INTRODUCTION

The Hutchinson Municipal Airport (HUT) Master Plan Study has been undertaken to evaluate the airport's capabilities and role, to forecast future aviation demand, and to plan for the timely development of new or expanded facilities that may be required to meet that demand. The ultimate goal of the master plan is to provide systematic guidelines for the airport's overall maintenance, development, and operation.

The master plan is intended to be a proactive document which identifies and then plans for future facility needs well in advance of the actual need for the facilities. This is done to ensure that the City of Hutchinson can coordinate project approvals, design, financing, and construction to avoid experiencing detrimental effects due to inadequate facilities. An important result of the master plan is reserving sufficient areas for future facility needs. This protects development areas and ensures they will be readily available when required to meet future needs. The intended result is a detailed land use concept which outlines specific uses for all areas of airport property.

The preparation of this master plan is evidence that the City of Hutchinson recognizes the importance of air transportation to the community as well as the unique challenges operating an airport presents. The investment in an airport yields many benefits to the community and the region. With a sound and realistic master plan, Hutchinson Municipal Airport can maintain its role as an important link to the national air transportation system for the community and maintain the

existing public and private investments in its facilities.

MASTER PLAN OBJECTIVES

The primary objective of the master plan is to provide the community and its leadership with guidance for operating the airport in a safe and efficient manner while planning for future demand levels. To accomplish this objective requires a comprehensive evaluation of the existing airport and a determination of what actions should be taken to maintain a safe and reliable airport facility while meeting the aviation needs of the region. This master plan will provide a vision for the airport covering the next 20 years and, in some cases, beyond. With this vision, the City of Hutchinson will have advance notice of potential future airport funding needs so that appropriate steps can be taken to ensure that adequate funds are budgeted and planned.

Specific objectives of the Hutchinson Municipal Airport Master Plan are:

& To preserve and protect public and private investments in existing airport facilities;

& To enhance the safety of aircraft operations;

& To be reflective of community and regional goals, needs, and plans;

& To ensure that future development is environmentally compatible;

& To establish a schedule of development priorities designed to meet forecast aviation demand;

& To develop a plan that is responsive to air transportation demands;

& To develop an orderly plan for use of the airport;

& To meet runway safety area standards;

& To coordinate this master plan with local, regional, state, and federal agencies, and;

& To develop active and productive public involvement throughout the planning process.

The master plan will accomplish these objectives by carrying out the following:

& Determining projected needs of airport users through the year 2025;

& Identifying existing and future facility needs;

& Evaluating future airport facility development alternatives which will optimize airport capacity and aircraft safety; and

% Developing a realistic, commonsense plan for the use and/or expansion of the airport.

MASTER PLAN ELEMENTS AND PROCESS

The Hutchinson Municipal Airport Master Plan is being prepared in a systematic fashion following FAA guidelines and industry-accepted principles and practices, as shown on **Exhibit IA**. The master plan has six chapters that are intended to assist in the discovery of future facility needs and provide the supporting rationale for their implementation.

Chapter One - Inventory summarizes the inventory efforts. The inventory efforts are focused on collecting and assembling relevant data pertaining to the airport and the area it serves. Information is collected on existing airport facilities and operations. Local economic and demographic data is collected to define the local growth trends. Planning studies which may have relevance to the master plan are also collected.

Chapter Two - Forecasts examines the potential aviation demand at the airport. The analysis utilizes local socioeconomic information, as well as national air transportation trends to quantify the levels of aviation activity which can reasonably be expected to occur at Hutchinson Municipal Airport through the year 2025. The results of this effort are used to determine the types and sizes of facilities which will be required to meet the projected aviation demand at the airport through the planning period.

Chapter Three - Facility Requirements comprises the demand capacity and facility requirements analyses. The intent of this analysis is to compare the existing facility capacities to forecast aviation demand and determine where deficiencies in capacities (as well as excess capacities) may exist. Where deficiencies are identified, the size and type of new facilities to accommodate the demand are identified. The airfield analysis focuses on improvements needed to safely serve the type of aircraft expected to operate at the airport in the future, as well as navigational aids to increase the safety and efficiency of operations. This element also examines the general aviation terminal, hangar, apron, and support needs.

Chapter Four - Alternatives considers a variety of solutions to accommodate the projected facility needs. This element proposes various facility and site plan configurations which can meet the projected facility needs. An analysis is completed to identify the strengths and weaknesses of each proposed development alternative, with the intention of determining a single direction for development.

Chapter Five - Airport Plans provides both a graphic and narrative description of the recommended plan for the use, development, and operation of the airport. An environmental overview is also provided. The master plan also includes the official Airport Layout Plan (ALP) and detailed technical drawings depicting related airspace, land use, and property data. These drawings are used by the Federal Aviation Administration (FAA) in determining grant eligibility and funding.

Chapter Six - Financial Plan focuses on the capital needs program which defines the schedules, costs, and funding sources for the recommended development projects.

COORDINATION

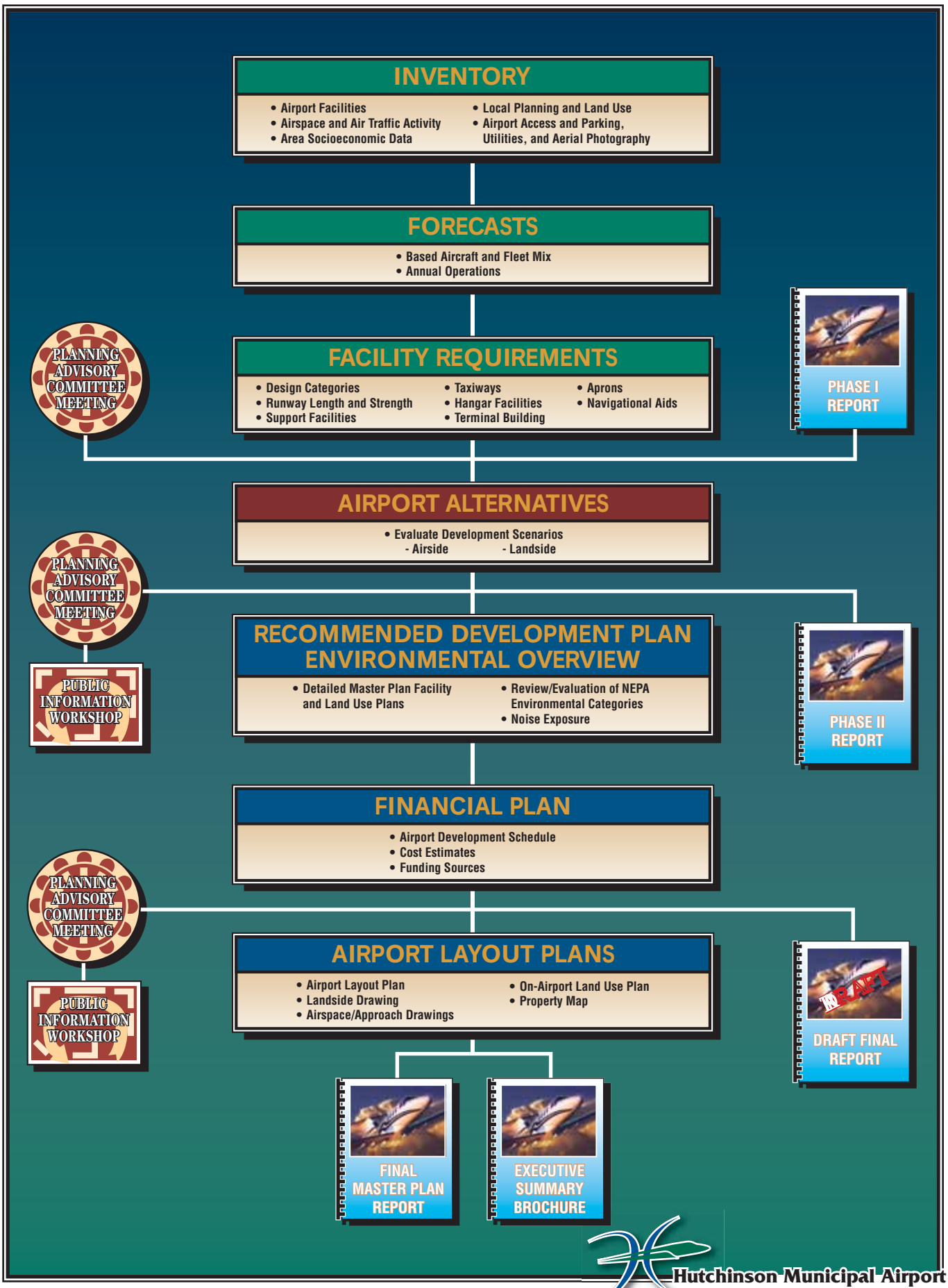
The Hutchinson Municipal Airport Master Plan is of interest to many within the local community. This includes local citizens, community organizations, airport users, airport tenants, area-wide planning agencies, and aviation organizations. As an important component of the regional, state, and national aviation systems, the Hutchinson Municipal Airport is of importance to both state and federal agencies responsible for overseeing air transportation.

To assist in the development of the master plan, the City of Hutchinson has identified a group of community members and aviation interest groups to act in an advisory role in the development of the master plan. Members of the Planning Advisory Committee (PAC) will review phase reports and provide comments throughout the study to help ensure that a realistic, viable plan is developed.

To assist in the review process, draft phase reports will be prepared at the various milestones in the planning process. The phase report process allows for timely input and review during each step within the master plan to ensure that all master plan issues are fully addressed as the recommended program develops.

A series of public information workshops will also be held as part of the plan coordination. The public information workshops are designed to allow any and all interested persons to become informed and provide input concerning the master plan. Notices of meeting times and locations will be advertised through the media as well as local neighborhood associations. The draft phase reports will also be made available to the public online at www.coffmanassociates.com.

05MP03-AI-10/26/05



Hutchinson Municipal Airport

Exhibit IA

MASTER PLAN PROCESS

Chapter One

INVENTORY

The inventory of existing conditions at Hutchinson Municipal Airport (HUT) will serve as an overview of the airport, its facilities, its role in regional and national aviation systems, and the relationship to development which has occurred around the airport over the years. The information delineated in this chapter attempts to provide a foundation, or starting point, for all subsequent evaluations.

This master plan required a comprehensive collection and evaluation of information relating to the airport and the surrounding area including the following:

- Physical inventories and descriptions of facilities and services now provided by the airport.
- An overview of existing regional plans and studies to determine their potential influence on the development and implementation of the airport master plan.
- Background information pertaining to the City of Hutchinson, the surrounding counties, and the State of Kansas. Analysis of these areas also includes descriptions of recent development which has taken place on the airport environs and plans for future development which may impact the airport.
- Population and socioeconomic information which provides an indication of the market and possible future development in the region and on the airport.

An accurate and complete inventory is essential to the success of a master plan. The inventory of existing

conditions serves primarily as a basis, or foundation, upon which most of the analysis conducted in later chapters is formed. This information was obtained through on-site investigations of the airport and interviews with airport management, airport tenants, representatives of various government agencies, and local and regional economic agencies. Information was also obtained from available studies concerning the airport including the *Hutchinson Municipal Airport Master Plan Update - 1996*; *Pavement Management Program Implementation and Structural Evaluation - 1999; Blueprint for Growth - Reno County, Kansas - 2004*; various environmental documents and City of Hutchinson land use and zoning plans.

AIRPORT CHARACTERISTICS

The purpose of this section is to summarize various studies and data collected to provide an understanding of the characteristics of the airport and the regional area. Within this section is a description of the airport setting, the ground access systems near the airport, the existing and future land use around the airport, local climate, and other regional airports. This information is important baseline data when developing forecasts for critical airport infrastructure to support demand over the planning period.

AIRPORT HISTORY

Construction of Hutchinson Municipal Airport was begun in 1929 and funded through a $75,000 bond issue passed by the citizens in June of the same year. The original tract of land was 262 acres located on the present airport site, three and one-half miles east of the central business district. By the spring of 1930, the airport included a hangar, office, and field lighting equipment. The City of Hutchinson became a common stop for barnstorming pilots including visits by Wiley Post and Major James Doolittle.

During the depression years of the 1930s, development of the Hutchinson Municipal Airport was funded through several WPA (Work Progress Administration) projects. A system of channels and dykes was constructed in 1936 near the airport. In 1939, three runways were first paved with a bituminous material. By 1940, the runway system consisted of a north to south runway that was 3,198 feet long; a northwest to southeast runway that was 3,150 feet long; a northeast to southwest runway that was 3,620 feet long; and a turf runway aligned east to west measuring 3,298 feet long.

In 1941, the first airport master plan was completed. In the following three years, 993 acres of land were purchased for airport use and expansion. During the war years, the airport was utilized by the Navy Department. The Navy provided extensive improvements including widening of the runways, construction of taxiways, and strengthening of the pavement. Navy improvements also included installation of sewer systems and utility installation.

In 1950, the City of Hutchinson constructed the terminal building and provided surface maintenance to the runway system. Other improvements during the 1950s included the construction of a number of hangars and improvements to the runway lighting systems.

The 1960s and 1970s saw further hangar construction and the acquisition of property for the installation of a medium intensity approach lighting system with runway alignment indicator lights (MALSR). This approach lighting system supported an instrument landing system (ILS) approach for Runway 13. The ILS was partly financed through the FAA Facilities and Equipment (F&E) program.

A master plan for the airport was completed in 1980 and a number of airfield improvements were recommended. Runway 13-31 was reduced from 200 feet wide to 100 feet wide and ongoing surface maintenance was undertaken.

The most recent master plan was completed in 1996. Many of the recommended improvements have been completed including runway and taxiway resurfacing, application of runway and taxiway markings, installation of taxiway lights, and runway strengthening.

AIRPORT ADMINISTRATION

Hutchinson Municipal Airport is owned and operated by the City of Hutchinson. It is the only publically-owned airport in Reno County. The daily operations of the airport are managed by a full-time Airport Manager who reports to the Assistant Parks Superintendent for the City of Hutchinson. The city also employs two additional full-time positions responsible for routine maintenance and upkeep.

The airport management and the city are advised by an eight-member Airport Advisory Committee. Members of the committee are elected by a vote of the committee and are eligible to serve two full three years terms and an additional partial term. Meetings are held once a month. It is the responsibility of the committee to advise the city and airport management on matters that pertain to the airport.

AIRPORT LOCATION

As depicted on **Exhibit 1A**, Hutchinson Municipal Airport is located in the northeast quadrant of Reno County, Kansas. Hutchinson, located approximately 35 miles to the northwest of Wichita, Kansas, is the county seat and the largest city in Reno County. The City of Hutchinson rests along the banks of the Arkansas River and Cow Creek.

Although portions of Reno County have thick, rich soils suitable to support a significant agriculturally-based economy (primarily wheat, corn, milo, and soybeans), other portions of Reno County have very sandy soils. These sandy soils have supported large and ongoing sand and salt mining operations. Other industries located in the county are hydraulics

manufacturing, agricultural implement manufacturing, the manufacture of fire engines, ambulances and limousines, grocery storage, and trucking.

Reno County encompasses 1,256 square miles of land. The terrain is rolling and relatively flat at an average elevation of 1,600 feet above mean sea level (MSL). The land cover is typically woodland and native tall grass prairies.

The Hutchinson Municipal Airport is located approximately three and one-half miles to the east of the central business district. The airport is within the city limits of the City of Hutchinson and encompasses a total of 1,549 acres. Portions of the north, east, and south airport property line border unincorporated Reno County.

AIRPORT ACCESS

The City of Hutchinson is located in south-central Kansas, approximately 35 miles to the northwest of Wichita, Kansas. The next largest city is Salina, located approximately 60 miles to the northeast. State Highway 61 connects Hutchinson to Interstate 135, approximately 20 miles to northeast. State Highway 96 connects to Wichita to the southeast. U.S. Highway 50 also connects to Interstate 135, approximately 30 miles to the east.

Direct access to the airport is provided by Airport Road, which traverses the western airport property boundary. East 4th Avenue runs along the south airport boundary and connects to Airport Road at the southwest corner of airport property. North Obee Road comprises the eastern border while East 23rd Avenue is the first major east/west route to the north.

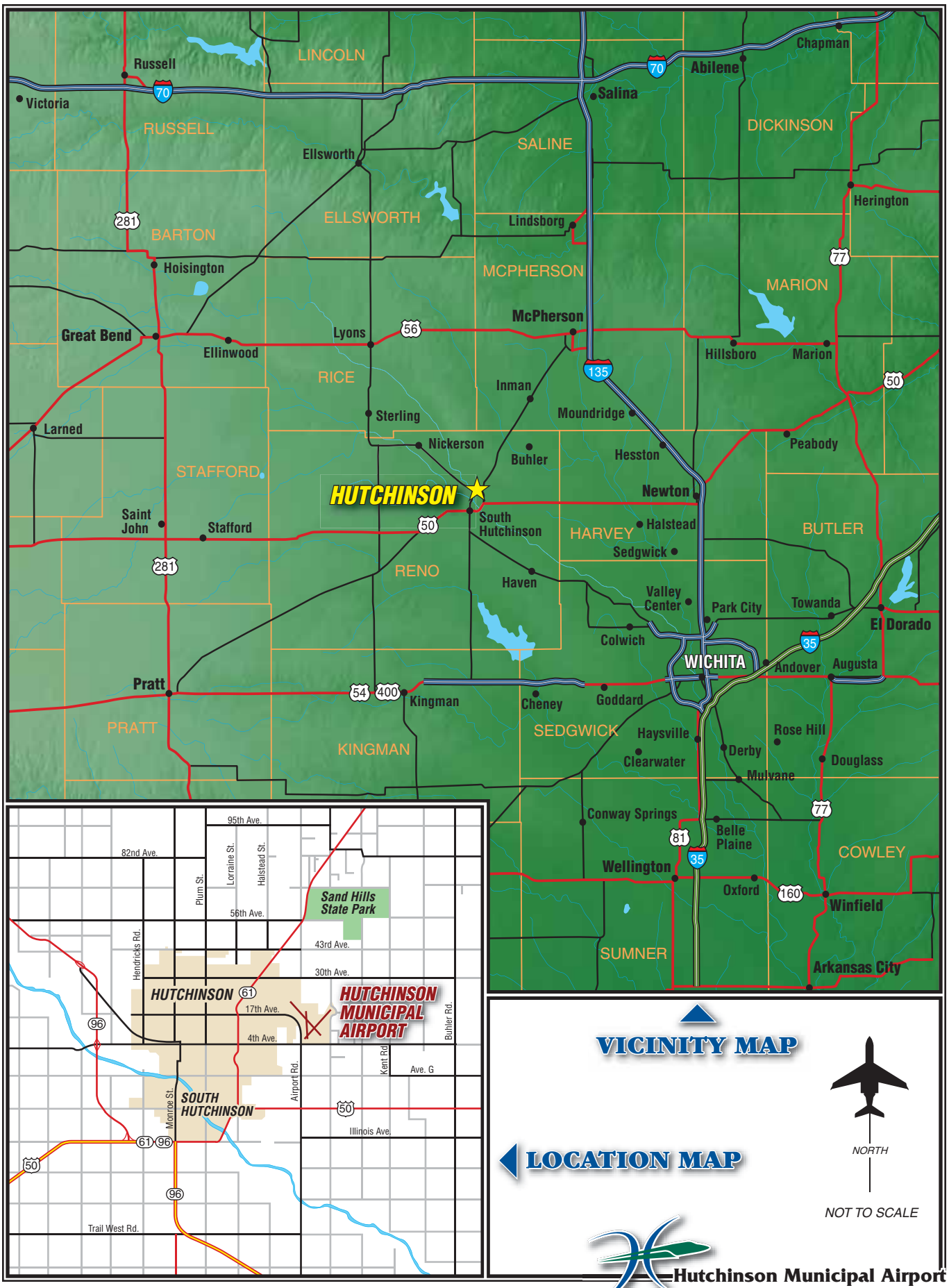
REGIONAL AIRPORTS

A review of public-use airport facilities within a 30-nautical mile radius of Hutchinson Municipal Airport was conducted to identify and distinguish the types of air service provided in the region. Information pertaining to each airport was obtained from FAA Form 5010, Airport Master Record. The area airspace exhibit presented later in this chapter also identifies the location of most of these airports.

The Sunflower Aerodrome Gliderpark (SN76) is a private airfield, located approximately eight miles to the south of the City of Hutchinson. This airport has 20 based gliders and four single engine tow aircraft. Runway 17-35 is 7,000 feet long by 200 feet wide and is constructed of concrete. The condition of the runways is very poor. There are no runway markings, navigational aids, or instrument approaches. Other available runways are: Runway 4-22, measuring 4,200 feet long by 35 feet wide, also constructed of concrete and in poor condition; and Runway 13-31 is 4,200 feet long by 100 feet wide, also in poor condition.

The airport served as the Hutchinson Naval Air Station during World War II but was decommissioned and sold. The airport was the site of automobile road racing through the 1980s and early 1990s. Currently, the facility is a public gliderpark. Users of Hutchinson Municipal Airport (HUT) should be

05MP03-1A-9/20/05



Hutchinson Municipal Airport

Exhibit 1A

AIRPORT VICINITY/LOCATION MAP

aware of the location of this airport as there may be glider operations in the area. Gliders are, of course, much slower than aircraft with engines and their maneuverability is limited. This airport can also serve as an emergency landing strip.

Moundridge Municipal Airport (47K) is located 22 statute miles to the northeast of HUT. This airport is served by Runway 17-35, which is constructed of asphalt and is 3,405 feet in length and 50 feet wide. There are 14 single-engine aircraft based at the airport. The airport also provides GPS instrument approaches with visibility minimums down to one mile.

McPherson Airport (MPR) is 22 miles to the northeast of HUT as well. Runway 18-36 is 5,500 feet long by 100 feet wide. It is constructed of concrete and is in good condition. Precision approach path indicators (PAPIs) are provided on both ends of the runway to aid pilots in maintaining the correct approach slope. Instrument approaches are provided for both approach ends with visibility minimums down to one mile.

The airport has 41 based aircraft, 27 of which are single-engine piston and nine are multi-engine piston. The remaining five aircraft are ultra-lights. Runway 8-26 is a turf runway measuring 2,511 feet long by 75 feet wide. The airport reports nearly 110 operations per day. Services available include Avgas, and Jet A fuel as well as maintenance operations.

Lyons-Rice County Municipal Airport (LYO) is 28 miles to the northwest. This airport provides a 3,000-foot by 50-foot asphalt runway (Runway 17R-35L) and two shorter turf runways. There are 18 single-engine aircraft based here as well as two multi-engine and two ultralights. Instrument approaches with visibility minimums down to one mile are available for smaller aircraft.

Kingman Airport - Clyde Cessna Field (9K8) is 31 miles to the southwest of HUT. Runway 18-36 is 4,300 feet long by 75 feet wide. Runway 11-29 is the crosswind runway and measures 3,400 feet long by 60 feet wide. Both runways are constructed of concrete and are in good condition. There are 20 based single-engine aircraft.

Newton City-County Airport (EWK) is 32 miles to the east of HUT. Runway 17-35 is the primary runway and is 7,003 feet long by 100 feet wide. It is constructed of concrete with an asphalt overlay and is in good condition. Runway 8-26 is 3,501 feet long by 60 feet wide with an asphalt overlay on concrete.

The airport is home to five jets, 14 multi-engine and 97 single-engine aircraft. It is estimated that the airport accounts for 178 operations per day or roughly 65,000 annual operations. Airport services include Avgas and Jet A fuel, line services and maintenance, rental cars, courtesy cars, and catering. Instrument approaches are provided to all runway ends including a CAT I ILS approach to Runway 17. The CAT I approach provides one-half mile visibility minimums and 200-foot cloud height ceilings. **Table 1A** provides information related to the regional airports.

TABLE 1A
Regional Airports
Hutchinson Municipal Airport

Airport	ID	Distance (mi)	Longest Runway	Services	Approaches/ Visibility
Sunflower Gliderpark	SN76	8 S	Runway 17-35: 7,000 x 200 (poor condition)	NA	NA
Moundridge Municipal	47K	22 NE	Runway 17-35: 3,405 x 50	Avgas	GPS/1 Mile
McPherson Airport	MPR	22 NE	Runway 18-36: 5,500 x 100	Jet A, Avgas, FBO	VOR, NDB, GPS/1 Mile
Lyons-Rice County	LYO	28 NW	Runway 17R-35L: 3,000 v 50	Avgas, FBO	VOR, NDB, GPS/1 Mile
Kingman Airport	9K8	31 SW	Runway 18-36: 4,300 x 75	Avgas, FBO	GPS, VOR/1 Mile
Newton-City-County	EWK	32 E	Runway 17-35: 7,003 x 100	Fuel, Full FBO	ILS/1/2 Mile

Source: Airnav.com

MILITARY ACTIVITY

Nearly 14 percent of the operations at Hutchinson Municipal Airport are conducted by military aircraft. Vance Air Force Base (AFB) is located in Enid, Oklahoma, approximately 170 miles to the south.

Vance Air Force Base is home to the 71st Flying Training Wing which provides joint specialized undergraduate pilot training for qualified U.S. military officers. The Air Base provides primary training in two aircraft types: The T1 and the T6. The Beechcraft T-1 Jayhawk, a small jet-powered aircraft, is designed to prepare pilots for active duty, flying tanker and transport aircraft. The Raytheon T-6 is a single-engine turboprop with jet-like handling characteristics. The T-6 is used for entry level aviation students who will potentially move into one of four training tracks: Air Force bomber fighter; Air Force airlift/tanker or Navy maritime; Navy Strike; or the Air Force Navy helicopter track.

Training missions from Vance AFB bring aircraft to Hutchinson Municipal Airport on a regular basis. Interviews with airport staff indicate that the ILS approach, runway length, and navigational aids, such as the NDB, are important features available at HUT that the military is interested in exposing to student pilots. Airport staff estimates that nearly half of the Jet A fuel sales on the airport are purchased by these trainers from Vance AFB.

CFR PART 139 CERTIFICATION

Title 14 of the Code of Federal Regulations (CFR) Part 139, *Certification and Operations: Land Airports Serving Certain Air Carriers*, provides the minimum standards for airports accommodating air passenger service. The FAA issues operating certificates to airports that meet stringent requirements related to safety, planning, and maintenance. Certificates are issued to airports serving scheduled and unscheduled passenger air service utilizing aircraft with seating capacity greater than nine passenger seats. Hutchinson Municipal Airport currently meets the stringent FAA requirements and maintains this certification as a Class IV airport under 14 CFR Part 139. This allows the airport to accommodate unscheduled air passenger service using aircraft with more than 30 passengers seats.

AREA LAND USE

Land use is important to the existing and potential needs of the airport. By understanding the land use issues surrounding the airport, more appropriate recommendations can be made for the future. Land uses surrounding Hutchinson Municipal Airport are varied and include a mix of residential, industrial, and institutional and agricultural development. Industrial land uses are predominant to the immediate west of the airport. Agricultural lands provide a buffer between the airport and residential land uses to the south. Low density residential housing is predominant to the north. To the west is unincorporated Reno County where residential housing is located. **Exhibit 1B** shows the existing land use based on a recent aerial photograph of the airport and the surrounding area.

AIRPORT LAND USE

A variety of land uses exist on airport property as depicted on **Exhibit 1B**. Nearly 576 acres are currently under agricultural leases. There is a water retention pond, maintained by the City Flood Department, to the east of the Runway 17 threshold. This is a pond that collects area storm water runoff. The eastern portion of airport property, to the east of Runway 4-22, is an unsealed Environmental Protection Agency (EPA) superfund site. Airside facilities include the runway and taxiway system as well as the associated navigational aids. Landside facilities include all the structures on airport property, predominantly located to the west of Runway 17-35. In addition, four parcels parallel to Runway 13-31 are identified as available for industrial development. The Hutchinson/Reno County Chamber of Commerce actively markets these building sites.

FUTURE LAND USE PLANS

The City of Hutchinson is directly responsible for planning and zoning on airport property and within the city limits. Areas to the west of the airport are zoned for industrial uses. Industrial uses are prevalent in this area with a number of residential single family houses intermixed. A portion of

airport property to the north borders on residential zoning where a number of homes exist. **Exhibit 1C** shows the current zoning for the City of Hutchinson.

Airport property on the north, east, and south borders on Reno County. Areas to the north are zoned residential by the county. Areas to the east are primarily zoned residential with a small portion zoned for agricultural uses. The undeveloped land to the south of the airport is zoned for industrial uses except for the southeast corner which is zoned for residential. Existing land uses for the county lands bordering airport property reflect the zoning.

Airport Height and Hazard Zoning/Ordinances

Height and hazard zoning in the vicinity of the airport is regulated by City Ordinance passed on May 10, 1954. The ordinance was implemented in order to regulate and restrict the height of structures and natural growth, and to regulate land use in the airport vicinity. The existing airport airspace zoning map from 1954 is presented in **Exhibit 1D.**

The City of Hutchinson has zoning restricting the use of land on, or adjacent to, the airport. The zoning regulations provide a means for the city to protect the airport and the necessary airspace, particularly the approaches to the runways. The City of Hutchinson controls zoning to the immediate north and west of the airport, while Reno County controls zoning to the south and east. Neither the city nor Reno County has adopted specific zoning ordinances based on 14 CFR Part 77, *Objects Affecting Navigable Airspace*, to limit the height of objects around the airport.

An example of an airport zoning ordinance is provided by the FAA in Advisory Circular 150/5190-4A, *A Model Zoning Ordinance to Limit Height of Object Around Airports.*

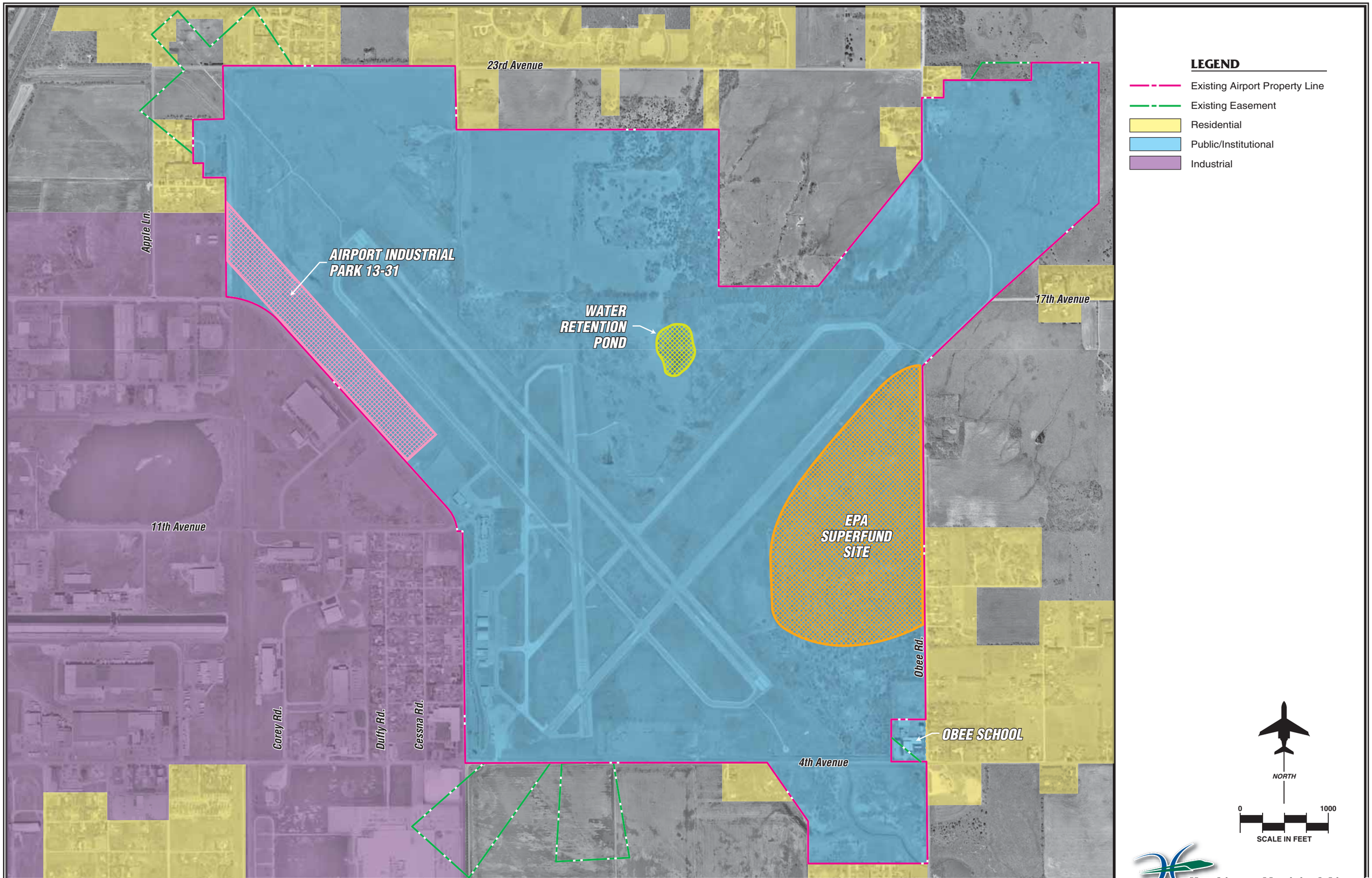
The City of Hutchinson, through the Land Development Ordinance (Chapter 27 of the city code, section 221, *Wireless Communication Facilities*) regulates the location and height of new cell phone towers to be located in the city. Applications for cell phone tower permits are reviewed by a number of city departments, including the airport, prior to approval.

CLIMATE

Weather conditions must be considered in the planning and development of an airport, as daily operations are affected by weather patterns. Temperature is a significant factor in determining runway length needs, while local wind patterns (both direction and speed) influence optimal runway orientation.

Hutchinson, Kansas experiences distinct seasonal changes. The area averages 14 inches of snowfall during the winter and an average low temperature of 17 degrees Fahrenheit (F) in January. Spring and summer typically bring thunderstorms and rising temperatures. July is the hottest month, with an average high temperature of 93 degrees. On average,

05MP03-1B-9/21/05

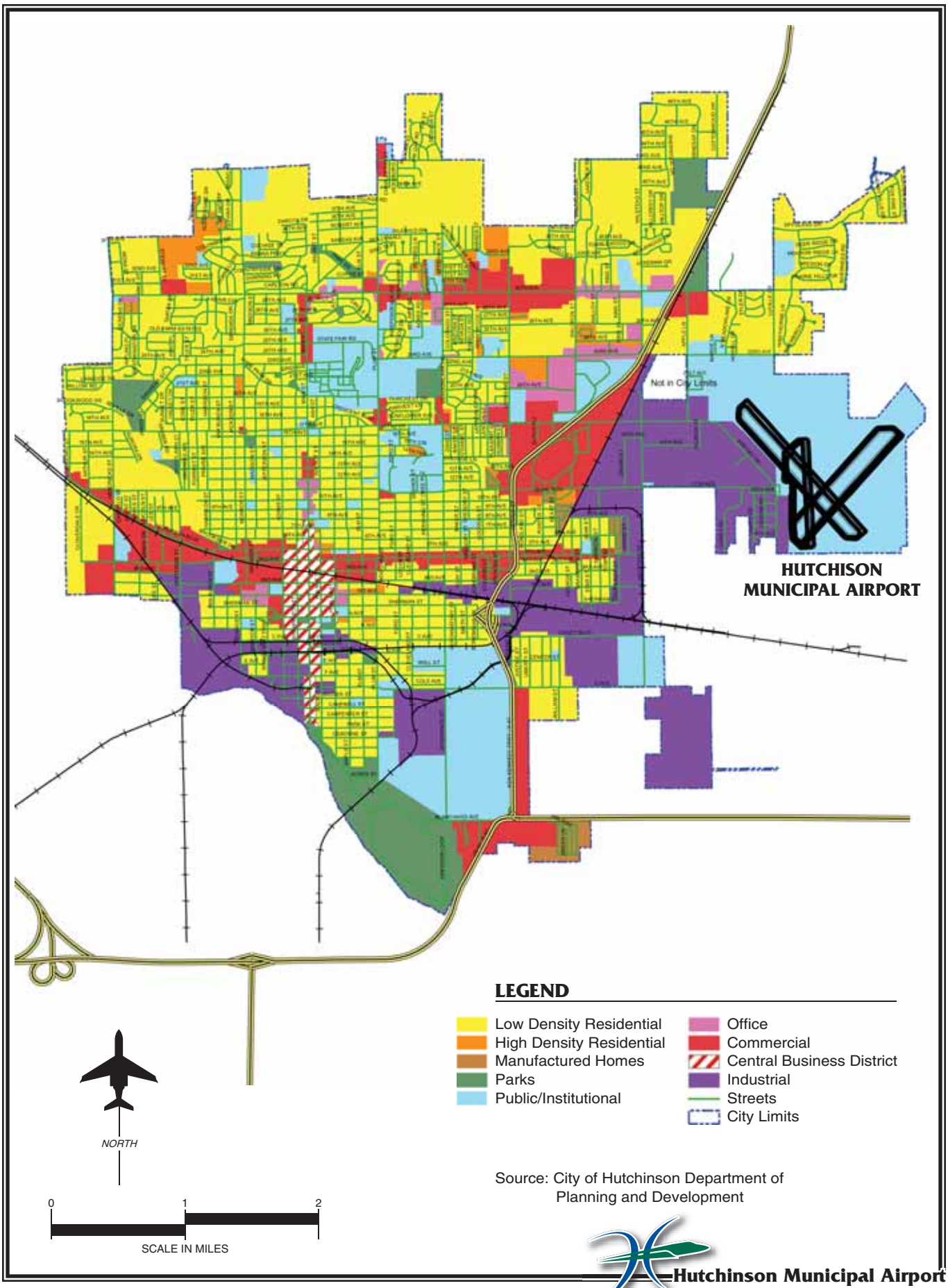


Hutchinson Municipal Airport

Exhibit 1B

EXISTING LAND USE

05MP03-1C-9/21/05



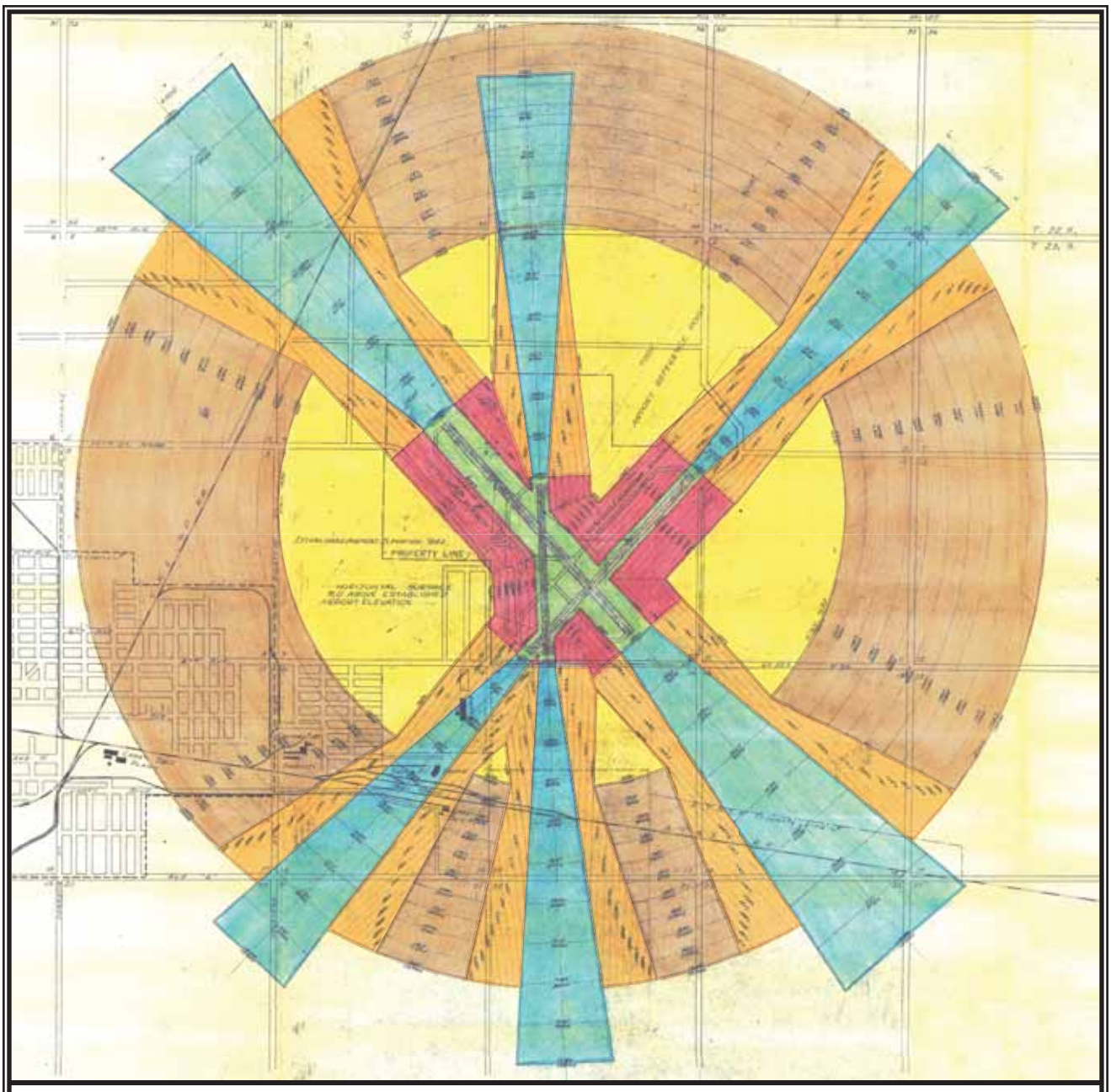
Source: City of Hutchinson Department of Planning and Development

Hutchinson Municipal Airport

Exhibit 1C

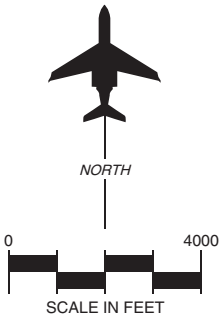
FUTURE LAND USE

05MP03-1D-9/15/05



LEGEND

- Landing Zones
- Approach Zones
- Landing Transition
- Turning Zone
- Approach Transition
- Conical Surface Zones



Source: Hutchinson Municipal Airport Zone Map, April 11, 1954

Hutchinson Municipal Airport

Exhibit 1D

EXISTING AIRPORT ZONING

the area receives approximately 30 inches per year. The prevailing wind is from the south and southwest. Climate data is summarized in **Table 1B**.

TABLE 1B
Climate Summary
Hutchinson Municipal Airport

	Jan	Feb	Mar	April	May	June	July	Aug	Sept	Oct	Nov	Dec
High Temp Average	39.9	46.8	56.4	66.3	75.4	86.9	92.6	90.8	82.2	70.3	54.2	43
Low Temp Average	17.3	22.3	31.5	41.3	52.3	62.2	67.3	65.6	56.4	43.5	30.6	21
Days with Precip.	5	5	8	8	11	9	8	7	8	6	5	6
Average Precip. (in)	0.7	1.1	2.7	2.7	4.5	4	3.8	3.2	2.9	2.4	1.6	1
Wind Speed (mph)	12	12.5	13.8	14	12.3	12.2	1.3	11.1	11.6	1.9	12.1	1.7
Sunshine (%)	58	61	62	63	64	69	76	75	68	65	58	57
Cloud Free Days	11	8	9	9	8	9	13	13	13	13	11	10
Partly Cloudy Days	6	7	7	8	10	11	11	10	7	7	7	7
Cloudy Days	14	13	15	13	13	10	7	8	10	11	13	14
Snowfall (in)	4.2	3.9	2.9	0.2	0	0	0	0	0	0	1.3	3.3

Source: www.weather.com; www.city-data.com

AIRPORT SYSTEM PLANNING ROLE

Airport planning exists on many levels: local, state, and national. Each level has a different emphasis and purpose. An airport master plan is the primary local airport planning document.

At the national level, Hutchinson Municipal Airport is included in the *National Plan of Integrated Airport Systems* (NPIAS). This plan identifies 3,344 existing airports which are identified by the Federal Aviation Administration (FAA) as significant to the national air transportation system. The NPIAS plan is used by the FAA in administering the Airport Improvement Program (AIP). The NPIAS supports the FAA's strategic goals for safety, system efficiency, and environmental compatibility by identifying specific airport improvements eligible for federal funding. An airport must be included in the NPIAS to be eligible for federal funding assistance through the AIP program.

The 2005-2009 NPIAS identified $39.5 billion for airport development. Of that, approximately 13 percent is identified for general aviation (GA) airports. Hutchinson Municipal Airport is classified as a GA airport in the NPIAS and, thus, is eligible for federal funding. The NPIAS includes over $877,000 in development costs for the airport over the five-year period.

Communities that do not receive scheduled commercial service may be included in the NPIAS as sites for GA airports if they account for enough activity (usually at least 10 locally-owned aircraft) and are at least 20 miles from the nearest NPIAS airport. The activity criterion may be relaxed for remote locations or other mitigating circumstances. Hutchinson Municipal Airport exceeds both of these thresholds.

The 2,556 GA airports in the NPIAS tend to be distributed on a one-per-county basis in rural areas and are more often located near the county seat. These airports, with an average of 33 based aircraft, account for 40 percent of the nation's general aviation fleet. These airports are the most convenient source of air transportation for about 19 percent of the population and are particularly important to rural areas. Hutchinson Municipal Airport has 41 based aircraft and an estimated average of 153 operations per day, thus making the airport further eligible for AIP funding.

At the state level, the State of Kansas, through the Department of Transportation, identifies aviation needs as a modal element of the overall transportation infrastructure.

AIRPORT FACILITIES

Airport facilities can be functionally classified into two broad categories: airside and landside. The airside category includes those facilities which are needed for the safe and efficient movement of aircraft such as runways, taxiways, lighting, and navigational aids. The landside category includes those facilities necessary to provide a safe transition from surface to air transportation and support aircraft servicing, storage, maintenance, and operational safety.

AIRSIDE FACILITIES

Existing airside facilities are identified on **Exhibit 1E**. **Table 1C** summarizes airside facility data for Hutchinson Municipal Airport.

Runways

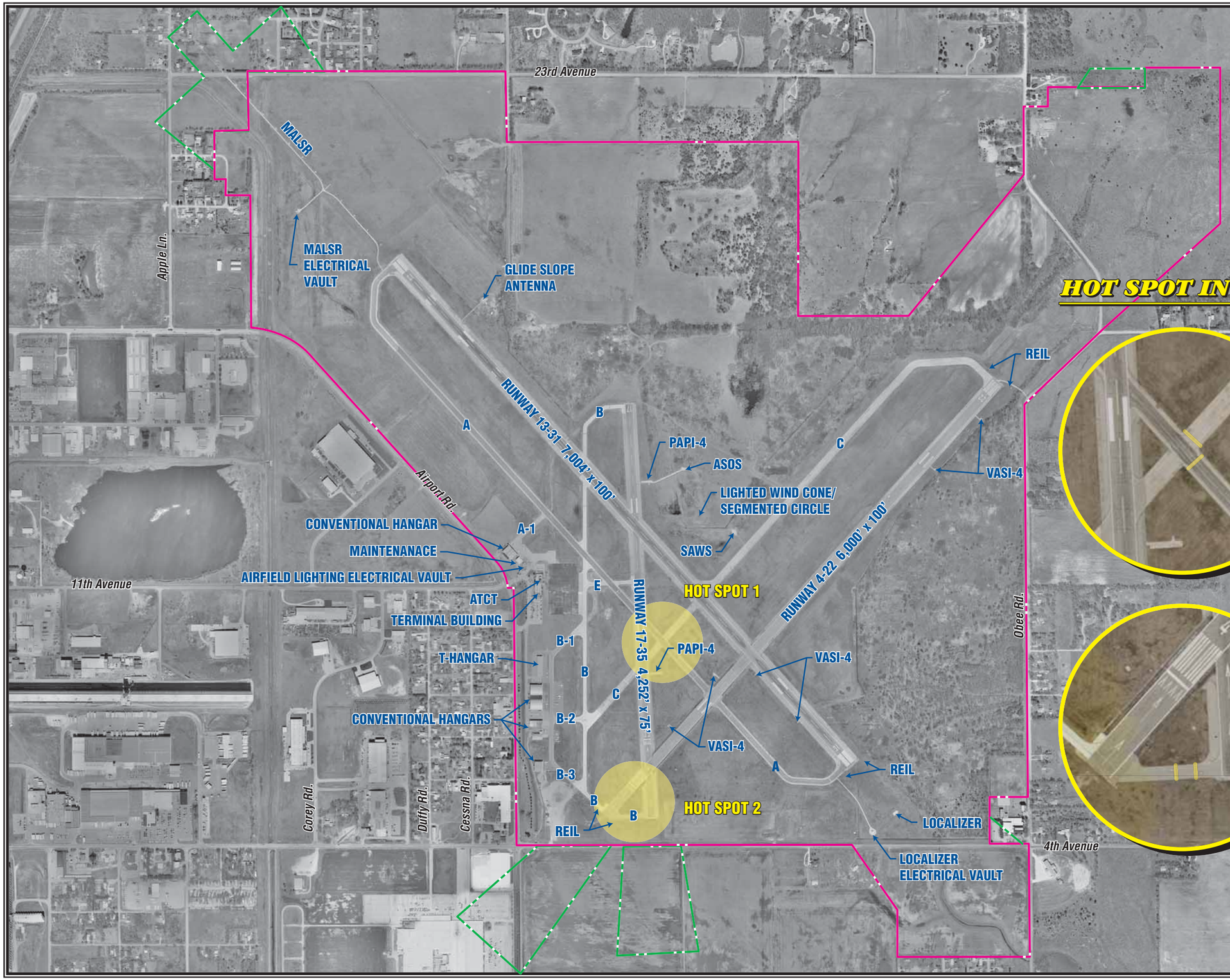
Hutchinson Municipal Airport is served by three intersecting asphalt runways. Runway 13-31 intersects the northern portion of Runway 17-35 and extends southeast to intersect Runway 4-22 at its southern end. Runway 4-22 and Runway 17-35 also have intersecting pavement at the southern ends of both runways.

Runway 17-35

Runway 17-35 is 4,252 feet long by 75 feet wide and oriented in a north-south manner. The Runway 35 landing threshold is displaced 800 feet in order to provide for the runway safety area (RSA) prior to the landing threshold and to clear 4th Avenue and trees in the approach surface. The asphalt surface is in good condition, the highest rating the FAA designates for runway condition. Runway 17-35 provides 35-foot paved runway shoulders.

Runway 17-35 has a pavement strength of 42,000 pounds single wheel loading (SWL). SWL refers to the design of certain aircraft landing gear that have a single wheel on each main landing gear strut. Other landing gear configurations would include dual wheel (DWL), dual tandem wheel (DTWL), and double dual tandem wheel (DDTL). Each of these distributes more of the aircraft weight on runway and taxiway surfaces and, thus, the surface itself can support a greater total airplane weight. The dual-wheel strength rating is 50,000 pounds and the dual-tandem-wheel strength rating is 76,000 pounds.

05MP03-1E-9/15/05



LEGEND

- Existing Airport Property Line
- Existing Easement

KEY

ASOS	Automated Surface Observing System
SAWS	Stand Alone Weather Sensor
VASI	Visual Approach Slope Indicator
PAPI	Precision Approach Path Indicator
REIL	Runway End Identification Lighting
ATCT	Airport Traffic Control Tower
MALSR	Medium Intensity Approach Lighting System with Runway Alignment Indicator Lights

HOT SPOT INTERSECTIONS

HOT SPOT 1

Aircraft departing Runway 13-31 at Taxiway C hold for Runway 17-35 prior to reaching Taxiway A. As hold markings are associated with runways, a hold marking prior to Taxiway A is confusing. Often aircraft will proceed past the designated hold marking when turning right onto Taxiway A from Taxiway C, to go toward the terminal building, thus creating an incursion. Aircraft taxiing northwest on Taxiway A must also hold short of Runway 17-35 prior to the intersection with Taxiway C.

HOT SPOT 2

Taxiway B between Runways 4-22 and 17-35 is very short. As a result, the hold position markings are very close together and overlap. If pilots are not cautious, they could stop at the wrong hold marking, placing the aircraft inside the runway safety area.

NORTH

0 1000

SCALE IN FEET

Hutchinson Municipal Airport

Exhibit 1E

EXISTING AIRSIDE FACILITIES

TABLE 1C
Airside Facility Data
Hutchinson Municipal Airport

	Runway 13-31	Runway 4-22	Runway 17-35
Runway Length (feet)	7,004	6,000	4,252
Runway Width (feet)	100	100	75
Runway Surface Material	Asphalt	Asphalt	Asphalt
Surface Treatment	None	None	None
Condition	Good	Good	Good
Runway Load Bearing Strength (lbs)			
Single Wheel Loading (SWL)	42,000	42,000	42,000
Dual-Wheel Loading (DWL)	52,000	52,000	50,000
Dual-Tandem Wheel Loading (DTWL)	76,000	76,000	76,000
Runway Markings	Precision	Non-precision	Basic
Runway Lighting	HIRL	MIRL	MIRL
Taxiway Markings	Centerline/ Holdlines	Centerline/ Holdlines	Centerline/ Holdlines
Taxiway Lighting	MITL	Can reflectors	MITL
Approach Aids	VASI - 4L (31) MALSR (13) REIL (31)	REIL VASI - 4L	PAPI - 4L (17) PAPI - 4R (35)
Instrument Approach Aids	LOC BC RWY 31 ILS RWY 13 NDB RWY 13 GPS RWY 13 GPS RWY 31	VOR/DME RWY 22 VOR RWY 4 GPS RWY 4 GPS RWY 22	Visual Only
Displaced Threshold	NA	400 feet (Rwy. 4)	800 feet (Rwy. 35)
Weather Aids	ASOS, SAWS, ATIS		
Visual Aids	Segmented Circle, Lighted Wind Cone, Rotating Beacon		

PAPI - Precision Approach Path Indicator
GPS - Global Positioning System
ASOS - Automated Surface Observing System
ATIS - Automated Terminal Information Service
HIRL & MIRL - High and Medium Intensity Runway Lights
MITL - Medium Intensity Taxiway Lighting
VOR/DME - Very High Frequency Omnidirectional Range/Distance Measuring Equipment
MALSR - Medium Intensity Approach Lighting System with Runway Alignment Indicator Lights
VASI - Visual Approach Slope Indicator
ILS - Instrument Landing System
REIL - Runway End Identification Lighting
LOC - Localizer
SAWS - Stand Alone Weather Sensors

Source: Airport Facility Directory; South Central (May 2005).

Runway 4-22

Runway 4-22 is 6,000 feet long and 100 feet wide. It is oriented in a northeast to southwest manner. The runway has a rated pavement strength of 42,000 pounds SWL, 52,000 pounds DWL, and, 76,000 pounds DTWL. This asphalt runway is in good condition and provides 25-foot paved shoulders. The Runway 4 landing threshold is displaced 400 feet to provide approach clearance over 4th Avenue.

Runway 13-31

Runway 13-31 is oriented in a northwest to southeast manner and serves as the primary runway for the airport. At 7,004 feet in length, this is the longest runway at the airport. The pavement strength rating is 42,000 pounds SWL, 52,000 pounds DWL, and 76,000 pounds DTWL. The runway is constructed of asphalt which is in good condition. Runway 13-31 provides 50-foot wide paved shoulders.

Taxiways

The taxiway system at Hutchinson Municipal Airport, as illustrated on **Exhibit 1E**, consists of parallel, connecting, access, and entrance/exit taxiways.

Taxiway A is a 50-foot wide, full-length parallel taxiway to Runway 13-31. The taxiway is separated from the Runway 13-3 centerline by 590 feet. Taxiway A provides access to the main terminal apron and to airport businesses located in the northwest portion of the airport. Taxiway A is constructed of asphalt and is in good condition.

Taxiway B is a 50-foot wide, full-length parallel taxiway to Runway 17-35. This taxiway is separated from Runway 17-35 by 640 feet at the southern end and 470 feet at the northern end. Taxiway B provides full access to the landside facilities including the southern terminal area where Wells Aviation, the airport fixed base operator (FBO), is located. Taxiway B is constructed of concrete and was recently reconstructed in 2004.

Taxiway C is the parallel taxiway serving Runway 4-22 and is 80 feet wide. Taxiway C is constructed of concrete and is in fair condition. There are a number of cracks and grass and weed intrusions. Taxiway C crosses both runways, Taxiway A, and terminates at Taxiway B near Wells Aircraft. Taxiway C will be reconstructed in 2006.

Taxiway E is a stub taxiway extending between the main apron and Runway 17-35.

Entrance/exit taxiways include Taxiway A1 providing access to the northernmost aircraft hangars. Taxiways B1, B2, and B3 each serve the southern FBO complex occupied by Wells Aircraft.

Pavement Markings

Pavement markings aid in the movement of aircraft along airport surfaces and identify closed or hazardous areas on the airport. The basic markings on Runway 17-35 identify the runway designations, centerline, touchdown point, and edges. Runways 4, 22, and 31 have non-precision markings which identify the runway centerline, edges, thresholds, and designations. Runway 13 has precision markings which identify the runway designations, edges, centerline, touchdown point, and landing zone. Arrows are painted on the southern 400 feet of Runway 4 and the southern 800 feet of Runway 35 to identify the displaced thresholds.

Taxiway centerline markings are provided to assist pilots in maintaining

proper clearance from pavement edges and objects near the taxiway/taxilane edges. Taxiway markings also include aircraft holding positions. Aircraft movement areas on the apron are also identified with centerline markings.

Airfield Lighting

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

Identification Lighting: The location of the airport at night is universally identified by a rotating beacon. The rotating beacon projects two beams of light, one white and one green, 180 degrees apart. The rotating beacon at Hutchinson Municipal Airport is located on the top of a 50-foot steel pole, approximately 600 feet to the northwest of the terminal building.

Runway and Taxiway Lighting/ Signage: Runway and taxiway edge lighting utilizes light fixtures placed near the edge of the pavement to define the lateral limits of the pavement. This lighting is essential for safe operations during night and/or times of low visibility in order to maintain safe and efficient access to and from the runways and aircraft parking areas.

Runway 13-31 is equipped with high intensity runway lights (HIRL) because it supports a precision instrument approach to Runway 13. Runways 4-22 and 17-35 are served by medium intensity runway lights (MIRL). Taxiways A and B are served by medium intensity taxiway lights (MITL). Taxiway C does not have lighting but is served by can reflectors which reflect aircraft lights to define the lateral limits of the taxiway.

All runway ends are equipped with threshold lighting. Threshold lighting consists of specially designed light fixtures that are red on the departure side and green on the arrival side.

The airport also has a runway/taxiway signage system. The presence of runway/taxiway signage is an essential component of a surface movement guidance control system necessary for the safe and efficient operation of the airport. The signage system installed at Hutchinson Municipal Airport includes runway and taxiway designations, holding positions, routing/directional, and runway end and exits.

Visual Approach Lighting: A four-light visual approach slope indicator (VASI) is located on the left side of Runway 31. The VASI consists of two forward and two rear lighting units that alert approaching pilots of their position relative to the desired three-degree glide slope. A VASI lighting system also serves both ends of Runway 4-22. Runway 4 provides the standard three-degree glide slope while Runway 22 provides a 3.4 degree-glide slope for obstruction clearance purposes.

Runway 17-35 is served by the more advanced precision approach path

indicator (PAPI) system, located to the left side of both runways. Both of these four-box units support a three-degree glide slope. When the system of red and green lights are interpreted by the pilot, they are given an indication of being above, below, or on the designated descent path to the runway threshold. A PAPI system has a range of five miles during the day and up to twenty miles at night.

Runway End Identification Lighting: Runway end identification lights (REILs) provide rapid and positive identification of the approach ends of a runway. A REIL system has been installed on each end of Runway 4-22 and the Runway 31 end. A REIL consists of two synchronized flashing lights, located laterally on each side of the runway end, facing the approaching aircraft.

Approach Lighting Systems: Runway 13 is equipped with a medium intensity approach lighting system with runway alignment indicator lights (MALSR). This system provides visual guidance to landing aircraft by radiating light beams in a direction pattern so the pilot can align the aircraft with the extended centerline of the runway. This system enhances the safety of operations at the airport, especially during inclement weather or nighttime activity.

Pilot-Controlled Lighting: During times when the airport traffic control town is closed, the runway, taxiway, and approach lighting systems are turned off. Pilots operating at night have the ability to turn on these systems, except for the VASIs serving Runway 31, through use of a radio transmitter. All airfield lights will remain on for 15 minutes.

Weather and Communication Aids

Hutchinson Municipal Airport has one lighted wind cone, and a segmented circle. The lighted wind cone provides information to pilots regarding wind conditions, such as direction and intensity. The segmented circle consists of a system of visual indicators designed to provide traffic pattern information to pilots.

Hutchinson Municipal Airport is equipped with an Automated Surface Observing System (ASOS). An ASOS will automatically record weather conditions such as temperature, dew point, wind speed, altimeter setting, visibility, sky condition, and precipitation. The ASOS updates observations every minute, 24 hours a day, and this information is transmitted to pilots in the airport vicinity via FAA VHF ground-to-air radio. Pilots can receive these broadcasts on frequency 124.25 MHz or via a local telephone number, where a computer-generated voice will present airport weather information.

The airport was recently outfitted with Stand Alone Weather Sensor (SAWS) that serves as a backup to the ASOS. The SAWS sensor will automatically collect, process, and broadcast weather data to airport traffic controllers, including wind speed, wind direction, wind gusts, altimeter setting, temperature, and dew point.

Hutchinson Municipal Airport is also equipped with an Automated Terminal Information Service (ATIS). ATIS broadcasts are used by airports to notify arriving and departing pilots of the current surface weather conditions, communication frequencies, and other important airport-specific information. The ATIS frequency at Hutchinson Municipal Airport is 124.25 MHz.

Hutchinson Municipal Airport maintains a Limited Aviation Weather Reporting Station (LAWRS) observer during the hours of airport traffic control tower (ATCT) operation (7:00 am - 11:00 pm). ATCT personnel document weather observations at regular intervals and provide reports to the National Weather Service. This function serves as a backup to the ASOS and SAWS.

Hutchinson Municipal Airport has access to the common advisory traffic frequency (CTAF). This radio frequency (118.5 MHz.) is used by pilots in the vicinity of the airport to communicate with each other about approaches to, or departures from, the airport when the airport traffic control tower is closed. In addition, a UNICOM frequency is also available (122.95 MHz.), where a pilot can obtain information pertaining to the airport.

Navigational Aids

Navigational aids are electronic devices that transmit radio frequencies, which pilots of properly equipped aircraft can translate into point-to-point guidance and position information. The types of electronic navigational aids available for aircraft flying to or from Hutchinson Municipal Airport include a non-directional beacon (NDB), a very high frequency omni-directional range (VOR) facility, LORAN-C, and the global positioning system (GPS).

The NDB transmits nondirectional radio signals whereby the pilot of an aircraft, equipped with direction-finding equipment, can determine their bearing to or from the NDB facility in order to track to the beacon station. The Salt NDB is 4.7 miles to the northwest of the airport. The McPherson NDB is approximately 22 miles to the northeast of the airport. The Lyons NDB is approximately 28 miles to the northwest, and the Newton NDB is 32 miles to the east.

The VOR, in general, provides azimuth readings to pilots of properly equipped aircraft transmitting a radio signal at every degree to provide 360 individual navigational courses. Frequently, distance measuring equipment (DME) is combined with a VOR facility (VOR-DME) to provide distance as well as direction information to the pilot. Military tactical air navigation aids (TACANs) and civil VORs are commonly combined to form a VORTAC. The VORTAC provides distance and direction information to both civil and military pilots. The Hutchinson VOR/DME is approximately six miles to the southwest of the airport.

GPS is an additional navigational aid for pilots. GPS was initially developed by the United States Department of Defense for military navigation around the world. GPS differs from a NDB or VOR, in that pilots are not required to

navigate using a specific facility. GPS uses satellites placed in orbit around the earth to transmit electronic radio signals, which pilots of properly equipped aircraft use to determine altitude, speed, and other navigational information. With GPS, pilots can directly navigate to any airport in the country and are not required to navigate using a specific navigation facility.

LORAN-C is a radio navigation system originally developed by the U.S. Coast Guard for maritime navigation. The system was expanded to include 24 ground-based stations across the continental United States. LORAN-C provides navigation, location and timing services to both civil and military air, land, and marine users. The system is approved as an en-route supplemental air navigation system for both Instrument Flight Rule (IFR) and Visual Flight Rule (VFR) operations.

With the advancements taking place with the GPS system, the need for the older LORAN-C facilities is being evaluated by the government. Although there are no short-term plans to close the LORAN-C system, in the long-term the system may be replaced by the GPS system.

Area Airspace

The Federal Aviation Administration (FAA) Act of 1958 established the FAA as the responsible agency for the control and use of navigable airspace within the United States. The FAA has established the National Airspace System (NAS) to protect persons and property on the ground and to establish a safe environment for civil, commercial, and military aviation. The NAS is defined as the common network of U.S. airspace, including air navigational facilities; airports and landing areas; aeronautical charts; associated rules, regulations and procedures; technical information; and personnel and material. System components shared jointly with the military are also included as part of this system.

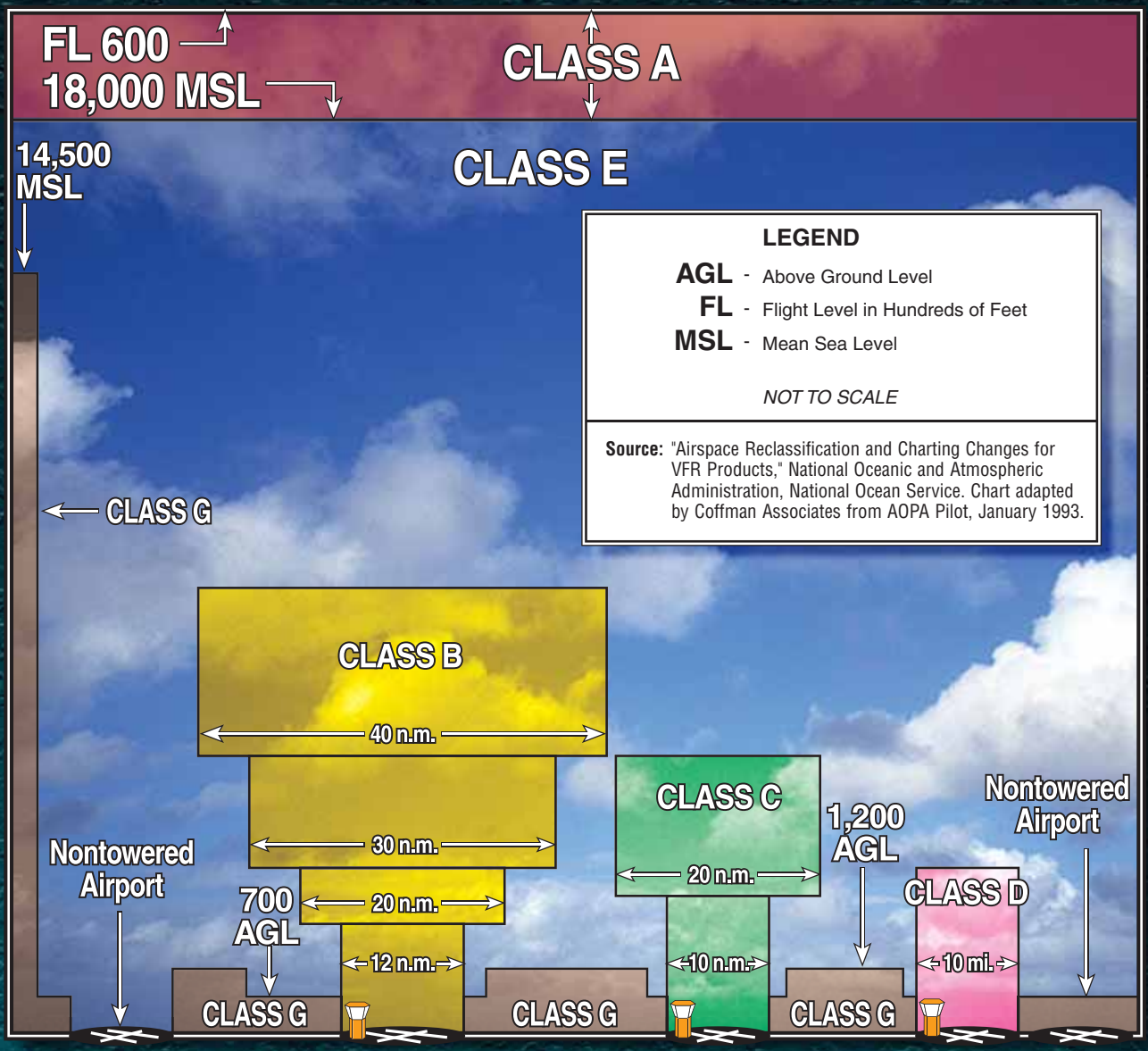
To ensure a safe and efficient airspace environment for all aspects of aviation, the FAA has established an airspace structure that regulates and establishes procedures for aircraft using the National Airspace System. The U.S. airspace structure provides for categories of airspace, controlled and uncontrolled, and identifies them as Classes A, B, C, D, E, and G as described below. **Exhibit 1F** generally illustrates each airspace type in three-dimensional form.

- Class A airspace is controlled airspace and includes all airspace from 18,000 feet mean sea level (MSL) to Flight Level 600 (approximately 60,000 feet MSL).

- Class B airspace is controlled airspace surrounding high-activity commercial service airports (i.e., Kansas City International Airport).

- Class C airspace is controlled airspace surrounding lower-activity commercial service (i.e.,

05MP03-1F-9/13/05



CLASSIFICATION	DEFINITION
CLASS A	Generally airspace above 18,000 feet MSL up to and including FL 600 .
CLASS B	Generally multi-layered airspace from the surface up to 10,000 feet MSL surrounding the nation's busiest airports.
CLASS C	Generally airspace from the surface to 4,000 feet AGL surrounding towered airports with service by radar approach control.
CLASS D	Generally airspace from the surface to 2,500 feet AGL surrounding towered airports.
CLASS E	Generally controlled airspace that is not Class A, Class B, Class C, or Class D.
CLASS G	Generally uncontrolled airspace that is not Class A, Class B, Class C, Class D, or Class E.

Hutchinson Municipal Airport

Exhibit 1F

AIRSPACE CLASSIFICATION

Wichita Mid-Continent Airport) and some military airports.

- Class D airspace is controlled airspace surrounding low-activity commercial service and general aviation airports with an airport traffic control tower (ATCT) such as Hutchinson Municipal Airport.

All aircraft operating within Classes A, B, C, and D airspace must be in constant contact with the air traffic control facility responsible for that particular airspace sector.

- Class E airspace is controlled airspace surrounding an airport that encompasses all instrument approach procedures and low-altitude federal airways. Only aircraft conducting instrument flights are required to be in contact with air traffic control when operating in Class E airspace. While aircraft conducting visual flights in Class E airspace are not required to be in radio contact with air traffic control facilities, visual flight can only be conducted if minimum visibility and cloud ceilings exist.

- Class G airspace is uncontrolled airspace that does not require communication with an air traffic control facility.

Airspace within the vicinity of Hutchinson Municipal Airport is depicted on **Exhibit 1G**. When the airport traffic control tower is open, the airport is located under Class D airspace. Class D airspace extends to a four-nautical-mile radius from the tower and to an elevation of 2,500 feet above ground level (AGL).

When the tower is closed, the airport operates in Class E airspace with a floor of 700 feet AGL and extending to 18,000 feet mean sea level (MSL), or where Class A airspace begins. The Class E airspace surrounding the airport extends to a seven-nautical-mile radius. There are four extensions of Class E airspace radiating from the seven-mile-radius. One of these extensions reaches to the Class E surface surrounding the City of Lyons, 28 miles to the northwest. This extension provides for the precision approach to Runway 13.

Victor Airways

Victor Airways start at 1,200 feet above ground level (AGL) extending upward to an altitude of 18,000 feet mean sea level (MSL) and measuring eight nautical miles wide. Airways are called "Victor" Airways because they run primarily between VOR facilities. The phonetic alphabet's term for "V", as in VOR, is Victor, thus they are referred to as "Victor" Airways.

There are a number of VOR facilities in proximity to Hutchinson Municipal Airport. To the north is the Salina VOR. To the southeast is the Wichita VOR. To the south is the Hutchinson VOR. Victor Airways criss-cross the airspace around Hutchinson Municipal Airport connecting these VORs.

Military Training Routes

Military training routes, or MTRs, are long, low-altitude corridors that serve as flight paths to a particular destination for military aircraft. The corridor is often 10 miles wide, 70 to 100 miles long, and may range from 500 feet to 1,500 feet above ground level; occasionally, they are higher. MTRs are designed to provide realistic low-altitude training conditions for pilots. In times of conflict, to avoid detection by enemy radar, tactical fighter aircraft are often called upon to fly hundreds of miles at low altitudes over varying terrain. Obviously, navigation is extremely difficult on high-speed low-altitude flights. That's why it is imperative that fighter pilots have ample opportunity to practice these necessary and demanding skills. There are a number of MTRs within a short distance of Hutchinson Municipal Airport. Civilian aircraft are not restricted from operating in the vicinity of the MTRs, although they should be aware of the locations of the MTRs and exercise special caution if they need to cross them. The MTRs in the vicinity of the airport are designated VR536 and VR119.

Military Operational Areas (MOAs)

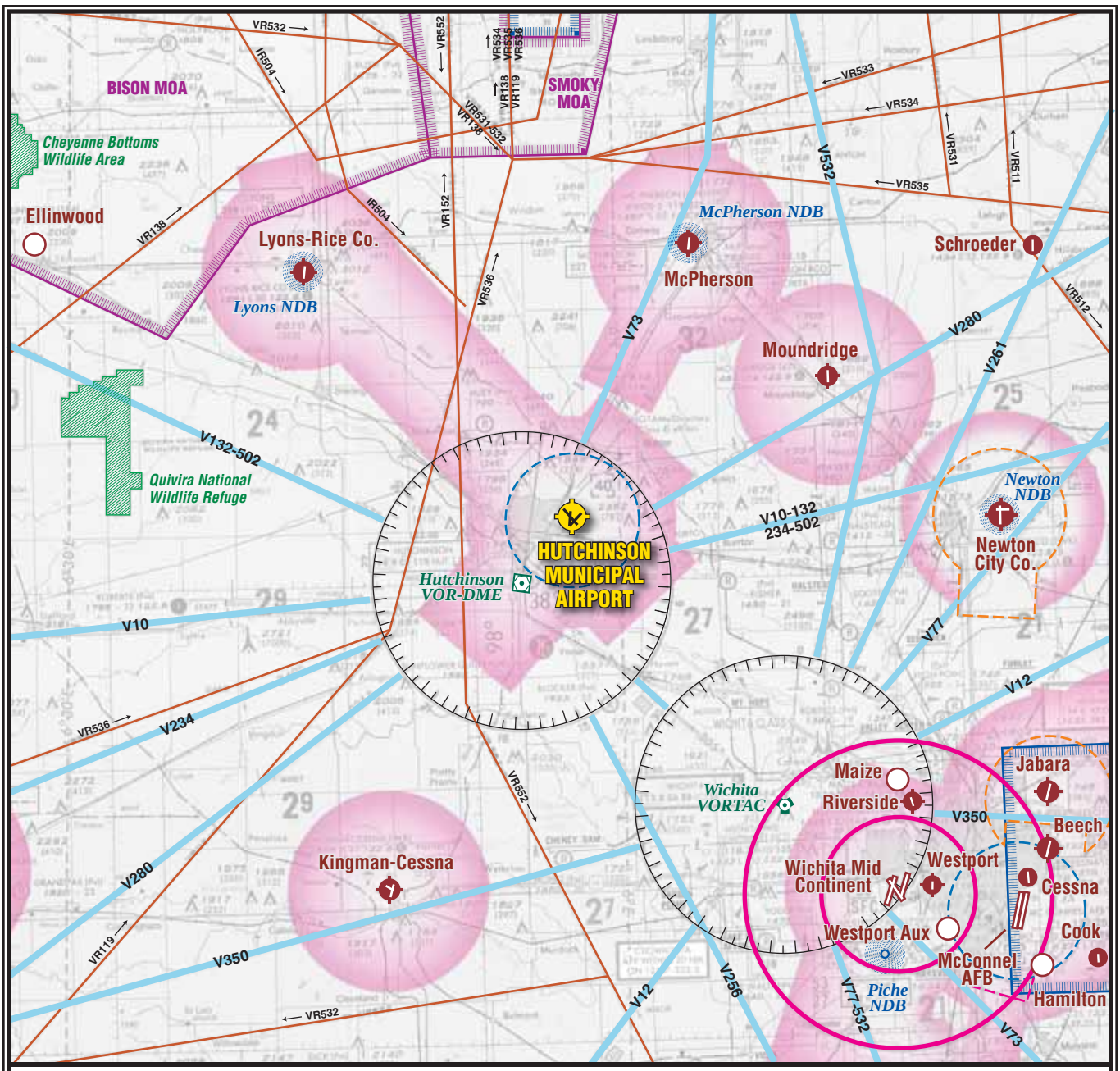
Hutchinson Municipal Airport is situated with the Bison and Smoky-Hi MOAs to the north and the Vance 1A and Vance 1B MOAs to the south. A MOA is an area of airspace designated for military training use. This is not restricted airspace; pilots can use the airspace, however, they should be on alert for the possibility of military traffic. A pilot may need to be aware that military aircraft can be found in high concentrations, conducting aerobatic maneuvers, and possibly operating at high speed at lower elevations. The activity status of a MOA is announced by a *Notice to Airmen* (NOTAM) and is indicated on sectional charts.

Instrument Approach Procedures

Instrument approach procedures are a series of predetermined maneuvers established by the FAA, using electronic navigational aids to assist pilots in locating and landing at an airport during low visibility and cloud ceiling conditions. The capability of an instrument approach is defined by the visibility and cloud ceiling minimums associated with the approach. Visibility minimums define the horizontal distance that the pilot must be able to see to complete the approach. Cloud ceilings define the lowest level a cloud layer (defined in feet above the ground) can be situated for a pilot to complete the approach. If the observed visibility or cloud ceiling is below the minimums prescribed for the approach, the pilot cannot complete the instrument approach.

Numerous instrument approaches have been approved for Hutchinson Municipal Airport serving all runways except Runway 17-35. Runway 13 is served by a Category I instrument landing system (ILS) approach, which provides both course guidance and vertical descent information to pilots. The original ILS system was installed at the airport in 1977 and 1978. The

05MP03-1G-9/27/05



LEGEND

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

NORTH

NOT TO SCALE

Source: Wichita Sectional Chart, US Department of Commerce, National Oceanic and Atmospheric Administration, August 4, 2005

Hutchinson Municipal Airport

Exhibit 1G

AREA AIRSPACE

ILS consists of the localizer, the glideslope antenna, and the MALSR approach lighting system.

The ILS approach to Runway 13 provides the lowest minimums available at the airport allowing operations in inclement weather. The cloud ceiling minimum is 200 feet AGL and the visibility minimum is one-half-mile. Runway 13 also provides separate instrument approaches utilizing the localizer as well as a circling approach.

A circling approach allows pilots to land on any active runway at the airport. While providing flexibility for the pilot to land on the runway most closely aligned with the prevailing wind at that time, a circling approach will have higher visibility and cloud ceiling minimums than other instrument approaches which are aligned with a particular runway end. This is done to provide pilots with sufficient visibility and ground clearance to navigate visually from the approach to the desired runway end for landing.

Runway 13 also provides both a GPS and an NDB instrument approach. The lowest visibility minimum provided by the GPS approach is one-half-mile with cloud ceiling minimums of 476 feet AGL. The NDB approach to Runway 13 provides for three-quarters-of-a-mile visibility minimums and cloud height ceilings of 676 feet AGL.

Table 1D shows the minimums for each instrument approach approved for use at Hutchinson Municipal Airport.

Local Operating Procedures

Hutchinson Municipal Airport is situated at 1,543 feet above mean sea level (MSL). All runways utilize a left-hand traffic pattern.

Obstructions: Runway 13 has 96-foot tall trees, 4,875 feet from the runway end, which are 1,000 feet left of centerline. Runway 31 has a road 650 feet from the runway, which penetrates the approach surface by 21 feet. Runway 17 has 125-foot tall trees, located 3,900 feet from the runway end, 100 feet right of centerline. Runway 35 has a road 290 feet from the runway end that penetrates the approach surface by 16 feet.

Displaced Thresholds: A displaced threshold reduces the available runway length for landing operations. Typically, a threshold will be displaced in order to provide adequate safety area on approach or to provide clearance over potential obstructions. Other factors such as the provision of a safe and efficient runway/taxiway system can lead to implementation of displaced thresholds. FAA Advisory Circular (AC) 150/5300-13, Appendix 2, Change 8, *Airport Design*, provides guidance for threshold siting requirements.

Runway 4 is displaced 400 feet due to the location of 4th Avenue. Were the runway end to be designated at the end of the Runway 4 pavement, the runway safety area and the object free area would both extend beyond airport property and over 4th Avenue. In order

to allow the safety areas to remain on airport property, a displacement of 110 feet is necessary. Due to the close proximity of the Runway 35 landing threshold to the Runway 4 threshold, and to avoid pilot confusion, the Runway 4 landing threshold has been displaced farther than needed for obstacle clearance.

TABLE 1D
Instrument Approach Data
Hutchinson Municipal Airport

	WEATHER MINIMUMS BY AIRCRAFT TYPE					
	Category A		Category B		Category C	
	CH	VIS	CH	VIS	CH	VIS
ILS 13						
Straight	200	0.5	200	0.5	200	0.5
Straight LOC	476	0.5	476	0.5	476	0.75
Circling	538	1	538	1	538	1.5
GPS RWY 13						
Straight	476	0.5	476	0.5	476	0.75
Circling	538	1	538	1	538	1.5
NDB RWY 13						
Straight	676	0.75	676	0.75	676	1.5
Circling	658	1	658	1	658	2
LOC BC RWY 31						
Straight	360	1	360	1	360	1
Circling	538	1	538	1	538	1.5
GPS RWY 31						
Straight	460	1	460	1	460	1.25
Circling	538	1	538	1	538	1.5
GPS RWY 4						
Straight	482	1	482	1	482	1.25
Circling	538	1	538	1	538	1.5
VOR RWY 4						
Straight	522	1	522	1	522	1.5
Circling	538	1	538	1	538	1.5
VOR/DME RWY 22						
Straight	458	1	458	1	458	1.25
Circling	538	1	538	1	538	1.5
GPS RWY 22						
Straight	458	1	458	1	458	1.25
Circling	538	1	538	1	538	1.5

Aircraft Categories are established based on 1.3 times the stall speed in landing configuration as follows:
Category A/B: 0-120 knots
Category C: 121-140 knots
Category D: 141-166 knots
CH - Cloud Height (in feet above ground level)
VIS - visibility minimums (in miles)
LOC - Localizer Only
BC - Back Course

Source: Airport/Facility Directory; South Central U.S., (May, 2005).

Runway 35 is displaced 800 feet. According to design criteria presented in the AC, the runway safety area and object free area prior to the runway are 300 feet long. Utilizing the existing Runway 35 pavement end, approximately 240 feet of the safety areas would be on airport property, while 60 feet would extend onto 4th Avenue. Similar to the Runway 4 end, Runway 35 is displaced farther than necessary for obstacle clearance and meeting safety area standards.

Hot Spots: The FAA has placed a higher significance on maintaining adequate runway safety area (RSA) at all airports. Under Order 5200.8, the FAA established the *Runway Safety Area Program*. The Order states, "The goal of the Runway Safety Area Program is that all RSAs at federally-obligated airports and all RSAs at airports certified under 14 CFR Part 139 shall conform to the standards contained in Advisory Circular 150/5300-13, Airport Design, to the extent practical." Under the Order, each Regional Airports Division of the FAA is obligated to collect and maintain RSA data for each runway at airports under their jurisdiction.

As part of this program, the FAA Central Region publishes locations on the airport where incursions are more likely to occur due to non-standard airport layout or inadequate safety area. Such areas are termed "Hot Spots," and two such spots are identified for Hutchinson Municipal Airport and are presented on **Exhibit 1E**.

Taxiway B, between Runways 4-22 and 17-35, is very short. As a result, the hold markings are close together and overlap. If pilots are not cautious, they could stop at the wrong marking, placing the aircraft inside the runway safety area. When taxiing southwest on Taxiway C, the hold marking for Runway 17-35 is located prior to Taxiway A. When taxiing northwest on Taxiway A, the hold marking for Runway 17-35 is located prior to Taxiway C. These hold markings can be confusing to pilots as the hold markings are typically located prior to an intersecting runway, not taxiway.

Airport Traffic Control

Hutchinson Municipal Airport is supported by an airport traffic control tower (ATCT). The tower was constructed in the 1950s at the same time as the terminal building and is located on top of the terminal building. The ATCT is owned by the FAA and the operation is contracted to Midwest Air Traffic Control Services, Inc. The tower operates from 7:00 a.m. to 11:00 p.m. daily and is available on frequency 118.5 MHz.

The ATCT manages air traffic within the Class D airspace surrounding the airport. En-route air traffic control services are provided by Kansas City Air Route Traffic Control Center (ARTCC), which controls aircraft traffic in a large multi-state area. Instrument approach and departures are handled by Wichita Approach Control.

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

The ATCT at Hutchinson Municipal Airport does not currently have terminal radar facilities at the airport. Wichita Mid-Continent Airport is scheduled to install the Standard Terminal Automation Replacement System (STARS) in 2006. STARS may be able to provide coverage for the Hutchinson Class D airspace.

The airport also provides a Remote Communications Outlet for those times when a pilot needs clearance during IFR conditions and the Hutchinson ATCT is closed. By utilizing radio frequency 122.05 MHz, a pilot can communicate directly with Wichita Approach Control for clearance. IFR clearance would otherwise be handled by the ATCT.

LANDSIDE FACILITIES

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

Terminal Building

The airport terminal building was constructed in 1950 and is approximately 9,600 square feet. The structure houses airport administration offices, FBO offices, FAA operations areas including the ATCT, a restaurant, a waiting lobby, and equipment and restroom facilities. The terminal building is centrally located immediately to the west of the main aircraft apron.

Wells Aviation, the primary FBO at the airport, leases space in the terminal building and offers a number of services including line services and fueling. Flight planning, a pilots' lounge, and a pilot shop are also provided. A subsidiary of Wells Aviation, Cottonwood Aviation also leases terminal building space and provides flight training.

Aircraft Parking Apron

The main aircraft parking apron area at Hutchinson Municipal Airport is located directly to the east of the terminal building and provides space for aircraft parking, tie-downs, and circulation. The apron area totals approximately 17,400 square yards, with 26 aircraft tie-down positions. The tie-down positions on this apron are utilized by transient aircraft and are not intended for long term lease. A reconfiguration and expansion of the tie-down apron will take place in 2006. The redesigned apron will have tie-down space for 36 small aircraft and six large aircraft.

05MP03-1H-10/31/05

BLDG# 1180
CONVENTIONAL HANGAR

BLDG# 800
BLDG# 780
CONVENTIONAL HANGARS

BLDG# 1160
AIRPORT MAINTENANCE SHOP

BLDG# 720
CONVENTIONAL HANGAR

BLDG# 1140
AIRFIELD LIGHTING
ELECTRICAL VAULT

BLDG# 680
CONVENTIONAL HANGAR

BLDG# 1100
TERMINAL BUILDING

BLDG# 620
CONVENTIONAL HANGAR

BLDG# 880
T-HANGARS

Hutchison Municipal Airport

Exhibit 1H

EXISTING LANDSIDE FACILITIES

It is estimated that the single wheel strength rating of the apron is 42,000 pounds, similar to the runways. Taxiway B runs along the east side of the terminal apron and provides access to the apron. The apron is also directly accessible via Taxiway E which connects to Runway 17-35. A terminal area taxilane is provided from the north portion of the apron connecting to the FBO apron to the north of the terminal building.

Two aprons are available to the south of the terminal building. The larger apron occupies approximately 3,800 square yards. Two tie-down positions are marked on the pavement. The smaller apron is approximately 700 square yards and provides no permanently marked tie-down positions. These aprons were constructed by the City of Hutchinson and are public use aprons. An apron area north of the terminal encompasses approximately 2,200 square yards but has no tie-downs.

Aircraft Hangar Facilities

Hangar facilities at Hutchinson Municipal Airport are comprised of conventional hangars and T-hangars. T-hangars provide for separate hangar facilities within a larger contiguous facility. One T-hangar structure is available for aircraft storage at the airport and it provides eight positions. Conventional hangars provide a large open space, free from roof support structures, and have the capability to accommodate several aircraft simultaneously. The hangar facilities at HUT are identified on **Exhibit 1H**.

All hangars on the airport are owned by the City of Hutchinson. The southernmost five hangars are leased to Wells Aviation and utilized in support of their FBO operations. To the north of the terminal building is the airport maintenance building and the Mead Aviation Services hangar. Hangar details are presented in **Table 1E**.

TABLE 1E
Airport Hangar Facilities
Hutchinson Municipal Airport

Hangar Number	Hangar Style	Year Constructed	Lessee	Aircraft storage area (sf)	Office area (sf)
620	Conventional	1968	Wells	8,000	NA
680	Conventional	1960	Wells	6,000	542
720	Conventional	1966	Wells	8,500	100
780	Conventional	1958	Wells	12,350	3,150
800	Conventional	1958	Wells	12,350	3,150
880	T-hangar (8-unit)	1967	Wells	11,330	NA
1100	Terminal Building	1950	City/Wells	NA	9,600
1140	Electrical vault	1952	City	NA	550
1160	Maintenance Shop	1966	City	NA	3,100
1180	Conventional	1945	Mead	10,700	400

Source: Airport Records

Automobile Parking

There are several parking lots available for automobile parking at Hutchinson Municipal Airport. The airport terminal parking area totals approximately 40,000 square feet and provides approximately 70 total spaces. There are 25 additional parking spaces available on the circle drive leading to the terminal entrance. A parking lot located immediately north of the terminal building supplies approximately 20 spaces designated for FAA and ATCT personnel.

The FBO parking area north of the terminal building is approximately 6,000 square feet with 20 parking spaces. There are 76 FBO parking spaces south of the terminal building encompassing approximately 15,000 square feet.

Fuel Facilities

The primary fuel farm is located underground, 50 feet to the south of the southernmost aircraft hangar. This facility has a 10,000-gallon Avgas storage tank and a 20,000-gallon Jet A tank. The fuel farm is privately owned and operated. In addition, the FBO maintains two Jet A fuel trucks, both with 2,200-gallon capacity, and two Avgas trucks, one with 1,200-gallon capacity and the other with 1,000-gallon capacity. Under the north apron is a 10,000-gallon Avgas fuel storage tank. Both FBOs dispense fuel and pay a fuel flowage fee to the airport.

Aircraft Firefighting and Rescue (ARFF)

There are no ARFF facilities permanently based at Hutchinson Municipal Airport. The City of Hutchinson Fire Department provides ARFF services as needed. Fire Station No. 4 is located on the corner of East 11th Avenue and North Halstead Street, approximately one mile from the airport.

Fire Station No. 4 maintains chemicals designed for combating aircraft fuel fires to Index A levels as defined by the FAA. Index A requires at least one vehicle carrying the following:

- 500 pounds of sodium-based dry chemical or halon 1211; or
- 450 pounds of potassium-based dry chemical and water with a commensurate quantity of Aqueous Film Forming Foam (AFFF) to a total 100 gallons for simultaneous dry chemical and AFFF application; and
- Certified and fully-trained personnel.

All Hutchinson firefighters are trained and have obtained their ARFF certification.

Utilities

Water and sewer services at the airport are provided by the City of Hutchinson. Electrical service is furnished by Westar Energy. Natural gas is supplied by Kansas Gas Service and Aquila to local distributors. SBC provides telephone and data access.

Airport Businesses

Those businesses that choose to locate on airport property or adjacent to the airport provide a significant economic impact not only to the airport, but also to the region. Encouraging businesses to locate in the vicinity of an airport is a good practice for a number of reasons. First, the business will benefit from being near a commerce and transportation hub. Second, the community will benefit because the airport will develop a buffer of industry and manufacturing that will restrict incompatible land uses, such as residential housing, from locating too close to the airport. Thirdly, business development on and around airports can generate a direct revenue stream to the airport. Some general aviation airports have done this successfully, leading to airport self- sufficiency.

- Wells Aviation is the full service FBO for Hutchinson Municipal Airport. They lease six hangar structures on the airfield. Services provided include aircraft rentals, charters, flight school, avionics, maintenance, line services, fuel, and courtesy cars and rental cars through Enterprise Rent-A-Car.

- Cottonwood Aviation is owned and operated by Wells Aviation as a full service flight school.

- Mead Aircraft Services is nationally known for specializing in maintenance and custom services for owners of Piper Malibu aircraft. Mead also maintains a 10,000-gallon Avgas underground fuel tank for their customers.

AIRPORT CAPITAL IMPROVEMENT HISTORY

Table 1F presents an overview of capital improvement projects undertaken at Hutchinson Municipal Airport since 1995 with state and federal grant funding. Locally-funded routine maintenance is not included in this list.

Many of the projects listed have been eligible for 90 percent federal funding from the Airport Improvement Program as administered through the U.S. Department of Transportation and the FAA.

The upcoming 2005 and 2006 projects have been funded through 50 percent grants from the Kansas Department of Transportation - Aviation Division. Since the completion of the previous master plan, Runway 4-22 has been maintained by the City of Hutchinson. This runway was over-laid with a three-inch layer of asphalt in 2000.

SOCIOECONOMIC CHARACTERISTICS

A variety of historical and forecast socioeconomic data has been collected for use in various elements of this master plan. This information provides essential background for use in determining aviation service level requirements. Aviation forecasts are related to the population base, economic

TABLE 1F
Airport Projects Since 1995
Hutchinson Municipal Airport

Date Let	Project Number	Federal/Local & Total Cost	Project Description
03/01/95	03-20-0035-08	$467,332 $51,925 $519,258	Runway Overlays 13-31 &17-35
09/22/98	03-20-0035-08	$422,451 $46,939 $469,390	AIP 98-03 Airport Lighting/Signage
12/14/99	AV-2001-11	$400,000 $477,512 $844,512	AIP 0-08 Runway 3-21 Improvements/Overlay
07/31/01	03-20-0035-10	$91,017 $10,113 $101,130	AIP 01-25 Runways 13-31 & 17-35,Taxiway Striping
04/09/02	03-20-0035-11	$91,152 $10,128 $101,280	AIP 02-07 (Design) Runway 4 to 13-31, Runway 13-31 to Runway 17 Reconstruct Taxiway "E" from Rwy 17-35 to Apron Guidance Signs, Lighting Systems, A/C Unit for Vault, ATCT Computer
07/09/02	03-20-0035-12	$811,248 $90,138 $901,387	AIP 02-07 (Construction) Runway 4 to 13-31, Runway 13-31 to Runway 17 Reconstruct Taxiway "E" from Rwy 17-35 to Apron Guidance Signs, Lighting Systems, A/C Unit for Vault, ATCT Computer
04/17/03	03-20-0035-13	$853,468 $94,830 $948,298	AIP 02-07 (Construction) Runway 4 to 13-31, Runway 13-31 to Runway 17 Reconstruct Taxiway "E" from Rwy 17-35 to Apron Guidance Signs, Lighting Systems, A/C Unit for Vault, ATCT Computer
07/26/05	03-20-0035-14	$125,685 $6,615 $132,300	AIP 05-02 Airport Master Plan
Fall 2005	AV-2005-15	$81,647 $81,647 $163,294	AIP 05-03 Runway 4-22 Seal Coat (KDOT)
Fall 2005	AV-2005-17	$84,309 $84,309 $168,618	AIP 05-03 Terminal Apron (KDOT)
Fall 2005	AV-2005-18	$32,273 $32,273 $64,546	AIP 05-03 FBO Apron (KDOT)
Spring 2006	AV-2005-14	$100,000 $100,000 $200,000	AIP 05-03 Runway 4-22 Seal Coat (KDOT)
Pending	AV-2005-16	$190,302 $190,302 $380,604	Taxiway "C" Rehabilitation (KDOT)

Source: City of Hutchinson, City Engineer

strength of the region, and the ability of the region to sustain a strong economic base over an extended period of time. Historical and forecast data were obtained from the *Complete Economic and Demographic Data Source* (CEDDS)

2004, which is published by Woods & Poole Economics, Inc., and compiled from data published by the U.S. Department of Commerce and the U.S. Census Bureau.

COMMUNITY PROFILE

Located in central Kansas, Reno County is home to more than 64,000 people, as well as some of Kansas' most popular attractions, including the Kansas Cosmosphere and Space Center, The Kansas State Fair, and the nationally-ranked links at Prairie Dunes Country Club. The central location allows for a variety of leisure activities to enjoy year-round, including nature areas, wildlife refuges, parks, and reservoirs. The cost of living is among the most affordable in the nation, ranging between 88 and 92 percent of the national average.

The community is also home to Hutchinson Community College which offers traditional undergraduate course work and vocational/technical classes. Local industries include agribusiness, aerospace, healthcare, specialty vehicle manufacturing, grocery distribution, mining, and food processing.

POPULATION

Population is one of the most important elements to consider when planning for future needs of the airport. Historical population data for Reno County and the surrounding counties, as well as the City of Hutchinson and the State of Kansas are shown in **Table 1G**.

TABLE 1G
Historical Population Statistics
Hutchinson Municipal Airport

County Populations	1970	1980	1990	2000	2005	Avg. Annual Growth Rate (1970-2000)
Reno	60,820	65,080	62,400	64,680	63,950	0.14%
Sedgwick	349,510	368,750	404,610	453,460	469,320	0.85%
Harvey	27,290	30,650	31,030	32,880	33,850	0.62%
Kingman	8,850	8,950	8,300	8,680	8,370	-0.16%
McPherson	24,790	26,960	27,340	29,590	29,670	0.51%
Rice	12,320	11,850	10,570	10,740	10,340	-0.50%
Stafford	5,920	5,700	5,320	4,770	4,510	-0.77%
Pratt	10,030	10,320	9,670	9,630	9,380	-0.19%
State Population						
Kansas	2,248,130	2,370,120	2,481,350	2,692,640	2,757,830	0.59%
City Population*						**Avg. Annual Growth Rate (1990-2005)**
Hutchinson			39,308	40,787	41,036	0.29%

*Source: Woods & Poole Economics, CEDDS-2005. *Interpolated from Hutchinson/Reno Chamber.*

As shown in the table, half the counties in the region have shown a negative growth in population over the last 35 years. Sedgwick County has seen the largest growth, adding approximately 120,000 residents over the last 35 years. Sedgwick County includes the City of Wichita. This pattern is indicative of the trend of persons moving from the rural communities to the larger cities.

Reno County has shown a slight increase in population over the last 35 years, having added slightly more than 3,000 persons. The City of Hutchinson has accounted for most of this increase as it is the largest city in Reno County.

EMPLOYMENT

Analysis of a community's employment base can be valuable in determining the overall well-being of that community. In most cases, the community make-up and health are significantly impacted by the availability of jobs, variety of employment opportunities, and types of wages provided by local employers. **Table 1H** provides historical employment characteristics for Reno County from 1998 to the present.

TABLE 1H
Employment Characteristics
Reno County

	1998	1999	2000	2001	2002	2003	2004	2005*
Non-Ag. Labor Force	38,861	37,376	37,150	36,776	36,847	37,208	37,678	37,865
Total Employment	37,402	36,287	35,859	35,294	35,362	35,572	35,782	35,993
Unemployment	1,459	1,089	1,291	1,482	1,485	1,636	1,896	1,872
Unemployment Rate	3.9	3	3.6	4.2	4.2	4.6	5.3	5.2

*Source: Kansas Bureau of Labor Statistics; Woods & Poole CEDDS-2005; *Jan-July 2005*

The unemployment rate has historically been low in Reno County compared to the national unemployment numbers (4.25 percent compared to 5.0 percent, respectively, from 1998 to 2005). **Table 1H** also shows that Reno County's employment trend has closely followed the ups and downs of the national economic trend. The lowest unemployment rates were in 1999 and 2000 when the national economy was experiencing unprecedented growth. The highest unemployment rates correspond to the current slow recovery from the economic downturn in 2002.

Major Employers

The Hutchinson Hospital is the largest employer in Hutchinson, with approximately 1,402 full and part-time positions. The headquarters for the Dillon Companies, a regional grocery store chain, is located in Hutchinson and employs 930 people. Other major employers are identified in **Table 1J**.

INCOME

Table 1K compares the per capita personal income (PCPI), adjusted to

1996 dollars, for Reno County, the State of Kansas, and the United States between 1990 and 2025. Per capita personal income (PCPI) is a statistical measure of the amount of money available to each individual. Total personal income is the income received by persons from all sources; that is, from participation in production, from both government and business transfer payments, and from government interest. As such, personal income includes all revenue streams, whether from government sources or private sources.

TABLE 1J
Major Employers
Reno County, Kansas

Company Name	Product	Number of Employees
Hutchinson Hospital	Medical Services	1,402
Dillon Companies	Groceries	930
Hutchinson Public Schools (USD #308)	Public Education	845
Hutchinson Clinic	Medical Services	768
Hutchinson Correctional Facility	State Prison	656
Tyson Prepared Foods	Pre-cooked Meats	530
Eaton Corporation	Hydraulic Components Mfr.	452
Reno County	Local Government	410
City of Hutchinson	Local Government	388
Wal-Mart Supercenter	Discount Retailer	375
Hutchinson Community College	Higher Education	340
Lowen Corporation	Industrial Marking/Sign Mfr.	330
Buhler Public Schools (USD 313)	Public Education	300
Collins Industries	Ambulance/Bus Mfr.	292
Wesley Towers	Health Care/Retirement Services	255
Mega Manufacturing	Metal Fabrication Equipment Mfr.	230
Krause Corporation	Ag. & Industrial Equipment Mfg.	200
Kroger Convenience Store Division	Corporate Offices - Accounting	191
First National Bank	Financial Institution	170
Data Center, Inc.	Financial Technology / Banking	163

Source: Hutchinson/Reno County Chamber of Commerce

TABLE 1K
Personal Income Per Capita (1996$)
Hutchinson Municipal Airport

	HISTORICAL		
Area	1990	2000	Avg. Annual Growth Rate (2000-2025)
Reno County	$19,061	$22,410	1.63%
State of Kansas	$21,017	$25,907	2.11%
United States	$22,856	$27,712	1.95%

Source: Woods & Poole Economics, CEDDS-2005

SUMMARY

The information discussed in this inventory chapter provides a foundation upon which the remaining elements of the planning process will be constructed. Information on current airport facilities and utilization will serve as a basis, with additional analysis and data collection for the development of forecasts of aviation activity and facility requirement determinations.

DOCUMENT SOURCES

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

Airport/Facility Directory, South Central U.S., U.S. Department of Transportation, Federal Aviation Administration, National Aeronautical Charting Office, September 1, 2005, Edition.

Wichita Sectional Aeronautical Chart, U.S. Department of Transportation, Federal Aviation Administration, National Aeronautical Charting Office, 75th edition, August 4th, 2005.

National Plan of Integrated Airport Systems (NPIAS), U.S. Department of Transportation, Federal Aviation Administration, 2005-2009.

U.S. Terminal Procedures, South Central U.S., U.S. Department of Transportation, Federal Aviation Administration, National Aeronautical Charting Office, September 1, 2005, Edition.

Hutchinson Municipal Airport Master Plan Update. Prepared by Bucher, Willis & Ratliff Corporation, 1996.

Blueprint for Growth - Reno County, Kansas. Prepared by Reno County 2020 Vision Task Force and Gould Evans Goodman Associates. September 2004.

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

FAA Form 5010 Data:
http://www.gcr1.com/5010web/

Hutchinson/Reno County Economic Development:
http://www.hutchecodevo.com/

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

Kansas Department of Labor:
http://laborstats.dol.ks.gov/

The City of Hutchinson, Kansas:
http://www.hutchgov.com

Hutchinson Municipal Airport
http://www.hutchairport.net/

Reno County
http://renogov.com/

Chapter Two

AVIATION DEMAND FORECASTS

Facility planning begins by defining the demand that may reasonably be expected to occur at the facility over a specific period of time. For Hutchinson Municipal Airport (HUT), this involves forecasts of aviation activity indicators through the year 2025. In this master plan, forecasts of based aircraft, based aircraft fleet mix, annual aircraft operations, and operational peak periods will serve as the basis for facility development planning.

It is virtually impossible to predict, with certainty, year-to-year fluctuations of activity when looking 20 years into the future. However, a trend can be established which delineates long term growth potential. While a single line is often used to express the anticipated growth, it is important to remember that actual growth may fluctuate above and below this line. Forecasts serve as guidelines, and planning must remain flexible enough to respond to unforeseen facility needs. This is because aviation is affected by many external influences, as well as by the types of aircraft used and the nature of the available services and facilities at the airport.

Recognizing this, it is intended to develop a master plan for Hutchinson Municipal Airport that will be demand-based rather than time-based. As a result, the reasonable levels of activity potential that are derived from this forecasting effort will be related to the planning horizon levels rather than dates in time. These planning levels will be established as levels of activity from which specific actions for the airport to consider will be presented.

In order to fully assess current and future aviation demand for Hutchinson

Municipal Airport, an examination of several key factors is needed. These include national and regional aviation trends, historical and forecast socioeconomic and demographic information for the area, competing transportation modes, and facilities. Consideration and analysis of these factors will ensure a comprehensive outlook for future aviation demand at Hutchinson Municipal Airport.

The demand-based manner in which this master plan is being prepared is intended to accommodate variations in demand at the airport. Demand-based planning relates capital improvements to demand factors, such as based aircraft operations, instead of points in time. This allows the airport to address capital improvement needs according to actual demand occurring at the airport. Therefore, should growth in aircraft operations or based aircraft slow or decline, it may not be necessary to implement some improvement projects. However, should the airport experience accelerated growth, the plan will have accounted for that growth and will be flexible enough to respond accordingly.

SOCIOECONOMIC PROJECTIONS

The local socioeconomic conditions provide an important baseline for preparing aviation demand forecasts. Local socioeconomic variables such as population, employment, and income can be indicators for understanding the dynamics of the community and, in particular, the trends in aviation growth. The following is a summary of the research and projections presented in Chapter One.

POPULATION

Table 2A summarizes historical and forecast population estimates for the City of Hutchinson, Reno and Sedgwick Counties, and the State of Kansas. The State of Kansas' projections are provided as a point of comparison. Sedgwick County projections are presented since portions of Sedgwick County are in the HUT service area.

Population in the City of Hutchinson is projected to continue a modest growth trend. From 2005 to 2025, the City is projected to add 2,400 new residents. This represents an annual growth rate of 0.29 percent. Reno County is projected to add slightly more than 2,000 people over the same time frame. This represents an annual growth rate of 0.16 percent. These figures represent a common trend in rural parts of the country where the population is migrating to the cities.

Both Reno County and the City of Hutchinson are lagging behind the population growth averages of the State of Kansas, and nearly Sedgwick County. Because of the influence of Sedgwick County, Reno County is able to maintain a positive growth trend through the forecast period. All counties to the west of Reno are realizing diminishing populations.

TABLE 2A
Socioeconomic Forecast
Hutchinson Municipal Airport

	HISTORICAL		FORECAST			ANNUAL GROWTH RATE	
	1990	**2005**	**2010**	**2015**	**2025**	**1990 to 2005**	**2005 to 2025**
Reno County							
Population	62,400	63,950	64,230	64,740	66,010	**0.16%**	**0.16%**
Employment	33,321	35,993	37,047	38,106	40,240	**0.52%**	**0.56%**
PCPI	$19,061	$23,216	$24,537	$25,921	$29,081	**1.32%**	**1.13%**
Sedgwick County							
Population	404,610	469,320	486,030	504,080	543,030	**0.99%**	**0.73%**
Employment	267,537	312,379	328,862	345,366	378,440	**1.04%**	**0.96%**
PCPI	$22,840	$28,049	$29,395	$30,770	$33,709	**1.38%**	**0.92%**
City of Hutchinson*							
Population	39,308	41,036	41,629	42,230	43,459	**0.29%**	**0.29%**
Employment	29,770	31,246	31,749	32,260	33,307	**0.32%**	**0.32%**
State of Kansas							
Population	2,481,350	2,757,830	2,847,480	2,944,850	3,156,880	**0.71%**	**0.68%**
Employment	1,383,124	1,743,490	1,860,476	1,977,226	2,326,412	**1.56%**	**1.45%**
PCPI	$21,017	$27,319	$29,162	$31,069	$35,194	**1.76%**	**1.27%**

*Source: Woods & Poole, CEDDS-2005. *Hutchinson Chamber; Employment extrapolated.*
** Adjusted to 1996 dollars.*

EMPLOYMENT

Historical and forecast employment data for the region is also presented in **Table 2A**. The State of Kansas is projected to show an annual employment growth rate of 1.45 percent from 2005 to 2025. This growth is slightly slower than the 1.56 percent from 1990 to 2005. The City of Hutchinson is projected to see an employment growth rate that outpaces the population growth rate.

PER CAPITA PERSONAL INCOME (PCPI)

Table 2A compares per capita personal income (adjusted to 1996 dollars) for the selected areas of study. From 1990 to 2005, PCPI for Reno County showed a robust 1.32 percent annual average growth rate. Sedgwick County and the State of Kansas also showed strong PCPI growth rates. Forecast PCPI figures show a slight slowing of growth, but personal income is still projected to continue to grow.

SOCIOECONOMIC SUMMARY

The overall economic picture for the airport service area, primarily Reno County, is forecast to show modest growth over the next 20 years. Population is increasing along with employment and personal income. Counties to the west of Reno County are showing negative growth trends in all three areas. Sedgwick County to the immediate southeast is showing stronger positive growth. Reno County, although rural in nature, is able to maintain a modest positive growth trend primarily because of the presence of the City of Hutchinson and its proximity to an even larger city, Wichita.

FORECASTING APPROACH

The development of aviation forecasts proceeds through both analytical and judgmental processes as presented in **Exhibit 2A**. A series of mathematical relationships is tested to establish statistical logic and rationale for projected growth. However, the judgement of the forecast analyst, based upon professional experience, knowledge of the aviation industry, and assessment of the local situation, is important in the final determination of the preferred forecast.

The most reliable approach to estimating aviation demand is through the utilization of more than one analytical technique. Methodologies frequently considered include trend line projections, correlation/regression analysis, and market share analysis.

Trend line projections are probably the simplest and most familiar of the forecasting techniques. By fitting growth curves to historical demand data, then extending them into the future, a basic trend line projection is produced. A basic assumption of this technique is that outside factors will continue to affect aviation demand in much the same manner as in the past. As broad as this assumption may be, the trend line projection does serve as a reliable benchmark for comparing other projections.

Correlation analysis provides a measure of direct relationship between two separate sets of historic data. Should there be a reasonable correlation between the data sets, further evaluation using regression analysis may be employed.

Regression analysis measures the statistical relationship between dependent and independent variables yielding a "correlation coefficient." The correlation coefficient (Pearson's "r") measures association between the changes in a dependent variable and independent variable(s). If the r-squared (r^2) value (coefficient determination) is greater than 0.90, it indicates good predictive reliability. A value below 0.90 may be used with the understanding that the predictive reliability is lower.

Market share analysis involves a historical review of airport activity as a percentage, or share, of a larger regional, state, or national aviation market. A historical market share trend is determined providing an

05MP03-2A-10/3/05

Forecast Methodology

STEP 1

Identify aviation activity parameters and measures to forecast

STEP 2

Collect and review previous airport forecasts

STEP 3

Gather data
- Determine and identify data sources
- Historical aviation data
- FAA forecasts
  - Terminal area forecast (TAF)
  - Other FAA forecsts
- Collect and evaluation historical and forecast data

STEP 4

Select forecast methods
- Regression and trend analysis
- Market share analysis
- Correlation analysis

STEP 5

Apply forecast methods and evaluate results

STEP 6

Apply local factors and experience

STEP 7

Summarize and document results

STEP 8

Compare airport planning forecasts

Hutchinson Municipal Airport

Exhibit 2A

FORECAST METHODOLOGY

expected market share for the future. These shares are then multiplied by the forecasts of the larger geographical area to produce a market share projection. This method has the same limitations as trend line projections, but can provide a useful check on the validity of other forecasting techniques.

It is important to note that one should not assume a high level of confidence in forecasts that extend beyond five years. Facility and financial planning usually require at least a 10-year view, since it often takes more than five years to complete a major facility development program. However, it is important to use forecasts which do not overestimate revenue-generating capabilities or understate demand for facilities needed to meet public (user) needs.

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

The following forecast analysis examines each of the aviation demand categories expected at Hutchinson Municipal Airport through 2025. Each segment will be examined individually, and then collectively, to provide an understanding of the overall aviation activity at Hutchinson Municipal Airport through 2025.

AIRPORT SERVICE AREA

The initial step in determining the general aviation demand for an airport is to define its generalized service area. The airport service area is determined primarily by evaluating the location of competing airports, their capabilities and services, and their relative attraction and convenience. To aid in identifying the generalized service area for Hutchinson Municipal Airport, an analysis of the billing addresses for most of the based aircraft owners was conducted.

The airport service area is a generalized geographical area where there is a potential market for airport services. Access to general aviation airports, commercial air service, and transportation networks enter into the equation to determine the size of a service area, as well as the quality of aviation facilities, distance, and other subjective criteria.

The proximity and level of service offered by other airports are largely the defining factors when describing the airport service area. A description of nearby airports was previously

completed in Chapter One - Inventory. The nearest general aviation airport with a similar level of service to Hutchinson Municipal Airport is the Newton City-County Airport, 32 miles to the east. This airport has a precision approach and a 7,000-foot long runway, similar to HUT.

Moundridge, Lyons-Rice County, and Kingman Airports have shorter runways and fewer services available than does Hutchinson Municipal Airport. It is unlikely that the primary service area for HUT would extend to these airports as the need for advanced FBO services in rural areas is not to the level it is at an airport serving a larger city such as Hutchinson.

McPherson Airport is 22 miles to the northeast and has a 5,500-foot runway. There are five jets included in the total of 41 based aircraft. This airport would limit the extent of the HUT service area to the northeast.

As in any business enterprise, the more attractive the facility is in services and capabilities, the more competitive it will be in the market. As the level of attractiveness expands, so will the service area. If an airport's attractiveness increases in relation to nearby airports, so will the size of the service area. If facilities are adequate and rates and fees are competitive at Hutchinson Municipal Airport, some level of general aviation activity might be attracted to the airport from surrounding areas.

In determining the aviation demand for an airport, it is necessary to identify the role of that airport. The primary role of Hutchinson Municipal Airport is to serve the needs of general aviation operators in the region. General aviation is a term used to describe a diverse range of aviation activities, which includes all segments of the aviation industry except commercial air carriers and the military. This includes recreational flying in single engine aircraft, up to corporate business jets.

The largest concentration of based aircraft owners (31 of 41) register their aircraft in the City of Hutchinson. Four aircraft are registered in Wichita, two in McPherson, and the remaining four based aircraft are registered in other rural Kansas towns. **Exhibit 2B** depicts a primary service area to include Reno County and a secondary service area extending south and east toward Wichita.

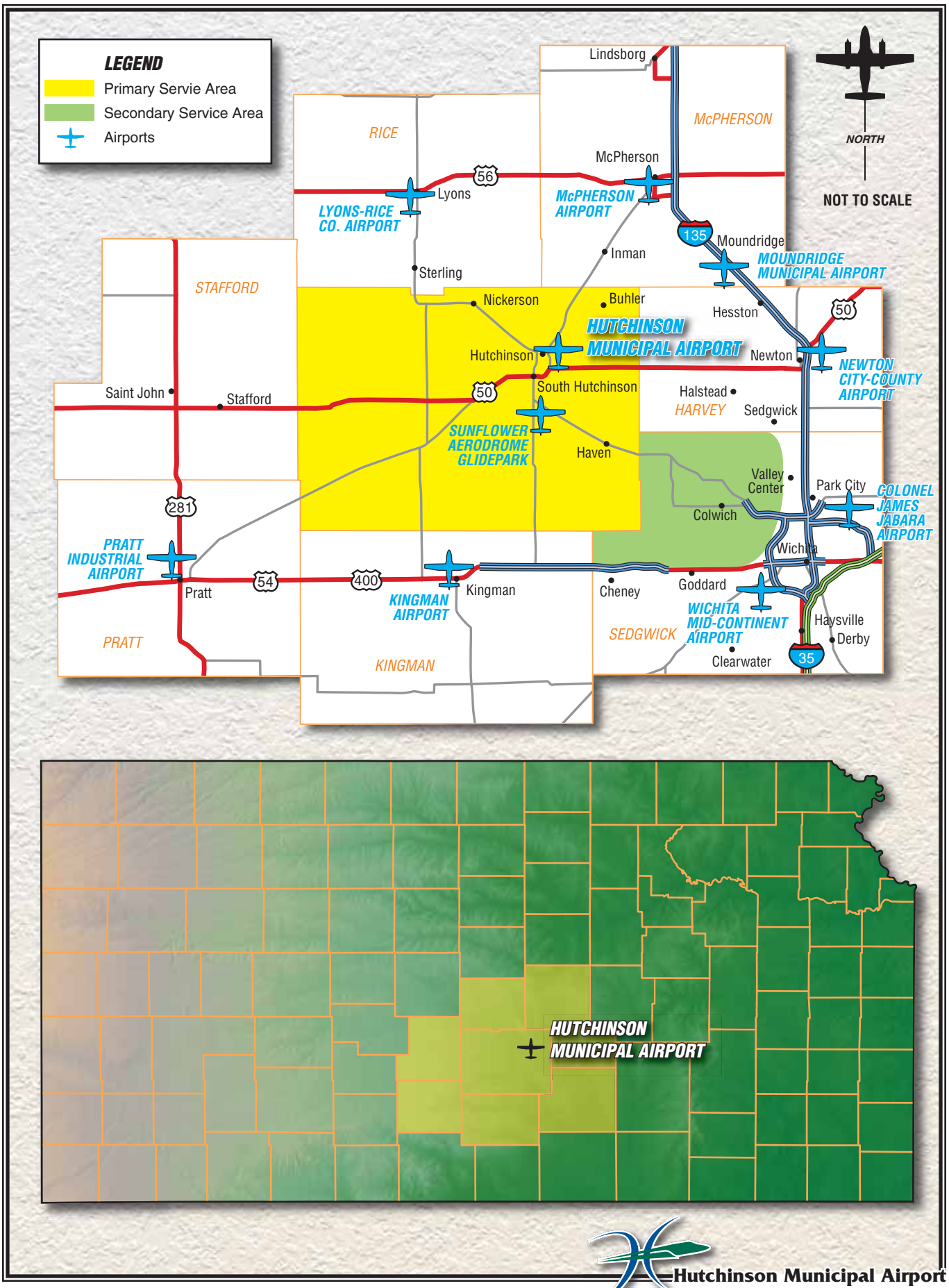
The service area for Hutchinson Municipal Airport is primarily the City of Hutchinson, with Reno County also being included in the service area. Due to a lack of similar services at other airports, additional areas of service may stretch beyond the Reno County boundary, particularly on the south and west.

AVIATION TRENDS

NATIONAL AVIATION TRENDS

Each year, the Federal Aviation Administration (FAA) publishes its national forecast. Included in this publication are forecasts for large air carriers, regional air carriers, general aviation, and FAA workload measures. The forecasts are prepared to meet

05MP03-2B-9/29/05



Hutchinson Municipal Airport

Exhibit 2B

AIRPORT SERVICE AREA

budget and planning needs of the constituent units of the FAA and to provide information that can be used by state and local authorities, the aviation industry, and the general public. The current edition when this chapter was prepared was *FAA Aerospace Forecasts-Fiscal Years, 2005-2016*. The forecast uses the economic performance of the United States as an indicator of future aviation industry growth. Similar economic analyses are applied to the outlook for aviation growth in international markets.

In the seven years prior to the events of 9/11, the U.S. civil aviation industry experienced unprecedented growth in demand and profits. The impacts to the economy and the aviation industry from the events of 9/11 were immediate and significant. However, the economic climate and aviation industry are both experiencing significant upturns. The FAA expects the U.S. economy to experience strong growth over the next few years, with moderate growth thereafter. This will positively influence the aviation industry, leading to passenger, air cargo, and general aviation growth throughout the forecast period (assuming that there will not be any new successful terrorist incidents against either U.S. or world aviation).

For the first time since 2000, the number of passenger enplanements on U.S. commercial carriers increased in 2004. This is due in large part to the extremely strong growth of low-cost carriers such as Southwest and AirTran Airways, among others. A total of 502.2 million passengers were enplaned in 2004, up 4 percent from 2003, but still 10.6 percent below the 2000 peak. Over the forecast period, enplanements are expected to grow by 2.9 percent annually.

Regional/commuter passenger enplanements are projected to increase by 15.4 percent in 2005, 9.9 percent in 2006, and 6.3 percent in 2007. Between 2008 and 2016, enplanements are projected to grow at an average rate of 3.9 percent annually, reaching 245.5 million by 2016. Over the entire 12-year forecast period, passenger enplanements are forecast to grow by 5.5 percent annually.

An additional measure of the health of the aviation system is the trend in air cargo as measured in revenue ton-miles (RTM). The FAA projects air cargo RTMs to grow at 5.1 percent annually.

GENERAL AVIATION

In the 11 years since the passage of the General Aviation Revitalization Act of 1994 (federal legislation which limits the liability on general aviation aircraft to 18 years from the date of manufacture), it is clear that the Act has successfully infused new life into the general aviation industry. This legislation sparked an interest to renew the manufacturing of general aviation aircraft due to the reduction in product liability, as well as renewed optimism for the industry. Annual shipments of new aircraft rose every year between 1994 and 2000.

The growth in the general aviation industry slowed considerably from 2001 to 2003, having been negatively

impacted by the events of 9/11 and economic recession.

In 2004, the general aviation industry showed a significant increase in activity, returning to pre-9/11 levels for most indicators. The FAA forecast assumes that the regulatory environment affecting general aviation will not change dramatically. The forecast also assumes that the fractional ownership market will continue to expand and bring new operators and shareholders into business aviation. It also assumes that another successful terrorist attack on aviation will not occur.

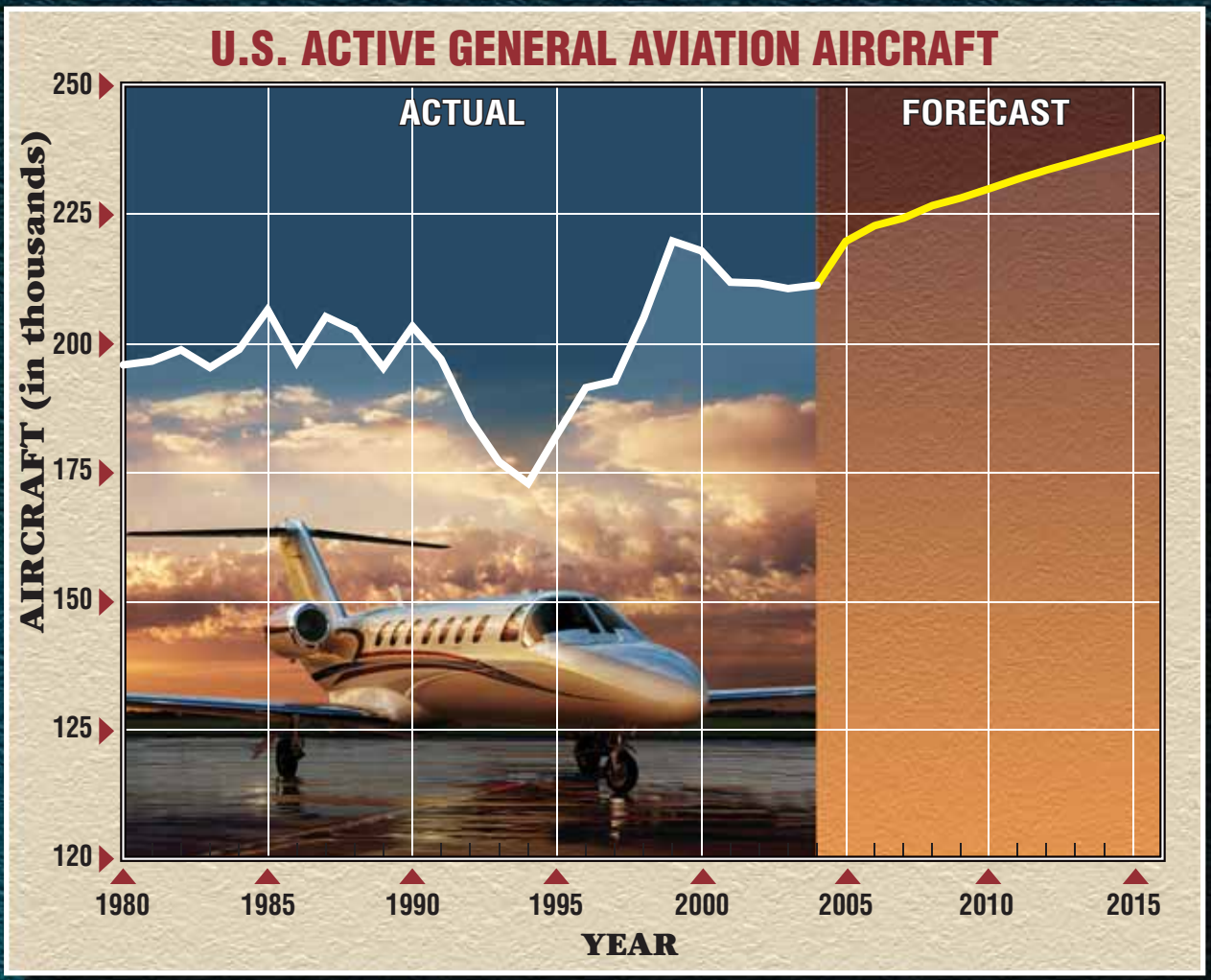
The active general aviation aircraft fleet is expected to increase at an average annual rate of 1.1 percent over the 12-year forecast period, increasing from 210,600 in 2003, to 240,070 in 2016. This growth includes the addition of a new aircraft category, light sport aircraft, which is expected to enter the active fleet in 2005, and account for 15,410 aircraft in 2016. Light sport aircraft include small fixed-wing airplanes, powered-parachutes, gyro-planes, ultra-lights, and others.

FAA forecasts identify two general aviation economies that follow different market patterns. The turbojet fleet is expected to increase at an average annual rate of 5.4 percent, increasing from 8,153 in 2003, to 15,900 in 2016. Factors leading to this substantial growth include expected strong U.S. and global economic growth; the continued success of fractional-ownership programs; and a continuation of the shift from commercial air travel to corporate/ business air travel by business travelers and corporations. In addition, new micro jets will begin to enter the fleet in 2006, and grow to 4,500 aircraft by 2016. These aircraft are expected to stimulate the market for on-demand air taxis.

Exhibit 2C depicts the FAA forecast for active general aviation aircraft in the United States. The number of single engine piston aircraft is projected to reach 148,000 in 2015, which represents an average annual growth rate of 0.2 percent. During this same time, the number of active multi-engine piston aircraft in the fleet is expected to decline by 0.2 percent, resulting in a total of 17,235 aircraft in 2016. The number of turboprop aircraft is expected to increase at an average annual rate of 3.7 percent over the 12-year forecast period to 8,400 active aircraft. The rotorcraft fleet is forecast to grow 1.2 percent annually through 2016, while the number of experimental aircraft is projected to increase from 20,603 in 2003, to 21,380 in 2010. Thereafter, the growth in experimental aircraft is expected to flatten, primarily due to the growth in sport aircraft.

The declines in the aircraft utilization rates experienced in 2000 (down 3.2 percent) and 2001 (down 7.2 percent) were due, in part, to higher fuel prices and the 2001 U.S. economic recession. However, the restrictions placed on general aviation in the aftermath of the 9/11 events contributed heavily to the decline in utilization in 2001. A strong recovery in the U.S. economy in 2004 and 2005 has led to increased utilization rates for most categories of general aviation aircraft.

05MP03-2C-9/29/05



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

Year	FIXED WING									
	PISTON		TURBINE		ROTORCRAFT					
	Single Engine	Multi-Engine	Turboprop	Turbojet	Piston	Turbine	Experimental	Sport Aircraft	Other	Total
2004 (Est.)	144.0	17.7	7.3	8.4	2.2	4.7	20.8	N/A	6.2	211.3
2008	145.5	17.5	7.7	10.5	2.4	4.9	21.3	10.8	6.1	227.7
2012	147.0	17.4	8.1	13.3	2.5	5.1.	21.4	13.2	5.9	233.9
2016	148.0	17.2	8.4	15.9	2.6	5.3	21.4	15.4	5..8	240.1

Source: FAA Aerospace Forecasts, Fiscal Years 2005-2016.

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

Hutchinson Municipal Airport
Exhibit 2C
U.S. ACTIVE GENERAL AVIATION
AIRCRAFT FORECASTS

The total pilot population is projected to increase from an estimated 618,633 in 2004, to 750,260 by 2016, which represents an average annual growth rate of 1.6 percent. The student pilot population increased 0.7 percent in 2004, and is forecast to increase at an annual rate of 1.8 percent over the 12-year forecast period, reaching a total of 108,800 in 2016. Growth rates for the other pilot categories over the forecast period are as follows: airline transport pilots, up 1.7 percent; recreational pilots, up 1.6 percent; rotorcraft only, up 1.2 percent; and glider only, up 0.2 percent.

The General Aviation Manufacturers Association (GAMA) publishes a yearly outlook on the general aviation industry. The most recent edition was published in early 2005. 2004 represented a year of strong recovery for the general aviation industry. Total billings reached almost $12 billion, which is nearly a 20 percent growth over 2003. GAMA forecasts that the industry will continue a strong growth trend.

Over the past several years, the general aviation industry has launched a series of programs and initiatives whose main goals are to promote and assure future growth within the industry. "No Plane, No Gain" is an advocacy program created in 1992 by the General Aviation Manufacturers Association (GAMA) and the National Business Aircraft Association (NBAA) to promote acceptance and increased use of general aviation as an essential, cost-effective tool for businesses. Other programs are intended to promote growth in new pilot starts and introduce people to general aviation. "Project Pilot," sponsored by the Aircraft Owners and Pilots Association (AOPA), promotes the training of new pilots in order to increase and maintain the size of the pilot population. The "Be a Pilot" program is jointly sponsored and supported by more than 100 industry organizations. The NBAA sponsors "AvKids," a program designed to educate elementary school students about the benefits of business aviation to the community and career opportunities available to them in business aviation. Over the years, programs such as these have played an important role in the success of general aviation and will continue to be vital to its growth in the future.

AVIATION FORECASTS

To determine the types and sizes of facilities that should be planned to accommodate general aviation activity, certain elements of this activity must be forecast. Indicators of general aviation demand include:

- Based Aircraft
- Based Aircraft Fleet Mix
- Annual Operations
- Peaking Operations
- Annual Instrument Approaches

The remainder of this chapter will examine historical trends with regard to these areas of general aviation and will project future demand for these segments of general aviation activity at the airport.

BASED AIRCRAFT

The number of based aircraft is the most basic indicator of general aviation demand. Based aircraft are those aircraft that are stored at the airport. By first developing a forecast of based aircraft, the trend of other indicators can be projected, and other factors characteristic to Hutchinson Municipal Airport and the area it serves can be assessed. Based aircraft totals have been derived from city records and lessee records. This data has been used to arrive at the based aircraft data utilized in this analysis.

Based aircraft have steadily declined since 1994, at the time of the previous master plan. At that time there were nearly 60 based aircraft. Today there are 41 based aircraft. Due to the variations in annual based aircraft totals, trendline projections are not applicable. Future based aircraft demand has been examined according to population correlations.

Market Share per 1,000 Population

Trends comparing the number of based aircraft with both the population of Reno County and the City of Hutchinson were analyzed. **Table 2B** presents the market share forecasts developed using the population of the Reno County. The constant share forecast, which is an average of the last 15 years, results in 52, 53, and 54 based aircraft, while the increasing share forecast results in 47, 53, and 65 based aircraft through 2025.

TABLE 2B
Based Aircraft vs. Reno County Population
Hutchinson Municipal Airport

Year	Based Aircraft	Reno County Population	Aircraft per 1,000 Residents
1995	60	63,458	0.95
2000	54	64,681	0.83
2004	41	63,954	0.64
Constant Market Share Projection			
2010	52	64,228	0.81
2015	53	64,738	0.81
2025	54	66,007	0.81
Increasing Ratio Projection			
2010	47	64,228	0.72
2015	53	64,738	0.81
2025	65	66,007	0.97

Sources: Airport Records, U.S. Census Bureau.

An additional population comparison was conducted utilizing the historical growth trend for the City of Hutchinson. Although the airport service area would include the whole of Reno County, the majority of based aircraft are registered in the City of Hutchinson. The City of Hutchinson also shows a slightly stronger population growth trend.

Table 2C shows a constant and increasing market share projection

based on the population of the City of Hutchinson. The constant market share projection is based on an average over the last 10 years. This results in 54, 55, and 56 based aircraft in 2010, 2015, and 2025, respectively. The increasing share ratio reflects a more likely scenario should the based aircraft numbers begin to trend upward, regaining their numbers of the early 1990s.

TABLE 2C
Based Aircraft vs. City of Hutchinson Population
Hutchinson Municipal Airport

Year	Based Aircraft	Hutchinson Population	Aircraft per 1,000 Residents
1995	60	40,041	1.49
2000	54	40,787	1.32
2004	41	40,909	1.00
Constant Market Share Projection			
2010	54	41,629	1.27
2015	55	42,230	1.27
2025	56	43,459	1.27
Increasing Ratio Projection			
2010	46	41,629	1.10
2015	51	42,230	1.20
2025	66	43,459	1.50

Sources: Airport Records, U.S. Census Bureau.

Comparative Forecasts

The FAA *Terminal Area Forecast* (TAF) contains projections of based aircraft for Hutchinson Municipal Airport. For 2010, the TAF projects 30 based aircraft, decreasing to 25 by 2020. The TAF baseline number for 2004 and 2005 identified 33 based aircraft compared to the actual number of 41. This discrepancy is not unusual as the TAF is sometimes not complete. Due to this variation, the TAF cannot be relied upon for predicting future demand.

The 1994 Master Plan projected 54 based aircraft by 2010 and 53 by 2015. Extrapolation of the trend results in a forecast of 63 based aircraft for 2025.

Based Aircraft Summary

Deciding which forecast or which combination of forecasts to use to arrive at a final based aircraft forecast involves more than just statistical analysis. Recognition of the trends in aviation both locally and nationally are important considerations. The introduction of the new sport aircraft pilot license is projected to have a significant impact on the growth of general aviation. Previously, those interested in flying who may have been prevented from doing so due to medical limitations or financial considerations can now train for this less time-consuming and less expensive license.

In addition, the instrument landing system (ILS) equipped 7,000-foot runway makes the airport attractive as an alternative to larger airports in Wichita, particularly for business and corporate aircraft. The possibility of some of the aircraft based at the Sunflower Gliderpark relocating to Hutchinson in the future is also considered. All of these factors contribute to the potential for growth in based aircraft at Hutchinson Municipal Airport.

Table 2D shows a summary of the based aircraft forecasts as well as the selected forecast. **Exhibit 2D** presents the based aircraft forecasting methods in graphical form. The selected planning forecast projects moderate growth for based aircraft. Based aircraft are projected to grow by one aircraft per year, or at a 2.2 percent rate annually.

TABLE 2D
Based Aircraft Projections Summary
Hutchinson Municipal Airport

	2004	2010	2015	2025
Based Aircraft per 1,000 Population (Reno County)				
Constant		52	53	54
Increasing		47	53	65
Based Aircraft per 1,000 Population (Hutchinson)				
Constant		54	55	56
Increasing		46	51	66
Comparative Forecasts				
FAA Terminal Area Forecast*		30	27	23
1994 Master Plan*		54	57	63
Selected Forecast	***41***	***47***	***53***	***65***

*Source: Coffman Associates analysis; * 2025 extrapolated from original data.*

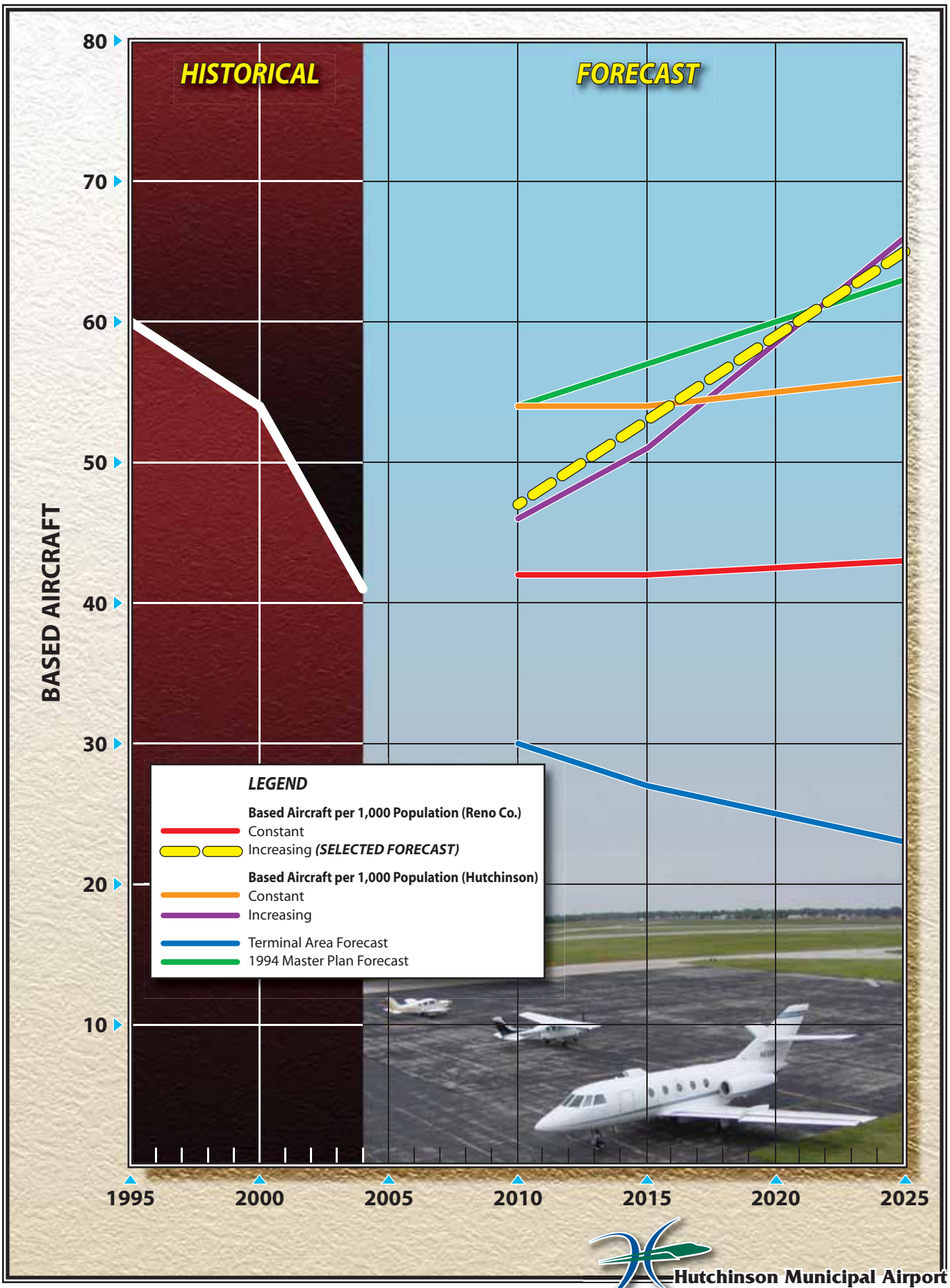
BASED AIRCRAFT FLEET MIX PROJECTION

Knowing the aircraft fleet mix expected to utilize the airport is necessary to properly plan facilities that will best serve the level of activity and the type of activities occurring at the airport. The existing based aircraft fleet mix is comprised of 25 single engine and 10 multi-engine, piston-powered aircraft, two jet-powered aircraft, two turboprops, and two helicopters.

As detailed previously, the national trend is toward a larger percentage of sophisticated turboprop, jet aircraft, and helicopters in the national fleet. Active multi-engine piston aircraft are expected to be the only category of aircraft which shows a decrease in annual growth. Growth within each based aircraft category at the airport has been determined by comparison with national projections (which reflect current aircraft production) and consideration of local economic conditions.

Currently, single engine aircraft compose the largest segment of aircraft type at Hutchinson Municipal Airport,

05MP03-2D-9/29/05



Hutchinson Municipal Airport

Exhibit 2D

BASED AIRCRAFT FORECASTS

making up 61 percent of total based aircraft. Future based aircraft mix will continue to be dominated by single engine aircraft; however, turboprop and turbojet are projected to increase as well.

The projected trend of based aircraft at Hutchinson Municipal Airport includes a growing number of aircraft in each category except multi-engine piston, which are projected to decline as a percentage of the total mix. Moderate growth in jet aircraft, turboprops, and helicopters is expected to follow national trends. The based aircraft fleet mix projection for Hutchinson Municipal Airport is summarized in **Table 2E**.

TABLE 2E
Based Aircraft Fleet Mix Projections
Hutchinson Municipal Airport

	EXISTING		FORECAST					
Aircraft Type	**2004**	**%**	**2010**	**%**	**2015**	**%**	**2025**	**%**
Single Engine	25	60.98%	29	61.70%	33	62.26%	42	64.62%
Multi-Engine	10	24.39%	10	21.28%	10	18.87%	10	15.38%
Turboprop	2	4.88%	3	6.38%	4	7.55%	5	7.69%
Jet	2	4.88%	3	6.38%	4	7.55%	5	7.69%
Helicopters	2	4.88%	2	4.26%	2	3.77%	3	4.62%
Totals	**41**	**100.00%**	**47**	**100.00%**	**53**	**100.00%**	**65**	**100.00%**

Source: Airport Records, Coffman Associates analysis

OPERATIONS FORECASTS

There are two types of operations at an airport: local and itinerant. A local operation is a takeoff or landing performed by an aircraft that operates within sight of the airport, or which executes simulated approaches or touch-and-go operations at the airport. Itinerant operations are those performed by aircraft with a specific origin or destination away from the airport. Generally, local operations are characterized by training operations. Itinerant operations are characterized by aircraft landing at the airport for short stays or departing for other regional/national airports. Itinerant operations are typically those conducting business, tourism, or simply refueling.

Annualized operational counts are available for Hutchinson Municipal Airport as there is an airport traffic control tower (ATCT). Tower operational records are available from the FAA and include annual, monthly, weekly, and daily reports. Hourly operational records were obtained from the ATCT management directly for analysis of the peak periods at the airport.

Table 2F represents historical annual operations as reported by the ATCT. The operations are categorized into local and itinerant operations. Local operations are further categorized into general aviation and military. Although there are no military aircraft based at the airport, they still account

for a portion of the local operations as the military will often travel to Hutchinson Municipal Airport in order to train.

TABLE 2F
Historical Annual Operations
Hutchinson Municipal Airport

	Itinerant Operations				Local Operations			
Year	**AT/AC**	**GA**	**MIL**	**Total**	**GA**	**MIL**	**Total**	**Total**
1998	2,085	25,957	2,303	30,345	30,357	4,219	34,576	64,921
1999	1,534	28,242	2,603	32,379	35,991	3,392	39,383	71,762
2000	1,511	21,089	2,989	25,589	32,993	3,653	36,646	62,235
2001	3,810	24,501	2,984	31,295	29,799	5,056	34,855	66,150
2002	721	24,000	4,515	29,236	24,526	8,359	32,885	62,121
2003	627	22,146	2,940	25,713	21,442	5,524	26,966	52,679
2004	1,455	23,183	2,619	27,257	22,371	5,082	27,453	54,710

Source: Tower Records from FAA APO; Airport Records.

The table also reflects the historical itinerant operations at the airport. The itinerant category includes general aviation, military, and the additional classification for air taxi/air carrier. Air taxi/air carrier operations are always classified itinerant because, by definition, they are revenue flights with a specific destination to or from the airport. These flights do not conduct training operations. Each classification of aviation operations will be forecast separately in the sections to follow.

General Aviation Operations

General aviation operations account for the greatest percentage of total operations at Hutchinson Municipal Airport. Historically there has been approximately a 50/50 split between local and itinerant general aviation operations.

Three forecasts of general aviation activity have been created and are presented in **Table 2G**. The first is a market share forecast that assumes that the airport will continue to account for a constant share of total local general aviation operations at all towered airports in the United States. The constant share identified is the average of the last seven years of activity. The average is utilized primarily because the events of 9/11 had a negative impact on general aviation activity, which is only now beginning to recover. The constant market share forecast shows a steady increase in operations from 28,000 to 33,000 over the 20-year planning period of the Master Plan.

A second forecast utilizing an increasing market share of total general aviation operations at all towered airports in the United States is also presented. This forecast assumes that the airport can regain a portion of general aviation activity that would bring their aviation activity back to the levels of 1999 when the airport experienced their greatest market share. This forecast has a high level of local general aviation operations (42,000) by the end of the study period.

A third method of forecasting involves examining the number of operations as related to the number of based aircraft. Over the previous seven years, the airport has averaged approximately 586 operations per based aircraft. For a general aviation airport that is not an official reliever airport, this number is somewhat on the high range. Typically, rural general aviation airports can expect to average somewhere between 300 and 500 operations per year. The high average at HUT is an indicator of the significant number of training operations from other regional airports, in particular Wichita Mid-Continent Airport. When utilizing the 586 operations per based aircraft, local general aviation operations is projected to increase to 37,000 by 2025.

The FAA *Terminal Area Forecast* (TAF) also identifies annual operations for Hutchinson Municipal Airport. According to these figures, the airport is projected to realize approximately 26,000 GA operations by 2010, with this figure rising to 32,000 by 2025.

TABLE 2G
General Aviation Local Operations Forecast
Hutchinson Municipal Airport

Year	HUT Local GA*	US Local GA Ops	Market Share	Based Aircraft	Operations Per Based Aircraft
1998	30,357	15,960,000	0.19%	54	562
1999	35,991	16,980,200	0.21%	52	692
2000	32,993	17,034,400	0.19%	50	660
2001	29,799	16,193,700	0.18%	48	621
2002	24,526	16,202,700	0.15%	46	533
2003	21,442	15,292,700	0.14%	44	487
2004	22,371	14,948,400	0.15%	41	546
Constant Market Share of U.S. Local GA Operations					
2010	28,000	16,066,800	0.17%	47	596
2015	30,000	17,020,500	0.17%	53	566
2025	33,000	18,988,300	0.17%	65	508
Increase in Market Share of U.S. Local GA Operations					
2010	26,000	16,066,800	0.16%	47	553
2015	31,000	17,020,500	0.18%	53	585
2025	42,000	18,988,300	0.22%	65	646
Constant Local GA Operations Per Based Aircraft					
2010	28,000	16,066,800	0.17%	47	586
2015	31,000	17,020,500	0.18%	53	586
2025	38,000	18,988,300	0.20%	65	586
Selected Forecast					
2010	27,000	16,066,800	0.17%	47	574
2015	30,000	17,020,500	0.18%	53	566
2025	37,000	18,988,300	0.19%	65	569

*Source: FAA Aerospace Forecasts 2005-2016. Coffman Associates analysis. *Operations rounded*

The selected forecast represents the average of the three forecasts presented in **Table 2G**. Further examination of these results indicates that they follow

the general trend identified in the FAA TAF of an increasing number of operations at the airport. The selected forecast represents a slightly decreasing number of operations per based aircraft. The chapters to follow will utilize the selected forecast of 27,000, 30,000 and 37,000 annual local general aviation operations for the planning years 2010, 2015, and 2025, respectively.

Itinerant general aviation operations have also been forecast and are presented in **Table 2H**. A constant share of U.S. itinerant general aviation operations results in nearly 29,000 operations by 2025. An increasing market share of U.S. itinerant general aviation operations results in nearly 35,000 annual operations by 2025. The third forecast represents a constant number of operations (507) per based aircraft. This results in approximately 33,000 annual itinerant general aviation operations in 2025. The selected forecast is an approximate average of these three forecasting methods.

Local factors can increase itinerant activity at the airport. With a restaurant in the terminal building, the airport becomes a destination airport. The City of Hutchinson also offers many attractions such as the Cosmosphere, the annual Kansas State Fair, and the regular professional golf tournament held at the Prairie Dunes Golf Course.

Military Operations

The historical military aviation operations are relatively consistent for both local and itinerant operations. A recognizable spike in activity took place in 2002 and has been identified as the result of increased military activity in response to the events of 9/11. Because the number of military operations are similar year after year, excluding 2002, a constant number of both local and itinerant operations will be utilized in future analysis. Local military operations have been projected at 5,000 annually, and itinerant operations are projected at 2,900 annually.

Air Taxi/Air Carrier Operations

In the post-9/11 environment, many executives have opted to use private jets for their travel needs. Fractional ownership programs were well-positioned to meet this growing demand. There are a number of companies, including Citation Shares, NetJets, Bombardier FlexJet, and Flight Options, which provide this service. Companies or individuals are able to purchase partial ownership, typically one-sixteenth or one-eighth of an aircraft. This gives them a certain allotment of time to use an aircraft in the fractional ownership fleet. In this regard, fractional ownership is much like owning a timeshare.

Analysis of air taxi operators can have a significant impact on the needs of an airport. Fractional ownership companies utilize business jets almost exclusively, and many of these aircraft are the larger business jets. As more of the larger business jets utilize the airport, the necessary design standards for the airport may change. Charter operators use a variety of piston and

turboprop, and on occasion, jet-powered aircraft. The type of aircraft using the airport will be a critical element for the airport to prepare for in the future.

TABLE 2H
General Aviation Itinerant Operations Forecast
Hutchinson Municipal Airport

Year	HUT Itinerant GA *	US Itinerant GA	Market Share	Based Aircraft	Operations Per Based Aircraft
1998	25,957	22,086,500	0.12%	54	481
1999	28,242	23,019,400	0.12%	52	543
2000	21,089	22,844,100	0.09%	50	422
2001	24,501	21,433,300	0.11%	48	510
2002	24,000	21,450,500	0.11%	46	522
2003	22,146	20,231,300	0.11%	44	503
2004	23,183	19,989,900	0.12%	41	565
Constant Market Share of Total U.S. Itinerant GA Operations					
2010	25,000	21,961,600	0.11%	47	532
2015	26,000	23,519,000	0.11%	53	491
2025	29,000	25,723,600	0.11%	65	446
Increase Market Share of Total U.S. Itinerant GA Operations					
2010	26,000	21,961,600	0.12%	47	553
2015	29,000	23,519,000	0.13%	53	547
2025	35,000	25,723,600	0.14%	65	538
Constant Itinerant GA Operations Per Based Aircraft					
2010	24,000	21,961,600	0.11%	47	507
2015	27,000	23,519,000	0.11%	53	507
2025	33,000	25,723,600	0.13%	65	507
Selected Forecast					
2010	25,000	21,961,600	0.11%	47	532
2015	28,000	23,519,000	0.12%	53	528
2025	32,000	25,723,600	0.12%	65	492

*Source: FAA Aerospace Forecasts 2005-2016. Coffman Associates analysis. *Operations rounded*

Air carrier operations are typically associated with scheduled air passenger service. In order to accommodate such carriers, the airport must meet the stringent requirements of 14 CFR Part 139. Hutchinson Municipal Airport has maintained Part 139 certification. Although there is no scheduled air carrier service to the airport, on occasion an aircraft meeting the Part 139 standards will utilize the airport. These numbers have been so low, accounting for zero operations in most years and no more that 10 operations in any given year, that they are included in the air taxi figures.

The air taxi/air carrier operations at the airport over the past seven years have varied widely, from a high of 3,810 in 2001 to a low of 627 in 2003. Interviews with ATCT staff indicate that the drop in air taxi/air carrier operations in 2002 and 2003 is directly attributable to the events of 9/11. The downward trend appears to have reversed in 2004 with 1,455 operations, and an estimated 1,500 operations in

2005. As air taxi operations are most closely associated with itinerant operations on the national level, the forecast will utilize the national average growth rate for itinerant general aviation operations of 1.1 percent. That growth rate is applied to the average of the five previous years, not including 2002 and 2003. These years were not included as the events of 9/11 are considered an anomaly. With 2,079 operations representing the base year, air taxi operations are projected to reach 2,600 annual operations by 2025. Air taxi/air carrier historical data and forecasts are presented in **Table 2J**.

TABLE 2J
Air Taxi/Air Carrier
Forecast Operations
Hutchinson Municipal Airport

Year	AC/AT
1998	2,085
1999	1,534
2000	1,511
2001	3,810
2002	721
2003	627
2004	1,455
Five Year Average	2,079
2010	2,200
2015	2,300
2025	2,600

Source: ATCT Records.

TOTAL OPERATIONS

Total operations are summarized on **Exhibit 2E**. An adjustment for nighttime operations is included in the total operations figure. Each segment of activity was increased by three percent to account for operations after the tower is closed.

PEAKING CHARACTERISTICS

Many airport facility needs are related to the levels of activity during peak periods (busy times). The periods used in developing facility requirements for this study are as follows:

1. **Peak Month -** The calendar month when peak aircraft operations occur.

2. **Design Day -** The average day in the peak month. This indicator is derived by dividing the peak month operations by the number of days in the month.

3. **Busy Day** - The busy day of a typical week in the peak month.

4. **Design Hour -** The peak hour within the design day.

The peak month is an absolute peak within a given year. All other peak periods will be exceeded at various times during the year. However, they do represent reasonable planning standards that can be applied without overbuilding or being too restrictive. The peak periods forecast has been determined utilizing operations reported by the ATCT to the FAA. Hourly peaking characteristics are maintained by the ATCT and were provided for use in this analysis.

The peak month at Hutchinson Municipal Airport has historically been during the summer months. In 2000, June was the busiest month with 6,680

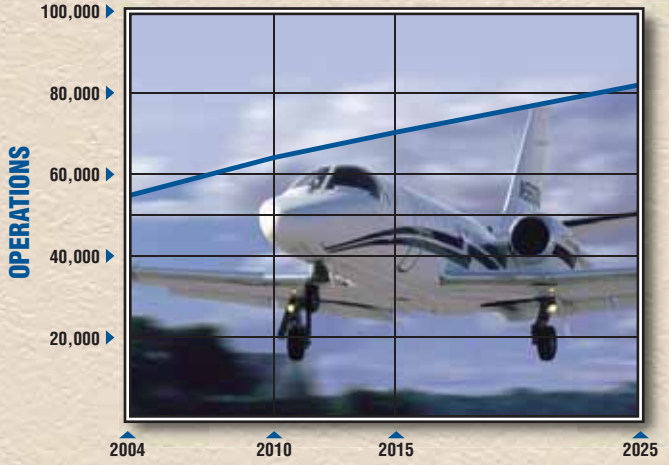
05MP03-2E-10/28/05

	2004	2010	2015	2025
BASED AIRCRAFT FORECASTS				
Single Engine	25	29	33	42
Multi-engine	10	10	10	10
Turboprop	2	3	4	5
Jet	2	3	4	5
Helicopter	2	2	2	3
Total Based Aircraft	***41***	***47***	***53***	***65***
OPERATIONS FORECASTS[1]				
Itinerant GA	23,183	25,800	28,800	33,000
Itinerant Military	2,619	3,000	3,000	3,000
Itinerant AT/AC	1,455	2,300	2,400	2,700
Total Itinerant	*27,257*	*31,100*	*34,200*	*38,700*
Local GA	22,371	27,800	30,900	38,100
Local Military	5,082	5,200	5,200	5,200
Total Local	*27,453*	*33,000*	*36,100*	*43,300*
Total Annual Operations	***54,710***	***64,100***	***70,300***	***82,000***
Peak Operations Forecasts				
Peak Month	6,358	6,831	7,502	8,745
Busy Day	355	381	419	488
Design Day	212	228	250	292
Design Hour	48	52	57	67
AIA's	***191***	***492***	***624***	***892***

[1]*Increased 3% to account for times when tower is closed.*

BASED AIRCRAFT FORECASTS

OPERATIONS FORECASTS



Hutchinson Municipal Airport
Exhibit 2E
FORECAST SUMMARY

total operations. In 2001 it was August with 6,598 operations. July represented the busiest month in 2002 with 6,460 operations. May of 2003 represented the busy month with 5,608 operations, while June 2004 was the peak month with 6,358 operations. On average, the peak month over the last five years has accounted for 10.68 percent of the annual operations.

When determining peaking characteristics, it is important to account for all airport operations including those that occur when the tower is closed. Typically, a general aviation airport with a tower that is open for 16 hours per day can expect up to three percent of their operations to occur when the tower is closed. As a result, the annual operations figures presented in **Table 2K** represent the addition of three percent to the total operations count.

TABLE 2K
Peak Operations Forecasts
Hutchinson Municipal Airport

	2004	Short Term	Intermediate Term	Long Term
Total Annual Operations	54,710	64,100	70,300	82,000
Peak Month	6,358	6,835	7,497	8,745
Busy Day	355	381	418	488
Design Day	212	228	250	292
Design Hour	48	52	57	67

Source: Coffman Associates Analysis

The design day is simply the peak month divided by the number of days in the month. Since the peak month at Hutchinson Municipal Airport fluctuates, the design day is arrived at by dividing the peak month by 30. The design day is primarily used in airfield capacity calculations.

The busy day provides information for use in determining aircraft parking apron requirements. Analysis of the June 2004 operations counts (the peak month) indicated that the busy day, on average, represented 342 operations or 161 percent of the design day.

Based on ATCT hourly counts, the average busiest hour of activity will account for 22.82 percent of daily operations. This is a fairly high figure for a general aviation airport, but the trends are clearly identified. The busiest hours are during the lunch period or between 4 and 6 p.m. Because of the high volume of traffic during these times, future planning must consider accommodating this volume. **Table 2K** presents the peaking characteristics for Hutchinson Municipal Airport.

ANNUAL INSTRUMENT APPROACHES (AIAs)

An instrument approach, as defined by the FAA, is "an approach to an airport with the intent to land by an aircraft in accordance with an Instrument Flight Rule (IFR) flight plan, when visibility is less than three miles and/or when the ceiling is at or below the minimum initial approach altitude." To qualify as an instrument approach at Hutchinson Municipal Airport, aircraft must land at the airport after following one of the published instrument approach procedures and then properly close their flight plan on the ground. The approach must be conducted in weather conditions which necessitate the use of the instrument approach. If the flight plan is closed prior to landing, then the AIA is not counted in the statistics. Forecasts of annual instrument approaches (AIAs) provide guidance in determining an airport's requirements for navigational aid facilities. It should be noted that practice or training approaches do not count as annual AIAs.

Typically, AIAs for airports with available instrument approaches utilized by advanced aircraft will average between one and two percent of itinerant operations. Two percent has been an accepted industry standard for general aviation airports that currently, or are expected to, support corporate jet aircraft, which is the case for Hutchinson Municipal Airport. Also, the increased availability of low-cost navigational equipment could allow for smaller and less sophisticated aircraft to utilize instrument approaches. National trends indicate an increasing percentage of annual approaches given the greater availability of approaches at airports with GPS and the availability of more cost-effective equipment. **Table 2L** summarizes both historical and forecast AIAs for the planning period.

According to the FAA Air Traffic Activity statistics, Hutchinson Municipal Airport had 191 AIAs in 2004. This is the absolute minimum number of AIAs conducted at the airport. As previously mentioned, to be counted as an AIA, a flight plan cannot be closed prior to landing, but this practice is common if the airport comes within visual range. The forecast presented in **Table 2L** recognized an increasing number of AIAs, up to 2.5 percent of itinerant operations by 2025.

TABLE 2L
Annual Instrument Approach (AIAs) Projections
Hutchinson Municipal Airport

Year	AIAs	Itinerant Operations	Ratio
1998	706	30,345	2.33%
1999	447	32,379	1.38%
2000	467	25,589	1.83%
2001	267	31,295	0.85%
2002	752	29,236	2.57%
2003	368	25,713	1.43%
2004	191	27,257	0.70%
FORECASTS			
2010	492	28,100	1.75%
2015	624	31,200	2.00%
2025	892	35,700	2.50%

Source: FAA Terminal Area Forecast - Approach Operations

SUMMARY

This chapter has provided demand-based forecasts of aviation activity at

Hutchinson Municipal Airport over the next 20 years. An attempt has been made to define the projections in terms of short, intermediate, and long term expectations. Elements such as local socioeconomic indicators, anticipated regional development, and historical aviation data, as well as national aviation trends were considered when determining future conditions.

The next step in the master planning process will be to assess the capacity of existing facilities, their ability to meet forecast demand, and to identify changes to the airfield and/or landside facilities which will create a more functional aviation facility. A summary of aviation forecasts is depicted on **Exhibit 2E**.

Chapter Three

AIRPORT FACILITY REQUIREMENTS

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

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

PLANNING HORIZONS

Cost-effective, safe, efficient, and orderly development of an airport should rely more upon actual demand at an airport than a time-based forecast figure. In order to develop a master plan that is demand-based rather than time-based, a series of planning horizon milestones has been established for Hutchinson Municipal Airport that take into consideration the reasonable range of aviation demand projections prepared in Chapter Two.

It is important to consider that the actual activity at the airport may be

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

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

TABLE 3A
Planning Horizons
Hutchinson Municipal Airport

	2004	Short Term	Intermediate Term	Long Term
Itinerant Operations				
General Aviation	23,183	25,800	28,800	33,000
Air Taxi/Air Carrier	1,455	2,300	2,400	2,700
Military	2,619	3,000	3,000	3,000
Total Itinerant	27,257	31,100	34,200	38,700
Local Operations				
General Aviation	22,371	27,800	30,900	38,100
Military	5,082	5,200	5,200	5,200
Total Local	27,453	33,000	36,100	43,300
TOTAL OPERATIONS	**54,710**	**64,100**	**70,300**	**82,000**
TOTAL BASED AIRCRAFT	**41**	**47**	**53**	**65**

Historical Data Source: Airport records/FAA records.
Forecast Source: Coffman Associates analysis.

In this chapter, existing components of the airport are evaluated so that the capacities of the overall system are identified. Once identified, the existing capacity is compared to the planning horizon milestones to determine where deficiencies currently exist or may be expected to materialize in the future. Once deficiencies in a component are identified, a more specific determination of the approximate sizing and timing of the new facilities can be made.

AIRFIELD REQUIREMENTS

Airfield requirements include the need for those facilities related to the arrival and departure of aircraft. The adequacy of existing airfield facilities at Hutchinson Municipal Airport has been analyzed from a number of perspectives, including:

- Critical Design Aircraft
- Safety Area Design Standards
- Airfield Capacity
- Runways
- Taxiways
- Navigational Approach Aids
- Airfield Lighting, Marking, and Signage

CRITICAL DESIGN AIRCRAFT

The selection of appropriate Federal Aviation Administration (FAA) design standards for the development and location of airport facilities is based primarily upon the characteristics of the aircraft which are currently using, or are expected to use, the airport. The critical design aircraft is used to define the design parameters for the airport. The critical design aircraft is defined as the most demanding category of aircraft, or family of aircraft, which conducts at least 500 operations per year at the airport. Planning for future aircraft use is of particular importance since design standards are used to plan separation distances between facilities. These future standards must be considered now to ensure that short term development does not preclude the long range potential needs of the airport.

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

According to FAA Advisory Circular (AC) 150/5300-13, *Airport Design*, Change 9, an aircraft's approach category is based upon 1.3 times its stall speed in landing configuration at that aircraft's maximum certificated weight. The five approach categories used in airport planning are as follows:

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

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

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

Exhibit 3A summarizes representative aircraft by ARC. As shown on the exhibit, the airport does not currently, nor is it expected to, regularly serve aircraft in ARCs C-IV, D-IV, or D-V. These are large transport aircraft commonly used by commercial air carriers and air cargo carriers, which do not currently use, nor are they expected to use, Hutchinson Municipal Airport through the planning period.

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

As detailed in Chapter One, there is considerable miliary use of the airport for training operations conducted by aircraft from Vance Air Force Base. This includes the Beechcraft T-1 Jayhawk. The civil version of this aircraft is the Beechcraft 400A which falls within ARC C-I. Military use of the airport also includes the Raytheon T-6A/B. This is an aircraft developed specifically for the military that falls within ARC B-I. Military aircraft conducted more than 2,600 operations at HUT in 2004.

General aviation aircraft conduct the remainder of operations at HUT. General aviation aircraft using the airport include a variety of small single and multi-engine piston-powered aircraft, turboprops, and turbojet aircraft. While the airport is used by a limited number of helicopters, helicopters are not included in this determination as they are not assigned an ARC.

The majority of the based aircraft are single and multi-engine piston-powered aircraft which fall within approach categories A and B and ADG I. There are two business jets based at the airport. The smaller of the two is a Sabreliner 40 with a wingspan of 45 feet and an approach speed of 120 knots making it an ARC B-I aircraft. The largest aircraft currently based at the airport is the Learjet 45. This aircraft has a wingspan of approximately 48 feet and an approach speed of 129 knots making it an ARC C-I aircraft.

A wide range of transient turbojet aircraft operate at the airport. In order to discern the number and type of business jets operations at HUT, an analysis of instrument flight plan data was conducted. Flight plan data was acquired for this study from the subscription service, *AirportIQ*. The data available includes documentation of flight plans that are opened and closed on the ground at the airport. Flight plans that are opened or closed from the air are not credited to the airport. Therefore, it is likely that there are more business jet operations at the

05MP03-1B-9/13/05

A-I

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

C-I, D-I

- Beech 400
- **Lear** 25, 31, **35**, 45, 55, 60
- Israeli Westwind
- HS 125-400, 700

B-I less than 12,500 lbs.

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

C-II, D-II

- Cessna Citation X
- **Gulfstream** II, III, **IV**
- Canadair 600
- Canadair Regional Jet
- Embraer Regional Jet
- Lockheed JetStar
- Super King Air 350

B-II less than 12,500 lbs.

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

C-III, D-III

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

B-I, II over 12,500 lbs.

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

C-IV, D-IV

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

A-III, B-III

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

D-V

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

Note: Aircraft pictured is identified in bold type.

Hutchinson Municipal Airport

Exhibit 3A

AIRPORT REFERENCE CODES

airport that are not captured by this methodology. Additionally, many business jets conduct operations within the traffic pattern at the airport. These local operations are also not captured on instrument flight plans. This likely increases the number of business jet operations at the airport; however, the number of local turbojet operations is not readily discernable.

As shown in **Table 3B**, general aviation business jets completing instrument flight plans conducted more than 1,000 operations at HUT in the most recent 12-month period (September 4, 2004 to September 5, 2005) used for this study. The highest number of operations were conducted within approach category B. Business jets within approach category C conducted 516 operations in 2004.

TABLE 3B
General Aviation Business Jet Operations By Design Categories
Hutchinson Municipal Airport

Design Categories	12-Month Operational Count
Approach Category B	398
Approach Category C	516
Approach Category D	88
Total	**1002**
Airplane Design Group I	598
Airplane Design Group II	400
Airplane Design Group III	4
Total	**1002**

Source: Airport IQ, Coffman Associates analysis

CRITICAL DESIGN AIRCRAFT CONCLUSIONS

The critical design aircraft is defined as the most demanding category of aircraft which conduct 500 or more operations at the airport each year. In some cases, more than one specific make and model of aircraft comprises the airport's critical design aircraft. One category of aircraft may be the most critical in terms of approach speed, while another is most critical in terms of wingspan affecting runway/taxiway width and separation distances. This is the case for HUT. While smaller general aviation piston-powered aircraft within approach categories A and B and ADG I conduct the majority of operations at HUT, these aircraft do not comprise the critical design aircraft. Business turboprops and turbojets comprise the current critical design aircraft due to the longer wingspans and higher approach speeds than the remaining general aviation aircraft that use the airport.

Based upon the operational counts shown in **Table 3B**, business jet aircraft within approach category C conducted more than 500 annual operations at the airport. Therefore, consistent with federal design guidance, this is the critical approach category. The critical ADG is ADG II. ADG II is comprised of business jets, turboprops, and some piston-powered aircraft operations. Therefore, the critical design standards for HUT are defined by combining critical approach category C and critical ADG II. The most demanding ARC for HUT is currently expressed as ARC C-II.

The aviation demand forecasts indicate the potential for continued growth in business jet activity at the airport. This includes the addition of at least three based business jets through the planing period and growth in transient business

jet activity. Therefore, it is expected that business turbojets will continue to define the critical design parameters for HUT through the planning period; however, this is not expected to change the critical approach category. Aircraft within approach category C are expected to conduct more than 500 annual operations at the airport through the planning period. While aircraft within approach category D are likely to increase in the number of operations at the airport, this category of aircraft is not expected to surpass the 500 annual operations threshold through the planning period. As shown in **Table 3B**, there were less than 100 operations within approach category D at HUT in 2004. Business turbojet aircraft within approach category D comprise a small portion of the national fleet. Newer business jets are being developed with more efficient wing designs, which reduce the approach speeds.

While the critical approach category is not expected to change through the planning period, facility planning should consider the requirements of the more demanding ADG III. On occasion, aircraft with larger wingspans within ADG III are using the airport. Typically these aircraft will come from the various aircraft manufacturing facilities in Wichita for training and certification. The occasional use of the airport by larger transport aircraft conducting cargo operations cannot be excluded from future facility needs. Additionally, the airport maintains a Class IV Title 14 CFR Part 139 Operating Certificate. This allows the airport to accommodate unscheduled operations by aircraft with more than 30 passenger seats. This has included, in the past, occasional large transport aircraft in ADG III such as the DC-9. Finally, HUT has also accommodated diverted commercial airline traffic from Wichita Mid-Continent Airport in the past. This can include large transport aircraft within ADG III. While aircraft within ADG III may not conduct 500 annual operations at the airport, it is important to consider the effect that these larger wingspans have on facility placement. To ensure that the occasional use of aircraft in this category can be accommodated safely at the airport, the future facility planning will consider the requirements of ADG III. Therefore, the future critical design aircraft is best expressed as ARC C-III.

It is not necessary to design all airfield elements to the same critical ARC. This is the case at HUT where there are marked differences in the capabilities between runways. Runway 13-31 provides the longest length and most advanced instrument approach capability of all three runways at the airport. Therefore, Runway 13-31 should be designed and be capable of accommodating all aircraft expected to use the airport through the planning period. Considering this, Runway 13-31 should be designed to ARC C-III standards.

For Runway 4-22, a lower design category can be considered since this runway does not provide the same capabilities as Runway 13-31. The current approved Airport Layout Plan (ALP) applies ARC C-II design requirements to Runway 4-22. This is consistent with the current critical design aircraft for the airport and

future critical approach category. This runway can also be expected to accommodate aircraft within approach categories C and D as the existing instrument approach procedures define landing minimums for aircraft within these approach categories.

ARC B-II design standards are currently appropriate for Runway 17-35 as this runway currently serves smaller aircraft during periods when the wind is strongly blowing from the north or south.

SAFETY AREA DESIGN STANDARDS

The FAA has established several safety surfaces to protect aircraft operational areas and keep them free from obstructions that could affect their safe operation. These include the runway safety area (RSA), object free area (OFA), obstacle free zone (OFZ), and runway protection zone (RPZ).

The entire RSA, OFZ, and OFA should be under the direct control of the airport sponsor to ensure these areas remain free of obstacles and can be readily accessed by maintenance and emergency personnel. It is not required that the RPZ be under airport ownership, but it is strongly recommended. An alternative to outright ownership of the RPZ is the purchase of avigation easements (acquiring control of designated airspace within the RPZ) or have sufficient land use control measures in places which ensure the RPZ remains free of incompatible development. **Exhibit 3B** visually depicts the existing runway safety areas at Hutchinson Municipal Airport.

Dimensional standards for the various safety areas associated with the runways are a function of the type of aircraft (ARC) expected to use the runways as well as the approved instrument approach visibility minimums. Each runway can be designed to serve a different type of aircraft based on ARC. At Hutchinson Municipal Airport, Runway 13-31 is the designated primary runway and should meet design standards for ARC C-III. Runway 4-22 should meet design standards for ARC C-II. Runway 17-35 should meet design standards for aircraft in ARC B-II.

Runway Safety Area (RSA)

The RSA is defined in FAA Advisory Circular (AC) 150/5300-13, *Airport Design*, Change 9 as a "surface surrounding the runway prepared or suitable for reducing the risk of damage to airplanes in the event of an undershoot, overshoot, or excursion from the runway." The RSA is centered on the runway and dimensioned in accordance to the approach speed of the critical aircraft using the runway. The FAA requires the RSA to be cleared and graded, drained by grading or storm sewers, capable of accommodating the design aircraft and fire and rescue vehicles, and free of obstacles not fixed by navigational purpose.

The FAA has placed a higher significance on maintaining adequate RSAs at all airports. Under Order 5200.8, effective October 1, 1999, the

FAA established the *Runway Safety Area Program*. The Order states, "The objective of the Runway Safety Area Program is that all RSAs at federally-obligated airports . . . shall conform to the standards contained in Advisory Circular 150/5300-13, *Airport Design*, to the extent practicable." Each Regional Airports Division of the FAA is obligated to collect and maintain data on the RSA for each runway at the airport, and perform airport inspections.

For ARC B-II aircraft, the FAA calls for the RSA to be 150 feet wide, centered on the runway, and extend 300 feet beyond the runway ends. Runway 17-35 does not fully meet this standard as the RSA behind the Runway 35 end is obstructed by the perimeter fence and 4th Avenue. The RSA is 75 feet short of standard. The obstructed portion of the RSA encompasses approximately one-quarter acre.

For ARC C-II and C-III, AC 150/5300-13 requires the RSA to be 500 feet wide, centered on the runway, and extend 1,000 feet beyond the end of the runway. The RSA is required to extend 600 feet prior to the landing threshold. A 400-foot wide RSA for ARC C-I and C-II runways is permissible; however, facility requirements may consider conformance to the more demanding 500-foot wide standards, where possible. The 400-foot wide RSA may be applicable to Runway 4-22.

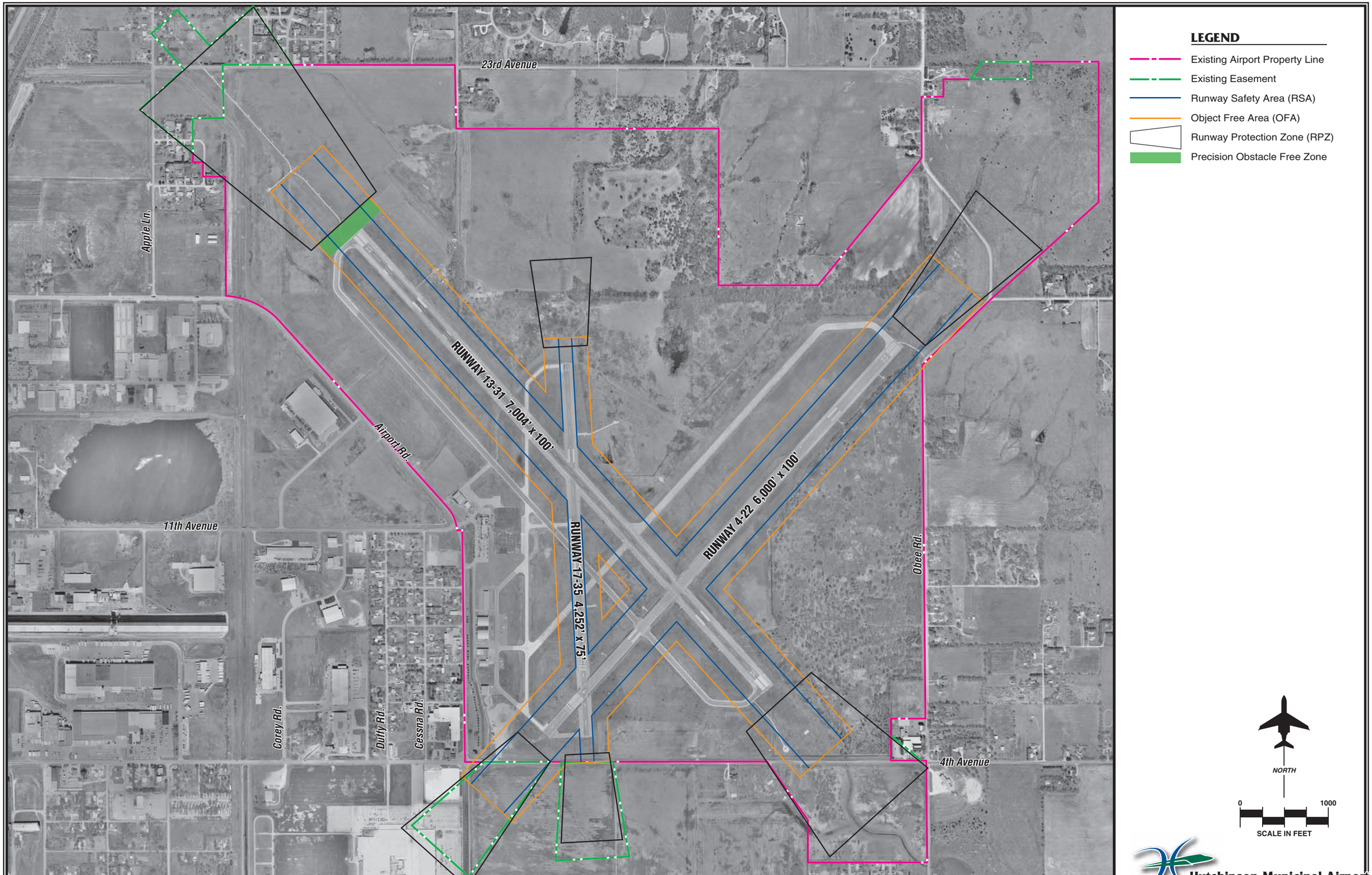
RSA standards are currently met behind the Runway 13 and Runway 22 ends. The RSA behind the Runway 31 and Runway 4 ends do not satisfy the RSA standards. A portion of the RSA behind the Runway 31 end is obstructed by perimeter fencing and 4th Avenue. In addition, the localizer antenna for the Runway 13 instrument landing system (ILS) approach is situated approximately 670 feet off the Runway 31 threshold in the RSA. The obstructed portion of the RSA encompasses approximately one-half acre. The RSA behind the Runway 4 end is also obstructed by perimeter fencing and 4th Avenue. The obstructed portion of the Runway 4 RSA encompasses approximately 7.3 acres.

Object Free Area (OFA)

The runway OFA is "a two-dimensional ground area, surrounding runways, taxiways, and taxilanes, which is clear of objects except for objects whose location is fixed by function (i.e., airfield lighting)." The OFA does not have to be graded and level as does the RSA; instead, the primary requirement for the OFA is that no object in the OFA penetrate the lateral elevation of the RSA. The runway OFA is centered on the runway, extending out in accordance to the critical aircraft design category utilizing the runway.

For ARC B-II aircraft, the FAA calls for the OFA to be 500 feet wide, centered on the runway, extending 300 feet beyond each runway end. The OFA behind the Runway 35 end does not meet standard. Similar to the RSA extending behind the Runway 35 end, the OFA is obstructed by perimeter fencing and 4th Avenue. The obstructed portion of the OFA encompasses approximately one (1) acre. The OFA

05MP03-3B-10/3/05



Hutchinson Municipal Airport

Exhibit 3B

EXISTING RUNWAY SAFETY AREAS

behind the Runway 17 end meets FAA standard.

For aircraft in approach category C and D, the OFA must be 800 feet wide, centered on the runway, and extend 1,000 feet beyond the runway pavement end. Both Runways 13 and 22 currently meet this standard. The OFA behind the Runway 31 end is obstructed by perimeter fencing, 4th Avenue, the localizer antenna, and the localizer electrical vault. The obstructed portion of the OFA encompasses approximately 1.34 acres. The OFA behind the Runway 4 end is obstructed by perimeter fencing and 4th Avenue. The obstructed portion of the OFA encompasses approximately 12 acres.

Obstacle Free Zones (OFZ)

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

For all runways serving aircraft over 12,500 pounds, the OFZ is 400 feet wide, centered on the runway, and extends 200 feet beyond the runway ends. This standard will apply to all runways at HUT. Currently, there are no OFZ obstructions at Hutchinson Municipal Airport. Future planning should maintain the OFZ for the appropriate runway type. **Table 3C** shows the existing and ultimate OFZ dimensions.

Precision Obstacle Free Zone (POFZ)

For runways providing a vertically-guided approach, a precision obstacle free zone (POFZ) is required. The POFZ is defined as "a volume of airspace above an area beginning at the runway threshold, at the threshold elevation, and centered on the extended runway centerline, 200 feet long by 800 feet wide." The POFZ is only in effect when the following operational conditions are met:

- Vertically-guided approach
- Reported ceiling below 250 feet and/or visibility less than three-quarters-of-a-statute-mile
- An aircraft on final approach within two (2) miles of the runway threshold

When these conditions are met, aircraft holding for take-off must hold in such a position so that neither the fuselage nor the tail of the aircraft penetrates the POFZ. The wings of the aircraft are allowed to penetrate the surface. Runway 13 is supported by a precision ILS approach, thus POFZ standards will apply to this runway end when conditions are met. This runway currently meets POFZ requirements.

TABLE 3C Safety Area Design Standards and Deficiencies Hutchinson Municipal Airport			
	Runway 13-31	**Runway 4-22**	**Runway 17-35**
Airport Reference Code (ARC)	**C-III**	**C-III**	**B-II**
Runway Safety Area			
Width (ft.)	500	500	150
Length Beyond Runway End (ft.)	1,000	1,000	300
Deficiencies	Runway 31	Runway 4	Runway 35
Length provided (ft.)	675	110	225
Area Obstructed	0.5 acres	7.3 acres	0.25 acres
Object Free Area			
Width (ft.)	800	800	500
Length Beyond Runway End (ft.)	1,000	1,000	300
Deficiencies	Runway 31	Runway 4	Runway 35
Length provided (ft.)	680	20	220
Area Obstructed	1.34 acres	11.84 acres	1 acre
Obstacle Free Zone			
Width (ft.)	400	400	250
Length Beyond Runway End (ft.)	200	200	200
Deficiencies	None	None	None
Source: FAA AC 150/5300-13, Airport Design, Change 9			

Runway Protection Zones (RPZ)

The RPZ is a trapezoidal area centered on the runway, typically beginning 200 feet beyond the runway end. The RPZ has been established by the FAA to provide an area clear of obstructions and incompatible land uses, in order to enhance the protection of approaching aircraft as well as people and property on the ground. The dimensions of the RPZ vary according to the visibility minimums serving the runway and the type of aircraft operating on the runway.

The dimensions of the RPZs at Hutchinson Municipal Airport are presented in **Table 3D.**

TABLE 3D Runway Protection Zones Hutchinson Municipal Airport					
	RWY 13	**RWY 31**	**RWY 4**	**RWY 22**	**RWY 17-35**
Approach Visibility Minimums	½ mile	3/4 mile	1 mile	1 mile	Visual
Inner Width (ft.)	1,000	1,000	500	500	500
Outer Width (ft.)	1,750	1,510	1,010	1,010	700
Length (ft.)	2,500	1,700	1,700	1,700	1,000
Source: FAA AC 150/5300-13, Airport Design, Change 9					

As previously discussed, where possible, the airport should have positive control over all safety areas. Currently the airport owns all the land within the

RPZ for Runways 22, 17, and 31. The airport owns an avigation easement for the areas encompassing the RPZs for Runways 35, 4, and 13.

The Runway 13 RPZ includes residential property which is not consistent with RPZ standards. This includes six residential houses on Apple Lane as well as five residential houses north of 23rd Avenue.

Approximately 31 acres of this RPZ is off airport property, but is part of an airport-owned avigation easement. The RPZ for Runway 4 extends over two industrial type businesses to the southwest and is a total of approximately 26 acres. Alternatives for clearing the RPZ will be examined in Chapter Four - Alternatives. The RPZ serving Runway 35 encompasses approximately 12 acres of undeveloped land to the south of the airport.

AIRFIELD CAPACITY

A demand/capacity analysis measures the capacity of the airfield facilities (i.e., runways and taxiways) in order to identify and plan for additional development needs. Hutchinson Municipal Airport's multi-runway system can provide up to 230,000 annual operations under ideal conditions. Due to times when the airport is closed, typically due to weather, a more reasonable capacity is identified as approximately 220,000 annual operations.

FAA Order 5090.3B, *Field Formulation of the National Plan of Integrated Airport Systems (NPIAS)*, indicates that improvements to capacity should be considered when operations reach 60 percent of the airfield's annual service volume (ASV). If the projected long range planning horizon level of 81,900 operations comes to fruition, the airfield's ASV will reach 37 percent. As a result, there is not a need for additional runways.

RUNWAYS

The adequacy of the existing runway system at Hutchinson Municipal Airport has been analyzed from a number of perspectives, including runway orientation, runway length, pavement strength, width, and adherence to safety area standards. From this information, requirements for runway improvements were determined for the airport.

Runway Orientation

The airport is served by three intersecting runways. Runway 13-31 is orientated in a northwest to southeast manner, intersecting both Runways 17-35 and 4-22. Runway 4-22 is oriented from the southwest to the northeast, and intersects Runway 13-31 and a portion of Runway 17-35. Runway 17-35 is oriented in a north to south manner, and it intersects both other runways.

For the operational safety and efficiency of an airport, it is desirable for the primary runway to be oriented as close as possible to the direction of the prevailing wind. This reduces the impact of wind components

perpendicular to the direction of travel of an aircraft that is landing or taking off.

FAA Advisory Circular 150/5300-13, *Airport Design*, Change 9, recommends that a crosswind runway should be made available when the primary runway orientation provides for less than 95 percent wind coverage for specific crosswind components. The 95 percent wind coverage is computed on the basis of the crosswind component not exceeding 10.5 knots (12 mph) for ARCs A-I and B-I; 13 knots (15 mph) for ARCs A-II and B-II; and 16 knots (18 mph) for ARC C-I through D-II.

All-weather wind data specific to HUT is depicted on **Exhibit 3C**. Runway 13-31 provides 89.45 percent wind coverage for 10.5 knot crosswinds, 94.76 percent coverage at 13 knots, and 98.36 percent at 16 knots. Since this runway does not provide 95 percent wind coverage for the 10.5-knot and 13.0-knot crosswind conditions, additional runway orientations are needed at HUT.

Runway 4-22 and Runway 17-35 currently serve as crosswind runways, accommodating aircraft operations when the winds are more directly aligned with these runways. Runway 4-22 provides 83.08 percent coverage for 10.5-knot crosswinds and 90.68 percent coverage for 13.0-knot crosswind situations. Runway 17-35 provides better coverage with 95.38 percent wind coverage for 10.5-knot crosswinds and 97.82 percent coverage at 13 knots. In any two runway combinations with Runway 13-31, the 95 percent wind coverage requirement is met at HUT.

Runway Length

FAA Advisory Circular (AC) 150/5235-4B, *Runway Length Requirements for Airport Design*, provides guidelines to determine runway lengths for civil airports. Quoting from the AC: "For airport projects receiving Federal funding, the use of this AC is mandatory." AC 5325-4B provides the procedure and rationale for determining the runway length. The five steps and the applicability to Hutchinson Municipal Airport are as follows:

Step 1. ***Identify the list of critical design airplanes that will make regular use of the proposed runway and establish a planning period of at least five years.*** Regular use is defined in AC 150/5325-4B as at least 500 or more annual itinerant operations.

For Hutchinson Municipal Airport, Runway 13-31 is used by all categories of aircraft using the airport, each with different runway length requirements. Small single and multi-engine piston-powered aircraft conduct the majority of operations on Runway 13-31. No additional length is needed on Runway 13-31 to serve these aircraft now or into the future.

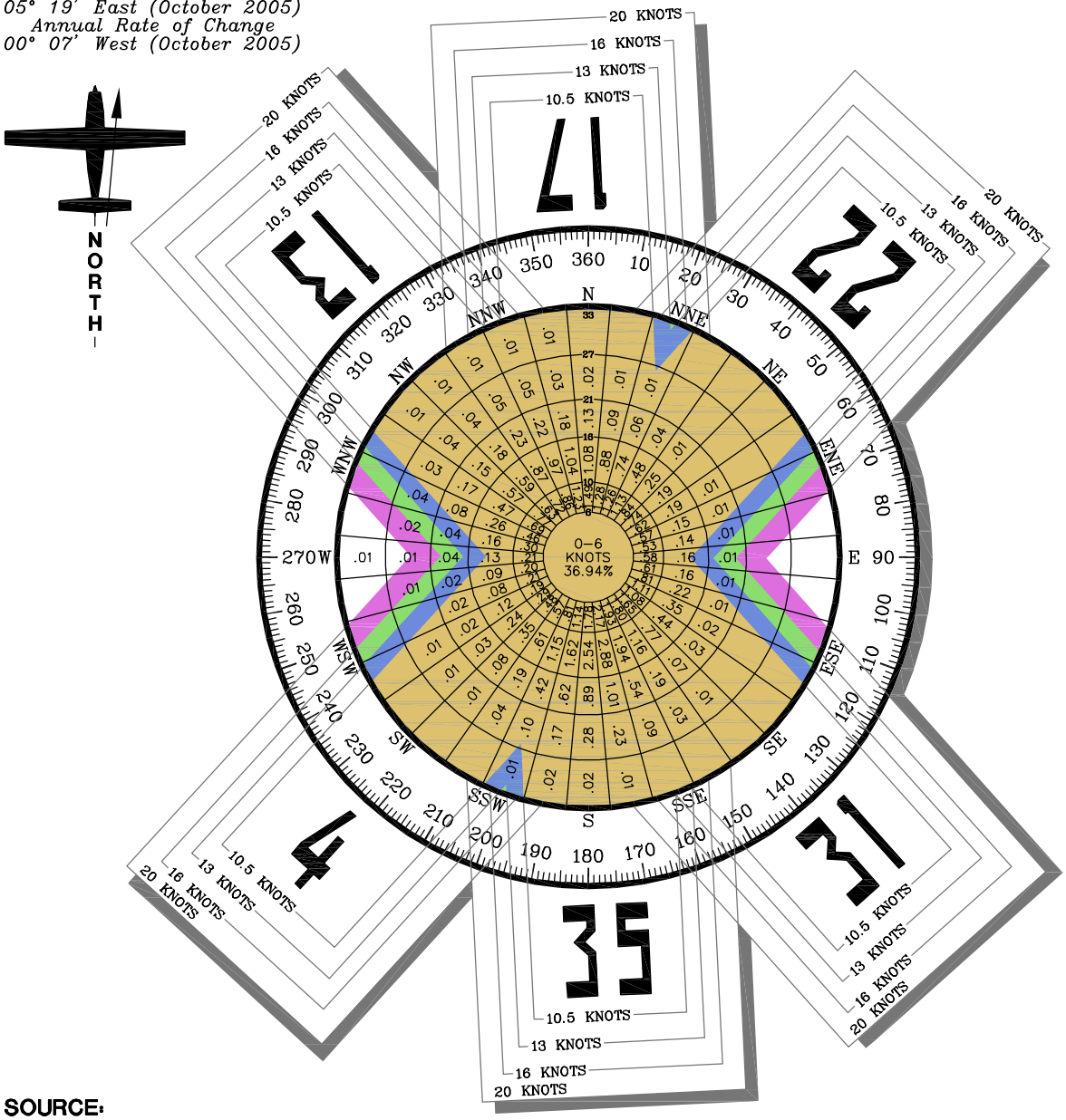
The increased use of the airport by privately-owned business jets must be considered in this analysis. Business jets have proved themselves to be an asset to corporations by meeting the needs of executives for flexibility in scheduling, speed, and privacy. In response to these types of needs, AC 150/5325-4B recommends that "GA

Draft 05MP03-3C-10/21/05

ALL WEATHER WIND COVERAGE

Runways	10.5 Knots	13 Knots	16 Knots	20 Knots
4-22	83.08%	90.68%	96.84%	99.23%
13-31	89.45%	94.76%	98.36%	99.63%
17-35	95.38%	97.82%	99.34%	99.80%
4-22/13-31 Combined	97.01%	99.09%	99.80%	99.98%
4-22/17-35 Combined	97.09%	98.79%	99.59%	99.89%
13-31/17-35 Combined	98.24%	99.36%	99.84%	99.95%
All Combined	99.64%	99.89%	99.96%	99.99%

Magnetic Variance
05° 19' East (October 2005)
Annual Rate of Change
00° 07' West (October 2005)



SOURCE:
NOAA National Climatic Center
Asheville, North Carolina
Hutchinson Municipal Airport
Hutchinson, Kansas

OBSERVATIONS:
76,003 All Weather Observations
1995-2004

Hutchinson Municipal Airport

Exhibit 3C
WINDROSES

airports that receive regular use by large airplanes over 12,500 pounds, in addition to business jets, should provide a runway length comparable to non-GA airports." In 2004, business jets conducted over 1,000 operations at HUT. Therefore, these aircraft will be critical for determining the future critical runway length for HUT.

Step 2. ***Identify the airplanes that will require the longest runway length at maximum certificated takeoff weight (MTOW).*** When the MTOW of the critical design airplane for runway length is 60,000 pounds or less, runway length requirements are determined according to a "family grouping of airplanes" having similar performance characteristics and operating weights. For HUT, nearly all business jet operations were conducted by aircraft weighing less than 60,000 pounds. Therefore, the runway length requirements for the family of general aviation business jets weighing less than 60,000 pounds are critical for critical for determining runway length for HUT.

Step 3. ***Determine methodology for establishing the recommended runway length.*** Having established in Steps 1 and 2 that business jets weighing less than 60,000 pounds are critical for determining the length requirements for Runway 13-31, the appropriate methodology from AC 150/5325-4B must be applied to determine runway length needs. The design procedure in AC 150/5325-4B requires the following information: airport elevation above mean sea level (MSL), mean daily maximum temperature of the hottest month, and the critical design aircraft under evaluation and their useful load. Hutchinson Municipal Airport is situated at 1,543 feet MSL, and the mean daily maximum temperature of the hottest month is 93 degrees and this occurs in July.

AC 150/5325-4B stipulates that the critical design aircraft actually be a grouping of airplanes with similar operating characteristics. The AC provides two separate "family grouping of airplanes" each based upon their representative percentage of aircraft in the national fleet. **Table 3E** compares a 12-month count (September 2004 - September 2005) of business jet operations at Hutchinson Municipal Airport to the two separate "family grouping of airplanes" stipulated by AC 150/5325-4B. As shown in the table, aircraft within the grouping of "Airplanes that Make Up 75 Percent of the Fleet" conduct more than 500 annual operations at the airport. Therefore, this "family grouping of airplanes" meets the substantial use threshold of more than 500 annual operations. The critical runway length for this "family grouping of airplanes" is used to determine the future critical runway length for HUT.

Having established the critical "family grouping of airplanes," the useful load must be determined. Useful load consists of the fuel, passengers, baggage, and cargo that can be carried. The useful load is reduced at airports where there is not sufficient runway length for departure and landing operations. During the warmest summer months, aircraft operators may have to reduce fuel or passenger loading

TABLE 3E
12-Month Business Jet Aircraft Operations
Critical Design Family Grouping of Airplanes
Hutchinson Municipal Airport

Aircraft Make	Aircraft Model	12-Month Operational Count
Airplanes that Make Up 75 Percent of the Fleet		
Aerospatiale	Sn-601 Corvette	0
BAe	125-700	0
Beech Jet	400A	44
Beech Jet	Premier I	0
Bombardier	Challenger 200	0
Cessna	500 Citation/501 Citation Special	16
Cessna	Citation I/II/III	28
Cessna	525A II (CJ-2)/525B	18
Cessna	550 Citation Bravo	52
Cessna	550 Citation II	0
Cessna	551 Citation II/Special	6
Cessna	552 Citation	0
Cessna	560 Citation Encore	78
Cessna	560/560 XL Citation Excel	18
Cessna	560 Citation V Ultra	0
Cessna	650 Citation VII	28
Cessna	680 Citation Sovereign	10
Dassault	Falcon 10	96
Dassault	Falcon 20	2
Dassault	Falcon 50/50 EX	48
Dassault	Falcon 900/900B	0
IAI	Jet Commander 1121	0
IAI	Westwind 1123/1124	8
Learjet	20 Series	10
Learjet	31/31A/31A ER	2
Learjet	35/35A/36/36A	278
Learjet	40/45	34
Mitsubishi	Mu-300 Diamond	16
Raytheon	390 Premier	6
Raytheon/Hawker	400/400XP	0
Raytheon/Hawker	600	0
Sabreliner	40/60	0
Sabreliner	75A	0
Sabreliner	80	0
Sabreliner	T-39	0
Subtotal Operations		**798**

Source: AirportIQ based on flight plan data.

TABLE 3E (Continued) 12-Month Business Jet Aircraft Operations Critical Design Family Grouping of Airplanes Hutchinson Municipal Airport		
Aircraft Make	**Aircraft Model**	**12-Month Operational Count**
Airplanes that Make Up 100 Percent of the Fleet		
BAe	Corporate 800/1000	6
Bombardier	Challenger 600	20
Bombardier	Challenger 604	0
Bombardier	BD-100 Continental	0
Cessna	S550 Citation S/II	0
Cessna	650 Citation III/IV	22
Cessna	750 Citation X	12
Dassault	Falcon 900C/900EX	0
Dassault	Falcon 2000/2000EX	0
IAI	Astra 1125	0
IAI	Galaxy 1126	2
Learjet	45XR	6
Learjet	55/55B/55C	20
Learjet	60	20
Raytheon/Hawker	Horizon	0
Raytheon/Hawker	800/800XP	12
Raytheon/Hawker	1000	0
Sabreliner	65/75	18
Subtotal Operations		138
Business Jets over 60,000 pounds		
Gulfstream	II	56
Gulfstream	III	0
Gulfstream	IV	8
Gulfstream	V	4
Embrier (ERJ)	135	4
Subtotal Operations		**72**
Total ALL Operations		**1,008**
Source: AirportIQ based on flight plan data.		

to ensure that they can depart on the available runway length. This increases operator costs as they must stop enroute to their final destination to take on the additional fuel needed. A review of departure destinations from aircraft filing instrument flight plans confirms that many of the current users at HUT currently conduct long non-stop trips from the airport. This requires maximizing useful load. Non-stop destinations on the east and west coasts are not uncommon for aircraft operating from HUT. This capability is currently provided by the primary runway length at HUT. Consistent with the use of the airport now, and to ensure that operators can reach their intended destinations in the future, just the same as they are now, without reducing fuel and/or passenger loading, runway length requirements for Hutchinson Municipal Airport are determined

assuming aircraft are loaded to 90 percent useful load.

Step 4. ***Determine the recommended runway length.*** Using the information determined in Step 3 above, the recommended critical runway length for HUT per AC 150/5325-4B is 6,900 feet.

Step 5. ***Apply any necessary adjustments to the runway length obtained in Step 4 to determine the final runway length.*** As the primary runway, Runway 13-31 should provide the necessary runway length for the critical design aircraft at HUT. The 6,900 feet of length determined in Step 4 is based on zero effective runway gradient. Effective runway gradient is defined as the difference between the highest and lowest elevations of the runway centerline divided by the runway length. AC 150/5325-4 stipulates that the 6,900 feet of runway length be increased to account for effective runway gradient. At Hutchinson Municipal Airport, the Runway 13 end is located at 1,525 feet MSL, while the Runway 31 end is located at 1514.8 feet MSL. This is a difference of 10.2 feet, or an effective runway gradient of 0.99 percent. AC 150/5325-4B states that the runway length be increased at a rate of 10 feet for each foot of elevation difference between runway ends. The 10.2-foot difference in elevation along Runway 13-31 results in a 102-foot increase in runway length requirements, or a new total length of 7,002 feet. At 7,004 feet, Runway 13-31 fully meets this design requirement. No additional runway length is needed for the primary runway at HUT.

Crosswind Runway Lengths

The determination of the length of a crosswind runway must consider its role, the type of aircraft regularly using the runway, and wind coverage requirements. Based upon the wind coverage analysis discussed above, an additional runway orientation is needed at HUT to meet wind coverage requirements for the crosswind components of 10.5 and 13.0 knots. Aircraft included in these crosswind components include a wide variety of general aviation aircraft from single and multi-engine piston-powered aircraft to turboprops and some light turbojet aircraft under 12,500 pounds. Using AC 150/5325-4B, the appropriate runway length for this category of aircraft is 4,300 feet. At 4,252 feet, Runway 17-35 is 48 feet short of this runway length requirement.

In many cases, the role of the crosswind runway is not only to meet wind coverage requirements, but also serve as a back-up runway when the primary runway is closed for maintenance or other reasons. Runway 4-22 serves as the back-up runway for Runway 13-31. In a back-up role, the crosswind runway should be able to safely accommodate the critical design aircraft for landings, but may not need to provide the full useful load capabilities provided by the primary runway. This is the case at HUT where Runway 4-22 is shorter than Runway 13-31 and, therefore, cannot provide the same loading capabilities for departure. For a back-up runway, runway length requirements for 60 percent useful loading have been determined using AC

150/5325-4B. For 75 percent of the fleet of aircraft over 12,500 pounds at 60 percent useful load, AC 150/5325-4B recommends a runway length of 5,500 feet. At 6,000 feet, Runway 4-22 exceeds this runway length requirement.

Runway Width

Runway 13-31 is 100 feet wide and constructed of asphalt. FAA design standards call for a runway width of 100 feet for ARC C-II and ARC C-III. Both Runway 13-31 and Runway 4-22 are 100 feet wide, meeting this design requirement. For ARC B-II, FAA design standards specify a width of 75 feet. Runway 17-35 is 75 feet wide, meeting this design requirement.

Runway Strength

The FAA pavement strength rating for Runway 13-31 is 42,000 pounds single wheel loading (SWL). As previously mentioned, SWL refers to the aircraft weight based upon the landing gear configuration with a single wheel on the landing strut. The strength rating for dual wheel configurations (DWL) is 52,000 pounds. For dual-tandem wheel aircraft, the runway is strength-rated at 76,000 pounds.

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

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

The strength rating of a runway can change over time. Regular usage by heavier aircraft can decrease the strength rating, while periodic runway resurfacing can increase the strength rating. The current strength ratings of the runways are adequate to serve the critical aircraft in ARC C-II as well as occasional operations by larger aircraft.

Runway/Taxiway Separation

FAA Advisory Circular 150/5300-13, *Airport Design*, Change 9, also discusses separation distances between a taxiway centerline and various areas on the airport. The separation distances are a function of the approaches approved for the airport and the critical design aircraft. For Runway 13-31 with an ARC C-III and CAT I instrument

approach (visibility of one-half-mile, 200-foot cloud ceiling), a parallel taxiway should be at least 400 feet from the runway centerline. The edge of aircraft parking areas should be at least 500 feet from the runway centerline. These standard dimensions are also the same for ADG II and ADG IV. Taxiway A, the parallel taxiway to Runway 13-31, is located 585 feet from the Runway 13-31 centerline south of Runway 17-35 and 589 feet north of Runway 17-35.

For Runway 4-22 with an ARC of C-II and approach visibility minimums of one mile or more, the parallel taxiway can be located 300 feet from the runway centerline. Taxiway C has a uniform 750-foot separation from the Runway 4-22 centerline, exceeding this minimum design requirement.

For ARC B-II, FAA design standards require a runway-to-taxiway centerline separation distance of 240 feet. Taxiway B, which parallels Runway 17-35, does not provide a uniform separation. South of Taxiway A, the separation is 675 feet, while north of Taxiway A, the separation is 475 feet, exceeding this design requirement.

TAXIWAYS

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

As discussed in Chapter One - Inventory, there are two identified 'Hot Spots' on the airfield involving the taxiways. The first 'Hot Spot' is located where Taxiway C intersects Taxiway A. The hold lines for aircraft taxiing southwest on Taxiway C, approaching Runway 17-35, are located prior to Taxiway A. As hold lines are typically associated with runways, it is not uncommon for pilots to be confused by this non-standard hold line location. This is the same situation for aircraft taxiing northwest on Taxiway A prior to reaching Runway 17-35 and Taxiway C.

The second 'Hot Spot' is located on Taxiway B between Runways 4-22 and 17-35. This portion of Taxiway B is very short, resulting in overlapping hold lines. It is not uncommon for pilots to naturally position their aircraft to hold at the second hold line. When this happens, the aircraft has already passed their designated hold position and have created an aircraft incursion into the runway safety area. Solutions to both of these 'Hot Spots' will be presented as part of the airfield development alternatives.

To improve runway occupancy times and allow aircraft to exit the runway quicker after landing on Runway 4-22, consideration should be given to providing an additional exit taxiway between Runway 13-31 and the Runway 22 end. No additional exit taxiways are needed at the airport.

Recommended taxiway width is determined by the Airplane Design Group (ADG) of the most demanding aircraft to use the taxiway. For

Taxiway A, ADG III requires a 50-foot wide taxiway. Taxiway A is presently 50 feet wide meeting this design requirement. For Taxiways B, C, and E, ADG II requires a taxiway width of 35 feet. Taxiways B and E are presently 35 feet wide, meeting this design requirement. Taxiway C is 75 feet wide. Consideration should be given to reducing Taxiway C to 35 feet.

A taxiway object free area (TOFA) applies to taxiways and taxilanes. The width of the TOFA is dependent on the wingspan of critical aircraft. For ADG II aircraft, the TOFA is 131 feet wide, 65.5 feet on either side of centerline. For ADG III, the TOFA is 186 feet wide, 93 feet on either side of the taxiway centerline. The separation distance between the taxiway/taxilane and any fixed or movable object is half of the TOFA. The taxiway shoulder width requirements are 10 feet for Group II aircraft and 20 feet for Group III. The shoulders need to be traversable by vehicles and aircraft, should they veer off the taxiway. Often, a smooth grass surface is provided. The shoulders for Taxiway A are paved. Taxiway design standards are presented in **Table 3F**.

TABLE 3F
Taxiway Design Standards
Hutchinson Municipal Airport

	Airplane Design Group	
	Group II (49' to 79' wingspan)	Group III (79' to 118' wingspan)
Taxiway Width (ft.)	35	50
Shoulder Width (ft.)	10	20
Object Free Area (ft.)		
Taxiway OFA	131	186
Taxilane OFA	115	162
Separation Distances (ft.)		
Taxiway Centerline to Object	65.5	93
Taxilane Centerline to Object	57.5	81

Source: FAA AC 150/5300-13, Airport Design, Change 9

NAVIGATIONAL AND APPROACH AIDS

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

Navigational aids provide two primary services to airport operations: precision guidance to specific runway and/or non-precision guidance to a runway or the airport itself. The basic difference between a precision and non-precision navigational aid is that the former provides electronic descent, alignment (course), and position guidance, while the non-precision navigational aid provides only alignment and position location information; no elevation information is given. The necessity of such equipment is usually determined by design standards predicated on safety considerations and operational

needs. The type, purpose, and volume of aviation activity expected at the airport are factors in the determination of the airport's eligibility for navigational aids.

Global Positioning System

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

The Global Positioning System (GPS) uses three or more satellites to derive an aircraft's location by a triangulation method. The accuracy of these systems has been remarkable, with initial error of only a few meters. As the technology improves, it is anticipated that GPS may be able to provide accurate-enough position information to allow category II and III precision approaches, independent of any existing ground-based navigational facilities. In addition to the navigational benefits, it has been estimated that GPS equipment will be much less costly than existing precision approach landing systems.

Instrument Approaches

Instrument approach procedures (IAP) are a series of predetermined maneuvers established by the FAA, using electronic navigational aids that assist pilots in locating and landing at an airport during low visibility and cloud ceiling conditions. At Hutchinson Municipal Airport, there are nine published instrument approach procedures. The approaches are approved for use by aircraft with approach speeds in approach categories A, B, and C. None of the airports' approaches are approved for approach category D aircraft.

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

As previously discussed in Chapter One, the lowest visibility minimum available is a CAT I ILS approach to Runway 13. A GPS approach with one-half-mile visibility minimums is also available to Runway 13 for smaller aircraft. Runway 31 supports both GPS and NDB-Backcourse approaches with one mile visibility minimums. The lowest approach available for Runway 4-22 is one mile while Runway 17-35 has no instrument approach.

Under the current airfield configuration, these approaches meet the needs of airport users. With the presentation of airfield development alternatives, additional approaches may be necessary and will be presented.

Visual Approach Aids

Runway 13 provides a medium intensity approach lighting system with runway alignment indicator lights (MALSR). The MALSR is a sophisticated approach lighting system that provides the basic means to transition from instrument flight to visual flight for landing. The existing MALSR is required for the CAT I ILS approach and should be maintained through the planning period.

To provide pilots with visual glideslope and descent information, visual approach slope indicators (VASIs) or precision approach path indicators (PAPIs) are commonly found to the side of the runway. These systems can consist of either a two- or four-box unit. Four-box PAPIs are recommended for runways, utilized by business jet aircraft.

Runway 31 is served by a four-box VASI on the left of the runway. As this is the primary runway utilized by business jet aircraft, consideration should be given to upgrading to the four-box PAPI system. A four-box PAPI system should be considered for Runway 13 to accommodate those aircraft that approach this runway visually. Both ends of Runway 4-22 are served by four-box VASIs. Currently, this runway provides crosswind coverage for the critical aircraft and, as such, consideration should be given to upgrading to the four-box PAPI.. Runway 17-35 is served by four-box PAPIs on both ends of the runway. The existing PAPIs are sufficient and should be maintained through the planning period.

Runway end identification lighting (REILs) provide rapid and positive identification of the approach end of the runway. The REIL system consists of two synchronized flashing lights, located laterally on each side of the runway threshold facing the approaching aircraft. REILs are located on both ends of Runway 4-22. REILs should be located at each runway end not served by a more sophisticated approach lighting system.

The airport beacon provides positive airport location information to pilots at night. The existing airport beacon should be maintained through the planning period

Weather Reporting Aids

Hutchinson Municipal Airport has one lighted wind cone and a segmented circle. The lighted wind cone provides information to pilots regarding wind conditions, such as direction and intensity. The segmented circle consists of a system of visual indicators designed to provide traffic pattern information to pilots. A wind cone and segmented circle are required since the airport traffic control tower (ATCT) is not open 24 hours-a-day. These should be maintained through the planning period. Title 14 CFR Part 139 further

requires lighted supplemental wind cones at each end of Runway 13-31. The existing supplemental wind cones are sufficient and should be maintained through the planning period.

Hutchinson Municipal Airport is equipped with an Automated Surface Observing System (ASOS). An ASOS will automatically record weather conditions such as temperature, dew point, wind speed, altimeter setting, visibility, sky condition, and precipitation. The ASOS updates observations every minute, 24 hours-a-day, and this information is available to pilots in the airport vicinity via FAA VHF ground-to-air radio or telephone.

The airport also provides a Stand Alone Weather Sensor (SAWS) that serves as a backup to the ASOS. The SAWS sensor will automatically collect, process, and broadcast weather data to airport traffic controllers, including wind speed, wind direction, wind gusts, altimeter setting, temperature, and dew point.

Hutchinson Municipal Airport is equipped with an Automated Terminal Information Service (ATIS). ATIS broadcasts are used by airports to notify arriving and departing pilots of the current surface weather conditions, communication frequencies, and other important airport specific information.

Hutchinson Municipal Airport maintains a Limited Aviation Weather Reporting Station (LAWRS) observer during the hours of airport traffic control tower (ATCT) operation (7:00 a.m. - 11:00 p.m.). ATCT personnel document weather observations at regular intervals and provide reports to the National Weather Service. This function serves as a backup to the ASOS.

Each of these systems provides a critical resource for pilots navigating to and from Hutchinson Municipal Airport. They should be maintained up to current standards.

AIRFIELD LIGHTING AND MARKING

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

Runway and Taxiway Lighting

Runway identification lighting provides the pilot with a rapid and positive identification of the runway and its alignment. Runway 13-31 is equipped with high intensity runway lighting (HIRL). Runways with an ILS should have this type of runway lighting. Runways 4-22 and 17-35 are served by medium intensity runway lighting (MIRL). Each of these systems should be maintained.

Medium intensity taxiway lighting (MITL) is provided on all taxiways except Taxiway C which provides reflective can lighting. Without consideration of other airfield issues, the can reflectors on Taxiway C should be upgraded to MITL.

Pavement Markings

Runway markings are designed according to the type of instrument approach available on the runway. FAA AC 150/5340-1F, *Marking of Paved Areas on Airports*, provides guidance necessary to design an airport's markings. Runway 13 provides precision instrument markings, while Runway 31 provides non-precision instrument markings. Runway 4-22 provides non-precision markings and Runway 17-35 provides basic markings. These markings should be properly maintained through the planning period.

Helipad

Hutchinson Municipal Airport does not have a transient helipad. Transient helicopters must operate in the same area as fixed-wing aircraft. Parking areas for helicopters and aircraft are typically segregated to the extent practicable to avoid the effects of helicopter rotor wash on fixed-wing aircraft.

Facility planning should include establishing a designated transient helipad along the terminal flight-line near the transient apron. Ultimate planning should include appropriate lighting to allow for operations at night and during poor visibility conditions.

LANDSIDE REQUIREMENTS

Landside facilities are those necessary for the handling of aircraft and passengers while on the ground. These facilities provide the essential interface between the air and ground transportation modes. The capacity of the various components of each area was examined in relation to projected demand to identify future landside facility needs. This includes components for general aviation needs such as:

- Aircraft Hangars
- Aircraft Parking Aprons
- General Aviation Terminal
- Auto Parking and Access
- Airport Support Facilities

HANGARS

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

The demand for aircraft storage hangars is dependent upon the number and type of aircraft expected to be based at the airport in the future. For planning purposes, it is necessary to estimate hangar requirements based upon forecast operational activity. However, hangar development should be based upon actual demand trends and financial investment conditions.

While a majority of aircraft owners prefer enclosed aircraft storage, a number of based aircraft will still tie-

down outside (due to the lack of hangar availability, hangar rental rates, and/or operational needs). Therefore, enclosed hangar facilities do not necessarily need to be planned for each based aircraft. At Hutchinson Municipal Airport, all based aircraft are currently stored in hangars. The primary reason for this is the availability of both T-hangars and bulk storage in conventional hangars.

Hutchinson Municipal Airport offers eight T-hangar spaces. T-hangars are individual spaces within a larger structure. For T-hangars, a planning standard of 1,200 square feet per based aircraft will be used to determine future space requirements.

Conventional and executive hangars are open-space facilities with no supporting structure interference. There is a total of 57,900 square feet of conventional/ executive hangar storage space. In addition, there are 7,342 square feet of space within the hangars dedicated to management and office needs. Conventional hangars are also used for maintenance activity; this activity limits the available space for aircraft storage. A planning standard of 175 square feet per based aircraft is considered for maintenance activities.

Table 3G provides a summary of the aircraft storage needs through the planning period.

TABLE 3G
Aircraft Storage Hangar Requirements
Hutchinson Municipal Airport

		Future Requirements		
	Available	**Short Term**	**Intermediate Term**	**Long Term**
Total Based Aircraft	41	47	53	65
Aircraft to be Hangared	41	46	51	63
T-Hangar Positions	8	12	15	25
Conventional Hangars	33	35	36	38
Hangar Area Requirements				
T-hangar	11,330	14,400	17,800	30,400
Conventional Hangars	57,900	86,400	89,400	95,100
Maintenance/Office	7,342	8,200	9,300	11,400
Total Hangar Area (s.f.)	**76,572**	**109,000**	**116,500**	**136,900**

Additional aircraft storage space is necessary to address forecast demand during each period of the analysis. In the short term, 28,500 square feet of conventional/executive hangar space is needed and 3,000 square feet of T-hangar space is needed. Through the long term planning period, more than 60,000 square feet of combined storage/maintenance/office space is needed.

AIRCRAFT PARKING APRON

A parking apron should provide space for the number of locally-based aircraft that are not stored in hangars, transient aircraft, and for maintenance activity. As discussed in the previous section, there are no formal aircraft tie-down arrangements but it is an option that should be made available for owners who may prefer an outside tie-

down. For local tie-down needs, an additional five spaces are identified for maintenance activity. Maintenance activity would include the movement of aircraft into and out of hangar facilities and temporary storage of aircraft on the ramp. A planning criterion of 650 square yards per aircraft was used to determine the apron requirements for local aircraft.

FAA Advisory Circular 150/5300-13, *Airport Design*, Change 9, suggests a methodology by which transient apron requirements can be determined from knowledge of busy-day operations. At Hutchinson Municipal Airport, the number of itinerant spaces required was determined to be approximately 18 percent of the busy-day itinerant operations. A planning criterion of 800 square yards per aircraft was applied to determine future transient apron requirements for single and multi-engine aircraft. For business jets (which can be much larger), a planning criterion of 1,600 square yards per aircraft position was used. For planning purposes, 85 percent of these spaces are assumed to be utilized by non-jet aircraft, which is in line with national trends.

Total apron parking requirements are presented in **Table 3H**. Currently, apron area at the airport totals approximately 19,400 square yards, with approximately 30 total tie-down positions. As shown in the table, there will likely be a need for more apron space throughout the planning period. As itinerant operations increase, especially by turbine aircraft, consideration should be given to constructing more apron space.

TABLE 3H
Aircraft Parking Apron Requirements
Hutchinson Municipal Airport

	Available	Short Term	Intermediate Term	Long Term
Single, Multi-engine Transient Aircraft				
Positions	26	29	31	35
Apron Area (s.y.)	17,333	23,000	24,800	28,300
Transient Business Jet Positions	4	3	4	5
Apron Area (s.y.)	2,067	5,100	5,600	8,000
Locally-Based Aircraft Positions	0	6	7	7
Apron Area (s.y.)	0	3,900	4,600	4,600
Total Positions	**30**	**38**	**42**	**47**
Total Apron Area (s.y.)	**19,400**	**32,000**	**35,000**	**40,900**

GENERAL AVIATION TERMINAL FACILITIES

General aviation terminal facilities have several functions. Space is required for a pilots' lounge, flight planning, concessions, management, storage, and various other needs. This space is not necessarily limited to a single, separate terminal building, but can include space offered by fixed base operators (FBOs) for these functions and services.

The methodology used in estimating general aviation terminal facility needs is based on the number of airport users expected to utilize general aviation facilities during the design hour. General aviation space requirements were then based upon providing 120 square feet per design hour itinerant passenger. Design hour itinerant passengers are determined by multiplying design hour itinerant operations by the number of passengers on the aircraft (multiplier). An increasing passenger count (from 1.9 to 2.2) is used to account for the likely increase in the number of passengers utilizing general aviation services. **Table 3J** outlines the general aviation terminal facility space requirements for Hutchinson Municipal Airport.

TABLE 3J
General Aviation Terminal Area Facilities
Hutchinson Municipal Airport

	Available	Short Term	Intermediate Term	Long Term
Design Hour Operations	48	52	57	67
Design Hour Itinerant Operations	23	25	27	31
Multiplier	1.8	1.9	2	2.2
Total Design Hour Itinerant Passengers	41	47	55	68
General Aviation Building Spaces (s.f.)	9,600	4,300	4,900	6,100

As presented in the table, the existing public spaces appear adequate through the intermediate term of the plan. By the long term, there may be a need for additional space. This space can be provided by the FBOs dedicating more space for terminal services.

An additional consideration for terminal space is the anticipated emergence of a new class of aircraft. A number of aircraft manufacturers are producing low cost microjets. The microjets typically have a capacity of up to six passengers. New companies, such as Pogo, Inc., are positioning themselves to utilize the microjets, for on-demand air taxi services. The air taxi businesses are banking on a desire by business travelers to avoid delays at major commercial service airports by taking advantage of the nationwide network of general aviation airports such as Hutchinson Municipal Airport.

General aviation airports with appropriate terminal building services are better positioned to meet the needs of this new class of business traveler. The current terminal building serving Hutchinson Municipal Airport should be adequate to meet these needs.

SUPPORT REQUIREMENTS

Various facilities that do not logically fall within classifications of airside or landside facilities have also been identified. These other areas provide certain functions related to the overall operation of the airport and include:

- Automobile Parking
- Fuel Storage
- Aircraft Rescue and Firefighting
- Snow Removal
- Utilities
- Wash Rack
- Perimeter Fencing.

AUTOMOBILE PARKING

General aviation vehicular parking demands have been determined for Hutchinson Municipal Airport. Space determinations were based on an evaluation of existing airport use, as well as industry standards. Terminal automobile parking spaces required to meet general aviation itinerant demands were calculated by taking the design hour itinerant passengers and using a multiplier of 1.9, 2.0, and 2.2 for each planning period. This multiplier represents the anticipated increase in corporate operations and, thus, passengers. It is projected that there will be a need for more terminal vehicle parking by the long term of the plan.

The parking requirements of based aircraft owners should also be considered. Although some owners prefer to park their vehicles in their hangars, safety can be compromised when automobile and aircraft movements are intermixed. For this reason, separate parking requirements, which consider one-half of based aircraft at the airport, were applied to general aviation automobile parking space requirements. Parking requirements for the airport are summarized in **Table 3K**.

TABLE 3K
Vehicle Parking Requirements
Hutchinson Municipal Airport

		Future Requirements		
	Available	**Short Term**	**Intermediate Term**	**Long Term**
Design Hour Itinerant Passengers	42	47	55	67
Terminal Vehicle Spaces	115	85	99	121
Parking Area (s.f.)	41,000	34,100	39,400	48,500
General Aviation Spaces	96	24	27	33
Parking Area (s.f.)	31,000	9,400	10,600	13,200
Total Parking Spaces	**211**	**109**	**125**	**154**
Total Parking Area (s.f.)	**72,000**	**43,500**	**50,000**	**61,700**

Throughout the planning period, additional dedicated parking spaces are forecast to be needed. Currently, most airport users travel across landside pavements in order to reach their place of business or hangar. Future planning will develop more dedicated parking areas, with the goal of limiting the potential interaction of aircraft and vehicles. Locating parking in convenient areas is critical for a general aviation airport. If a parking area is not conveniently located, then airport users will continue to drive on aircraft surfaces.

FUEL STORAGE

The primary fuel farm is located underground, 50 feet to the south of the southernmost aircraft hangar. This facility has a 10,000-gallon Avgas storage tank and a 20,000-gallon Jet A tank. The fuel farm is owned and operated by Wells Aviation. Wells Aviation also maintains two Jet A fuel trucks, both with 2,200-gallon capacity and two Avgas trucks; one with a 1,200-gallon capacity and the other with a 1,000-gallon capacity. Mead Aircraft Services also owns and maintains a 10,000- gallon underground Avgas fuel tank.

Fuel storage requirements are typically based upon maintaining a two-week supply of fuel during an average month. However, more frequent deliveries can reduce the fuel storage capacity requirement. Generally, fuel tanks should be of adequate capacity to accept a full refueling tanker, which is approximately 8,000 gallons, while maintaining a reasonable level of fuel in the storage tank. For Avgas, there is a total of 22,200 storage gallons available and for Jet A, there are 24,400 gallons of storage available.

Growth in operations and based aircraft will not significantly impact fuel storage requirements. With the existing storage mix, the airport will be able to maintain a two-week supply of both Avgas and Jet A fuel.

AIRCRAFT RESCUE AND FIREFIGHTING (ARFF)

There are no ARFF facilities located directly on the Hutchinson Municipal Airport site. The City of Hutchinson Fire Department provides rescue and firefighting service as needed. Fire Station No. 4, located approximately one mile west of the airport, is the entity responsible for rapid response. The airport provides emergency vehicle access gates so that all airport property can be accessed by these emergency vehicles.

As a Class IV certificated airport under 14 CFR Part 139, HUT is required to have the necessary equipment to meet Index A requirements listed in 139.317, *Aircraft Rescue and Firefighting: Equipment and Agents*. Index A requires at least one vehicle carrying at least 500 pounds of sodium-based dry chemical, halon 1211, or clean agent; or 450 pounds of potassium-based dry chemical and water with a commensurate quantity of Aqueous Film Forming Foam (AFFF) to total 100 gallons for simultaneous dry chemical and AFFF application. Existing vehicles maintained at Station No. 4 meet or exceed this requirement. No additional equipment is needed to meet ARFF requirements.

An on-airport facility to house firefighting vehicles and personnel is not required at HUT. 14 CFR Part

139.319(a), *Aircraft Rescue and Firefighting: Operational Requirements*, requires this capability to be on the airport only during an air carrier operation. Many corporate flight departments are requesting ARFF services at the airports they utilize. The arrangement with the City fire department allows these flight departments to utilize the airport.

SNOW REMOVAL

No snow removal equipment is maintained on the airport site. During periods of snowfall, the airport must be closed until city maintenance crews complete the clearing of vehicle access roads. With this arrangement, the clearing of the runways is considered secondary to the clearing of roads.

FAA AC 150/5220-20, *Airport Snow and Ice Control Equipment*, and AC 150/3200-30A, *Airport Winter Safety and Operations*, provides guidance in determining the type of equipment needed for snow removal operations at HUT. According to the recommendations in AC 150/5200-30A, HUT should have sufficient equipment to clear one inch of snow weighing up to 25 pounds per cubic foot from the primary instrument runway, principal taxiways to the ramp area, and sufficient ramp area to accommodate anticipated aircraft operations. Based upon the number of annual operations at HUT, this should be accomplished within two hours.

The minimum area required for HUT to clear includes Runway 13-31, Taxiway A, Taxiways B and E, and the main terminal apron. Adherence to these requirements constitutes approximately 1.3 million square feet of pavement to be cleared. This translates into a requirement to clear 1,002 tons of snow per hour.

FAA AC 150/5220-20 recommends that airports such as HUT, which have over 10,000 operations and at least 15 inches (.38 m) of snow annually, should have a minimum of one high-speed rotary plow supported by two displacement plows of equal capacity. For HUT, this equates to one snow blower with the capacity to move 1,002 tons per hour and two displacement plows totaling 24.5 feet in length.

WASH RACK

The airport does not currently maintain an aircraft wash rack. The availability of an airport wash rack allows for containment of aircraft cleaning materials. Development alternatives will examine the possible location of an aircraft wash rack.

UTILITIES

Electrical, water, and sanitary sewer services are available at the airport. Electrical service is provided by Westar Energy. Water and sewer services are provided by the City of Hutchinson. Natural gas is available through local distributors and SBC provides telephone service and data connections. No utility deficiencies have been identified; therefore, it is expected that

there is sufficient availability of utilities to support any new or expanded facilities.

PERIMETER FENCING/GATES

Hutchinson Municipal Airport is currently surrounded by standard eight-foot chainlink fencing. There are two gated access points to the airfield. The first is located to the north of the terminal building. This gate is constructed as to allow emergency vehicles to rapidly respond to the airfield with minimal damage to vehicles, should time be of the essence. A second gate is located to the south of the terminal building. Both of the entrance gates are equipped with a key pad which allows entrance to the airfield when the authorized code is entered.

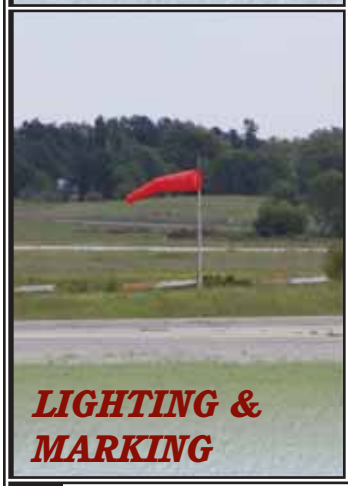
Airport fencing and restricted access gating provides an additional level of safety beyond what the FAA requires for general aviation airports. With Hutchinson Municipal Airport being located on the urban edge of the city, it is prudent to maintain the fencing. By limiting access to the airport from non-aviation related traffic and pedestrians, community safety and security is enhanced. This fencing is adequate and should be maintained through the planning period.

SUMMARY

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

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

05MP03-3E-6/15/06

	AVAILABLE	SHORT TERM	LONG TERM
RUNWAYS AND DESIGN STANDARDS	**Runway 13-31** 7,004' x 100' 42,000# SWL • 52,000# DWL ARC C-II **Runway 4-22** 6,000' x 100' 42,000# SWL • 50,000# DWL ARC C-II **Runway 17-35** 4,252' x 75' 42,000# SWL • 52,000# DWL ARC B-II	**Runway 13-31** Improve RSA and OFA behind Runway 31 end **Runway 4-22** Improve RSA and OFA behind Runway 4 end **Runway 17-35** Improve RSA and OFA behind Runway 35 end	**Runway 13-31** Address incompatible land uses in RPZ **Runway 4-22** Address incompatible land uses in RPZ **Runway 17-35** Same
TAXIWAYS	A - 50' wide B and E - 35' wide C - 80' wide A1, B1, B2, B3 - 50' wide	Alleviate "Hot Spot" isues	Conform to taxiway width standards
NAVIGATIONAL AIDS	ATCT, ASOS, SAWS, ATIS **Runway 13-31** VASI-4L (31), REIL (31) ILS (13), NDB (13), GPS LOC-BC (31) **Runway 4-22** VASI-4L, REIL VOR/DME (22), VOR (4) GPS **Runway 17-35** Visual Only	ATCT, ASOS, SAWS, ATIS **Runway 13-31** Add PAPI-4 Runway 13 Upgrade to PAPI-4 Runway 31 **Runway 4-22** Upgrade to PAPI-4 **Runway 17-35** Add GPS 1 mile Add REIL	**SAME** **Runway 13-31** Same **Runway 4-22** Same **Runway 17-35** Same
 ***LIGHTING & MARKING***	Rotating Beacon Lighted Wind Cone Segmented Circle Airfield Signage **Runway 13-31** HIRL, MITL Precision Marking MALSR (13) **Runway 4-22** MIRL, Taxiway C - reflectors Non-Presicion Marking **Runway 17-35** MIRL, MITL Basic Marking	**SAME** **Runway 13-31** Same **Runway 4-22** Add MITL Taxiway C **Runway 17-35** Same	**SAME** **Runway 13-31** Same **Runway 4-22** Same **Runway 17-35** Upgrade to nonprecision markings

KEY

ARC - Airport Reference Code
ASOS - Automated Surface Observation Station
ATCT - Airport Traffic Control Tower
ATIS - Automated Terminal Information Service
DME - Distance Measuring Equipment
DWL - Dual Wheel Landing Gear Aircraft
GPS - Global Positioning System
HIRL - High Intensity Runway Edge Lighting
MALSR - Medium Intensity Approach Lighting System with Runway Alignment Indicator Lights
MIRL - Medium Intensity Runway Edge Lighting
MITL - Medium Intensity Taxiway Edge Lighting
OFA - Object Free Area
PAPI - Precision Approach Path Indicator
REIL - Runway End Identifier Lighting
RPZ - Runway Protection Zone
RSA - Runway Safety Area
SAWS - Stand Alone Weather Sensor
SWL - Single Wheel Landing Gear Aircraft
VASI - Visual Approach Slope Indicator
VOR - Very High Frequency Omni-directional Range
( ) - Runway End Identifier

Exhibit 3D
AIRFIELD FACILITY REQUIREMENTS

05MP03-3E-10/4/05

AIRCRAFT STORAGE HANGARS

	Available	Short Term Need	Intermediate Need	Long Term Need
Aircraft to be hangared	41	46	51	63
T-hangar area (s.f.)	11,330	14,400	17,800	30,400
Conventional/Executive Hangar Area (s.f.)	57,900	86,400	89,400	95,100
Maintenance Area (s.f.)	7,342	8,200	9,300	11,400
Total Hangar area (s.f.)	**76,572**	**109,000**	**116,500**	**136,900**

AIRCRAFT PARKING APRON

	Available	Short Term Need	Intermediate Need	Long Term Need
Single, multi-engine aircraft positions	26	29	31	35
Apron area (s.y.)	17,333	23,000	24,800	28,300
Transient business jet positions	4	3	4	5
Apron area (s.y.)	2,067	5,100	5,600	8,000
Locally-based aircrft positions	0	6	7	7
Apron area (s.y.)	0	3,900	4,600	4,600
Total Positions	**30**	**38**	**42**	**47**
Total Apron Area (s.y.)	**19,400**	**32,000**	**35,000**	**40,900**

GENERAL AVIATION FACILITIES

	Available	Short Term Need	Intermediate Need	Long Term Need
Terminal building spaces (s.f.)	9,600	4,300	5,000	6,100
Total vehicle parking spaces	211	109	125	154
Total vehicle parking area (s.f.)	72,000	43,500	50,000	61,700

OTHER SERVICES

	Aircraft Wash Rack	Same	Same

Hutchinson Municipal Airport

Exhibit 3E

LANDSIDE FACILITY REQUIREMENTS

Chapter Four

ALTERNATIVES

In the previous chapter, airside and landside facilities required to satisfy the demand for the long range planning period were identified. The next step in the planning process is to evaluate reasonable ways these facilities can be provided. There can be countless combinations of design alternatives, but the alternatives presented are those with the greatest potential for implementation.

Any development proposed for a master plan is evolved from an analysis of projected needs for a set period of time. Though the needs were determined by the best methodology available, it cannot be assumed that future events will not change these needs. The master planning process attempts to develop a viable concept for meeting the needs caused by projected demands for the next twenty years. However, no plan of action should be developed which may be inconsistent with the future goals and objectives of the City of Hutchinson and its citizens, who have a vested interest in the development and operation of the airport.

The development alternatives for Hutchinson Municipal Airport (HUT) can be categorized into two functional areas: the **airside** (runways, navigational aids, taxiways, etc.) and **landside** (general aviation hangars, apron, and terminal area). Within each of these areas, specific facilities are required or desired. In addition, the utilization of the remaining airport property to provide revenue support for the airport and to benefit the economic development and well-being of the region must be considered.

Each functional area interrelates and affects the development potential of the others. Therefore, all areas must be examined individually, then coordinated as a whole to ensure the

final plan is functional, efficient, and cost-effective. The total impact of all these factors on the existing airport must be evaluated to determine if the investment in Hutchinson Municipal Airport will meet the needs of the community, both during and beyond the planning period.

The alternatives considered are compared using environmental, economic, and aviation factors to determine which of the alternatives will best fulfill the local aviation needs. With this information, as well as the input and direction from local government agencies and airport users, a final airport concept can evolve into a realistic development plan.

AIRSIDE PLANNING ISSUES

A number of airside deficiencies to Federal Aviation Administration (FAA) design standards have been identified in Chapter Three - Facility Requirements. This chapter will attempt to provide reasonable solutions to those deficiencies following FAA criteria. Airside alternatives to follow will attempt to provide both a short term and long term solution to airfield deficiencies, while allowing the airport to continue as a viable community economic development tool.

The focus of these alternatives is to address long term solutions to the following airside issues:

- Mitigate deficiencies in meeting runway safety area (RSA) design requirements beyond the Runway 4, 35, and 31 ends.
- Mitigate deficiencies in meeting object free area (OFA) for design requirements beyond the Runway 4, 35, and 31 ends.
- Hot Spot 1: Address the confusing nature of the intersection of Taxiways A and C prior to Runway 17-35.
- Hot Spot 2: Address the overlapping nature of the hold markings on Taxiway B between Runways 17-35 and 4-22.
- Analyze runway orientation as a function of wind coverage and determine the role of each runway.
- Identify any land acquisition needs based on meeting safety and efficiency standards.
- Review instrument approach procedure requirements in conjunction with airfield improvements.

Alternatives to each of these critical issues have the potential to affect the landside development possibilities for the airport. Therefore, once airside alternatives have been developed, analysis of their feasibility in conjunction with landside development and land use restrictions will be considered. **Exhibit 4A** outlines alternative issues to be considered in this analysis.

RUNWAY SAFETY AREA

The current approved Airport Layout Plan (ALP) for HUT dates from 1993.

05MP03-4A-3/3/06

AIRSIDE PLANNING CONSIDERATIONS

- Analyze deficiencies to Runway Safety Area.
- Analyze other safety area deficiencies including Object Free Area and Runway Protection Zones.
- Plan airfield to meet safety standards for a current critical aircraft in ARC C-II and a future critical aircraft in ARC C-III.
- Provide pavement layout solutions to FAA identified airfield "Hot Spots".
- Determine ideal runway orientation and the future role of each runway.
- Identify potential land acquisition.

LANDSIDE PLANNING CONSIDERATIONS

- Maximize available property for facility development.
- Develop additional aircraft storage capability.
- Plan appropriate landside facilities to aircraft in ADG III.

Hutchinson Municipal Airport

Exhibit 4A

AIRPORT DEVELOPMENT CONSIDERATIONS

The ALP is a computer aided drawing (CAD) of the airport in both its current state and in its proposed future condition. The ALP is approved by the FAA and must be current prior to any changes being made to the runway/taxiway system. An updated ALP drawing, based on the recommended development plan, will be provided as a part of this master plan.

The RSA is defined as "a defined surface surrounding the runway, prepared or suitable for reducing the risk of damage to airplanes in the event of an undershoot, overshoot, or excursion from the runway." The existing ALP makes no determination regarding safety area compliance, but it does provide the baseline condition at the airport. As previously presented in Table 3C, the RSAs beyond the Runway 4, 35, and 31 ends do not meet FAA standards. **Exhibit 4B** presents the baseline condition and highlights the runway safety area deficiencies.

OBJECT FREE AREA

The OFA is an imaginary surface surrounding the runway that is to be kept clear of any object rising above the lateral elevation of the RSA. Exceptions are made for navigational aids and other objects which must be located there by their function. The purpose of the OFA is to prevent an aircraft's wings from striking an object should that plane traverse the RSA.

The standard OFA for Runway 13-31 and Runway 4-22 is 800 feet wide (centered on the runway centerline) and extends 1,000 feet beyond each runway end. The OFA for Runway 17-35 is 500 feet wide and extends 300 feet beyond the runway end. Similar to the RSA, the OFA beyond the Runway 4, 35, and 31 ends is obstructed by perimeter fencing and 4th Avenue. The Runway 31 OFA is obstructed by the localizer antenna, associated electrical equipment vault, the perimeter fencing, and 4th Avenue.

RUNWAY PROTECTION ZONES

The runway protection zone (RPZ) is a trapezoidal surface which typically begins 200 feet from the runway threshold. The RPZ is a designated area beyond the runway end that the FAA encourages airports to gain or maintain positive control. The goal of the RPZ is to prevent incompatible land uses that encourage the congregation of people, such as houses or office buildings. By limiting these types of land uses for areas in the RPZ, safety for both pilots and those on the ground is increased. Unlike the RSA, the RPZ can have objects located in them provided the objects are not obstructions under 14 Code of Federal Regulations (CFR) Part 77, *Objects Affecting Navigable Airspace*, or FAA ORDER 8260.3B, *Terminal Instrument Procedures (TERPS)* or considered incompatible by Advisory Circular 150/5300-13, *Airport Design*. A number of residential homes are located within the Runway 13 RPZ. Two large commercial warehouses are located within the Runway 4 RPZ.

The FAA does not necessarily require the fee simple acquisition of the RPZ area, but highly recommends that the airport have positive control over development within the RPZ. Avigational easements (positive control of airspace within the RPZ, to the elevation of the approach slope) can be pursued if fee simple purchase is not possible. It should be noted, however, that avigation easements can often cost as much as 80 percent of the land value and may not fully prohibit incompatible land uses from the RPZ. Therefore, for planning purposes, all alternatives will assume fee simple acquisition of the RPZ where practicable, and acquisition of avigation easements otherwise.

RUNWAY ROLE

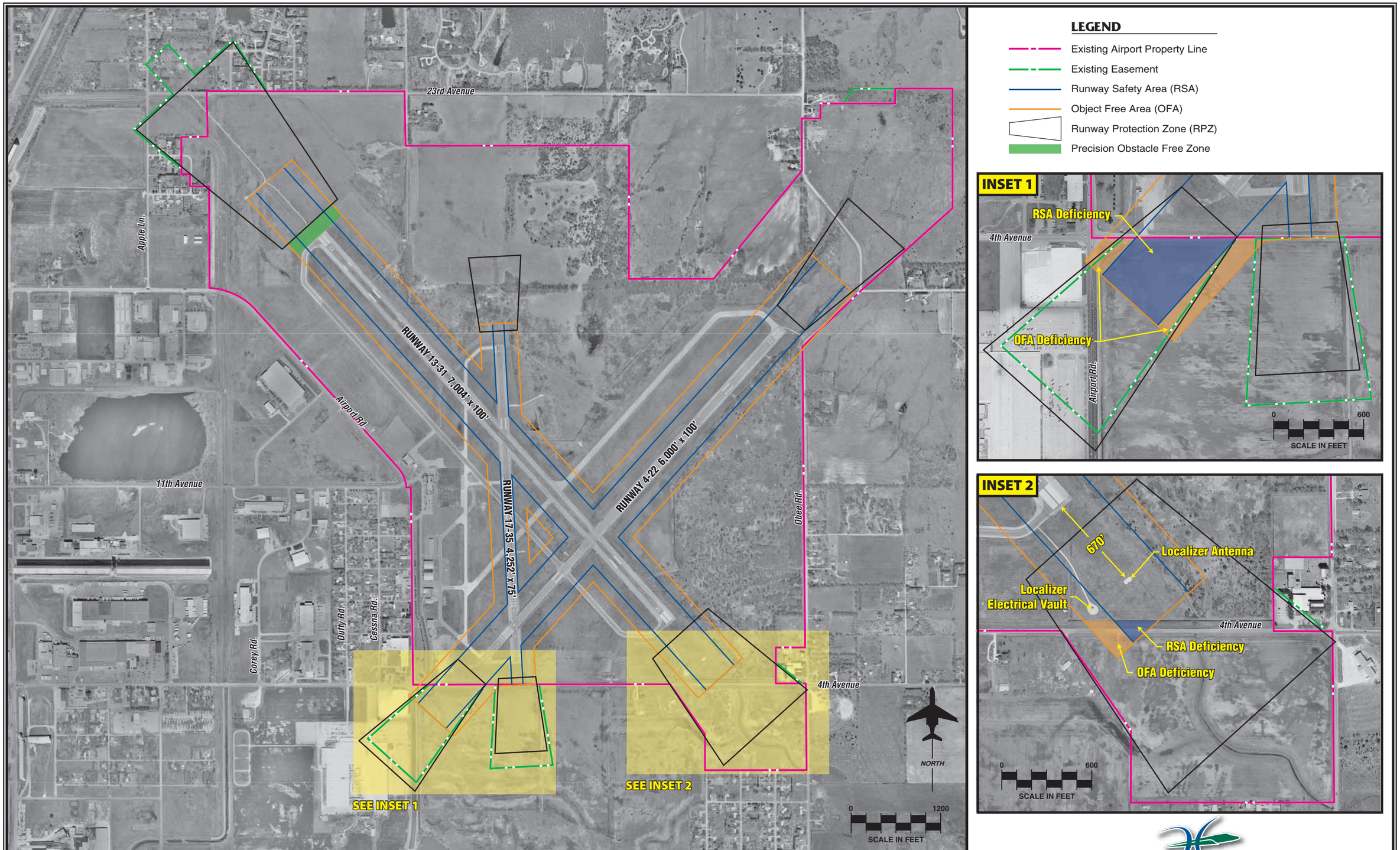
The primary runway at an airport should be oriented in the prevailing wind direction in order to minimize the number of runway orientations. At HUT, as in much of the Midwest, the optimal runway orientation is north to south. As presented previously, Runway 17-35 provides greater than 95 percent wind coverage for all crosswind components. Ideally, Runway 17-35 would be designated as the primary runway and outfitted to serve as such. According to FAA design standards, only this single runway orientation is needed at HUT. However, since Runway 13-31 is the primary runway and does not provide sufficient wind coverage for all aircraft, in particular small aircraft less than 12,500 pounds, two runway orientations are required at the airport.

Development of Runway 17-35 as the primary runway can be excluded from consideration for a number of reasons. First is the enormous cost associated with upgrading the runway. At 4,252 feet long by 75 feet wide, the runway would require lengthening and widening in order to accommodate aircraft up to ARC C-III. High-intensity runway edge lighting would need to be installed and the medium intensity approach lighting system with runway alignment indicator lights (MALSR), glide-slope antenna, and localizer antenna from the instrument landing system (ILS) approach would need to be relocated to this runway. Significant property acquisition may also be necessary in order to provide a runway to the capabilities of the existing Runway 13-31. With the existing investment in Runway 13-31, it would be hard to justify reducing the role of that runway and re-designating Runway 17-35 as the primary runway.

With the understanding that Runway 13-31 will be the designated primary runway, attention shifts to providing a single crosswind runway that, in conjunction with Runway 13-31, will provide the appropriate wind coverage in accordance with FAA standards. The crosswind runway needs to be designed to serve aircraft in ARC B-II as those are the category of aircraft that are not fully covered on Runway 13-31. For HUT, this is Runway 17-35.

Airside Alternatives will consider Runway 13-31 as the primary runway. A second runway will be designed to the crosswind standard of B-II. Alter-

05MP03-4B-3/3/06



Hutchinson Municipal Airport

Exhibit 4B

BASELINE CONDITIONS

natives will also consider the feasibility of the third runway being maintained at the C-II standards, even though this is not required to meet FAA or industry-accepted standards for wind coverage or capacity.

TAXIWAYS

The primary consideration with regard to the taxiways at Hutchinson Municipal Airport is meeting safety standards while mitigating the existing "Hot Spots." The first "Hot Spot" is located along Taxiway B, between Runways 4-22 and 17-35. This taxiway segment is very short, causing the hold markings to be located too close together, even overlapping. If pilots are not cautious, they could stop at the wrong marking, placing the aircraft inside the runway safety area.

The second "Hot Spot" is located along Taxiway C. When taxiing southwest on Taxiway C, the hold marking for Runway 17-35 is located prior to Taxiway A. When taxiing northwest on Taxiway A, the hold marking for Runway 17-35 is located prior to Taxiway C. These hold markings can be confusing to pilots as the hold markings are typically located prior to an intersecting runway, not taxiway.

In addition to addressing these "Hot Spot" issues, improving the efficiency of the taxiway system will also be addressed.

INSTRUMENT APPROACH PROCEDURES

All airside alternatives will consider maintaining the current approach minimums to Runway 13-31. This includes the ILS Category (CAT) I approach serving Runway 13 with ½-mile visibility minimums and 200-foot cloud ceiling minimums. Runway 31 would be maintained at ¾-mile visibility minimums. Since there are excellent approaches to the primary runway, all approaches for a crosswind runway will be considered to be global positioning system (GPS) satellite navigation approaches with one-mile visibility minimums.

RUNWAY SAFETY AREA ALTERNATIVES

FAA Order 5300.1F, *Modification of Agency Airport Design, Construction, and Equipment Standards*, indicates in Paragraph 6.d the following:

". . . Runway safety areas at both certificated and non-certificated airports that do not meet dimensional standards are subject to FAA Order 5200.8, *Runway Safety Area Program*. Modification of Standards is not issued for nonstandard runway safety areas."

The FAA placed a greater emphasis on meeting RSA standards with the publication of FAA Order 5200.8, *Runway Safety Area Program* in 1999

following congressional direction. A new law enacted in 2006 requires the FAA to complete planning for improving nonstandard runway safety areas by 2010 and all runway safety area improvements be completed by 2015.

FAA Order 5200.8 states in Paragraph 5, "The object of the Runway Safety Area Program is that all RSAs at federally-obligated airports and all RSAs at airports certified under 14 Code of Federal Regulations (CFR) Part 139 shall conform to the standards contained in AC 150/5300-13, *Airport Design*, to the extent practicable."

The Order goes on to state in Paragraph 8.b:

"The Regional Airports Division Manager shall review all data collected for each RSA in Paragraph 7, along with the supporting documentation prepared by the region for that RSA, and make one of the following determinations:

(1) The existing RSA meets the current standards contained in AC 150/5300-13, *Airport Design*.

(2) The existing RSA does not meet the current standards, but it is practicable to improve the RSA so that it will meet current standards.

(3) The existing RSA can be improved to enhance safety, but the RSA will still not meet current standards.

(4) The existing RSA does not meet current RSA standards, and it is not practicable to improve the RSA."

It is the findings of this master plan that will aid the Regional Airports Division Manager for the FAA's Central Region in making a determination on the existing condition of the RSAs at Hutchinson Municipal Airport.

Appendix 2 of FAA Order 5200.8 provides the direction for an RSA determination. This includes the alternatives that must be evaluated. Paragraph 3 of Appendix 2 states:

"The first alternative that must be considered in every case is constructing the traditional graded runway safety area surrounding the runway. Where it is not practicable to obtain the entire safety area in this manner, as much as possible should be obtained. Then the following alternatives shall be addressed in the supporting documentation . . . :

A. Relocation, shifting, or realignment of the runway.

B. Reduction in runway length where the existing runway length exceeds that which is required for the existing or projected design aircraft.

C. A combination of runway relocation, shifting, grading, realignment, or reduction.

D. Declared distances.

E. Engineered Materials Arresting Systems (EMAS)."

The following subsections will discuss the application of the above FAA-recommended alternatives for mitigating RSA deficiencies. This discussion will assume that each runway will remain in its current orientation, with the Airport Reference Code (ARC) noted on the current ALP and in Chapter Three - Facility Requirements.

RUNWAY 13-31 RUNWAY SAFETY AREA ALTERNATIVES

Runway 13-31 is the primary runway serving Hutchinson Municipal Airport. Under the baseline condition, this runway is designed to serve the critical aircraft which falls in ARC C-II and is projected to transition to ARC C-III. Both of these conditions must provide an RSA that is 500 feet wide, centered on the runway, and extends 1,000 feet beyond the runway ends. The safety area deficiency was depicted previously on **Exhibit 4B**. The following subsections address the feasibility of applying each FAA-prescribed alternative solution to Runway 31.

Alternative 1 - Provide Full Safety Area

As stated in FAA Order 5200.8, *Runway Safety Area Program*, analysis of the possibility of providing full RSA is the first step in an RSA determination. In order to provide full safety area for Runway 31, 4th Avenue would have to be relocated, as depicted on **Exhibit 4C**. The localizer antenna and the localizer electrical vault would also have to be relocated outside of the RSA (and OFA for the electrical vault) and calibrated.

The overall cost of this alternative, with a 30 percent contingency for both design and construction, is approximately $669,000. Under current Federal law, 95 percent of this cost would be eligible for grants administered by the FAA. This alternative would not require the acquisition of additional property as the affected undeveloped property south of 4th Avenue is already owned by the airport.

Alternative 2 - Relocation, Shifting, or Realignment of Runway

Shifting the runway would involve removing runway pavement on one end and adding the same amount of pavement on the opposite end in order to maintain the existing runway length. In order to avoid relocating 4th Avenue, the only possible direction to shift the runway would be to the northwest, by adding approximately 330 feet to the runway. The Runway 31 end would then be reduced by 330 feet. This solution would solve the RSA deficiency on Runway 31, but it would create a number of issues on the Runway 13 end.

Most notably, the existing ILS approach to Runway 13 would need to be reconfigured. This not only includes reconfiguration of the airspace and approach procedures, but also requires the relocation of the MALSR approach lighting system, glideslope antenna, and outer marker.

Shifting the runway would also shift the Runway Protection Zone (RPZ) farther to the northwest. As previously discussed, the RPZ is to remain clear of structures that cause the congregation of people and property on the ground as much as possible. The new RPZ location would fall over more residential property, creating a need to acquire property and remove the residential properties. Currently, there are ten houses within the existing RPZ. Depending upon actual property acquisition costs, the cost to implement this alternative could exceed $2.8 million, of which 95 percent is eligible for federal grants. Due to the cost, disruption to navigation aids, and potential displacement of residential neighbors of the airport, the runway shifting option is not considered further.

Realignment involves changing the bearing of the runway centerline. Relocation involves shifting the centerline of the runway in a direction away from the controlling obstruction. Realignment or relocation of Runway 13-31 is also not considered due to cost and potential dislocation of residential neighbors. Any change in orientation would place new homes within the RPZ and under the approach paths. This would also change wind coverage at th airport. Relocating the runway centerline would not clear the RSA as the localizer is located in the center of the RSA and 4th Avenue extends completely through the RSA. For these reasons, the alignment and relocation alternatives are not considered further.

Alternative 3 - Reduction in Runway Length

This alternative involves reducing runway length by removing pavement and relocating the Runway 31 end to an appropriate distance from the controlling obstacle to ensure the full RSA standard can be met behind the runway end. For HUT, this involves relocating the Runway 31 end approximately 330 feet northwest.

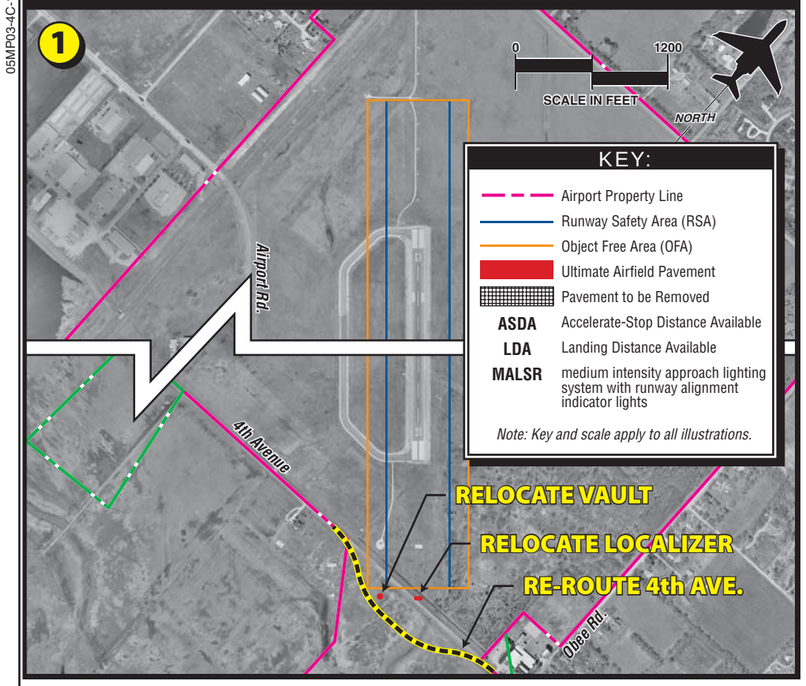
As stated in FAA Order 5200.8, this alternative is only practicable when the existing runway length "exceeds that what is required for the existing or projected design aircraft." For HUT, the entire existing length of Runway 13-31 is required for both civil and military use of the airport.

The current and projected critical design aircraft includes the full-range of business jets in the national fleet. Analysis completed in Chapter Three concluded that the current length of Runway 13-31 (7,004 feet) is need to meet long term business jet aircraft needs. As a result, a reduction in runway length is not considered prudent as the airport needs to maintain the existing length for these critical design aircraft in the future.

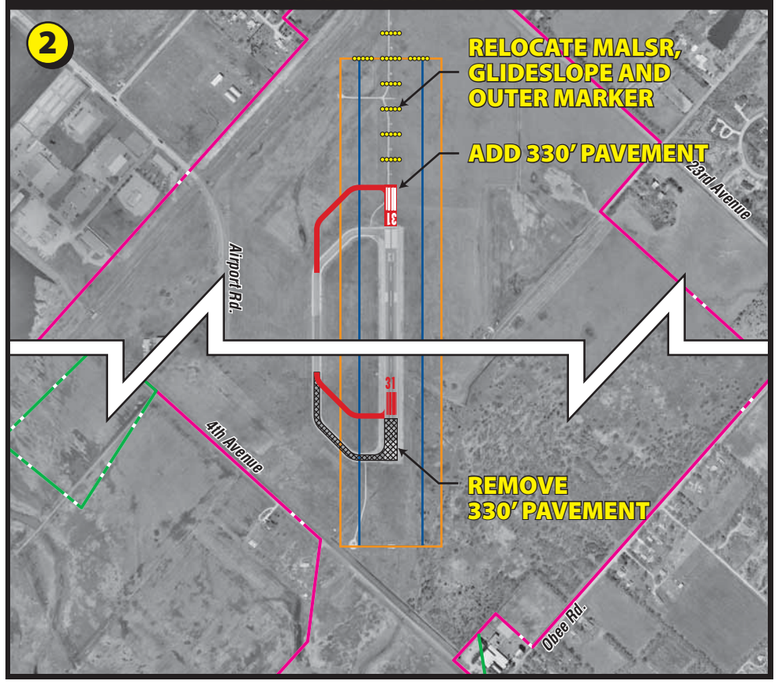
Military training aircraft from Vance Air Force Base (AFB) are also frequent users of the airport. Student pilots regularly fly T-1, T-37, and T-6 training aircraft to HUT. Interviews with commanders at Vance AFB indicate

05MP03-4C-1/13/06

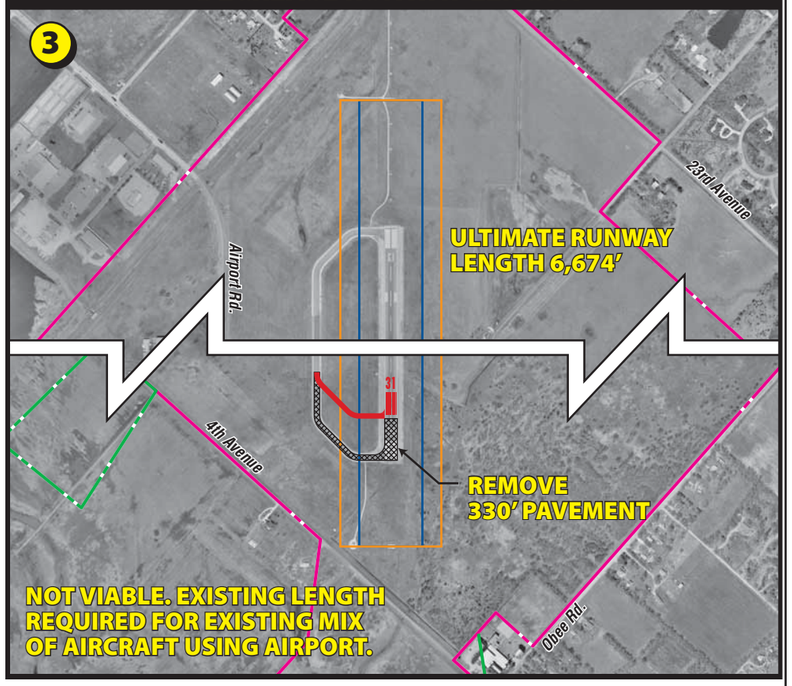
CLEAR AND GRADE RSA



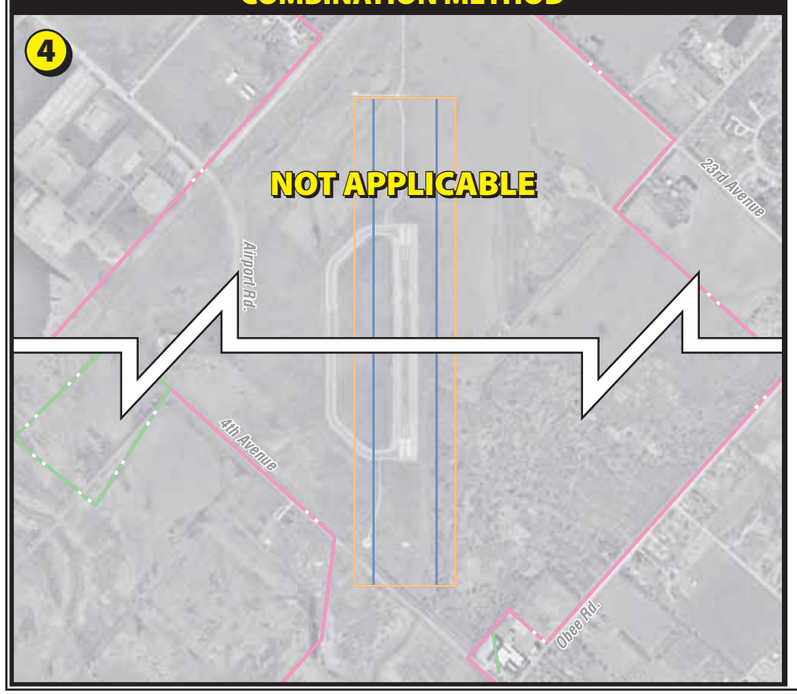
SHIFT RUNWAY



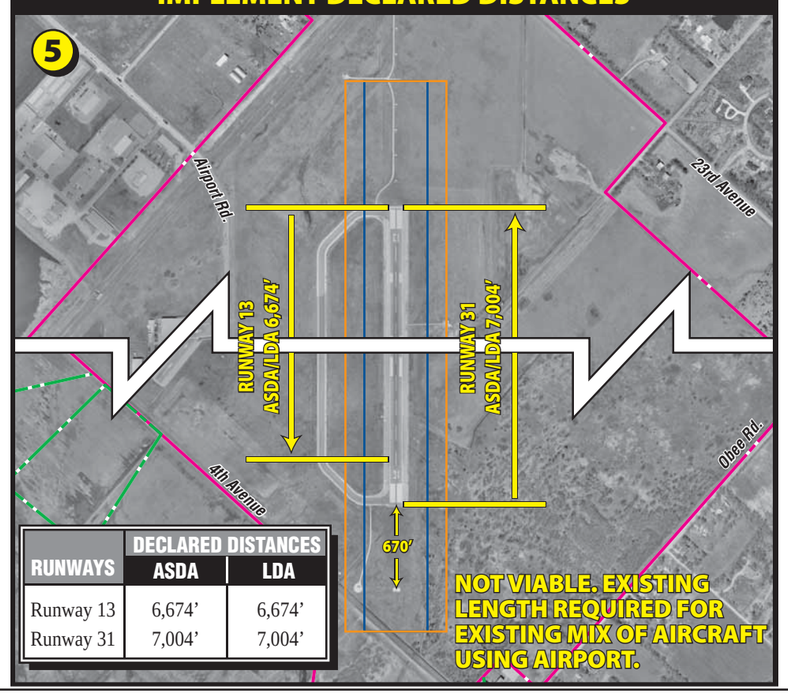
DECREASE RUNWAY LENGTH



COMBINATION METHOD

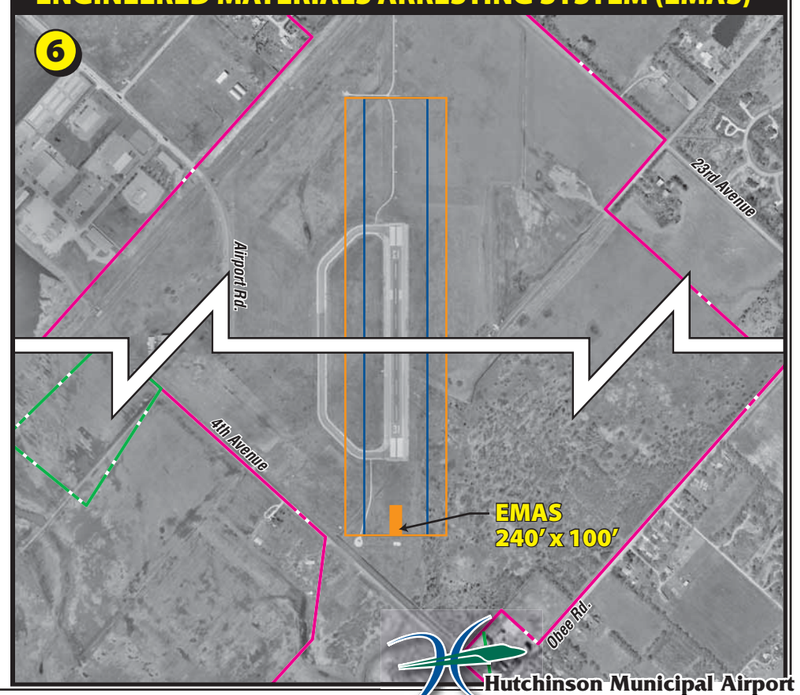


IMPLEMENT DECLARED DISTANCES



RUNWAYS	DECLARED DISTANCES ASDA	LDA
Runway 13	6,674'	6,674'
Runway 31	7,004'	7,004'

ENGINEERED MATERIALS ARRESTING SYSTEM (EMAS)



Hutchinson Municipal Airport

Exhibit 4C
RSA ALTERNATIVES
RUNWAY 13-31

that HUT is a popular destination for military training exercises for a number of reasons including:

- Lower activity levels allow for full touch-and-go activity.
- The presence of the airport traffic control tower (ATCT) provides an increased level of safety.
- The 7,000-foot runway meets the length requirements for T-6 training exercises.
- The instrument approach procedures allow for student training on multiple navigational aids.
- Jet fuel is available with a relatively quick turnaround time.
- There is a restaurant on the airfield.

Military operations currently account for more than 7,000 annual operations and forecasts assume a slight increase to this figure. The T-1 and the T-37 military trainers use jet engines. The T-6 is a single engine turboprop. All of these aircraft use jet fuel. In 2005, the military purchased nearly 42,000 gallons of jet fuel. This accounts for approximately 17 percent of all jet fuel sales at the airport.

Typically, the FAA will not include military needs when evaluating the future needs of a civilian, general aviation airport. With that said, there are many elements of an airport master plan, as presented in AC 150/5070-6B, *Airport Master Plans*, where the FAA considers the impact of the military operations in conjunction with the civilian critical aircraft needs for planning purposes. Operational forecasts are to include military activity. Recommendations for fuel storage capacity include all fuel sales, not just civilian sales.

Advisory Circular 150/5220-22A, *Engineered Materials Arresting Systems (EMAS) for Aircraft Overruns*, published in September 2005, states the following:

"The FAA does not require an airport sponsor to reduce the length of a runway or declare its length to be less than the actual pavement length to meet runway safety area standards if there is an operational impact to the airport."

As indicated in the letter from Vance AFB (see Appendix B), a reduction in runway length would have a negative operational impact on their operations at the airport. The letter states, "A reduction in runway length below 7,000 feet would significantly affect T-1 operations, and . . . the primary user of Hutchinson is the T-1." Both the T-6 and T-37 would be able to continue training operations at HUT, but a reduction in runway length would not allow for the operation of the T-1, the principal military user of the airport.

An additional consideration is the potential direct economic impact that a reduction in runway length may have on the airport. The airport currently collects a fuel flowage fee of five-cents-per-gallon of fuel sold. A reduction of runway length and subsequent loss of T-1 aircraft training would likely mean the loss of this revenue stream to the airport and the fixed base operator (FBO). The T-1 did not use the airport

in the past when declared distances were in place on Runway 13-31.

A reduction of Runway 13-31 by 330 feet, allowing for the full 1,000-foot RSA, is not considered prudent either for short term or long term planning. It is estimated that physically reducing the runway length would cost approximately $320,000 for pavement removal, taxiway construction, and remarking. This project would be eligible for FAA grants. Due to the need to maintain the existing runway length for the critical aircraft using the airport, safety area alternatives that do not reduce operational runway length will be given preference.

Alternative 4 - Combination of Runway Relocation, Shifting, Grading, Realignment, or Reduction

Since a relocation, shifting, realignment of the runway orientation, or a reduction in runway length did not prove viable, a combination of alternatives is impracticable and will not be given further consideration.

Alternative 5 - Declared Distances

The next alternative for meeting RSA standards is through the use of declared distances. Declared distances are the effective runway distances that the airport operator declares are available for take-off run, take-off distance, accelerate stop distance, and landing distance requirements. These are defined by the FAA as:

Take-off run available (TORA) - The length of the runway declared available and suitable to accelerate from brake release to lift-off, plus safety factors.

Take-off distance available (TODA) - The TODA plus the length of any remaining runway or clearway beyond the far end of the TORA available to accelerate from break release past lift-off to start of take-off climb, plus safety factors.

Accelerate-stop distance available (ASDA) - The length of the runway plus stopway declared available and suitable to accelerate from brake release to take-off decision speed, and then decelerate to a stop, plus safety factors.

Landing distance available (LDA) - The distance from threshold to complete the approach, touchdown, and decelerate to a stop, plus safety factors.

The ASDA and the LDA are the primary considerations in determining the runway length available for use by aircraft, as the RSA and OFA must be considered in the calculations. The ASDA and LDA can be figured as the usable portions of the runway minus the area required to maintain adequate RSA and OFA beyond the ends of the runway. For take-off, or ASDA calculations, 1,000 feet of RSA and OFA must be provided at the far end of the runway in which the departure is occurring. For landing operations, or LDA calculations, 600 feet of RSA and OFA must be provided prior to the landing threshold, and 1,000 feet must be provided beyond the far end of the runway.

For operations on Runway 31, there are no limitations as the RSA and OFA extend a full 1,000 feet beyond the Runway 13 end and 600 feet of RSA and OFA are available prior to the Runway 31 landing threshold. Thus, the ASDA and LDA for Runway 31 is 7,004 feet. The ASDA and LDA for Runway 13 is reduced to 6,674 feet, the length necessary to provide the full 1,000 feet of RSA and OFA behind the Runway 31 end.

This alternative would be the least expensive alternative as no construction or pavement marking is necessary because the airport sponsor simply publishes the declared distances. The primary disadvantage of this alternative is operational impacts on the critical design aircraft. As discussed previously, the entire length of Runway 13-31 is needed for both civil and military users of the airport.

Alternative 6 - Engineered Materials Arresting Systems (EMAS)

The final alternative to be considered when trying to achieve full RSA compliance is the use of Engineered Materials Arresting Systems (EMAS). Guidance for comparing RSA alternatives with EMAS is provided in FAA Order 5200.9, *Financial Feasibility and Equivalency of Runway Safety Area Improvements and Engineered Material Arresting Systems*. The installation of EMAS on the extended runway centerline is accepted by the FAA as complying with RSA standards.

EMAS is essentially designed of compressible concrete and is similar in function to the sandy, high-speed exits provided on highways in mountainous terrain in order to safely stop a runaway tractor trailer. EMAS is designed to stop an aircraft overrun by exerting predictable deceleration forces on the landing gear as the EMAS material crushes. It is designed to minimize the potential for structural damage to the aircraft, since such damage could result in injuries to passengers and/or affect the predictability of deceleration forces.

EMAS is designed to decelerate the critical aircraft at exit speeds of 70 knots or less without imposing loads that exceed the aircraft's structural design limits. The total length of an EMAS bed needed for Runway 31 is estimated at 240 feet. The EMAS bed should be set back a minimum of 75 feet from the threshold in order to protect it from jet blast.

The installation of EMAS can be expensive compared to other solutions. With design, engineering, site preparation and installation, the total cost is estimated at $2.8 million for Runway 31.

RUNWAY 4-22 RUNWAY SAFETY AREA ALTERNATIVES

Runway 4-22 is one of two crosswind runways serving Hutchinson Municipal Airport. Under the baseline condition, Runway 4-22 is designed to meet safety

standards associated with ARC C-II. The RSA should be 500 feet wide and extend 1,000 feet beyond the runway pavement end. As noted previously, the RSA prior to the landing threshold need only be 600 feet in length. Approximately 200 feet of RSA (60 feet of OFA) is available prior to the Runway 4 landing threshold. **Exhibit 4D** presents the safety area alternatives for Runway 4. Safety area standards are met behind the Runway 22 end. The following subsections address the feasibility of applying each alternative solution to Runway 4.

Prior to examining alternatives to provide safety area for Runway 4-22, the role of the runway should be reviewed. The City of Hutchinson has maintained Runway 4-22 as a back-up to Runway 13-31 for those times when Runway 13-31 may be closed for maintenance or winds are more favorable for its use. The 6,000-foot length of Runway 4-22 allows for continued operation of the current critical design aircraft as this runway has similar pavement strength but haul length and useful load (payload and passengers) may be somewhat less than that provided for by the primary runway.

Since Runway 13-31 and Runway 17-35 together provide the necessary wind coverage for the airport, the FAA does not participate in funding improvements or maintenance for Runway 4-22. This has led the FAA to support improvements to Runway 17-35 since it can serve ARC B-II aircraft and can provide better overall wind coverage than Runway 4-22. In the view of the FAA, only two runway orientations are needed at HUT. Therefore, the maintenance and repair of Runway 4-22 has been the sole responsibility of the City of Hutchinson. Even though the FAA does not provide funding support to the City for Runway 4-22, the FAA expects that RSA and OFA standards are met for any runway in use.

Alternative 1 - Provide Full Safety Area

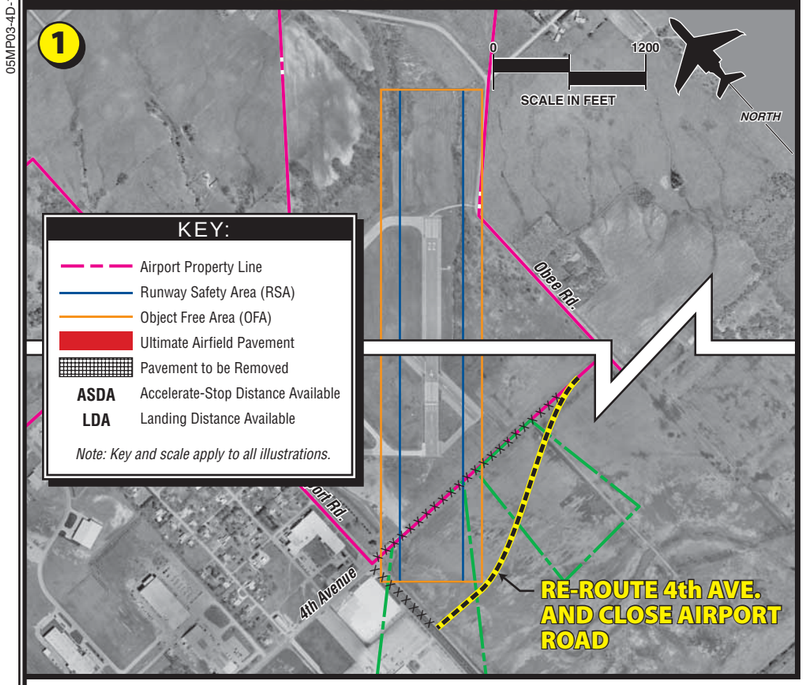
As stated in FAA Order 5200.8, *Runway Safety Area Program*, analysis of the possibility of providing full RSA is the first step in the RSA determination. This alternative is addressed by clearing, grading, and draining the extended RSA a full 1,000 feet. This would involve relocating 4th Avenue. In addition, the OFA would extend even further, crossing Airport Road just south of the intersection with 4th Avenue, and ending at the east facing wall of the building on the southwest corner of the intersection, causing the closure of Airport Road to meet FAA standards.

The advantage of this alternative is that Runway 4-22 can be maintained as a C-II runway. Significant improvements have been made to the runway recently, including a complete overlay and marking project in 2000. The City of Hutchinson is also now required by grant assurances from KDOT Aviation to maintain Runway 4-22 for the useful life of the pavement.

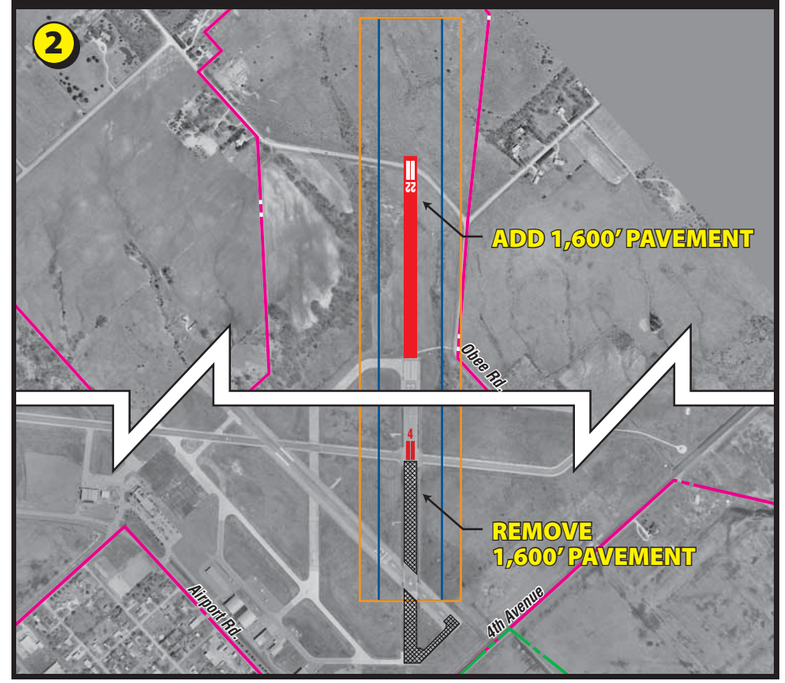
The disadvantages of this alternative primarily revolve around financing and the effect on future vehicular traffic patterns. Since Runway 4-22 is

05MP03-4D-1/13/06

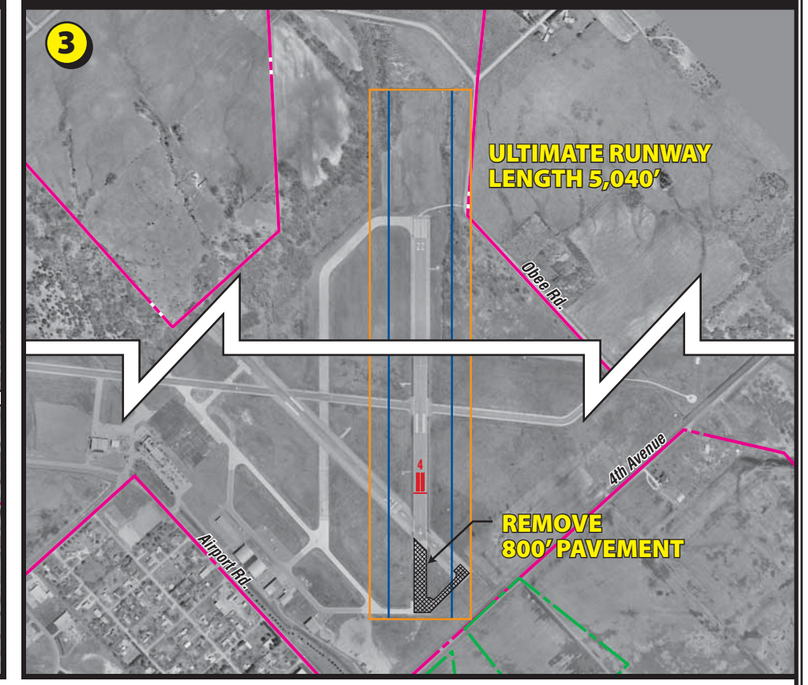
CLEAR AND GRADE RSA



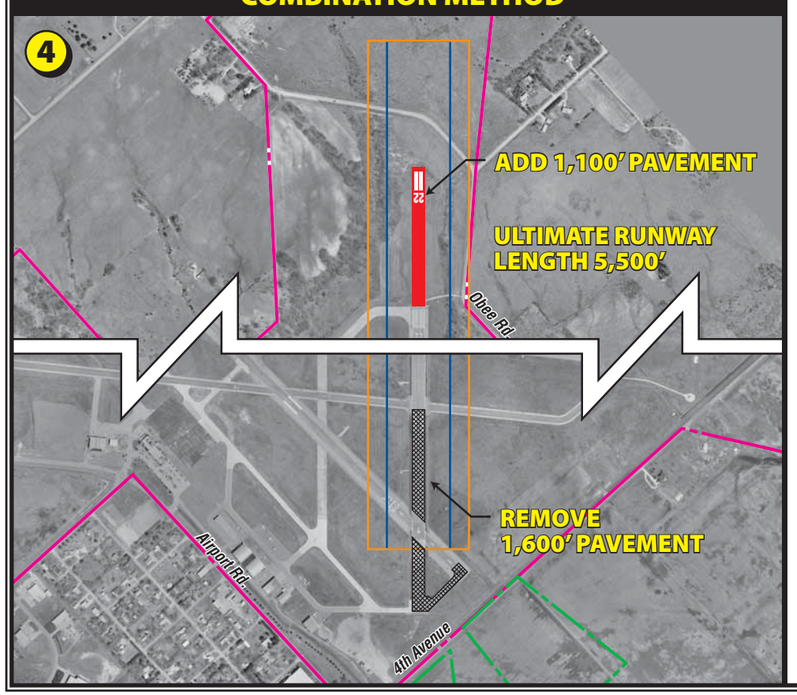
SHIFT RUNWAY



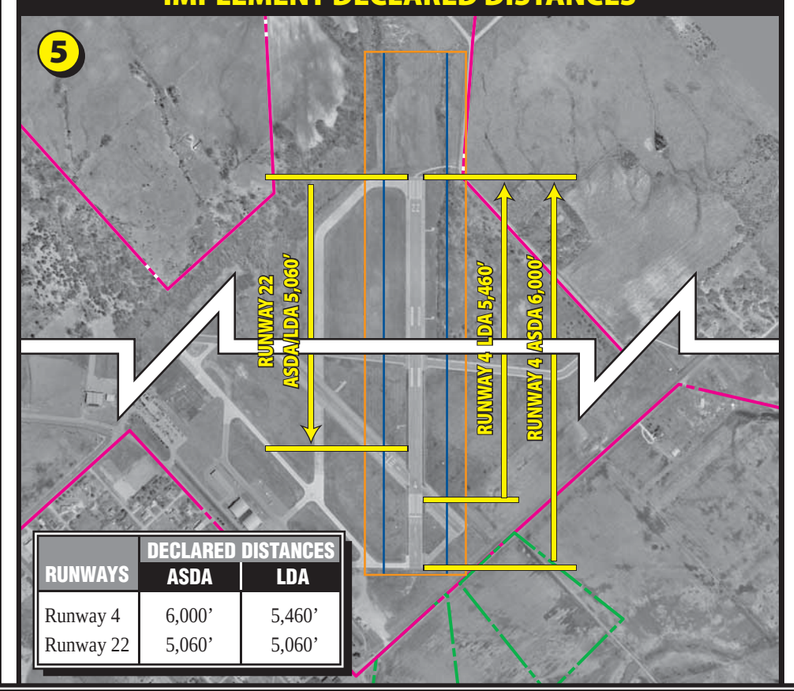
DECREASE RUNWAY LENGTH



COMBINATION METHOD

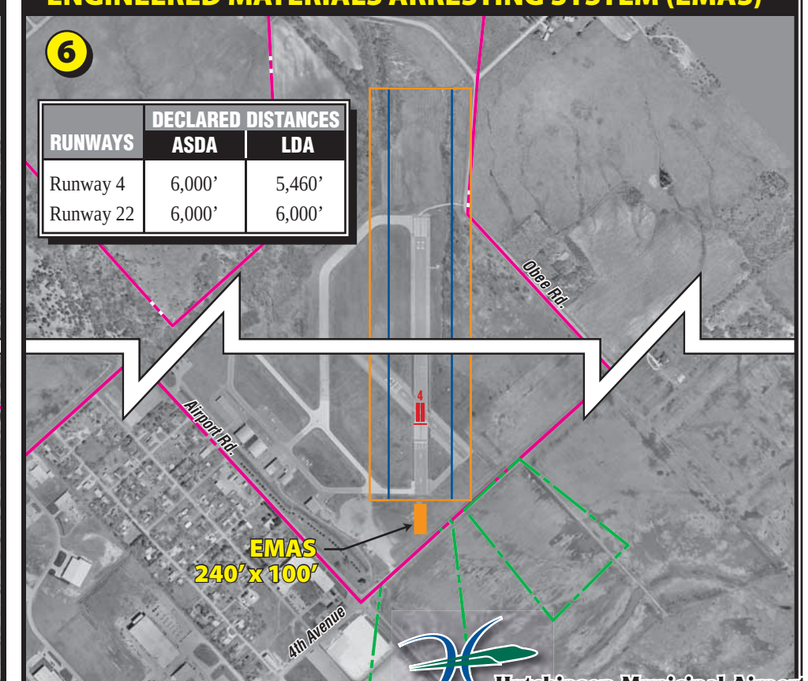


IMPLEMENT DECLARED DISTANCES



RUNWAYS	DECLARED DISTANCES	
	ASDA	LDA
Runway 4	6,000'	5,460'
Runway 22	5,060'	5,060'

ENGINEERED MATERIALS ARRESTING SYSTEM (EMAS)



RUNWAYS	DECLARED DISTANCES	
	ASDA	LDA
Runway 4	6,000'	5,460'
Runway 22	6,000'	6,000'

Hutchinson Municipal Airport

Exhibit 4D
RSA ALTERNATIVES
RUNWAY 4-22

maintained by the City of Hutchinson, most of the investment associated with this project would be the responsibility of the City. A portion of the total project cost may be eligible for 50/50 funding from the State of Kansas Aviation Department. Cost factors include property acquisition, rerouting 4th Avenue and preparing the RSA. The total cost for property acquisition and road construction of this alternative is estimated at $376,000.

Additionally, this alternative does not resolve the incompatibilities in the Runway 4 RPZ. Since the Runway 4 threshold is maintained in its existing location and to ARC C-II standards, the two large warehouses would remain within the RPZ.

Alternative 2 - Relocation, Shifting, or Realignment of Runway

Relocation involves moving the centerline of the runway to clear the RSA and OFA. Relocating Runway 4-22 to the northwest or southeast would only further impact the RSA as 4th Avenue extends completely through the RSA. Realigning Runway 4-22 would not clear the RSA for the same reasons. These alternatives are not given further consideration.

In order to provide for the entire RSA and OFA for Runway 4 on airport property, a shift of nearly 940 feet is necessary. Shifting the Runway 4 end 940 feet leaves it without taxiway access as the new runway end would be located between Taxiway A and Runway 17-35. In order to provide taxiway access, the Runway 4 threshold in this alternative is shifted to the intersection with Taxiway A. This leads to a total shift of 1,600 feet.

The addition of 1,600 feet of runway to the Runway 22 end presents a series of challenges. The terrain north of Runway 22 slopes upward. A significant amount of site preparation and earthworks would be necessary prior to the addition of the runway length. Obee Road would also have to be relocated. The north RPZ would need to be extended beyond airport property, leading to additional property acquisition. An advantage would be that the south RPZ would be removed from the commercial properties to the southwest.

The total cost of a runway shift of 1,600 feet to the northeast is estimated at nearly $5 million. This expense would be the sole responsibility of the City of Hutchinson.

Alternative 3 - Reduction in Runway Length

In order to provide for the full RSA and OFA beyond the Runway 4 end, Runway 4-22 would need to be shortened by at least 940 feet. Taking this action will lead to additional problems as the landing threshold would now be located near the intersection with Runway 17-35. This configuration would be confusing to pilots, and the relocation of landing threshold lights could be problematic.

Shortening the runway by nearly 1,000 feet would reduce overall runway length to 5,040 feet. A minimum length of

5,500 feet is needed to serve ARC C-II aircraft. Thus, a shorter runway would have significant operational limitations and may not be able to effectively serve as a back-up to Runway 13-31. This alternative would have the advantage of clearing the incompatibilities in the Runway 4 RPZ.

The cost of decreasing the length of Runway 4-22 is estimated to be $155,000. The full cost is the responsibility of the City of Hutchinson.

Alternative 4 - Combination of Runway Relocation, Shifting, Grading, Realignment, or Reduction

There are possibilities for a combination solution to the Runway 4 RSA deficiencies. By shifting the Runway 22 end 1,100 feet to the northeast and removing a total of 1,600 feet of pavement on the south end of the runway to again align the Runway 4 end with Taxiway A, a total runway length of 5,500 feet is achieved. This would place all safety areas, except for small portions of the RPZ, on airport property. It would also maintain ARC C-II dimensional standards while meeting runway length requirements for the critical aircraft.

Obstacles to this solution would include the expense of adding pavement to lengthen the runway. The terrain north of Runway 22 slopes upward to such a degree that site preparation may be cost prohibitive. An additional consideration is the existing grade of the runway. Runways for large aircraft must have a slope of less than 1.5 percent from end to end, and the grade cannot exceed 0.08 percent in the first and last quarter of the runway length. The existing grade of the last quarter of Runway 22 is 1.4 percent. The addition of runway length would likely necessitate a grading, lowering, and reconstruction of the northern 1,500 feet of runway in order to remove the hump in the runway that already exceeds standards. This alternative is estimated to cost $3.6 million, of which the full cost is the responsibility of the City of Hutchinson.

Relocation and realignment alternatives are not practicable for meeting Runway 4 RSA and OFA needs. This is due to 4th Avenue extending through the RSA and OFA. No realignment or relocation alternative would clear the RSA and OFA. The only means to clear the RSA and OFA is to move 4th Avenue to the south or move the Runway 4 threshold to the northeast.

Alternative 5 - Declared Distances

Declared distances involve the City of Hutchinson declaring those portions of the runway that are usable for take-off and landing calculations. Since the full RSA and OFA is available beyond the Runway 22 end, take-off (ASDA) calculations are not restricted on Runway 4 and the full 6,000 feet of runway length is available for departure. The landing distance available (LDA) is reduced by 540 feet to 5,460 feet, the length necessary to provide for 600 feet of RSA (and OFA) before the Runway 4 landing threshold as required by FAA design

requirements. The ASDA and LDA on Runway 22 are reduced by 940 feet, the length necessary to provide for the full RSA and OFA beyond the Runway 4 end. In this alternative, the Runway 22 ASDA and LDA are reduced to 5,060 feet.

As mentioned previously, a minimum length of 5,500 feet is needed for ARC C-II aircraft. This alternative does not provide this length. While this alternative does not have significant costs, it would impose operating limitations on Runway 4-22, which would reduce the utility of this runway for users. This alternative does not address the "Hot Spot" issue at the Runway 4 end, nor does it clear the incompatibilities from the Runway 4 RPZ.

Alternative 6 - Engineered Materials Arresting Systems (EMAS)

Exhibit 4D depicts the location of an EMAS structure behind the Runway 4 end. Even though there is sufficient area to locate the EMAS structure behind the Runway 4 end, the landing threshold would still need to be displaced to meet FAA design requirements which require 600 feet of RSA prior to the landing threshold. To achieve this on Runway 4, the Runway 4 landing threshold would be need be relocated approximately 540 feet northeast, reducing the overall Runway 4 landing distance to 5,460 feet.

This alternative is estimated to cost $3 million. This cost would be the sole responsibility of the City of Hutchinson.

RUNWAY 17-35 RUNWAY SAFETY AREA ALTERNATIVES

Runway 17-35 is the crosswind runway that the FAA has agreed to support with grant funding. It is designed to ARC B-II standards. The standard RSA is 150 feet wide and extends 300 feet beyond the runway end. Approximately 70 feet of the RSA extends beyond the fence line beyond the Runway 35 end. As presented previously, an ARC B-II runway should be at least 4,300 feet in length. Thus, all RSA alternatives will consider Runway 17-35 to be extended by 48 feet to the north to achieve the 4,300-foot standard.

Alternative 1 - Provide Full Safety Area

Providing full safety area on the existing runway would require the realignment of 4th Avenue. This could, in essence, be a small shifting of the roadway centerline to the south as presented in **Exhibit 4E**. If this approach were taken, care should be given to move the road far enough south so that it is no longer an obstruction to approaches to Runway 35, as is the case now. To achieve full clearance of the 20:1 threshold siting surface (TSS), 4th Avenue should be relocated at least 540 feet from the runway pavement end, where it is currently only 295 feet away. This would be the exact clearance necessary, provided the road and the runway threshold are at the same elevation. If possible, greater clearance should be provided to meet a 34:1 approach surface clearance. This would allow for the development of an

instrument approach procedure to Runway 35. 4th Avenue would need to be located approximately 780 feet from the existing Runway 35 end to provide this clearance.

The cost of relocating the road, grading the RSA, and altering airport fencing is estimated at $127,000, of which 95 percent is eligible for FAA grant assistance.

Alternative 2 - Relocation, Shifting, or Realignment of Runway

Relocating or realigning Runway 17-35 is not practicable as neither option would remove 4th Avenue from the RSA or OFA.

Shifting the runway to the north would provide for RSA and OFA to the south. By removing approximately 100 feet of pavement on the south end and constructing 100 feet on the north end, the runway shift would provide for full RSA and OFA compliance. Under this option, it is recommended that an additional 48 feet be added to the runway length, as a total runway length of 4,300 feet is optimal for a crosswind runway at HUT.

This RSA alternative is estimated to cost $252,000, of which 95 percent is eligible for FAA grants.

Alternative 3 - Reduction in Runway Length

Currently, Runway 17-35 serves as a B-II crosswind runway. As such, it should meet the runway length standard of 4,300 feet for small aircraft. Although a reduction in runway length of approximately 100 feet on the southern end will satisfy RSA needs, the lost runway length could adversely affect operations to the runway. Therefore, reducing the length of Runway 17-35 is not considered further.

Alternative 4 - Combination of Runway Relocation, Shifting, Grading, Realignment, or Reduction

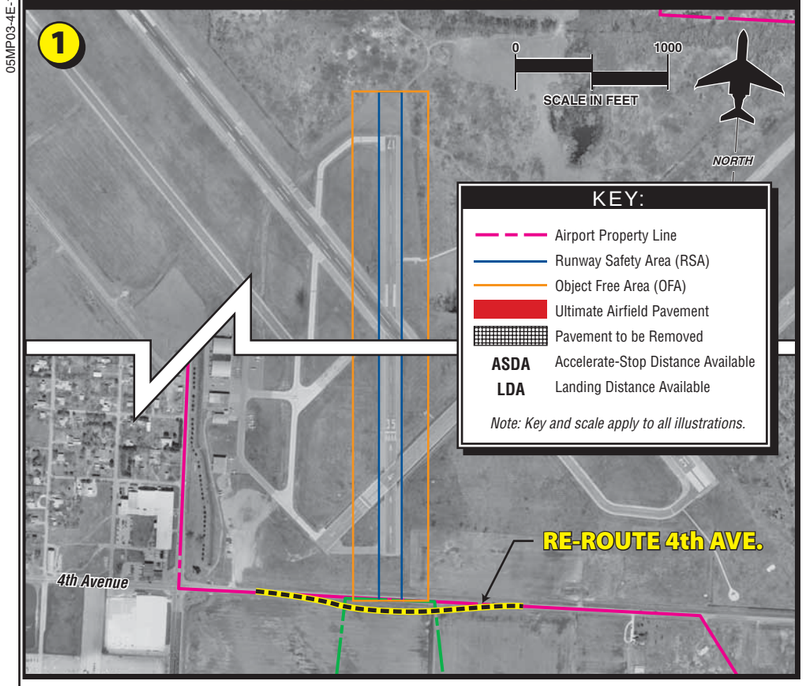
Since a relocation, realignment, or reduction in pavement length did not prove viable, a combination of these alternatives is not practicable and will not be given further consideration.

Alternative 5 - Declared Distances

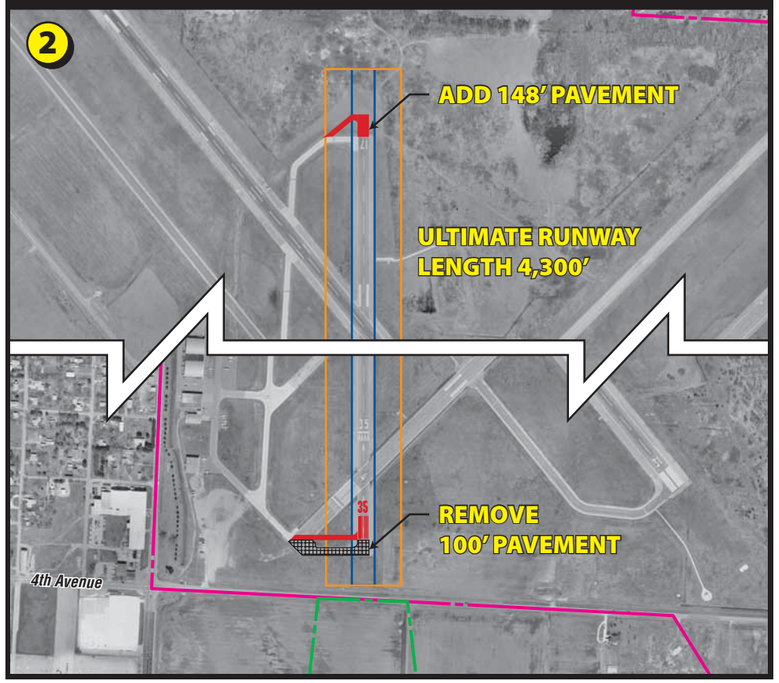
Utilizing declared distances is feasible, but not recommended as a long term solution. Declaring the runway to be approximately 100 feet shorter on the southern end could lead to greater pilot confusion as the runway would not be marked to show these conditions. This is due to the requirement for the present landing threshold displacement on Runway 35. Under this scenario, the ASDA and LDA for Runway 17 would be 4,152 feet. The LDA for Runway 35 would be 4,152 feet, and the ASDA would be the full 4,252 feet. Since there is no operational benefit to providing the extra 100 feet of runway length for take-off operations to the north, a more appropriate solution would be to simply remove 100 feet of pavement.

05MP03-4E-1/13/06

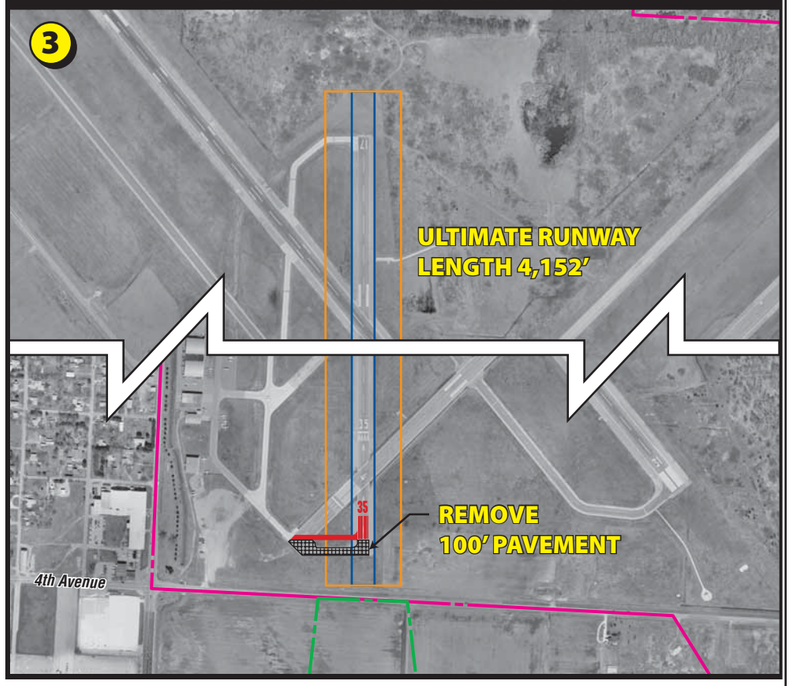
CLEAR AND GRADE RSA



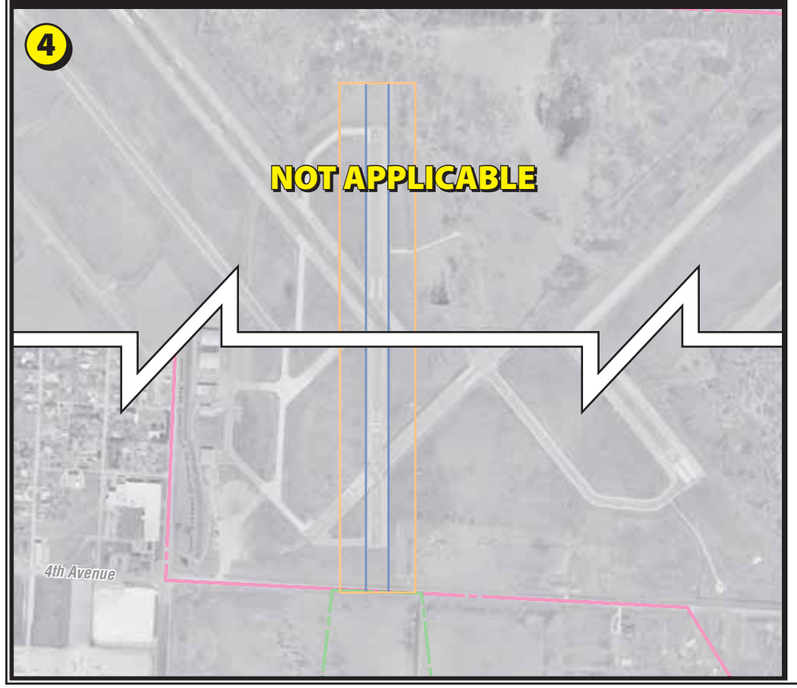
SHIFT RUNWAY



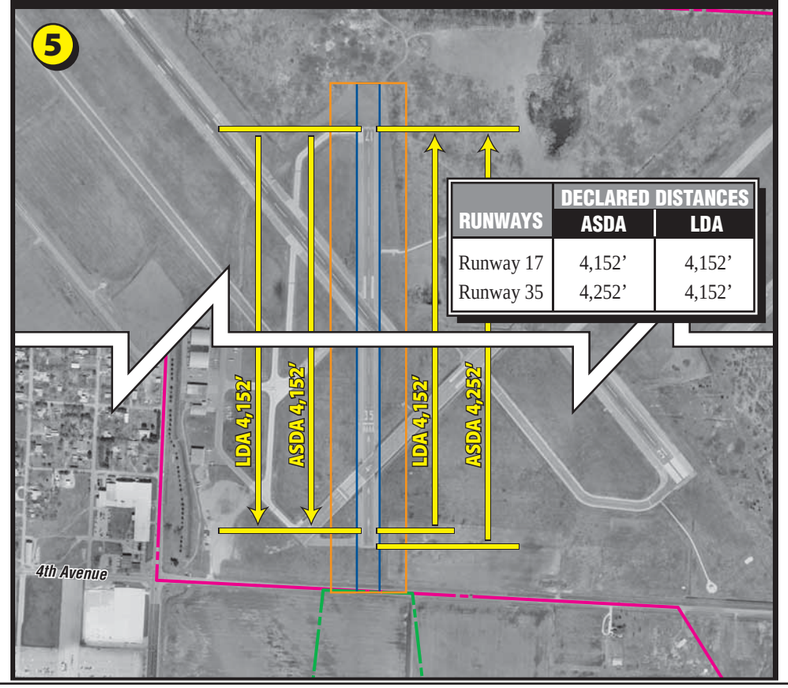
DECREASE RUNWAY LENGTH



COMBINATION METHOD



IMPLEMENT DECLARED DISTANCES



RUNWAYS	DECLARED DISTANCES ASDA	LDA
Runway 17	4,152'	4,152'
Runway 35	4,252'	4,152'

ENGINEERED MATERIALS ARRESTING SYSTEM (EMAS)

Hutchinson Municipal Airport

Exhibit 4E
RSA DETERMINATION
RUNWAY 17-35

Alternative 6 - Engineered Materials Arresting Systems (EMAS)

EMAS is designed for runways serving aircraft over 25,000 pounds. Runway 17-35 is designed for aircraft weighing less than 12,500 pounds. Therefore, EMAS is not a practicable solution and will not be given further consideration.

AIRSIDE ALTERNATIVES

The airside alternatives will now combine all of the issues that have been presented, including the role of each runway, the RSA alternatives, and additional safety area factors. By examining the airside issues as a whole at this point, solutions to the "Hot Spots" and RSA deficiencies are addressed.

Each alternative presented will identify specific parts of the airfield that would be eligible for future FAA grant funding. Under the current system, Runways 13-31 and 17-35 and the associated taxiways are eligible for funding. Runway 4-22 and the majority of Taxiway C are maintained solely by the City of Hutchinson, without FAA grant assistance.

AIRSIDE ALTERNATIVE A

Airside Alternative A, as shown on **Exhibit 4F**, considers realigning 4th Avenue to provide full RSA for Runway 31. The localizer antenna and electrical vault are relocated outside of the limits of the RSA and OFA. The RSA would be prepared through grading for drainage to meet the technical standards provided by the FAA. The length of Runway 13-31 would remain at 7,004 feet for operations in both directions. This length would meet all current and forecast operational needs.

This project would be eligible for FAA funding since it would lead directly to providing the full RSA and OFA standards behind the Runway 31 end. This option will also preserve the current operational fleet mix by protecting the existing runway length.

Taxiway A is improved with holding aprons on both ends of the taxiway. The holding aprons provide an area off the taxiway for aircraft to prepare for departure. This allows aircraft that are ready for departure to by-pass those aircraft preparing for departure, thus reducing departure delays.

Currently, the RPZ for Runway 13 extends beyond airport property and encompasses approximately ten residential properties. Residential housing is considered incompatible within the RPZ by the FAA. There are four properties on East 21st Avenue, in the Apple Lane subdivision, that should be acquired. There are an additional six houses off of 23rd Avenue, three on Marge Street, one on South Meadowlake Drive, and two on Meadowlake. Property acquisition in order to meet RPZ standards is eligible for FAA funding.

Shifting Runway 17-35 1,000 feet to the north is proposed in this alternative. By undertaking this shift, the RSA and OFA deficiencies for Runway 35 are

resolved as both safety areas would be located entirely on airport property. The "Hot Spot" issue between Runway 4 and Runway 35 is also resolved, as the new Runway 35 threshold would not have any hold line conflicts with Runway 4. With the shift, 1,048 feet of runway pavement is added to the north, providing an ultimate runway of 4,300 feet by 75 feet. Taxiway B is extended to the new Runway 17 threshold.

Since the maximum runway length needed for Runway 17-35 is 4,300 feet, the runway shifting project would be eligible for FAA funding. Shifting this runway will provide for full safety area compliance and remove existing penetrations (4th Avenue) of the approach surface to Runway 35. The RPZs serving the runway are entirely on airport property.

Runway 4-22 is presented as a C-II runway. To provide adequate RSA for Runway 4, approximately 1,400 feet of 4th Avenue is closed east of Airport Road and a new section of road will be constructed. This road relocation would require the acquisition of approximately six acres of undeveloped land (the southeast corner of the intersection of 4th Avenue and Airport Road) to provide for a cleared RSA.

Airport Road would pass through the OFA, so a modification of standards would need to be obtained from the FAA. If a modification of standards could not be obtained from the FAA, then a small portion of Airport Road, south of the intersection with 4th Avenue, would also need to be closed. Under this circumstance, 4th Avenue traffic would need to be diverted around the airport using Halstead Street or some other north-south route.

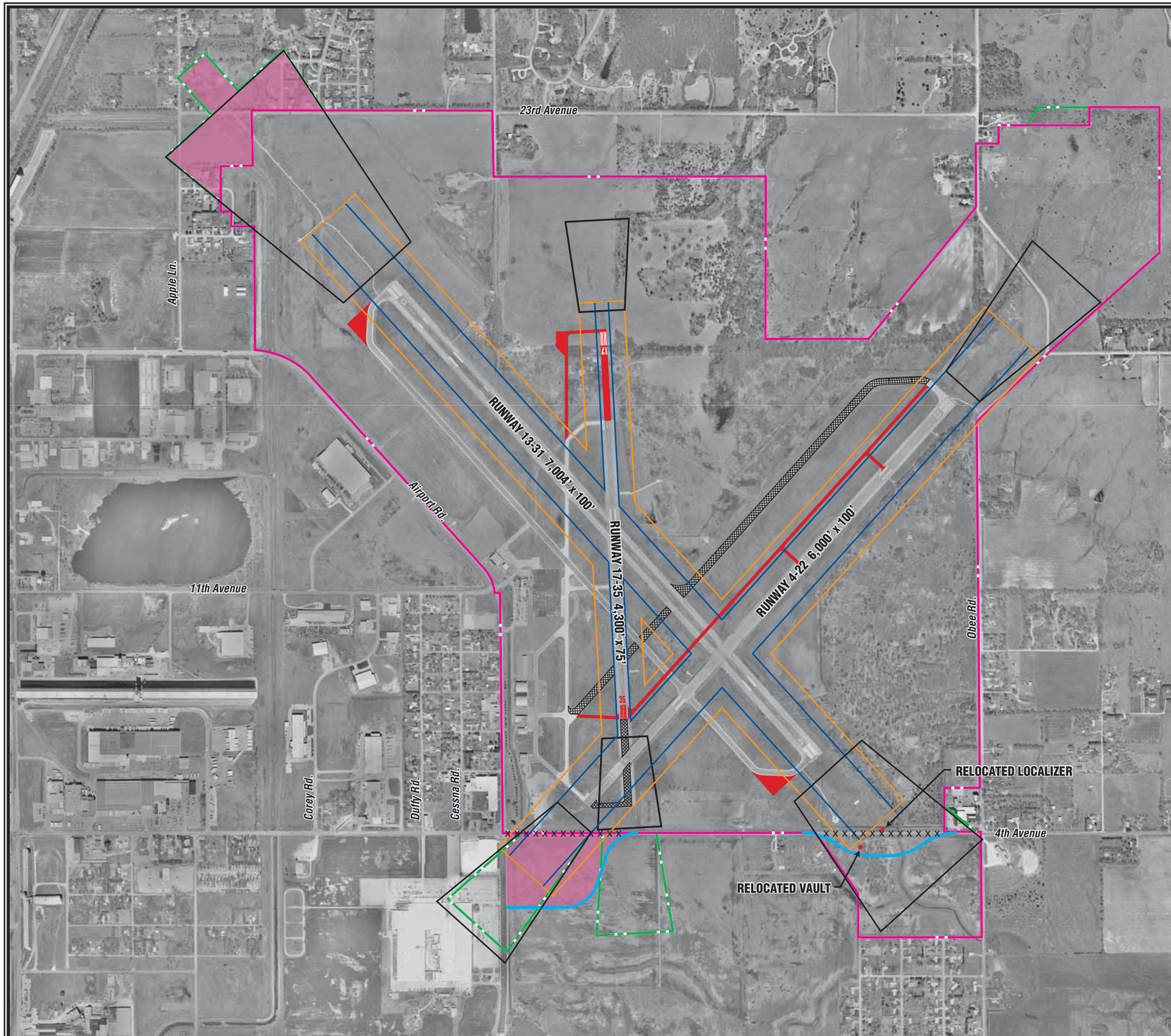
The landing threshold for Runway 4 could be relocated back to the end of the runway pavement, as the road would no longer be an obstruction to the approach surface. This would allow for the use of the full 6,000 feet of runway for operations, where landing operations on Runway 4 are currently limited to 5,600 feet.

The RPZ serving Runway 4 would remain unchanged, extending over two industrial buildings to the southwest. The airport currently owns avigation easements over these two buildings which will prevent any further encroachment of the RPZ, but the FAA would recommend removing any facilities that encourage the congregation of people or property on the ground within the RPZ, such as these businesses.

Taxiway C is relocated to a distance of 300 feet from Runway 4-22. Additional exit taxiways are constructed to reduce the need for a back-taxiing maneuver on the runway. The relocated Taxiway C would intersect Runway 17-35 at the shifted Runway 35 threshold and then continue toward the FBO terminal area. The relocation of Taxiway C removes the second "Hot Spot" issue as aircraft taxiing on Taxiway C would now encounter a hold line prior to Runway 17-35 and not prior to Taxiway A, the source of prior confusion.

That portion of Taxiway C from the south general aviation terminal area to Runway 13-31 would be eligible for FAA funding. The remaining portion of

05MP03-4F-1/18/06



LEGEND

- Existing Airport Property Line
- Existing Easement
- Runway Safety Area (RSA)
- Object Free Area (OFA)
- Runway Protection Zone (RPZ)
- Ultimate Airfield Pavement
- Pavement to be Removed
- Ultimate Road
- Property Acquisition

RUNWAY 13-31

- Realign 4th Avenue outside ARC C-II RSA and OFA
- Relocate localizer and vault
- Add hold aprons each end
- Maintain instrument approaches
- Realign perimeter fence
- Acquire residential properties in Runway 13 RPZ

RUNWAY 4-22

- Meet ARC C-II Standard
- Maintain one mile minimums on instrument approaches
- Relocate Taxiway C to 300' from runway centerline
- Add two taxiway exits
- Extend Taxiway B2 to meet Taxiway C
- Re-route 4th Avenue outside C-II RSA and OFA
- Purchase south RSA and OFA

RUNWAY 17-35

- Meet ARC B-II Standards
- One mile minimums on future instrument approaches

KEY:

ARC - Airport Reference Code

0 1200
SCALE IN FEET

NORTH

Hutchinson Municipal Airport

Exhibit 4F

AIRFIELD ALTERNATIVE A

Taxiway C from Runway 13-31 to the Runway 22 end would be the responsibility of the City. The FAA would not consider funding the relocation of 4th Avenue to provide for adequate RSA, but would require that appropriate RSA be provided for Runway 4.

Estimated Construction Costs: Table 4B presents estimated costs associated with implementation of Airside Alternative A. These estimates are in 2005 dollars. Phasing the projects is not considered in this analysis, but will be considered once the preferred alternative is identified. These estimates are presented as a point of financial comparison between development alternatives.

TABLE 4B
Cost Estimates: Airside Alternative A ($2005)
Hutchinson Municipal Airport

Project	Total	FAA Share	Local Share
Clear and Grade Runway 4 RSA	$376,000	$0	$376,000
Clear and Grade Runway 31 RSA	$669,000	$635,000	$33,000
Shift Runway 17-35	$1,120,000	$1,064,000	$56,000
Taxiway C Terminal Area to Runway 13-31	$729,000	$693,000	$36,000
Taxiway C from Runway 13-31 to Runway 22 Threshold	$2,057,000	$0	$2,057,000
Runway 13 RPZ Property Acquisition	$1,300,000	$1,235,000	$65,000
Runway 13-31 Holding Aprons	$845,000	$803,000	$42,000
Total	**$7,096,000**	**$4,430,000**	**$2,665,000**

Source: Coffman Associates analysis

Advantages: This alternative provides acceptable solutions to all RSA and OFA deficiencies and airfield "Hot Spot" issues. The City is able to maintain Runway 4-22 as a C-II runway at its current length, while mitigating RSA and OFA deficiencies.

Disadvantages: It would be expensive to improve the RSA serving Runway 4, and that cost would be the sole responsibility of the City. Relocating 4th Avenue may create undesired changes in traffic flow through the City. If a modification of standard for the OFA is not granted by the FAA, then Airport Road would also need to be closed, creating additional traffic problems. The Runway 4 RSA mitigation project could increase in cost significantly if other roads need to be improved to carry 4th Avenue traffic. The relocation of Taxiway C presents significant local cost as well. There are still incompatible structures within the Runway 4 RPZ.

AIRSIDE ALTERNATIVE B

Airside Alternative B, as shown on **Exhibit 4G**, presents an alternative that will also preserve the current role of Runway 4-22 (ARC C-II) while fixing safety area and "Hot Spot" issues on the airfield. A portion of 4th Avenue is realigned and the localizer and electrical vault relocated to provide for

the RSA and OFA standards beyond the Runway 31 end. The length of Runway 13-31 would remain at 7,004 feet for operations in both directions. This length would meet all current and forecast operational needs.

This project would be eligible for FAA funding since it would lead directly to providing the full RSA and OFA standards beyond the Runway 31 end. This option will also preserve the current operational fleet mix by protecting the existing runway length.

Holding aprons are added to each end of Taxiway A. All residential properties within the Runway 13 RPZ are recommended to be acquired. Property acquisition in order to meet RPZ standards is eligible for FAA funding.

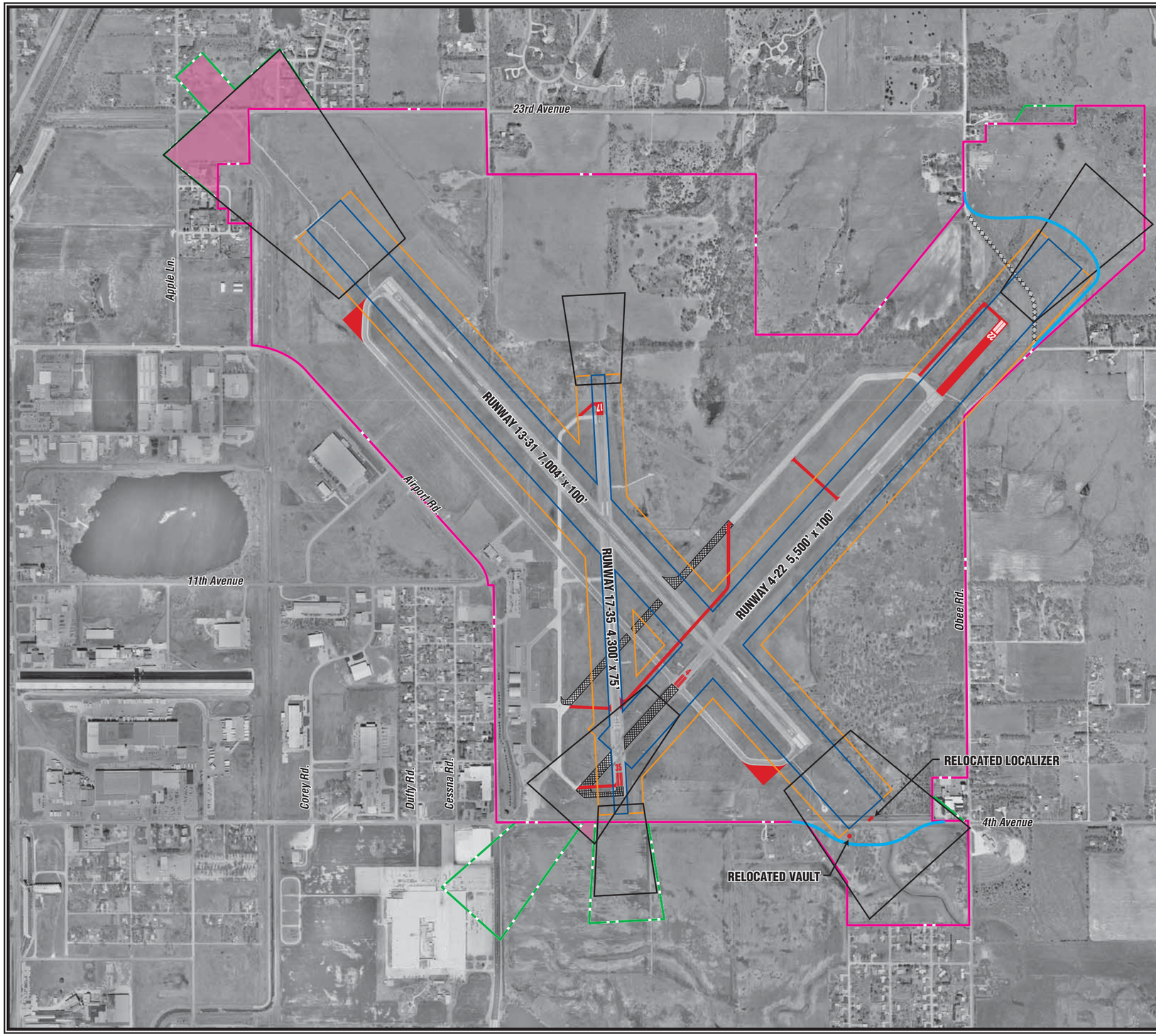
The RSA and OFA deficiencies beyond the Runway 35 end is resolved by removing 100 feet of pavement on the Runway 35 end. The runway is then shifted to the north by adding 148 feet on the ends which meets the recommended length for this category of runway. In this alternative, Runway 17-35 is 4,300 feet by 75 feet. This length would allow the runway to accommodate those aircraft in ARC B-II and smaller. New access taxiways to both thresholds are also necessary. Project costs associated with shifting Runway 17-35 would be eligible for FAA funding.

Runway 4-22, as presented on the exhibit, is shifted to the northeast and is maintained as an ARC C-II runway. On the Runway 4 end, 1,600 feet of runway pavement is removed. The Runway 4 threshold is relocated to the intersection with Taxiway A. To maintain an acceptable runway length for business jet aircraft within ARC C-II, 1,100 feet of pavement is added to the northeast, resulting in a 5,500-foot long by 100-foot wide runway. Shifting the Runway 4 threshold to the northeast resolves the "Hot Spot" issue at the south end of Taxiway B. The RPZ serving Runway 4 would be pulled back almost entirely onto airport property and clear of any incompatible structures.

Improvements are also made to Taxiway C serving Runway 4-22. The portion of the taxiway from Taxiway B2 to Runway 13-31 is relocated in order to remove the second "Hot Spot" issue in the midfield. Aircraft taxiing west on Taxiway C will now be able to hold prior to Runway 17-35, rather than prior to Taxiway A, a procedure which led to pilot confusion and runway incursions. This portion of Taxiway C would be eligible for FAA funding. The additional exit taxiway shown would be the responsibility of the City. This taxiway would eliminate the need for back-taxiing on Runway 4-22 when aircraft land on Runway 4.

Estimated Construction Costs: Table 4C presents estimated costs associated with implementation of Airside Alternative B. These estimates are in 2005 dollars. Phasing the projects is not considered in this analysis, but will be considered once the preferred alternative is identified. These estimates are presented as a point of financial comparison between development alternatives.

05MP03-4G-1/18/06



LEGEND

- Existing Airport Property Line
- Existing Easement
- Runway Safety Area (RSA)
- Object Free Area (OFA)
- Runway Protection Zone (RPZ)
- Ultimate Airfield Pavement
- Pavement to be Removed
- Ultimate Road
- Property Acquisition

RUNWAY 13-31

- Realign 4th Avenue outside ARC C-II RSA and OFA
- Relocate localizer and vault
- Add hold aprons
- Maintain instrument approaches
- Realign perimeter fence
- Acquire residential properties in Runway 13 RPZ

RUNWAY 4-22

- Meet ARC C-II standards
- Remove 1,600' pavement on south end
- Shift Runway 22 end 1,100' north
- Relocate portion of Taxiway C 300' from runway centerline
- Maintain approaches with 1 mile minimums
- Add exit taxiway
- Realign Obee Road

RUNWAY 17-35

- Meet ARC B-II standards
- Add taxiway to Runway 17 and 35 thresholds
- Remove 100' pavement on south end
- Shift Runway 17 end 148' on north end
- One mile approach minimums on future instrument approaches

KEY:

ARC - Airport Reference Code

0 1200
SCALE IN FEET

NORTH

Hutchinson Municipal Airport

Exhibit 4G

AIRFIELD ALTERNATIVE B

Advantages: The full RSA and OFA design standards are met beyond the Runway 31 end, and the full operational length of Runway 13-31 is maintained. The shift of Runway 17-35 resolves the encroachments to the RSA and OFA beyond the Runway 35 end. Shifting Runway 4 to Taxiway A allows the RSA and OFA beyond the Runway 4 end to be located on airport property and also resolves the "Hot Spot" issue on Taxiway B. The shifting of the Runway 22 end to the northeast preserves the ability of this runway to accommodate ARC C-II aircraft. The RPZ serving Runway 4 would be almost entirely on airport property and be clear of any incompatibilities.

Disadvantages: It is estimated that shifting Runway 4-22 would cost as much as $2.5 million. This includes nearly $1 million just for earth moving projects to bring the north end down to grade. This entire cost would be the responsibility of the City.

TABLE 4C
Cost Estimates: Airside Alternative B ($ 2005)
Hutchinson Municipal Airport

Project	Total	FAA Share	Local Share
Shift Runway 4-22	$2,517,000	$0	$2,517,000
Clear and Grade Runway 31 RSA	$669,000	$636,000	$33,000
Shift Runway 17-35	$252,000	$239,000	$13,000
Taxiway C Terminal Area to Runway 13-31	$729,000	$693,000	$36,000
Runway 4-22 Exit Taxiway	$206,000	$0	$206,000
Runway 13 RPZ Property Acquisition	$1,300,000	$1,235,000	$65,000
Runway 13-31 Holding Aprons	$845,000	$803,000	$42,000
Total	**$6,518,000**	**$3,606,000**	**$2,912,000**

Source: Coffman Associates analysis

AIRSIDE ALTERNATIVE C

Airside Alternative C, as presented on **Exhibit 4H**, considers upgrading Runway 17-35 to accommodate ARC C-II aircraft while closing Runway 4-22. As discussed previously, Runway 4-22 is not needed for wind coverage purposes as defined by the FAA, nor is it eligible for funding from the FAA. Thus, Runway 4-22 is proposed to be closed and air traffic would be directed to either of the two remaining runways, both of which provide sufficient wind coverage and capacity to accommodate forecast demand. No longer would the City have the expense of maintaining this runway.

Runway 17-35 is extended a total of 1,248 feet to the north, bringing the ultimate runway dimensions to 5,500 feet long by 100 feet wide. This is the length recommended for a runway designed to accommodate business jet aircraft within ARC C-II. The FAA has indicated that it will only participate in the improvement of Runway 17-35 to B-II standards. That means that the City of Hutchinson would have to pay for further improvements to bring this runway up to C-II standards, as presented on the exhibit. Additional improvements recommended when upgrading the runway include the installation of runway end identification lighting (REILs) and

precision approach path indicators (PAPIs), as well as the construction of hold aprons on each end of Taxiway B.

A portion of Runway 4-22 between Runway 13-31 would be retained at 50 feet in width to serve as a taxiway. This taxiway would then be extended to the south general aviation terminal area, improving the efficiency of aircraft exiting from Runway 13-31 desiring to access this portion of the airport.

When Runway17-35 is upgraded to ARC C-II standards, the RSA and OFA beyond the Runway 35 end would extend beyond airport property and be obstructed by 4th Avenue. This alternative realigns 4th Avenue to allow for the development of the RSA and OFA. This alternative requires the acquisition of approximately 90 acres of property, including two residential homes.

As an alternate to realigning 4th Avenue, **Exhibit 4H** presents an option of closing 4th Avenue from Airport Road to Obee Road and diverting traffic to other existing roadways. This reduces the development costs associated with the realignment of 4th Avenue. Under this option, traffic would then be diverted south on Airport Road to East Avenue G and then north again on Obee Road. Both East Avenue G and Obee Road would need to be paved to standards for an arterial road. Improvement of these roads is estimated at approximately $600,000. Rerouting traffic in this manner would increase traffic through residential areas and create greater travel times for motorists using 4th Avenue.

In this alternative, the RPZs associated with Runways 17, 35, and 13 would all extend beyond airport property and would be recommended for acquisition. The RPZ serving Runway 13 encompasses ten residential properties and a total of 13 acres. Approximately ten acres to the north and 17 acres to the south of Runway 17-35 would also need to be acquired.

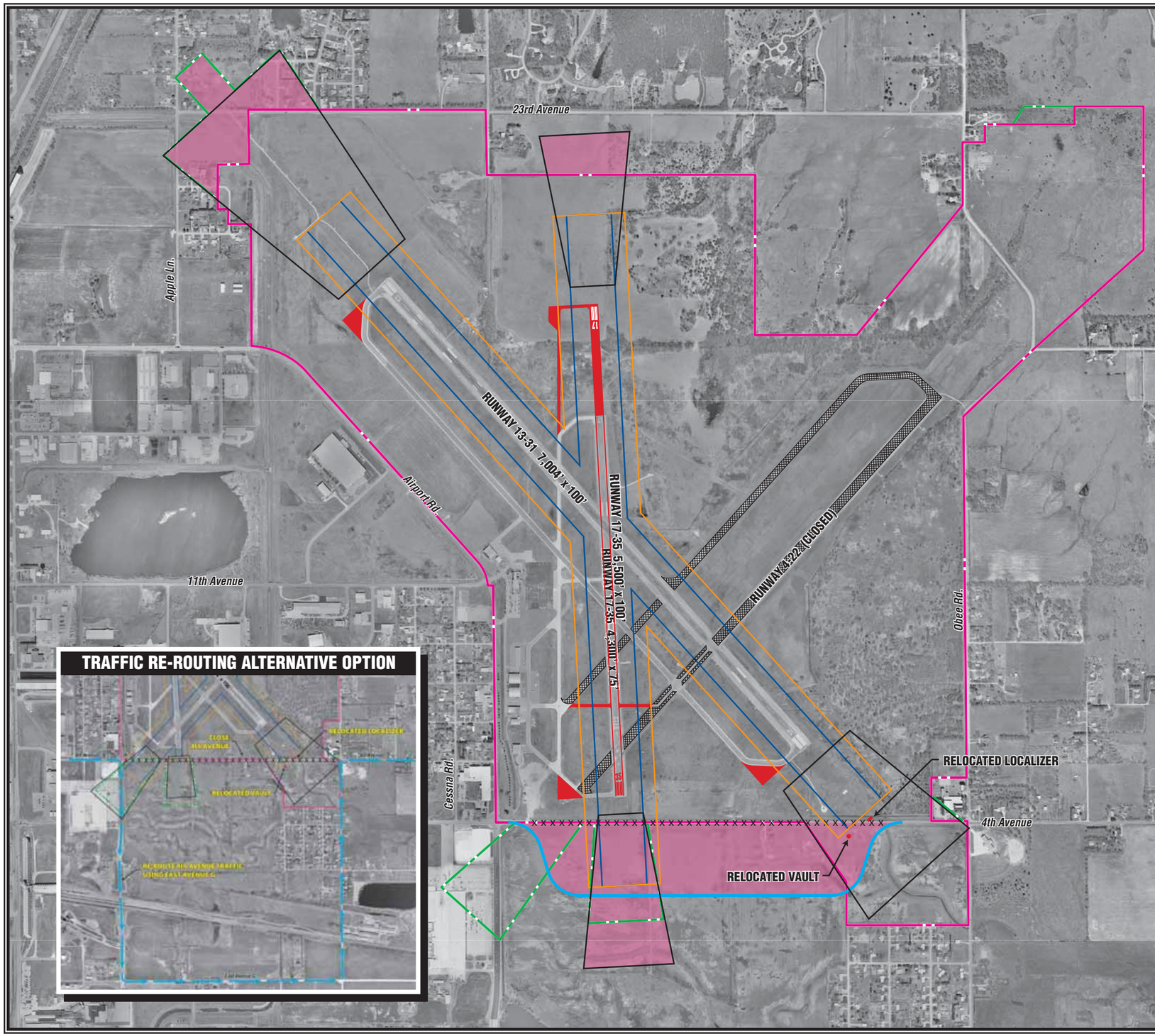
It should be noted that although the RPZ serving Runway 13 directly encompasses ten houses, a total of 24 properties are affected. If it is not reasonable to acquire a portion of the affected property without acquiring the house, then the buy-out estimates could increase substantially.

Additional improvements to the airfield include holding aprons for both ends of Taxiway A and the south end of Taxiway B.

Estimated Construction Costs: Table 4D presents estimated costs associated with implementation of Airside Alternative C in 2005 dollars. Phasing the projects is not considered in this analysis, but will be considered once a preferred alternative is identified. These estimates are presented as a point of financial comparison between development alternatives.

Advantages: Meets all FAA design standard requirements including RPZ ownership. The airport is able to maintain a second runway to the standard of Runway 4-22. The expense of maintaining a third runway is removed. Efficiency of aircraft move-

05MP03-4H-2/2/06



LEGEND

- Existing Airport Property Line
- Existing Easement
- Runway Safety Area (RSA)
- Object Free Area (OFA)
- Runway Protection Zone (RPZ)
- Ultimate Airfield Pavement
- Pavement to be Removed
- Ultimate Road
- Property Acquisition

RUNWAY 13-31

- Realign 4th Avenue outside the ARC C-II RSA and OFA
- Relocate localizer and vault
- Add hold aprons
- Maintain instrument approaches
- Realign perimeter fence
- Acquire residential properties in Runway 13 RPZ

RUNWAY 4-22 (CLOSED)

- Close runway

RUNWAY 17-35

- Meet ARC C-II standards
- Add taxiway to Runway 17 threshold
- Extend runway 1,248' to the north
- One mile approach minimums for future instrument approaches
- Realign 4th Avenue outside ARC C-II RSA and OFA
- Realign perimeter fence
- Add holding aprons

KEY:

ARC - Airport Reference Code

0 1200
SCALE IN FEET

NORTH

Hutchinson Municipal Airport

Exhibit 4H

AIRFIELD ALTERNATIVE C

ment is increased with Runway 17-35 being capable of supporting critical aircraft operations. The program could be phased over time to significantly reduce cost.

Disadvantages: Property acquisition is necessary to have ownership over all RPZs and RSAs. Improvements to Runway 17-35 are only eligible for FAA grants up to ARC B-II standards. The City would have to commit to covering the cost of upgrading to ARC C-II standards.

TABLE 4D
Cost Estimates: Airside Alternative C ($ 2005)
Hutchinson Municipal Airport

Project	Total	FAA Share	Local Share
Close Runway 4-22	$50,000	$0	$50,000
Runway 17 and 35 RPZ Acquisition	$40,000	$0	$40,000
Runway 13 RPZ Acquisition	$1,300,000	$1,235,000	$65,000
South RSA Land Acquisition/Realignment of 4th Avenue	$2,219,000	$2,108,000	$111,000
Upgrade Runway 17-35	$3,317,600	$252,000	$3,065,600
Runway 13-31 Holding Aprons	$845,000	$803,000	$42,000
New Taxiway Serving South Terminal Area	$379,000	$360,000	$19,000
Total	**$8,150,600**	**$4,758,000**	**$3,392,600**

Source: Coffman Associates analysis

AIRSIDE ALTERNATIVE D

Airside Alternative D, presented on **Exhibit 4J**, is exactly the same as Airside Alternative C, except that Runway 4-22 is not closed, but is instead downgraded to serve small aircraft in ARC B-II. The Runway 4 threshold is relocated to the intersection with Taxiway A. The ultimate dimensions of the runway would be 4,400 feet long by 75 feet wide.

The City of Hutchinson would still be responsible for maintaining Runway 4-22. In addition, the City would still be sharing the cost difference between Runway 17-35 being maintained as a B-II and a C-II runway. Taxiway C is shown relocated to a distance of 300 feet from the Runway 4 centerline.

Estimated Construction Costs: Table 4E presents estimated costs associated with implementation of Airside Alternative D in 2005 dollars. Phasing the projects is not considered in this analysis, but will be considered once a preferred alternative is identified. These estimates are presented as a point of financial comparison between development alternatives.

Advantage: Meets all safety area requirements including RPZ ownership. All approach slopes are also cleared as 4th Avenue is relocated. Runway 4-22 is maintained. Efficiency of aircraft movement is increased with Runway 17-35 being capable of supporting critical aircraft operations. The program could be phased over time to significantly reduce initial cost.

Disadvantages: Over the long term, this is the most expensive solution as the City would be maintaining Runway 4-22 to ARC B-II standards. The FAA already assists with the funding of an ARC B-II runway, Runway 17-35. Improvements to Runway 17-35 are only eligible for FAA grants up to ARC B-II standards. The City would have to commit to covering the cost of upgrading to ARC C-II standards.

TABLE 4E
Cost Estimates: Airside Alternative D ($ 2005)
Hutchinson Municipal Airport

Project	Total	FAA Share	Local Share
Taxiway C from Runway 13-31 to Runway 22 Threshold	$1,137,500	$0	$1,137,500
Runway 17 and 35 RPZ Acquisition	$40,000	$0	$40,000
Runway 13 RPZ Acquisition	$1,300,000	$1,235,000	$65,000
South RSA Land Acquisition/Realignment of 4th Avenue	$2,219,000	$2,108,000	$111,000
Upgrade Runway 17-35 to ARC C-II	$3,317,600	$252,000	$3,065,600
Runway 13-31 Holding Aprons	$845,000	$803,000	$42,000
New Taxiway Serving South Terminal Area	$379,000	$360,000	$19,000
Total	**$9,238,100**	**$4,758,000**	**$4,480,100**

Source: Coffman Associates analysis

LANDSIDE PLANNING ISSUES

The orderly development of available land on airport property is critical to preserving and maximizing the future efficiency and use of the airport. The following landside planning issues are addressed in each of the landside alternatives:

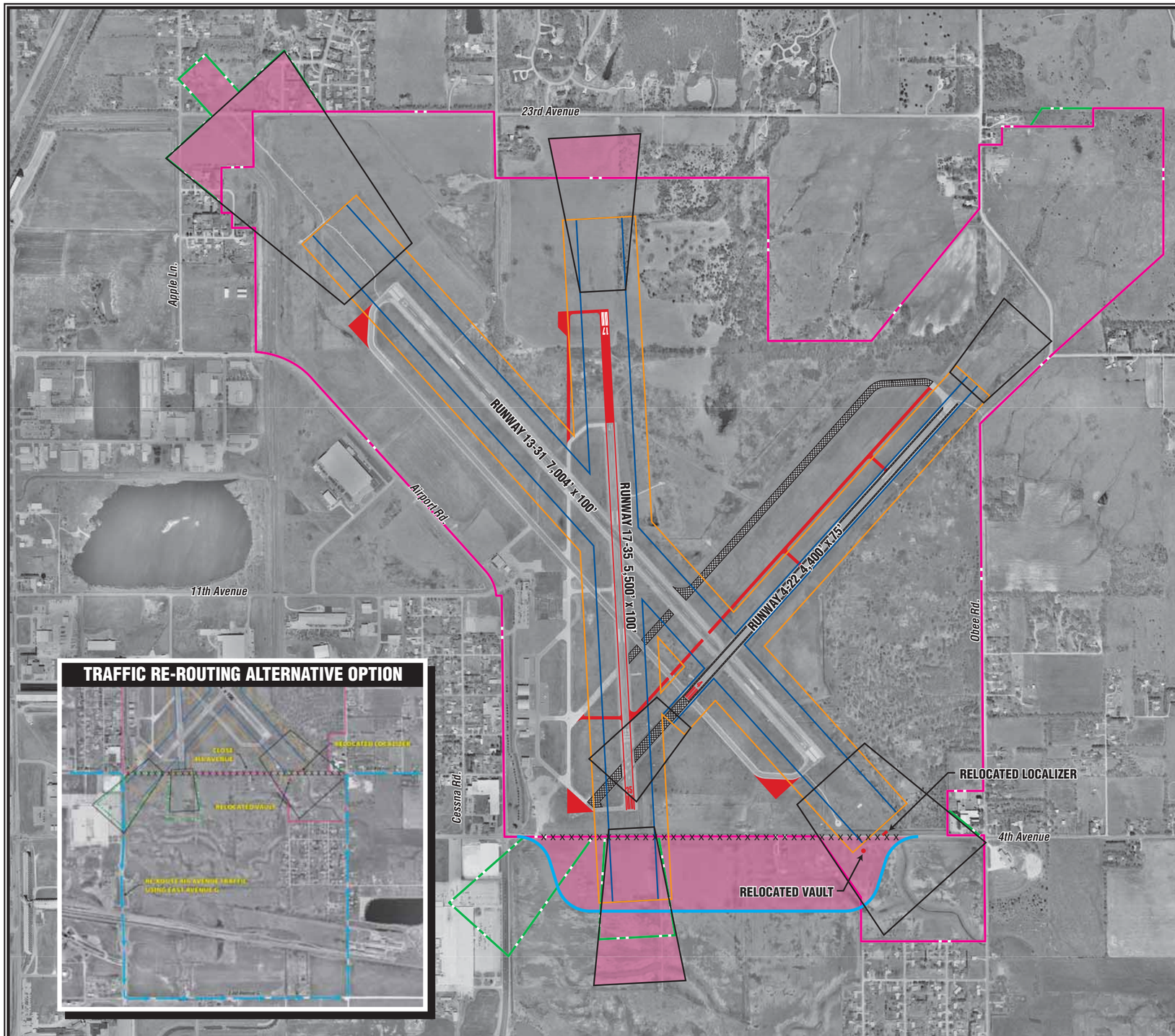
- Identify appropriate locations for facility development
- Develop T-hangars and conventional hangars
- Consider long term airport land uses

Chapter Three - Facility Requirements outlined specific types and quantities of facilities necessary to meet projected aviation demand throughout the planning period. Modest expansion will be required to meet the long range planning horizon level of demand. The remainder of this chapter will describe various alternatives for landside facility development. **Exhibit 4A** outlines key landside planning issues to be addressed.

LANDSIDE IMPROVEMENT ALTERNATIVES

The orderly development of the airport terminal area, those areas parallel to the runway and along the flight line, can be the most critical, and probably the most difficult development to control on the airport. A development approach of taking the path of least resistance can have a significant effect on the long term viability of an airport. Allowing development without regard to a functional plan could result in a haphazard array of buildings and small ramp areas, which will eventually

05MP03-4J-2/8/06



LEGEND

- Existing Airport Property Line
- Existing Easement
- Runway Safety Area (RSA)
- Object Free Area (OFA)
- Runway Protection Zone (RPZ)
- Ultimate Airfield Pavement
- Pavement to be Removed
- Ultimate Road
- Property Acquisition

RUNWAY 13-31

- Realign 4th Avenue outside ARC C-II RSA and OFA
- Relocate localizer and vault
- Add hold aprons
- Maintain instrument approaches
- Realign perimeter fence
- Acquire residential properties in Runway 13 RPZ

RUNWAY 4-22

- Reduce to 4,400' x 75'
- Meet ARC B-II design standards
- Relocate Taxiway C 240' from runway centerline

RUNWAY 17-35

- Meet ARC C-II design standards
- Add taxiway to Runway 17 threshold
- One mile approach minimums on future instrument approaches

KEY:

ARC - Airport Reference Code

0 1200
SCALE IN FEET

NORTH

Hutchinson Municipal Airport

Exhibit 4J

AIRFIELD ALTERNATIVE D

preclude the most efficient use of the valuable space along the flight line.

Activity in the terminal area should be divided into three areas at an airport. The high-activity area should be planned and developed as the area providing aviation services on the airport. An example of the high-activity area is the aircraft parking apron, which provides outside storage and circulation of aircraft. In addition, large conventional hangars housing FBOs and corporate aviation departments, or for use as storage for a large number of aircraft, would be considered a high-activity use. A conventional hangar structure in the high-activity area should be a minimum of 6,400 square feet (80' x 80'). If space is available, it is more common to plan these hangars for 150 feet by 150 feet to 200 feet by 200 feet. The best location for high-activity areas is along the flight line near midfield, for ease of access to all areas of the airfield.

The medium-activity category defines the next level of airport use and primarily includes smaller corporate aircraft that may desire their own executive or conventional hangar on the airport. A hangar in the medium-activity use area should be at least 50 feet by 50 feet, or a minimum of 2,500 square feet. The best location for medium-activity use is to the sides of the flight line, with ready access to the runway/taxiway system. Parking and utilities such as water and sewer should also be provided in this area.

The low-activity use category defines the area for storage of smaller single and twin-engine aircraft. Low-activity users are recreational or small business aircraft owners who prefer individual space in T-hangars or small box hangars. Low-activity areas should be located in less-conspicuous areas, off or to the ends of the flight line. This use category will require electricity, but generally does not require water or sewer utilities.

In addition to the functional compatibility of the terminal area, the proposed development concept should provide a first-class appearance for Hutchinson Municipal Airport. Consideration to aesthetics should be given high priority in all public areas, as the airport serves as the first impression a visitor may have of the community.

The existing terminal area at Hutchinson Municipal Airport appears to be relatively efficient and provides an acceptable level of separation of activity types. The terminal building and associated ramp is centrally located and provides quick access to the runways. To the north of the terminal building is a conventional hangar housing an aviation business. To the south is a larger general aviation complex with large conventional hangars, flanked by smaller T-hangars to the north and executive hangars to the south.

General aviation airports that have excess available lands removed from the flight line can encourage non-aviation-related businesses to locate on airport property. Hutchinson Municipal Airport does have some land available for industrial development. The airport sponsor and the Reno/Hutchinson Chamber of Commerce actively promote development of the area fronting Taxiway A to the north of the terminal

building. This already planned parcel will be maintained.

The possibilities for landside development alternatives are endless. The following development alternatives analysis utilizes accepted airport planning methodologies in conjunction with FAA AC 5300/13, *Airport Design*, Change 9. The three alternatives presented are based upon meeting safety standards, the goals of the City of Hutchinson, and consideration of fiscal realities.

It should be noted that landside facility development is the purview of the City of Hutchinson. The FAA will not approve or comment on the landside development alternatives except to conduct airspace analysis when specific structures are proposed. As a result, these alternatives represent a vision for the future and can be altered should the City desire to do so.

LANDSIDE ALTERNATIVE 1

Landside Alternative 1 is presented on **Exhibit 4K**. To the north of the terminal building, consideration is given for the addition of a conventional hangar immediately north of the existing conventional hangar. In addition to this hangar, the ramp area is expanded to accommodate tie-down aircraft or additional transient aircraft. The edge of this apron area is separated from the runway centerline by 93 feet. This meets the standard for aircraft through Aircraft Design Group (ADG) III, or aircraft with wingspans up to 118 feet.

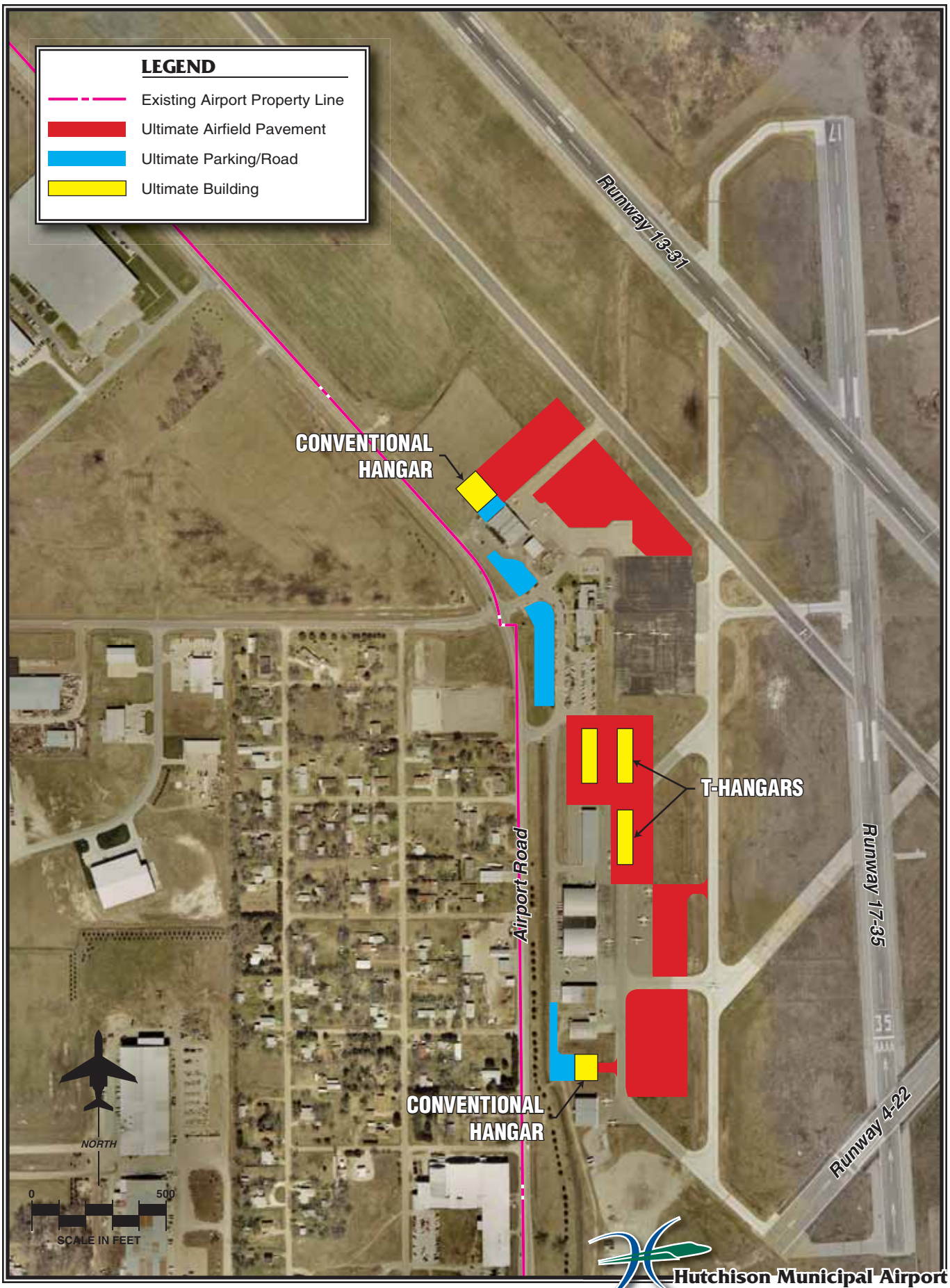
Moving to the south of the terminal building, three eight-unit T-hangar structures are considered. New T-hangars are located in this area in an effort to segregate low-activity level facility uses from those of larger conventional FBO-type hangars. Moving to the south, expansion of the public apron serving the FBO is considered. The final addition to the landside layout is an executive hangar to the south.

Landside facility development includes the expansion of the public parking space around the terminal building. Although previous analysis indicated that there is adequate public parking available to serve current aviation activity at the airport, it is clear that the location of those parking spaces may not be convenient. Particularly during lunch time, the parking lots reach capacity and patrons of the airport and the airport restaurant are forced to walk greater distances from their car to the airport. It is suggested that the terminal area parking lot be expanded. It should be noted that parking lot expansion is not eligible for FAA grant funding.

LANDSIDE ALTERNATIVE 2

Landside Alternative 2, as presented on **Exhibit 4L**, shows a different development pattern. New T-hangar structures are located to the north, away from the high-activity terminal area. To the south of the terminal building is space for a large conventional hangar. Additional public apron space is also depicted. An

05MP03-4K-2/17/06

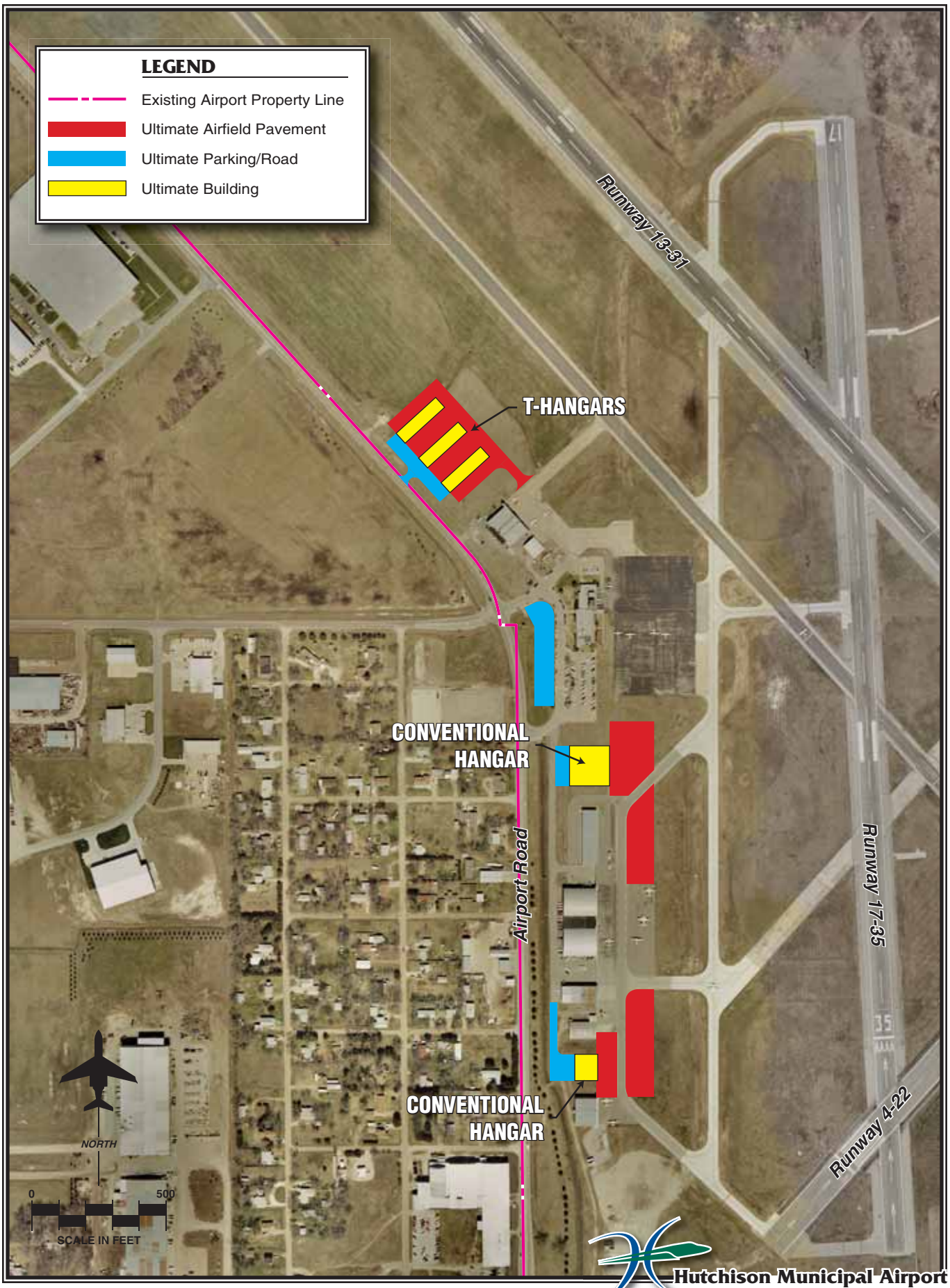


Hutchison Municipal Airport

Exhibit 4K

LANDSIDE ALTERNATIVE 1

05MP03-4L-2/20/06



Hutchison Municipal Airport

Exhibit 4L

LANDSIDE ALTERNATIVE 2

additional executive hangar is shown to the south of the FBO hangars. Additional terminal parking is again considered a priority.

LANDSIDE ALTERNATIVE 3

Landside Alternative 3 is presented on **Exhibit 4M**. This alternative shows a slightly different development pattern to the north in that both T-hangars and a conventional hangar are considered.

Any development to the north of the terminal building should consider the line-of-sight of personnel in the tower. To this end, all proposed structures to the north are set back toward Airport Road as far as possible.

Additional T-hangars are considered to the south of the terminal building. The attempt is made to group similar land uses, such as low activity T-hangars, in the same general location. Public apron expansion is considered as an additional executive hangar to the south. This alternative also recommends the expansion of the public parking areas.

LANDSIDE SUMMARY

Actual demand levels will dictate facility development. For example, if the airport needed to house a large number of small aircraft, the decision to build (or allow private developers to build) T-hangars would be prudent. However, if corporate aircraft are more demanding, executive or conventional hangar development would be necessary.

The ultimate plan will provide the City of Hutchinson with the means to meet the future demands in an efficient manner. Each alternative does, however, give the City a future vision of what the airport could become. This vision is important, as it shifts the focus from haphazard, build-as-you-go development to a long-term, focused development process. As a result, the City will be capable of providing a first-class airport which maximizes airport property.

Future consideration should be given to overall future airport land uses in conjunction with both airside and landside development. Areas to the northwest of Runway 13-31 have been designated for aviation-related industrial development. Other potential airport development areas may include the current location of Runway 4-22 or the area east of Runway 17-35 and south of Runway 4-22. Of course, the potential development areas would be dependant on the ultimate airfield condition.

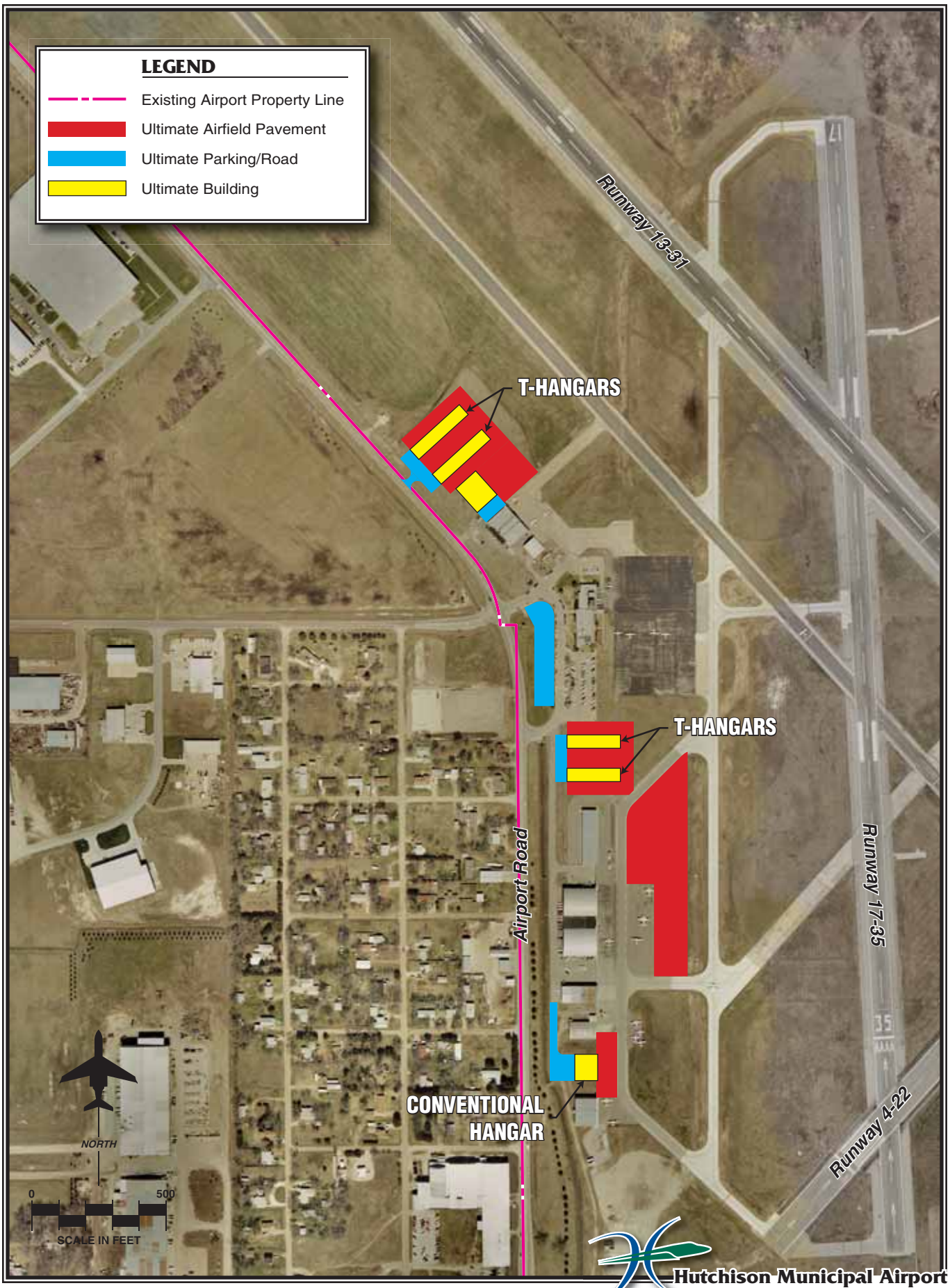
SUMMARY

The process utilized in assessing the airside and landside development alternatives involved a detailed analysis of short and long term requirements, as well as future growth potential. Current airport design standards were considered at every stage in the analysis. Safety, both air and ground, were given the highest priority in the analysis of alternatives.

After review and input from the Planning Advisory Committee (PAC), City officials, and the public, a recommended concept will be developed by the consultant. The resultant plan will represent an airside facility that fulfills safety design standards, and a landside complex that can be developed as demand dictates. The development plan for Hutchinson Municipal Airport must represent a means by which the airport can evolve in a balanced manner, both on the airside and landside, to accommodate the forecast demand. In addition, the plan must provide flexibility to meet activity growth beyond the long range planning horizon.

The following chapters will be dedicated to refining concepts presented in this chapter into a final plan, with recommendations to ensure proper implementation and timing for a demand-based program.

05MP03-4M-2/20/06



Hutchison Municipal Airport

Exhibit 4M

LANDSIDE ALTERNATIVE 3

Chapter Five

RECOMMENDED MASTER PLAN CONCEPT

The airport master planning process for Hutchinson Municipal Airport (HUT) has evolved through the development of forecasts of future demand, an assessment of future facility needs, and the evaluation of airport development alternatives to meet those future facility needs. The planning process has included the development of two phase reports which were presented to the Planning Advisory Committee (PAC) and discussed at several coordination meetings and a public information workshop held throughout the study process. The City of Hutchinson has participated in each of these meetings and has been actively involved in the master planning process.

The PAC was comprised of several constituencies with a stake in the Hutchinson Municipal Airport. Groups represented on the PAC included the Federal Aviation Administration (FAA), the City of Hutchinson departments of planning and engineering, airport management, airport traffic control, airport fixed base operators (FBOs), pilot associations, and the chamber of commerce. This diverse group has provided extremely valuable input into this recommended plan.

In the previous chapter, several development alternatives were analyzed to explore options for the future growth and development of Hutchinson Municipal Airport. The development alternatives were refined into a single recommended concept for the master plan. This chapter describes, in narrative and graphic form, the recommended direc-

tion for the future use and development of Hutchinson Municipal Airport.

RECOMMENDED MASTER PLAN CONCEPT

The Recommended Master Plan Concept incorporates elements from each of the airside and landside alternatives presented in the previous chapter. This concept provides the airport with the ability to meet the increasing demands on the airport by larger corporate aircraft, while also providing adequate space for small, general aviation aircraft operators. At the outset of this master planning process, the FAA specifically requested viable solutions to the various runway safety area deficiencies and taxiway AHot Spot@ issues that currently exist at the airport. The Recommended Master Plan Concept, as presented on **Exhibit 5A**, presents an ultimate configuration for the airport that solves the airfield issues while meeting the needs of both the FAA and the City of Hutchinson. A phased program to implement the recommended development configuration will be presented in Chapter Six, Capital Improvement Program.

The following sub-sections will describe the Recommended Master Plan Concept in detail.

AIRFIELD DESIGN STANDARDS

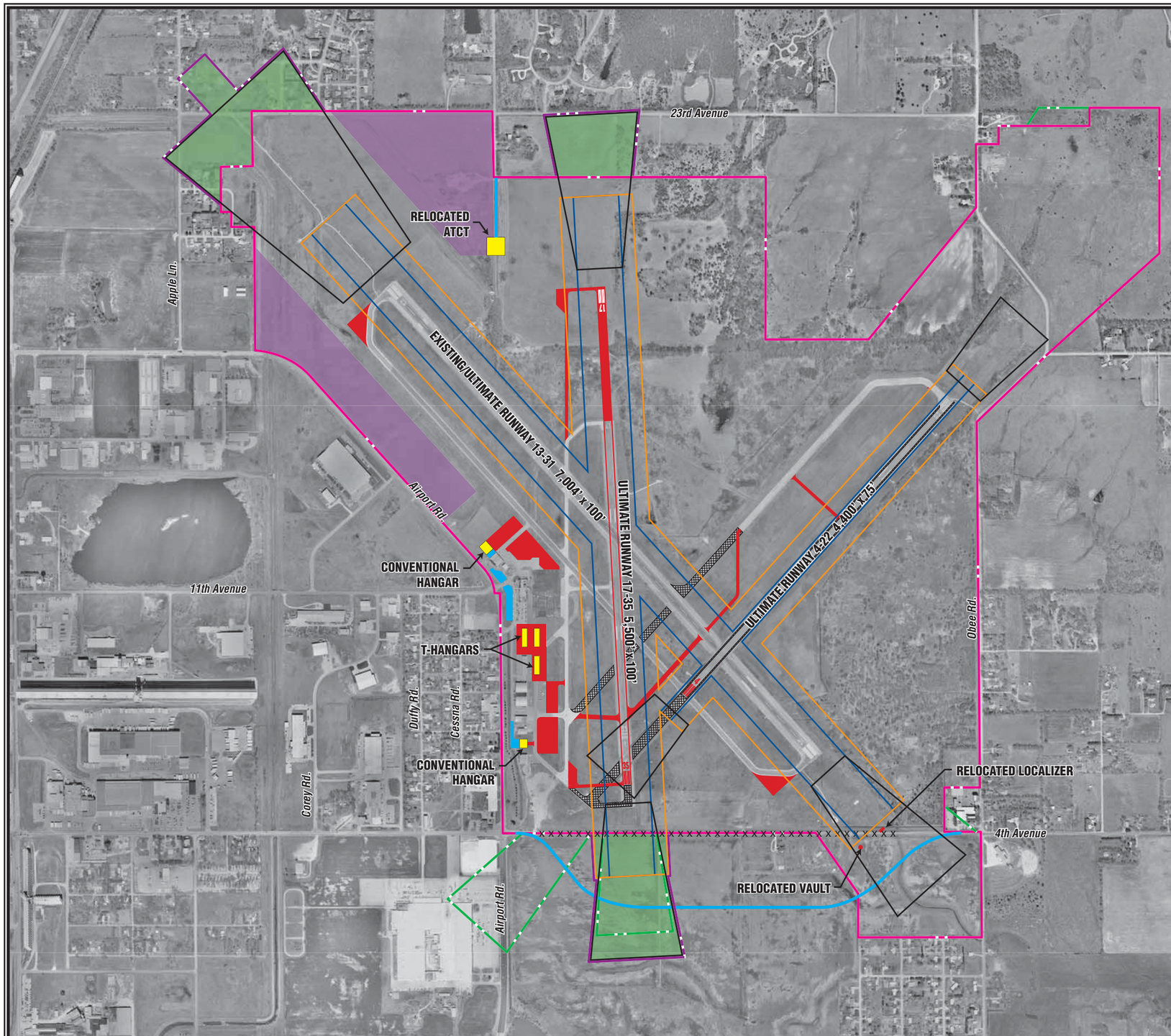
The FAA has established design criteria to define the physical dimensions of runways and taxiways, as well as the imaginary surfaces surrounding them which protect the safe operation of aircraft at the airport. These design standards also define the separation criteria for the placement of landside facilities.

As discussed previously, FAA design criteria primarily center around the airport=s critical design aircraft. The critical aircraft is the most demanding aircraft or family of aircraft which currently, or are projected to, conduct 500 or more operations (take-offs or landings) per year at the airport. Factors included in airport design are an aircraft=s wingspan, approach speed, and, in some cases, the instrument approach visibility minimums for each runway. The FAA has established the Airport Reference Code (ARC) to relate these critical aircraft factors to airfield design standards.

Analysis conducted in Chapter Three, Facility Requirements, concluded that the current critical aircraft is defined by general aviation business jets that fall into ARC C-II (approach speeds less than 120 knots, wingspans less than 79 feet). This category of aircraft includes models such as the Cessna 650, 680, and 750; Falcon 900EX and F-Series; and Hawker 800XP and 1000. Larger business jet aircraft, such as the Gulfstream II, IV, and V and Bombardier Global Express and Learjet 60, also contribute to the current critical aircraft. The master plan anticipates that business jet aircraft using the airport will increase in the future, consistent with national trends and FAA forecasts.

The Hutchinson Municipal Airport is certificated as a Class IV airport under Title 14 Code of Federal Regulations (CFR) Part 139, *Certification and Operations: Land Airports Serving Certain*

05MP03-5A-5/22/06



LEGEND

- Existing Airport Property Line
- Ultimate Airport Property Line
- Existing Easement
- Runway Safety Area (RSA)
- Object Free Area (OFA)
- Runway Protection Zone (RPZ)
- Ultimate Airfield Pavement
- Pavement to be Removed
- Ultimate Road/Parking
- Ultimate Building
- FAA Eligible Property Acquisition
- Revenue Support

RUNWAY 13-31

- Realign 4th Avenue outside ARC C-II RSA and OFA
- Relocate localizer and vault
- Add hold aprons
- Maintain instrument approaches
- Realign perimeter fence
- Acquire residential properties in Runway 13 RPZ

RUNWAY 4-22

- Relocate Runway 4 end 1,600' north to eliminate "hot spot"
- Meet ARC B-II design standards
- Relocate portion of Taxiway C 300' from runway centerline to eliminate "hot spot"

RUNWAY 17-35

- Meet ARC C-II design standards
- Add taxiway to Runway 17 threshold
- One mile approach minimums on future instrument approaches to each end

KEY:

ARC - Airport Reference Code

ATCT - Airport Traffic Control Tower

0 1200
SCALE IN FEET

NORTH

Hutchinson Municipal Airport

Exhibit 5A

RECOMMENDED MASTER PLAN CONCEPT

Air Carriers. This certificate allows the Hutchinson Municipal Airport to accommodate unscheduled operations by aircraft with greater than 30 passenger seats. At times, this can include large transport passenger aircraft diverted from Wichita Mid-Continent Airport or charter aircraft which can fall within ARC C-III (approach speeds less than 120 knots, wingspans up to 118 feet).

To ensure adequate wingtip clearance for these larger aircraft, the master plan assigns ARC C-III as the ultimate design category for Runway 13-31 and its associated taxiways. Planning for ARC C-III will allow the airport to accommodate all business jets on the market today. Moreover, meeting this more stringent design standard, where possible and/or applicable (e.g., runway width, taxiway width, etc.), ensures that Hutchinson Municipal Airport can continue to serve a wide range of aircraft, even on an infrequent basis.

It is not necessary to design all airfield and landside elements to the same design standards. Varying design standards can be applied to other runways and taxiways based upon the role of the runway and the aircraft that frequently use that runway or taxiway. Runway 17-35 presently serves only small aircraft; therefore, this runway can be designed to a lesser design standard. For Runway 17-35, this is ARC B-II (approach speeds less than 90 knots, wingspans up to 79 feet). Runway 4-22 is capable of serving the full mix of business aircraft that serve the airport, so it is presently assigned ARC C-II. The role of Runway 17-35 and Runway 4-22 is planned to change over time as will be discussed later in this chapter. This will change the ultimate design categories for Runway 17-35 from ARC B-II to ARC C-II and Runway 4-22 from ARC C-II to ARC B-II. **Table 5A** summarizes the airport design standards to be applied to the ultimate design of Hutchinson Municipal Airport, as well as a comparison to the current design requirements.

AIRSIDE PLANNING RECOMMENDATIONS

The airside recommendations pertain to meeting the safety standards for the runway and taxiway system. This includes recommendations for the acquisition of adjacent airport property to insure compatible land uses surrounding the airport. The potential for improved instrument approaches is also considered. Of primary consideration are solutions to the runway safety area deficiencies and the taxiway AHot Spot@ issues. The Recommended Master Plan Concept satisfies these goals.

The runway safety areas (RSAs) behind the Runway 4, Runway 35, and Runway 31 ends are obstructed by 4th Avenue and the perimeter fencing and do not meet existing or ultimate design requirements. To meet RSA standards, the Recommended Master Plan Concept considers the relocation of 4th Avenue approximately 800 feet to the south between Airport Road and Obee Road.

Table 5A
Airfield Planning Design Standards (Ultimate)
Hutchinson Municipal Airport

	Runway 13-31		Runway 17-35		Runway 4-22	
	Existing	**Ultimate**	**Existing**	**Ultimate**	**Existing**	**Ultimate**
DESIGN STANDARDS						
Airport Reference Code (ARC)	C-II	C-III	B-II	C-II	C-II	B-II
Lowest Visibility Minimum	1/2 Mile (ILS)	1/2 Mile (ILS/GPS)	1 Mile (GPS)	1 Mile (GPS)	1 Mile (VOR/GPS)	1 Mile (GPS)
Runways						
Length (ft.)	7,004		4,252	5,500	6,000	4,400
Width (ft.)	100		75	100	100	75
Pavement Strength (lbs.)						
SWL	42,000		42,000		42,000	
DWL	52,000		50,000		52,000	
DTWL	76,000		76,000		76,000	
Shoulder Width (ft.)	10	20	10		10	
Runway Safety Area (ft.):						
Width	500		150	500	500	150
Length Beyond Runway End	1,000		300	1,000	1,000	300
Length Prior to Landing	600		300	600	600	300
Object Free Area (ft.):						
Width	800		500	800	800	500
Length Beyond Runway End	1,000		300	1,000	1,000	300
Obstacle Free Zone (ft.):						
Width	400		400		400	
Length Beyond Runway End	200		200		200	
Taxiways (ft.):						
Width	Min 35	Min 50	Min 35		Min 35	
OFA	131	186	131		131	
Centerline to Fixed or Movable Object (ft.):	66	93	66		66	
Runway Centerline to (ft.):						
Parallel Taxiway	400		240	300	300	240
Aircraft Parking	500		250	400	400	250
Building Restriction Line (ft.):						
20 ft. Height Clearance	640		390	640	640	390
35 ft. Height Clearance	745		495	745	745	495
Runway Protection Zone (ft.):	Rwy. 13	Rwy. 31				
Inner Width	1,000	1,000	500	500	500	500
Outer Width	1,750	1,510	700	1,010	1,010	700
Length	2,500	1,700	1,000	1,700	1,700	1,000
14 CFR Part 77 Approach Slope	50:1- Runway 13 34:1 - Runway 31		34:1		34:1	
Approach Slope (TSS)	34:1		20:1		20:1	
Departure Surface	40:1		40:1		40:1	

Source: FAA Advisory Circular 150/5300-13, Airport Design, Change 9
SWL - Single Wheel Loading
DWL - Dual Wheel Loading
DTWL - Dual Tandem Wheel Loading
TSS - Threshold Siting Surface

Beyond the Runway 31 end, shifting 4th Avenue south allows for the relocation of the localizer antenna and associated electrical vault outside of the RSA and object free area (OFA) and full grading of the RSA to standard. These physical improvements allow the airport to maintain the full 7,004 feet of pavement useable for both takeoff and landing in both directions. While consideration was given to implementing declared distances to meet RSA standards beyond the Runway 31 end in the airport development alternatives presented previously in Chapter Four, this would impact existing users of the airport. Most notably, existing military training aircraft from Vance Air Force Base which require the full 7,004 feet of runway length to operate at the airport would no longer be able to use the airport. Therefore, this option was not recommended by the PAC, even though it had no cost to implement and requires no physical changes to the runway. In implementing declared distances, the airport would simply publish limitations on takeoffs and landings on Runway 13 to ensure the RSA is considered in these calculations by pilots. Essentially, declared distances would limit the takeoff and landing distance on Runway13 to 6,674 feet. Since RSA standards are fully met beyond the Runway 13 end, there would be no limitations on the use of Runway 31.

The full relocation of 4th Avenue, as shown on **Exhibit 5A**, is not needed to meet RSA standards beyond the Runway 31 end. Only a portion of 4th Avenue near the Runway 31 end needs to be relocated to meet the Runway 31 RSA standards. Ultimately, the full relocation of 4th Avenue would support the planned upgrade of Runway 17-35 to ARC C-II and the extension to 5,500 feet to serve the full mix of general aviation aircraft using the airport.

The Runway 35 end is planned to be relocated 240 feet to the north. This relocation of the runway end is designed to solve two deficiencies effecting the current Runway 35 pavement end. First, it locates the full 300-foot RSA behind Runway 35 onto existing property, thus removing the perimeter fence and 4th Avenue as RSA penetrations. Second, this would allow Runway 35 to fully conform to approach clearance standards. The existing approach slope to the Runway 35 end is obstructed by 4th Avenue. Federal standards require the approach slope to be located at least 15 feet above 4th Avenue. Presently, there is only a four-foot clearance between 4th Avenue and the approach surface. The runway end relocation to the north will provide for appropriate clearance over 4th Avenue. Approximately 288 feet of length would be added to the Runway 17 end to provide a total length of 4,300 feet on Runway 17-35 in accordance with FAA runway length recommendations for ARC B-II.

As mentioned previously, Runway 17-35 is planned to an ultimate length of 5,500 feet and upgraded from ARC B-II to ARC C-II. This upgrade would allow the airport to maintain two runways capable of serving the critical design aircraft. This would also allow the airport to remain operational during periods when the primary runway (Runway 13-31) may be closed for maintenance or other operational reasons. Runway 17-35 is also best oriented into the prevailing winds at the airport. Therefore, this

runway should be capable of accommodating the mix of aircraft that use the airport. Upgrading and extending Runway 17-35 allows the airport to meet this planning goal as well as replace the back-up capability lost with the shortening of Runway 4-22 to 4,400 feet to meet design requirements. This will be discussed in greater detail later in this chapter.

The improvements to Runway 17-35 would be a shared expense between the FAA and the City of Hutchinson. The FAA has indicated that they will provide grant funding for Runway 17-35 to the ARC B-II standards (4,300 feet long, 75 feet wide). This is the length and width necessary to assure minimum wind coverage requirements at the airport. According to FAA standards, a fully capable back-up runway is not required at a general aviation airport such as Hutchinson Municipal Airport. Therefore, the extension of Runway 17-35 to 5,500 feet and widening to 100 feet to meet ARC C-II standards is the full responsibility of the City of Hutchinson. The maintenance of the runway beyond 4,300 feet long and 75 feet wide would also be the responsibility of the City of Hutchinson. The extension and upgrade of Runway 17-35 will require the acquisition of approximately 39 acres to the south and 16 acres to the north to protect the ultimate RPZs from incompatible development and accommodate the ultimate RSA and OFA beyond the Runway 35 end on airport property.

Some land acquisition will be necessary to facilitate the relocation of 4th Avenue, as shown on **Exhibit 5A**. The portion of that land intended for direct airside use (i.e., the RSA, OFA and RPZ serving Runway 35), approximately 39 acres, would be eligible for FAA grant funding. The remaining land between a relocated 4th Avenue and the existing airport boundary (approximately 70 acres) would not be grant eligible. Therefore, should the City of Hutchinson desire that this land become part of the airport property, the acquisition would need to be funded entirely by the City of Hutchinson.

The RSA issues concerning Runway 4-22 are significant. Nearly all of the RSA beyond Runway 4 extends off airport property. A portion of the OFA extends across Airport Road south of 4th Avenue. In addition, the RPZ serving Runway 4 extends over two light industrial buildings, which are not compatible with RPZ standards.

Runway 4-22 is not eligible for FAA funding. According to FAA standards, only Runway 13-31 and Runway 17-35 are needed to meet FAA minimum wind coverage standards for all aircraft. Therefore, the FAA considers Runway 4-22 in excess of standard requirements, discontinuing funding improvements. That means that all of the costs associated with the maintenance and upgrades to Runway 4-22 are the responsibility of the City of Hutchinson. The City has obtained grant assistance from the Kansas Department Transportation (KDOT) in the past to assist in funding improvements to this runway.

The role of Runway 4-22 was discussed at length with the PAC during the review of the airport development alternatives. Members of the PAC stressed the importance to maintain Runway 4-

22 for small general aviation aircraft which are more susceptible to crosswind conditions. Therefore, the PAC did not support closing Runway 4-22. However, the PAC did support a reduction in design category and shortening of length to allow Runway 4-22 to fully meet FAA design standards, reduce future maintenance costs to the City, and still allow for Runway 4-22 to remain operational during those periods when the wind is aligned with this runway. Therefore, the Recommended Master Plan Concept includes shortening Runway 4-22 to 4,400 feet and reducing the width to 75 feet to meet ARC B-II design standards for small general aviation aircraft.

While the Recommended Master Plan Concept reduces Runway 4-22 to 75 feet to meet FAA ARC B-II design standards, the decision to ultimately reduce the width will need to be made by the City at the time of construction. The cost to reduce the pavement width must be compared against the cost to relocate the pavement edge lighting since these lights must be located at a prescribed distance from the runway edge. Should the lighting costs be more than the cost to remove pavement, then the City may elect to maintain the full 100-foot width of Runway 4-22.

By changing the role and length of Runway 4-22, a number of safety area and AHot Spot@ issues can be solved. Since the full 6,000-foot length of Runway 4-22 is not needed to serve ARC B-II aircraft, the Runway 4 end can be relocated 1,600 feet northeast to allow for the RSA, OFA, and RPZ to be located on existing airport property and clear of obstructions. This also solves one of the taxiway AHot Spot@ issues. The aircraft hold lines on Taxiway B2 prior to Runway 35 and Runway 4 overlap, causing pilot confusion and potential aircraft incursions into the RSA. Relocating the Runway 4 threshold to the intersection with Taxiway A completely eliminates this "Hot Spot."

The remaining AHot Spot@ issue involves the intersection of Taxiway C with Taxiway A near Runway 17-35. Taxiway C serves Runway 4-22 but is also used as an exit for aircraft landing on Runway 13-31. As aircraft are traveling on Taxiway C from the northeast to the southwest, the hold line for Runway 17-35 is located prior to Taxiway A. Since hold lines are associated with runways, pilots may be confused and proceed looking for the hold line after passing Taxiway A. Once a pilot passes Taxiway A looking for the hold line for Runway 17-35, they have already caused a runway incursion.

To solve this "Hot Spot" issue, a portion of Taxiway C is relocated, as depicted on **Exhibit 5A**. Taxiway C is currently located 600 feet from Runway 4-22. This distance exceeds design standards. By shifting a portion of Taxiway C to 300 feet from Runway 4-22, the proper holdline location can be marked on Taxiway A prior to Runway 17-35.

While the whole length of Taxiway C would ideally be relocated to 300 feet from Runway 4-22, only a portion of Taxiway C is relocated to reduce the cost of construction to the City. While the relocation of Taxiway C is eligible for FAA grants since it solves an FAA identified safety issue, the relocation of the remaining portions of Taxiway C would be the sole responsibility of the

City since the FAA does not support funding of Runway 4-22.

A new exit taxiway is also planned midway between Runway 13-31 and the Runway 22 end. This new exit taxiway would allow aircraft to exit Runway 4-22 without needing to taxi completely to the Runway 22 end when landing Runway 4. This would also eliminate the need to back-taxi as is a common practice now.

The capability of instrument approaches to all runway ends has been considered. The Category I ILS serving Runway 13 should be maintained with current visibility and cloud height ceilings. Instrument approaches providing for one mile visibility minimums serve Runways 31, 4, and 22. These approach minimums should maintained and redesigned when the runways are improved. Instrument approaches with one mile visibility minimums, likely GPS, are considered for each end of Runway 17-35.

The final airside issue addressed in the Recommended Master Plan Concept is the acquisition of those portions of the Runway 13 RPZ that extend beyond airport property. This includes the acquisition of approximately 25 acres of land and 13 residential home sites following FAA guidelines for compatible land uses within the RPZ.

LANDSIDE PLANNING RECOMMENDATIONS

The primary goal of landside facility planning is to provide adequate aircraft storage space to meet the forecast need while also maximizing operational efficiencies and land uses. Achieving this goal yields a development scheme which segregates aircraft activity levels while maximizing the airport=s revenue potential. **Exhibit 5A** depicts the recommended landside development plan for the airport.

In Chapter Three, Aviation Demand Forecasts, the addition of one new based aircraft per year through the 20-year scope of the plan was projected. To accommodate this growth, the addition of some aircraft storage facilities is necessary.

The recommended landside plan includes the addition of conventional hangars to the north and south of the existing terminal area. Three eight-unit T-hangar structures are added to the vicinity of the existing T-hangar facility to group similar uses together and limit the interaction of large and small aircraft. Apron expansion is considered for both the existing main apron area located adjacent to the terminal building and the public apron area serving the high-activity FBO areas to the south of the terminal building.

The landside plan also includes the relocation of the airport traffic control tower (ATCT) to the north side of Runway 13-31, west of Runway 17-35. The existing tower was constructed in the 1950s and is costly for the City to maintain. The current ATCT location on top of the terminal building also restricts potential landside development. To maintain a clear line-of-sight to all runways and taxiways, the location of the current ATCT severely limits the location and height of buildings located north of the terminal area.

Two sites for the replacement ATCT were considered. The first was between Runway 17-35 and 4-22, in the general vicinity of the existing segmented circle. The second site is between Runways 17-35 and 13-31, which was selected primarily due to its proximity to infrastructure. Any new ATCT will likely be the financial responsibility of the City of Hutchinson, so construction costs were heavily weighted in the location choice. Should the City pursue the construction of a relocated ATCT on their own, a formal site selection study should be undertaken prior to a final site determination.

Two areas for revenue enhancement have been reserved on airport property. The areas are in excess of actual aviation needs; therefore, this property could be used for the development of commercial or industrial uses. The City already markets the land located along Airport Road north of the terminal building for these types of uses. An area along 23rd Avenue is also reserved for this purpose, as shown on **Exhibit 5A**. It should be noted that should the City consider the use of these portions of the airport for non-aeronautical uses, the City would need to obtain a release from grant assurances from the FAA prior to development. All revenue generated on the airport would also need to be dedicated to the airport. Furthermore, should the City consider placing other municipal operations on the airport not related to aviation, the City would need to ensure the airport fund is paid fair market value for the land used by the other municipal operation.

NOISE EXPOSURE ANALYSIS

Aircraft sound emissions are often the most noticeable environmental effect an airport will produce on the surrounding community. If the sound is sufficiently loud or frequent in occurrence, it may interfere with various activities or otherwise be considered objectionable.

To determine the noise-related impacts that the proposed development could have on the environment surrounding Hutchinson Municipal Airport, noise exposure patterns were analyzed for both existing airport activity conditions and projected long term activity conditions.

The basic methodology employed to define aircraft noise levels involves the use of a mathematical model for aircraft noise predication. The Yearly Day Night Average Sound Level (DNL) is used in this study to assess aircraft noise. DNL is the metric currently accepted by the FAA, Environmental Protection Agency (EPA), and Department of Housing and Urban Development (HUD) as an appropriate measure of cumulative noise exposure. These three federal agencies

have each identified the 65 DNL noise contour as the threshold of incompatibility, meaning that noise levels below 65 DNL are considered compatible with underlying land uses.

DNL is defined as the average A-weighted sound level as measured in decibels (dB) during a 24-hour period. A 10-dB penalty applies to noise events occurring at night (10:00 p.m. to 7:00 a.m.). DNL is a summation metric which allows objective analysis and can describe noise exposure comprehensively over a large area. Most federally funded airport noise studies use DNL as the primary metric for evaluating noise.

Since noise decreases at a constant rate in all directions from a source, points of equal DNL noise levels are routinely indicated by means of a contour line. The various contour lines are then superimposed on a map of the airport and its environs. It is important to recognize that a line drawn on a map does not imply that a particular noise condition exists on one side of the line and not on the other. DNL calculations do not precisely define noise impacts. Nevertheless, DNL contours can be used to: (1) highlight existing or potential incompatibilities between an airport and any surrounding development; (2) assess relative exposure levels; (3) assist in the preparation of airport environs land use plans; and (4) provide guidance in the development of land use control devices, such as zoning ordinances, subdivision regulations, and building codes.

The noise contours for Hutchinson Municipal Airport have been developed from the Integrated Noise Model (INM), Version 6.1. The INM was developed by the Transportation Systems Center of the U.S. Department of Transportation at Cambridge, Massachusetts, and has been specified by the FAA as one of the two models acceptable for federally-funded noise analysis.

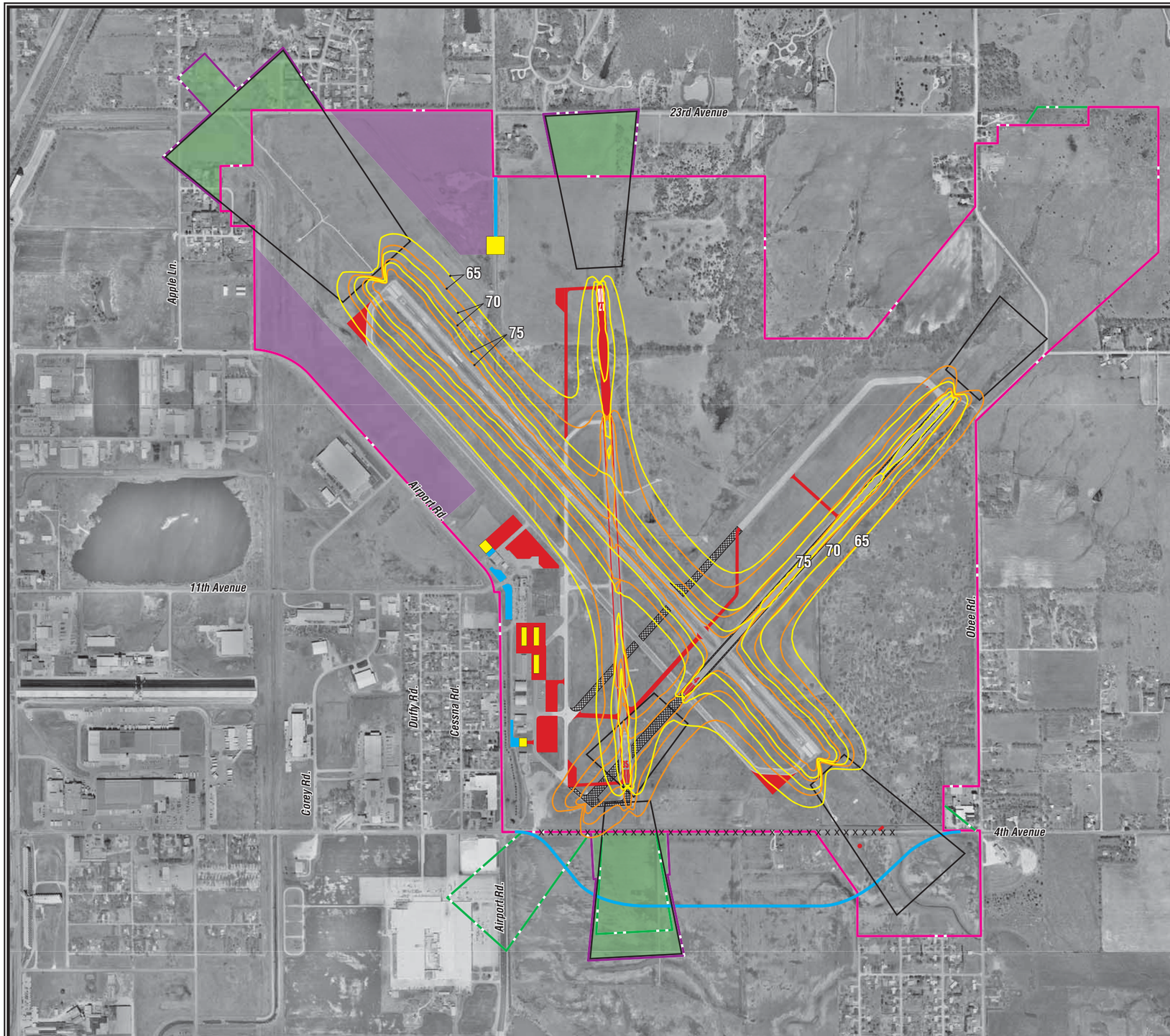
The INM is a computer model which accounts for each aircraft along flight tracks during an average 24-hour period. These flight tracks are coupled with separate tables contained in the database of the INM, which relate to noise, distances, and engine thrust for each make and model of aircraft type selected.

Computer input files for the noise analysis contain operational data, runway utilization, aircraft flight tracks, and fleet mix as projected in the plan. The operational data and aircraft fleet mix are summarized in **Table 5B**. These estimates were derived after review of instrument flight plans maintained by the FAA and existing airport records.

The runway use percentages are summarized in **Table 5C**.

The aircraft noise contours generated using the aforementioned data for Hutchinson Municipal Airport are depicted on **Exhibit 5B**. In the current condition a small portion of the 65 DNL crosses 4th Avenue just south of the Runway 4 pavement end. However, no incompatible development is located within the 65 DNL contour. In the future, none of the noise contours leave airport property.

05MP03-5B-5/22/06



LEGEND

- Existing Airport Property Line
- Ultimate Airport Property Line
- Existing Easement
- Runway Protection Zone (RPZ)
- Ultimate Airfield Pavement
- Pavement to be Removed
- Ultimate Road/Parking
- Ultimate Building
- FAA Eligible Property Acquisition
- Revenue Support
- 2006 DNL Noise Contour
- Ultimate Day-night Noise Level (DNL) Noise Contour

0 1200
SCALE IN FEET

NORTH

Hutchinson Municipal Airport

Exhibit 5B

AIRCRAFT NOISE EXPOSURE CONTOURS

TABLE 5B
Noise Model Input: Aircraft Operations
Hutchinson Municipal Airport

Operations By Type	Single Engine	Multi-Engine	Turboprop	Turbojet	Helicopter	Totals
Existing Conditions						
Local	21,063	547	1,269	3,173	0	26,053
Itinerant	21,063	2,188	1,466	3,392	547	28,657
Total	42,126	2,735	2,735	6,565	547	54,710
Long Term Conditions						
Local	35,990	820	1,968	4,920	0	43,698
Itinerant	27,150	3,280	2,132	4,920	820	38,302
Total	63,140	4,100	4,100	9,840	820	82,000

Source: Coffman Associates Analysis

TABLE 5C
Noise Model Input: Runway Use Percentages
Hutchinson Municipal Airport

	RUNWAY					
	13	31	4	22	17	35
Existing						
General Aviation (non-turbine or prop)	25.0%	20.0%	15.0%	15.0%	12.5%	12.5%
Turbine and Turboprop	36.0%	28.0%	18.0%	18.0%	0.0%	0.0%
Long Term						
General Aviation (non-turbine or prop)	25.0%	20.0%	15.0%	15.0%	12.5%	12.5%
Turbine and Turboprop	36.0%	28.0%	0.0%	0.0%	18.0%	18.0%

Source: Coffman Associates analysis

ENVIRONMENTAL EVALUATION

A review of the potential environmental impacts associated with proposed airport projects is an essential consideration in the Airport Master Plan process. The primary purpose of this Environmental Evaluation is to review the proposed improvement program for Hutchinson Municipal Airport to determine whether the proposed actions could, individually or collectively, have the potential to significantly impact the quality of the environment.

Construction of the improvements proposed in the master plan require compliance with the *National Environmental Policy Act* (NEPA) *of 1969*, as amended, to receive federal financial assistance. For projects not "categorically excluded" under FAA Order 1050.1E, *Environmental Impacts: Policies and Procedures*, compliance with NEPA is generally satisfied through the preparation of an Environmental Assessment (EA). In instances in which significant environmental impacts are expected, an Environmental Impact Statement (EIS) may be required. While this portion of the master plan is not designed to satisfy the NEPA requirements for a categorical exclusion, EA, or EIS, it is intended to supply a preliminary review of environmental issues that would need to be analyzed in more detail within the NEPA process.

This evaluation, presented in **Table 5D**, considers all environmental categories required for the NEPA process as outlined in FAA Order 1050.1E and Order 5050.4B, *National Environmental Policy Act Implementing Instructions for Airport Actions*.

TABLE 5D
Environmental Evaluation

Environmental Resource	Potential Resource Impacts
Air Quality. The U.S. Environmental Protection Agency (EPA) has adopted air quality standards that specify the maximum permissible short-term and long-term concentrations of various air contaminants. The National Ambient Air Quality Standards (NAAQS) consist of primary and secondary standards for six criteria pollutants which include: Ozone (O3), Carbon Monoxide (CO), Sulfur Dioxide (SO_2), Nitrogen Dioxide (NO_2), Particulate matter (PM10 and PM 2.5), and Lead (Pb). Potentially significant air quality impacts, associated with an FAA project or action, would be demonstrated by the project or action exceeding one or more of the NAAQS for any of the time periods analyzed. Various levels of review apply within both NEPA and permit requirements.	• Hutchinson Municipal Airport is located in Reno County, which is in attainment for all criteria pollutants.
Coastal Resources. Federal activities involving or affecting coastal resources are governed by the Coastal Barriers Resource Act (CBRA), the Coastal Zone Management Act (CZMA), and Executive Order 13089, Coral Reef Protection.	• No impacts. The airport is not located within a Coastal Management Zone or Coastal Barrier Area.
Compatible Land Use. The compatibility of existing and planned land uses in the vicinity of an airport is usually associated with the extent of the airport's noise impacts. Typically, significant impacts will occur over noise-sensitive areas within the 65 DNL noise contour.	• Noise contours prepared for Hutchinson Municipal Airport indicate that no noise-sensitive development is contained within either the existing or the ultimate 65 DNL noise contours.
Construction Impacts. Construction impacts typically relate to the effects on specific impact categories, such as air quality or noise, during construction.	• The use of best management practices (BMPs) during construction is a requirement of construction-related permits such as an NPDES permit. Use of these measures typically alleviates potential resource impacts. • With the proposed improvements to the existing hangar area, some construction-related noise may impact the properties west of the construction site.

TABLE 5D (Continued) Environmental Evaluation	
Environmental Resource	**Potential Resource Impacts**
Department of Transportation Act, Section 4(f). A significant impact would occur when a proposed action involves more than a minimal physical use of a section 4(f) property, (publicly owned land from a public park, recreation area, or wildlife and waterfowl refuge of national, state, or local significance, or any land from a historic site of national, state, or local significance) or is deemed a "constructive use" substantially impairing the 4(f) property where mitigation measures do not reduce or eliminate the impacts. Substantial impairment would occur when impacts to section 4(f) lands are sufficiently serious that the value of the site in terms of its prior significance and enjoyment are substantially reduced or lost.	• There are no known Section 4(f) resources within the airport environs. The proposed airport improvements will not impact any public parks, recreation areas, or wildlife and waterfowl refuges.
Farmlands. Under the *Farmland Protection Policy Act* (FPPA), federal agencies are directed to identify and take into account the adverse effects of federal programs on the preservation of farmland, to consider appropriate alternative actions which could lessen adverse effects, and to assure that such federal programs are, to the extent practicable, compatible with state or local government programs and policies to protect farmland. The FPPA guidelines apply to farmland classified as prime or unique, or of state or local importance as determined by the appropriate government agency, with concurrence by the Secretary of Agriculture.	• Although prime or unique farmland soils are present on airport property, these areas are dedicated to public use; therefore, FPPA guidelines do not apply. • Properties proposed for acquisition also contain prime or unique farmland soil; however, FPPA guidelines likely will not apply due to the urbanization of the area.
Fish, Wildlife, and Plants. The U.S. Fish and Wildlife Service (FWS) and the National Marine Fisheries Service (NMFS) determines that a significant impact will result when the proposed action would likely jeopardize the continued existence of a species in question, or would result in the destruction or adverse modification of federally designated critical habitat in the area. Lesser impacts, as outlined by agencies and organizations having jurisdiction, may result in a significant impact.	• According to the U.S. Fish and Wildlife Service, Reno County contains habitat for four species listed as threatened, endangered, or candidate species. These are the Arkansas Darter, Bald Eagle, Interior Least Tern, and the Whooping Crane. Consultation with the U.S. Fish and Wildlife Service will be needed to determine potential impacts to any of these species prior to any development. A Biological Assessment may be requested.

TABLE 5D (Continued) Environmental Evaluation	
Environmental Resource	**Potential Resource Impacts**
Floodplains. Significant impacts to floodplains occur when a proposed action results in notable adverse impacts on natural and beneficial 100-year floodplain values.	• According to the Federal Emergency Management Agency (FEMA) Federal Insurance Rate Maps (FIRM), the airport is located primarily in Zone X, which is a 500-year floodplain. • However, portions of airport property are classified as Zone A; this zone represents a special flood hazard area inundated by a 100-year flood. Zone A areas which will not be impacted by any proposed projects within the master plan include the area west of the existing T-hangars and the area north of the Runway 13-31 and Runway 4-22 intersection. These floodplains will not likely be impacted. • The remaining Zone A area is also the site of the planned airport industrial park. Should this site be developed, further analysis and floodplain use permits may be required.
Hazardous Materials, Pollution Prevention, and Solid Waste. The airport must comply with applicable pollution control statutes and requirements. Impacts may occur when changes to the quantity or type of solid waste generated, or type of disposal, differ greatly from existing conditions.	• A former military landfill that has reached capacity is located on the southeastern portion of airport property. This site is classified as a Superfund site by the Environmental Protection Agency (EPA); however, no airport developments are proposed to occur on this site.
Historical, Architectural, Archaeological, and Cultural Resources. Impacts may occur when the proposed project causes an adverse effect on a property which has been identified (or is unearthed during construction) as having historical, architectural, archaeological, or cultural significance.	• An online search of the National Register of Historic Places did not identify any historic resources that would be affected by the proposed airport improvements. • Further coordination with the State Historic Preservation Officer (SHPO) will be needed to determine field survey requirements for those areas proposed for development which have not been previously disturbed, such as the extension to Runway 17-35.
Light Emissions and Visual Impacts. Impacts occur when lighting associated with an action will create an annoyance among people in the vicinity or interfere with their normal activities. Aesthetic impacts relate to the extent that the development contrasts with the existing environment and whether the jurisdictional agency considers this contrast objectionable.	• Planned airport development will likely result in a less-than-significant impact to light emissions. • Properties located west of the airport's hangars have the potential to be affected by increased light emissions and visual impacts due to the planned improvements in this area.
Natural Resources and Energy Supply. In instances of major proposed actions, power companies or other suppliers of energy will need to be contacted to determine if the proposed project demands can be met by existing or planned facilities.	• Planned airport development will likely result in a less-than significant impact to energy supply and natural resources. Impacts are a result of increased operations and upgraded facilities.

TABLE 5D (Continued) Environmental Evaluation	
Environmental Resource	**Potential Resource Impacts**
Noise. The Yearly Day-Night Average Sound Level (DNL) is used in this study to assess aircraft noise. DNL is the metric currently accepted by the Federal Aviation Administration (FAA), Environmental Protection Agency (EPA), and Department of Housing and Urban Development (HUD) as an appropriate measure of cumulative noise exposure. These three agencies have each identified the 65 DNL noise contour as the threshold of incompatibility.	• Noise contours were prepared for Hutchinson Municipal Airport. The existing and ultimate 65 DNL noise contours remain on airport property; therefore, no noise-sensitive developments will be impacted.
Secondary (Induced) Impacts. These impacts address those secondary impacts to surrounding communities resulting from the proposed development, including shifts in patterns of population growth, public service demands, and changes in business and economic activity to the extent influenced by airport development.	• Significant shifts in patterns of population movement or growth, or public service demands are not anticipated as a result of the proposed development. It could be expected, however, that the proposed development would potentially induce positive socioeconomic impacts for the community over a period of years. The airport, with expanded facilities and services, would be expected to attract additional users. It is also expected to encourage tourism, industry, and trade and to enhance the future growth and expansion of the community-s economic base. Future socioeconomic impacts resulting from the proposed development would be primarily positive in nature.
Socioeconomic Impacts, Environmental Justice, and Children's Environmental Health and Safety Risks. Impacts occur when disproportionately high and adverse human health or environmental effects occur to minority and low-income populations; disproportionate health and safety risks occur to children; and extensive relocation of residents, businesses, and disruptive traffic patterns are experienced.	• The proposed project includes the acquisition of approximately 13 homes and no businesses. It is anticipated that this acquisition will result in minimal disruption to the established community. The final acquisition plan will need to be refined to ensure minimal impacts to the established neighborhood. • All property acquisition must comply with the *Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970* (URARPAPA).
Water Quality. Water quality concerns associated with airport expansion most often relate to domestic sewage disposal, increased surface runoff and soil erosion, and the storage and handling of fuel, petroleum, solvents, etc.	• The airport will need to comply with current NPDES operations permit requirements. • With regard to construction activities, the airport and all applicable contractors will need to obtain and comply with the requirements and procedures of the construction related NPDES General Permit, including the preparation of a *Notice of Intent* and a *Stormwater Pollution Prevention Plan*, prior to the initiation of product construction activities.

TABLE 5D (Continued) Environmental Evaluation	
Environmental Resource	**Potential Resource Impacts**
Wetlands. Wetlands are defined by Executive Order 11990, *Protection of Wetlands*, as those areas that are inundated by surface or groundwater with a frequency sufficient to support, and under normal circumstances, does or would support a prevalence of vegetation or aquatic life that requires saturated or seasonally saturated soil conditions for growth and reproduction.	• Freshwater emergent wetlands do exist on airport property; these are located near the existing Runway 17 end. Coordination with the U.S. Army Corps of Engineers and further wetland studies will be required prior to any development in these areas. • Freshwater emergent wetlands are also located near the EPA Superfund site; however, this area will not be impacted by proposed projects.
Wild and Scenic Rivers. Wild and scenic rivers (WSR) are designated by the Wild and Scenic River Act. A National Rivers Inventory (NRI) is maintained to identify those river segments which are protected under this act.	• No impacts. The airport is not located near any designated wild and scenic rivers.

SUMMARY

The recommended master plan concept has been developed in conjunction with the Planning Advisory Committee, airport management, and numerous City officials and is designed to assist in making decisions on future development and growth of Hutchinson Municipal Airport. This plan provides the necessary development to accommodate and satisfy the anticipated growth over the next 20 years and beyond.

Flexibility will be very important to future development at the airport. Activity projected over the next 20 years may not occur as predicted. The plan has attempted to consider demands that may be placed on the airport even beyond the 20-year planning horizon to ensure that the facility will be capable of handling a wide range of circumstances. The recommended plan provides the airport stakeholders with a general guide that, if followed, can maintain the airport=s long term viability and allow the airport to continue to provide air transportation service to the region.

Chapter Six

CAPITAL IMPROVEMENT PROGRAM

The analyses completed in previous chapters evaluated development needs at the airport over the next 20 years and beyond, based on forecast activity and operational efficiency. Next, basic economic, financial, and management rationale is applied to each development item so that the feasibility of each item contained in the plan can be assessed.

The presentation of the capital improvement program has been organized into three sections. First, the airport development schedule is presented in narrative and graphic form. Second, cost estimates are presented for the development schedule in current U.S. dollars. Third, capital improvement funding sources on the federal, state, and local levels are identified and discussed.

AIRPORT DEVELOPMENT SCHEDULES AND COST SUMMARIES

Once the specific needs and improvements for the airport have been established, the next step is to determine a realistic schedule and the associated costs for implementing the plan. This section will examine the overall cost of each item in the development plan and present a development schedule. The recommended improvements are grouped by planning horizon: short term, intermediate term, and long term. **Table 6A** summarizes the key milestones for each of the three planning horizons.

TABLE 6A
Planning Horizon Milestone Summary
Hutchinson Municipal Airport

	2004	Short Term	Intermediate Term	Long Term
ANNUAL OPERATIONS				
Total Itinerant	27,257	31,100	34,200	38,700
Total Local	27,453	33,000	36,100	43,300
Total Operations	54,710	64,100	70,300	82,000
BASED AIRCRAFT				
Single Engine	25	29	33	42
Multi-Engine	10	10	10	10
Turboprop	2	3	4	5
Jet	2	3	4	5
Helicopter/Other	2	2	2	3
Total Based Aircraft	**41**	**47**	**53**	**65**
Total Annual Instrument Approaches (AIAs)	191	492	624	892

A key aspect of this planning document is the use of demand-based planning milestones. The short term planning horizon contains items of highest priority. These items should be considered for development based on actual demand levels within the next five years. As short term horizon activity levels are reached, it will then be time to program for the intermediate term based upon the next activity milestones. Similarly, when the intermediate term milestones are reached, it will be time to program for the long term activity milestones.

Many development items included in the recommended concept will need to follow demand indicators. For example, the plan includes construction of new hangar aprons and taxilanes. Based aircraft will be the indicator for additional hangar needs. If based aircraft growth occurs as projected, additional hangars will need to be constructed to meet the demand.

If growth slows or does not occur as projected, hangar pavement projects can be delayed. As a result, capital expenditures will be undertaken as needed, which leads to a responsible use of capital assets. Some development items do not depend on demand, such as pavement maintenance. These types of projects typically are associated with day-to-day operations and should be monitored and identified by airport management.

As a master plan is a conceptual document, implementation of these capital projects should only be undertaken after further refinement of their design and costs through architectural and engineering analyses. Moreover, some projects may require extensive infrastructure improvements (i.e., replacement airport traffic control tower [ATCT]) which requires further studies at the time of implementation.

The cost estimates presented in this chapter have been increased to allow for contingencies that may arise on the project. Capital costs presented here should be viewed only as estimates subject to further refinement during design. Nevertheless, these estimates are considered sufficiently accurate for planning purposes. Cost estimates for each of the development projects listed in the capital improvement plan are listed in current (2006) dollars. **Exhibit 6A** presents the proposed capital program for Hutchinson Municipal Airport (HUT).

SHORT TERM IMPROVEMENTS

The proposed capital improvement program (CIP) has been divided into three segments: short, intermediate, and long term. The short term planning horizon CIP centers around several needs of the airport projected for the next five years. The largest cost items in the short term planning horizon center around the resolution of the runway safety area (RSA) deficiencies and the taxiway "Hot Spot" issues.

The first year of the CIP considers projects that may be accomplished in the 2007 federal funding cycle (October 2006 to September 2007). The first project is the commission of a formal land use study to focus on the potential acquisition of those properties in the Runway 13 runway protection zone (RPZ). As previously stated, residential housing is considered an incompatible land use within the RPZ. The FAA supports planning to purchase any facilities that attract the assembly of people in the RPZ. The study should prioritize land acquisition and provide financial methodologies for that acquisition.

The remaining items in the first year CIP pertain to various on-going maintenance projects. Taxiway A, parallel to primary Runway 13-31, is in need of a slurry seal. Runway 13-31 is in need of milling and an asphalt overlay and the re-application of precision runway markings. The runway markings on Runway 17-35 are in poor condition and should be re-applied to comply with the airport's Part 139 Certificate. The terminal building is 55 years old and is in need of replacement water and sewer lines.

Fiscal year 2008 CIP projects begin to solve the RSA deficiency and the taxiway "Hot Spot" issues. The first project is to relocate a portion of 4th Avenue in order to provide the full RSA beyond the Runway 31 end for aircraft departing Runway 13. As part of this project, the localizer antenna and associated electrical vault will also have to be relocated along with portions of the perimeter fencing.

The next item is the commencement of property acquisition in the Runway 13 RPZ. This acquisition is considered a short term need and is divided into the last four years of the short term CIP. The acquisition of all property in the RPZ is estimated at $1.3 million. The first three years of the CIP assume $260,000 for property acquisition, and the last year assumes a lump sum of

$520,000. Although this figure is considered appropriate for planning purposes, it will need to be revised based upon the land use study previously recommended. The final project of the 2008 CIP is the repair and upgrade of the airport maintenance building. This is an original building to the airport and it is in a state of disrepair.

The third year of the CIP (2009) includes resolution to the RSA deficiency beyond the Runway 4 end and the "Hot Spot" issues between Runway 4 and 35. To accomplish this, the Runway 4 end is relocated approximately 1,600 feet northeast to Taxiway A. This allows the RSA, OFA, and RPZ to be located on existing airport property and to be clear of obstructions. All pavement behind the Runway 4 end would be removed as it would no longer be needed to serve the new role of Runway 4-22. This development essentially changes the role of Runway 4-22 from serving the full mix of aircraft at the airport to serving only small general aviation aircraft. Since the City has the full responsibility to fund the maintenance and improvements to Runway 4-22, reducing the role also reduces future maintenance costs for the City.

This project reduces Runway 4-22 from 6,000 feet to 4,400 feet as presented on **Exhibit 6B**. The Runway 4 runway end identifier lights (REILs) and visual approach slope indicators (VASI) would be relocated to the new Runway 4 end. The City may also consider reducing the runway to 75 feet wide at this time since the runway would only be used by small aircraft. However, reducing the width should be compared against the cost to relocate the pavement edge lighting which must be located at a prescribed distance from the runway edge. Should the cost to relocate the lighting be more than the cost to remove the pavement, the City may desire to maintain the 100-foot width on Runway 4-22. Since this adjustment to the runway configuration is being undertaken to solve safety deficiencies identified by the FAA, this project is FAA- eligible. The reduction in width would be the sole responsibility of the City. Runway 13 RPZ property acquisition is also included in the third year of the CIP.

Currently, the RSA on the approach end of Runway 35 is penetrated by the perimeter fence and 4th Avenue. In addition, the approach slope to the runway end is penetrated by vehicles on 4th Avenue. To solve both problems, the Runway 35 end is recommended to be shifted 240 feet north in 2010. An additional 52 feet of pavement is added at the Runway 17 end to bring the total runway length to 4,300 feet. This is the length recommended by the FAA for a crosswind runway serving small aircraft.

The Runway 35 RPZ would be purchased in fee simple at this time. The Runway 35 RPZ encompasses approximately 39 acres beyond airport property. Currently, there is an airport-owned avigation easement in this area but only the fee simple ownership will guarantee compatible land uses in the RPZ. Runway 13 RPZ property acquisition also continues in this year.

05MP03-6A-6/15/06

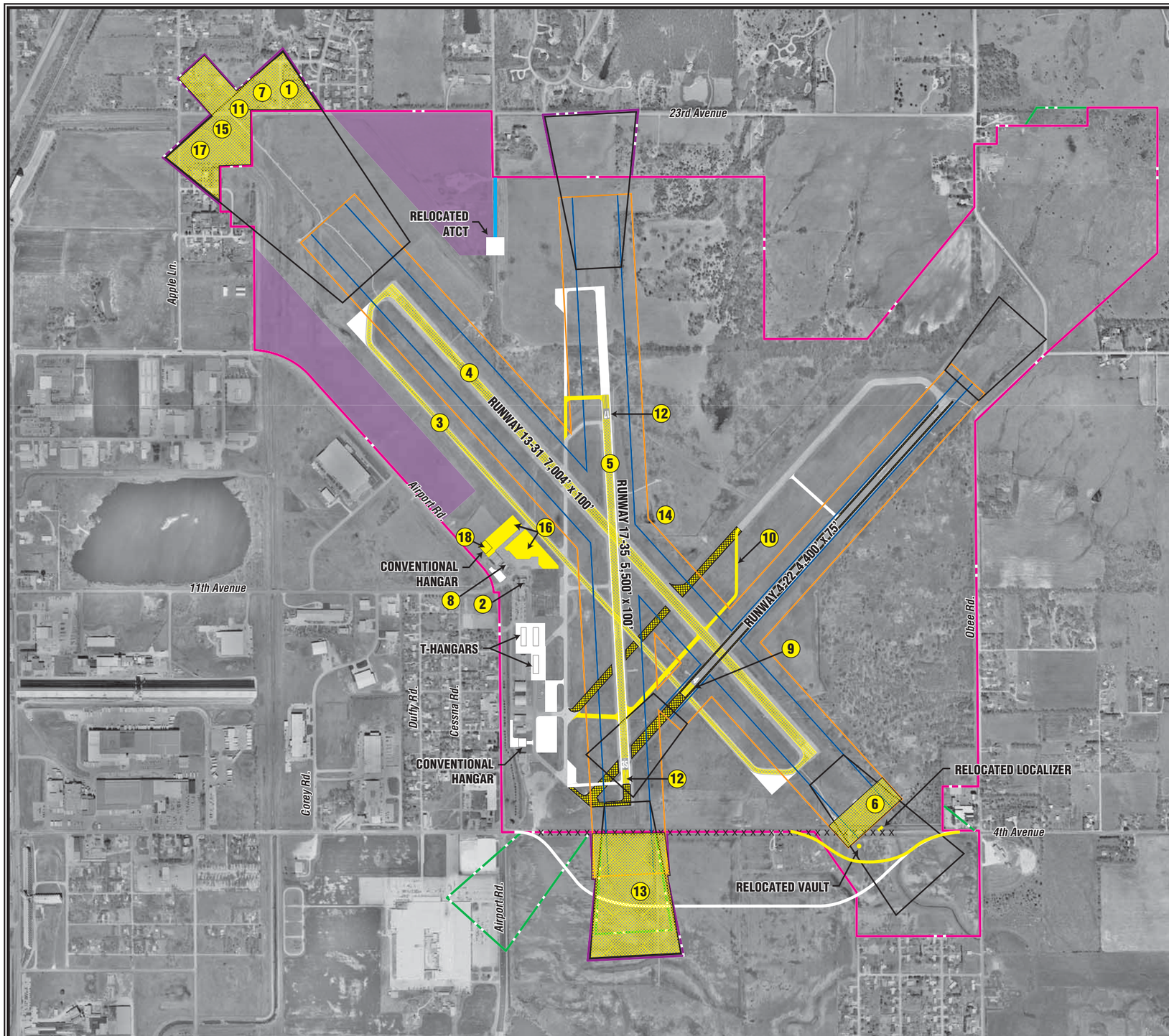
	PROJECT DESCRIPTION	Project Cost	FAA Share	Local Share
SHORT TERM PROGRAM (0-5 YEARS)				
2007				
1	Land Use Study to Prioritize Runway 13 RPZ Acquisition	$150,000	$142,500	$7,500
2	Replace Terminal Building Water and Sewer Lines	$184,000	$0	$184,000
3	Taxiway A Slurry Seal	$189,000	$179,550	$9,450
4	Overlay and Mark Runway 13-31	$897,000	$852,150	$44,850
5	Mark 17-35 for Part 139 Compliance	$130,000	$123,500	$6,500
2007 Total		**$1,550,000**	**$1,297,700**	**$252,300**
2008				
6	Clear and Grade Runway 31 RSA (Relocate 4th Avenue)	$669,000	$635,550	$33,450
7	Runway 13 RPZ Acquisition	$260,000	$247,000	$13,000
8	Upgrade and Repair Maintenance Building	$63,000	$0	$63,000
2008 Total		**$992,000**	**$882,550**	**$109,450**
2009				
9	Locate Runway 4 end 1,600 Feet Northeast	$604,000	$573,800	$30,200
10	Relocate Taxiway C	$1,519,000	$1,443,050	$75,950
11	Runway 13 RPZ Acquisition	$260,000	$247,000	$13,000
2009 Total		**$2,383,000**	**$2,263,850**	**$119,150**
2010				
12	Runway 17-35 Shift North, Extend Taxiway A	$720,000	$684,000	$36,000
13	Runway 35 RPZ Acquisition (39 acres)	$39,000	$37,050	$1,950
14	Runway 17-35 Excavation and Drainage Improvements	$400,000	$380,000	$19,000
15	Runway 13 RPZ Acquisition	$260,000	$247,000	$13,000
2010 Total		**$1,419,000**	**$1,348,050**	**$69,950**
2011				
16	North Public Apron Expansion	$1,408,000	$1,337,600	$70,400
17	Runway 13 RPZ Acquisition	$520,000	$494,000	$26,000
18	Construct Aircraft Storage Hangar	$320,000	$0	$320,000
2011 Total		**$2,248,000**	**$1,831,600**	**$416,400**
TOTAL SHORT TERM PROGRAM		**$8,592,000**	**$7,623,750**	**$967,250**
INTERMEDIATE TERM PROGRAM (6-10 YEARS)				
1	Construct Runway 4-22 Exit Taxiway	$300,000	$0	$300,000
2	T-Hangar Access Pavement	$423,000	$401,850	$21,150
3	Construct T-Hangar (Eight Units)	$280,000	$0	$280,000
4	Pavement Maintenance	$1,000,000	$950,000	$50,000
TOTAL INTERMEDIATE TERM PROGRAM		**$2,003,000**	**$1,351,850**	**$651,150**
LONG TERM PROGRAM (11-20 YEARS)				
1	South Public Apron Expansion	$1,354,000	$1,286,300	$67,700
2	Hold Aprons Runway 13-31	$845,000	$802,750	$42,250
3	T-Hangar Access Pavement	$864,000	$820,800	$43,200
4	Construct T-Hangar (16 Unit)	$560,000	$0	$560,000
5	Expand Terminal Parking Lot	$94,000	$0	$94,000
6	Runway 17 RPZ Acquisition (16 acres)	$32,000	$30,400	$1,600
7	Re-route 4th Avenue	$520,000	$0	$520,000
8	Upgrade Runway 17-35 to ARC C-II	$3,262,000	$0	$3,262,000
9	Construct Airport Traffic Control Tower	$3,000,000	$1,500,000	$1,500,000
10	Pavement Maintenance	$2,000,000	$1,900,000	$100,000
TOTAL LONG TERM PROGRAM		**$12,531,000**	**$6,340,250**	**$6,190,750**
TOTAL PROGRAM COSTS		**$23,126,000**	**$15,315,850**	**$7,809,150**

RPZ - Runway Protection Zone
ARC - Airport Reference Code

Hutchinson Municipal Airport

Exhibit 6A
CAPITAL IMPROVEMENT PROGRAM

05MP03-6B-5/22/06



LEGEND

- Existing Airport Property Line
- Ultimate Airport Property Line
- Existing Easement
- Runway Safety Area (RSA)
- Object Free Area (OFA)
- Runway Protection Zone (RPZ)
- Pavement to be Removed
- Revenue Support
- Short Term Development

SHORT TERM IMPROVEMENTS

1. Land Use Study to Prioritize Runway 13 RPZ Acquisition
2. Replace Terminal Building Water and Sewer Lines
3. Taxiway A Slurry Seal
4. Overlay and Mark Runway 13-31
5. Mark 17-35 for Part 139 Compliance
6. Clear and Grade Runway 31 RSA (Relocate 4th Avenue)
7. Runway 13 RPZ Acquisition (2008)
8. Upgrade and Repair Maintenance Building
9. Locate Runway 4 end 1,600 Feet Northeast
10. Relocate Taxiway C
11. Runway 13 RPZ Acquisition (2009)
12. Runway 17-35 Shift North, Extend Taxiway A
13. Runway 35 RPZ Acquisition (39 acres)
14. Runway 17-35 Excavation and Drainage Improvements
15. Runway 13 RPZ Acquisition (2010)
16. North Public Apron Expansion
17. Runway 13 RPZ Acquisition (2011)
18. Construct Aircraft Storage Hanger

0 1200
SCALE IN FEET

NORTH

Hutchinson Municipal Airport

Exhibit 6B

SHORT TERM DEVELOPMENT

Significant puddling and other draining issues are degrading Runway 17-35. Storm water runoff is also pooling in the vicinity of the various airport weather sensors potentially eroding their foundation. The final project of the 2010 CIP includes recommendations to solve these water runoff issues. It makes sense to do these projects at the same time as the Runway 17-35 shift project.

Three projects are identified in the fiscal year 2011 CIP. The first is the expansion of the terminal area aircraft parking apron. This project should only be pursued if there is a demand-based need (i.e., the existing apron become constrained). The second project is the completion of the Runway 13 RPZ property acquisition. The final project is the construction of an 8,000 square-foot conventional hangar, immediately north of Mead Aircraft Services for lease to an existing or future airport business.

The total investment necessary for the short term CIP is approximately $8.59 million. Of this total, $7.62 million is eligible for FAA grant funding, with the airport sponsor responsible for the matching $967,000.

INTERMEDIATE TERM IMPROVEMENTS

Due to the fluid nature of general aviation growth, the next five years of the CIP are combined into the intermediate planning horizon. The implementation of many of the items in the intermediate term should be based upon actual demand. Those projects, such as T-hangar construction, should not be undertaken unless there is an existing demand for such facilities.

The first project in the intermediate term planning horizon is the construction of an exit taxiway midway between Runway 13-31 and the Runway 22 end. This taxiway would prevent the need for back-taxiing or long taxiing time from the Runway 22 end. Since this project would be the responsibility of the City, it should only be pursued if there is a long term commitment, at the time, to maintaining the reconfigured Runway 4-22.

By the intermediate term, forecasts indicate that based aircraft may increase to such a level that an additional eight-unit T-hangar facility could be justified. The access pavement to the T-hangar would be eligible for FAA funding.

Construction of T-hangars is generally not eligible for FAA grant funding. In cases where all priority airfield deficiencies have been addressed, general aviation airports may use yearly non-primary airport entitlement funding from the FAA for hangar construction. Discussion of entitlement funds will be presented in the next section of this chapter.

A total of $1.0 million is included in this planning period for on-going pavement maintenance needs such as crack sealing, rejuvenating seal coats, and slab replacements as necessary.

Total intermediate term projects would require an investment of $2.00 million, with the City being responsible for $651,000 of that total.

LONG TERM IMPROVEMENTS

Long term improvements, as presented on **Exhibit 6C**, continue the expansion of landside facilities and aircraft aprons to accommodate growth. Landside improvements include the addition of two eight-unit T-hangar structures. Additional public apron space to the south of the terminal is also considered. The potential for more automobile parking at the terminal building is also included in the long term CIP.

The extension of Runway 17-35 to 5,500 feet and upgrade in design standards is also included in the long term planning horizon. This project would be entirely City-funded as the FAA will only participate in grant funding for Runway 17-35 to accommodate small general aviation aircraft. This project is proposed to allow Runway 17-35 to serve as a capable back-up to Runway 13-31 should it need to be closed for maintenance or other operational reasons. This project includes a 1,200-foot extension to the north, and a widening of the runway to 100 feet. The relocation of visual approach lighting aids and addition of REILs is also planned.

The relocation of 4th Avenue to the south and acquisition of approximately 16 acres of land to protect the Runway 17 RPZ are also included in this project. The total Runway 17-35 upgrade costs are estimated at $3.26 million.

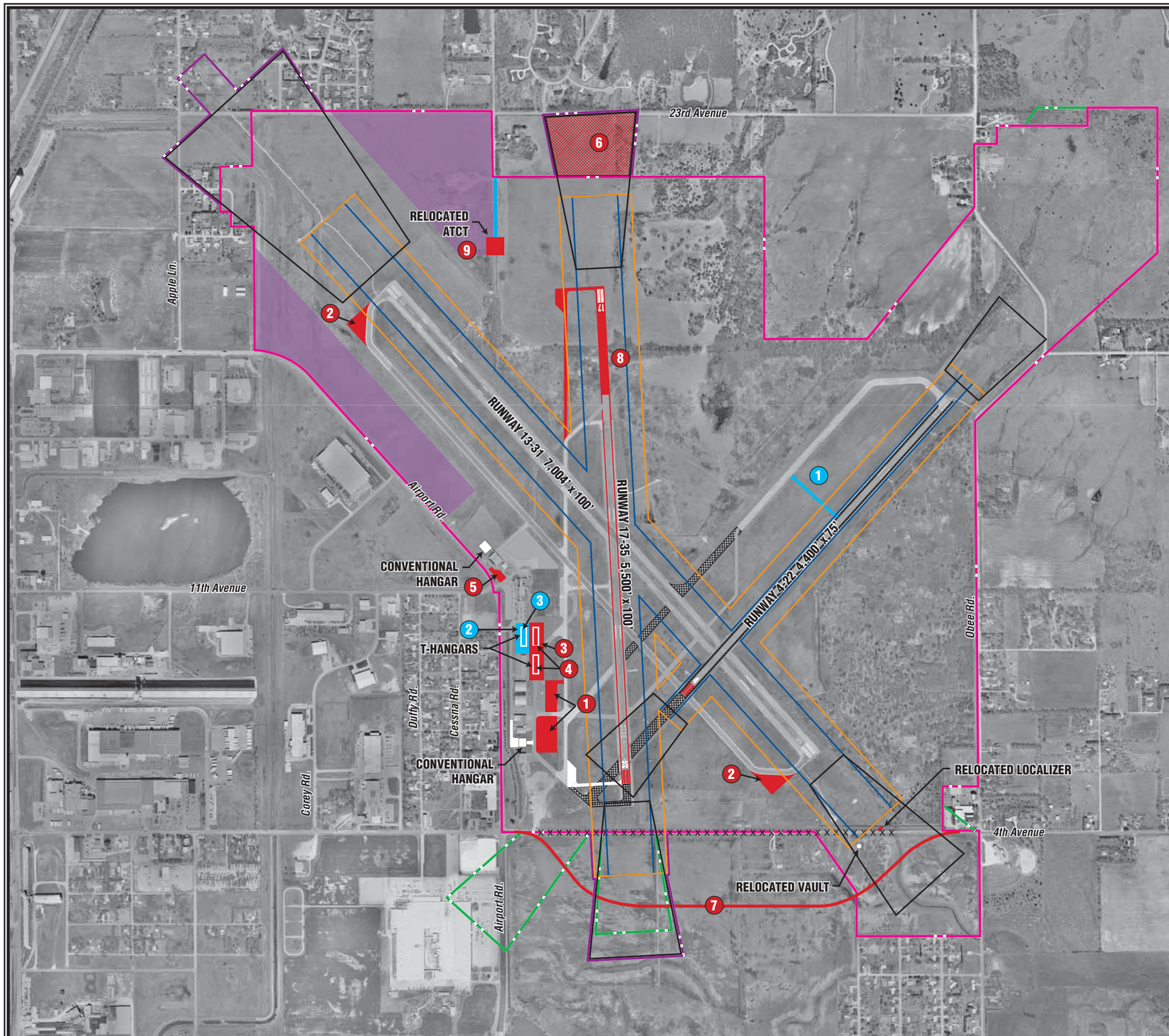
The addition of holding aprons at the Runway 13 and Runway 31 ends is also programmed. These holding aprons provide an area for aircraft to prepare for departure off the taxiway surface. This allows aircraft ready for departure to by-pass these aircraft and depart without delay.

The construction of a replacement airport traffic control tower (ATCT) is also included in this period. Typically, new ATCTs for general aviation airports cost approximately $3 million. Of this amount, half is technically eligible for AIP funding but the FAA would prefer that any tower funding come from the Air Traffic Organization (ATO). ATO is a division within the FAA that maintains navigational aids, including towers, at many airports. The CIP will reflect the possibility that half of the tower construction cost may be grant-eligible but the City of Hutchinson should be aware that new or replacement towers are not a high priority item for the FAA

A total of $2.0 million is included in this planning period for on-going pavement maintenance needs such as crack sealing, rejuvenating seal coats, and slab replacements as necessary.

Total long term improvements are estimated at $12.53 million. The total City portion is estimated at $6.19 million.

05MP03-6C-5/22/06



LEGEND

- Existing Airport Property Line
- Ultimate Airport Property Line
- Existing Easement
- Runway Safety Area (RSA)
- Object Free Area (OFA)
- Runway Protection Zone (RPZ)
- Pavement to be Removed
- Revenue Support
- Intermediate Term Development
- Long Term Development

INTERMEDIATE TERM IMPROVEMENTS

1. Construct Runway 4-22 Exit Taxiway
2. T-Hangar Access Pavement
3. Construct T-Hangar (Eight Units)
4. Pavement Maintenance (not pictured)

LONG TERM IMPROVEMENTS

1. South Public Apron Expansion
2. Hold Aprons Runway 13-31
3. T-Hangar Access Pavement
4. Construct T-Hangars (16 Units)
5. Expand Terminal Parking Lot - Phase II
6. Runway 17 RPZ Acquisition (16 acres)
7. Re-route 4th Avenue
8. Upgrade Runway 17-35 to ARC C-II
9. Construct Airport Traffic Control Tower
10. Pavement Maintenance (not pictured)

0 1200
SCALE IN FEET

NORTH

Hutchinson Municipal Airport

Exhibit 6C

INTERMEDIATE & LONG TERM DEVELOPMENT

CAPITAL IMPROVEMENT SUMMARY

The CIP for Hutchinson Municipal Airport focuses heavily on providing resolutions to RSA deficiencies and taxiway "Hot Spot" issues. Runway 31 RSA penetrations are solved by providing a full and clear RSA by relocating 4th Avenue. The Runway 35 RSA is improved by shifting the Runway 35 end approximately 240 feet to the north. The role of Runway 4-22 is changed to only serving small aircraft. This enables the runway length to be reduced and the Runway 4 end to be relocated 1,600 feet northeast to allow the required safety areas to be located on airport property. The taxiway "Hot Spot" issues are resolved by relocating Taxiway C and relocating the Runway 4 threshold as part of the reduction in runway length. The estimated cost of these projects is $3.24 million with the City responsible for $162,000.

All landside improvements presented in the recommended concept are demand-based. These facilities should be constructed to serve an existing demand at the airport at that time. This plan does not support building facilities in order to attract activity (the "if you build it, they will come" scenario). Because the plan is demand-based rather than time-based, it provides the airport management and the City of Hutchinson with the flexibility to develop facilities as needed. Should demand increase at a greater rate than is forecast, implementation of these improvements can be advanced. Should demand slow, the life of the master plan is effectively increased.

The 20-year investment total is approximately $23.13 million, with $7.81 million of that total being the responsibility of the City.

CAPITAL IMPROVEMENT FUNDING SOURCES

Financing capital improvements at the airport will not rely solely on the financial resources of the airport. Capital improvements funding is available through various grant-in-aid programs on both the state and federal levels. The following discussion outlines key sources of funding potentially available for capital improvements at Hutchinson Municipal Airport.

FEDERAL GRANTS

Through federal legislation over the years, various grant-in-aid programs have been established to develop and maintain a system of public airports across the United States. The purpose of this system and its federally-based funding is to maintain national defense and to promote interstate commerce. The most recent legislation affecting federal funding was enacted in late 2003 and is titled, *Century of Aviation Re-authorization Act,* or *Vision 100.*

The four-year bill covers FAA fiscal years 2004, 2005, 2006, and 2007. This

bill presented similar funding levels to the previous bill - *Air 21*. Airport Improvement Program (AIP) funding was authorized at $3.4 billion in 2004, $3.5 billion in 2005, $3.6 billion in 2006, and $3.7 billion in 2007. This new bill provides the FAA the opportunity to plan for longer term projects versus one-year re-authorizations.

The source for *Vision 100* funds is the Aviation Trust Fund. The Aviation Trust Fund was established in 1970 to provide funding for aviation capital investment programs (aviation development, facilities and equipment, and research and development). The Aviation Trust Fund also finances the operation of the FAA. It is funded by user fees including taxes on airline tickets, aviation fuel, and various aircraft parts.

Funds are distributed each year by the FAA from appropriations by Congress. A portion of the annual distribution is to primary commercial service airports based upon enplanement levels. If Congress appropriates the full amounts authorized by *Vision 100*, eligible general aviation airports could receive up to $150,000 of funding each year in Non-Primary Entitlement (NPE) funds (*National Plan of Integrated Airport Systems* [NPIAS] inclusion is required for general aviation entitlement funding). Hutchinson Municipal Airport qualifies for full NPE funding as the NPIAS includes over $150,000 in yearly capital projects.

The remaining AIP funds are distributed by the FAA based upon the priority of the project for which they have requested federal assistance through discretionary apportionments. A national priority ranking system is used to evaluate and rank each airport project. Those projects with the highest priority are given preference in funding.

Under the AIP program, examples of eligible development projects include the airfield, public aprons, and access roads. Additional buildings and structures may be eligible if the function of the structure is to serve airport operations in a non-revenue generating capacity such as maintenance facilities.

Whereas entitlement monies are guaranteed on an annual basis, discretionary funds are not assured. If the combination of entitlement, discretionary, and airport sponsor match, does not provide enough capital for planned development, projects may be delayed. Other supplemental funding sources are described in the following subsections.

STATE FUNDING PROGRAM

In support of the state aviation system, the State of Kansas also participates in airport improvement projects. The source for state airport improvement funds is the 1999 *Kansas Comprehensive Transportation Program*. This legislation provides $30 million ($3 million per year) over the ten-year term of the funding allocation. The Kansas Department of Transportation - Division of Aviation is the distributor of those funds.

Under the State of Kansas' grant program, non-primary public use airports serving a community of greater than 10,000 people can receive 50 percent funding. The airport sponsor would be required to provide the remaining 50 percent match. Eligible projects include runways, taxiways, ramps, and aviation-related facilities and equipment. The project must be the sponsor's top priority and capable of being completed in one year (no phased projects). State funding cannot be used to match federal AIP grants. Hutchinson Municipal Airport has utilized this unique funding source for many projects over the years.

LOCAL FUNDING

The balance of project costs, after consideration has been given to grants, must be funded through local resources. HUT is operated by the City of Hutchinson, and could receive some assistance from the City. The goal of the City is to generate ample revenues to cover all operating and capital expenditures. As with many general aviation airports, this is not possible and other financial methods will be needed.

There are several alternatives for local financing options for future development at the airport, including airport revenues, direct funding from the City of Hutchinson, issuing bonds, and leasehold financing. These strategies could be used to fund the local matching share, or complete the project if grant funding cannot be arranged. The capital improvement program has assumed that some landside facility development would be completed privately, while other developments (namely T-hangars) would be completed by the City of Hutchinson.

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

In contrast to general obligation bonds, limited obligation bonds (sometimes referred to as self-liquidating bonds) are secured by revenues from a local source. While neither general fund revenues nor the taxing power of the local community is pledged to pay the debt service, these sources may be required to retire the debt if pledged revenues are insufficient to make interest and

principal payments on the bonds. These bonds still carry the full faith and credit pledge of the local community and, therefore, are considered, for the purpose of financial analysis, as part of the debt burden of the local community. The overall debt burden of the local community is a factor in determining interest rates on municipal bonds.

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

Leasehold financing refers to a developer or tenant financing improvements under a long term ground lease. The obvious advantage of such an arrangement is that it relieves the community of all responsibility for raising the capital funds for improvements. However, the private development of facilities on a ground lease, particularly on property owned by a government agency, produces a unique set of concerns.

In particular, it is more difficult to obtain private financing as only the improvements and the right to continue the lease can be claimed in the event of a default. Ground leases normally provide for the reversion of improvements to the lessor at the end of the lease term, which reduces their potential value to a lender taking possession. Also, companies that want to own their property as a matter of financial policy may not locate where land is only available for lease.

SUMMARY

The best means to begin implementation of the recommendations in this master plan is to first recognize that planning is a continuous process that does not end with completion and approval of this document. Rather, the ability to continuously monitor the existing and forecast status of airport activity must be provided and maintained. The issues upon which this master plan is based will remain valid for a number of years. The primary goal is for the airport to best serve the air transportation needs of the region, while continuing to be economically self-sufficient.

The actual need for facilities is most appropriately established by airport activity levels rather than a specified date. For example, projections have been made as to when additional hangars may be needed at the airport. In reality, however, the time frame in which the development is needed may be substantially different. Actual demand may be slower to develop than expected. On the other hand, high levels of demand may establish the need

to accelerate the development. Although every effort has been made in this master planning process to conservatively estimate when facility development may be needed, aviation demand will dictate when facility improvements need to be delayed or accelerated.

The real value of a usable master plan is in keeping the issues and objectives in the minds of the managers and decision-makers so that they are better able to recognize change and its effect. In addition to adjustments in aviation demand, decisions made as to when to undertake the improvements recommended in this master plan will impact the period that the plan remains valid. The format used in this plan is intended to reduce the need for formal and costly updates by simply adjusting the timing. Updating can be done by the manager, thereby improving the plan's effectiveness.

In summary, the planning process requires the airport management consistently monitor the progress of the airport in terms of aircraft operations and based aircraft. Analysis of aircraft demand is critical to the timing and need for new airport facilities. The information obtained from continually monitoring airport activity will provide the data necessary to determine if the development schedule should be accelerated or decelerated.

Glossary of Terms

ABOVE GROUND LEVEL: The elevation of a point or surface above the ground.

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

ADVISORY CIRCULAR: External publications issued by the FAA consisting of non-regulatory material providing for the recommendations relative to a policy, guidance and information relative to a specific aviation subject.

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

AIRCRAFT: A transportation vehicle that is used or intended for use for flight.

AIRCRAFT APPROACH CATEGORY: An alphabetic classification of aircraft based upon 1.3 times the stall speed in a landing configuration at their maximum certified landing weight.

AIRCRAFT OPERATION: The landing, takeoff, or touch-and-go procedure by an aircraft on a runway at an airport.

AIRCRAFT OPERATIONS AREA: A restricted and secure area on the airport property designed to protect all aspects related to aircraft operations.

AIRCRAFT OWNERS AND PILOTS ASSOCIATION: A private organization serving the interests and needs of general aviation pilots and aircraft owners.

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

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

AIRCRAFT RESCUE AND FIRE FIGHTING: A facility located at an airport that provides emergency vehicles, extinguishing agents, and personnel responsible for minimizing the impacts of an aircraft accident or incident.

AIRFIELD: The portion of an airport which contains the facilities necessary for the operation of aircraft.

AIRLINE HUB: An airport at which an airline concentrates a significant portion of its activity and which often has a significant amount of connecting traffic.

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

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

AIRPORT AUTHORITY: A quasi-governmental public organization responsible for setting the policies governing the management and operation of an airport or system of airports under its jurisdiction.

AIRPORT BEACON: A navigational aid located at an airport which displays a rotating light beam to identify whether an airport is lighted.

AIRPORT CAPITAL IMPROVEMENT PLAN: The planning program used by the Federal Aviation Administration to identify, prioritize, and distribute funds for airport development and the needs of the National Airspace System to meet specified national goals and objectives.

AIRPORT ELEVATION: The highest point on the runway system at an airport expressed in feet above mean sea level (MSL).

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

AIRPORT MASTER PLAN: The planner's concept of the long-term development of an airport.

AIRPORT MOVEMENT AREA SAFETY SYSTEM: A system that provides automated alerts and warnings of potential runway incursions or other hazardous aircraft movement events.

AIRPORT OBSTRUCTION CHART: A scaled drawing depicting the Federal Aviation Regulation (FAR) Part 77 surfaces, a representation of objects that penetrate these surfaces, runway, taxiway, and ramp areas, navigational aids, buildings, roads and other detail in the vicinity of an an airport.

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

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

AIRPORT SPONSOR: The entity that is legally responsible for the management and operation of an airport, including the fulfillment of the requirements of laws and regulations related thereto.

AIRPORT SURFACE DETECTION EQUIPMENT: A radar system that provides air traffic controllers with a visual representation of the movement of aircraft and other vehicles on the ground on the airfield at an airport.

AIRPORT SURVEILLANCE RADAR: The primary radar located at an airport or in an air traffic control terminal area that receives a signal at an antenna and transmits the signal to air traffic control display equipment defining the location of aircraft in the air. The signal provides only the azimuth and range of aircraft from the location of the antenna.

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

AIR ROUTE TRAFFIC CONTROL CENTER: A facility which provides enroute air traffic control service to aircraft operating on an IFR flight plan within controlled airspace over a large, multi-state region.

AIRSIDE: The portion of an airport that contains the facilities necessary for the operation of aircraft.

AIRSPACE: The volume of space above the surface of the ground that is provided for the operation of aircraft.

AIR TAXI: An air carrier certificated in accordance with FAR Part 121 and FAR Part 135 and authorized to provide, on demand, public transportation of persons and property by aircraft. Generally operates small aircraft "for hire" for specific trips.

AIR TRAFFIC CONTROL: A service operated by an appropriate organization for the purpose of providing for the safe, orderly, and expeditious flow of air traffic.

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

AIR TRAFFIC HUB: A categorization of commercial service airports or group of commercial service airports in a metropolitan or urban area based upon the proportion of annual national enplanements existing at the airport or airports. The categories are large hub, medium hub, small hub, or non-hub. It forms the basis for the apportionment of entitlement funds.

AIR TRANSPORT ASSOCIATION OF AMERICA: An organization consisting of the principal U.S. airlines that represents the interests of the airline industry on major aviation issues before federal, state, and local government bodies. It promotes air transportation safety by coordinating industry and governmental safety programs and it serves as a focal point for industry efforts to standardize practices and enhance the efficiency of the air transportation system.

ALERT AREA: See special-use airspace.

ALTITUDE: The vertical distance measured in feet above mean sea level.

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

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

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

APPROACH SURFACE: An imaginary obstruction limiting surface defined in FAR Part 77 which is longitudinally centered on an extended runway centerline and extends outward and upward from the primary surface at each end of a runway at a designated slope and distance based upon the type of available or planned approach by aircraft to a runway.

APRON: A specified portion of the airfield used for passenger, cargo or freight loading and unloading, aircraft parking, and the refueling, maintenance and servicing of aircraft.

AREA NAVIGATION: The air navigation procedure that provides the capability to establish and maintain a flight path on an arbitrary course that remains within the coverage area of navigational sources being used.

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

AUTOMATED SURFACE OBSERVATION SYSTEM (ASOS): A reporting system that provides frequent airport ground surface weather observation data through digitized voice broadcasts and printed reports.

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

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

AVIGATION EASEMENT: A contractual right or a property interest in land over which a right of unobstructed flight in the airspace is established.

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

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

BASED AIRCRAFT: The general aviation aircraft that use a specific airport as a home base.

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

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

BLAST PAD: A prepared surface adjacent to the end of a runway for the purpose of eliminating the erosion of the ground surface by the wind forces produced by airplanes at the initiation of takeoff operations.

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

CAPITAL IMPROVEMENT PLAN: The planning program used by the Federal Aviation Administration to identify, prioritize, and distribute Airport Improvement Program funds for airport development and the needs of the National Airspace System to meet specified national goals and objectives.

CARGO SERVICE AIRPORT: An airport served by aircraft providing air transportation of property only, including mail, with an annual aggregate landed weight of at least 100,000,000 pounds.

CATEGORY I: An Instrument Landing System (ILS) that provides acceptable guidance information to an aircraft from the coverage limits of the ILS to the point at which the localizer course line intersects the glide path at a decision height of 100 feet above the horizontal plane containing the runway threshold.

CATEGORY II: An ILS that provides acceptable guidance information to an aircraft from the coverage limits of the ILS to the point at which the localizer course line intersects the glide path at a decision height of 50 feet above the horizontal plane containing the runway threshold.

CATEGORY III: An ILS that provides acceptable guidance information to a pilot from the coverage limits of the ILS with no decision height specified above the horizontal plane containing the runway threshold.

CEILING: The height above the ground surface to the location of the lowest layer of clouds which is reported as either broken or overcast.

CIRCLING APPROACH: A maneuver initiated by the pilot to align the aircraft with the runway for landing when flying a predetermined circling instrument approach under IFR.

CLASS A AIRSPACE: See Controlled Airspace.

CLASS B AIRSPACE: See Controlled Airspace.

CLASS C AIRSPACE: See Controlled Airspace.

CLASS D AIRSPACE: See Controlled Airspace.

CLASS E AIRSPACE: See Controlled Airspace.

CLASS G AIRSPACE: See Controlled Airspace.

CLEAR ZONE: See Runway Protection Zone.

COMMERCIAL SERVICE AIRPORT: A public airport providing scheduled passenger service that enplanes at least 2,500 annual passengers.

COMMON TRAFFIC ADVISORY FREQUENCY: A radio frequency identified in the appropriate aeronautical chart which is designated for the purpose of transmitting airport advisory information and procedures while operating to or from an uncontrolled airport.

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

CONICAL SURFACE: An imaginary obstruction-limiting surface defined in FAR Part 77 that extends from the edge of the horizontal surface outward and upward at a slope of 20 to 1 for a horizontal distance of 4,000 feet.

CONTROLLED AIRPORT: An airport that has an operating airport traffic control tower.

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

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

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

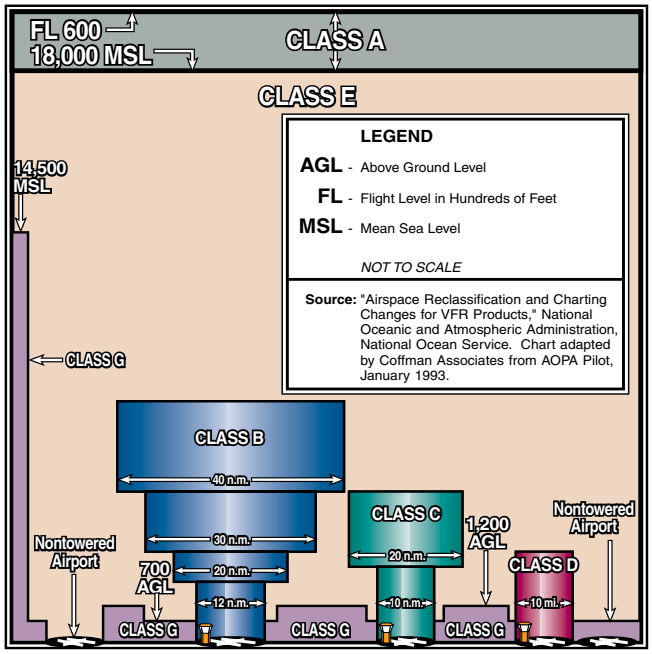
- *CLASS C:* Generally, the airspace from the surface to 4,000 feet above the airport elevation (charted as MSL) surrounding those airports that have an operational control tower and radar approach control and are served by a qualifying number of IFR operations or passenger enplanements. Although individually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

- *CLASS D:* Generally, that airspace from the surface to 2,500 feet above the air port elevation (charted as MSL) surrounding those airport that have an operational control tower. Class D airspace is individually tailored and configured to encompass published instrument approach proce dures. Unless otherwise authorized, all persons must establish two-way radio communication.

- *CLASS E:* Generally, controlled airspace that is not classified as Class A, B, C, or D. Class E airspace extends upward from either the surface or a designated altitude to the overlying or adjacent controlled airspace. When designated as a surface area, the airspace will be configured to contain all instrument

procedures. Class E airspace encompasses all Victor Airways. Only aircraft following instrument flight rules are required to establish two-way radio communication with air traffic control.

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



CONTROLLED FIRING AREA: See special-use airspace.

CROSSWIND: A wind that is not parallel to a runway centerline or to the intended flight path of an aircraft.

CROSSWIND COMPONENT: The component of wind that is at a right angle to the runway centerline or the intended flight path of an aircraft.

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

DECIBEL: A unit of noise representing a level relative to a reference of a sound pressure 20 micro newtons per square meter.

DECISION HEIGHT: The height above the end of the runway surface at which a decision must be made by a pilot during the ILS or Precision Approach Radar approach to either continue the approach or to execute a missed approach.

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

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

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

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

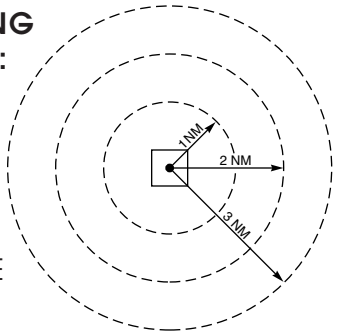
- *LANDING DISTANCE AVAILABLE (LDA):* The runway length declared available and suitable for landing.

DEPARTMENT OF TRANSPORTATION: The cabinet level federal government organization consisting of modal operating agencies, such as the Federal Aviation Administration, which was established to promote the coordination of federal transportation programs and to act as a focal point for research and development efforts in transportation.

DISCRETIONARY FUNDS: Federal grant funds that may be appropriated to an airport based upon designation by the Secretary of Transportation or Congress to meet a specified national priority such as enhancing capacity, safety, and security, or mitigating noise.

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

DISTANCE MEASURING EQUIPMENT (DME): Equipment (airborne and ground) used to measure, in nautical miles, the slant range distance of an aircraft from the DME navigational aid.



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

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

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

ELEVATION: The vertical distance measured in feet above mean sea level.

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

ENPLANEMENT: The boarding of a passenger, cargo, freight, or mail on an aircraft at an airport.

ENTITLEMENT: Federal funds for which a commercial service airport may be eligible based upon its annual passenger enplanements.

ENVIRONMENTAL ASSESSMENT (EA): An environmental analysis performed pursuant to the National Environmental Policy Act to determine whether an action would significantly affect the environment and thus require a more detailed environmental impact statement.

ENVIRONMENTAL AUDIT: An assessment of the current status of a party's compliance with applicable environmental requirements of a party's environmental compliance policies, practices, and controls.

ENVIRONMENTAL IMPACT STATEMENT (EIS): A document required of federal agencies by the National Environmental Policy Act for major projects ar legislative proposals affecting the environment. It is a tool for decision-making describing the positive and negative effects of a proposed action and citing alternative actions.

ESSENTIAL AIR SERVICE: A federal program which guarantees air carrier service to selected small cities by providing subsidies as needed to prevent these cities from such service.

FEDERAL AVIATION REGULATIONS: The general and permanent rules established by the executive departments and agencies of the Federal Government for aviation, which are published in the Federal Register. These are the aviation subset of the Code of Federal Regulations.

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

FINDING OF NO SIGNIFICANT IMPACT (FONSI): A public document prepared by a Federal agency that presents the rationale why a proposed action will not have a

significant effect on the environment and for which an environmental impact statement will not be prepared.

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

FLIGHT LEVEL: A designation for altitude within controlled airspace.

FLIGHT SERVICE STATION: An operations facility in the national flight advisory system which utilizes data interchange facilities for the collection and dissemination of Notices to Airmen, weather, and administrative data and which provides pre-flight and in-flight advisory services to pilots through air and ground based communication facilities.

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

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

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

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

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

GLOBAL POSITIONING SYSTEM (GPS): A system of 24 satellites used as reference points to enable navigators equipped with GPS receivers to determine their latitude, longitude, and altitude.

GROUND ACCESS: The transportation system on and around the airport that provides access to and from the airport by ground transportation vehicles for passengers, employees, cargo, freight, and airport services.

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

HIGH INTENSITY RUNWAY LIGHTS: The highest classification in terms of intensity or brightness for lights designated for use in delineating the sides of a runway.

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

HORIZONTAL SURFACE: An imaginary obstruction-limiting surface defined in FAR Part 77 that is specified as a portion of a horizontal plane surrounding a runway located 150 feet above the established airport elevation. The specific horizontal dimensions of this surface are a function of the types of approaches existing or planned for the runway.

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

INSTRUMENT FLIGHT RULES (IFR): Procedures for the conduct of flight in weather conditions below Visual Flight Rules weather minimums. The term IFR is often also used to define weather conditions and the type of flight plan under which an aircraft is operating.

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

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

INSTRUMENT METEOROLOGICAL CONDITIONS: Meteorological conditions expressed in terms of specific visibility and ceiling conditions that are less than the minimums specified for visual meteorological conditions.

ITINERANT OPERATIONS: Operations by aircraft that are not based at a specified airport.

KNOTS: A unit of speed length used in navigation that is equivalent to the number of nautical miles traveled in one hour.

LANDSIDE: The portion of an airport that provides the facilities necessary for the processing of passengers, cargo, freight, and ground transportation vehicles.

LANDING DISTANCE AVAILABLE (LDA): See declared distances.

LARGE AIRPLANE: An airplane that has a maximum certified takeoff weight in excess of 12,500 pounds.

LOCAL AREA AUGMENTATION SYSTEM: A differential GPS system that provides localized measurement correction signals to the basic GPS signals to improve navigational accuracy, integrity, continuity, and availability.

LOCAL OPERATIONS: Aircraft operations performed by aircraft that are based at the airport and that operate in the local traffic pattern or within sight of the airport, that are known to be departing for or arriving from flights in local practice areas within a prescribed distance from the airport, or that execute simulated instrument approaches at the airport.

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

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

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

LONG RANGE NAVIGATION SYSTEM (LORAN): Long range navigation is an electronic navigational aid which determines aircraft position and speed by measuring the difference in the time of reception of synchronized pulse signals from two fixed transmitters. Loran is used for enroute navigation.

LOW INTENSITY RUNWAY LIGHTS: The lowest classification in terms of intensity or brightness for lights designated for use in delineating the sides of a runway.

MEDIUM INTENSITY RUNWAY LIGHTS: The middle classification in terms of intensity or brightness for lights designated for use in delineating the sides of a runway.

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

MILITARY OPERATIONS: Aircraft operations that are performed in military aircraft.

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

MILITARY TRAINING ROUTE: An air route depicted on aeronautical charts for the conduct of military flight training at speeds above 250 knots.

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

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

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

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

NATIONAL AIRSPACE SYSTEM: The network of air traffic control facilities, air traffic control areas, and navigational facilities through the U.S.

NATIONAL PLAN OF INTEGRATED AIRPORT SYSTEMS: The national airport system plan developed by the Secretary of Transportation on a biannual basis for the development of public use airports to meet national air transportation needs.

NATIONAL TRANSPORTATION SAFETY BOARD: A federal government organization established to investigate and determine the probable cause of transportation accidents, to recommend equipment and procedures to enhance transportation safety, and to review on appeal the suspension or revocation of any certificates or licenses issued by the Secretary of Transportation.

NAUTICAL MILE: A unit of length used in navigation which is equivalent to the distance spanned by one minute of arc in latitude, that is, 1,852 meters or 6,076 feet. It is equivalent to approximately 1.15 statute mile.

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

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

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

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

NOTICE TO AIRMEN: A notice containing information concerning the establishment, condition, or change in any component of or hazard in the National Airspace System, the timely knowledge of which is considered essential to personnel concerned with flight operations.

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

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

OPERATION: A take-off or a landing.

OUTER MARKER (OM): An ILS navigation facility in the terminal area navigation system located four to seven miles from

the runway edge on the extended centerline, indicating to the pilot that he/she is passing over the facility and can begin final approach.

PILOT CONTROLLED LIGHTING: Runway lighting systems at an airport that are controlled by activating the microphone of a pilot on a specified radio frequency.

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

- *CATEGORY I (CAT I):* A precision approach which provides for approaches with a decision height of not less than 200 feet and visibility not less than 1/2 mile or Runway Visual Range (RVR) 2400 (RVR 1800) with operative touchdown zone and runway centerline lights.
- *CATEGORY II (CAT II):* A precision approach which provides for approaches with a decision height of not less than 100 feet and visibility not less than 1200 feet RVR.
- *CATEGORY III (CAT III):* A precision approach which provides for approaches with minima less than Category II.

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

PRECISION APPROACH RADAR: A radar facility in the terminal air traffic control system used to detect and display with a high degree of accuracy the direction, range, and elevation of an aircraft on the final approach to a runway.

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

PRIMARY AIRPORT: A commercial service airport that enplanes at least 10,000 annual passengers.

PRIMARY SURFACE: An imaginary obstruction limiting surface defined in FAR Part 77 that is specified as a rectangular surface longitudinally centered about a runway. The specific dimensions of this surface are a function of the types of approaches existing or planned for the runway.

PROHIBITED AREA: See special-use airspace.

RADIAL: A navigational signal generated by a Very High Frequency Omni-directional Range or VORTAC station that is measured as an azimuth from the station.

REGRESSION ANALYSIS: A statistical technique that seeks to identify and quantify the relationships between factors associated with a forecast.

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

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

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

RESTRICTED AREA: See special-use airspace.

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

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

RUNWAY ALIGNMENT INDICATOR LIGHT: A series of high intensity sequentially flashing lights installed on the extended centerline of the runway usually in conjunction with an approach lighting system.

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

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

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

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

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

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

SCOPE: The document that identifies and defines the tasks, emphasis, and level of effort associated with a project or study.

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

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

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

SMALL AIRPLANE: An airplane that has a maximum certified takeoff weight of up to 12,500 pounds.

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

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

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

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

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

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

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

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

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

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

STOPWAY: An area beyond the end of a takeoff runway that is designed to support an aircraft during an aborted takeoff without causing structural damage to the aircraft. It is not to be used for takeoff, landing, or taxiing by aircraft.

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

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

TAKEOFF RUNWAY AVAILABLE (TORA): See declared distances.

TAKEOFF DISTANCE AVAILABLE (TODA): See declared distances.

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

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

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

TERMINAL INSTRUMENT PROCEDURES: Published flight procedures for conducting instrument approaches to runways under instrument meteorological conditions.

TERMINAL RADAR APPROACH CONTROL: An element of the air traffic control system responsible for monitoring the en-route and

terminal segment of air traffic in the airspace surrounding airports with moderate to high-levels of air traffic.

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

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

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

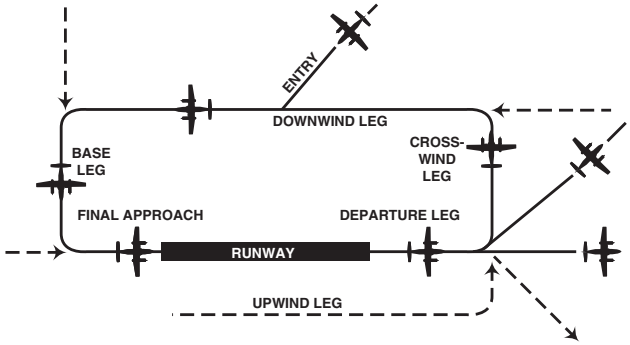
TOUCHDOWN: The point at which a landing aircraft makes contact with the runway surface.

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

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

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

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



UNCONTROLLED AIRPORT: An airport without an air traffic control tower at which the control of Visual Flight Rules traffic is not exercised.

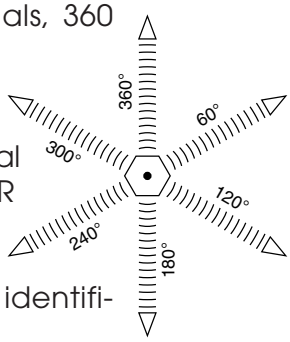
UNCONTROLLED AIRSPACE: Airspace within which aircraft are not subject to air traffic control.

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

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

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

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



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

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

VISUAL APPROACH: An approach wherein an aircraft on an IFR flight plan,

operating in VFR conditions under the control of an air traffic control facility and having an air traffic control authorization, may proceed to the airport of destination in VFR conditions.

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

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

VISUAL METEOROLOGICAL CONDITIONS: Meteorological conditions expressed in terms of specific visibility and ceiling conditions which are equal to or greater than the threshold values for instrument meteorological conditions.

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

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

WARNING AREA: See special-use airspace.

WIDE AREA AUGMENTATION SYSTEM: An enhancement of the Global Positioning System that includes integrity broadcasts, differential corrections, and additional ranging signals for the purpose of providing the accuracy, integrity, availability, and continuity required to support all phases of flight.

Abbreviations

AC: advisory circular

ADF: automatic direction finder

ADG: airplane design group

AFSS: automated flight service station

AGL: above ground level

AIA: annual instrument approach

AIP: Airport Improvement Program

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

ALS: approach lighting system

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

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

APV: instrument approach procedure with vertical guidance

ARC: airport reference code

ARFF: aircraft rescue and firefighting

ARP: airport reference point

ARTCC: air route traffic control center

ASDA: accelerate-stop distance available

ASR: airport surveillance radar

ASOS: automated surface observation station

ATCT: airport traffic control tower

ATIS: automated terminal information service

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

AWOS: automated weather observation station

BRL: building restriction line

CFR: Code of Federal Regulations

CIP: capital improvement program

DME: distance measuring equipment

DNL: day-night noise level

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

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

FAA: Federal Aviation Administration

FAR: Federal Aviation Regulation

FBO: fixed base operator
FY: fiscal year

GPS: global positioning system

GS: glide slope

HIRL: high intensity runway edge lighting

IFR: instrument flight rules (FAR Part 91)

ILS: instrument landing system

IM: inner marker

LDA: localizer type directional aid

LDA: landing distance available

LIRL: low intensity runway edge lighting

LMM: compass locator at middle marker

LOC: ILS localizer

LOM: compass locator at ILS outer marker

LORAN: long range navigation

MALS: medium intensity approach lighting system

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

MIRL: medium intensity runway edge lighting

MITL: medium intensity taxiway edge lighting

MLS: microwave landing system

MM: middle marker

MOA: military operations area

MSL: mean sea level

NAVAID: navigational aid

NDB: nondirectional radio beacon

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

NPES: National Pollutant Discharge Elimination System

NPIAS: National Plan of Integrated Airport Systems

NPRM: notice of proposed rulemaking

ODALS: omnidirectional approach lighting system

OFA: object free area

OFZ: obstacle free zone

OM: outer marker

PAC: planning advisory committee

PAPI: precision approach path indicator

PFC: porous friction course

PFC: passenger facility charge

PCL: pilot-controlled lighting

PIW: public information workshop

PLASI: pulsating visual approach slope indicator

POFA: precision object free area

PVASI: pulsating/steady visual approach slope indicator

RCO: remote communications outlet

REIL: runway end identifier lighting

RNAV: area navigation

RPZ: runway protection zone

RSA: Runway Safety Area

RTR: remote transmitter/receiver

RVR: runway visibility range

RVZ: runway visibility zone

SALS: short approach lighting system

SASP: state aviation system plan

SEL: sound exposure level

SID: standard instrument departure

SM: statute mile (5,280 feet)

SRE: snow removal equipment

SSALF: simplified short approach lighting system with sequenced flashers

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

STAR: standard terminal arrival route

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

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

TACAN: tactical air navigational aid

TDZ: touchdown zone

TDZE: touchdown zone elevation

TAF: Federal Aviation Administration (FAA) Terminal Area Forecast

TODA: takeoff distance available

TORA: takeoff runway available

TRACON: terminal radar approach control

VASI: visual approach slope indicator

VFR: visual flight rules (FAR Part 91)

VHF: very high frequency

VOR: very high frequency omni-directional range

VORTAC: VOR and TACAN collocated

DEPARTMENT OF THE AIR FORCE
71ST OPERATIONS SUPPORT SQUADRON (AETC)
VANCE AIR FORCE BASE, OKLAHOMA

21 November 2005

MEMORANDUM FOR HUTCHINSON AIRPORT MANAGER

FROM: 71 OSS/OSOP
301 Gritz St
Vance AFB, OK 73705

SUBJECT: Military Requirements for regular use of Hutchinson Airport

1. Vance AFB has been asked to comment on the military requirements for regular use of Hutchinson Municipal Airport. Of particular interest is the desired runway length necessary for conducting training exercises at Hutchinson. We have been asked if there is a minimum runway length that is acceptable to the military for continued operations at the airport. This letter only speaks for Vance AFB aircraft, particularly the T-1, T-37, and T-6. The T-38 does not utilize Hutchinson due to runway length well below its minimum.

2. A reduction in runway length below 7000 feet would significantly effect T-1 operations. Operating instructions dictate that students will not perform full stop landings on runways less than 7000'. It is highly desirable for our student pilots to have an actual landing on every mission. Since most T-1 missions planning to full stop at HUT are planned for only one landing per student, a runway length less than the minimum for student full stop landings would have a negative effect on training. Operating instructions also dictate 7000' as the minimum length for touch and go's without supervisor approval. While we can fly approaches to a low approach only, it is obviously better training for the students to be able to land out of their approaches. Therefore, our instructors will avoid utilizing airfields with less than 7000' of runway for both safety and training reasons.

3. The minimum runway length for the T-6 is 4000' x 75'. The minimum runway length for the T-37 is 5000' x 75'. While a reduction in runway length above these minimums would not effect T-6/T-37 operations, the primary user of Hutchinson is the T-1.

4. The Vance AFB airspace management office, representing the needs of the four flying training squadrons, enjoys the availability of Hutchinson Municipal Airport. The proximity to Vance, multiple approaches, less congested approach airspace, and good service make Hutchinson a valuable training destination. This resource would be lost to the T-1 if the runway were reduced below 7000'.

JOSEPH J. DINATALE, Major, USAF
Vance Airspace Manager

As part of this master plan, the FAA requires the development of several computer drawings detailing specific parts of the airport and its environs. These drawings were created on a computer-aided drafting system (CAD) and serve as the official depiction of the current and planned condition of the airport. These drawings will be delivered to the FAA for their review and inspection. The FAA will critique the drawings from a technical perspective to be sure all applicable federal regulations are met. The FAA will use the CAD drawings as the basis and justification for funding decisions.

It should be noted that the FAA requires that any changes to the airfield (i.e., runway and taxiway system, etc.) be represented on the drawings. The landside configuration, developed during this master planning process, is also depicted on the drawings but the FAA recognized that landside development is much more fluid and dependent upon developer needs. Thus, an updated drawing set is not necessary for future landside alterations.

The following is a description of the CAD drawings included with this master plan.

AIRPORT LAYOUT PLAN

An official Airport Layout Plan (ALP) drawing has been developed for Hutchinson Municipal Airport and can be found at the end of this chapter. The ALP drawing graphically presents the existing and ultimate airport layout plan. The ALP drawing will include such elements as the physical airport features, wind data tabulation, location of airfield facilities (i.e., runways, taxiways, navigational aids), and existing

general aviation development (and commercial development for air carrier airports). Also presented on the ALP is the runway safety areas, airport property boundary, and revenue support areas. The ALP is used by FAA to determine funding eligibility for future capital projects.

The computerized plan provides detailed information on existing and future facility layouts on multiple layers that permit the user to focus on any section of the airport at a desired scale. The plan can be used as base information for design and can be easily updated in the future to reflect new development and more detail concerning existing conditions as made available through design surveys.

AIRSPACE DRAWING

Federal Aviation Regulation (F.A.R.) Part 77, *Objects Affecting Navigable Airspace*, was established for use by local authorities to control the height of objects near airports. The Part 77 Airspace Drawing included in this master plan is a graphic depiction of this regulatory criterion. The Part 77 Airspace Drawing is a tool to aid local authorities in determining if proposed development could present a hazard to aircraft using the airport. The Airspace Drawing can be a critical tool for the airport sponsor's use in planning against future development limitations.

The City of Hutchinson should do all in its power to ensure development stays below the Part 77 surfaces to protect the future role of the airport. The following discussion will describe those approach surfaces that make up the recommended F.A.R. Part 77 operations at Hutchinson Municipal Airport.

The Part 77 Airspace Drawing assigns three-dimensional imaginary areas to each runway. These imaginary surfaces emanate from the runway centerline and are dimensioned according to the visibility minimums associated with the approach to the runway end and size of aircraft to operate on the runway. The Part 77 imaginary surfaces include the primary surface, approach surface, transitional surface, horizontal surface, and conical surface. Part 77 imaginary surfaces are described as follows.

Primary Surface

The primary surface is an imaginary surface longitudinally centered on the runway. The primary surface extends 200 feet beyond each runway end. The elevation of any point on the primary surface is the same as the elevation along the nearest associated point on the runway centerline. Under Part 77 regulations, the primary surface for future approaches to existing Runway 17-35 is 1,000 feet wide.

Approach Surface

An approach surface is also established for each runway. The approach surface begins at the same width as the primary surface and extends upward and outward from the primary surface end and is centered along an extended runway centerline. The future approach surface to Runways 17 and 35 extends 10,000 feet from the end of the primary surface at an upward slope of 34 to 1, to a width of 4,000 feet.

Transitional Surface

Each runway has a transitional surface that begins at the outside edge of the primary surface at the same elevation as the runway. The transitional surface also connects with the approach surfaces of each runway. The surface rises at a slope of 7 to 1, up to a height 150 feet above the highest runway elevation. At that point, the transitional surface is replaced by the horizontal surface.

Horizontal Surface

The horizontal surface is established at 150 feet above the highest elevation of the runway surface. Having no slope, the horizontal surface connects the transitional and approach surfaces to the conical surface at a distance of 10,000 feet from the end of the primary surfaces of each runway.

Conical Surface

The conical surface begins at the outer edge of the horizontal surface. The conical surface then continues for an additional 4,000 feet horizontally at a slope of 20 to 1. Therefore, at 4,000 feet from the horizontal surface, the elevation of the conical surface is 350 feet above the highest airport elevation.

RUNWAY PROFILE DRAWING

The runway profile drawing presents the entirety of the F.A.R. Part 77 approach surface to each runway end. It also depicts the runway centerline profile with elevations. This drawing provides profile detail that the Airspace Drawing does not. There is a separate drawing for each runway.

INNER APPROACH SURFACE DRAWINGS

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

TERMINAL AREA DRAWING

The terminal area drawing is a larger scale plan view drawing of existing and planned aprons, buildings, hangars, parking lots, and other landside facilities. It is prepared in accordance with FAA AC 150/5300-13, *Airport Design*.

AIRPORT PROPERTY MAP

The Property Map provides information on the acquisition and identification of all land tracts under control of the airport. Easement interests in areas outside the fee property line are also included. The primary purpose of the drawing is to provide information for analyzing the current and future aeronautical use of land acquired with federal funds.

AIRPORT LAYOUT PLANS

FOR

HUTCHINSON MUNICIPAL AIRPORT

Hutchinson, Kansas

VICINITY MAP

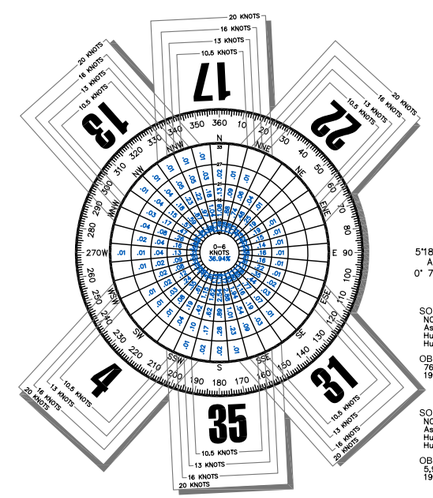
LOCATION MAP

Prepared for the

Hutchinson Municipal Airport

ALL WEATHER WIND COVERAGE				
Runways	10.5 Knots	13 Knots	16 Knots	20 Knots
4–22	83.08%	90.68%	96.84%	99.23%
13–31	89.45%	94.76%	98.36%	99.63%
17–35	95.38%	97.82%	99.34%	99.80%
4–22/13–31 Combined	97.01%	99.09%	99.80%	99.98%
4–22/17–35 Combined	97.09%	98.79%	99.59%	99.89%
13–31/17–35 Combined	98.24%	99.36%	99.84%	99.95%
All Combined	99.64%	99.89%	99.96%	99.99%

IFR CAT-I WIND COVERAGE				
Runways	10.5 Knots	13 Knots	16 Knots	20 Knots
4–22	84.64%	91.75%	97.36%	99.25%
13–31	90.23%	95.89%	99.10%	99.78%
17–35	95.97%	98.21%	99.53%	99.86%
4–22/13–31 Combined	98.13%	99.46%	99.80%	99.95%
4–22/17–35 Combined	97.56%	99.16%	99.78%	99.95%
13–31/17–35 Combined	98.43%	99.39%	99.77%	99.94%
All Combined	99.73%	99.92%	99.94%	99.98%



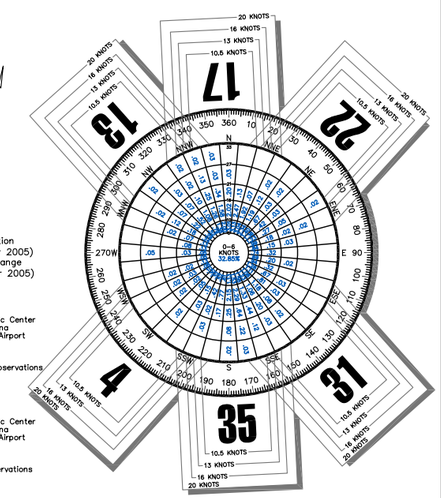
Magnetic Declination
5°18' East (December 2005)
Annual Rate of Change
0° 7' West (December 2005)

SOURCE:
NOAA National Climatic Center
Asheville, North Carolina
Hutchinson Municipal Airport
Hutchinson, Kansas

OBSERVATIONS:
76,003 All Weather Observations
1995–2004

SOURCE:
NOAA National Climatic Center
Asheville, North Carolina
Hutchinson Municipal Airport
Hutchinson, Kansas

OBSERVATIONS:
5,946 IFR CAT-I Observations
1995–2004



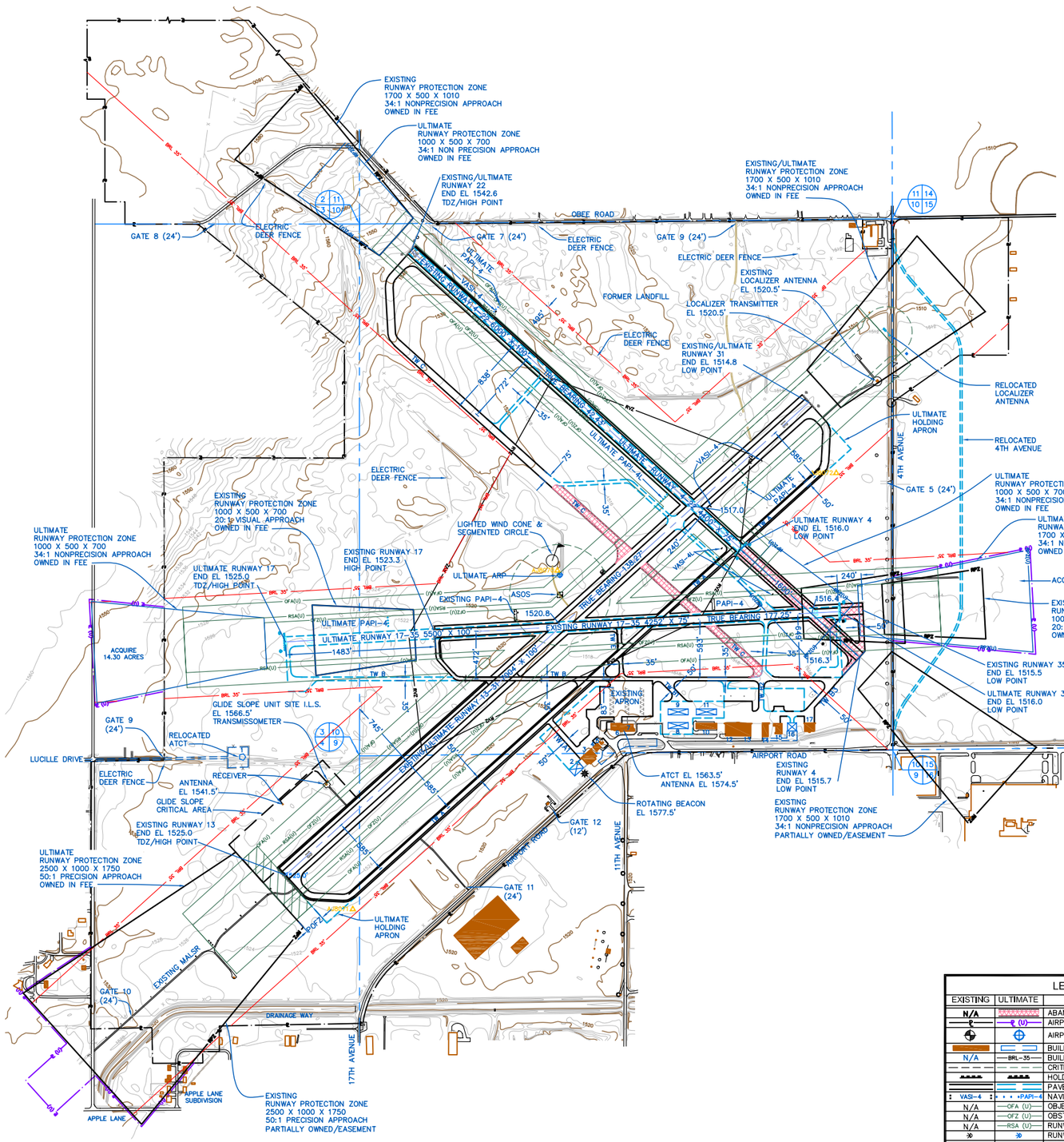
INDEX OF DRAWINGS

COVER
1. AIRPORT LAYOUT DRAWING
2. AIRPORT AIRSPACE DRAWING I
3. AIRPORT AIRSPACE DRAWING II
4. RUNWAY 13–31 PROFILES
5. RUNWAY 4–22 PROFILES
6. RUNWAY 17–35 PROFILES
7. RUNWAY 13 INNER PORTION OF APPROACH SURFACE DRAWING
8. RUNWAY 31 INNER PORTION OF APPROACH SURFACE DRAWING
9. RUNWAY 4 INNER PORTION OF APPROACH SURFACE DRAWING
10. RUNWAY 22 INNER PORTION OF APPROACH SURFACE DRAWING
11. RUNWAY 17 INNER PORTION OF APPROACH SURFACE DRAWING
12. RUNWAY 35 INNER PORTION OF APPROACH SURFACE DRAWING
13. TERMINAL AREA DRAWING I
14. AIRPORT PROPERTY MAP

AUGUST 2006

Coffman Associates
Airport Consultants
www.coffmanassociates.com

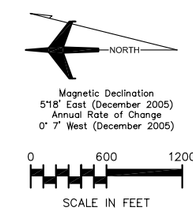
Coffman Associates R:\CAD\Hopkins\MP\HUT\ALP\HUT COVER.dwg Printed Date: 8-15-06 08:56:11 AM Dhopkins



RUNWAY DATA	EXISTING		ULTIMATE		EXISTING		ULTIMATE		EXISTING		ULTIMATE	
	13	31	13	31	4	22	4	22	17	35	17	35
AIRCRAFT APPROACH CATEGORY–DESIGN GROUP	C–II		C–III		C–II		B–II		B–II		C–II	
RUNWAY LENGTH & WIDTH	7,004' x 100'		7,004' x 100'		6,000' x 100'		4,400' x 75'		4,252' x 75'		5,500' x 100'	
RUNWAY INSTRUMENTATION	Precision	Nonprecision	Precision	Nonprecision	Nonprecision	Nonprecision	Nonprecision	Nonprecision	Visual	Visual	Nonprecision	Nonprecision
RUNWAY APPROACH SURFACE SLOPE	50:1	34:1	50:1	34:1	34:1	34:1	34:1	34:1	20:1	20:1	34:1	34:1
APPROACH VISIBILITY MINIMA	1/2 Mile	1 Mile	1/2 Mile	1 Mile	1 Mile	1 Mile	1 Mile	1 Mile	Visual	Visual	1 Mile	1 Mile
RUNWAY BEARING (TRUE)	138.27°		138.27°		42.43°		42.43°		177.25°		177.25°	
RUNWAY OBJECT FREE AREA (OFA) LENGTH	8,682'		9,004'		6,440'		5,000'		4,788'		7,500'	
RUNWAY OBJECT FREE AREA WIDTH	800'		800'		800'		500'		500'		800'	
RUNWAY SAFETY AREA (RSA) LENGTH	8,682'		9,004'		6,440'		5,600'		4,788'		7,500'	
RUNWAY SAFETY AREA WIDTH	500'		500'		500'		150'		150'		500'	
RUNWAY OBSTACLE FREE ZONE (OFZ) LENGTH	7,404'		7,404'		6,400'		5,400'		4,652'		5,900'	
RUNWAY OBSTACLE FREE ZONE WIDTH	400'		400'		400'		400'		400'		400'	
RUNWAY PAVEMENT MATERIAL	Asphalt		Asphalt		Asphalt		Asphalt		Asphalt		Asphalt	
RUNWAY PAVEMENT DESIGN STRENGTH (in thousands lbs.)	42 S; 50 DW; 76 DTW		42 S; 50 DW; 76 DTW		42 S; 50 DW; 76 DTW		42 S; 50 DW; 76 DTW		42 S; 50 DW; 76 DTW		42 S; 50 DW; 76 DTW	
RUNWAY EFFECTIVE GRADIENT	0.1%		0.1%		0.4%		0.6%		0.3%		.2%	
RUNWAY TOUCHDOWN ZONE ELEVATION	1525.1'	1519.9'	1525.1'	1519.9'	1519.0'	1542.6'	1522.0'	1542.6'	1523.4'	1522.3'	1525.0'	1522.3'
RUNWAY MARKING	Precision	Nonprecision	Precision	Nonprecision	Nonprecision	Nonprecision	Nonprecision	Nonprecision	Basic	Basic	Nonprecision	Nonprecision
RUNWAY LIGHTING	HIRL		HIRL		MIRL		MIRL		MIRL		MIRL	
RUNWAY/TAXIWAY HOLDING POSITION MARKING	250'		250'		250'		200'		200'		250'	
TAXIWAY WIDTH	50'		35'		75'		35'		35'/75'		35'	
TAXIWAY LIGHTING	MITL		MITL		None		MITL		MITL		MITL	
TAXIWAY SAFETY AREA WIDTH	79'		118'		79'		79'		79'		79'	
TAXIWAY OBJECT FREE AREA WIDTH	131'		186'		131'		131'		131'		131'	
RUNWAY ELECTRONIC AIDS	ILS (13), NDB (13) GPS (13), LOC–BC (31)		ILS (13), NDB (13) GPS (13, 31) LOC–BC (31)		GPS (4, 22) VOR (4), VOR/DME (22)		GPS (4, 22)		NONE		GPS (17–35)	
RUNWAY VISUAL AIDS	MALSR (13) VASI–4L (31), REIL (31)		MALSR (13) PAPI–4 (31) REIL (31)		VASI–4L, REIL (4, 22)		PAPI–4L (4, 22) REIL (4, 22)		PAPI 4 (17, 35)		PAPI 4 (17, 35) REIL (17, 35)	
DISPLACED THRESHOLD ELEVATION	NA	NA	NA	NA	1,516.3'	NA	NA	NA	NA	1,517.3'	NA	NA
TAKE–OFF RUN AVAILABLE	7,004'	7,004'	7,004'	7,004'	6,000'	6,000'	4,400'	4,400'	4,252'	4,252'	5,500'	5,500'
TAKE–OFF DISTANCE AVAILABLE	7,004'	7,004'	7,004'	7,004'	6,000'	6,000'	4,400'	4,400'	4,252'	4,252'	5,500'	5,500'
LANDING DISTANCE AVAILABLE	7,004'	7,004'	7,004'	7,004'	6,000'	6,000'	4,400'	4,400'	4,252'	4,252'	5,500'	5,500'
ACCELERATE STOP DISTANCE AVAILABLE	7,004'	7,004'	7,004'	7,004'	5,600'	6,000'	4,400'	4,400'	4,252'	3,452'	5,500'	5,500'

SURVEY CONTROL COORDINATES		
PERMANENT IDENTIFIER	LATITUDE	LONGITUDE
AJ8070	38°04'00.27"	97°51'37.99"
AJ8071	38°04'20.32"	97°52'19.94"
AJ8072	38°03'32.94"	97°51'25.91"

AIRPORT DATA		
OWNER: CITY OF HUTCHINSON	AIRPORT NPIAS CODE: GENERAL AVIATION	
CITY: HUTCHINSON, KANSAS	COUNTY: RENO	
	EXISTING	ULTIMATE
AIRPORT REFERENCE CODE	C–II	C–III
AIRPORT ELEVATION (MSL)	1543.1	1543.1
MEAN MAXIMUM TEMPERATURE OF HOTTEST MONTH (JULY)	93.0° F	93.0° F
AIRPORT REFERENCE POINT (ARP) Latitude	38° 03' 55.800" N	38° 04' 00.032" N
COORDINATES (NAD 83) Longitude	97° 51' 38.300" W	97° 51' 38.520" W
AIRPORT ELECTRONIC AIDS	GPS, VOR, ILS, NDB	GPS, VOR, ILS, NDB



RUNWAY END COORDINATES (NAD 83)			
RUNWAY	END EL	LATITUDE	LONGITUDE
RUNWAY 13	1525.0	38° 04' 27.149" N	97° 52' 15.897" W
RUNWAY 31	1514.8	38° 03' 35.477" N	97° 51' 17.612" W
EXISTING RUNWAY 4	1515.7	38° 03' 30.606" N	97° 51' 49.154" W
ULTIMATE RUNWAY 4	1516.0	38° 03' 42.279" N	97° 51' 35.665" W
RUNWAY 22	1542.6	38° 04' 14.380" N	97° 50' 58.540" N
RUNWAY 17	1523.3	38° 04' 12.274" N	97° 51' 45.932" W
ULTIMATE RUNWAY 17	1525.0	38° 04' 26.913" N	97° 51' 46.820" W
RUNWAY 35	1515.5	38° 03' 30.290" N	97° 51' 43.380" W
ULTIMATE RUNWAY 35	1516.4	38° 03' 32.605" N	97° 51' 43.521" W

BUILDING/FACILITIES		
EXIST	ULT	DESCRIPTION
	1	AIR TRAFFIC CONTROL TOWER
	2	CONVENTIONAL HANGAR
3		CONVENTIONAL HANGAR
4		AIRPORT MAINTENANCE SHOP
5		AIRFIELD ELECTRICAL VAULT
6		AIR TRAFFIC CONTROL TOWER
7		TERMINAL BUILDING
	8	T–HANGAR (8 UNIT)
	9	T–HANGAR (8 UNIT)
10		T–HANGAR (8 UNIT)
	11	T–HANGAR (8 UNIT)
12		CONVENTIONAL HANGAR
13		CONVENTIONAL HANGAR
14		CONVENTIONAL HANGAR
15		CONVENTIONAL HANGAR
	16	CONVENTIONAL HANGAR
17		CONVENTIONAL HANGAR

GENERAL NOTES:

HORIZONTAL DATUM: NAD 83; NAVD 88 RUNWAY END, TOUCH DOWN ZONE, HIGH, AND LOW POINT ELEVATION DATUM, FROM AERONAUTICAL DATA SHEET, FROM SURVEY DATED 07/29/2002. HTTP://WWW.NGS.NOAA.GOV/AERO/DOLE.HTM#KS.

SURVEY MONUMENT LOCATIONS PER NATIONAL GEODETIC SURVEY DATA SHEET, HTTP: WWW.NGS.NOAA.GOV/CGI–BIN/DS_RADIUS.PRL.

SEE INNER PORTION OF THE APPROACH SURFACE DRAWINGS, SHEETS 7 THROUGH 12 FOR APPROACH SURFACE TRAVERSEWAY INTERSECTION DETAILS.

SEE INNER PORTION OF THE APPROACH SURFACE DRAWINGS, SHEETS 7 THROUGH 12 FOR THRESHOLD SITING SURFACE PENETRATION DETAILS.

NO EXISTING MODIFICATIONS TO DESIGN STANDARDS

NO OBSTACLE FREE ZONE PENETRATIONS

BRL BASED ON 35' BUILDING HEIGHT

ALL ELEVATIONS ARE MEAN SEA LEVEL (MSL)

APPROVAL BLOCK	
APPROVED BY:	DATE
Phillip E. Florey, Airport Manager	

LEGEND		
EXISTING	ULTIMATE	DESCRIPTION
N/A		ABANDONED PAVEMENT
	(U)	AIRPORT PROPERTY LINE
		AIRPORT REFERENCE POINT (ARP)
		BUILDING
N/A	BRL–35	BUILDING RESTRICTION LINE (BRL)
		CRITICAL AREA
		HOLDING POSITION MARKING
		PAVEMENT
VASI–4	PAPI–4	NAVIGATION AID
N/A	OFA (U)	OBJECT FREE AREA (OFA)
N/A	OFZ (U)	OBSTACLE FREE ZONE (OFZ)
N/A	RSA (U)	RUNWAY SAFETY AREA (RSA)
		RUNWAY END IDENTIFIER LIGHTS (REILS)
		THRESHOLD LIGHTS
	N/A	SURVEY MONUMENT
	N/A	SEGMENTED CIRCLE/WIND INDICATOR
	N/A	WIND INDICATOR (Lighted)
1070	N/A	CONTOURS

No.	REVISIONS	DATE	BY	APP'D.

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

HUTCHINSON MUNICIPAL AIRPORT

AIRPORT LAYOUT DRAWING

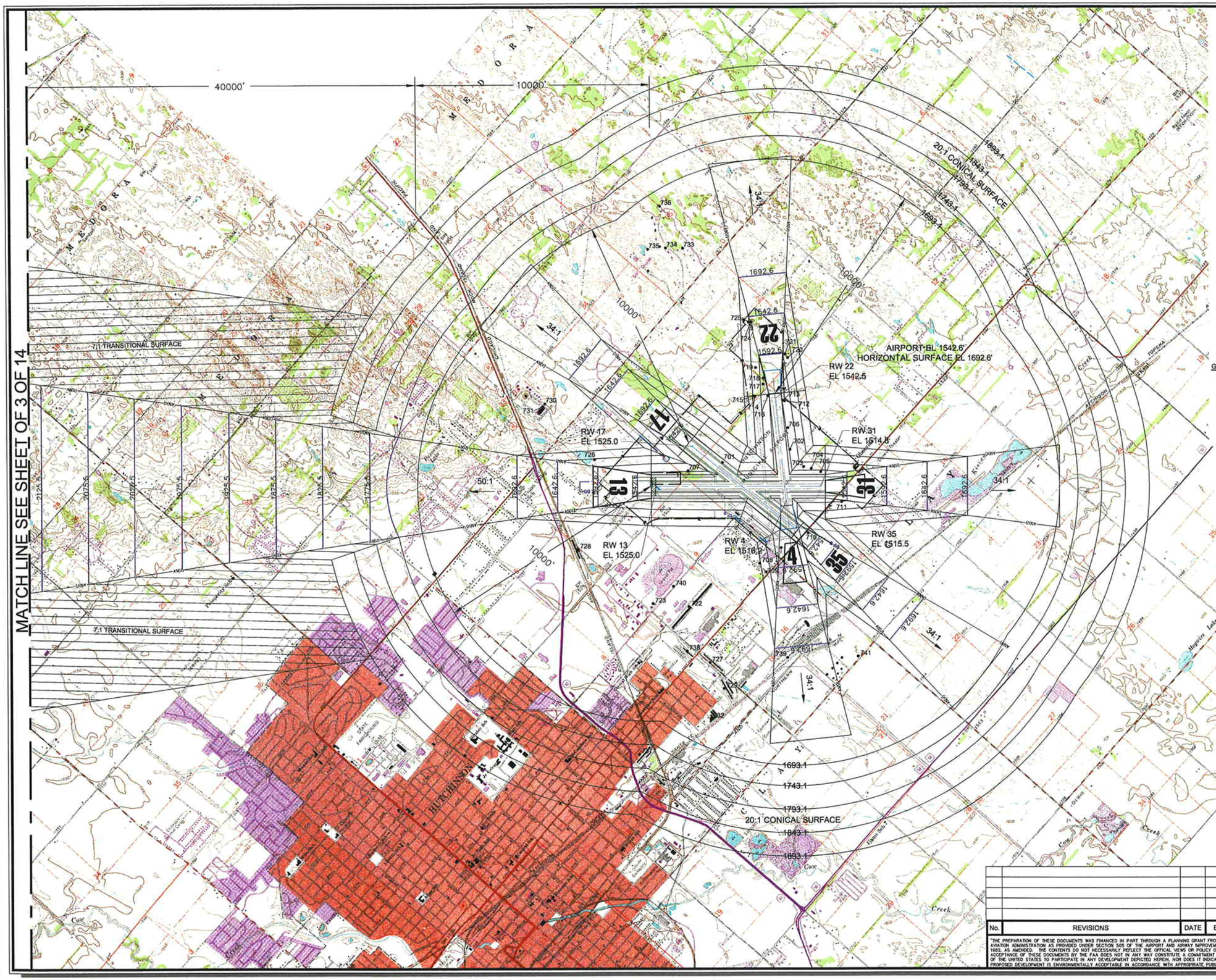
Hutchinson, Kansas

PLANNED BY: Patrick C. Taylor
DETAILED BY: Diana L. Hopkins
APPROVED BY: Chris M. Hugunin

August 1, 2006 SHEET 1 OF 14

Coffman Associates Airport Consultants

Coffman Associates R:\CAD\hopkinsD\MP\HUT\ALP\HUT ALD.dwg Printed Date: 8-15-06 08:51:45 AM DHopkins



OBSTRUCTION TABLE				
No.	Top Elevation	Object Description	Penetration	Remediation
701	1546	TREE	5	TRIM OR REMOVE
702	1561	TREE	27	TRIM OR REMOVE
703	1573	TREE	3	TRIM OR REMOVE
704	1587	TREE	27	TRIM OR REMOVE
705	1584	TREE	45	TRIM OR REMOVE
706	1573	TREE	33	TRIM OR REMOVE
707	1558	TREE	12	TRIM OR REMOVE
708	1685	ANT ON OL TWR	1	TO REMAIN LIGHTED
709	1553	POLE	11	ADD OBSTRUCTION LIGHT
710	1529	TREE	CLEAR	NO ACTION REQUIRED
711	1561	TREE	16	TRIM OR REMOVE
712	1589	TREE	40	TRIM OR REMOVE
713	1567	TREE	24	TRIM OR REMOVE
714		NOT USED		
715	1646	TREE	1	TRIM OR REMOVE
716	1594	TREE	37	TRIM OR REMOVE
717	1626	TREE	41	TRIM OR REMOVE
718	1634	TREE	52	TRIM OR REMOVE
719	1625	TREE	37	TRIM OR REMOVE
720	1649	TREE	39	TRIM OR REMOVE
721	1635	TREE	42	TRIM OR REMOVE
722	1772	ANT ON ELEVATOR	79	ADD OBSTRUCTION LIGHT
723	1695	OL ON TANK	2	TO REMAIN LIGHTED
724	1653	TREE	8	TRIM
725	1664	TREE	7	TRIM
726	1599	TREE	CLEAR	NO ACTION REQUIRED
727	1748	OL ON ELEVATOR	55	TO REMAIN LIGHTED
728	1740	OL ON ELEVATOR	47	TO REMAIN LIGHTED
729	1743	PIPE ON ELEVATOR	50	ADD OBSTRUCTION LIGHT
730	1751	OL ON BLDG	58	TO REMAIN LIGHTED
731	1751	ROD ON TOWER	58	ADD OBSTRUCTION LIGHT
732	1712	PIPE ON OL ELEVATOR	19	TO REMAIN LIGHTED
733	1713	TREE	20	TRIM OR REMOVE
734	1693	TREE	CLEAR	NO ACTION REQUIRED
735	1723	TREE	30	TRIM OR REMOVE
736	1723	TREE	30	TRIM OR REMOVE
737	1744	ELEVATOR	14	ADD OBSTRUCTION LIGHT
738	1721	ELEVATOR	28	ADD OBSTRUCTION LIGHT

GENERAL NOTES:

1. HORIZONTAL DATUM: NORTH AMERICAN DATUM 1983 – NAD 83; VERTICAL DATUM: NORTH AMERICAN VERTICAL DATUM – NAVD88. FROM AERONAUTICAL DATA SHEET, PUBLISHED MARCH 2003. HTTP://WWW.NGS.NOAA.GOV/AERO/DOLE.HTM#KS.
2. THE FOLLOWING USGS QUAD MAPS WERE USED AS REFERENCE: HUTCHINSON, HUTCHINSON NW, HUTCHINSON SE, AND NICKERSON.
3. SEE THE INNER PORTION OF THE APPROACH SURFACE DRAWINGS FOR CLOSE-IN OBSTRUCTIONS.

No.	REVISIONS	DATE	BY	APP'D.

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

HUTCHINSON MUNICIPAL AIRPORT

AIRPORT AIRSPACE DRAWING I

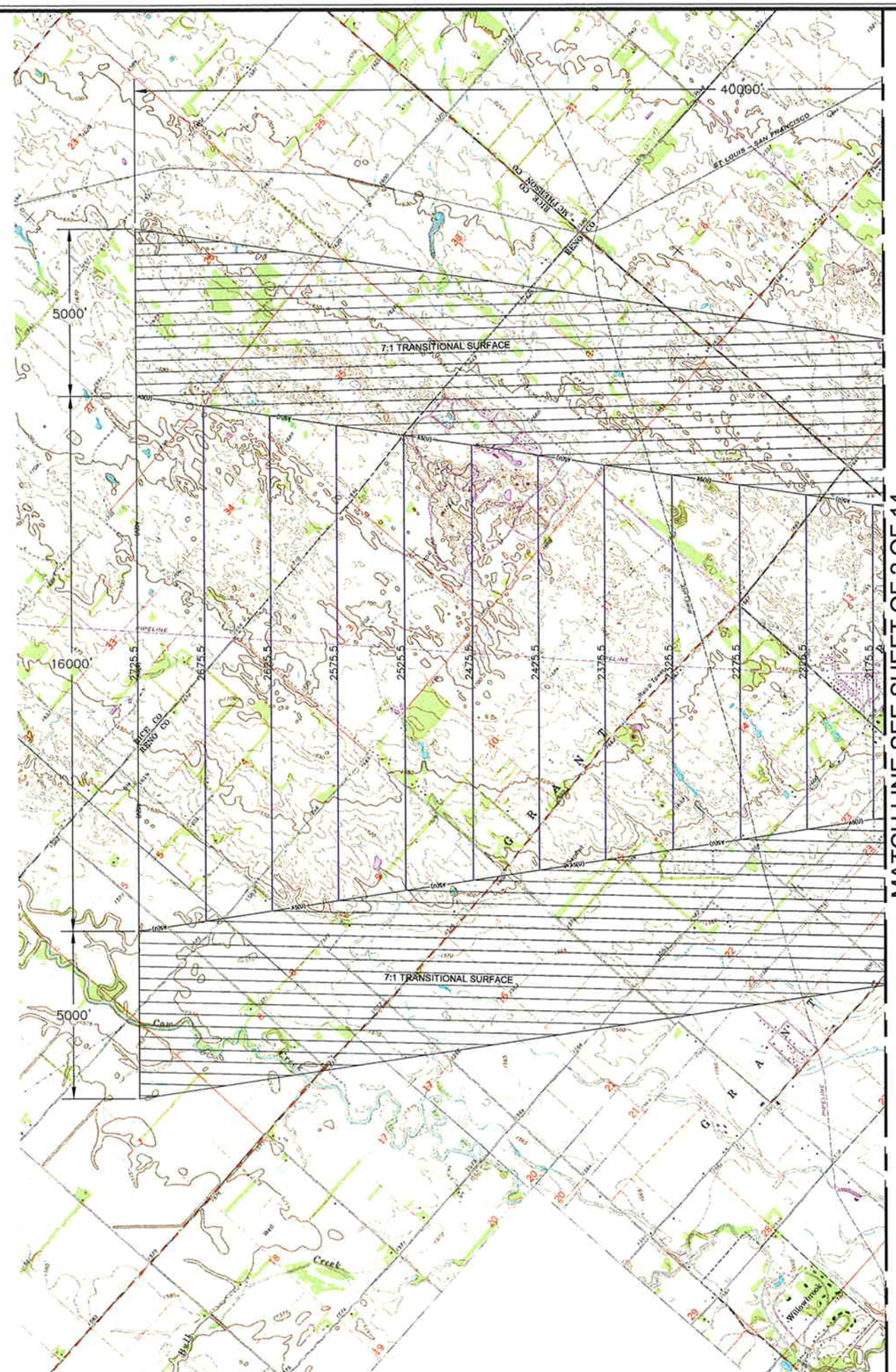
Hutchinson, Kansas

PLANNED BY: Patrick C. Taylor
DETAILED BY: Diana L. Hopkins
APPROVED BY: Chris M. Hoppin

August 1, 2006

Goffman Associates
Airport Consultants

Goffman Associates X:\CAD\projects\UAP\UST\ALP\UST_AIRSPACE.dwg Printed Date: 8-15-06 08:49:40 AM Dhopkins



OBSTRUCTION TABLE							
No.	Object Description	Distance From RW End	Offset From RW Centerline	Top Elevation	Surface Penetrated	Penetration	Remediation
	NONE FOUND						

GENERAL NOTES:

1. HORIZONTAL DATUM: NORTH AMERICAN DATUM 1983 – NAD 83; VERTICAL DATUM: NORTH AMERICAN VERTICAL DATUM – NAVD88.
2. THE FOLLOWING USGS QUAD MAPS WERE USED AS REFERENCE: HUTCHINSON, HUTCHINSON NW, HUTCHINSON SE, AND NICKERSON.
3. SEE THE INNER PORTION OF THE APPROACH SURFACE DRAWINGS FOR CLOSE-IN OBSTRUCTIONS.

0 2000 4000
SCALE IN FEET

NORTH

MAGNETIC DECLINATION
5° 18' East (December 2005)
ANNUAL RATE OF CHANGE
7' West (December 2005)

No.	REVISIONS	DATE	BY	APP'D.

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

HUTCHINSON MUNICIPAL AIRPORT

AIRPORT AIRSPACE DRAWING II

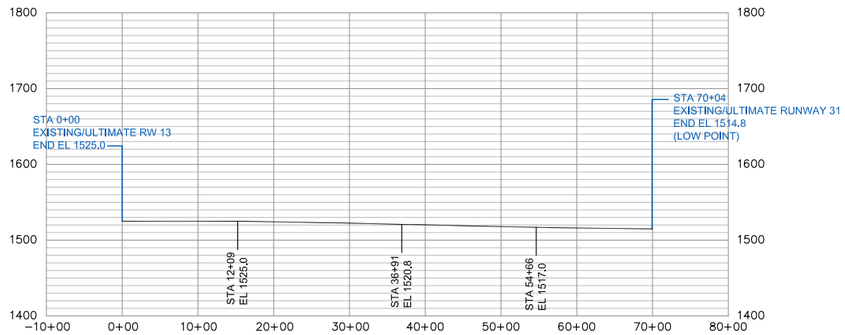
Hutchinson, Kansas

PLANNED BY: Patrick C. Taylor
DETAILED BY: Diana L. Hopkins
APPROVED BY: Chris M. Hagarin

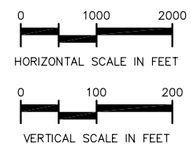
August 1, 2006 | SHEET 3 OF 14

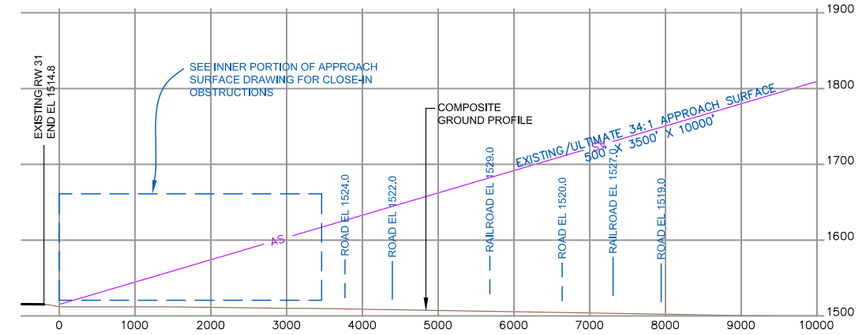
Coffman Associates
Airport Consultants

Coffman Associates R:\CAD\Hopkins3\MP\HUT\HUT AIRSPACE.dwg Printed Date 8-15-06 08:50:50 AM Dhopkins

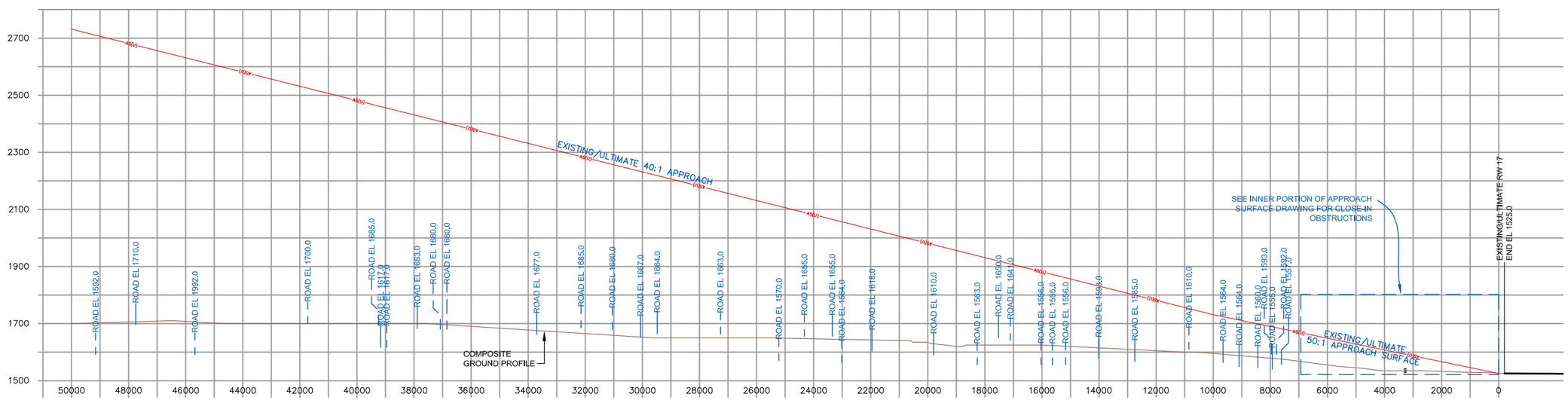


RUNWAY 13-31 CENTERLINE PROFILE





RUNWAY 31 APPROACH PROFILE



GENERAL NOTES:

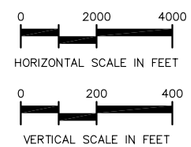
All distance measurements in feet.

The reference datum used is North American Datum 1983 - NAD 83, and NAVD 88 from Aeronautical Data Sheet, published March 2003. http://www.ngs.noaa.gov/AERO/dole.htm#KS.

Feature and object locations and elevations obtained from Aeronautical Data Sheet, http://www.ngs.noaa.gov/AERO/dole.htm#KS.

Elevations of traverse ways include a safety clearance of 10' for unpaved or private roads, 15' for noninterstate roads, 17' for interstate roads and 23' for railroad per Section 77.23, Part 77--Objects Affecting Navigable Airspace.

RUNWAY 13 APPROACH PROFILE



Magnetic Declination
5°18' East (December 2005)
Annual Rate of Change
0° 7' West (December 2005)

RUNWAY 13 OBSTRUCTION TABLE

OBJECT DESCRIPTION	DISTANCE FROM RW END	OFFSET FROM RW CENTERLINE	TOP ELEVATION	PT 77 34:1 APP PENETRATION	20:1 TSS PENETRATION	REMEDIATION
NONE FOUND						

RUNWAY 31 OBSTRUCTION TABLE

OBJECT DESCRIPTION	DISTANCE FROM RW END	OFFSET FROM RW CENTERLINE	TOP ELEVATION	PT 77 20:1 APP PENETRATION	20:1 TSS PENETRATION	REMEDIATION
NONE FOUND						

No.	REVISIONS	DATE	BY	APP'D.

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

HUTCHINSON MUNICIPAL AIRPORT

RUNWAY 13-31 PROFILES

Hutchinson, Kansas

PLANNED BY: Patrick C. Taylor
DETAILED BY: Diana L. Hopkins
APPROVED BY: Chris M. Hagerty

August 1, 2006

Coffman Associates
Airport Consultants

Coffman Associates R:\CAD\Hopkins3\MP\HUT\ALP\HUT AS 1331 PROFILES.dwg Printed Date: 8-15-06 08:54:42 AM DHopkins

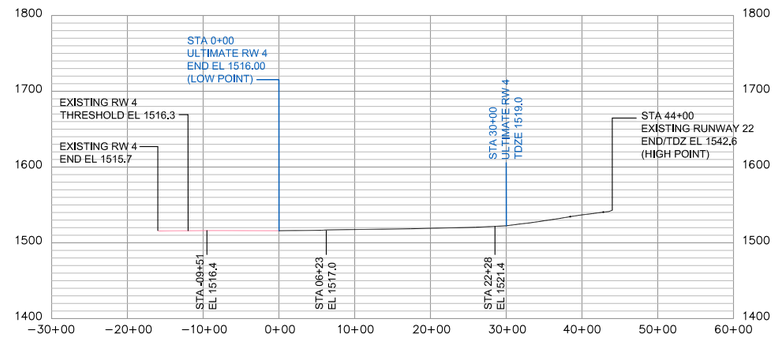
GENERAL NOTES:

All distance measurements in feet.

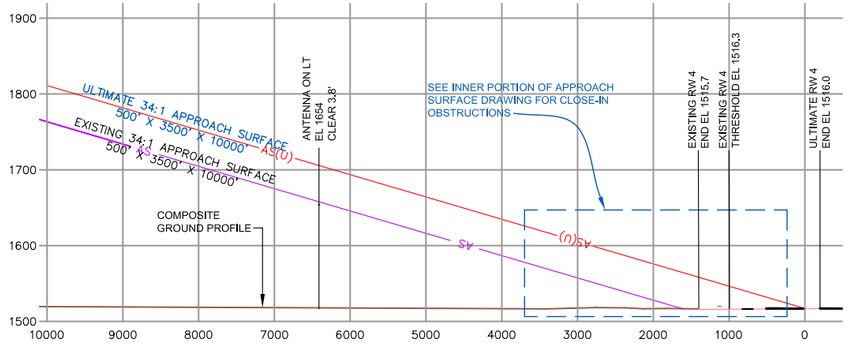
The reference datum used is North American Datum 1983 - NAD 83, and NAVD 88 from Aeronautical Data Sheet, published March 2003. http://www.ngs.noaa.gov/AERO/dole.htm#KS.

Feature and object locations and elevations derived from Aeronautical Data Sheet, http://www.ngs.noaa.gov/AERO/dole.htm#KS; and the Airport Obstruction Chart published March 2003.

Elevations of traverse ways include a safety clearance of 10' for unpaved or private roads, 15' for noninterstate roads, 17' for Interstate roads and 23' for railroad per Section 77.23, Part 77--Objects Affecting Navigable Airspace.

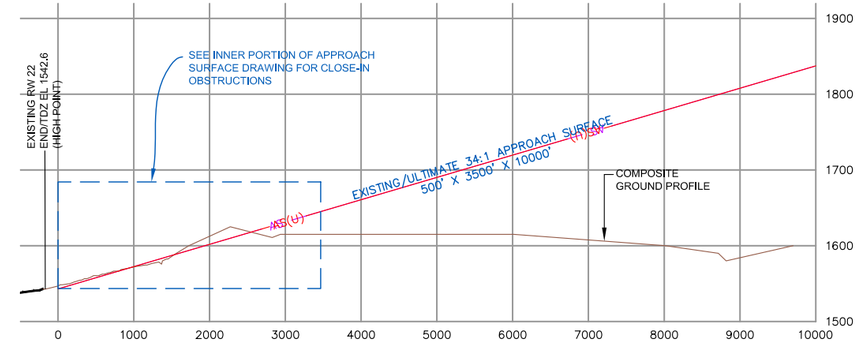


RUNWAY 4-22 CENTERLINE PROFILE



RUNWAY 4 APPROACH PROFILE

Magnetic Declination
5°18' East (December 2005)
Annual Rate of Change
0° 7' West (December 2005)



RUNWAY 22 APPROACH PROFILE

0 1000 2000
HORIZONTAL SCALE IN FEET

0 100 200
VERTICAL SCALE IN FEET

RUNWAY 4 OBSTRUCTION TABLE						
OBJECT DESCRIPTION	DISTANCE FROM RW END	OFFSET FROM RW CENTERLINE	TOP ELEVATION	PT 77 34:1 APP PENETRATION	20:1 TSS PENETRATION	REMEDIATION
NONE FOUND						

RUNWAY 22 OBSTRUCTION TABLE						
OBJECT DESCRIPTION	DISTANCE FROM RW END	OFFSET FROM RW CENTERLINE	TOP ELEVATION	PT 77 20:1 APP PENETRATION	20:1 TSS PENETRATION	REMEDIATION
NONE FOUND						

No.	REVISIONS	DATE	BY	APP'D.

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

HUTCHINSON MUNICIPAL AIRPORT

RUNWAY 4-22 PROFILES

Hutchinson, Kansas

PLANNED BY: Patrick C. Taylor
DETAILED BY: Diana L. Hopkins
APPROVED BY: Chris M. Haquith

August 1, 2006

Coffman Associates
Airport Consultants

Coffman Associates R:\CAD\Hopkinsd\MP\HUT\ALP\HUT AS 422 PROFILES.dwg Printed Date: 8-15-06 08:54:03 AM Dhopkins

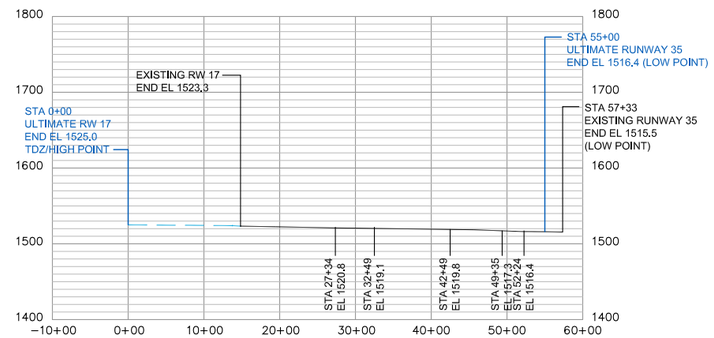
GENERAL NOTES:

All distance measurements in feet.

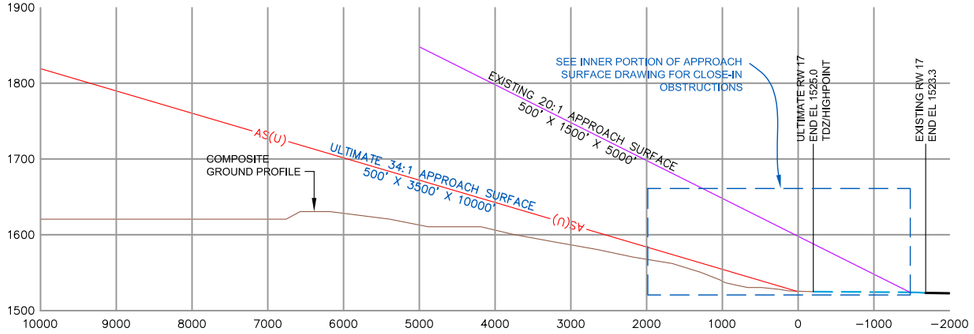
The reference datum used is North American Datum 1983 - NAD 83, and NAVD 88 from Aeronautical Data Sheet, published March 2003. http://www.ngs.noaa.gov/AERO/dole.htm#KS.

Feature and object locations and elevations derived from Aeronautical Data Sheet, http://www.ngs.noaa.gov/AERO/dole.htm#KS.

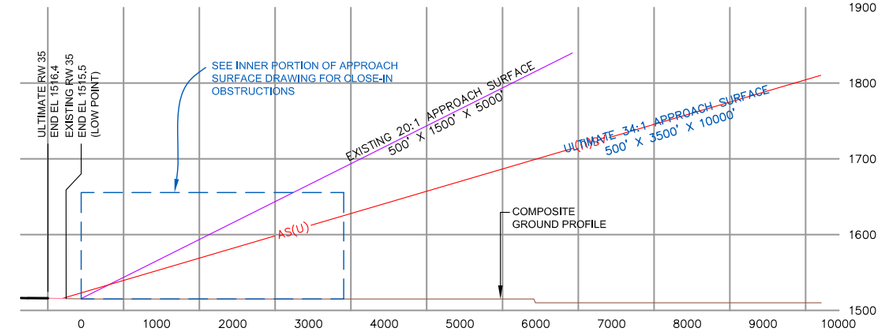
Elevations of traverse ways include a safety clearance of 10' for unpaved or private roads, 15' for noninterstate roads, 17' for Interstate roads and 23' for railroad per Section 77.23, Part 77--Objects Affecting Navigable Airspace.



RUNWAY 17-35 CENTERLINE PROFILE

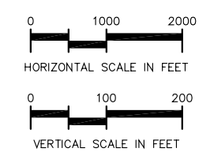


RUNWAY 17 APPROACH PROFILE



RUNWAY 35 APPROACH PROFILE

Magnetic Declination
5°18' East (December 2005)
Annual Rate of Change
0° 7' West (December 2005)



RUNWAY 17 OBSTRUCTION TABLE

OBJECT DESCRIPTION	DISTANCE FROM RW END	OFFSET FROM RW CENTERLINE	TOP ELEVATION	PT 77 34:1 APP PENETRATION	20:1 TSS PENETRATION	REMEDIATION
NONE FOUND						

RUNWAY 35 OBSTRUCTION TABLE

OBJECT DESCRIPTION	DISTANCE FROM RW END	OFFSET FROM RW CENTERLINE	TOP ELEVATION	PT 77 20:1 APP PENETRATION	20:1 TSS PENETRATION	REMEDIATION
NONE FOUND						

No.	REVISIONS	DATE	BY	APP'D.

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

HUTCHINSON MUNICIPAL AIRPORT

RUNWAY 17-35 PROFILES

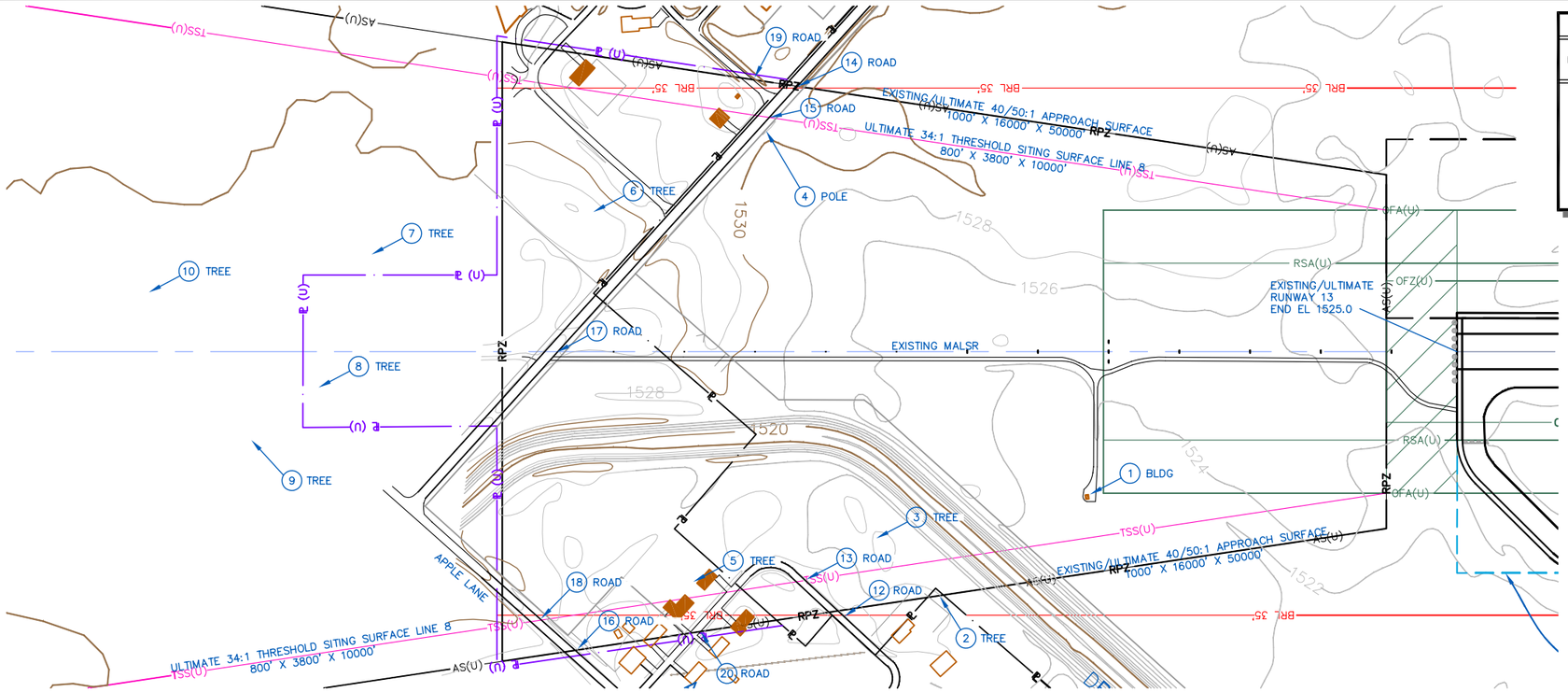
Hutchinson, Kansas

PLANNED BY: Patrick C. Taylor
DETAILED BY: Diana L. Hopkins
APPROVED BY: Chris M. Hugunin

August 1, 2006 SHEET 6 OF 14

Coffman Associates
Airport Consultants

Coffman Associates R:\CAD\Hopkins3D\MP\HUT\ALP\HUT AS 1735 PROFILES.dwg Printed Date: 8-15-06 08:55:21 AM DHopkins



RUNWAY 13 PLAN

EXISTING/ULTIMATE RUNWAY 13 APPROACH SURFACE PENETRATION TABLE							
NO.	OBJECT DESCRIPTION	DISTANCE FROM RW END	OFFSET FROM RW CENTERLINE	TOP ELEVATION	PT 77 APP PENETRATION	TSS PENETRATION	REMEDIATION
2	TREE	1463.0	689.0 R	1572.0	21.2	N/A	TRIM TO CLEAR TSS
3	TREE	1642.0	530.0 R	1569.0	14.6	1.1	TRIM TO CLEAR TSS
4	POLE	1954.0	624.0 L	1565.0	4.4	NONE	CLEARS TSS; NAR
5	TREE	2160.0	653.0 R	1581.0	16.3	NONE	CLEARS TSS; NAR
6	TREE	2440.0	396.0 L	1592.0	21.7	0.6	TRIM TO CLEAR TSS
7	TREE	3067.0	276.0 L	1589.0	6.1	NONE	CLEARS TSS; NAR
8	TREE	3217.0	100.0 R	1589.0	3.1	NONE	CLEARS TSS; NAR
9	TREE	3410.0	246.0 R	1595.0	5.3	NONE	CLEARS TSS; NAR

NAR: NO ACTION REQUIRED

ALL OFFSETS DESCRIBED AS RIGHT (R) OR LEFT (L) OF THE EXTENDED RUNWAY CENTERLINE AS SEEN FROM APPROACHING AIRCRAFT.

GENERAL NOTES:

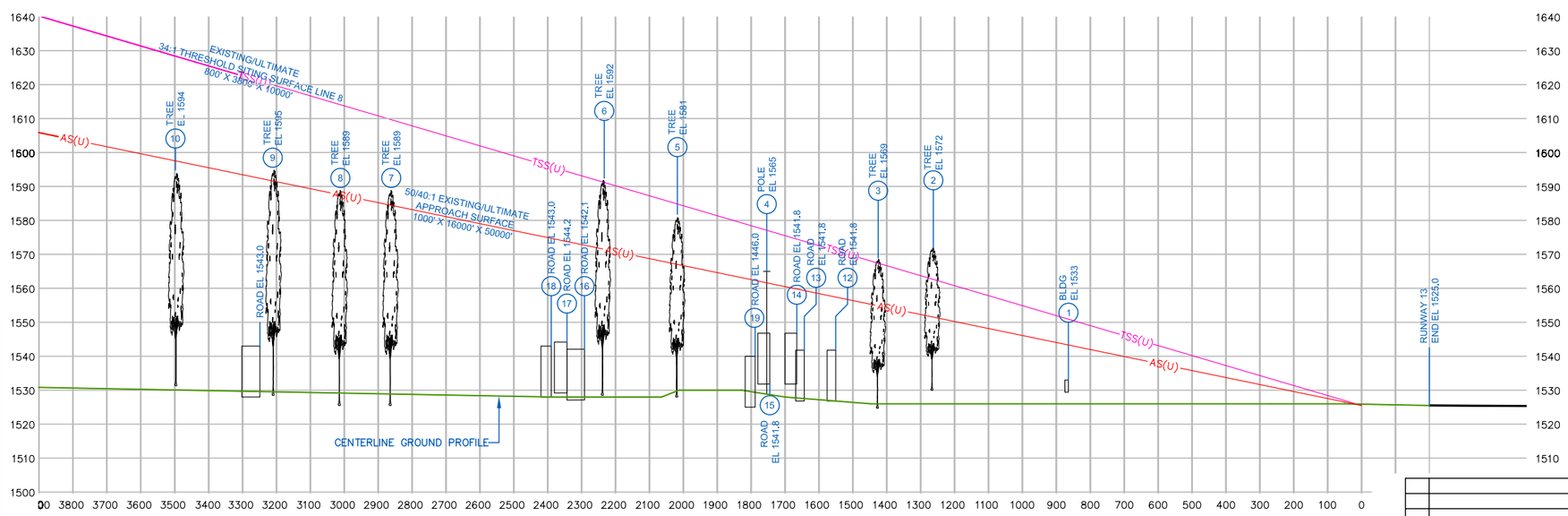
All distance measurements in feet.

The reference datum used is North American Datum 1983 - NAD 83, and NAVD 88 from Aeronautical Data Sheet, published March 2003. http://www.ngs.noaa.gov/AERO/dole.htm#KS.

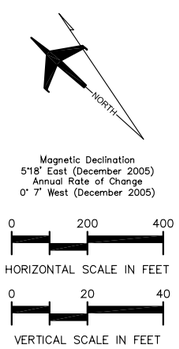
Traverse way locations and elevations derived from USGS Maps and are depicted where they intersect the approach surface edges and extended runway centerline per AC 150/5300-13.

Traverse way elevations include a safety clearance of 10' for unpaved or private roads, 15' for noninterstate roads, 17' for Interstate roads and 23' for railroad per Section 77.23, Part 77—Objects Affecting Navigable Airspace.

Ground contour elevations supplemented by USGS mapping.



RUNWAY 13 PROFILE



No.	REVISIONS	DATE	BY	APP'D.

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

HUTCHINSON MUNICIPAL AIRPORT

INNER PORTION OF RUNWAY 13 APPROACH SURFACE DRAWING

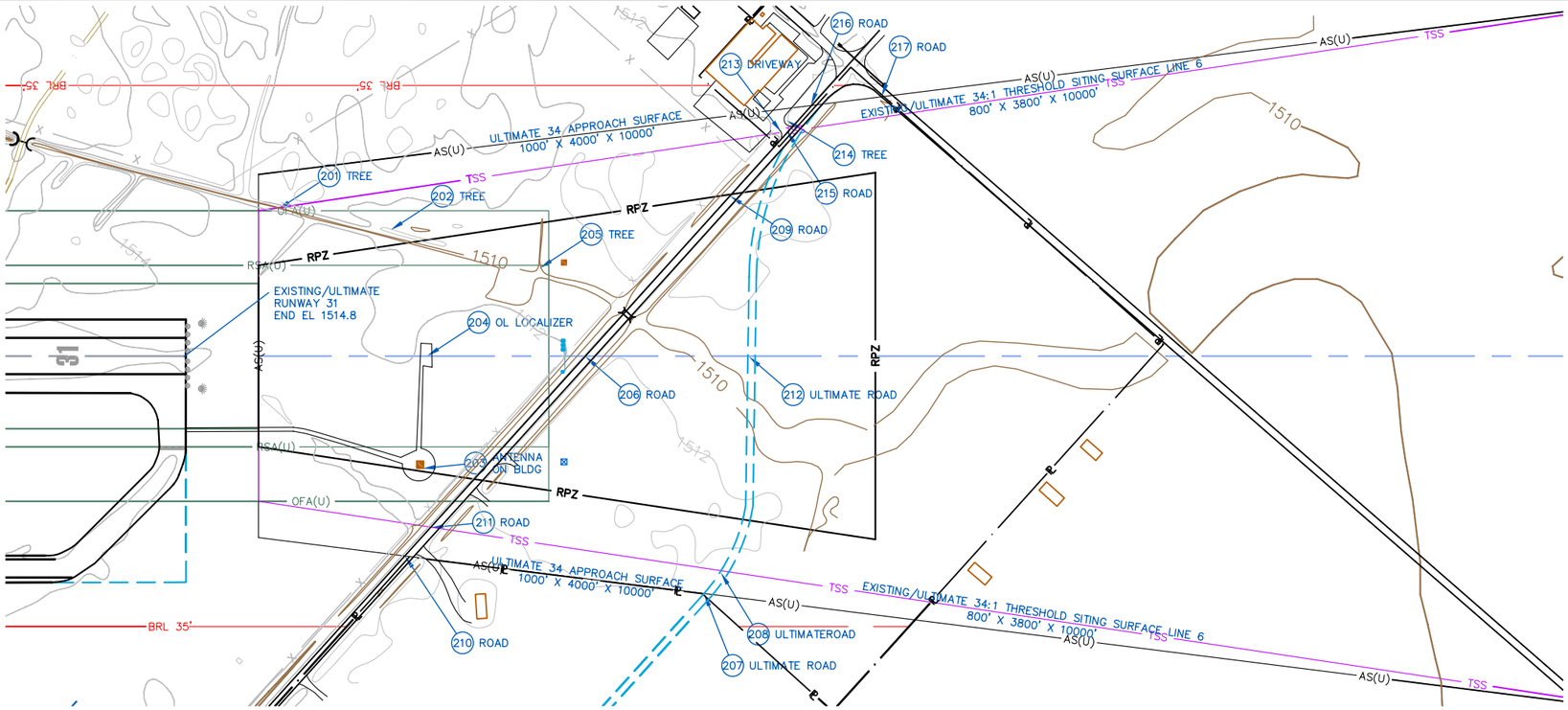
Hutchinson, Kansas

PLANNED BY: Patrick C. Taylor
DETAILED BY: Diana L. Hopkins
APPROVED BY: Chris M. Hugunin

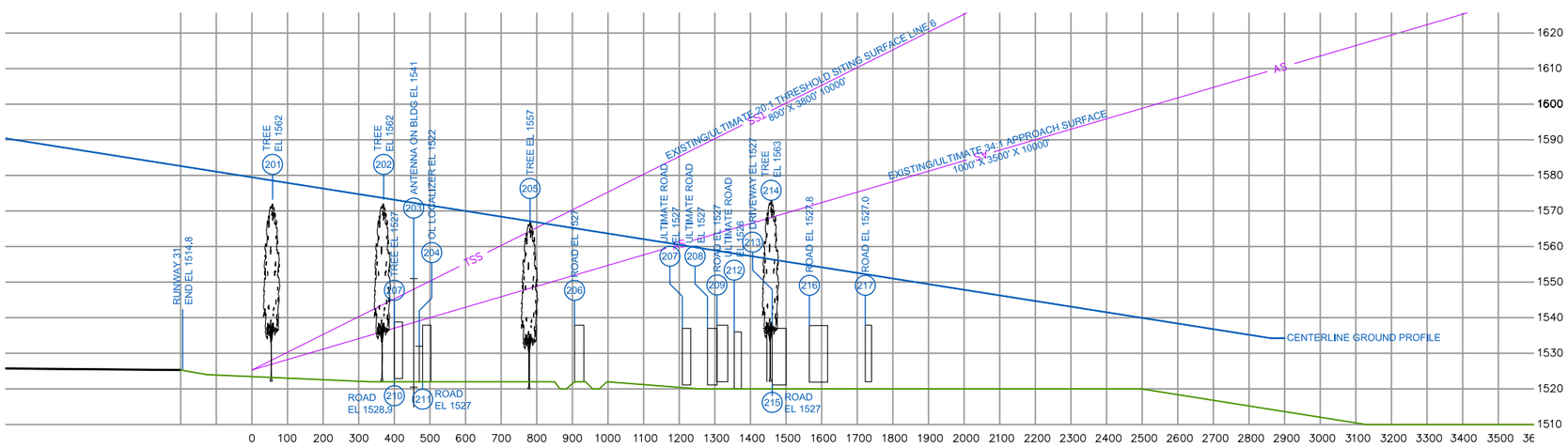
August 1, 2006 SHEET 7 OF 14

Coffman Associates Airport Consultants

Coffman Associates R:\CAD\Hopkins\MP\HUT\ALP\HUT IPASD 13.dwg Printed Date: 8-15-06 08:58:01 AM DHopkins



RUNWAY 31 PLAN



RUNWAY 31 PROFILE

EXISTING/ULTIMATE RUNWAY 31 APPROACH SURFACE PENETRATION TABLE

NO.	OBJECT DESCRIPTION	DISTANCE FROM RW END	OFFSET FROM RW CENTERLINE	TOP ELEVATION	PT 77 APP PENETRATION	TSS PENETRATION	REMEDIATION
201	TREE	258.0	404.1 R	1562.0	45.5	44.3	TRIM TO CLEAR TSS
202	TREE	570.0	347.5 R	1562.0	36.3	28.7	TRIM TO CLEAR TSS
203	ANT ON BLDG	657.0	301.9 L	1541.0	12.8	3.4	ADD OBS LIGHT TO BLDG
204	OL ON LOC	670.0	0.0	1522.0	CLEAR	CLEAR	NAR
205	TREE	981.0	245.5 R	1557.0	19.2	3.2	TRIM TO CLEAR TSS
206	ROAD	1106.0	0.0	1528.0	CLEAR	CLEAR	NAR
207	RELOC ROAD	1428.1	653.9 L	1527.0	CLEAR	NA	NAR
208	RELOC ROAD	1479.5	591.9 L	1527.0	CLEAR	CLEAR	NAR
209	ROAD	1505.8	443.0 R	1527.0	CLEAR	CLEAR	NAR
210	ROAD	603.3	550.5 L	1528.9	2.2	NA	NAR
211	ROAD	679.5	471.9 L	1528.5	CLEAR	CLEAR	NAR
212	RELOC ROAD	1554.2	0.0	1526.0	CLEAR	CLEAR	NAR
213	DRIVEWAY	1643.7	735.6 R	1527.0	CLEAR	CLEAR	NAR
214	TREE	1661.0	652.0 R	1563.0	5.2	NA	NAR
215	ROAD	1666.0	621.6 R	1527.0	CLEAR	CLEAR	NAR
216	ROAD	1724.2	690.0 R	1527.8	CLEAR	NA	NAR
217	ROAD	1916.8	714.0 R	1527.0	CLEAR	NA	NAR

NAR: NO ACTION REQUIRED

ALL OFFSETS DESCRIBED AS RIGHT (R) OR LEFT (L) OF THE EXTENDED RUNWAY CENTERLINE AS SEEN FROM APPROACHING AIRCRAFT.

GENERAL NOTES:

All distance measurements in feet.

The reference datum used is North American Datum 1983 - NAD 83, and NAVD 88 from Aeronautical Data Sheet, published March 2003. http://www.ngs.noaa.gov/AERO/dole.htm#KS.

Traverse way locations and elevations derived from USGS Maps and are depicted where they intersect the approach surface edges and extended runway centerline per AC 150/5300-13.

Traverse way elevations include a safety clearance of 10' for unpaved or private roads, 15' for noninterstate roads, 17' for interstate roads and 23' for railroad per Section 77.23, Part 77–Objects Affecting Navigable Airspace.

Ground contours supplemented by USGS mapping.

Magnetic Declination
5°18' East (December 2005)
Annual Rate of Change
0° 7' West (December 2005)

0 200 400
HORIZONTAL SCALE IN FEET

0 20 40
VERTICAL SCALE IN FEET

No.	REVISIONS	DATE	BY	APP'D.

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

HUTCHINSON MUNICIPAL AIRPORT

INNER PORTION OF RUNWAY 31 APPROACH SURFACE DRAWING

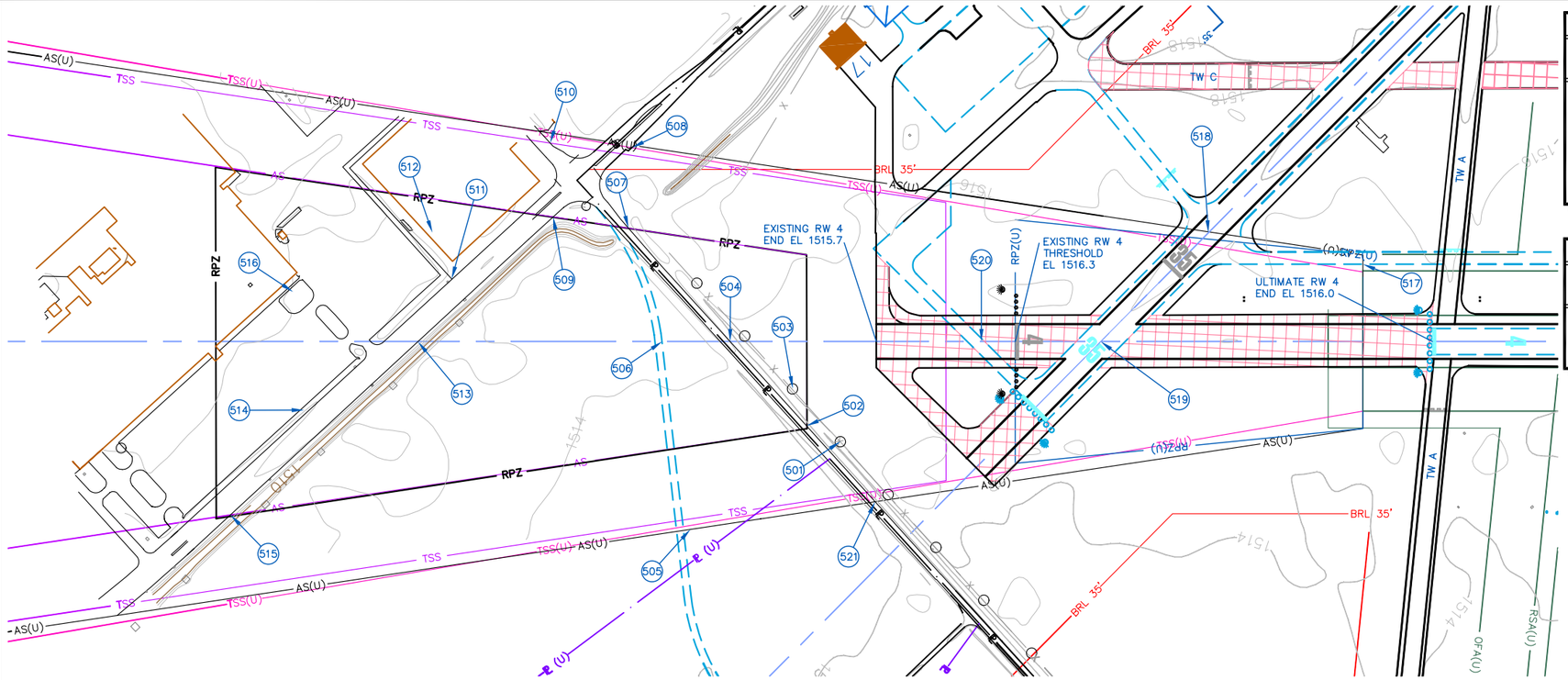
Hutchinson, Kansas

PLANNED BY: Patrick C. Taylor
DETAILED BY: Diana L. Hopkins
APPROVED BY: Chris M. Hugunin

August 1, 2006 SHEET 8 OF 14

Coffman Associates Airport Consultants

Coffman Associates R:\CAD\Hopkins\MP\HUT\MP\HUT IPASD 31.dwg Printed Date: 8-15-06 09:02:41 AM DHopkins



EXISTING RUNWAY 4 APPROACH SURFACE PENETRATION TABLE

NO.	OBJECT DESCRIPTION	DISTANCE FROM RW END	OFFSET FROM RW CENTERLINE	TOP ELEVATION	PT 77 34:1 APP PENETRATION	20:1 TSS PENETRATION	REMEDIATION
502	ROAD	200.0	243.0 R	1531.0	14.7	CLEAR	RELOCATE
503	LT ON FENCE	240.0	133.0 R	1526.0	8.5	CLEAR	TO REMAIN LIGHTED
504	ROAD	420.6	0.0	1532.0	9.2	CLEAR	RELOCATE
509	ROAD	927.2	358.8 L	1532.0	CLEAR	CLEAR	NAR
510	ROAD	935.9	350.5 L	1532.8	CLEAR	CLEAR	NAR
511	POLE	1229.8	183.0 L	1549.0	2.4	CLEAR	CLEARS TSS; NAR
512	VENT ON BLDG	1275.3	313.3 L	1553.0	5.1	CLEAR	CLEARS TSS; NAR
516	TREE	1678.0	143.0 L	1566.0	6.2	CLEAR	CLEARS TSS; NAR

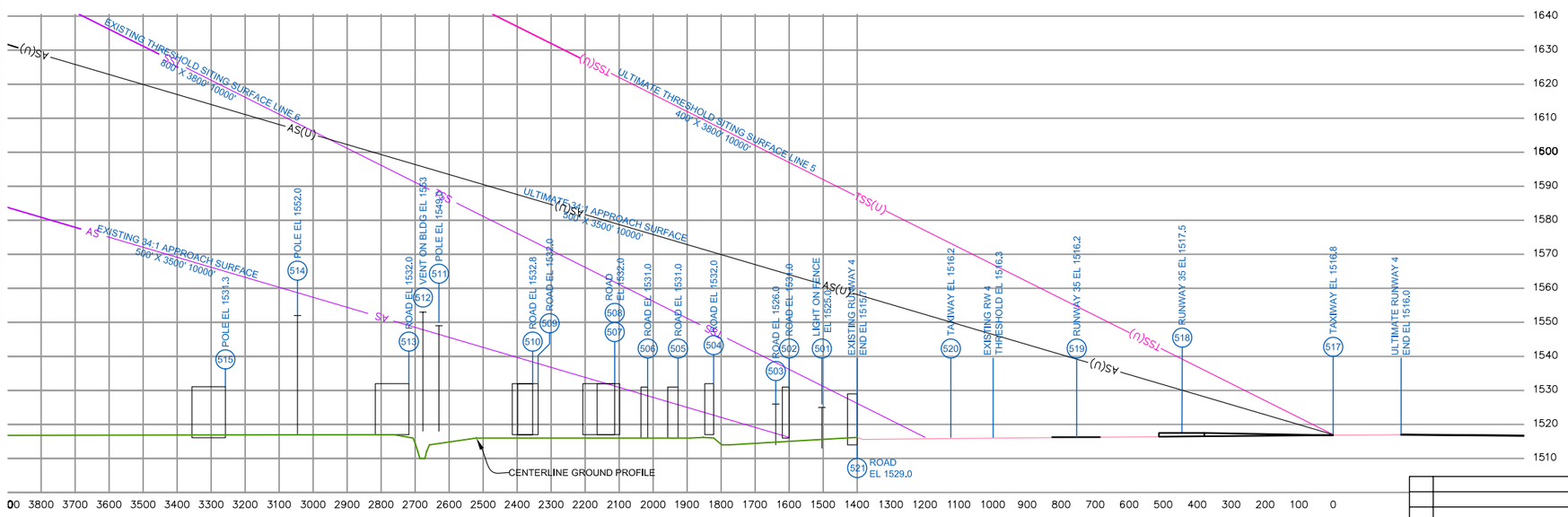
ULTIMATE RUNWAY 4 APPROACH SURFACE PENETRATION TABLE

NO.	OBJECT DESCRIPTION	DISTANCE FROM RW END	OFFSET FROM RW CENTERLINE	TOP ELEVATION	PT 77 20:1 APP PENETRATION	20:1 TSS PENETRATION	REMEDIATION
	NONE FOUND						

NAR: NO ACTION REQUIRED

ALL OFFSETS DESCRIBED AS RIGHT (R) OR LEFT (L) OF THE EXTENDED RUNWAY CENTERLINE AS SEEN FROM APPROACHING AIRCRAFT.

RUNWAY 4 PLAN



RUNWAY 4 PROFILE

GENERAL NOTES:

All distance measurements in feet.

The reference datum used is North American Datum 1983 - NAD 83, and NAVD 88 from Aeronautical Data Sheet, published March 2003. http://www.ngs.noaa.gov/AERO/dole.htm#KS.

Traverse way locations and elevations derived from USGS Maps and are depicted where they intersect the approach surface edges and extended runway centerline per AC 150/5300-13.

Traverse way elevations include a safety clearance of 10' for unpaved or private roads, 15' for noninterstate roads, 17' for interstate roads and 23' for railroad per Section 77.23, Part 77–Objects Affecting Navigable Airspace.

Magnetic Declination
5°18' East (December 2005)
Annual Rate of Change
0° 7' West (December 2005)

0 200 400
HORIZONTAL SCALE IN FEET

0 20 40
VERTICAL SCALE IN FEET

No.	REVISIONS	DATE	BY	APP'D.

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

HUTCHINSON MUNICIPAL AIRPORT

INNER PORTION OF RUNWAY 4 APPROACH SURFACE DRAWING

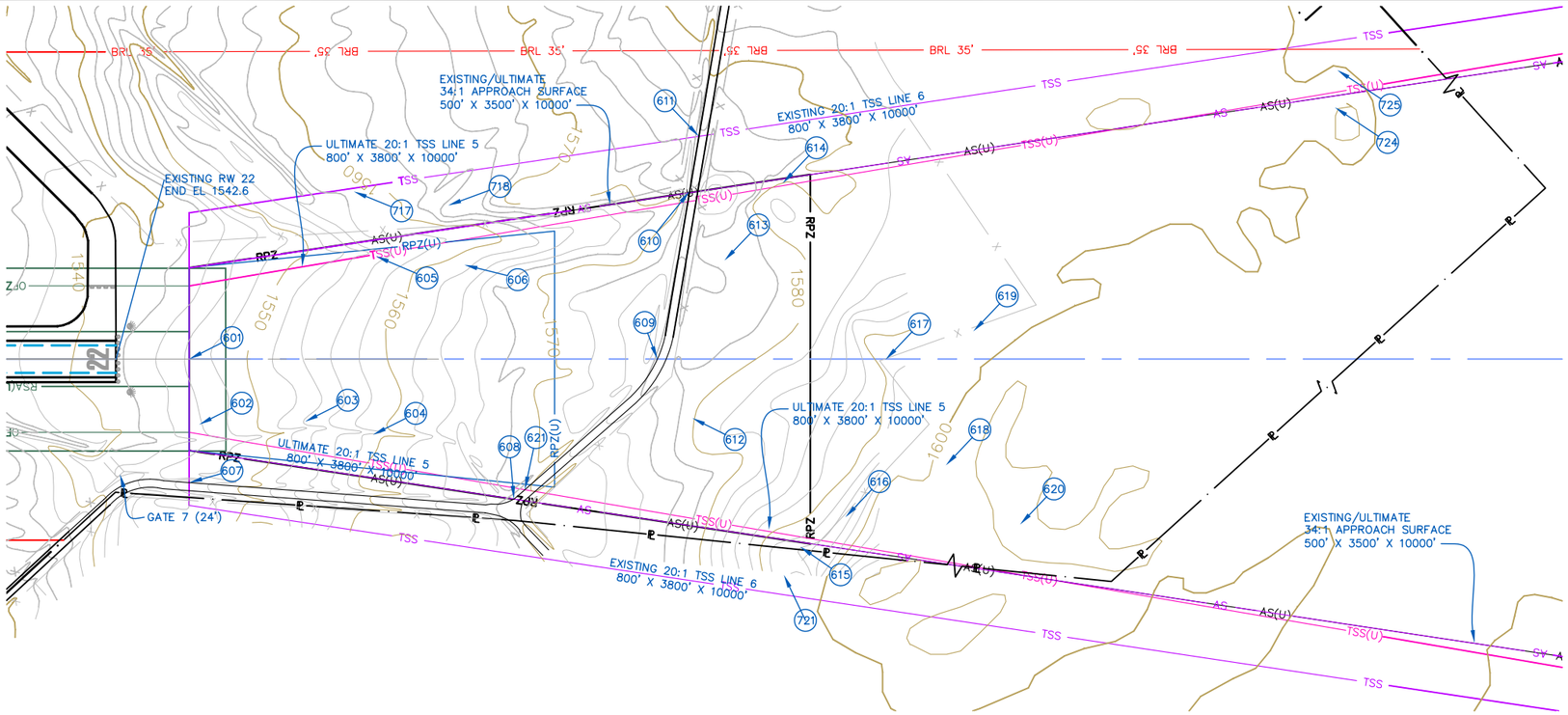
Hutchinson, Kansas

PLANNED BY: Patrick C. Taylor
DETAILED BY: Diana L. Hopkins
APPROVED BY: Chris M. Hugunin

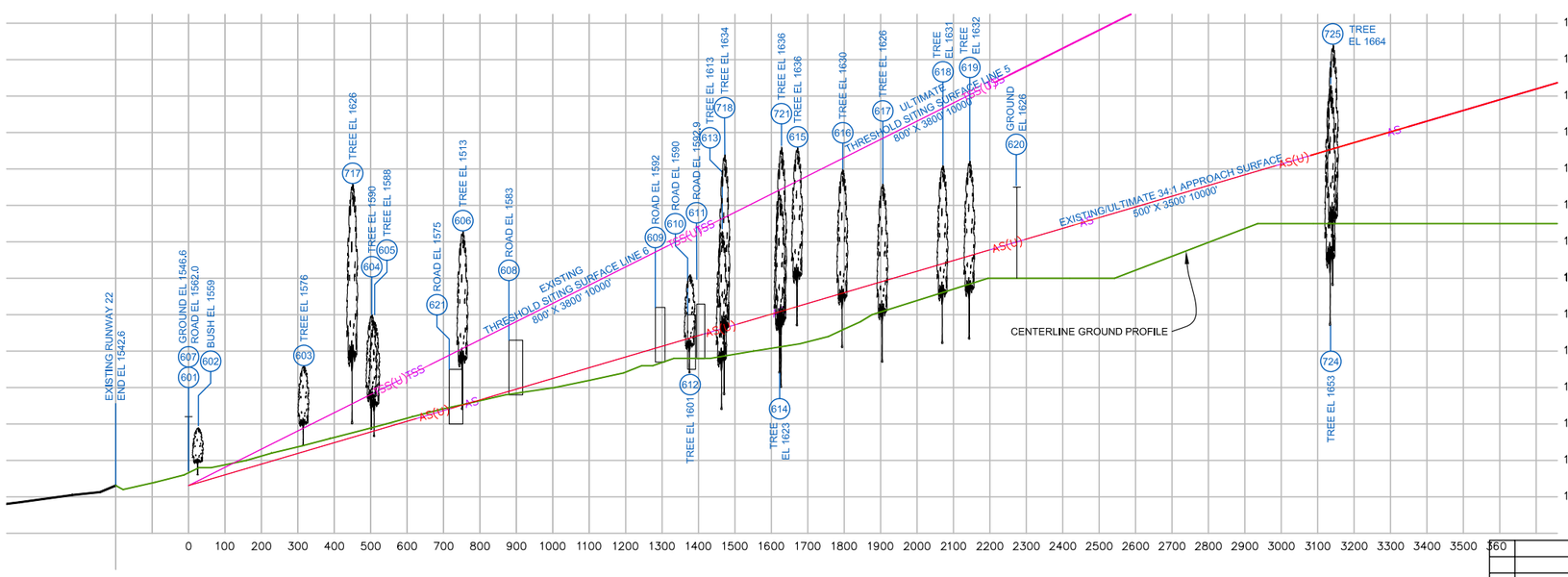
August 1, 2006 SHEET 9 OF 14

Coffman Associates Airport Consultants

Coffman Associates R:\CAD\Hopkins\MP\HUT\MP\HUT IPASD 4.dwg Printed Date: 8-15-06 08:57:19 AM Dhopkins



RUNWAY 22 PLAN



RUNWAY 22 PROFILE

EXISTING RUNWAY 22 APPROACH SURFACE PENETRATION TABLE

NO.	OBJECT DESCRIPTION	DISTANCE FROM RW END	OFFSET FROM RW CENTERLINE	TOP ELEVATION	PT 77 34:1 APP PENETRATION	20:1 TSS PENETRATION	REMEDIATION
601	GROUND	200.0	0.0	1546.6	3.5	3.5	GRADE TO CLEAR TSS
602	BUSH	227.0	179.0 L	1559.0	15.1	14.5	TRIM TO CLEAR TSS
603	TREE	517.0	171.0 L	1576.0	23.6	17.0	TRIM TO CLEAR TSS
604	TREE	703.0	207.0 L	1590.0	32.6	22.3	TRIM OR REMOVE
605	TREE	711.0	282.0 R	1588.0	30.4	19.9	TRIM OR REMOVE
606	TREE	953.0	258.0 R	1613.0	48.3	32.8	TRIM OR REMOVE
607	ROAD	200.0	349.0 L	1562.0	NA	19.4	APPLY TSS LINE 5
608	ROAD	1079.4	388.0 L	1583.0	14.5	CLEAR	CLEARS TSS; NAR
609	ROAD	1482.0	0.0	1593.1	12.8	CLEAR	CLEARS TSS; NAR
610	ROAD	1570.0	455.0 R	1590.0	7.1	CLEAR	CLEARS TSS; NAR
612	TREE	1577.0	161.0 L	1601.0	17.9	CLEAR	CLEARS TSS; NAR
613	TREE	1665.0	207.0 R	1613.0	27.3	CLEAR	CLEARS TSS; NAR
614	TREE	1824.0	481.0 R	1623.0	32.6	CLEAR	CLEARS TSS; NAR
615	TREE	1872.0	513.0 L	1536.0	NA	9.8	TRIM TO CLEAR TSS
616	TREE	1996.0	432.0 L	1630.0	34.6	CLEAR	CLEARS TSS; NAR
617	TREE	2106.0	1.0 L	1626.0	27.3	CLEAR	CLEARS TSS; NAR
618	TREE	2271.0	290.0 L	1631.0	27.5	CLEAR	CLEARS TSS; NAR
619	TREE	2346.0	76.0 R	1632.0	26.3	CLEAR	CLEARS TSS; NAR
620	GROUND	2474.0	452.0 L	1626.0	16.5	CLEAR	CLEARS TSS; NAR
621	ROAD	1120.6	357.1 L	1575.0	5.3	CLEAR	CLEARS TSS; NAR
717	TREE	650.5	458.4 R	1626.0	69.6	60.4	TRIM OR REMOVE
718	TREE	903.9	420.4 R	1634.0	70.2	55.7	TRIM OR REMOVE
721	TREE	1827.7	590.2 L	1636.0	45.0	11.5	TRIM TO CLEAR TSS
724	TREE	3335.8	688.6 R	1653.0	17.7	CLEAR	CLEARS TSS; NAR
725	TREE	3342.7	790.8 R	1664.0	28.5	CLEAR	CLEARS TSS; NAR

ULTIMATE RUNWAY 22 APPROACH SURFACE PENETRATION TABLE

NO.	OBJECT DESCRIPTION	DISTANCE FROM RW END	OFFSET FROM RW CENTERLINE	TOP ELEVATION	PT 77 20:1 APP PENETRATION	20:1 TSS PENETRATION	REMEDIATION
601	GROUND	200.0	0.0	1546.6	3.5	3.5	GRADE TO CLEAR TSS
602	BUSH	227.0	179.0 L	1559.0	15.1	14.5	TRIM TO CLEAR TSS
603	TREE	517.0	171.0 L	1576.0	23.6	17.0	TRIM TO CLEAR TSS
604	TREE	703.0	207.0 L	1590.0	32.6	22.3	TRIM OR REMOVE
605	TREE	711.0	282.0 R	1588.0	30.4	19.9	TRIM OR REMOVE
606	TREE	953.0	258.0 R	1613.0	48.3	32.8	TRIM OR REMOVE
608	ROAD	1079.4	388.0 L	1583.0	14.5	CLEAR	CLEARS TSS; NAR
609	ROAD	1482.0	0.0	1593.1	12.8	CLEAR	CLEARS TSS; NAR
610	ROAD	1570.0	455.0 R	1590.0	7.1	NA	CLEARS TSS; NAR
612	TREE	1577.0	161.0 L	1601.0	17.9	CLEAR	CLEARS TSS; NAR
613	TREE	1665.0	207.0 R	1613.0	27.3	CLEAR	CLEARS TSS; NAR
614	TREE	1824.0	481.0 R	1623.0	32.6	NA	CLEARS TSS; NAR
616	TREE	1996.0	432.0 L	1630.0	34.6	CLEAR	CLEARS TSS; NAR
617	TREE	2106.0	1.0 L	1626.0	27.3	CLEAR	CLEARS TSS; NAR
618	TREE	2271.0	290.0 L	1631.0	27.5	CLEAR	CLEARS TSS; NAR
619	TREE	2346.0	76.0 R	1632.0	26.3	CLEAR	CLEARS TSS; NAR
620	GROUND	2474.0	452.0 L	1626.0	16.5	CLEAR	CLEARS TSS; NAR
621	ROAD	1120.6	357.1 L	1575.0	5.3	CLEAR	CLEARS TSS; NAR
717	TREE	650.5	458.4 R	1626.0	69.6	CLEAR	CLEARS TSS; NAR
718	TREE	903.9	420.4 R	1634.0	70.2	CLEAR	CLEARS TSS; NAR
721	TREE	1827.7	590.2 L	1636.0	45.0	CLEAR	CLEARS TSS; NAR
724	TREE	3335.8	688.6 R	1653.0	17.7	CLEAR	CLEARS TSS; NAR
725	TREE	3342.7	790.8 R	1664.0	28.5	CLEAR	CLEARS TSS; NAR

NAR: NO ACTION REQUIRED

ALL OFFSETS DESCRIBED AS RIGHT (R) OR LEFT (L) OF THE EXTENDED RUNWAY CENTERLINE AS SEEN FROM APPROACHING AIRCRAFT.

GENERAL NOTES:

All distance measurements in feet.

The reference datum used is North American Datum 1983 - NAD 83, and NAVD 88 from Aeronautical Data Sheet, published March 2003. http://www.ngs.noaa.gov/AERO/dole.htm#KS.

Traverse way locations and elevations derived from USGS Maps and are depicted where they intersect the approach surface edges and extended runway centerline per AC 150/5300-13.

Traverse way elevations include a safety clearance of 10' for unpaved or private roads, 15' for noninterstate roads, 17' for interstate roads and 23' for railroad per Section 77.23, Part 77–Objects Affecting Navigable Airspace.

Ground contours supplemented by USGS mapping.

NORTH

Magnetic Declination
5°18' East (December 2005)
Annual Rate of Change
0° 7' West (December 2005)

0 200 400
HORIZONTAL SCALE IN FEET

0 20 40
VERTICAL SCALE IN FEET

No.	REVISIONS	DATE	BY	APP'D.

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

HUTCHINSON MUNICIPAL AIRPORT

INNER PORTION OF RUNWAY 22 APPROACH SURFACE DRAWING

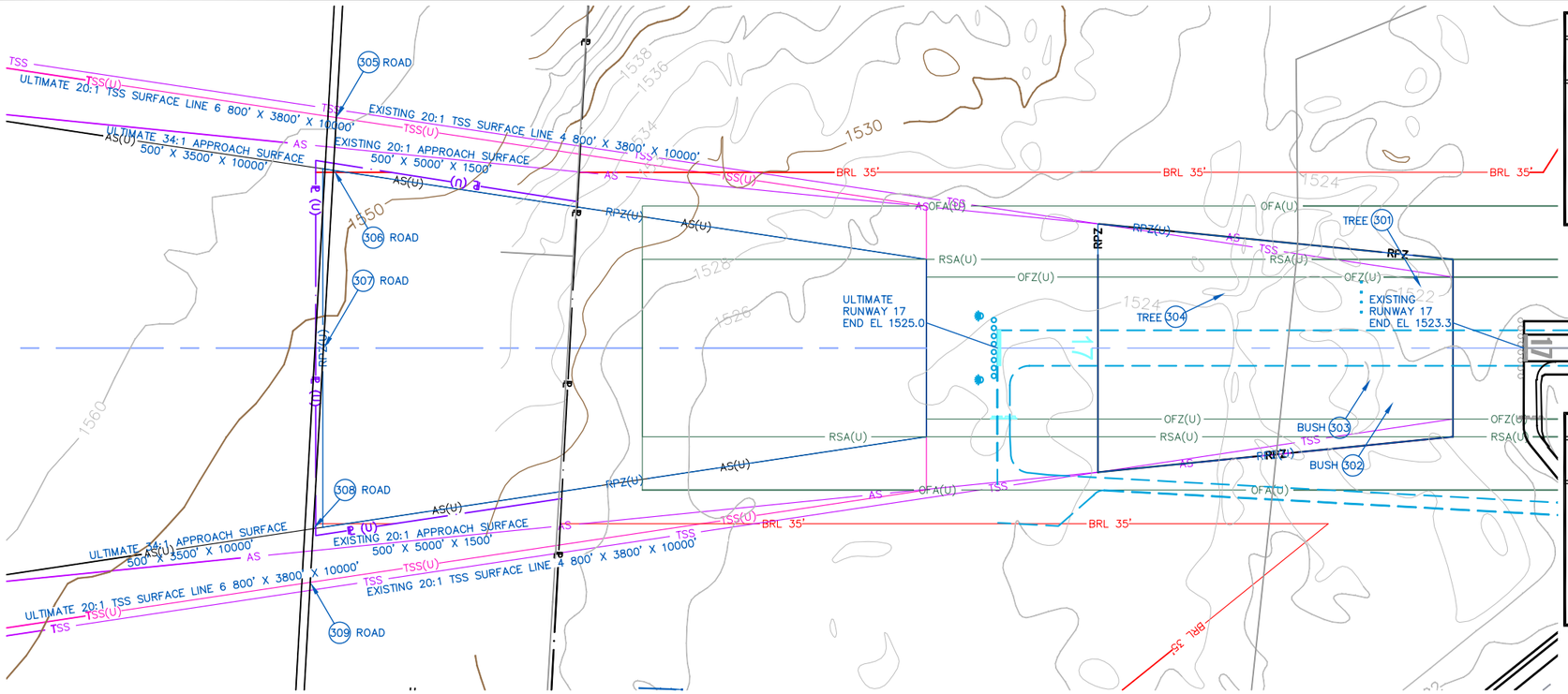
Hutchinson, Kansas

PLANNED BY: Patrick C. Taylor
DETAILED BY: Diana L. Hopkins
APPROVED BY: Chris M. Hugunin

August 1, 2006 SHEET 10 OF 14

Coffman Associates
Airport Consultants

Coffman Associates R:\CAD\Hopkins\MP\HUT\MP\HUT IPASD 22.dwg Printed Date: 8-15-06 09:01:11 AM Dhopkins



EXISTING RUNWAY 17 APPROACH SURFACE PENETRATION TABLE

NO.	OBJECT DESCRIPTION	DISTANCE FROM RW END	OFFSET FROM RW CENTERLINE	TOP ELEVATION	PT 77 20:1 APP PENETRATION	20:1 TSS PENETRATION	REMEDIATION
301	TREE	289.0	170.0 L	1546.0	18.3	NA	CLEAR OF TSS; NAR
302	BUSH	368.0	152.0 R	1541.0	9.3	CLEAR	CLEAR OF TSS; NAR
303	BUSH	1051.0	88.0 R	1539.0	4.1	CLEAR	CLEARS TSS; NAR
304	TREE	642.0	155.0 L	1554.0	CLEAR	CLEAR	NAR
305	ROAD	3344.9	301.0 L	1577.0	NA	CLEAR	NAR
306	ROAD	3353.2	649.3 L	1573.0	CLEAR	CLEAR	NAR
307	ROAD	3383.0	0.0	1563.0	CLEAR	CLEAR	NAR
308	ROAD	3409.8	508.0 R	1553.0	CLEAR	CLEAR	NAR
309	ROAD	3413.8	649.3 L	1553.0	CLEAR	CLEAR	NAR

NAR: NO ACTION REQUIRED

ALL OFFSETS DESCRIBED AS RIGHT (R) OR LEFT (L) OF THE EXTENDED RUNWAY CENTERLINE AS SEEN FROM APPROACHING AIRCRAFT.

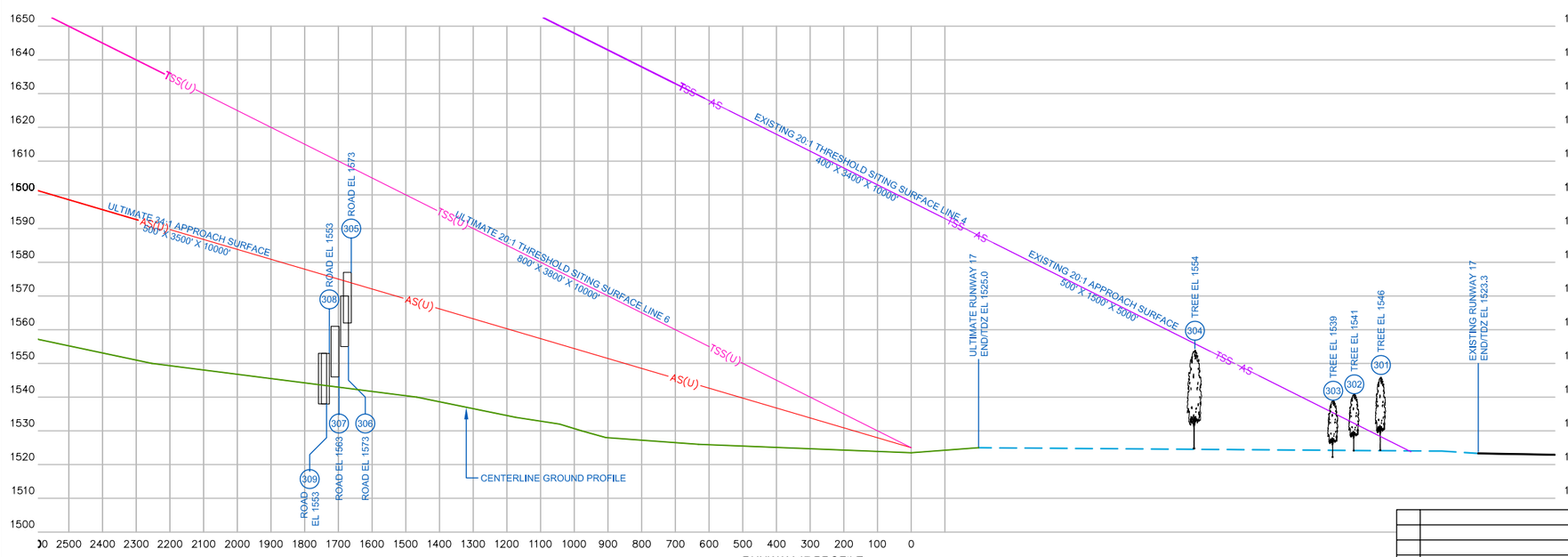
ULTIMATE RUNWAY 17 APPROACH SURFACE PENETRATION TABLE

NO.	OBJECT DESCRIPTION	DISTANCE FROM RW END	OFFSET FROM RW CENTERLINE	TOP ELEVATION	PT 77 34:1 APP PENETRATION	20:1 TSS PENETRATION	REMEDIATION
301	TREE	-1194.0	170.0 L	1546.0	NA	NA	TO BE REMOVED
302	BUSH	-1115.0	152.0 R	1541.0	NA	NA	TO BE REMOVED
303	BUSH	-1051.0	88.0 R	1539.0	NA	NA	TO BE REMOVED
304	TREE	-642.0	155.0 L	1554.0	NA	NA	TO BE REMOVED
305	ROAD	1861.9	301.0 L	1577.0	NA	CLEAR	NAR
306	ROAD	1870.2	649.3 L	1573.0	CLEAR	CLEAR	NAR
307	ROAD	1900.0	0.0	1563.0	CLEAR	CLEAR	NAR
308	ROAD	1926.8	508.0 R	1553.0	CLEAR	CLEAR	NAR
309	ROAD	1930.8	649.3 L	1553.0	CLEAR	CLEAR	NAR

NAR: NO ACTION REQUIRED

ALL OFFSETS DESCRIBED AS RIGHT (R) OR LEFT (L) OF THE EXTENDED RUNWAY CENTERLINE AS SEEN FROM APPROACHING AIRCRAFT.

RUNWAY 17 PLAN



RUNWAY 17 PROFILE

GENERAL NOTES:

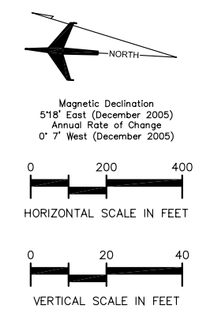
All distance measurements in feet.

The reference datum used is North American Datum 1983 - NAD 83, and NAVD 88 from Aeronautical Data Sheet, published March 2003. http://www.ngs.noaa.gov/AERO/dole.htm#KS.

Traverse way locations and elevations derived from USGS Maps and are depicted where they intersect the approach surface edges and extended runway centerline per AC 150/5300-13.

Traverse way elevations include a safety clearance of 10' for unpaved or private roads, 15' for noninterstate roads, 17' for interstate roads and 23' for railroad per Section 77.23, Part 77—Objects Affecting Navigable Airspace.

Ground contours supplemented by USGS mapping.



No.	REVISIONS	DATE	BY	APP'D.

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

HUTCHINSON MUNICIPAL AIRPORT

INNER PORTION OF RUNWAY 17 APPROACH SURFACE DRAWING

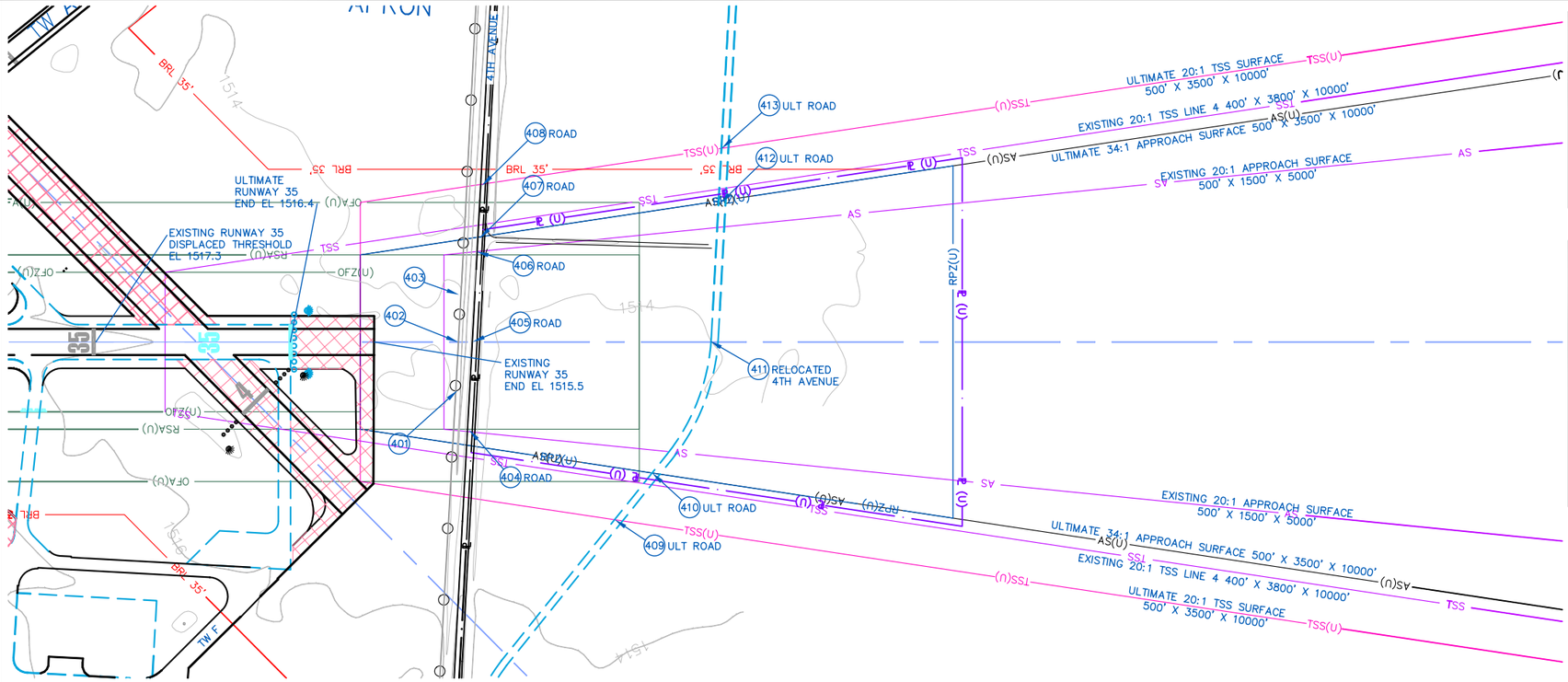
Hutchinson, Kansas

PLANNED BY: Patrick C. Taylor
DETAILED BY: Diana L. Hopkins
APPROVED BY: Chris M. Hugunin

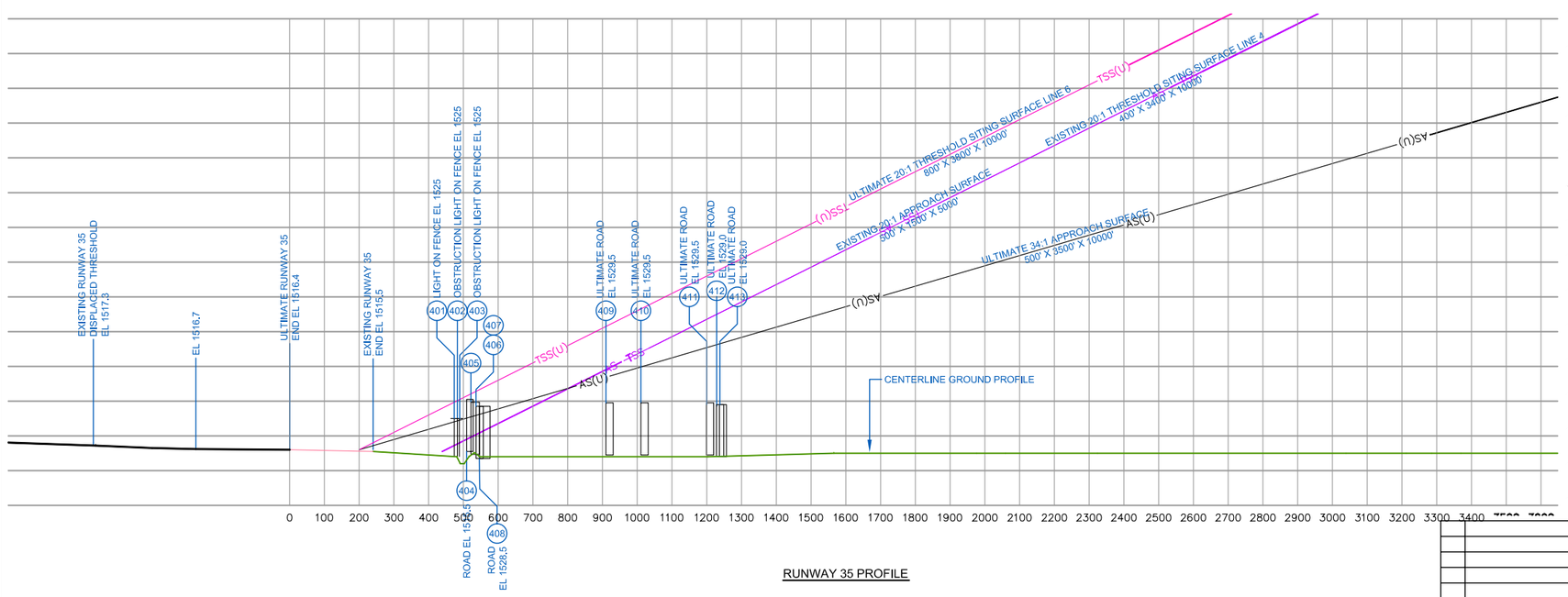
August 1, 2006 SHEET 11 OF 14

Coffman Associates Airport Consultants

Coffman Associates R:\CAD\Hopkins\MP\HUT\MP\HUT IPASD 17.dwg Printed Date: 8-15-06 08:59:28 AM DHopkins



RUNWAY 35 PLAN



RUNWAY 35 PROFILE

EXISTING RUNWAY 35 APPROACH SURFACE PENETRATION TABLE							
NO.	OBJECT DESCRIPTION	DISTANCE FROM RW END	OFFSET FROM RW CENTERLINE	TOP ELEVATION	PT 77 20:1 APP PENETRATION	20:1 TSS PENETRATION	REMEDIATION
401	LT ON FENCE	235.9	141.0 L	1525.0	7.7	CLEAR	CLEARS TSS; NAR
402	OL ON FENCE	243.2	3.0 L	1525.0	7.3	CLEAR	CLEARS TSS; NAR
403	OL ON FENCE	243.3	136.0 R	1525.0	7.3	CLEAR	CLEARS TSS; NAR
404	ROAD	268.0	256.7 L	1530.2	11.3	CLEAR	CLEARS TSS; NAR
405	ROAD	282.6	0.0	1530.2	10.6	CLEAR	CLEARS TSS; NAR
406	ROAD	295.0	259.5 R	1528.5	8.1	CLEAR	CLEARS TSS; NAR
407	ROAD	297.3	299.6 R	1528.5	NA	NA	NAR
408	ROAD	303.8	450.8 R	1528.5	NA	NA	NAR

ULTIMATE RUNWAY 35 APPROACH SURFACE PENETRATION TABLE							
NO.	OBJECT DESCRIPTION	DISTANCE FROM RW END	OFFSET FROM RW CENTERLINE	TOP ELEVATION	PT 77 20:1 APP PENETRATION	20:1 TSS PENETRATION	REMEDIATION
401	LT ON FENCE	475.9	141.0 L	1525.0	0.5	CLEAR	CLEARS TSS; NAR
402	OL ON FENCE	483.2	3.0 L	1525.0	0.3	CLEAR	TO REMAIN
403	OL ON FENCE	483.3	136.0 R	1525.0	0.3	CLEAR	TO REMAIN
404	ROAD	508.0	256.7 L	1530.2	4.7	CLEAR	TO BE RELOCATED
405	ROAD	522.6	0.0	1530.2	4.3	10.1	TO BE RELOCATED
406	ROAD	295.0	259.5 R	1528.5	2.2	7.8	TO BE RELOCATED
407	ROAD	537.3	299.6 R	1528.5	2.2	7.8	TO BE RELOCATED
408	ROAD	543.8	450.8 R	1528.5	NA	7.3	TO BE RELOCATED
409	ROAD	931.0	505.4 L	1529.5	NA	CLEAR	NAR
410	ROAD	1039.2	370.5 L	1529.5	CLEAR	CLEAR	NAR
411	ROAD	1206.5	0.0	1529.5	CLEAR	CLEAR	NAR
412	ROAD	1229.6	405.7 R	1529.5	CLEAR	CLEAR	NAR
413	ROAD	1237.7	555.4 R	1529.5	CLEAR	CLEAR	NAR

NAR: NO ACTION REQUIRED

ALL OFFSETS DESCRIBED AS RIGHT (R) OR LEFT (L) OF THE EXTENDED RUNWAY CENTERLINE AS SEEN FROM APPROACHING AIRCRAFT.

GENERAL NOTES:

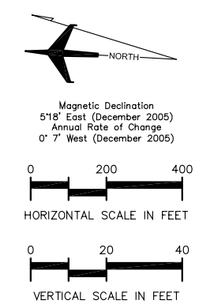
All distance measurements in feet.

The reference datum used is North American Datum 1983 - NAD 83, and NAVD 88 from Aeronautical Data Sheet, published March 2003. http://www.ngs.noaa.gov/AERO/dole.htm#KS.

Traverse way locations and elevations derived from USGS Maps and are depicted where they intersect the approach surface edges and extended runway centerline per AC 150/5300-13.

Traverse way elevations include a safety clearance of 10' for unpaved or private roads, 15' for noninterstate roads, 17' for interstate roads and 23' for railroad per Section 77.23, Part 77--Objects Affecting Navigable Airspace.

Ground contours supplemented by USGS mapping.



No.	REVISIONS	DATE	BY	APP'D.

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

HUTCHINSON MUNICIPAL AIRPORT

INNER PORTION OF RUNWAY 35 APPROACH SURFACE DRAWING

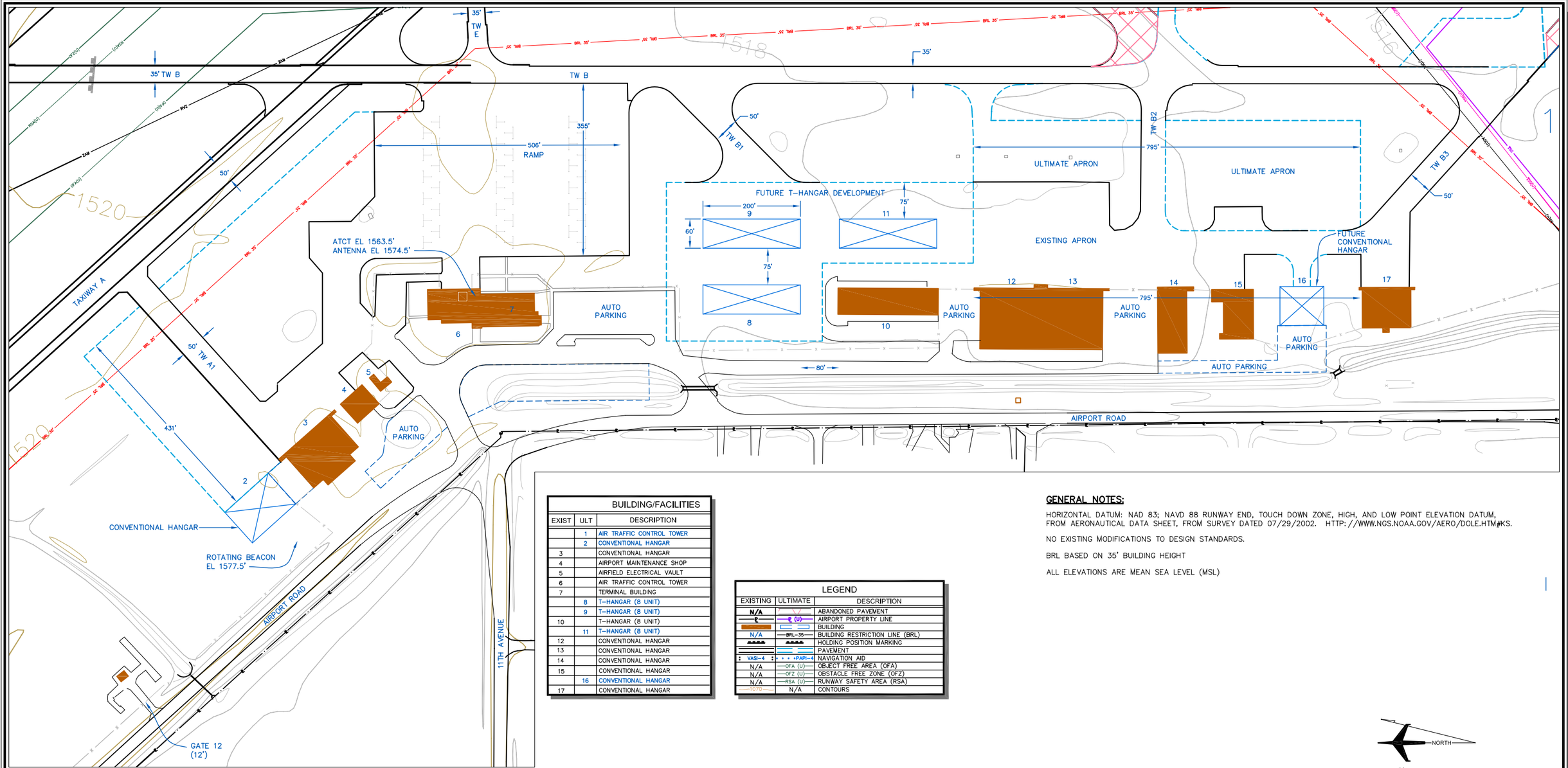
Hutchinson, Kansas

PLANNED BY: Patrick C. Taylor
DETAILED BY: Diana L. Hopkins
APPROVED BY: Chris M. Hugunin

August 1, 2006 SHEET 12 OF 14

Coffman Associates Airport Consultants

Coffman Associates R:\CAD\Hopkins\MP\HUT\ALP\HUT IPASD 35.dwg Printed Date: 8-15-06 09:03:44 AM DHopkins



BUILDING/FACILITIES		
EXIST	ULT	DESCRIPTION
	1	AIR TRAFFIC CONTROL TOWER
	2	CONVENTIONAL HANGAR
3		CONVENTIONAL HANGAR
4		AIRPORT MAINTENANCE SHOP
5		AIRFIELD ELECTRICAL VAULT
6		AIR TRAFFIC CONTROL TOWER
7		TERMINAL BUILDING
	8	T-HANGAR (8 UNIT)
	9	T-HANGAR (8 UNIT)
10		T-HANGAR (8 UNIT)
	11	T-HANGAR (8 UNIT)
12		CONVENTIONAL HANGAR
13		CONVENTIONAL HANGAR
14		CONVENTIONAL HANGAR
15		CONVENTIONAL HANGAR
	16	CONVENTIONAL HANGAR
17		CONVENTIONAL HANGAR

LEGEND		
EXISTING	ULTIMATE	DESCRIPTION
N/A		ABANDONED PAVEMENT
℄	℄ (U)	AIRPORT PROPERTY LINE
		BUILDING
N/A	BRL-35	BUILDING RESTRICTION LINE (BRL)
		HOLDING POSITION MARKING
		PAVEMENT
VASI-4	PAPI-4	NAVIGATION AID
N/A	OFA (U)	OBJECT FREE AREA (OFA)
N/A	OFZ (U)	OBSTACLE FREE ZONE (OFZ)
N/A	RSA (U)	RUNWAY SAFETY AREA (RSA)
1070	N/A	CONTOURS

GENERAL NOTES:

HORIZONTAL DATUM: NAD 83; NAVD 88 RUNWAY END, TOUCH DOWN ZONE, HIGH, AND LOW POINT ELEVATION DATUM, FROM AERONAUTICAL DATA SHEET, FROM SURVEY DATED 07/29/2002. HTTP://WWW.NGS.NOAA.GOV/AERO/DOLE.HTM#KS.

NO EXISTING MODIFICATIONS TO DESIGN STANDARDS.

BRL BASED ON 35' BUILDING HEIGHT

ALL ELEVATIONS ARE MEAN SEA LEVEL (MSL)

NORTH

Magnetic Declination
5°18' East (December 2005)
Annual Rate of Change
0° 7' West (December 2005)

0 100 200
SCALE IN FEET

No.	REVISIONS	DATE	BY	APP'D.

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

HUTCHINSON MUNICIPAL AIRPORT

TERMINAL AREA DRAWING

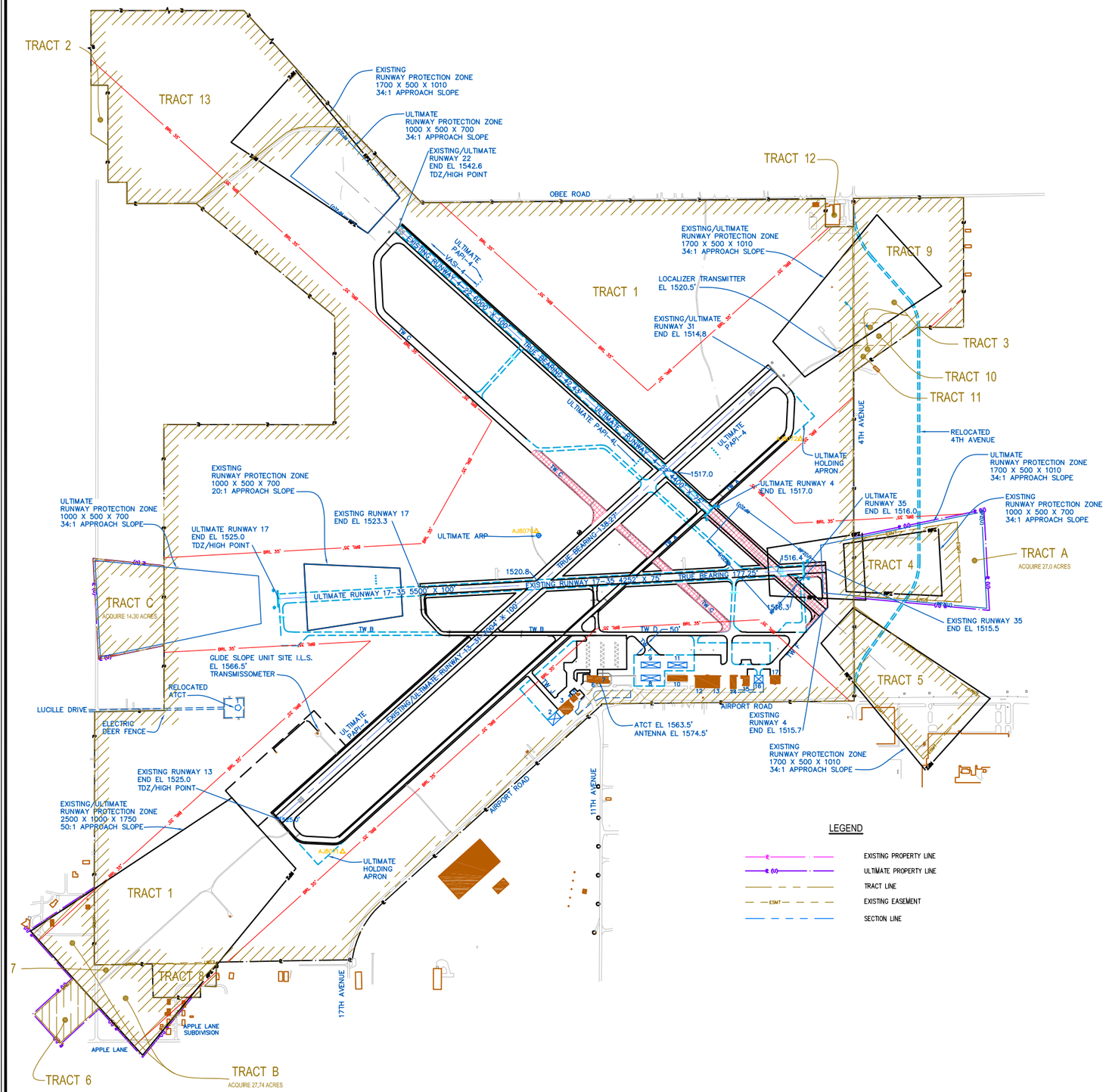
Hutchinson, Kansas

PLANNED BY: Patrick C. Taylor
DETAILED BY: Diana L. Hopkins
APPROVED BY: Chris M. Huguelin

August 1, 2006 SHEET 13 OF 14

Coffman Associates Airport Consultants

Coffman Associates R:\CAD\Hopkins\MP\HUT\HUT TAD.dwg Printed Date: 8-15-06 09:05:42 AM DHopkins



EXISTING PROPERTY DATA TABLE				
TRACT NO.	PROPERTY INTEREST	ACREAGE	DATE OF ACQUISITION	FEDERAL PROJECT NO.
1	WARRANTY DEED	1275.00	--	--
2	AVIGATION EASEMENT	95.0	--	--
3	AVIGATION EASEMENT	28.02	1964	9-14-049-C404
4	AVIGATION EASEMENT	17.34	1964	9-14-049-C404
5	AVIGATION EASEMENT	21.91	1964	9-14-049-C404
6	AVIGATION EASEMENT	5.70	1961	9-14-049-03
7	AVIGATION EASEMENT	21.45	1964	9-14-049-C404
8	WARRANTY DEED	3.83	1964	9-14-049-C404
9	FEE SIMPLE	34.6	1987	3-20-0035-04
10	FEE SIMPLE	2.35	1987	3-20-0035-04
11	FEE SIMPLE	1.14	1987	3-20-0035-04
12	REVISED AVIGATION EASEMENT	0.32	1987	3-20-0035-04
13	FEE SIMPLE	101.32	1987	3-20-0035-04

FUTURE PROPERTY DATA TABLE		
TRACT ID.	FUTURE PROPERTY INTEREST	ACREAGE
A	FEE SIMPLE	27.00±
B	FEE SIMPLE	27.74±
C	FEE SIMPLE	14.30±

GENERAL NOTES:

HORIZONTAL DATUM: NAD 83; NAVD 88, FROM AERONAUTICAL DATA SHEET, FROM SURVEY DATED 07/29/2002. HTTP://WWW.NGS.NOAA.GOV/AERO/DOLE.HTM#KS.

SURVEY MONUMENT LOCATIONS PER NATIONAL GEODETIC SURVEY DATA SHEET, HTTP:WWW.NGS.NOAA.GOV/CGI-BIN/DS_RADIUS.PRL.

BRL BASED ON 35' BUILDING HEIGHT

ALL ELEVATIONS ARE MEAN SEA LEVEL (MSL)

NORTH

Magnetic Declination
5°18' East (December 2005)
Annual Rate of Change
0° 7' West (December 2005)

0 600 1200
SCALE IN FEET

No.	REVISIONS	DATE	BY	APP'D.

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

HUTCHINSON MUNICIPAL AIRPORT

AIRPORT PROPERTY MAP

Hutchinson, Kansas

PLANNED BY: Patrick C. Taylor
DETAILED BY: Diana L. Hopkins
APPROVED BY: Chris M. Haquith

August 1, 2006 SHEET 14 OF 14

Coffman Associates Airport Consultants

Coffman Associates R:\CAD\Hopkinsd\MP\HUT\ALP\HUT PROP MAP.dwg Printed Date: 8-15-06 09:04:31 AM Dhopkins