansas.**

The referenced project was reviewed for potential impacts on crucial wildlife habitats, current state-listed threatened and endangered species and species in need of conservation, and public recreation areas for which this agency has some administrative authority.

Our review indicates none of the named resources will be impacted. No special mitigation measures are necessary. No Department of Wildlife and Parks permits or special authorizations are needed. Although the state's species listings and the Department's lands obligations periodically change, due to the project's location and design, no future clearances will be required regardless of when the project work starts.

Thank you for the opportunity to provide these comments and recommendations.

Sincerely,



Chris Hase, Aquatic Ecologist
Environmental Services Section

Pratt Operations Office
512 SE 25th Ave., Pratt, KS 67124-8174
Phone 620-672-5911 Fax 620-672-6020 www.kdwp.state.ks.us



United States Department of the Interior

FISH AND WILDLIFE SERVICE

Kansas Field Office

315 Houston Street, Suite E
Manhattan, Kansas 66502-6172

September 9, 2005

Robert Crain
Airport Planner
Bucher, Willis & Ratliff Corp.
7920 Ward Parkway
Kansas City, MO 64114

RE: Herington Regional Airport
BWR Job No. 2004-0253

Dear Mr. Crain:

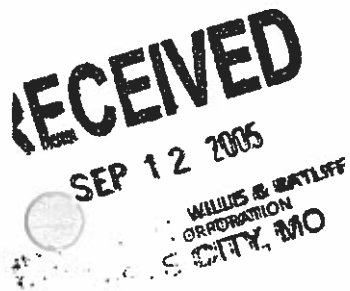
This is in response to your letter of August 8, 2005, describing proposed runway expansions and other improvements to the Herington Regional Airport, located east of Herington in rural Morris County, Kansas. Based on our review of the proposed actions, all of which will occur within the previously developed airport perimeter, I conclude that no threatened and endangered species are likely to be present in the project area. In addition, I have no concerns with impacts to other fish and wildlife resources, such as wetlands or migratory birds. Therefore, the Service has no objection to this request.

Thank you for this opportunity to comment on the proposal.

Sincerely,

Michael J. LeValley
Field Supervisor

cc: KDWP, Pratt, KS (Environmental Services)



APPENDIX E

DEVELOPMENT COSTS WORKSHEETS

*HERINGTON REGIONAL AIRPORT
MASTER PLAN UPDATE*

HERINGTON REGIONAL AIRPORT

0-5 YEAR DEVELOPMENT (PHASE I)

ESTIMATED PROJECT COSTS AND FUNDING SOURCES

Project Description	Unit	Quantity	Unit Cost	Local Cost (5%)	KDOT/FAA Cost (95%)	Total Cost (100%)
PHASE I - LAND ACQUISITION						
None Required						
Subtotal Project Cost				\$0	\$0	\$0
Engineering, Administrative & Legal Costs (10%)				\$0	\$0	\$0
TOTAL PHASE I - LAND ACQUISITION				\$0	\$0	\$0

PHASE I - RUNWAY AND TAXIWAY

Rehabilitate Runway 17-35 (4,184' x 75'; 30,000 lbs SWG)

Paving

Mobilization	L.S.	1	\$125,000	\$6,250	\$118,750	\$125,000
Temporary Marking, Lighting & Barricades	L.S.	1	\$10,000	\$500	\$9,500	\$10,000
Saw Cut (Full-Depth Concrete)	L.F.	30	\$6.00	\$9	\$171	\$180
Saw Cut (Full-Depth Concrete)	L.F.	1,005	\$6.00	\$302	\$5,729	\$6,030
Remove Existing Pavement and Stockpile for Recycle	S.Y.	77,202	\$2.50	\$9,850	\$183,355	\$193,005
Compacted Embankment	C.Y.	11,023	\$6.50	\$3,582	\$68,067	\$71,650
Recycled Concrete Base and Subbase Course (18")	S.Y.	38,308	\$8.00	\$15,323	\$291,141	\$306,464
Portland Cement Concrete Pavement (6")	S.Y.	38,307	\$30.00	\$54,461	\$1,034,750	\$1,089,210
Bituminous Prime Coat	Gal.	201	\$2.00	\$20	\$382	\$402
Bituminous Tack Coat	Gal.	60	\$1.30	\$4	\$74	\$78
Bituminous Surface Course (4")	Ton	94	\$68.00	\$320	\$6,072	\$6,392
Pavement Marking	S.F.	31,374	\$1.00	\$1,569	\$29,805	\$31,374
Seeding	Acre	19	\$1,200	\$1,140	\$21,660	\$22,800
Mulching	Acre	19	\$700	\$665	\$12,635	\$13,300

Underdrains

12" Prefabricated Underdrains	L.F.	8,123	\$25	\$10,154	\$192,921	\$203,075
4" Non-Perforated PVC Outlet Pipe	L.F.	426	\$15	\$320	\$6,071	\$6,390
Splash Pad	Each	11	\$650	\$358	\$6,793	\$7,150
Ditch Grading	C.Y.	1,357	\$10	\$679	\$12,892	\$13,570

Electrical

Remove Existing Lighting System (lights, cables, etc.)	L.S.	1	\$8,000	\$400	\$7,600	\$8,000
Underground Cable (1/c, #8 AWG, 5kV, XLPE/USE)	L.F.	19,118	\$1.00	\$956	\$18,162	\$19,118
Bare Counterpoise (#8 AWG) and Trench	L.F.	8,158	\$0.85	\$347	\$6,588	\$6,934
Cable Trench	L.F.	9,215	\$8.00	\$3,686	\$70,034	\$73,720
M.I.R.L. (Red/Green), Stake Mounted	Each	12	\$200	\$120	\$2,280	\$2,400
M.I.R.L. (Red/Green), Base Mounted	Each	4	\$200	\$40	\$760	\$800
M.I.R.L. (Clear/Yellow), Stake Mounted	Each	32	\$200	\$320	\$6,080	\$6,400
M.I.R.L. (Clear/Yellow), Base Mounted	Each	8	\$200	\$80	\$1,520	\$1,600
M.I.R.L. (Clear), Stake Mounted	Each	2	\$200	\$20	\$380	\$400
2-4" Concrete Encased Electrical Ducts	L.F.	170	\$35.00	\$298	\$5,653	\$5,950
7.5 kW Constant Current Regulator (5-step)	L.S.	1	\$8,000	\$400	\$7,600	\$8,000
Vault Modifications and Vault Housing	L.S.	1	\$15,000	\$750	\$14,250	\$15,000
						\$2,254,392

Rehabilitate/Widen Taxiway Connector (978' x 35'; 30,000 SWG)

Mobilization	L.S.	1	\$80,000	\$4,000	\$76,000	\$80,000
Temporary Marking, Lighting & Barricades	L.S.	1	\$10,000	\$500	\$9,500	\$10,000
Saw Cut (Full-Depth Concrete)	L.F.	220	\$6.00	\$66	\$1,254	\$1,320
Remove Existing Pavement and Stockpile for Recycle	S.Y.	3,803	\$2.50	\$475	\$9,032	\$9,508
Compacted Embankment	C.Y.	500	\$6.50	\$163	\$3,088	\$3,250
Recycled Concrete Base and Subbase Course (18")	S.Y.	3,803	\$8.00	\$1,521	\$28,903	\$30,424
Portland Cement Concrete Pavement (6")	S.Y.	3,803	\$30.00	\$5,705	\$108,386	\$114,090
Bituminous Prime Coat	Gal.	1,902	\$2.00	\$190	\$3,614	\$3,804
Bituminous Tack Coat	Gal.	571	\$1.30	\$37	\$705	\$742
Bituminous Surface Course (4")	Ton	1,326	\$68.00	\$4,508	\$85,660	\$90,168
Pavement Marking	S.F.	978	\$1.00	\$49	\$929	\$978
Seeding	Acre	1	\$1,200	\$60	\$1,140	\$1,200
Mulching	Acre	1	\$700	\$35	\$665	\$700
						\$346,184

HERINGTON REGIONAL AIRPORT						
6-10 YEAR DEVELOPMENT (PHASE II)						
ESTIMATED PROJECT COSTS AND FUNDING SOURCES						
Project Description	Unit	Quantity	Unit Cost	Local Cost	KDOT/FAA Cost	Total Cost (100%)
PHASE II - LAND ACQUISITION						
None Required				\$0	\$0	\$0
Subtotal Project Cost				\$0	\$0	\$0
Engineering, Administrative & Legal Costs (10%)				\$0	\$0	\$0
TOTAL PHASE II - LAND ACQUISITION				\$0	\$0	\$0
PHASE II - RUNWAY AND TAXIWAY						
Construct Partial Parallel Taxiway (2,650' x 35'; 30,000 lbs SWG) and Connector (510' x 35')						
Mobilization	L.S.	1	\$75,000	\$3,750	\$71,250	\$75,000
Temporary Marking, Lighting & Barricades	L.S.	1	\$10,000	\$500	\$9,500	\$10,000
Saw Cut (Full-Depth Concrete)	L.F.	1,100	\$6.00	\$330	\$6,270	\$6,600
Remove Existing Pavement and Stockpile for Recycle	S.Y.	29,695	\$2.50	\$3,712	\$70,526	\$74,238
Compacted Embankment	C.Y.	5,578	\$6.50	\$1,813	\$34,444	\$36,257
Recycled Concrete Base and Subbase Course (18")	S.Y.	22,110	\$8.00	\$8,844	\$168,036	\$176,880
Bituminous Prime Coat	Gal.	6,242	\$2.00	\$624	\$11,860	\$12,484
Bituminous Tack Coat	Gal.	1,873	\$1.30	\$122	\$2,313	\$2,435
Bituminous Surface Course (4")	Ton	4,354	\$68.00	\$14,804	\$281,268	\$296,072
Pavement Marking	S.F.	3,160	\$1.00	\$158	\$3,002	\$3,160
Seeding	Acre	1	\$1,200	\$60	\$1,140	\$1,200
Mulching	Acre	1	\$700	\$35	\$665	\$700
						\$695,025
Construct Turnaround - North End (1,749 S.Y.)						
Mobilization	L.S.	1	\$60,000	\$3,000	\$57,000	\$60,000
Class A Excavation	C.Y.	1,658	\$2.50	\$207	\$3,938	\$4,145
Erosion Control Barrier	L.F.	500	\$4.00	\$100	\$1,900	\$2,000
Recycled Concrete Base and Subbase Course (18")	S.Y.	1,749	\$8.00	\$700	\$13,292	\$13,992
Bituminous Prime Coat	Gal.	882	\$2.00	\$88	\$1,676	\$1,764
Bituminous Tack Coat	Gal.	265	\$1.30	\$17	\$327	\$345
Bituminous Surface Course (4")	Ton	615	\$68.00	\$2,091	\$39,729	\$41,820
Pavement Marking	S.F.	100	\$1.00	\$5	\$95	\$100
24" RCP	L.F.	40	\$35.00	\$70	\$1,330	\$1,400
24" RCP End Section	Each	2	\$400	\$40	\$760	\$800
Prefabricated Underdrain	L.F.	40	\$7.00	\$14	\$266	\$280
Non-Perforated 4" PE Outlet Pipe	L.F.	40	\$8.00	\$16	\$304	\$320
Splash Pad	Each	2	\$500	\$50	\$950	\$1,000
2-4" PVC Concrete Encased Electrical Duct	L.F.	40	\$20.00	\$40	\$760	\$800
Stake Mounted M.I.T.L.	Each	5	\$500	\$125	\$2,375	\$2,500
Retro Reflectors	Each	6	\$50.00	\$15	\$285	\$300
Seeding and Miscellaneous	Acres	5	\$1,000	\$250	\$4,750	\$5,000
						\$76,566
Clean and Seal Runway Joints and Cracks						
Mobilization	L.S.	1	\$10,000	\$500	\$9,500	\$10,000
Temporary Marking, Lighting, & Barricades	L.S.	1	\$3,000	\$150	\$2,850	\$3,000
Pavement Marking Removal	S.F.	31,374	\$1.00	\$1,569	\$29,805	\$31,374
Clean and Seal Existing Joints & Cracks	L.F.	30,000	\$2.00	\$3,000	\$57,000	\$60,000
Pavement Marking	S.F.	31,374	\$1.00	\$1,569	\$29,805	\$31,374
						\$135,748
Subtotal Project Cost				\$48,367	\$918,972	\$967,339
Engineering, Administrative & Legal Costs (25%)				\$12,092	\$229,743	\$241,835
TOTAL PHASE II - RUNWAY AND TAXIWAY				\$60,459	\$1,148,715	\$1,210,174

HERINGTON REGIONAL AIRPORT						
11-20 YEAR DEVELOPMENT (PHASE III)						
ESTIMATED PROJECT COSTS AND FUNDING SOURCES						
Project Description	Unit	Quantity	Unit Cost	Local Cost	KDOT/FAA Cost	Total Cost (100%)
PHASE III - LAND ACQUISITION						
None Required				\$0	\$0	\$0
Subtotal Project Cost				\$0	\$0	\$0
Engineering, Administrative & Legal Costs (10%)				\$0	\$0	\$0
TOTAL PHASE III - LAND ACQUISITION				\$0	\$0	\$0
PHASE III - RUNWAY AND TAXIWAY						
Extend Runway 17-35 (416' x 75'; 30,000 lbs SWG)						
Paving						
Mobilization	L.S.	1	\$125,000	\$6,250	\$118,750	\$125,000
Temporary Marking, Lighting & Barricades	L.S.	1	\$10,000	\$500	\$9,500	\$10,000
Saw Cut (Full-Depth Concrete)	L.F.	300	\$6.00	\$90	\$1,710	\$1,800
Remove Existing Pavement and Stockpile for Recycle	S.Y.	11,950	\$2.50	\$1,494	\$28,381	\$29,875
Compacted Embankment	C.Y.	5,770	\$6.50	\$1,875	\$35,630	\$37,505
Class A Excavation	C.Y.	2,880	\$5.00	\$715	\$13,585	\$14,300
Recycled Concrete Base and Subbase Course (18")	S.Y.	3,467	\$8.00	\$1,387	\$26,349	\$27,736
Bituminous Prime Coat	Gal.	1,733	\$2.00	\$173	\$3,293	\$3,466
Bituminous Tack Coat	Gal.	520	\$1.30	\$34	\$642	\$676
Bituminous Surface Course (4")	Ton	806	\$68.00	\$2,740	\$52,068	\$54,808
Pavement Marking	S.F.	1,300	\$1.00	\$65	\$1,235	\$1,300
Seeding	Acre	2	\$1,200	\$120	\$2,280	\$2,400
Mulching	Acre	2	\$700	\$70	\$1,330	\$1,400
Underdrains						
12" Prefabricated Underdrains	L.F.	800	\$25.00	\$1,000	\$19,000	\$20,000
4" Non-Perforated PVC Outlet Pipe	L.F.	200	\$15.00	\$150	\$2,850	\$3,000
Splash Pad	Each	4	\$650	\$130	\$2,470	\$2,600
Ditch Grading	C.Y.	500	\$10.00	\$250	\$4,750	\$5,000
Electrical						
Underground Cable (1/c, #8 AWG, 5kV, XLPE/USE)	L.F.	927	\$1.00	\$46	\$881	\$927
Bare Counterpoise (#6 AWG) and Trench	L.F.	125	\$0.85	\$5	\$101	\$106
Cable Trench	L.F.	1,100	\$8.00	\$440	\$8,360	\$8,800
Relocate M.I.R.L. (Red/Green), Stake Mounted	Each	4	\$75	\$15	\$285	\$300
Relocate M.I.R.L. (Red/Green), Base Mounted	Each	4	\$75	\$15	\$285	\$300
M.I.R.L. (Clear/Yellow), Stake Mounted	Each	2	\$200	\$20	\$380	\$400
M.I.R.L. (Clear/Yellow), Base Mounted	Each	2	\$200	\$20	\$380	\$400
M.I.R.L. (Clear), Stake Mounted	Each	2	\$200	\$20	\$380	\$400
Vault Modifications and Vault Housing	L.S.	1	\$3,000	\$150	\$2,850	\$3,000
						\$356,499
Extend Parallel Taxiway (1,100' x 35'; 30,000 lbs SWG)						
Mobilization	L.S.	1.0	\$200,000	\$10,000	\$190,000	\$200,000
Erosion Control Barrier	L.F.	1,500	\$4.00	\$300	\$5,700	\$6,000
Class A Excavation	C.Y.	2,660	\$5.00	\$715	\$13,585	\$14,300
Recycled Concrete Base and Subbase Course (18")	S.Y.	8,578	\$8.00	\$68,624	\$0	\$68,624
Bituminous Prime Coat	Gal.	6,178	\$2.00	\$618	\$11,738	\$12,356
Bituminous Tack Coat	Gal.	1,853	\$1.30	\$120	\$2,288	\$2,409
Bituminous Surface Course (4")	Ton	2,873	\$68.00	\$9,768	\$185,596	\$195,364
Pavement Marking	S.F.	1,000	\$1.00	\$50	\$950	\$1,000
24" RCP	L.F.	90	\$35.00	\$158	\$2,993	\$3,150
24" RCP End Section	Each	4	\$400	\$80	\$1,520	\$1,600
Prefabricated Underdrain	L.F.	90	\$7.00	\$32	\$599	\$630
Non-Perforated 4" PE Outlet Pipe	L.F.	90	\$8.00	\$36	\$684	\$720
Splash Pad	Each	4	\$500	\$100	\$1,900	\$2,000
Stake Mounted M.I.T.L.	Each	5	\$500	\$125	\$2,375	\$2,500
Retro Reflectors	Each	12	\$50.00	\$30	\$570	\$600
Seeding and Miscellaneous	Acres	6	\$1,000	\$300	\$5,700	\$6,000
						\$317,253
Clean and Seal Runway Joints and Cracks						
Mobilization	L.S.	1	\$10,000	\$500	\$9,500	\$10,000
Temporary Marking, Lighting, & Barricades	L.S.	1	\$3,000	\$150	\$2,850	\$3,000
Pavement Marking Removal	S.F.	35,000	\$1.00	\$1,750	\$33,250	\$35,000
Clean and Seal Existing Joints & Cracks	L.F.	50,000	\$2.00	\$5,000	\$95,000	\$100,000
Pavement Marking	S.F.	35,000	\$1.00	\$1,750	\$33,250	\$35,000
						\$183,000
Subtotal Project Cost				\$117,980	\$937,772	\$855,752
Engineering, Administrative & Legal Costs (25%)				\$29,495	\$234,443	\$213,938
TOTAL PHASE III - RUNWAY AND TAXIWAY				\$147,476	\$1,172,215	\$1,069,690

PHASE III - TERMINAL AREA

Construct 10-Unit T-Hangar (12,474 S.F.)

Mobilization	L.S.	1	\$50,000	\$50,000	\$0	\$50,000
Saw Cut (Full-Depth Concrete)	L.F.	570	\$6.00	\$3,420	\$0	\$3,420
Remove Existing Pavement and Stockpile for Recycle	S.Y.	1,386	\$2.50	\$3,465	\$0	\$3,465
Recycled Concrete Base and Subbase Course (18")	S.Y.	1,386	\$8.00	\$11,088	\$0	\$11,088
Construct Concrete Hangar Pad (4")	S.Y.	1,386	\$42.00	\$58,212	\$0	\$58,212
Construct 10-Unit T-Hangar	S.F.	12,474	\$18.00	\$224,532	\$0	\$224,532
Seeding and Miscellaneous	Acres	1	\$1,000	\$1,000	\$0	\$1,000
Utility Hookup / Activation	L.S.	1	\$1,200	\$1,200	\$0	\$1,200
						\$352,917

Note: Hangar financing assumed through conventional methods using local (airport) funds or private investment options.

Construct Common Hangar (4,900 S.F.)*

Mobilization	L.S.	1	\$50,000	\$50,000	\$0	\$50,000
Saw Cut (Full-Depth Concrete)	L.F.	390	\$6.00	\$2,340	\$0	\$2,340
Remove Existing Pavement and Stockpile for Recycle	S.Y.	8,750	\$2.50	\$21,875	\$0	\$21,875
Recycled Concrete Base and Subbase Course (18")	S.Y.	8,750	\$8.00	\$70,000	\$0	\$70,000
Bituminous Prime Coat	Gal.	220	\$2.00	\$440	\$0	\$440
Bituminous Tack Coat	Gal.	66	\$1.30	\$86	\$0	\$86
Bituminous Surface Course (4")	Ton	102	\$68.00	\$6,936	\$0	\$6,936
Construct Concrete Hangar Pad (4")	S.Y.	4,900	\$42.00	\$205,800	\$0	\$205,800
Construct Common Hangar	S.F.	3,600	\$23.00	\$82,800	\$0	\$82,800
Seeding and Miscellaneous	Acres	1	\$1,000	\$1,000	\$0	\$1,000
Utility Hookup / Activation	L.S.	1	\$1,200	\$1,200	\$0	\$1,200
						\$442,477

Note: Hangar financing assumed through conventional methods using local (airport) funds or private investment options.

Construct Common Hangar (4,900 S.F.)*

Mobilization	L.S.	1	\$50,000	\$50,000	\$0	\$50,000
Saw Cut (Full-Depth Concrete)	L.F.	390	\$6.00	\$2,340	\$0	\$2,340
Remove Existing Pavement and Stockpile for Recycle	S.Y.	8,750	\$2.50	\$21,875	\$0	\$21,875
Recycled Concrete Base and Subbase Course (18")	S.Y.	8,750	\$8.00	\$70,000	\$0	\$70,000
Bituminous Prime Coat	Gal.	220	\$2.00	\$440	\$0	\$440
Bituminous Tack Coat	Gal.	66	\$1.30	\$86	\$0	\$86
Bituminous Surface Course (4")	Ton	102	\$68.00	\$6,936	\$0	\$6,936
Construct Concrete Hangar Pad (4")	S.Y.	4,900	\$42.00	\$205,800	\$0	\$205,800
Construct Common Hangar	S.F.	3,600	\$23.00	\$82,800	\$0	\$82,800
Seeding and Miscellaneous	Acres	1	\$1,000	\$1,000	\$0	\$1,000
Utility Hookup / Activation	L.S.	1	\$1,200	\$1,200	\$0	\$1,200
						\$442,477

Note: Hangar financing assumed through conventional methods using local (airport) funds or private investment options.

Expand Terminal Building (1,072 S.F.)*

Mobilization	L.S.	1.0	\$5,000	\$5,000	\$0	\$5,000
Expand Terminal Building	S.F.	1,072	\$60.00	\$64,320	\$0	\$64,320
Building Mounted Apron Security Lighting	Each	2.0	\$2,000	\$4,000	\$0	\$4,000
						\$73,320

Note: Financing for terminal building assumed through conventional methods using local (airport) funds.

