



SIOUX GATEWAY AIRPORT

Airport Layout Plan Narrative Report

RS&H Project Number 213-9554-012

Sioux Gateway Airport/Colonel Bud Day Field
City of Sioux City, Iowa



SIoux GATEWAY AIRPORT

AIRPORT LAYOUT PLAN UPDATE SIoux GATEWAY / COLONEL BUD DAY FIELD

Prepared for:

**THE SIoux GATEWAY AIRPORT AUTHORITY
SIoux CITY, IOWA**

May 2012

The preparation of this document was financed in part through a grant from the Federal Aviation Administration (FAA). The contents of this report reflect the views of the Sioux Gateway Airport Authority and the consultants, Reynolds, Smith and Hills, Inc., and do not necessarily reflect the views or policy of the FAA. Acceptance of this report 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 applicable public laws.

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CHAPTER 1

INTRODUCTION AND EXISTING CONDITIONS

CHAPTER 1

INTRODUCTION AND EXISTING CONDITIONS

1.1 INTRODUCTION

The Sioux Gateway Airport Authority initiated an Airport Layout Plan Update for Sioux Gateway/Colonel Bud Day Field (SUX) to provide resolution of key planning action items and depiction of future Airport improvements, as envisioned by the City and Airport Authority.

1.1.1 Study Need

The ALP serves as the Airport's official record drawings, as required in complying with federal planning standards and grant assurances. Although an ALP Update, this study involves an assessment of Airport facility needs and site layout options with respect to user demand, site development considerations and anticipated funding levels. The planned development must be substantiated by proper planning practices, graphically depicted on the Airport Layout Plan (ALP) drawings, and coincide with the Airport's schedule for capital improvements.

The overarching purpose of the ALP Update is to depict the Airport's 20-year improvement plan, and the orderly development of aeronautical facilities, airspace, land uses and property interests. The planned Airport improvement projects must be generally depicted on the ALP drawings consistent with the forecast of aviation demand, and in accordance with Federal Aviation Administration (FAA) and Iowa Department of Transportation (IDOT Aeronautics) procedural requirements. From this, the ALP documentation enables the Airport to apply for funding improvements, as eligible, under the respective federal and state airport aid programs. This permits the Airport to maintain, expand, and upgrade facilities, as demand warrants and funding becomes available.

1.1.2 Project Purpose and Approach

This ALP Update project involves an electronic update to the ALP Drawing set, to depict capital projects completed since the previous 2007 ALP technical as-built revisions, and to include planned developments as identified by the Airport's current Capital Improvement Program (CIP).

The following planning studies have been undertaken for the Airport, referenced in this ALP Update project, as applicable, for supporting documentation and justification of activity trends, facility needs and capital improvements:

- 2010 Runway 17-35 Feasibility Study (RS&H)
- 2010 Pavement Condition Index Study (RS&H)
- 2009 Iowa Air National Guard Base Implementation Study
- 2007 Airport Layout Plan as-built revisions per FAA approval letter dated September 8, 2008, using 2001 approved ALP drawings.
- 2004 Airport Layout Plan as-built revisions per FAA approval letter dated July 15, 2004, using 2001 approved ALP drawings.
- 1998 Airport Master Plan and ALP Update per FAA approval letter dated November 1, 2001.

- 1988 Airport Master Plan and ALP Update.
- 1982 Airport Master Plan and ALP Update.

The previous Sioux Gateway ALP drawings are outdated in terms of digital accuracy, FAA design standards, and the Airport's development program. The updated ALP drawing set is regenerated from new survey-based aerial photogrammetry, to meet FAA electronic-ALP (e-ALP) standards and to provide geospatially referenced data in GIS and AutoCad formats. The updated mapping, drawing features and GIS database attributes have been digitally integrated into a consolidated drawing format, and reconciled in a manner to accurately depict Airport features and boundaries.

This ALP Update study provides the following planning documentation:

ALP Narrative Report: concise narrative describing Airport decision-making leading to the major Airport improvements as depicted on the ALP drawings. The narrative is arranged as outlined below:

- Chapter 1 – Existing Conditions
- Chapter 2 – Aviation Forecasts
- Chapter 3 – Facility Developments / Alternatives Basis
- Chapter 4 – Airport Capital Development Plan
- Chapter 5 – Airport Layout Plan (ALP) Drawing

ALP Drawing Set: a set of planning drawing sheets as prescribed by FAA guidance, graphically illustrating Airport features and recommended improvements in accordance with FAA and IDOT standards.

1.1.3 ALP Update Action Items

The following planning items, as coordinated between the Airport and Federal Aviation Administration (FAA), are the major actions addressed and revised as part of this ALP Update project:

- Update ALP per FAA Advisory Circular 150/5300-13 (Change #18)
- Update ALP to meet FAA e-ALP Guidance
- New Surveyed Aerial Base Mapping per FAA Advisory Circular 150/5300-18-B
- Depict Airport's FAA Airport Capital Improvement Plan Projects (FY 2012-2016)
- Resolution of FAA Published Airfield "Hot Spots"
- Future Crosswind Runway 17-35 Dimensions (6,600' x 100': ARC C-II)
 - Extend Runway 35 End by 1,000' / Relocate Runway 17 End by 1,000'
 - Extend Parallel Taxiway System (Resolve Geometry Issues)
 - Future Runway 17-35 Paved Shoulders and Blast Pads
 - Removal of Pavement within RSA/OFA/OFZ
 - Future Precision Capabilities to Runway 35 End
 - Future Approach Lighting System and NAVAID Access Route
- Ultimate Runway 13-31 Dimension for Air National Guard Takeoff Requirements
- Depict Future Airfield Taxiway Modifications
 - Future Closure of Taxiway 'F' Portion (Between Rwy 17-35 and 13-31)
 - New Taxiway 'E' (Between Rwy 17-35 and 13-31)
 - Future Removal of Taxiway 'B' (Between Rwy 17-35 and Twy 'A')

- Future Reconfiguration of Taxiway 'A' and Taxiway 'G' to Runway 31 End
- Future Taxiway 'C' Extension to Future Runway 35 End
- Future Realignment of Taxiway to ANG Paint Facility
- Modifications to Taxiway Radius
- Apron and Ramp Reconfigurations
 - Planned Removal of Apron Pavement Areas
 - Dedicated Hangar Taxiways-Taxilanes
 - Future Drainage Basins
- ASR-7 Decommission
- Update Airport Building/Structure Layout
 - Update Airport Building Information
 - New Corporate Hangar and T-Hangar Layout
 - SRE Facility Improvements
 - Identify Future Building Dispositions (Modifications, Removal, Relocations)
- Expansion of Iowa Air National Guard Facilities (Ultimate Development Concept)
 - Convert Runway 31 Overrun into Takeoff Distance
 - Relocation of Runway 31 Navigational Aids/Lighting Systems
 - ANG Apron Expansion
- Depict On-Airport Roadway Improvements
 - Construction of Southbridge Road
 - Future Closure of Harbor Drive Access
 - Portion of Sully Road Closed Beyond Runway 31 Ends
 - Re-Alignment of Airport Perimeter Road Beyond Runway 13 End
 - Future Airport Perimeter Road Improvements
- Depict Airport Vehicle Gates and Auto Access Points
- Update On-Airport and Adjacent Off-Airport Land Uses
- Depiction of Planned Southbridge Developments
- Update Airspace Obstruction Data
- Update 65 DNL Noise Contour from Revised Aircraft Traffic Mix
- Update Airport Airspace Surfaces per Future Runway Dimensions and Approaches
- Update ALP Data Table and Wind Rose Information
- Update Airport Property per 2012 Exhibit 'A' Property Map & Inventory Table
 - Update Airport Perimeter Property Boundary
 - Acquisition of Parcel 10
 - Airport Land Releases
 - Proposed Airport Property Acquisition and Future Releases
- New Air Cargo Facility

1.2 EXISTING AIRPORT CONDITIONS

1.2.1 Airport Setting

The Sioux Gateway Airport is located six miles south of the Sioux City downtown. The Airport is within the corporate limits of the City of Sioux City, Iowa, bordered by Sergeant Bluff to the east, unincorporated areas to the south, and Dakota City, Nebraska to the west. The north-south Interstate 29 is located immediately east, with an interchange exit serving the Airport.

1.2.2 Airport Role and Mission

The Airport is a public-use facility providing assets and services for commercial, general aviation and military users. It is classified by the Federal Aviation Administration (FAA) *National Plan of Integrated Airport Systems (NPIAS)* as a 'non-hub primary commercial service airport', and also classified by the *Iowa State Aviation System Plan* as a 'Commercial Service Airport' facility. The Airport is certified as a Class I FAA Part 139 facility intended to serve passenger aircraft with 30-plus seats, and designated as an FAA D-III Airport Reference Code (ARC).

It is the mission of the Sioux Gateway Airport to maximize the utilization of the Airport facilities by providing a safe and efficient location for air service and various customer services at competitive prices. The Airport will oversee and undertake proactive development, construction, and improvements to equipment and facilities through short and long-range planning, as well as establishing systems to maintain such existing and future improvements. The Airport shall additionally operate and promote itself in a fiscally prudent manner, working toward reducing, and ultimately eliminating its dependency on City taxpayers.

1.2.3 Airport Activity Levels

From FAA-published information gathered in January 2012, the Airport experiences 20,000 aircraft operations per year (takeoffs and landings) of which 16,000 operations are attributed by civilian-user traffic; including 3,000 commercial service and 13,000 general aviation operations. Nearly 50,000 annual passengers (25,000 enplanement boardings) are processed from daily scheduled airline flights. The Airport has 64 based aircraft, including 14 business jets.

1.2.4 Airport Facilities

Figure 1-1 is an aerial of the Airport's vicinity. **Figure 1-2** is a diagram depicting the Airport's major runway, taxiway and terminal area facilities.

The Airport property totals about 2,500 acres in fee and easement land interests, of which nearly 1,000 acres are leased for row-crop farming. Airport infrastructure includes airfield facilities, buildings, hangars, a roadway system and other physical assets supporting aeronautical and non-aviation interests, including the Iowa Air National Guard base complex and residential housing units. The following summarizes the major airfield facilities:

Runway System: The airfield is a closed-V intersecting runway configuration, with a 9,000' x 150' primary Runway 13-31, and 6,600' x 150' crosswind Runway 17-35. Both runways serve commercial transport and general aviation traffic. The military operates almost exclusively on Runway 13-31, which includes a cable arresting system and 1,000-foot paved overruns and at both runway ends.

Runway 13-31 and Runway 17-35 have instrument approach procedures, are designated as instrument departure runways, and are published with standard left-hand visual traffic patterns (downwind, base and final) for itinerant and local flights, unless otherwise directed by air traffic control. Runway 31 is designated as the 'calm wind' runway, accommodating aircraft departures and arrivals when the winds are light and variable. The Airport does not publish or impose special traffic patterns/regulations for noise abatement procedures.

Taxiway System: The taxiway system was originally constructed to suit a three-runway configuration for military transport and fighter aircraft. Over the years, the taxiway system has been reconfigured to conform with a two-runway configuration, in which Runway 13-31 and Runway 17-35 are served by a full-length parallel taxiway system. The current taxiway system is comprised of seven taxiways totaling 20,000 linear feet and varying from 50 to 75 feet wide. The taxiway system associated with Runway 13-31 is designed to accommodate large military Category IV aircraft (KC-135 Stratotankers).

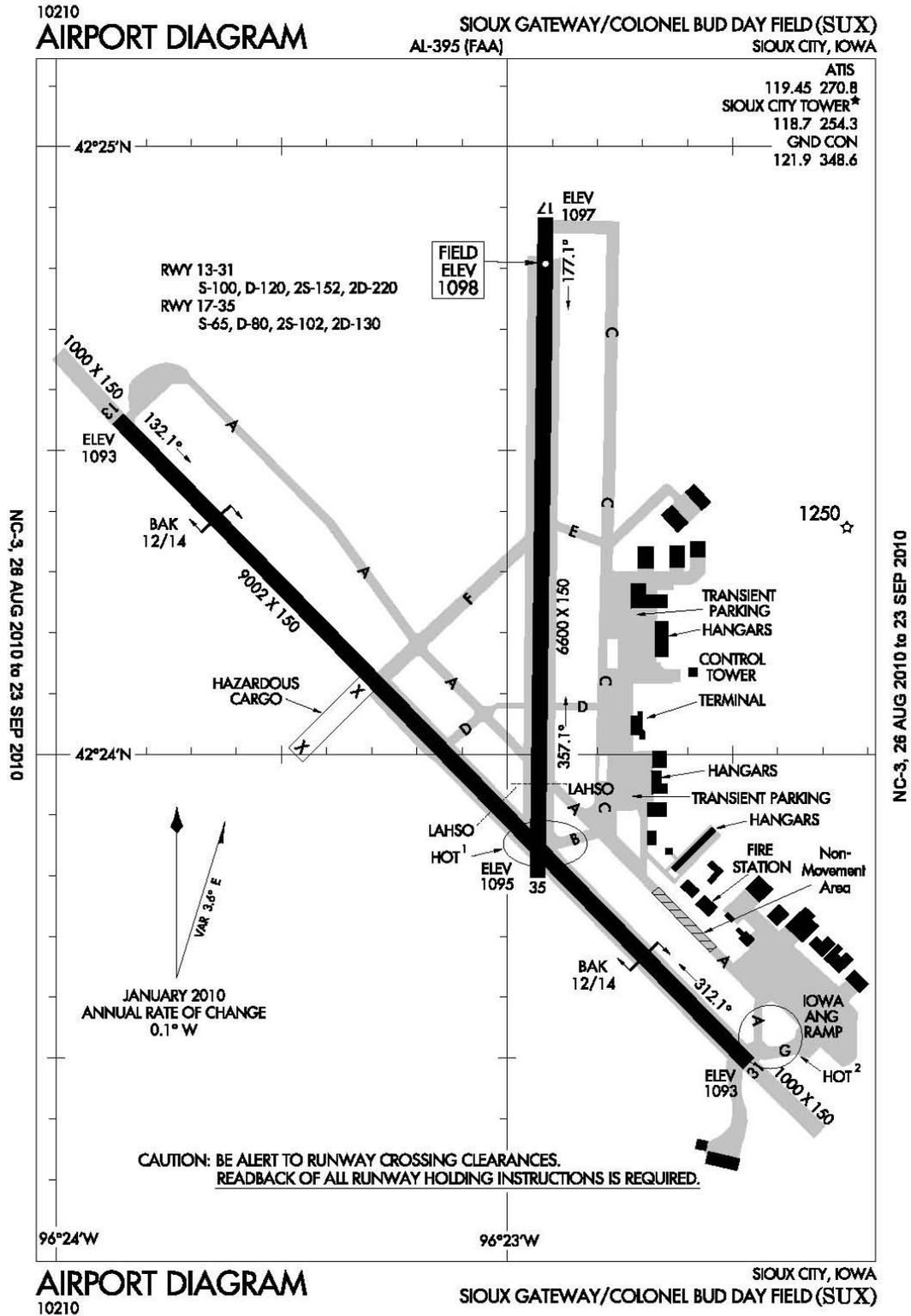
Apron System: The aprons and ramp areas are located on the east side of the airfield, supporting varied transport and general aviation aircraft parking for Airport tenants, commercial operators and transient users. The aprons consist of five paved areas (North Hangar, FBO, Air Carrier, South Apron and Air National Guard) totaling about 60 acres.

Reference the Airport Layout Plan (ALP) drawings for illustration of major facilities and supporting table information.

Figure 1-1: Airport Aerial



Figure 1-2: Airport Layout Diagram



Source: FAA Airport/Facility Directory Website (January, 2012).

Table 1-1 summarizes the Airport’s major airfield, navigational and support facilities. Reference the ALP drawings for the illustration of major facilities and supporting table information.

Table 1-1: Airfield Facilities

Airfield Item	Runway	
	Runway 13-31	RWY 31 END
Runway Length x Width (Surface)	9,002' x 150' (Concrete - Grooved)	
Pavement Strength (Gear Type)	220,000 (DTWG)	
Airport Reference Code (ARC)	ARC D-III (B-737 Series / Gulfstream 500 Series)	
Taxiway System	Full Parallel at 550' to 800' Separation	
Runway Instrument Approach Aids	CAT I ILS NDB RNAV VOR	CAT I ILS NDB RNAV VOR
Instrument Approach Minimums	Precision: 3/4-Mile / 200'	Precision: 1/2-Mile / 200'
FAR PART 77 Approach Surface	1,000' x 50,000' x 16,000'	1,000' x 50,000' x 16,000'
FAR PART 77 Approach Slope	50:1 (0 to 10,000') / 40:1	50:1 (0 to 10,000') / 40:1
Visual Approach Aids	MALS, VASI-4L	MALS, VASI-4L
Runway Edge Lighting	High Intensity (HIRL)	
Runway Marking	Precision (PI)	
Land and Hold Short Operations	No	No
BAK Arresting System	Yes: BAK 12(B) at 1,500'±	Yes: BAK 12(B)/14 at 1,400'±
	Runway 17-35	RWY 35 END
Runway Length x Width	6,600' x 150' (Asphalt - PFC)	
Pavement Strength (LBS.)	130,000 (DTWG)	
Airport Reference Code (ARC)	ARC C-II (Regional Jet)	
Taxiway System	Full Parallel at 550' Separation	
Runway Instrument Approach Aids	RNAV (LNAV GPS) NDB	NDB
Instrument Approach Minimums	Non-Precision: 1-Mile / 562'	Non-Precision: 1-Mile / 464'
FAR PART 77 Approach Surface	1,000' x 10,000' x 4,000'	1,000' x 10,000' x 4,000'
FAR PART 77 Approach Slope	34:1	34:1
Visual Approach Aids	VASI-4R, REIL	VASI-4L
Runway Edge Lighting	Med Intensity (MIRL)	
Runway Marking	Non-Precision (NPI)	
Land and Hold Short Operations	Yes	No
BAK Arresting System	No	No
NAVIGATIONAL AIDS		
NAVAIDS	ILS, VOR-DME, GPS, NDB	ILS, VOR-DME, GPS/RNAV, NDB
Air Traffic Control Tower	Radars Facility	Radars Facility
Weather System	AWOS-3	AWOS-3
Ground Communications	RTR	RTR
APRON		
	Apron Area	Parking
Air Carrier Apron	22,000 SY	Transport Aircraft
FBO Apron	35,000 SY	General Aviation Aircraft
North Hangar Ramp	70,000 SY	General Aviation Aircraft
South Hangar Ramp	32,000 SY	General Aviation Aircraft
ANG Ramp	95,000 SY	Military (±12 KC-135 Tankers)

Source: Sioux Airport Layout Plan Drawings | FAA Form 5010

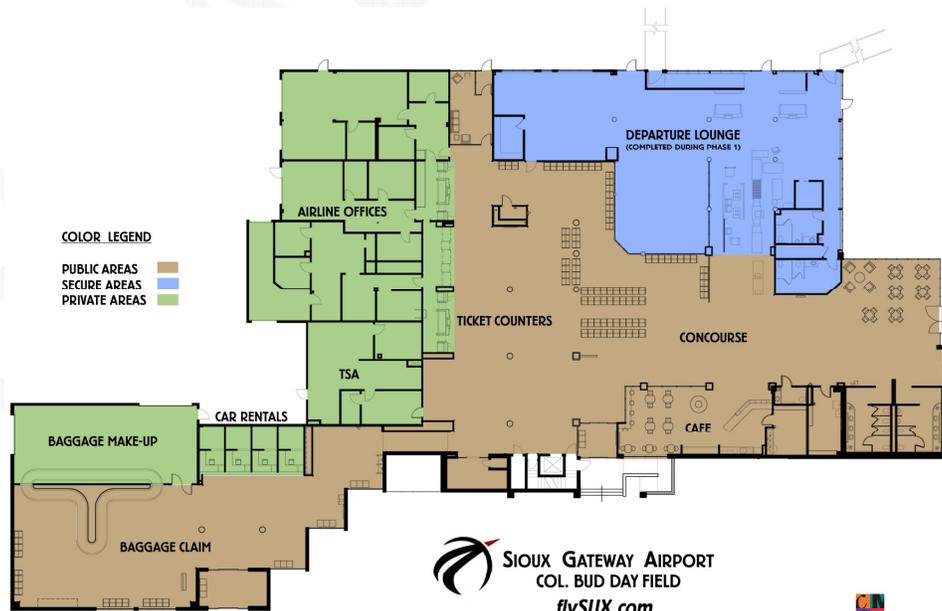
Table 1-2 summarizes the Airport’s major terminal area facilities. **Figure 1-3** illustrates the Airport Passenger Terminal Building configuration, which was renovated in 2011. Reference the ALP drawings for the illustration of major facilities and supporting table information.

Table 1-2: Terminal Area Facilities

TERMINAL FACILITIES	
AVIATION SUPPORT FACILITIES	
Passenger Terminal Building	38,000 SF 2 Gates-Loading Bridges
ARFF Building (ANG Facility)	12,000 SF ANG Facility (Index B/E Request)
SRE Building	20,000 SF
T-Hangars	1 Building - 20 Units 16,800 SF
Individual Box Hangars	3 Buildings 13,200 SF
Common/FBO/Corporate Hangars	13 Buildings 205,000 SF
Fuel Storage (Jet A)	2 Tanks 40,000 Gallons Total
Fuel Storage (100LL)	1 Tank 10,000 Gallons Total
ACCESS, CIRCULATION AND PARKING	
Passenger Terminal Parking	±400 Spaces 125,000 SF
Rental Car Ready Return Lot	±66 Spaces 14,000 SF
FBO Parking	±125 Spaces 45,000 SF
Main Entrance Road	± 2 Lane Divided 5,600 LF
Paved Public Streets	±5.2 Miles Paved
Internal Non-Public Streets	±2 Miles Paved 4.8 Miles Non-Paved
UTILITIES	
Electric	Mid America Energy
Gas	Mid America Energy
Water	City 16" Main
Sanitary Sewer	City 12" Main Trunk / Plant
Airport Perimeter Fencing	6' to 10' Fence

Source: Sioux Airport Layout Plan Drawings | FAA Form 5010

Figure 1-3: Airport Terminal Building

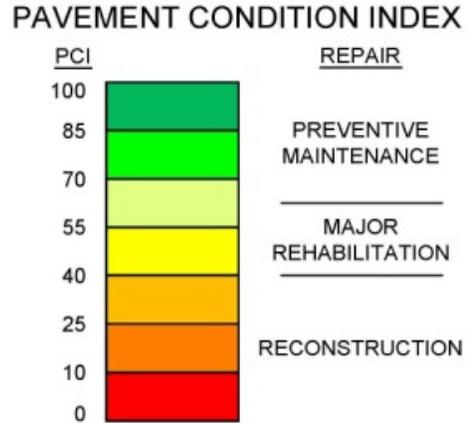


Canon Moss & Brygger & Assoc.

1.2.5 Pavement Condition

Figure 1-4 and *Figure 1-Figure 1-5*, respectively, illustrate the 2010 and extrapolated 2020 runway, taxiway and apron pavement conditions generated from a Pavement Condition Index (PCI) inspection performed at the Airport in July 2010.

The PCI is a visual pavement analysis of surface distresses, and assigns a value between 0 and 100 points indexed by color-code to correspond with the types of pavement repairs anticipated; 0 representing pavement failure up to 100 points for newer pavements in pristine condition. The following is the rating index for score, color-code and pavement repairs:



- Green: 75 to 100 points - Preventative Maintenance
- Yellow/Orange: 40 to 75 points – Rehabilitation
- Red: 0 to 40 points – Major Rehabilitation / Reconstruction

The Airport’s civilian public-use aircraft pavement areas total 6.0 million square feet (133 acres), as comprised of the following sections. Pavement conditions range from excellent to failed.

- The runway pavements total nearly 293,400 square yards (61 acres)
- The taxiway pavements total nearly 180,000 square yards (37 acres)
- The common apron/ramp pavements total nearly 170,000 square yards (35 acres)

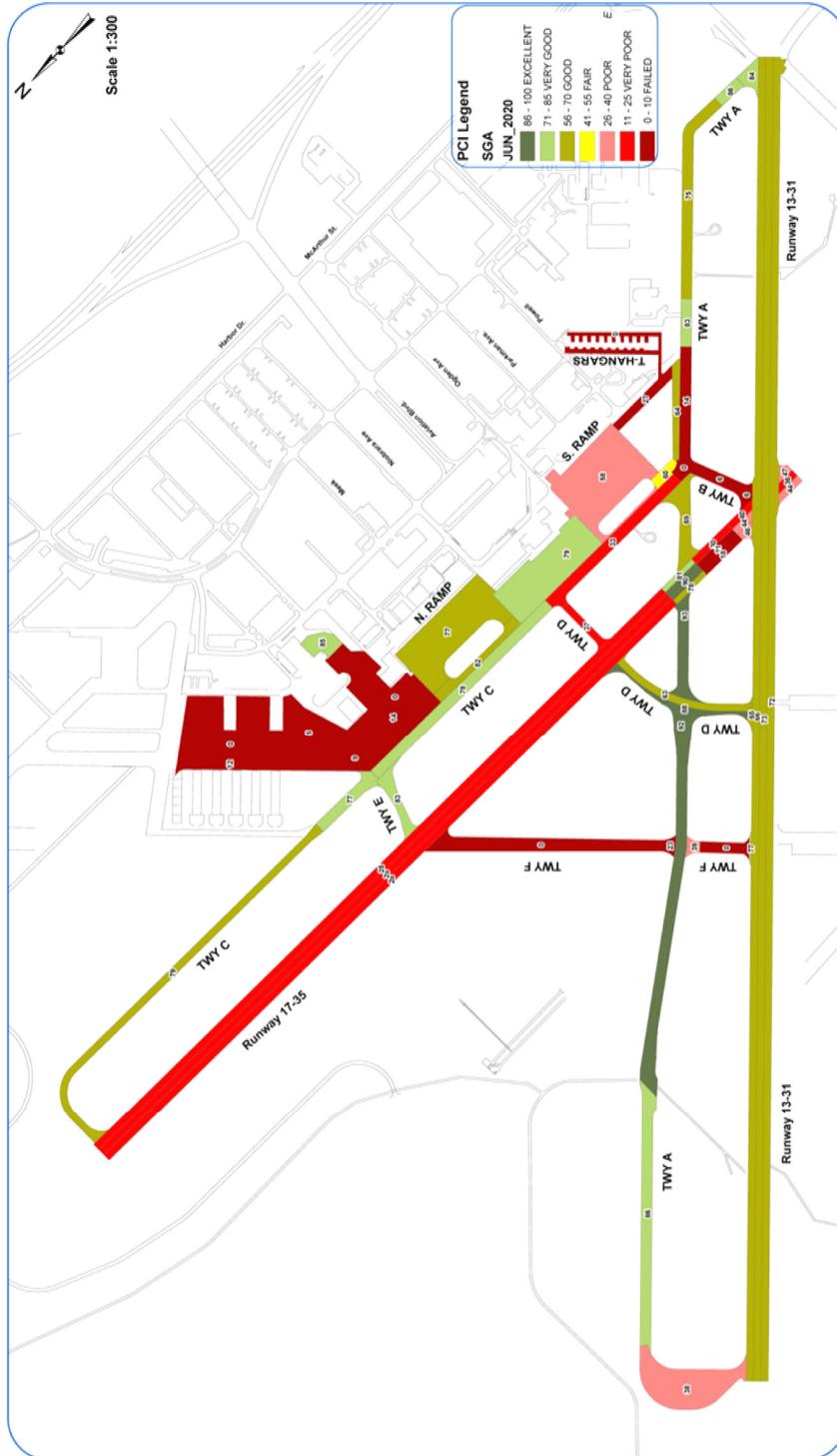
Table 1-3 is the PCI scoring thresholds per aircraft category, identifying the score at which pavement reaches a PCI value in which rehabilitation should commence. For larger Category C and D aircraft, such as the Airport’s critical aircraft, the pavement rehabilitation process is initiated based on a higher PCI value.

Table 1-3: Pavement Condition Index (PCI) Thresholds

Runway Design Category *	Branch Use	PCI Value
Category A Aircraft	Runway	60
	Taxiway	50
	Apron	50
Category B Aircraft	Runway	60
	Taxiway	50
	Apron	50
Category C Aircraft	Runway	65
	Taxiway	55
	Apron	55
Category D Aircraft	Runway	70
	Taxiway	60
	Apron	55

* Per FAA AC 150-5300-13.

Figure 1-5: Pavement Condition Index (2020 Projection)



Source: 2010 Pavement Condition Index Study (RS&H)

1.2.6 Climate Summary

The average annual temperature for Sioux City is 50° Fahrenheit, ranging from 75°F in July to 18°F in January, with an average mean maximum temperature of 86°F occurring during July. There are 28 days that the temperature exceeds 90°F, and 180 days exceeding 59°F (standard temperature). The average annual rainfall is 26 inches, and 32 inches of snow. The area receives rainfall events totaling more than 0.10" over a 24-hour period on average of 28 days per year, justifying the use of 'wet and slippery' runway length computations. Annually, marginal VFR conditions (less than 3,000' and/or 5 miles) are experienced 20 percent of the time (75 days), with IFR (less than 1,000' and/or 3 miles) occurring 10 percent (38 days).

1.2.7 Wind Patterns / Runway Use

Table 1-4 lists the crosswind components for Runway 13-31 and 17-35, expressed as a percent of coverage, reflective for two wind data observation periods. The wind rose and crosswind components are provided on the ALP. The wind data substantiates the need for a crosswind runway, as 95 percent coverage is not attained until the 16-knot wind component.

Table 1-4: Crosswind Conditions

Runway	All Weather (2001-2010 Data)			
	Crosswind Component (kts)			
	10.5	13.0	16.0	20.0
13-31	92.1%	95.9%	98.7%	99.6%
17-35	89.0%	94.1%	97.9%	99.5%
Combined	98.0%	99.3%	99.8%	100.0%

Note: Crosswind coverage, expressed as a percent of time, is the component of wind speed and relative direction acting at right angles to the runway. The FAA desirable threshold for adequate crosswind coverage is 95% at 10.5 knots.

Source: National Climatic Data Center, SUX Airport AWOS, Reporting Period 2001-2010.

Figure 1-6 graphs the wind patterns plotted from the past 10-years for all-weather wind data observations taken at the Sioux City Gateway Airport, with the strongest winds occurring as peaks indicated by the percent of observations. **Figure 1-7** plots the wind observations during instrument weather conditions (3 miles / 1,000'). As illustrated, the prevailing winds are generally from the northwest and southeast, with the stronger gusty winds (11-knots and greater) from the northwest and south. During periods of strong winds out of the north the weather conditions tend to coincide with poor visibility and lower cloud ceilings. During periods of strong winds out of the south the weather conditions tend to coincide with good visibility and higher cloud ceilings.

Based on a break-down of wind observations, Runway 13-31 would be the favored runway for about 60 percent of the time, and Runway 17-35 about 40 percent. However, it should be noted that other non-wind factors such as runway length, local direction of flight, instrument procedure preference, pilot familiarity, and ground parking destinations also influence the runway usage. As indicated by the ATC Tower, actual traffic usage indicates Runway 13-31 is used about 80 percent, and Runway 17-35 about 20 percent.

Figure 1-6: All-Weather Wind Conditions

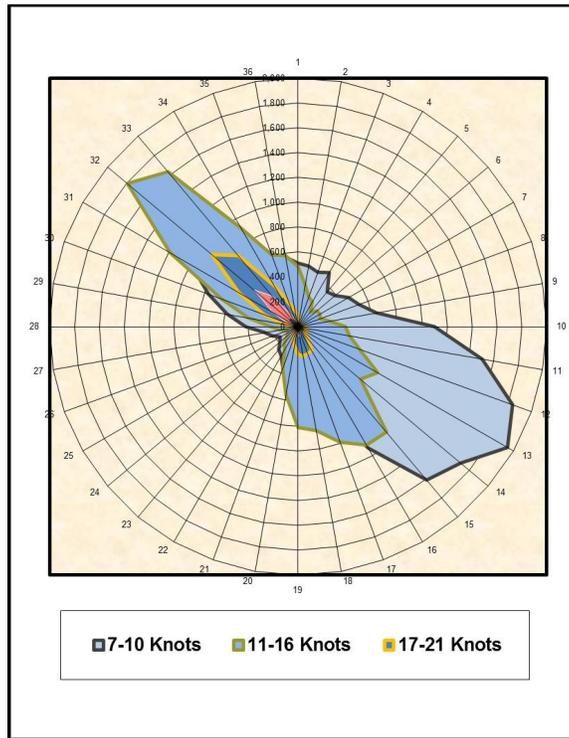
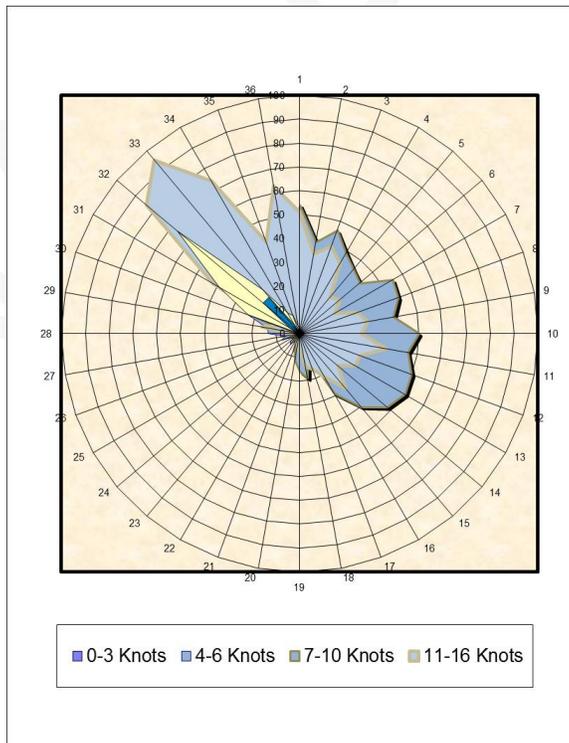


Figure 1-7: Instrument Wind Conditions



CHAPTER 2

AVIATION FORECASTS

CHAPTER 2 AVIATION FORECASTS

2.1 INTRODUCTION

Aviation forecasts are time-based projections offering a reasonable expectation of future Airport activity and influence all phases of the planning process. The relationship between activity and projected demand indicates the type, extent, and timing of Airport improvements including infrastructure, equipment and service needs.

Aviation forecasts at the Sioux Gateway Airport are identified for a 25-year planning period from 2010 until 2035, segmented into 5-year increments. The forecasts reflect the FAA Terminal Area Forecasts (TAF), as published for the Airport in 2012. Also discussed in this chapter are the Airport user trends and community developments which could influence the FAA TAF.

Although activity levels during individual years might vary above or below the FAA TAF forecast projections, the Airport's planning goals and objectives should conform to the actual level of activity. For this reason, the forecasts do not necessarily correspond to a specific year. Also, it should be noted that the forecasts are considered 'unconstrained', which assumes facilities and services are, or will be, sufficiently available to accommodate user demands when the activity arises.

2.2 AIRPORT ACTIVITY

The following summarizes the major Airport user activity groups:

Passengers: Air carrier passengers tend to average between 25,000 to 40,000 enplanements annually, or upwards of 80,000 total passengers. In recent years, passenger service has undergone significant changes in air carriers, hub destinations, aircraft equipment, flight schedules and pricing competition.

Commercial Carriers: Air carrier traffic totals about 3,000 to 5,000 annual operations (takeoffs and landings), accounting for 15 percent of the Airport's aircraft activity. Scheduled air carrier traffic has recently been comprised of 45 to 70-seat regional jets operating daily flights with non-stop service to major hub airports. The non-scheduled air carrier traffic includes flights by Allegiant, Sun Country and sports-event operators, accounting for two to three flights per month, most frequently operating narrow-body transports (MD-80, B-757, B-737 and B-727; ARC C-III to D-IV aircraft), with destinations including the Gulf Coast and western mountain regions. Other commercial service flights include charter and air taxi operations, largely processed through the fixed base operator.

Air Cargo: Air cargo consists of belly-cargo mail carried by the scheduled passenger air carrier aircraft. The Airport also receives occasional non-scheduled and charter-type cargo and express delivery flights, mostly by twin-piston aircraft transporting banking/financial documents. There is no scheduled air cargo or integrated air freight flights at the Airport. FedEx has a sort facility next to the Airport, in which all packages are currently handled with ground truck transport. In the future, air cargo, express package, and air freight remains an opportunity, particularly in support of the higher-tech industries locating in the Sioux City region, and the business developments being targeted surrounding the Airport. The domestic air cargo industry

predominately relies on a fleet of turboprops and narrow-body aircraft, commonly including the Boeing 757-200F, Boeing 727-200F, DC-9 and DC-8, which are aircraft in the ARC C-III to D-IV Airplane Design Group.

General Aviation: General aviation traffic totals about 13,000 to 15,000 annual operations, accounting for 70 percent of the Airport's aircraft activity. The Airport experiences about 2,000 jet operations per year, with frequent operations by the Gulfstream 400/500 series. The largest based general aviation jets are the Falcon 900 (ARC B/C-II), Gulfstream Astra (ARC C-II) and a Citation X (ARC C-II). Historically the Airport has based 60 to 80 based aircraft, as comprised of all fleet piston, turboprop and business jet segments. The fixed base operator provides a broad range of upper-end services and maintenance contributing to a variety of general aviation traffic, including; discounted contract fuel sales, ground handling support, maintenance and avionics repairs on all aircraft, aircraft sales, third-party charter service, transient hangar space and other pilot amenities. The FBO is also a certified maintenance service center for jets, turboprops and piston aircraft.

Military: Military traffic totals 3,500 to 4,000 annual operations, accounting for 20 percent of the Airport's aircraft activity. The Iowa Air National Guard is based at the Sioux Gateway Airport, comprised of the 185th Air Refueling Wing and 174th Air Refueling Squadron units, primarily operating the KC-135R Stratotanker which provides long-range strategic fueling for missions within the United States and overseas. The 185th Iowa Air National Guard Fighter Wing previously operated F-16 Falcons, but departed Sioux City in 2003. The Air National Guard uses Runway 13-31 almost exclusively, since Runway 17-35 is not long enough for most of its missions. In fact, the 9,000-foot Runway 13-31 length sometimes restricts the KC-135R takeoff performance at maximum weight, requiring mid-air refueling to compensate for fuel payload restrictions.

Helicopter Traffic: The Airport receives minimal helicopter traffic.

2.3 FAA AVIATION FORECASTS

Each year, the Federal Aviation Administration (FAA) prepares the Terminal Area Forecast (TAF) which is the official aviation activity forecast for all airports included in the *National Plan of Integrated Airport Systems*. The following is a summary of the FAA 2012 to 2035 TAF forecasts for passenger enplanements, aircraft operations and based aircraft at the Sioux Gateway Airport:

Passenger Enplanements: projects a positive 1.5 percent annual increase in passengers throughout the forecast period, increasing to 35,000 enplaned passengers.

Aircraft Operations: projects a sustained growth rate throughout the planning period, with a 0.7 percent increase of civilian itinerant traffic offset by a -0.5 percent decline in civilian local traffic. Total traffic is forecast to remain around 20,000 annual operations.

Based Aircraft: indicates a static forecast of 50 to 60 based aircraft throughout the 20-year period. The Airport has recently received interest in additional based aircraft, including turboprop and business jets, in which based aircraft could reasonably exceed the TAF forecast projections.

2.3.1 Aircraft / Runway Mix

Table 2-1 shows a breakdown of the Airport's 2010-2012 annual aircraft operations by runway and percentage of use. Approximately 77 percent of Airport traffic uses Runway 13-31 and approximately 23 percent uses Runway 17-35. Runway 17-35 will continue serving all segments of the transport passenger, cargo and military jets, including occasional mainline narrowbody jets with long-haul passenger and cargo destinations. Runway 17-35 will continue serving regional jets, smaller narrow-body transports and ultra-large business jets, but is not anticipated to serve the long-haul passenger or cargo transport aircraft.

Table 2-1 Runway Activity Summary (2012)

Airport Operations	Total Airport Operations	Operations Per Runway	% Runway Operations
Total Airport Operations	<u>23,500</u>	--	--
Runway 13-31	--	18,113	77%
Runway 17-35	--	5,388	23%
Runway Operations	Total Airport Operations	Runway 13-31 Operations	Runway 17-35 Operations
Itinerant Operations	<u>19,500</u>	<u>15,113</u>	<u>4,388</u>
Scheduled Air Carrier / Commuter	2,200	1,919	281
Other Commercial	1,200	826	374
General Aviation	13,500	9,522	3,978
Military	2,600	2,553	47
Local Operations	<u>4,000</u>	<u>3,000</u>	<u>1,000</u>
General Aviation	3,000	2,685	315
Military	1,000	1,000	0

Source: FAA Terminal Area Forecast (2012), SUX Air Traffic Control Tower.

2.3.2 Civilian Critical and Design Aircraft

Table 2-2 summarizes the Airport's critical aircraft type and designation. The critical aircraft remains an ultra-large cabin corporate jet as represented by the Gulfstream 500 series, an ARC D-III aircraft. This aircraft is associated with fixed base operator fueling and maintenance activity, conducting over 500 annual operations a year at the Sioux Gateway Airport. In the future, the Airport's design standards need to accommodate aircraft with an approach speed less than 166 knots and an aircraft wingspan of up to 118 feet. The Iowa Air National Guard is a joint Airport user, principally operating the Boeing KC-135 Stratotanker (ARC C-IV), which requires a 75-foot wide taxiway with a 259-foot wide Taxiway Object Free Area (TOFA).

Table 2-3 shows the Airport's critical aircraft in reference to the FAA Airport Reference Cod (ARC) designations. The critical aircraft is evaluated with respect to size, speed and weight, and is the basis for determining the airfield and terminal area standards for various structural dimensions, setbacks and separations, airspace clearances, safety areas and other design considerations. The future planning of runway facilities pertains to the operational and physical characteristics of the 'critical aircraft', or representative largest aircraft conducting more than 500 annual itinerant operations (takeoffs and landings) at the Airport.

AIRPORT CRITICAL PLANNING AIRCRAFT



The Gulfstream 400/500 is an ultra large-cabin corporate jet representing the Airport's critical planning aircraft, which operates on Runway 13-31 and Runway 17-35

AIRPORT CIVILIAN DESIGN AIRCRAFT



The MD-80 is a narrow-body commercial transport representing the Airport's civilian design aircraft, which operates on Runway 13-31 and Runway 17-35

AIRPORT MILITARY DESIGN AIRCRAFT



The Iowa Air National Guard KC-135R is a large transport representing the Airport's design aircraft for Runway 13-31.

Table 2-2 Airport Critical Aircraft (Airport Reference Code)

Airport	ARC Approach Category	Approach Speed (knots)	
	Category A	< 91 knots	
	Category B	91 to < 121 knots	
	Category C	121 to < 141 knots	
Gulfstream 500 Series	Category D	141 to < 166 knots	
	Category E	> 166 knots	
Existing / Future	ARC Design Group	Wingspan (ft)	Tail Height (ft)
	Group I	< 49'	< 20
	Group II	49' to < 79'	20' to < 30'
Gulfstream 500 Series	Group III	70' to < 118'	30' to < 45'
	Group IV	118' to < 171'	45' to < 60'
	Group V	171' to < 214'	60' to < 66'
	Group VI	214' to < 262'	66' to < 80'

Combined, the 'Approach Category' and 'Design Group' yields the Airport Reference Code (ARC) which determines the type of airplane the airport is designed to accommodate for dimensional geometry, separation standards and airspace surfaces.

Source: FAA Advisory Circular 150/5300-13.

Table 2-3 summarizes the Airport's major activity levels for the next 20 years as reflected by the FAA Terminal Area Forecast (TAF).

Table 2-3 Airport Forecast Summary (2010 to 2035)

Airport Activity	2010	2015 +5 Years (FAA TAF)	2020 +10 Years (FAA TAF)	2025 +15 Years (FAA TAF)	2030 +20 Years (FAA TAF)	2035 +25 Years (FAA TAF)
COMMERCIAL PASSENGERS						
Annual Passengers	49,600	56,300	59,100	62,100	65,200	68,500
Annual Enplaned	24,800	28,100	29,600	31,100	32,600	34,300
Peak-Month Passengers	5,460	6,190	6,500	6,830	7,180	7,540
Peak-Day Passengers	180	200	210	220	240	250
Peak-Hour Passengers	40	40	40	40	50	50
Average Annual Rate	--	2.5%	1.0%	1.0%	0.9%	1.0%
ANNUAL OPERATIONS						
Commercial	3,400	2,900	3,000	3,000	3,100	3,200
General Aviation	16,500	10,900	11,000	11,200	11,400	11,500
Military	3,600	2,800	2,800	2,800	2,800	2,800
Total	23,500	16,600	16,800	17,000	17,300	17,500
Average Annual Rate	--	-6.7%	0.2%	0.2%	0.4%	0.2%
BASED AIRCRAFT						
Total	64	52	52	52	52	52

Note: Operational values rounded

Source: FAA Terminal Area Forecast (2012), SUX Air Traffic Control Tower.

CHAPTER 3

FACILITY DEVELOPMENTS AND ALTERNATIVES BASIS

CHAPTER 3 FACILITY DEVELOPMENT / ALTERNATIVES BASIS

3.1 INTRODUCTION

This chapter documents the Airport facilities and alternative layout options necessary to satisfy the 20-year aviation demands at the Sioux Gateway Airport. The improvements, as depicted on the Airport Layout Plan (ALP) drawings, are identified for the purpose of resolving facility deficiencies, accommodating projected growth, and satisfying the strategic goals as envisioned by the Airport for long-term development. The alternatives form the basis in the agreed-to concept of how future development will take form at the Airport.

The following, listed by section number, are the key alternatives identified in this chapter:

- 3.2.1 Runway 17-35
- 3.2.1 Runway 31
- 3.2.3 Air National Guard Apron Expansion
- 3.2.4 Taxiway System
- 3.2.5 Paved Apron and Ramp Reconfiguration
- 3.2.6 Aircraft Hangars
- 3.2.7 Air Cargo Facility
- 3.2.8 Roadway Improvements
- 3.2.9 Airport Land Acquisition
- 3.2.10 On- and Off-Airport Land Uses

3.2 FACILITY OVERVIEW

The Airport facility requirements and preferred layout options have been identified and coordinated with the Airport Sponsor, and planned in accordance with Federal Aviation Administration (FAA) design standards and guidance. It should be noted the facility recommendations are not an absolute design requirement, but options to resolve facility or operational inadequacies, or to make improvements as demand warrants and funding becomes available. Also, extenuating circumstances can affect the timing of facilities, thereby triggering project improvements due to unforeseen user demand and unanticipated operator needs.

Overall, the Airport facility requirements are planned based on the Airport's critical aircraft, and in conjunction with the FAA Airport Capital Improvement Program (ACIP). The 2010 Iowa State Aviation System Plan did not indicate any facility performance requirements for the Sioux Gateway Airport.

3.2.1 Runway 17-35

Runway 17-35 requires improvements necessary to resolve various FAA design, incursion and pavement condition issues. The incursion problems stem from non-standard runway/taxiway geometry, which result in FAA-published 'hot spots'. In conjunction with these safety concerns, the Runway 17-35 pavement is in poor condition and in need of immediate rehabilitation/reconstruction. The sub-standard runway and taxiway configuration is not acceptable to current FAA airport design standards, and is recommended to be corrected as part of a major runway improvement project.

As part of a separate *SUX Runway 17-35 Feasibility Study* conducted in 2010, four runway alternatives (RFS-A, B, C and D) were presented for consideration, from which Alternative C was selected as the preferred Runway 17-35 option to carry forward as part of the Airport's development plan. Alternative C extends the Runway 35 end and parallel Taxiway 'C' about 1,000' to the south, and relocates the Runway 17 end to provide a usable 6,600-foot runway length, or with the threshold otherwise established due to runway and taxiway design or benefit-cost justification. This alternative resolves safety area issues, corrects sub-standard intersection geometry, and meets critical aircraft demands for runway length.

The future 6,600' x 100' dimension is consistent with accommodating aircraft in the FAA Airport Reference Code C-II category. The 6,600 foot length is required to meet the takeoff performance requirements of the 40 to 70-seat regional jet fleet operating at the Airport (CRJ 200, CRJ 7000, EMB 140, EMB 145), and the medium to large-cabin corporate/business jets conducting flights during wet and slippery runway conditions. The 100-foot width is consistent with FAA design standards accommodating transport aircraft weighing less than 150,000 pounds.

- Existing Runway 17-35: 6,600' x 150' (ARC C/D-III)
- Future Runway 17-35: 6,600' x 100' (ARC C-II)

In addition, the Runway 35 end is planned as a future precision instrument approach, including the planned installation of ILS equipment and approach lighting system (MALSR/MALS). At minimum, the Runway 35 end must be extended 950' to 1,000' beyond the Runway 13-31 centerline in order to achieve proper ILS glideslope clearances, and to provide sufficient holdshort separation along the parallel taxiway.

3.2.2 Runway 13-31

The 9,000-foot Runway 13-31 length places a restriction on the Iowa Air National Guard's KC-135R refueling tanker missions at the Sioux Gateway Airport. This results in a fuel payload reduction on certain KC-135 departures, which in turn, requires the tankers to be refueled during flight. The Iowa Air National Guard has indicated their takeoff performance length at the Sioux Gateway Airport is 10,000 to 10,500 feet. To support this KC-135 departure requirement, the Airport recommends converting the existing 1,000-foot Runway 31 overrun into takeoff distance for Runway 31 departures, for use exclusively by military operations. This additional runway length would also coincide with proposed Taxiway 'A' modifications to resolve geometry issues and the prospects for ANG apron expansion towards the southeast. The ALP depicts this runway development and associated pavement and navigational aid improvements as an 'ultimate' condition, contingent upon military funding.

3.2.3 Air National Guard Base Expansion

The Iowa Air National Guard base facilities are planned to expand to meet anticipated military mission requirements. These improvements, as depicted on the ALP as an 'ultimate' condition, include apron expansion towards the southeast (across the closed Harbor Road), apron taxiway re-configuration, and areas for future building and hangar development. The ANG expansion would result in the removal and relocation of Army Guard Complex facilities, along with roadway and perimeter road modifications.

3.2.4 Taxiway System

The ALP Update depicts taxiway improvements recommended to increase ground maneuvering efficiency, conform to FAA geometry standards, and reduce the possibility of runway incursions. In some cases, these taxiway improvements coincide with other airfield improvements and pavement condition improvements. The following is a description of the planned taxiway developments:

Taxiway 'A' is recommended to be reconfigured to the Runway 31 end in order to provide a 90-degree entry, and to provide a holding/by-pass area beyond the holdshort line, with lighting and markings to designate military-only access to the Iowa Air National Guard ramp. Also, an approximately 1,200 linear foot segment of Taxiway 'A' has Air Traffic Control Tower line-of-sight penetrations resulting from multiple buildings/hangars north of Taxiway 'A'. Future buildings/hangars will be planned so as to not exacerbate the line-of-sight.

Taxiway 'B' is located between Taxiway 'A' and the intersection of Runway 13-31 and 17-35 is recommended to be removed, in order to eliminate non-standard 3-note intersection geometry and reduce the risk of runway incursions.

Taxiway 'C' is planned to be extended as a full-length parallel taxiway to the future Runway 35 end, and to provide a replacement exit Taxiway 'B' location. The section of Taxiway 'E' between Runway 13-31 and Taxiway 'A' is planned to accommodate the KC-135 Stratotanker, an ARC D-IV design aircraft. The section of Taxiway 'E' between the future Runway 35 end and Runway 13-31 is planned to accommodate the 35 to 70-seat air carrier regional jets, which are ARC C-II design aircraft.

Taxiway 'D' provides access between Runway 13-31 and the air carrier ramp, and consists of three segments, all with varying widths (50' 60' and 75'), and includes turn fillets that do not accommodate the critical aircraft. In addition, parts of the taxiway pavement are rated "Fair" or worse. The taxiway is planned to be rehabilitated.

Taxiway 'E' is an exit taxiway between the midfield of Runway 17-35 and the North Ramp area. It is recommended Taxiway 'E' be extended as a connector from Runway 17-35 to Runway 13-31, serving as an exit to Taxiway 'A'.

Taxiway 'F' was converted into a taxiway from a former closed runway that now connects Runway 17-35 with Taxiway 'A' just northwest of the midpoint of Runway 13-31. Taxiway 'F' is experiencing failing pavement conditions, has drainage and design issues, has become obsolete as a connector taxiway since the construction of the full-parallel Taxiway 'A' system, and is redundant with Taxiway 'D' in providing a mid-field exit taxiway turnoff. It is recommended that the 1,650-foot segment of Taxiway 'F' be removed. The remaining section of Taxiway 'F' south of Runway 13-31 will continue to be designated as a Hazardous Cargo location.

Taxiway 'G' is an entry taxiway to the Runway 31 end serving the Iowa Air National Guard ramp, and is recommended to be removed to comply with Precision Obstacle Free Zone (POFZ) and FAA standards for taxiway-to-runway intersection geometry. A future replacement Taxiway 'G' is planned as the proposed entry taxiway to the Runway 31 end, as converted for use by the military Air National Guard for takeoff purposes.

Taxiway 'H' is the planned reconfiguration of the entry to the Runway 31 end, providing access to the proposed southside Air Cargo facility and Air National Guard paint facilities. The existing taxiway, although marked with an off-set holdshort line, encroaches the Precision Obstacle Free Zone (POFZ), and is within the runway Threshold Siting Surface (TSS).

3.2.5 Paved Apron/Ramp Reconfiguration

The ALP Update depicts apron and ramp improvements, which largely entails the deactivation of excessive paved areas. A section of pavement within the South General Aviation Hangar Apron, north of Taxiway 'A', is recommended for removal, and converted into a pervious drainage and snow dump area. The pavement, excessive to the Airport's maintenance requirements, is in failing condition and no longer needed for aircraft parking and maneuvering. Portions of pavement within the North General Aviation Hangar Apron area were constructed to serve military purposes, and have become excessive to the Airport's needs and maintenance requirements. The remaining 50' to 75' taxiways are intended to provide sufficient aircraft access and maneuvering for existing and future hangar developments.

3.2.6 Aircraft Hangars

The ALP Update depicts the general location of future hangar development, including areas allocated based on aircraft type, tenant prospects and access. It is anticipated that nearly all based aircraft will be stored in hangars. For planning purposes, the following are general siting criteria to be considered as part of future hangar development, as demand warrants, and as specific user preferences become evident:

- Hangars must be constructed beyond the runway and taxiway safety areas, navigational critical areas, remain beyond visibility line-of-sights, and regulated by height so as to not encroach imaginary airspace surfaces.
- Ideally, hangars should be developed in a linear, modular manner. Hangar locations should be centralized by type and function to promote efficient airfield and landside access, and constructed along existing flightlines as possible, to minimize costs associated with expanded paved areas, drainage, utilities, auto parking and secured access.
- Individual hangars typically range from 1,500 to 10,000 square feet, with larger special-purpose common hangars also including workshop and office space. Hangars with business or commercial uses typically range from 10,000 to 70,000 square feet.
- Hangar buildings should be separated to meet, at minimum, FAA taxilane width and safety area distances in providing sufficient access, maneuvering and ramp space. Hangar orientation should consider weather conditions, and provide adequate drainage with minimal slope differential, especially in front of hangar doors.

Future hangar expansion at the Sioux Gateway Airport entails the larger business/corporate hangars being located at the North Ramp Area, and the smaller T-hangars/box hangars located at the South Ramp area. The North Ramp Area would also be the preferred location for a tenant requiring a lease area for a large commercial hangar and ramp, along with other peripheral developments often needed to support large hangar site developments. The ALP depicts the area reserved for future hangar development.

3.2.7 Air Cargo Facility

A new air cargo facility is being contemplated as part of supporting the Southbridge Development, planned south of the Runway 31 end, along Sully Road adjacent to the Air National Guard paint facility. The air cargo facility is anticipated to contain a regional-size sort building and ramp to accommodate the typical cargo transport (ie, Boeing-757) and turbo-prop (ie, ATR 42/72, Shorts 330) aircraft.

3.2.8 Perimeter Roadway

The ALP Update depicts improvements to the Airport perimeter roadway network, including new, converted and re-aligned route segments. The future perimeter route has been planned to provide a continuous route, which also minimizes impacts to on-Airport farmed areas. The planned perimeter road improvements include:

- Re-alignment of new route(s) beyond Runway 31
- Conversion of Sully Road segment connecting with ANG Paint Facility
- Re-alignment beyond future Runway 35 end
- New connection north of City training facilities
- Re-alignment near North Ramp Area
- Conversion to new route beyond Runway 13 end

3.2.9 Airport Land Acquisition

It is recommended that the Airport purchase additional property south of planned Runway 35 extension in order to protect, in fee simple, future precision airspace surfaces.

3.2.10 Proposed Off-Airport Developments

The Airport is generally surrounded by agricultural land uses, which are zoned by the City and County as 'Industrial'. It is anticipated that future off-Airport developments will be concentrated south of the Airport. The Southbridge Park is a 9,000-acre planned business development area planned between Sully Road, Interstate-29 and Woodbury County 260th Street, intended to accommodate large-scale industrial and manufacturing business, including multi-modal transportation facilities. The developments are being planned to accommodate the Airport operational, airspace and property interests.



CHAPTER 4

AIRPORT CAPITAL DEVELOPMENT PLAN

CHAPTER 4

AIRPORT CAPITAL DEVELOPMENT PLAN

4.1 INTRODUCTION

This chapter identifies the short-term Airport Capital Development Plan for the Sioux Gateway Airport, which incorporates the facility requirements and preferred alternatives as depicted on the updated Airport Layout Plan (ALP) drawings. The development plan provides year-by-year guidance for continued maintenance, upgrade, and expansion of capital facilities, as consistent with the Airport facility requirements, pavement conditions and strategic vision.

It should be noted that the development plan does not represent an obligation of local funds, nor does it commit federal or state funding until demonstrating proper project justification and environmental clearance. In addition, other state and local coordination may also be necessary.

4.2 AIRPORT DEVELOPMENT PLAN

Table 4-1 lists the major Airport facility improvement projects and costs as referenced by the FAA Capital Improvement Program (ACIP) dated February 2012. The assignment of ACIP project priorities, phasing and estimated costs has been developed in close coordination and input by the Federal Aviation Administration (FAA), and their procedural guidance.

The FAA ACIP is a 5-year improvement schedule, including only eligible projects allowable under the federal and state grant programs, submitted by the Airport each year to FAA for federal and state programming consideration. The ACIP identifies project costs based on anticipated federal, state and local funding participation, and accounts for the project pre-planning, design and construction, as a reasonable implementation sequence necessary to fund and build multi-year projects.

The ACIP for the Sioux Gateway Airport includes 32 projects totaling approximately \$64.1 million. The local share, which typically ranges between 2.5 and 50 percent, totals \$4.1 million, or 6.3 percent of the total 5-year ACIP costs. It should be noted that the ALP depicts major ACIP facility improvements, and is not intended to depict every Airport project under consideration.

4.2.1 Airport Funding Resources

Financial resources for the Airport include revenue-generating enterprises from the landing field, terminal building, hangars and ramps, commercial properties, residential properties, public parking, and farm properties. Funds are also generated from Passenger Facility Charges (PFC's), Federal Aviation Administration (FAA) Airport Improvement Program (AIP) grants, Transportation Security Administration (TSA) Funds, and State Commercial Service Vertical Infrastructure (CSVI) funds.

4.2.2 Federal Aviation Administration (FAA)

FAA grants are funded through the Aviation Trust Fund as collected through user-generated taxes (airline passenger tax, aircraft parts and fuel) and distributed in accordance with the FAA Airport Improvement Program (AIP) by entitlement formula or discretionary provisions. *FAA Order 5100.38C*,

“*Airport Improvement Program Handbook*” provides guidance and sets forth policies and procedures for the administration of the Airport Improvement Program (AIP) by the Federal Aviation Administration (FAA). Statutory provisions require that AIP funds be apportioned by formula each year to specific airports or types of airports. While the AIP has been reauthorized several times since established by the Airport and Airway Improvement Act of 1982, including the adjustment of the appropriated amount and funding formulas to reflect current national priorities, the basic AIP program has remained essentially the same.

Described below are three FAA funding sources available to the Sioux Gateway Airport:

- **FAA Entitlement** – Commercial service airports greater than 10,000 commercial enplanements receive primary entitlements apportionment based on the number of annual passenger boardings the minimum being \$650,000 to around \$1,000,000 per year. These funds are typically dedicated for AIP-eligible projects per FAA approval, and can be carried over and accumulated typically for up to three years. It is anticipated that future primary entitlements will continue at similar levels under future aviation FAA authorization acts.
- **FAA Discretionary** – Any remaining AIP funds at the national level not mandated by set-asides or assigned to entitlements are designated as discretionary funds, and may be used for funding eligible FAA projects. Discretionary funds are airport and project specific, and based on the national priority system. Eligible discretionary projects are typically those that enhance airport capacity, address noise, or enhance safety and security, or are directed to certain national project priorities. The more expensive projects in the Airport Development Program and ACIP, such as airfield pavement rehabilitation, are expected to be funded from FAA discretionary funds. Discretionary funds, which vary from year-to-year, typically provide for 80 to 95 percent of the cost of eligible projects, with local or state funds providing the remaining match. In addition, the sponsor must be able to commence the work on projects using discretionary funds during the same fiscal year as the grant agreement or within 6 months, whichever is later.
- **FAA Apportionment** – FAA funds made available to states under various conditions, as apportioned based on an area/population formula within the 50 states.

FAA uses the National Priority Rating system for the distribution of AIP grant funds, which is a value generated equation that takes into consideration the airport and project role in accordance with FAA goals and objectives. The following are the point system assigned for project purpose categories:

1. Safety/Security = 10 points
2. Statutory Emphasis Programs = 9 points
3. Planning = 8 points
4. Reconstruction = 8 points
5. Environment = 8 points
6. Capacity = 7 points
7. Standards = 6 points
8. Other = 4 points

Table 4-1: Summary of Airport Capital Improvement Program
(FY 2013 to 2020)

Airport Activity	Federal (FAA)	State (IDOT)	Local (SUX)	Total
FAA ACIP (FY 2013 - 2018)				
FY 2013	\$ 1,301,500	\$ 338,000	\$ 275,500	\$ 1,914,999
FY 2014	\$ 3,048,644	\$ 338,000	\$ 367,455	\$ 3,754,099
FY 2015	\$ 43,129,429	\$ 338,000	\$ 2,476,969	\$ 45,944,398
FY 2016	\$ 7,789,997	\$ 338,000	\$ 616,999	\$ 8,744,996
FY 2017	\$ 2,992,499	\$ 338,000	\$ 364,499	\$ 3,694,998
SubTotal (\$)	\$ 58,262,069	\$ 1,689,998	\$ 4,101,423	\$ 64,053,490
SubTotal (%)	91.0%	2.6%	6.4%	
LONG-TERM (FY 2018-2020)				
FY 2018	\$ 3,248,999	\$ -	\$ 171,000	\$ 3,419,999
FY 2019	\$ 1,140,000	\$ -	\$ 60,000	\$ 1,200,000
FY 2020	\$ 570,000	\$ -	\$ 30,000	\$ 600,000
SubTotal (\$)	\$ 4,958,999	\$ -	\$ 261,000	\$ 5,219,999
SubTotal (%)	95.0%	0.0%	5.0%	
GRAND TOTAL	63,221,068	1,689,998	4,362,423	69,273,489
	91.3%	2.4%	6.3%	

Note: Includes eligible federal or state project only.

Source: SUX FAA ACIP (March, 2012) / IDOT Airport Long Range Needs Assessment (FY 2016-2020).

4.2.3 Future Development Considerations

It is recommended that the Airport Development Plan be used as a working tool. The projects should be re-assessed and updated annually, including necessary adjustments in project sequencing, multi-year phasing considerations, engineering-level cost opinions, funding participation and proper lead-time for project formulation and planning requirements.

Cooperation with the FAA/IDOT is important to facilitate project formulation and coordinate implementation in a timely manner. It is also important that the development plan receive favorable community support and agreement amongst airport tenants.

The long-term 10 to 20 year projects should be periodically re-examined for proper project chronology, and cost estimates assigned as the project development becomes more defined. It is anticipated that the Airport will continue to monitor and evaluate which long-term 10 to 20 year projects are best to accommodate tenant demands, accommodate growth, and meet federal and state requirements.

In addition, it is essential that improvements be scheduled and sequenced in a manner which does not unnecessarily burden or stop Airport operations, and phased in a manner which allows runway and navigational aid improvements to be implemented in a coordinated fashion.

4.2.4 Airport Project Responsibilities

Airport capital projects are typically closely coordinated with the FAA and IDOT, particularly when Airport Improvement Program (AIP) funding or NEPA environmental documentation is required. Therefore, in addition to the typical project procurement and execution responsibilities that most Airports address on a wide variety of non-airport projects, additional consideration of FAA requirements is needed for the projects listed in the ACIP. In general, for each project the Airport will be responsible for the following:

- Update the Airport Capital Improvement Program (ACIP) and financial documentation
- Verify the justification supporting the project and request FAA/IDOT participation for projects using AIP funding.
- Assure completion of the necessary environmental processing through agency coordination
- Prepare and submit grant applications
- Prepare and issue a Request For Qualification and selecting the consultant/engineer for the project planning, design, or environmental analysis, as applicable
- Prepare and issue a Request For Proposals and selection for project construction, management, and related construction services; these services may be provided or assisted by the design engineer
- Provide project administration including FAA grant maintenance and close out

Regular coordination with FAA is important to facilitate and gain acceptance of the responsibilities.

CHAPTER 5

AIRPORT LAYOUT PLAN DRAWINGS

CHAPTER 5 AIRPORT LAYOUT PLAN DRAWINGS

5.1 INTRODUCTION

The Airport Layout Plan (ALP) serves as the official record drawing set depicting Airport developments envisioned by the Airport Sponsor as part of complying with federal planning standards and grant assurances. The approved ALP drawings illustrate these developments, and enable the Airport Sponsor to seek funding for improvements as eligible under the respective federal and state airport aid program.

5.1.1 ALP Function

The ALP drawings are a graphic illustration of the Airport's 20-year Airport development program, and include the Airport Layout Drawing, and supporting sheets which together comprise the ALP set. The ALP Update entails new aerial base mapping features (planimetrics, topography and obstruction data), and also compiling various electronic drawing records, and integrating database information into a single composite electronic file system.

The Airport Layout Plan (ALP) drawings have been updated to depict and properly note the 20-year improvements identified in the Master Plan, as substantiated from the aviation forecasts, facility requirements and the alternatives analysis. In addition, the drawings have been updated to reflect current federal and state airport design standards, as the FAA has issued multiple updates to planning and airspace standards since completion of the previous ALP.

FAA Advisory Circular 150/5070-6B, *Airport Master Plans* identifies the primary ALP purposes:

- The approved plans are necessary in order to receive financial assistance under the terms of the Airport and Airway Improvement Act of 1982 (AIP), as amended.
- The plans create a blueprint for airport development by depicting proposed facility improvements consistent with the strategic vision of the airport sponsor.
- The ALP serves as a public document that is a record of aeronautical requirements, both present and future, and as a reference for community deliberations on land use proposals and budget resource planning.
- The approved ALP provides the FAA with a plan for airport development.
- The plans can be a working tool for use by the Airport Sponsor, including development and maintenance staff.

5.1.2 Electronic (e-ALP) Drawings

As part of the ALP Update, the ALP drawings have also been generated in electronic-ALP (e-ALP) format. The e-ALP conforms to Airport Geographic Information System (AGIS) standards, and reflects FAA standards for meeting survey and graphic database requirements per Advisory Circular 150/5300-18B, Table 2-1. It should be noted that the e-ALP is still under development as a FAA pilot program. However, this AGIS ALP update allows the FAA to gather most, if not all, of the possible data

categories, create GIS data layers, points, attributes, etc. and upload the data to the FAA GIS database. This results in a fully electronic ALP for the Airport, in AGIS and AutoCad formats.

5.1.3 Airport Compliance with FAA Design Standards

The ALP drawings for the Sioux Gateway Airport were approved by the Airport Sponsor as consistent with Federal Aviation Administration (FAA) design standards, procedural requirements, and airspace review process. The ALP drawing set was developed in conformance with the FAA-Central Region Airport Layout Plan Checklist, and as consistent with the following key FAA guidance regarding the preparation and review of ALP drawings:

- FAA Advisory Circular 150/5300-13, *Airport Design (Change #18)*
- FAA Advisory Circular 150/5070-6B, *Airport Master Plans*
- Federal Aviation Regulations Part 77, *Objects Affecting Navigable Airspace*

The FAA ALP Checklist, as signed by the Airport Sponsor, contains detailed remarks and supporting attachments to document the design rationale used in developing the ALP drawing set.

5.2 AIRPORT LAYOUT PLAN SHEETS

The Airport Layout Plan (ALP) consists of the Airport Layout Drawing, and supporting drawing sheets which together comprise the ALP set. The ALP drawings are produced electronically in AutoCAD (Version 2010) colored format, and scaled for 30" x 42" sheets, with reduced 11" x 17" sheets for insertion into the narrative report.

Below is the ALP drawing sheet index, and a brief description of each drawing sheet:

Sheet 1	Title and Approval Sheet
Sheet 2	Airport Data Sheet *
Sheet 3	Airport Layout Plan (Existing)
Sheet 4	Airport Layout Plan (Future) *
Sheet 5	Airport Facility Layout Aerial *
Sheet 6	Airspace Drawing (FAR Part 77) / Centerline Profile
Sheet 7	Inner Approach Plan & Profile - Runway 13 (Existing/Future)
Sheet 8	Inner Approach Plan & Profile - Runway 31 (Existing/Future)
Sheet 9	Inner Approach Plan & Profile - Runway 17 (Existing/Future)
Sheet 10	Inner Approach Plan & Profile - Runway 35 (Existing/Future)
Sheet 11	Departure Surface Drawing – Runway 13 & 31 (Existing/Future) *
Sheet 12	Departure Surface Drawing – Runway 17 & 35 (Existing/Future) *
Sheet 13	Terminal Area Drawing
Sheet 14	Airport Land Use Plan
Sheet 15	Airport Property Map

Note: * denotes new ALP drawing sheet

Title and Approval Sheet - A sheet identifying the Airport name, grant numbers and an index of drawing sheets contained in the ALP set. This sheet also contains the Airport location and vicinity maps, a revision block, and a location to chronicle ALP reviewer and approval stamps/letter(s).

Airport Data Sheet – A sheet separately listing the technical ALP data requirements, table information and notes, allowing a less cluttered ALP drawing image. Major components of the sheet include:

- Basic Data Table | Runway Data Table | Supporting Tables
- Runway Declared Distance Depiction
- Modification to Airport Design Standards
- Wind Rose Data
- Mapping Sources
- General Notes and Notices

The ALP planning phases are noted as:

Existing – Airport conditions as of November, 2011

Future – Airport conditions planned or recommended within the 20-year planning period

Ultimate – Airport projects or space allocation anticipated beyond the 20-year planning period.

Aerial-Existing Facilities Layout - This drawing shows the existing Airport facilities overlaid on the aerial photo. The drawing contains minimal text and dimensioning to provide an uncomplicated view of current infrastructure and equipment locations. This sheet is intended to be useful to the Airport and public-at-large by to illustrate the location of major Airport facilities.

Airport Layout Plan (ALP) Drawing – A sheet consisting of a scaled single-page drawing illustrating existing and future improvements planned throughout the 20-year Airport Master Plan development period, consistent with the future Airport Reference Code (ARC). The drawing set is a graphic illustration of the Airport’s existing and planned developments, generally depicting future airfield and landside facilities, airspace surfaces, airport land uses and airport property interests.

Major components of the ALP include:

- Depiction of Existing and Future Airport facilities
- Airfield, Landside Land Uses
- Navigational Aids
- Safety and Design Standard Dimensions
- Airport Property Interests
- General Notes and Notices

Terminal Area Plan Drawing – A scaled drawing depicting close-in features of the major terminal area(s) as consistent with the ALP drawing. This drawing depicts detailed reference to buildings, apron/ramp areas and auto access features, including geometric dimensional areas, safety setbacks and separation standards.

Key facilities shown on the Terminal Area Plan drawing:

- Terminal Building Footprint and Major Components
- Apron Configuration and Aircraft Parking Positions

- Aircraft Taxiways and Taxilanes
- Terminal Curbfront, Auto Parking Lot Area(s); Access Roadways
- Aircraft Hangars (Existing, Future, Relocated)
- Fueling Facilities
- Fencing & Security Access Points
- Airport Storage/Maintenance Facilities
- Commercial-Related Terminal Area Space
- Reserved Terminal Area Space

Runway Centerline Drawing – Scaled drawing depicting the runway elevation plotted in plan and profile view, including elevation stations and visibility line of sight standards.

Part 77 Airspace (Obstruction) Plan – Scaled drawing identifying the limits of recommended land use control for the height of objects surrounding the Airport. Airspace surfaces correspond with the ultimate runway dimensions and instrument approach capabilities, in which each of the Federal Aviation Regulations (FAR) Part 77, Subpart C imaginary surfaces (primary, horizontal, conical, approach and transitional) are depicted in plan and profile view. The approach surface is depicted in full-length view using 50-foot contour intervals. An obstruction data table provides structure disposition with respect to existing and future FAR Part 77 surfaces. In addition, the drawing includes tables referencing runway dimensions and elevations, data sources, general notes, an isometric cut-away view of airspace features, and a legend noting key drawing symbols. The drawing provides reference to applicable height and land use zoning ordinances of the Airport Sponsor, and surrounding governmental entities.

Runway Inner-Approach Plan & Profiles – Scaled drawings depicting close-in plan and profile approach features beyond each runway end. These drawings identify obstruction and non-compatible land uses within the runway protection zone and airspace surfaces extending beyond runway centerline. Airspace surfaces are depicted for disposition of obstructions to navigable airspace. The limits of the drawings extend to a point where the FAR Part 77, Subpart C approach surface reaches 100' height above the runway end elevation. Obstructions are indexed in plan and profile view, with an obstruction table used to denote existing and future obstructions to FAR Part 77 surfaces. The recommended mitigation of obstructions is noted, to correspond with the Airport's development plan. A general note section includes data sources and applicable references. A legend is used to note key drawing symbols.

The following are the runway instrument designations used:

- Runway 13 End – Existing and Future Precision
- Runway 31 End – Existing and Future Precision
- Runway 17 End – Existing and Future Non-Precision
- Runway 35 End – Existing Non-Precision / Future Precision

Runway Departure Surface Drawing – Depicts the applicable departure surfaces as defined in Appendix 2 of FAA AC 150/5300-13. The surfaces are shown for runway end(s) designated primarily for instrument departures. The one-engine inoperative (OEI) obstacle identification surface (OIS) should be shown for departure runway end(s) supporting air carrier operations.

Airport Land Use Plan – A scaled drawing for coordinating compatible land uses and land use controls around the Airport, providing recommendations for on and off Airport property uses through the 20-year planning period based on the proposed Airport developments and property interests. The drawing identifies aviation and non-aeronautical land uses within the Airport vicinity, as designated by local planning and zoning, and provides reference to height and land use zoning ordinances of the Airport Sponsor, and from those applicable to the surrounding governmental entities. The proposed Airport land uses are consistent with the Airport's requirements for aircraft operations, noise contours, and safety zones, including federal guidelines and state statutes.

The following are the on-Airport land uses designated for the Airport, which are not associated with local zoning or land use ordinances, but commonly used for ALP planning purposes:

ON-AIRPORT LAND USE LEGEND	
1	AIRFIELD OPERATION
2	COMMERCIAL AIRLINE
3	GENERAL AVIATION
4	REVENUE SUPPORT - AVIATION RELATED
5	REVENUE SUPPORT - NON AVIATION RELATED
6	AIRPORT SUPPORT
7	MILITARY
8	PARK / RECREATION / INSTITUTIONAL
9	AGRICULTURE/OPEN SPACE

NOTE: AGRICULTURE AREA DEFINED BY SUX AIRPORT FARMING PROPERTY MAP, WHICH INCLUDES ZONES FOR STANDARDS CROPS ALLOWED, LOW GROWING CROPS ONLY, AND NOT ACCESSIBLE.

Airport Property Map – A scaled drawing depicting the property interests held or to be acquired in all lands to be developed or used in connection with the Airport, as consistent with the Airport Layout Drawing. The drawing documents past Airport land acquisition, including fee-simple and easement tracts. A drawing table lists an inventory of all Airport property parcels by number; including the grantor, grantee, purpose, type of ownership interest, acreage, recorded liber, federal/state grant project number, and date of acquisition. The Airport Property Map was updated to reflect existing property boundary and ownership interests as reflected on the approved Exhibit 'A' Property Map dated 2012.

**DUE TO FILE SIZE, THE ALP DRAWING SHEETS
ARE NOT ELECTRONICALLY SAVED AS PART
OF THIS NARRATIVE, AND ARE AVAILABLE AS
SEPARATE FILES**

FINAL DRAFT

APPENDICES:

- APPENDIX A: Glossary-Acronyms**
- APPENDIX B: SUX FAA ALP Checklist**
- APPENDIX C: SUX FAA Cert Alert – Hot Spot Publications**
- APPENDIX D: SUX Airport Runway Design Compliance**
- APPENDIX E: SUX Airport Capital Improvement Program (ACIP)**
- APPENDIX F: Executive Summary of the 2010 Runway 17-35 Feasibility Study**
- APPENDIX G: Iowa Air National Guard Support Letter**



APPENDIX A

AIRPORT LAYOUT PLAN UPDATE

GLOSSARY

A

Above Ground Level (AGL)	Elevation above the surface of the ground.
Advisory Circular (AC)	A series of external FAA publications consisting of all non-regulatory material of a policy, guidance, and informational nature.
Area Navigation (RNAV)	Method of navigation that permits aircraft operations on any desired flight path.
Aircraft	A device that is used or intended to be used for flight in the air.
Aircraft Operation	A landing or takeoff by an aircraft. 'Local' operations are performed by aircraft which operate within 20-miles in the local traffic pattern or within sight of the airport. 'Itinerant' operations are all aircraft operations other than local operations.
Aircraft Owners and Pilots Association (AOPA)	A not-for-profit individual membership association serving the interests and needs of general aviation pilots and aircraft owners.
Aircraft Rescue and Fire Fighting (ARFF)	A facility designed to house emergency vehicles, extinguishing agents, and personnel responsible for minimizing the effects of an aircraft accident or incident.
Airport Advisory Area	The area within 10 statute miles of an airport where a flight service station is located, but where there is no control tower in operation.
Airport Authority	Similar to a port authority but with the single purpose of setting policy and management direction for airports within its jurisdiction.
Airport Beacon	A visual navigation aid displaying alternating lights used to identify the type of airport.
Airport Elevation	The highest point of an airport's usable runways measured in MSL.
Airport Improvement Program (AIP)	A program created under the Airport and Airway Improvement Act of 1982 to provide continued funding for airport planning and development.
Airport Layout Plan (ALP)	A plan for an airport showing boundaries and proposed additions to all areas owned or controlled by the sponsor for airport purposes, the location and nature of existing and proposed airport facilities and structures, and the location on the airport of existing and proposed non-aviation areas and improvements thereto.
Airport Master Plan (AMP)	A plan of the ultimate development of a specific airport. It presents the research and logic from which the plan was evolved and displays the plan in a graphic and written format.
Airport Movement Area Safety System (AMASS)	Enhances the function of the ground mapping radar by providing automated alerts and warnings of potential runway incursions and other hazards.
Airport Obstruction Chart (AOC)	A 1:12,000 scale graphic depicting Federal Aviation Regulations Part 77 surfaces, a representation of objects that penetrate these surfaces, runway, taxiway, and ramp areas, navigational aids, prominent airport buildings, plus a selection of roads and other planimetric detail in the airport vicinity.
Airport Reference Point (ARP)	The latitude and longitude of the approximate center of the airport.
Airport Sponsor	A public agency or tax-supported organization, such as an airport authority, that is authorized to own and operate the airport, to obtain property interests, to obtain funds, and to be legally, financially, and otherwise able to meet all applicable requirements of current laws and regulations.

Airport Surveillance Radar (ASR)	Approach and departure control radar used to detect and display an aircraft's position in the terminal area. Provides a 360-degree radar picture of the airspace surrounding the airport.
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.
Airspace	Space in the air above the surface of the earth or a particular portion of such space, usually defined by the boundaries of an area on the surface projected upward.
Air Taxi Aircraft	An aircraft operated by the holder of an Air Taxi Operating Certificate, which authorizes the carriage of passengers, mail, or cargo for revenue in accordance with FAR Parts 135 and 121.
Air Traffic Control (ATC)	A service operated by appropriate authority to promote the safe, orderly, and expeditious flow of air traffic.
Air Traffic Control System Command Center (ATCSCC)	A facility responsible for the operation of four distinct but integrated functions: central flow control, central altitude reservations, airport reservation position, and the air traffic service contingency command post.
Air Traffic Control Tower (ATCT)	A central operations facility in the terminal air traffic control system, consisting of a tower cab structure including an associated 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 Transport Association (ATA)	An organization for the principal U.S. airlines that supports and assists its members by promoting the air transport industry and the safety, cost effectiveness, and technological advancement of its operations; advocating common industry positions before state and local governments; conducting designated industry-wide programs; and assuring governmental and public understanding of all aspects of air transport.
Alert Area	Special use airspace that may contain a high volume of pilot training activities or an unusual type of aerial activity.
Altitude	Height expressed in units of distance above a reference plane, usually above mean sea level or above ground level.
Approach Lighting System (ALS)	An airport lighting facility that provides visual guidance to landing aircraft by radiating light beams in a directional pattern by which the pilot aligns the aircraft with the extended centerline of the runway on the final approach and landing.
Approach Surface	An imaginary surface longitudinally centered on the extended centerline of the runway, beginning at the end of the primary surface and rising outward and upward to a specified height above the established airport elevation.
Apron	A defined area, on a land airport, intended to accommodate aircraft for purposes of loading or unloading passengers or cargo, refueling, parking, or maintenance.
Area Navigation (RNAV)	Application of the navigation process providing the capability to establish and maintain a flight path on any arbitrary chosen course that remains within the coverage area of navigation sources being used.
Automated Terminal Information Service (ATIS)	The continuous broadcast of recorded non-control information in selected terminal areas. Its purpose is to improve controller effectiveness and to relieve frequency congestion by automating the repetitive transmission of essential but routine information.
Automatic Dependent Surveillance - Broadcast (ADS-B)	A satellite-based technology that broadcasts aircraft identification, position, and speed with once-per-second updates. A national ADS-B

program office has been established.

Automated Weather Observing System (AWOS) Gathers weather data from unmanned sensors, automatically formulates weather reports, and distributes them to airport control towers.

Automatic Direction Finder (ADF) An aircraft radio navigation system which senses and indicates the direction to an L/MF non-directional radio beacon (NDB) or commercial broadcast station.

Avigation Easement A grant or property interest in land over which a right of unobstructed flight in the airspace is established.

B

Based Aircraft The total number of active general aviation aircraft that use or may be expected to use an airport as a home base.

Basic Utility (BU) Airport An airport that accommodates most single-engine and many of the small twin-engine aircraft.

Bearing The horizontal direction to or from any point, usually measured clockwise from true north (true bearing), magnetic north (magnetic bearing), or some other reference point, through 360 degrees.

Blast Fence A barrier that is used to divert or dissipate jet or propeller blast.

Blast Pad A specially prepared surface placed adjacent to the ends of runways to eliminate the erosive effect of the high wind forces produced by airplanes at the beginning of their takeoff rolls.

Building Restriction Line (BRL) A line shown on the airport layout plan beyond which airport buildings must not be positioned in order to limit their proximity to aircraft movement areas.

C

Category I (CAT-I) An ILS that provides acceptable guidance information from the coverage limits of the ILS to the point at which the localizer course line intersects the glide path at a height of 100 feet above the horizontal plane containing the runway threshold. Supports landing minima as low as 200 feet HAT and 1,800 feet RVR.

Category II (CAT-II) An ILS that provides acceptable guidance information from the coverage limits of the ILS to the point at which the localizer course line intersects the glide path at a height of 50 feet above the horizontal plane containing the runway threshold. Supports landing minima as low as 100 feet HAT and 1,200 feet RVR.

Category III (CAT-III) An ILS that provides acceptable guidance information from the coverage limits of the ILS with no decision height specified above the horizontal plane containing the runway threshold.

Capital Improvement Plan (CIP) The primary planning tool used by the Federal Aviation Administration for systematically identifying, prioritizing, and assigning funds to critical airport development and associated capital needs for the National Airspace System. Also serves as the basis for distribution of grant funds under the Airport Improvement Program.

Ceiling The height above the earth's surface of the lowest layer of clouds which is reported as broken or overcast or the vertical visibility into an obscuration.

Common Traffic Advisory Frequency (CTAF) A frequency designed for the purpose of carrying out airport advisory practices while operating to or from an uncontrolled airport. The CTAF may be a UNICOM, MULTICOM, FSS, or tower frequency and it is identified in appropriate aeronautical publications.

Conical Service A surface extending from the periphery of the horizontal surface

outward and upward at a slope of 20 to 1 for the horizontal distances and to the elevations above the airport elevation as prescribed in FAR Part 77.

Controlled Airport	An airport that has an operating control tower.
Controlled Airspace	Airspace designed as a continental control area, control area, control zone, terminal control area, or transition area, within which some or all aircraft may be subject to air traffic control.
Critical Aircraft	The most demanding category or family of aircraft that performs 500 annual itinerant operations at an airport (Also referred to as the design aircraft).
Crosswind	A wind which is not parallel to a runway or the path of an aircraft.
Crosswind Component	A wind component which is at a right angle to the runway or the flight path of an aircraft.

D

Decibel (dB)	A unit of noise level representing a relative quantity. This reference value is a sound pressure of 20 micronewtons per square meter.
Decision Height (DH)	With respect to the operating of aircraft means the height at which a decision must be made, during the ILS or PAR instrument approach, to either continue the approach or to execute a missed approach.
Declared Distances	The runway distances available for required aircraft takeoff-run (TOFA), take-off distance (TODA), accelerate-stop distance (ASDA), and landing distance (LDA).
Department of Transportation (DOT)	Established in 1966 to promote coordination of existing federal programs and to act as a focal point for future research and development efforts in transportation.
Discretionary Funds	Grants that go to projects that address goals established by Congress, such as enhancing capacity, safety, and security or mitigating noise at all types of airports
Displaced Threshold	When the landing area begins at a point on the runway other than the designated beginning of the runway.
Distance Measuring Equipment (DME)	Equipment (airborne and ground) to measure, in nautical miles, the slant range distance of an aircraft from the navigational aid.

E

Effective Runway Gradient	The maximum difference between runway centerline elevations divided by the runway length, expressed as a percentage.
Emergency Locating Transmitter (ELT)	A battery-operated radio transmitter attached to the aircraft structure that transmits on 121.5 MHz and 243.0 MHz. It aids in locating downed aircraft.
Enplanement (Passenger Boarding)	Passengers and cargo which board a departing aircraft.
Environmental Assessment (EA)	A concise public document for which a Federal agency is responsible that serves to briefly provide sufficient evidence and analysis for determining whether to prepare an environmental impact statement of a finding of no significant impact.
Environmental Impact Statement (EIS)	A federal document that reflects the FAA's final evaluation of the environmental impact of a proposed action.
Essential Air Service (EAS)	Guarantees air carrier service to selected small cities and provides subsidies if needed so as to prevent these cities from losing service.

F

Federal Aviation Administration (FAA)	Created by the act that established the DOT. Assumed all of the responsibilities of the form Federal Aviation Agency. FAA Part 77: A definition of the protected airspace required for the safe navigation of aircraft, which define obstructions to air navigation (primary, approach, transitional, horizontal, conical surfaces). FAR Part 91: General operating and flight rules. FAR Part 121: Certification and operations; domestic, flag, and supplemental air carriers and commercial operators of large aircraft. FAR Part 135: Air Taxi Operators and Commercial Operators. FAR Part 150, Airport-Land Use Compatibility Planning: Designed to assist airport operators in determining the extent and nature of the noise problem at a given airport.
Federal Aviation Regulations (FAR)	The codification of the general and permanent rules published in the Federal Register by the executive departments and agencies of the Federal Government for aviation.
Federal Inspection Services (FIS)	Conducts customs and immigration services including passport inspection, inspection of baggage, and collection of duties on certain imported items, and sometimes inspection for agricultural materials, illegal drugs, or other restricted items.
Final Approach Fix (FAF)	Designated point at which the final approach segment begins for a non-precision approach.
Finding of No Significant Impact (FONSI)	A federal document prepared by a Federal agency that briefly presents the reasons why an action will not have a significant effect on the human environment and for which an environmental impact statement will not be prepared.
Fixed Base Operator (FBO)	A business located at an airport that provides a variety of services to pilots, which may include aircraft rental, training, fueling, maintenance, parking, and the sale of pilot supplies.
Flight Level (FL)	Designations for altitudes within controlled airspace Class A.
Flight Service Station (FSS)	A central operations facility in the national flight advisory system utilizing data interchange facilities for the collection and dissemination of NOTAM, weather, and administrative data and providing preflight and inflight advisory service and other services to pilots via air/ground communication facilities.

G

General Aviation (GA)	That portion of civil aviation that encompasses all facets of aviation except air carriers holding a certificate of convenience and necessity and large aircraft commercial operators.
General Utility (GU) Airports	Accommodates all general aviation aircraft.
Global Positioning System (GPS)	A satellite-based navigation system that will enhance user preferred routing, reduce separation standards, and increase access to airports under instrument meteorological conditions through more precision approaches.

H

Height Above Touchdown (HAT)	A designated height measured from the touchdown zone elevation or the threshold elevation of the runway served by the instrument approach.
High Intensity Runway Lights (HIRL)	The highest classification for the intensity of the lights bordering the

sides of the runway.

Horizontal Surface

A specified portion of a horizontal plane located 150 feet above the established airport elevation which established the height above which an object is determined to be an obstruction to air navigation.

I

Initial Approach Fix (IAP)

The designated point at which the initial approach segment begins for an instrument approach.

Instrument Approach Procedures (IAP)

A procedure that allows an aircraft to descend safely by reference to instruments from the enroute altitude to a point near the runway at the pilot's discretion from which a landing can be made visually.

Instrument Flight Rules (IFR)

FAR rules that govern the procedures of conducting flight in weather conditions below VFR weather minimums. The term IFR is also used to define weather conditions and the type of flight plan under which an aircraft is operating.

Instrument Landing System (ILS)

A system that provides, in the aircraft, the lateral, longitudinal, and vertical guidance necessary for a landing.

Instrument Meteorological Conditions (IMC)

Meteorological conditions expressed in terms of visibility and ceiling less than the minimum specified for visual meteorological conditions.

Itinerant Operation

Operation by an aircraft other than local operations.

J

K

Knots (Kts)

A unit of speed equivalent to 1.15 statute miles per hour.

L

Large Aircraft

Aircraft of more than 12,500 pounds maximum certificated takeoff weight.

Lateral Precision Performance with Vertical Guidance (LPV)

The Wide Area Augmentation System (WAAS) offers an opportunity for airports to gain an instrument landing system (ILS) like approach capability without the purchase or installation of any ground-based navigation equipment at the airport. The WAAS-enabled vertically-guided approach procedures provide approach minimums as low as 200 feet at qualifying airports.

Local Operation

Operations performed by aircraft that (1) operate in the local traffic pattern or within sight of the airport; (2) are known to be departing for, or arriving from, flight in local practice areas within a 20-mile radius of the airport; or (3) execute simulated instrument approaches or low passes at the airport.

Longitude

Measurement east or west of the Prime Meridian in degrees, minutes, and seconds. Lines of longitude are also called meridians. The Prime Meridian is zero degrees longitude and runs through Greenwich, England.

Long Range Navigation System (LORAN)

A navigational system by which lines of position are determined by measuring the difference in the time of reception of synchronized pulse signals from fixed transmitters.

Low Intensity Runway Lights (LIRL)

The lowest classification for the intensity of the lights bordering the sides of the runway.

M

Mean Sea Level (MSL)

The average height of the surface of the sea for all stages of tide.

Medium Intensity Runway Lights (MIRL)

The middle classification for the intensity of the lights bordering the sides of the runway.

Microwave Landing System (MLS)	An instrument approach and landing system operating in the microwave frequencies that provides guidance in azimuth, elevation, and distance measurement.
Military Operations Area (MOA)	Special use airspace of defined vertical and lateral limits established to help VFR traffic identify locations where military activities are conducted.
Military Training Route (MTR)	Route depicted on an aeronautical chart for the conduct of military flight training at speeds above 250 knots.
N	
National Airspace System (NAS)	A network of navigational aids and a number of air traffic control facilities designed to operate in conjunction with the various defined classes of airspace.
National Plan of Integrated Airport Systems (NPIAS)	A national airport system plan published and revised every two years by the Secretary of Transportation for the development of public-use airports in the United States.
National Transportation Safety Board (NTSB)	Created by the act that established the DOT to determine the cause of transportation accidents and review on appeal the suspension or revocation of any certificates or licenses issued by the Secretary of Transportation.
Nautical Mile (Nm)	A unit of length equivalent to 1.15 statute miles.
Navigational Aid (NAVAID)	Any facility used as, available for use as, or designed for use as an aid to air navigation, including landing area, lights, any apparatus or equipment for disseminating weather information, for signaling, for radio direction-finding, or for radio or other electronic communication, and any other structure or mechanism having similar purpose for guiding and controlling flight in the air or the landing or takeoff of aircraft
Non-Directional Beacon (NDB)	Ground-based navigational aid
Non-Precision Approach (NPA)	Provides an aircraft with horizontal course guidance to a runway surface.
Notice to Airmen (NOTAM)	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 essential to personnel concerned with flight operations.
O	
Object	Include, but not limited to above ground structures, navigational aids, persons, equipment, vehicles, natural growth, terrain, and parked aircraft.
Obstruction	An object which penetrates an imaginary surface.
Obstruction Light	A light, or one of a group of lights, usually red or white, mounted on a surface structure or natural terrain to warn pilots of the presence of a flight hazard.
P	
Pilot Controlled Lighting	Runway lighting systems which are controlled by keying the aircraft's microphone on a specific frequency.
Precision Approach (PA)	A standards instrument approach procedure in which an electronic glideslope is provided.
Precision Approach Path Indicator (PAPI)	A visual-approach slope aid system consisting of four lights on either side of the approach runway that gives precise indication to the pilot of the approach path of the aircraft.

Precision Approach Radar (PAR)	A radar facility in the terminal air traffic control system used to detect and display, with a high degree of accuracy, azimuth, range, and elevation of an aircraft on the final approach to a runway.
Primary Surface	A rectangular surface longitudinally centered about a runway.
Prohibited Area	Airspace of defined dimensions identified by an area on the surface of the earth within which the flight of aircraft is prohibited.
Q	
R	
Radial	A navigational signal generated by a VOR or VORTAC, measured as a magnetic bearing from the station.
Required Navigation Performance (RNP)	Required navigation accuracy in the horizontal plane (lateral and longitudinal position fixing) necessary for operation in a defined airspace.
Restricted Area	Designated special use airspace within which aircraft flight, while not prohibited, is subject to restrictions.
Runway (RWY)	A defined rectangular area on a land airport prepared for the landing and taking off of aircraft along its length.
Runway Alignment Indicator Light (RAIL)	A series of five or more sequenced flashing light installed on the extended centerline of the runway. The maximum spacing between lights is 200 feet, extending out from 1,600 feet to 3,000 feet from the runway threshold.
Runway End Identifier Lights (REIL)	An airport lighting facility in the terminal area navigation system consisting of one flashing white high-intensity strobe light installed at each approach end corner of a runway and directed toward the approach zone, which enable the pilot to identify the threshold of a usable runway.
Runway Gradient	The amount of change in elevation over the length of the runway.
Runway Object Free Area (OFA):	An area on the ground centered on the 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.
Runway Obstacle Free Zone (OFZ):	The OFZ is airspace below 150 feet above the established airport elevation and along the runway and extended runway centerline that is required to be 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 protection for aircraft landing or departing from the runway, and for missed approaches (Runway OFZ, Inner-Approach OFZ, Inner-Transitional OFZ, Precision OFZ).
Protection Zone (RPZ Runway)	An area off the runway end to enhance the protection of people and property on the ground (formally the 'Clear Zone').
Runway Safety Area (RSA)	A defined surface surrounding the runway prepared or suitable for reducing the risk of damage o aircraft in the event of an overshoot, undershoot, or excursion from the runway.
Runway Visibility Zone (RVZ)	An area formed by imaginary lines connecting two intersecting runways' visibility points.
Runway Visual Range (RVR)	An instrumentally derived value that represents the horizontal distance a pilot can see down the runway from the approach end.

S

Sectional Chart	Most commonly used chart for VFR flight. Each chart covers six degrees to eight degrees of longitude and approximately four degrees of latitude and is given the name of a primary city within its coverage. The scale of a sectional chart is 1:500,000.
Segmented Circle	A set of visual indicators that provide traffic pattern information at airports without operating control towers.
Single Wheel Gear (SWG)	Aircraft with single main landing gear configuration.
Special Use Airspace	Defined airspace areas where aircraft operations may be limited.
Small Aircraft	Aircraft of 12,500 pounds or less maximum certificated takeoff weight.
Standard Instrument Departure Procedures (SIDS)	A procedure used after takeoff to provide a transition between the airport and the enroute structure.
Standard Terminal Arrival Route (STAR)	A procedure for departing the enroute structure and navigating to a destination.
Stopway	An area beyond the takeoff runway which is designed to support an airplane during an aborted takeoff without causing structural damage to the airplane. It cannot be used for takeoff, landing, or taxiing.
	T
Taxiway	A defined surface for the taxiing of aircraft from one part of an airport to another.
Taxilane	A defined surface used for the taxiing of aircraft between taxiways and aircraft parking areas.
Terminal Area Forecast (TAF)	The official forecast of aviation activity, both aircraft and enplanements, at FAA facilities. This includes FAA-towered airports, federally contracted towered airports, non-federal towered airports, and many non-towered airports.
Terminal Instrument Procedures Standards (TERPS)	Procedures used for conducting independent instrument approaches to converging runways under instrument meteorological conditions.
Terminal Radar Approach Control (TRACON)	An air navigation system facility responsible for monitoring the enroute and terminal segment of air traffic in the airspace surrounding airports with moderate to high-density traffic
Threshold	The designated beginning of the runway that is available and suitable for the landing of airplanes.
Threshold Crossing Height (TCH)	The height of the straight-line extension of the visual or electronic glideslope above the runway threshold.
Touchdown	The point at which an aircraft first makes contact with the landing surface.
Touch-and-Go Operation	An aircraft operation for practice or testing purposes characterized by a landing touch down and then continuing takeoff without stopping.
Touchdown Zone (TDZ)	The area of a runway near the approach end where aircraft normally alight.
Traffic Pattern	The traffic flow that is prescribed for aircraft landing and taking off from an airport. The usual components are the departure, crosswind, downwind, and base legs; and the final approach.
	U
Uncontrolled Airport	A nontower airport where control of VFR traffic is not exercised.
Uncontrolled Airspace	Airspace within which aircraft are not subject to air traffic control.

Universal Communication (UNICOM) A non-government communications facility which may provide airport information at certain airports.

V

Very High Frequency Omnidirectional Ranging (VOR) Ground based navigational system consisting of very high frequency omnidirectional range stations that provide course guidance.

Victor Airway An airway system based on the use of VOR facilities.

Visual Approach Slope Indicator (VASI) An airport lighting facility in the terminal area navigation system used primarily under VFR conditions. It provides vertical visual guidance to aircraft during approach and landing by radiating a direction pattern of high intensity red and white focused light beams that indicate to the pilot that the aircraft is on path, above path, or below path.

Visual Flight Rules (VFR) Rules that govern the procedures for conducting flight under visual conditions.

Visual Meteorological Conditions (VMC) Meteorological conditions expressed in terms of visibility and ceiling equal to or better than specified minima.

VORTAC Combined VOR and TACAN

W

Warning Area Airspace of defined dimensions, extending from three nautical miles outward from the coast of the United States, which contains activity that may be hazardous to nonparticipating aircraft.

Wide-Area Augmentation System (WAAS) An augmentation of GPS that includes integrity broadcasts, differential corrections, and additional ranging signals; its primary objective is to provide accuracy, integrity, availability, and continuity required to support all phases of flight.

World Aeronautical Chart (WAC) Similar to a sectional chart, but with a scale of 1:1,000,000 provides less detail and is best suited for flight planning.

X

Y

Z

ACRONYMS

AC: Advisory Circular
ADF: Automatic Direction Finder
AGL: Above Ground Level
AIP: Airport Improvement Program
ASR: Airport Surveillance Radar
ALP: Airport Layout Plan
ALS: Approach Lighting System
ARFF: Aircraft Rescue and Fire Fighting
ARTCC: Air Route Traffic Control Center
ASDA: Accelerate – Stop Distance Available
ASV: Annual Service Volume
ATC: Air Traffic Control
ATCT: Air Traffic Control Tower
AWOS: Automated Weather Observing System
BRL: Building Restriction Line
BWR: Bucher, Willis & Ratliff Corporation
CAT: Category
CWY: Clearway
dB: Decibel
DME: Distance Measuring Equipment
DNL: Day/Night Average Sound Level
DOT: Department of Transportation
FAA: Federal Aviation Administration
FAR: Federal Aviation Regulation
FIS: Federal Inspection Service
FBO: Fixed Base Operator
FSS: Flight Service Station
FTZ: Foreign Trade Zone
GA: General Aviation
GPS: Global Positioning System
GVGI: Generic Visual Slope Indicator
GS: Glide Slope
HIRL: High Intensity Runway Lights
HUD: U.S. Department of Housing and Urban Development
IFR: Instrument Flight Rules
ILS: Instrument Landing System
IMC: Instrument Meteorological Conditions
INM: Integrated Noise Model

KHz: Kilohertz
LAAS: Local Area Augmentation System
LDA: Landing Distance Available
LIRL: Low Intensity Runway Lights
LOC: Localizer
MALSF: Medium Intensity Approach Lighting System

MALSR: Medium Intensity Approach Lighting System with Runway Alignment Indicator Lights
MDA: Minimum Descent Altitude
MHZ: Megahertz
MIRL: Medium Intensity Runway Lights
MITL: Medium Intensity Taxiway Lights
MM: Middle Marker
MOA: Military Operations Area
MSA: Metropolitan Statistical Area
MSL: Mean Sea Level
NAVAID: Navigational Aid
NDB: Non-directional Beacon
NOS: National Ocean Survey
NPI: Non-precision Instrument
NPIAS: National Plan of Integrated Airport System
NWS: National Weather Service
OAG: Official Airline Guide
OC: Obstruction Chart
OFA: Object Free Area
OFZ: Obstacle Free Zone
OM: Outer Marker
OPBA: Operations Per Based Aircraft
PAPI: Precision Approach Path Indicators
PIR: Precision Instrument
PLASI: Pulsating Light Approach Slope Indicator
RAIL: Runway Alignment Indicator Lights
REIL: Runway End Identifier Lights
RNAV: Area Navigation
RPZ: Runway Protection Zone
RVR: Runway Visibility Range
RVZ: Runway Visibility Zone
RW: Runway
SSALF: Simplified Short Approach Light System with sequenced Flasher Lights
SSALR: Simplified Short Approach Light System with RAIL

TACAN: Tactical Air Navigation
TAP: Terminal Area Plan
TCA: Terminal Control Area
TERPS: Terminal Instrument Procedures
TVOR: Terminal Very High Frequency Omni Range
TW: Taxiway
UHF: Ultra-High Frequency
USGS: United States Geological Survey
VASI: Visual Approach Slope Indicator
VFR: Very High Frequency
VMC: Visual Meteorological Conditions
VOR: VHF Omni-Directional Range
WAAS: Wide Area Augmentation System



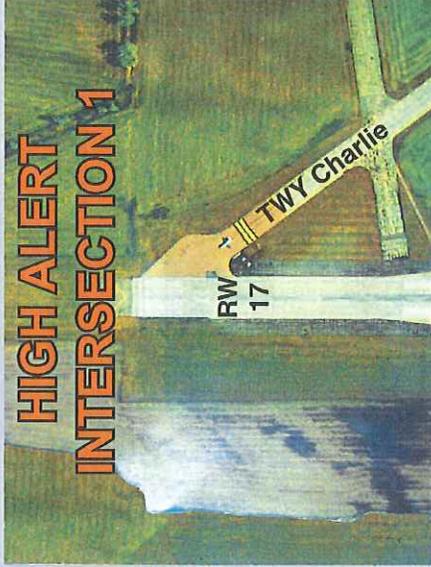
APPENDIX B

AIRPORT LAYOUT PLAN UPDATE

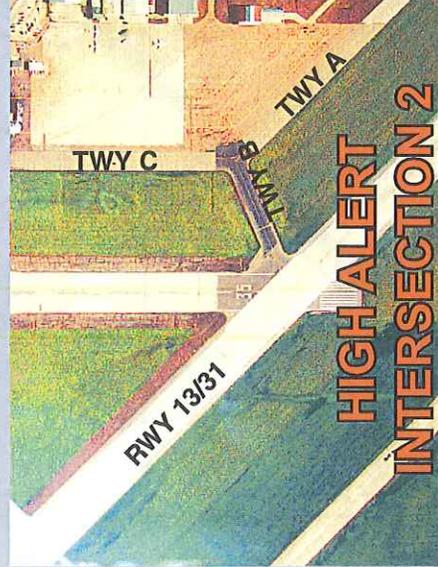
TO BE INSERTED UPON FAA REVIEW

APPENDIX C

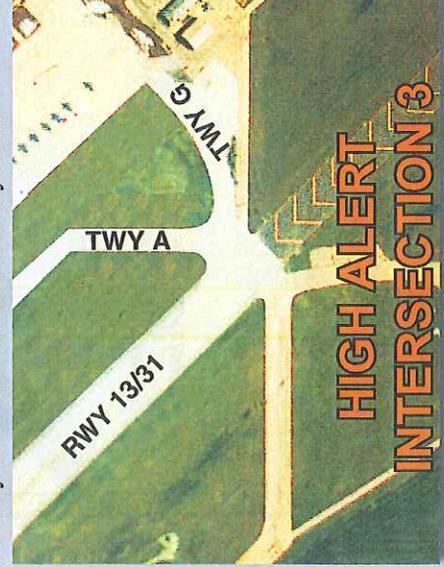
AIRPORT LAYOUT PLAN UPDATE



Looking North. Approach end of Runway 17.



Looking North. Complex Runway Intersection of Runway 17/35 and 13/31 at Taxiway Bravo.



Looking North. Approach end of Runway 31 at intersection of Taxiway A and G.

Airport Operations: (712) 279-6167

Air Traffic Control: (712) 277-3424

Hours of Operation: Tower 0600-2400 local

Latitude: N 42° 24'

Longitude: W 96° 23'

Elevation: 1098 ft.

Variation: 5.5E

From City: 7 miles South

Sectional Chart: Omaha

Control Tower: Yes

ARTCC: Minneapolis 124.1

FSS: FOD 1-800-WX-BRIEF

NOTAMS Facility: FOD

Wind Indicator: Yes

Beacon: Yes

Fire and Rescue: Yes

Airline Operations: Yes

Customs: No

UNICOM: 122.95

CTAF: 118.7

ATIS: 119.45

SUX Ground: 121.9

SUX Tower: 118.7

Approach Control: 124.6

ASOS: 712-255-6474

VOR: 116.5

RCO: 122.45

Emergency: 121.5



AIRPORT RUNWAY SAFETY INFORMATION

Sioux Gateway Airport (SUX)

September 2002

RUNWAY SAFETY
Everyone's Responsibility
STAY ALERT!

FEDERAL AVIATION ADMINISTRATION
Central Region Runway Safety Program
<http://www.faa.gov/runwaysafety>

HOT SPOTS

An "Airport surface hot spot" is a location on an aerodrome movement area with a history or potential risk of collision or runway incursion, and where heightened attention by pilots/drivers is necessary.

A "hot spot" is a runway safety related problem area on an airport that presents increased risk during surface operations. Typically it is a complex or confusing taxiway/taxiway or taxiway/runway intersection. The area of increased risk has either a history of or potential for runway incursions or surface incidents, due to a variety of causes, such as but not limited to: airport layout, traffic flow, airport marking, signage and lighting, situational awareness, and training. Hot spots are depicted on airport diagrams as open circles or polygons designated as "HOT¹", "HOT²", etc. and tabulated in the list below with a brief description of each hot spot. Hot spots will remain charted on airport diagrams until such time the increased risk has been reduced or eliminated.

CITY/AIRPORT	HOT SPOT	DESCRIPTION
IOWA		
CEDAR RAPIDS THE EASTERN IOWA (CID)	HOT ¹	Intersection of Rwy 13-31 and Rwy 08-26.
	HOT ²	Rwy 09 under construction, not available.
	HOT ³	Rwy 27 under construction, not available. Eastern 1000 feet of Rwy 27 used as taxi route. Taxi route crosses apch end of Rwy 26.
DES MOINES DES MOINES INTS (DSM)	HOT ¹	Westbound tfc on Twy B must remain alert so as to not miss the right turn onto Twy D when taxiing to Rwy 13. Comply with rwy hold signs, sfc painted signs and elevated rwy guard lgts at the intersection of Twy B and Rwy 13-31.
	HOT ²	Use caution and comply with the signs and markings when taxiing near this complex intersection.
	HOT ³	The apch end of Rwy 5 at Twy P has limited visibility from the twr.
	HOT ⁴	Iowa ANG complex is located north of Twy D on the northwest part of the arpt. Vehicle movement in this area is obstructed from the tower's view. Be vigilant for vehicles while taxiing in the area.
DUBUQUE DUBUQUE RGNL (DBQ)	HOT ¹	Use caution when taxiing to Rwy 18 or Rwy 13 via Twy A. Comply with rwy hold signs, sfc painted signs and elevated rwy guard lgts at the intersection of Twy A and Rwy 18-36.
	HOT ²	Use caution exiting the ramp area on Twy D. Twy D crosses Rwy 13-31 immediately after leaving ramp area.
	HOT ³	Use caution exiting the ramp area on Twy C. Twy C crosses Rwy 13-31 immediately after leaving ramp area.
FORT DODGE FORT DODGE RGNL (FOD)	HOT ¹	Westbound tfc on Twy B must remain alert at the intersection where Twy B splits with Twy D. Holding position markings for Rwy 06-24 and Rwy 12-30 are immediately after the twy split.
MASON CITY MASON CITY MUNI (MCW)	HOT ¹	Single twy leads to the apch end of Rwy 30 and Rwy 35. When departing northbound, cross check compass on rwy to verify use of correct rwy for departure. Approximately half of Rwy 12 and Rwy 18 are not mutually visible due to rising terrain and trees located between rwys. Use caution when operating on either Rwy 12 or Rwy 18 for crossing traffic. Broadcast your position and intentions on CTAF.
SIOUX CITY SIOUX GATEWAY/ COLONEL BUD DAY FIELD (SUX)	HOT ¹	Rwy 17-35 and Rwy 13-31 intersect at Twy B. When departing northbound, cross check compass on rwy to verify use of correct rwy for departure.
	HOT ²	Twy A and Twy G are located in the movement area near the approach end of Rwy 31. Do not traverse from Twy A and Twy G visa versa without ATC authorization.

APPENDIX D

AIRPORT LAYOUT PLAN UPDATE

Airfield Component	FAA ARC C/D-III Design	Runway 13 End			Runway 31 End		
		Actual Rwy 13 Condition	Rwy 13 Standard Met (✓)	Rwy 13 Comment	Actual Rwy 31 Condition	Rwy 31 Standard Met (✓)	Rwy 31 Comment
Runway Surface Standards:							
Rwy Length	N/A	9,002'	N/A		9,002'	N/A	
Rwy Width	100' to 150'	150'	✓		150'	✓	
Shoulder Width	20'	20'	✓		20'	✓	
Blast Pad Width	140'	150'	✓		150'	✓	
Blast Pad Length	200'	990'	✓		990'	✓	
Runway Separation Standards:							
Rwy to Twy Centerline Separation	400'	550'	✓	Portions are greater	550'	✓	Portions are greater
Rwy Centerline to Holdline Separation	250'	410'	✓		250'	✓	
Rwy Centerline to Aircraft Parking Area	500'	>5,000'	✓		670'	✓	Varies. This is minimum
Twy Centerline to Parallel Taxiway/Taxilane	152'	N/A	N/A		N/A	N/A	
Twy Centerline to Fixed or Movable Object	93.0'	Variable	✓		Variable	✓	
Runway Surfaces Standards:							
RSA Width	500'	500'	✓		500'	✓	
RSA Length Prior to Threshold	600'	1,000'	✓		1,000'	✓	
RSA Length Beyond Rwy End	1,000'	1,000'	✓		1,000'	✓	
OFA Width	800'	800'	✓		800'	✓	
OFA Length Beyond Rwy End	1,000'	1,000'	✓		1,000'	✓	
Runway OFZ Width	400'	400'	✓		400'	✓	
Runway OFZ Length Beyond Rwy End	200'	200'	✓		200'	✓	
Precision OFZ Width	800'	800'	✓		800'	✓	
Precision OFZ Length Beyond Rwy End	200'	200'	✓		200'	✓	

Airfield Component	FAA ARC C/D-III Design	Runway 17 End			Runway 35 End		
		Actual Rwy 17 Condition	Rwy 17 Standard Met (✓)	Rwy 17 Comment	Actual Rwy 35 Condition	Rwy 35 Standard Met (✓)	Rwy 35 Comment
Runway Surface Standards:							
Rwy Length	N/A	6,600'	N/A		6,600'	N/A	
Rwy Width	100' to 150'	150'	✓		150'	✓	
Shoulder Width	20'	None	Not Met	No Shoulders	None	N/A	No Shoulders
Blast Pad Width	140'	140'	✓		0'	Not Met	No Blast Pad
Blast Pad Length	200'	150'	Not Met	Paved to 150'	0'	Not Met	No Blast Pad
Runway Separation Standards:							
Rwy to Twy Centerline Separation	400'	540'	✓		540'	✓	
Rwy Centerline to Holdline Separation	250'	250'	✓		250'	✓	
Rwy Centerline to Aircraft Parking Area	500'	615'	✓		615'	✓	
Twy Centerline to Parallel Taxiway/Taxilane	152'	N/A	N/A		N/A	N/A	
Twy Centerline to Fixed or Movable Object	93.0'	Variable	✓		Variable	✓	
Runway Surfaces Standards:							
RSA Width	500'	500'	✓		500'	✓	
RSA Length Prior to Threshold	600'	600'	✓		400'	Not Met	Service Road
RSA Length Beyond Rwy End	1,000'	1,000'	✓		500'	Not Met	Service Road
OFA Width	800'	800'	✓		800'	✓	
OFA Length Beyond Rwy End	1,000'	1,000'	Not Met	Service Road	350'	Not Met	Service Road
Runway OFZ Width	400'	400'	✓		400'	✓	
Runway OFZ Length Beyond Rwy End	200'	200'	✓		200'	✓	
Precision OFZ Width	800'	N/A	N/A		N/A	N/A	
Precision OFZ Length Beyond Rwy End	200'	N/A	N/A		N/A	N/A	

Abbreviations:

RSA - Runway Safety Area

OFA - Runway Object Free Area

OFZ - Runway Obstacle Free Zone

Source: FAA Advisory Circular 150/5300-13.



APPENDIX E

AIRPORT LAYOUT PLAN UPDATE

Proj. #	FAA FY-#	Project Description	Funding Source	FY 2013 (Year 1)	FY 2014 (Year 2)	FY 2015 (Year 3)	FY 2016 (Year 4)	FY 2017 (Year 5)	TOTALS
Airport FAA Capital Improvement Program (ACIP)									
1	2013-1	Snow Removal Equipment	Federal	\$ 589,000					\$ 589,000
			State	\$ -					\$ -
			Local	\$ 31,000					\$ 31,000
			Total	\$ 620,000	(Equipment)				\$ 620,000
2	2013-2	Replace Jetbridge 2	Federal	\$ 712,500					\$ 712,500
			State	\$ -					\$ -
			Local	\$ 37,500					\$ 37,500
			Total	\$ 750,000	(Construction)				\$ 750,000
3	2013-11	Commercial Service Vertical Infru.	Federal	\$ -					\$ -
			State	\$ 110,000					\$ 110,000
			Local	\$ -					\$ -
			Total	\$ 110,000	(Construction)				\$ 110,000
4	2013-12	Pavement Maintenance	Federal	\$ -					\$ -
			State	\$ 200,000					\$ 200,000
			Local	\$ 200,000					\$ 200,000
			Total	\$ 399,999	(Construction)				\$ 399,999
5	2013-13	Air Service Development	Federal	\$ -					\$ -
			State	\$ 28,000					\$ 28,000
			Local	\$ 7,000					\$ 7,000
			Total	\$ 35,000	(Air Service)				\$ 35,000
6	2014-1	Taxiway F(E) Partial Resurface and Taxiway Safety Area and Runway Safety Area Improvements	Federal		\$ 712,500				\$ 712,500
			State		\$ -				\$ -
			Local		\$ 37,500				\$ 37,500
			Total		\$ 750,000	(Construction)			\$ 750,000
7	2014-2	Reconstruct and Extend Runway 17-35 -Design	Federal		\$ 1,813,644				\$ 1,813,644
			State		\$ -				\$ -
			Local		\$ 95,455				\$ 95,455
			Total		\$ 1,909,099	(Design)			\$ 1,909,099
8	2014-3	Rehabilitate North Corporate Ramp (Repair/ Remove) Design and Construction	Federal		\$ 522,500				\$ 522,500
			State		\$ -				\$ -
			Local		\$ 27,500				\$ 27,500
			Total		\$ 550,000	(Construction)			\$ 550,000
9	2014-11	Commercial Service Vertical Infru.	Federal		\$ -				\$ -
			State		\$ 110,000				\$ 110,000
			Local		\$ -				\$ -
			Total		\$ 110,000	(Construction)			\$ 110,000
10	2014-12	Perimeter Fenceline Improvements	Federal		\$ -				\$ -
			State		\$ 200,000				\$ 200,000
			Local		\$ 200,000				\$ 200,000
			Total		\$ 400,000	(Construction)			\$ 400,000
11	2014-13	Air Service Development	Federal		\$ -				\$ -
			State		\$ 28,000				\$ 28,000
			Local		\$ 7,000				\$ 7,000
			Total		\$ 35,000	(Air Service)			\$ 35,000
12	2015-1	Reconstruct and Extend Runway 17-35 - Construction and Construction Services	Federal			\$ 40,375,190			\$ 40,375,190
			State			\$ -			\$ -
			Local			\$ 2,125,010			\$ 2,125,010
			Total			\$ 42,500,200	(Construction)		\$ 42,500,200
13	2015-2	Terminal Area Fencing from Gate 1 to Gate 12	Federal			\$ 379,240			\$ 379,240
			State			\$ -			\$ -
			Local			\$ 19,960			\$ 19,960
			Total			\$ 399,200	(Construction)		\$ 399,200
14	2015-3	Terminal Renovation - Phase III (Discretionary Funding)	Federal			\$ 2,374,999			\$ 2,374,999
			State			\$ -			\$ -
			Local			\$ 125,000	(Design/		\$ 125,000
			Total			\$ 2,499,999	Construction)		\$ 2,499,999
15	2015-11	Commercial Service Vertical Infru.	Federal			\$ -			\$ -
			State			\$ 110,000			\$ 110,000
			Local			\$ -			\$ -
			Total			\$ 110,000	(Construction)		\$ 110,000
16	2015-12	Perimeter Fenceline Improvements	Federal			\$ -			\$ -
			State			\$ 200,000			\$ 200,000
			Local			\$ 200,000			\$ 200,000
			Total			\$ 399,999	(Construction)		\$ 399,999

Proj. #	FAA FY-#	Project Description	Funding Source	FY 2013 (Year 1)	FY 2014 (Year 2)	FY 2015 (Year 3)	FY 2016 (Year 4)	FY 2017 (Year 5)	TOTALS
17	2015-13	Air Service Development	Federal			\$ -			\$ -
			State			\$ 28,000			\$ 28,000
			Local			\$ 7,000			\$ 7,000
			Total			\$ 35,000	(Air Service)		\$ 35,000
18	2016-1	Full Master Plan - EALP / AGIS	Federal				\$ 759,999		\$ 759,999
			State				--		\$ -
			Local				\$ 40,000		\$ 40,000
			Total				(Planning)	\$ 799,999	
19	2016-2	Extension of Taxiway E - Design / Construction / Construction Services	Federal				\$ 4,749,999		\$ 4,749,999
			State				--		\$ -
			Local				\$ 250,000		\$ 250,000
			Total				(Design/Construction)	\$ 4,999,999	
20	2016-3	Rehabilitate Taxiway D / Removal of Taxiway F - Design / Construction / Construction Services	Federal				\$ 2,279,999		\$ 2,279,999
			State				\$0		\$ -
			Local				\$ 120,000		\$ 120,000
			Total				(Construction)	\$ 2,399,999	
21	2016-11	Commercial Service Vertical Infru.	Federal				\$ -		\$ -
			State				\$ 110,000		\$ 110,000
			Local				\$ -		\$ -
			Total				(Construction)	\$ 110,000	
22	2016-12	Pavement Maintenance	Federal				\$ -		\$ -
			State				\$ 200,000		\$ 200,000
			Local				\$ 200,000		\$ 200,000
			Total				(Construction)	\$ 399,999	
23	2016-13	Air Service Development	Federal				\$ -		\$ -
			State				\$ 28,000		\$ 28,000
			Local				\$ 7,000		\$ 7,000
			Total				(Air Service)	\$ 35,000	
24	2017-1	Wildlife Fencing	Federal					\$ 688,750	\$ 688,750
			State					--	\$ -
			Local					\$ 36,250	\$ 36,250
			Total				(Construction)	\$ 725,000	
25	2017-2	Rehabilitate Taxiway C partial - Design / Construction / Construction Services	Federal					\$ 1,424,999	\$ 1,424,999
			State					--	\$ -
			Local					\$ 75,000	\$ 75,000
			Total				(Design/Construction)	\$ 1,499,999	
26	2017-3	Snow Removal Equipment	Federal					\$ 617,500	\$ 617,500
			State					--	\$ -
			Local					\$ 32,500	\$ 32,500
			Total				(Equipment)	\$ 650,000	
27	2017-4	Update Pavement Management Plan / PCI Study	Federal					\$ 261,250	\$ 261,250
			State					--	\$ -
			Local					\$ 13,750	\$ 13,750
			Total				(Planning)	\$ 275,000	
28	2017-11	Commercial Service Vertical Infru.	Federal					\$ -	\$ -
			State					\$ 110,000	\$ 110,000
			Local					\$ -	\$ -
			Total				(Construction)	\$ 110,000	
29	2017-12	Pavement Maintenance	Federal					\$ -	\$ -
			State					\$ 200,000	\$ 200,000
			Local					\$ 200,000	\$ 200,000
			Total				(Construction)	\$ 399,999	
30	2017-13	Air Service Development	Federal					\$ -	\$ -
			State					\$ 28,000	\$ 28,000
			Local					\$ 7,000	\$ 7,000
			Total				(Air Service)	\$ 35,000	
Note: FAA Fiscal Year (FY) begins October 1.			Federal	\$ 1,301,500	\$ 3,048,644	\$ 43,129,429	\$ 7,789,997	\$ 2,992,499	\$ 58,262,069
			State	\$ 338,000	\$ 338,000	\$ 338,000	\$ 338,000	\$ 338,000	\$ 1,689,998
			Local	\$ 275,500	\$ 367,455	\$ 2,476,969	\$ 616,999	\$ 364,499	\$ 4,101,423
			ACIP Total	\$ 1,914,999	\$ 3,754,099	\$ 45,944,398	\$ 8,744,996	\$ 3,694,998	\$ 64,053,490

Proj. #	FAA FY-#	Project Description	Funding Source	FY 2013 (Year 1)	FY 2014 (Year 2)	FY 2015 (Year 3)	FY 2016 (Year 4)	FY 2017 (Year 5)	TOTALS	
Long-Term Development Program										
									TOTALS (2018-2020)	
31	2018-1	Taxiway A Reconstruction - North Connector (Design & Construction)	Federal						\$ 589,000	
			State							
			Local						\$ 31,000	
			Total						\$ 620,000	
32	2018-2	Acquire Snow Removal Equipment - Rotary Plow	Federal						\$ 617,500	
			State							
			Local						\$ 32,500	
			Total						\$ 650,000	
33	2018-3	South Ramp Rehabilitation (Design & Construction)	Federal						\$ 1,424,999	
			State							
			Local						\$ 75,000	
			Total						\$ 1,499,999	
34	2018-4	Acquire Snow Removal Equipment - Power Broom	Federal						\$ 617,500	
			State							
			Local						\$ 32,500	
			Total						\$ 650,000	
35	2019-1	South Ramp Rehabilitation (Design & Construction)	Federal						\$ 570,000	
			State							
			Local						\$ 30,000	
			Total						\$ 600,000	
36	2019-1	North GA Ramp Rehabilitation - Phase 1 (Design & Construction)	Federal						\$ 570,000	
			State							
			Local						\$ 30,000	
			Total						\$ 600,000	
37	2020-1	North GA Ramp Rehabilitation - Phase 2 (Design & Construction)	Federal						\$ 570,000	
			State							
			Local						\$ 30,000	
			Total						\$ 600,000	
<i>Submitted to IDOT (FY 2016-2020)</i>			Federal						\$ 4,958,999	
			State							\$ -
			Local							\$ 261,000
			Total	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 5,219,999
GRAND TOTAL (FAA ACIP AND LONG-TERM)			Federal					91.3%	\$ 63,221,068	
			State					2.4%	\$ 1,689,998	
			Local					6.3%	\$ 4,362,423	
			Total					100.0%	\$ 69,273,489	

YEARLY SUMMARY				
Year	Federal (FAA)	State (IDOT)	Local (SUX)	Total
FY 2013	\$ 1,301,500	\$ 338,000	\$ 275,500	\$ 1,914,999
FY 2014	\$ 3,048,644	\$ 338,000	\$ 367,455	\$ 3,754,099
FY 2015	\$ 43,129,429	\$ 338,000	\$ 2,476,969	\$ 45,944,398
FY 2016	\$ 7,789,997	\$ 338,000	\$ 616,999	\$ 8,744,996
FY 2017	\$ 2,992,499	\$ 338,000	\$ 364,499	\$ 3,694,998
FY 2018	\$ 3,248,999	\$ -	\$ 171,000	\$ 3,419,999
FY 2019	\$ 1,140,000	\$ -	\$ 60,000	\$ 1,200,000
FY 2020	\$ 570,000	\$ -	\$ 30,000	\$ 600,000
TOTAL	\$ 63,221,068	\$ 1,689,998	\$ 4,362,423	\$ 69,273,489



APPENDIX F

AIRPORT LAYOUT PLAN UPDATE

EXECUTIVE SUMMARY

Study Background

This study documents design improvements and project costs necessary to bring the crosswind Runway 17-35 into compliance with Federal Aviation Administration (FAA) standards.

Runway 17-35 has compliance and incursion issues stemming from sub-standard runway/taxiway geometry. In conjunction with these safety concerns, the Runway 17-35 pavement is in poor condition and in need of immediate rehabilitation.

Runway 17-35 Service Level

Runway 17-35 is 6,600' x 150', and accounts for about 20 percent of the Airport's traffic, or greater than 5,000 operations per year. The runway is designated as an Airport Reference Code (ARC) D-III runway per the 2008 FAA-approved Airport Layout Plan, accommodating commercial narrowbody transport aircraft and large-cabin business jets. This feasibility study identified the Embraer 170 Series aircraft, configured for either passenger or cargo service, as the future critical aircraft for Runway 17-35. Consistent with this activity, the crosswind is ultimately planned as a future precision instrument runway.

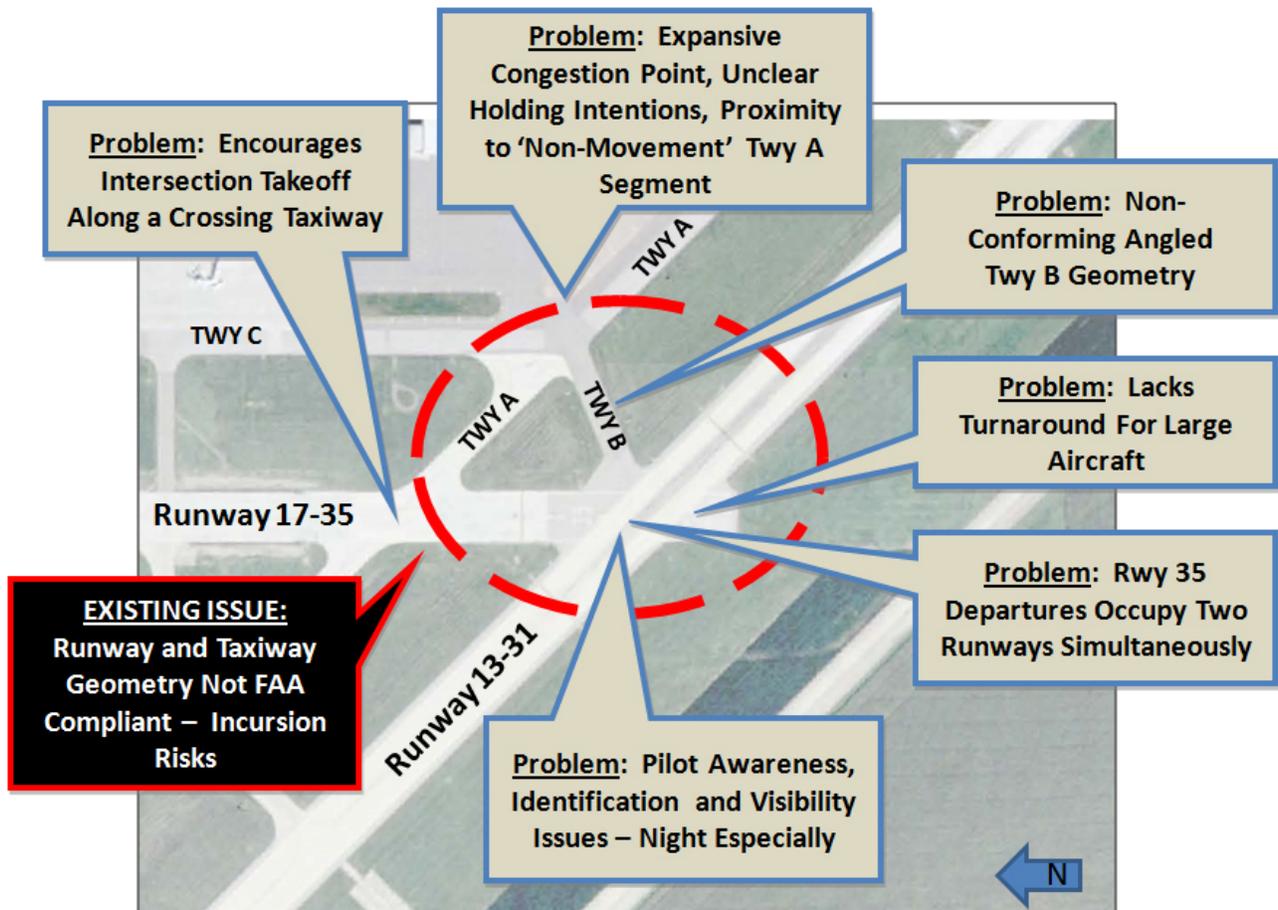
Preferred Runway 17-35 Improvement Plan

Four major Runway 17-35 feasibility concepts (RFS-A, B, C and D) were assessed, from which Alternative C was selected and further refined by the Sponsor as the preferred Runway 17-35 option to carry forward as part of the Airport's development plan. Alternative C extends the Runway 35 end and parallel Taxiway 'C' 950 feet to the south. The estimated cost is \$10.8 million, including projects to resolve safety issues, sub-standard geometry, and in meeting the future critical aircraft demands for runway length.

Preferred Runway 17-35 Exhibit

The following exhibit depicts the preferred Alternative C (RFS-C), in which the existing runway pavement is shown as yellow, and future runway pavement is blue.

Runway Intersection Geometry Issues



APPENDIX G

AIRPORT LAYOUT PLAN UPDATE



**IOWA AIR NATIONAL GUARD
HEADQUARTERS 185TH AIR REFUELING WING
2920 HEADQUARTERS AVE
SIOUX CITY IOWA 51111-1300**

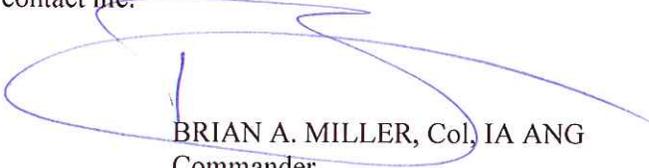
22 February 2011

MEMORANDUM FOR SIOUX GATEWAY AIRPORT

FROM: 185ARW/CC

SUBJECT: Establishing a displaced threshold at Sioux Gateway

1. This 185th Air Refueling Wing officially supports the establishment of a displaced threshold for runway 31/13 at Sioux Gateway Airport.
2. A Displaced Threshold will give the 185th greater flexibility in supporting our wartime and emergency response taskings. During normal operations we are limited in our takeoff weight capabilities due to runway length needed to ensure obstacle clearance. The addition of 1000' for takeoff will give us the ability to increase our maximum capability by 15,000lbs.
3. The addition of a displaced threshold will also give us greater flexibility in meeting our training needs and will also make Sioux Gateway more attractive to other military traffic for training purposes.
4. If you have any questions please contact me.


BRIAN A. MILLER, Col, IA ANG
Commander



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