



SEPTEMBER 2023

Working Paper 1 – Inventory of Existing Conditions





Sioux Gateway Airport Master Plan Inventory of Existing Conditions

Version 3.0

Sioux Gateway Airport

Sioux City, IA

RS&H No.: 1014.9554.054

Prepared by RS&H, Inc. at the
direction of Sioux Gateway Airport Board
of Trustees.

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1 Inventory of Existing Conditions

1.1 Introduction

The Federal Aviation Administration (FAA) Advisory Circular (AC) 150/5070-6B Change 2, *Airport Master Plans*, outlines the necessary steps in the development of an airport master plan. Identifying existing conditions at Sioux Gateway Airport (SUX or the Airport) is the initial step in the master planning process. This step involves collecting data pertinent to an airport and the region it serves with the objective of providing background information for subsequent phases of analysis.

The development of a master plan for SUX requires the collection and evaluation of data relating to the Airport and the surrounding area. This information was obtained through onsite investigations at the Airport, interviews with airport management and airport users/stakeholders, and the collection and analysis of previous reports and studies.

This inventory serves as an update to the 2001 Master Plan inventory by describing how conditions in 2022 (the base year for this master plan) have, or in some cases have not, changed since the previous inventory chapter.

1.2 Historic Context and Background

Sioux Gateway Airport, originally named Sioux City Municipal Airport, was constructed on 225 acres of farmland near Sergeant Bluff, Iowa in 1938 and was originally composed of just a single turf runway. In the years following the opening of the Airport, three hard surface runways, multiple taxiways, an apron, and a terminal building were constructed. The projects were jointly funded by the City of Sioux City and the federal government. After the attack at Pearl Harbor and the United States entering World War II, the Airport was commandeered by the U.S. Army Air Corps and transformed into a combat training base.

The City of Sioux City supported the Army's mission by purchasing more than 1,000 additional acres of land and immediately leasing it to the Air Corps. Initially, B-17 Flying Fortress and B-24 Liberator bomber crews received advanced group training at the Airport before being deployed for combat. Shortly before the end of the war, the existing facilities were retrofitted to support B-29 Superfortress bomber training. After the conclusion of World War II in 1945, the B-29 bomber training program was discontinued, and Sioux City Municipal Airport was quickly shifted into a processing center that helped discharge military personnel from service and aid their transition back into civilian life. While the Airport was occupied by the U.S. Army Air Corps, the existing runways were lengthened considerably and more than 200 buildings, including a new terminal, were constructed.

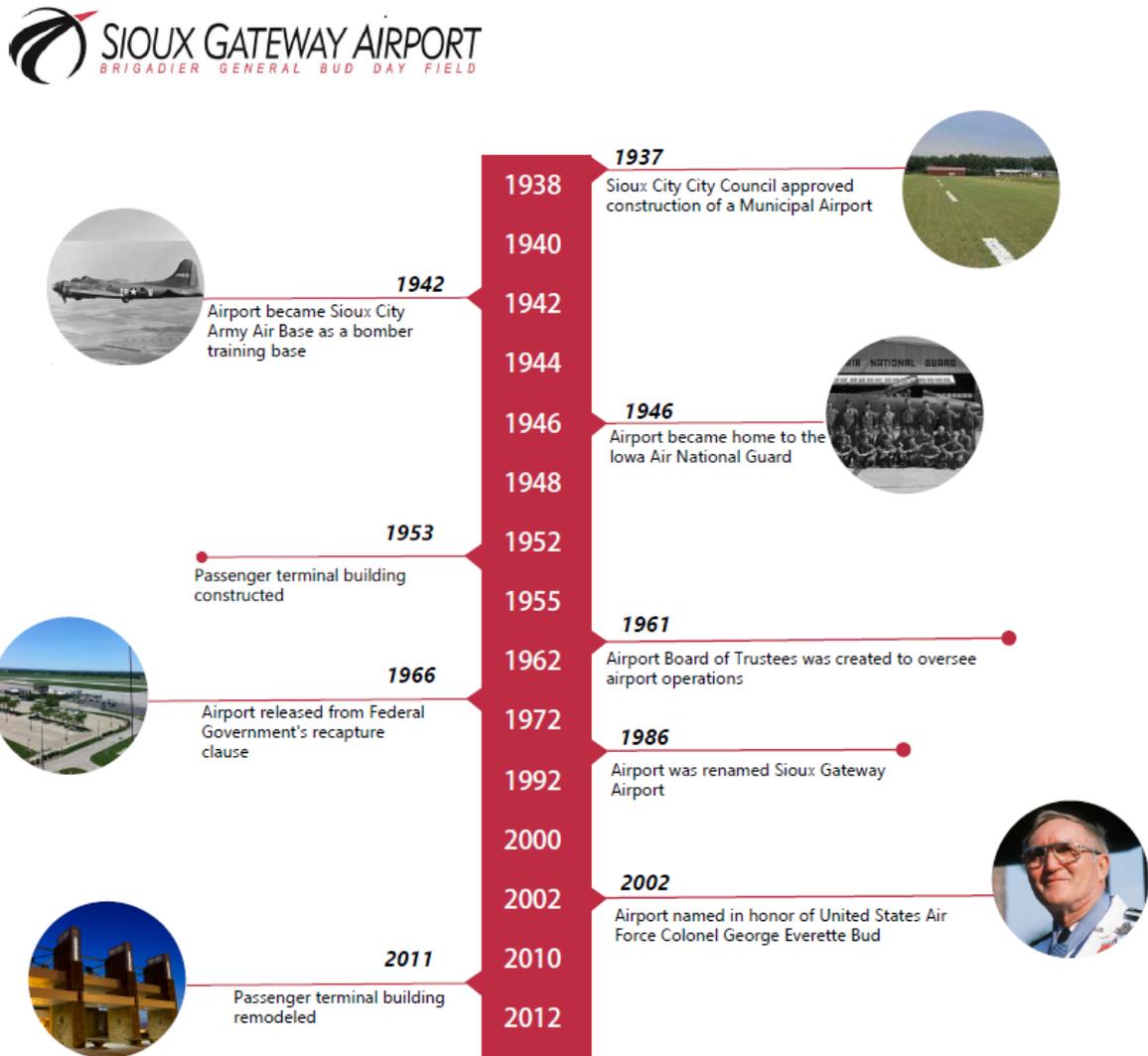
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In 1946, the Airport became home to the Iowa Air National Guard (IANG) which still operates out of SUX today. A year later, most of the Airport was deeded back to the City of Sioux City. After the start of the Korean War in 1950, primary control of SUX was passed on to the Air Force, which used it as a military training facility. Runway 13-31 was extended to 8,999 feet during this period to better support military aircraft operations. Ownership of the Airport was once again transferred back to the City after the armistice was signed in 1953 and was finally released from the Federal Government's recapture clause in 1966. This removed the Federal Government's right to retake control of the airport in the event of a national emergency and the Airport has remained the property of the City ever since. Soon after the end of the Korean War, a new passenger terminal building as well as 20 private hangars were constructed.

In 1973, radar was installed at SUX, a surveillance system designed to increase the situational awareness of air traffic controllers and improve the overall safety of congested airspace. In 1986, the Airport was renamed Sioux Gateway Airport. In 2002, the Airport was dedicated to U.S. Air Force Colonel George Everette "Bud" Day, a Sioux City Native, who remains the only person to receive both the Air Force Cross and Medal of Honor. There have been multiple airfield projects and terminal renovations at SUX in recent years, including a \$6.2 million re-modeling of the terminal building in 2011.

See **Figure 1-1** for a timeline of Airport milestones and other notable events.

Figure 1-1 Airport Timeline



Source: RS&H 2023

1.2.1 Commercial Passenger Service

Several airlines have provided commercial airline service at SUX since its inception. Mid-Continent Airlines was the first to provide Sioux City with regular airline service starting in 1940. Braniff International Airlines and North Central Airlines were not far behind, announcing routes into and out of Sioux City in the late 1940's. At the peak of its demand for commercial air service, approximately 230,000 passengers traveled through Sioux Gateway Airport in 1995.

More recently, Northwest Airlines, which merged with Delta Air Lines in 2009, offered routine flights between Sioux City and Minneapolis. The company would gradually reduce its presence

in the area before ending service entirely in 2012 citing weak nationwide economic conditions. Frontier Airlines connected SUX to Denver (DEN) with daily flights from 2007-2008. American Eagle, a subsidiary of American Airlines, offered flights to Chicago O'Hare (ORD) out of Sioux City for nine years before ending the service in 2021 due in part to the effects of the COVID-19 pandemic. Today, SkyWest Airlines DBA as United Express, is the only commercial airline service provider at SUX and operates direct flights to both Denver International Airport (DEN) and Chicago O'Hare International Airport (ORD). SUX also sees periodic non-scheduled charter operations.

1.2.2 Airport Ownership

The Airport is owned and operated by the city of Sioux City. The airport manager and airport staff oversee the day-to-day operations and are governed by a seven-member Airport Board of Trustees. Airport board members are appointed by the City Council and serve three-year terms. They establish rules, rates and fees, and regulations regarding the Airport's services and facilities; promotes, develops, and encourages civilian, commercial, and military aviation activities; applies for grants; selects a director responsible for daily administration and prepares the annual budget for approval by the City Council.¹

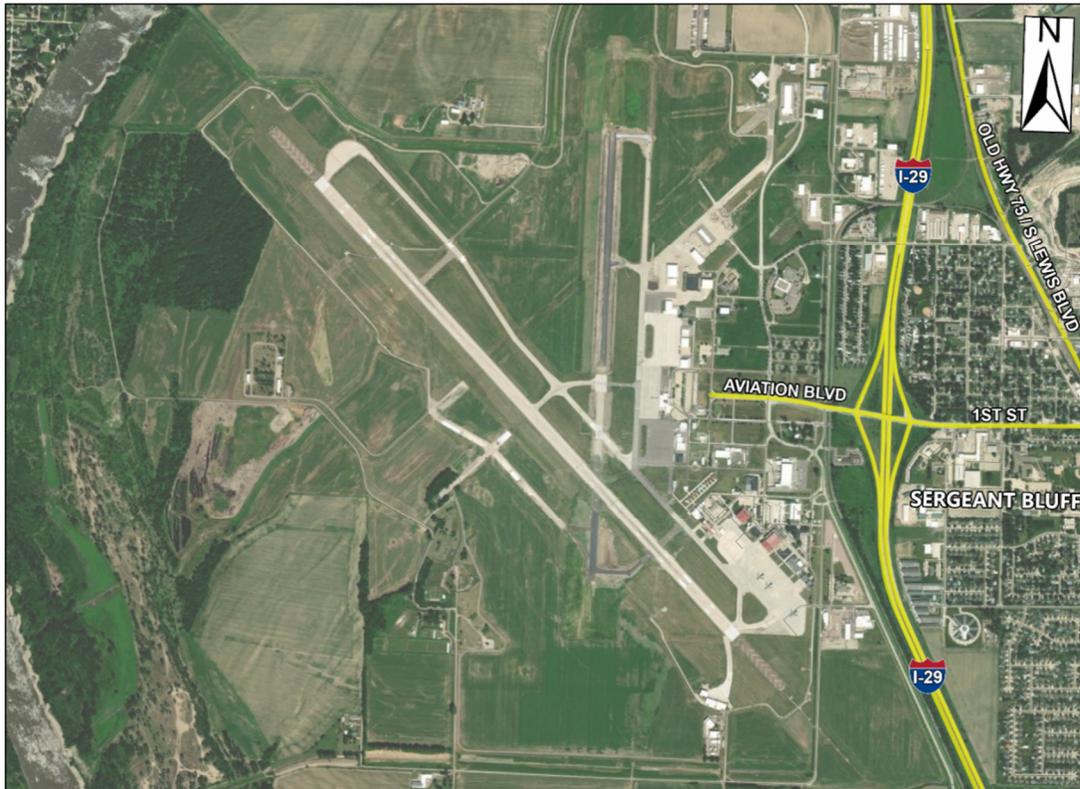
1.3 Airport Setting and Role

SUX sits along the Missouri River in the northwestern corner of Iowa where the state borders both Nebraska and South Dakota; approximately 90 miles north of Omaha, Nebraska and 90 miles south of Sioux Falls, South Dakota. The Airport is located in the southeast corner of Sioux City, Iowa, approximately seven miles south of the city's central business district. Most of the Sioux City metropolitan area and the entirety of Airport property lies within Woodbury County. A small portion of the city to the north is encompassed by Plymouth County.

SUX sits adjacent to the intersection of Interstate Highway 29, which runs north-south from Kansas City, Missouri to the Canada-U.S. border in North Dakota, and 1st Street. This interchange provides convenient regional access to both the nearby city of Sergeant Bluff, Iowa, and the Airport, as depicted in **Figure 1-2**. The Airport sits at an elevation of 1,098 feet and occupies approximately 2,500 acres of land, 1,000 of which are leased for row-crop farming.

¹ *City of Sioux City website*. Airport Board of Trustees. (n.d.). Retrieved April 7, 2023, from <https://www.sioux-city.org/government/boards-commissions/airport-board-of-trustees>

Figure 1-2 Vicinity Map



Source: RS&H, 2022

SUX is home to the 185th Air Refueling Wing (ARW) of the Iowa Air National Guard which plays a major role in the United States Air Force Air Mobility Command. The Airport is a vital transportation link in the community that prides itself on ease of access for commercial passengers as well as reliably supporting cargo, military, and general aviation operations year-round.

1.3.1 Airport NPIAS Classification

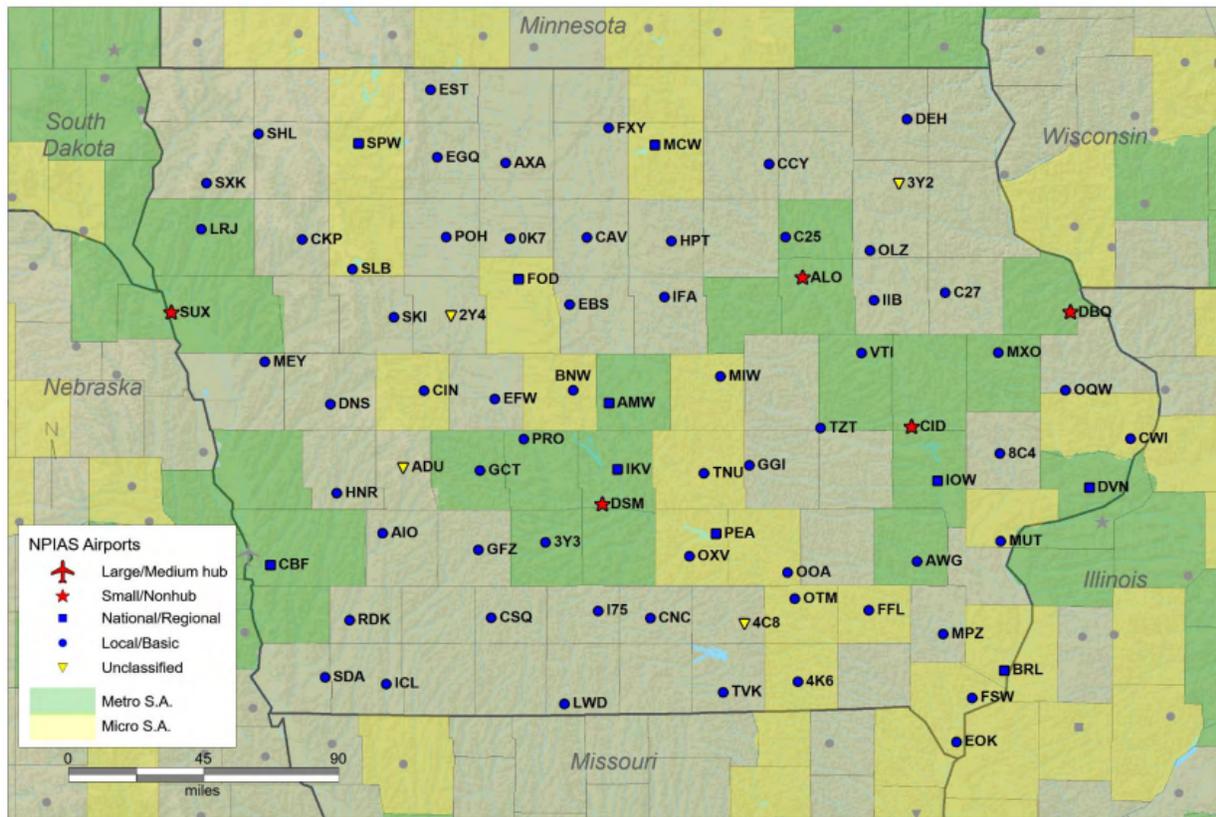
The determination of an airport's classification is a function of the FAA and is used in the process of assembling the NPIAS (National Plan of Integrated Airports) and determining airport project funding levels. For an airport to be fully eligible for federal funding, it must be included in the NPIAS. The NPIAS falls under the umbrella of the Airport Improvement Program (AIP) which provides grant funding for the planning and development of public-use airports. Every two years, the NPIAS is updated by the FAA and identifies public-use airports considered necessary to provide a safe, efficient, and integrated system of airports to meet the needs of civil aviation, national defense, and the United States Postal Service.

The NPIAS also takes into consideration the relationship of each airport to the rest of the transportation system in a particular area, the forecast of technological developments in

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aeronautics, and the development forecast in other modes of transportation. As of 2023, the FAA has identified and included 3,287 existing domestic airports in the NPIAS that are significant to national air transportation and are therefore eligible to receive federal grants within the scope of the AIP. An airport’s designated role in the NPIAS is determined by its share of U.S. annual enplanements and as a commercial service airport with approximately 31,000 enplanements in 2021, SUX is classified as a primary non-hub airport². A non-hub airport accounts for less than 0.05 percent of the total passenger enplanements (but more than 10,000 annual enplanements) provided by commercial aircraft operators within the United States. The state of Iowa has eight commercial service and 106 general aviation airports, 79 of which are included in the NPIAS³. NPIAS airports within the state of Iowa are shown in **Figure 1-3**.

Figure 1-3 NPIAS Airports in Iowa



Source: FAA NPIAS FY 2023-2027

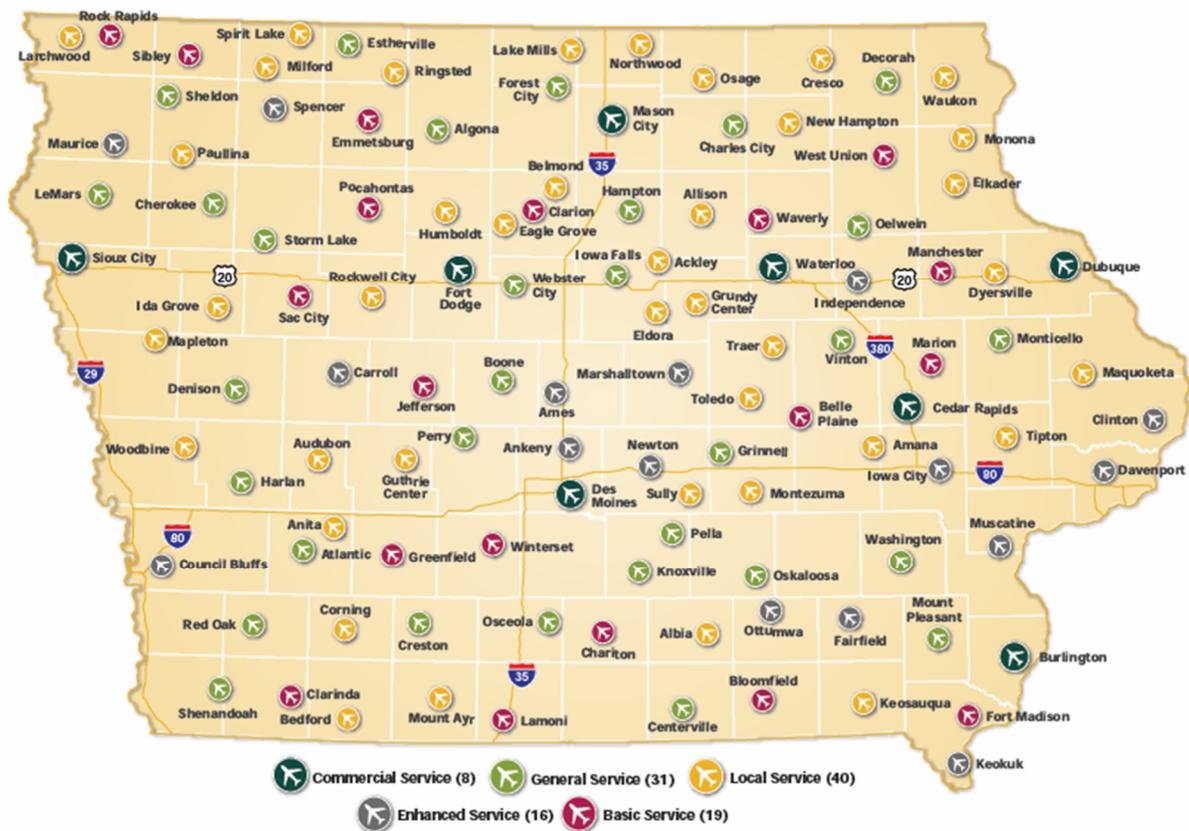
² National Plan of Integrated Airport Systems (NPIAS) 2023-2027, Federal Aviation Administration, September 30, 2022

³ Iowa Aviation System Plan 2020: Executive Summary. Iowa Publications Online. (2021, October 14). Retrieved April 7, 2023, from <https://publications.iowa.gov/40699/>

1.3.2 State Classification

The 2020 Iowa State Aviation System Plan (SASP) classifies each of its 114 state-funded airports based on their size and function. SUX is classified as a commercial service airport. A commercial service airport provides scheduled commercial service and support for all types of general aviation activity. Iowa SASP airports account for more than 900,000 general aviation operations and 2.2 million enplanements annually while providing coverage within 30 minutes to 97 percent of the state’s population⁴. See **Figure 1-4** for all airports in the Iowa SASP and their respective classification.

Figure 1-4 Iowa SASP Airports



Source: Iowa Aviation System Plan 2020

1.3.3 Essential Air Service (EAS) Role

The commercial airline industry became a free market for the first time in its history after the Airline Deregulation Act of 1978 was enacted to provide air carriers with a great degree of autonomy in selecting their domestic markets and fares. Inevitably, airlines began to shift their

⁴ Iowa Aviation System Plan 2020: Executive Summary. Iowa Publications Online. (2021, October 14). Retrieved April 7, 2023, from <https://publications.iowa.gov/40699/>

operational focus onto more populated, and thus more lucrative, passenger markets. With an understanding of the potential impact on air service availability to smaller, more isolated communities, the Essential Air Service (EAS) program was established by the U.S. Congress. EAS guarantees that small communities, such as Sioux City, Iowa, that were served by certificated air carriers before airline deregulation, can still maintain a minimum level of scheduled air service. The United States Department of Transportation is mandated to provide eligible EAS communities (60 in Alaska and 115 in the contiguous United States) with access to the national air transportation system. This is generally accomplished by subsidizing two round trips per day with 30 to 50 seat aircraft, or additional frequencies with aircraft having nine seats or fewer, usually to a large or medium hub airport.⁵

Prior to the COVID-19 pandemic, airline operators at SUX were not part of EAS due to demand in the region and success in the market. Beginning in 2021, SkyWest Airlines DBA United Express operates flights from SUX to Denver (DEN) and Chicago (ORD) using a 50-seat Bombardier CRJ200 under the protection of EAS.

1.3.4 Surrounding Commercial Service and General Aviation Airports

Omaha Eppley Airfield (OMA), approximately 90 miles south of SUX, and Joe Foss Field (FSD) in Sioux Falls, 90 miles north of SUX, are the closest commercial service airports to Sioux City. OMA is classified as a primary medium hub airport within the NPIAS and enplaned 1,829,912 passengers in 2021 while FSD is a primary small hub airport and enplaned 501,423 passengers in 2021.⁶ SUX is considered a “spoke” in a hub-and-spoke operating system that airlines use to connect passengers traveling out of smaller metropolitan areas to larger hub airports.

See **Table 1-1** and **Figure 1-5** for nearby commercial service airports and associated services.

⁵ *Essential Air Service*. U.S. Department of Transportation. (n.d.). Retrieved April 7, 2023, from <https://www.transportation.gov/policy/aviation-policy/small-community-rural-air-service/essential-air-service>

⁶ (National Plan of Integrated Airport Systems (NPIAS) 2023–2027: Appendix A - List of NPIAS Airports | Federal Aviation Administration, n.d.) *National Plan of Integrated Airport Systems (NPIAS) 2023–2027: Appendix A - List of NPIAS Airports | Federal Aviation Administration*. (n.d.). Retrieved April 7, 2023, from https://www.faa.gov/airports/planning_capacity/npias/current/2023_NPIAS_Appendix_A

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Table 1-1 Surrounding Commercial Service Airports

Identifier	Airport	City	State	Runway	Length/Width	Pavement	Instrument Approaches	NPIAS Role	Based Aircraft	Annual Ops
FSD	Joe Foss Field	Sioux Falls	SD	3/21	9,000' X 150'	Concrete - Grooved	ILS, GPS	Small	111	69,410
				15/33	8,000' X 150'	Concrete - Grooved	GPS, VOR, VOR/DME, TACAN			
				9/27	3,151 X 75'	Concrete	GPS			
OMA	Eppley Airfield	Omaha	NE	14R/32L	9,502 X 150'	Concrete - Grooved	ILS, GPS	Medium	89	93,856
				14L/32R	8,500' X 150'	Concrete - Grooved	ILS, GPS			
				18/36	8,154' X 150'	Concrete - Grooved	ILS, GPS			

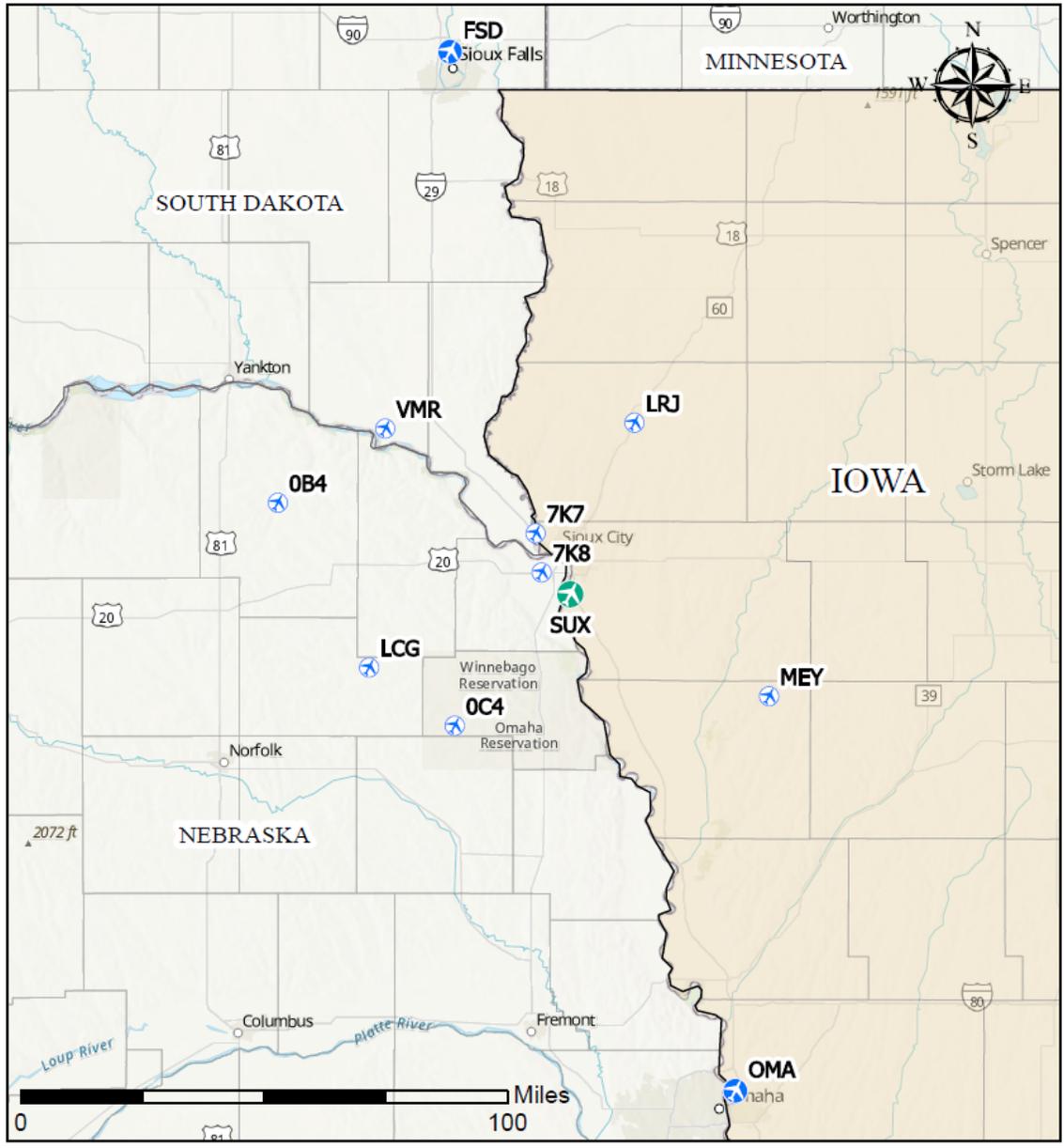
Source: FAA 5010, Airtav.com, NPIAS 2023-2027, OPSNET, compiled by RS&H, 2023

There are six general aviation (GA) airports near SUX that are included in the NPIAS located in Iowa, Nebraska, and South Dakota. The two closest GA airports to SUX are Martin Field (7K8) which sits five nautical miles NW, and Graham Field (7K7) which is 9.4 nautical miles N/NE of SUX, both of which are not currently recognized in the NPIAS.

See **Table 1-2** and **Figure 1-5** for surrounding general aviation airports and their associated services.

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Figure 1-5 Nearest Surrounding Airports



-  SIoux GATEWAY AIRPORT
-  OTHER COMMERCIAL SERVICE AIRPORTS
-  SURROUNDING GENERAL AVIATION AIRPORTS
-  IOWA COUNTIES
-  ALL OTHER COUNTIES

Source: RS&H, 2022

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Table 1-2 Surrounding General Aviation Airports

Identifier	Airport	City	State	Runway	Length/Width	Pavement	Instrument Approaches	NPIAS Role	Based Aircraft	Annual Ops
MEY	James G Whiting Memorial Field Airport	Mapleton	IA	2/20	2,801' X 60'	Concrete	GPS	Basic	10	2,500
LRJ	Le Mars Municipal Airport	Le Mars	IA	18/36	5,056' X 75'	Concrete	GPS	Local	13	4,750
0C4	Pender Municipal Airport	Pender	NE	15/33	3,600' X 60'	Concrete	GPS	Local	16	2,700
LCG	Wayne Municipal Airport	Wayne	NE	18/36	4,201' X 75'	Concrete	GPS	Basic	14	7,980
				5/23	3,406' X 60'	Concrete	GPS			
				13/31	2,070' X 120'	Turf	N/A			
0B4	Hartington Municipal Airport	Hartington	NE	13/31	3,950' X 60'	Concrete	GPS	Basic	17	6,350
				3/21	2,150' X 125'	Turf	N/A			
7K8	Martin Field	South Sioux City	NE	14/32	3,320 X 50'	Asphalt	N/A	N/A	37	5,300
VMR	Harold Davidson Field Airport	Vermillion	SD	12/30	4,105' X 75'	Concrete	GPS	Local	18	4,098
7K7	Graham Field	Noth Sioux City	SD	15/33	5,300' X 100'	Concrete/Turf	N/A	N/A	10	375

Source: FAA 5010, ADIP, Airmav.com, NPIAS 2023-2027

There are also several private airfields located in the vicinity of the Airport that are not available for public use, including Kristijanto Airstrip which is located two nautical miles west of the Airport.

1.4 Meteorological Conditions

A review of the prevailing meteorological conditions is necessary to assist in the evaluation of aircraft performance characteristics. Temperature, precipitation, winds, visibility, and cloud ceiling heights are elements used to summarize an area's climate for airport planning purposes.

Situated in the heart of the American Midwest and northwestern portion of The Great Plains, Sioux City sees a myriad of weather conditions that vary greatly between seasons. Sioux City has a humid continental climate which is characterized by hot and humid summers, moderate spring and fall seasons, and cold, dry winters. This type of climate is especially conducive to agriculture, especially corn, which helps Iowa lead the U.S. in corn production.

An analysis of monthly weather station data from 1991-2020 from the National Oceanographic and Atmospheric Administration (NOAA) shows that the temperature at SUX during the summer months ranges on average from 61.2° Fahrenheit to 83.2° Fahrenheit, with July being the warmest month with an average high temperature of 85° Fahrenheit. Comparatively, the coldest temperatures occur in the winter ranging from an average of 13.3° Fahrenheit to 32.4° Fahrenheit, with the coldest month typically being January.

The average annual precipitation is 29.27 inches with the majority coming between the months of April and September. The two wettest months are June and August which average 4.35 inches and 3.94 inches of precipitation respectively. The snow season for Sioux City usually runs from October to April with an average annual snowfall of 36.0 inches.⁷ The Midwest is particularly susceptible to severe weather like tornadoes and thunderstorms that are the most prevalent in the later stages of spring and early summer.

1.5 Financial Overview

Responsible airport master planning must examine the fiscal environment under which airport improvements may be undertaken. Key aspects of the fiscal environment are the airport's basic business model, operation revenues and expenses, and sources and uses of capital funds. This section provides an overview of key financial performance indicators for Sioux Gateway Airport. Historical financial data is used to help project anticipated finances during the implementation

⁷ All recorded weather data collected by the National Oceanic and Atmospheric Association (NOAA) National Centers for Environmental Information (NCEI), compiled by RS&H in October 2022

planning for preferred development alternatives later in this Master Plan. All data in the financial overview is reported in Federal fiscal years (FY).

The business model in place at SUX relies on operating revenues from airport tenants and users in the form of rentals and fees to cover operating costs at the Airport. Capital project funding sources include federal grants-in-aid from the FAA, state grant programs, and Passenger Facility Charges (PFCs).

1.5.1 Airport Revenues, Expenses, and Capital Expenditures

Every year the Airport submits a financial reporting form (FAA Form 127) as part of the FAA's Airport Financial Reporting Program. All airports that are obligated by grant assurances must submit these forms on an annual basis. Airport revenues are generated from a variety of sources, including revenue that comes directly from the operation of the Airport, non-operating sources, contributions from grants from the federal and state governments to be used for development of capital projects, and the financing of long-term debt.

Airport operating revenue can be categorized as aeronautical and non-aeronautical. Aeronautical revenue includes income from active airfield components of the airport, i.e., airlines, FBO, landing fees, hangar rentals and fuel flowage fees. Non-aeronautical revenue is generated from sources that support the airport but do not play a direct role in airside operations. These sources include the building and land rent from non-aviation related facilities, concessions, rental cars, and parking and ground transportation. Nonoperating revenues are generated outside the operation of the airport. These include revenues such as taxes levied, interest on investments, Passenger Facility Charges (PFCs), and some grants. The largest source of nonoperating revenues at SUX is the combination of federal and state-sponsored grants.

Table 1-3 details the Airport's revenues (aeronautical and non-aeronautical) as well as capital grant contributions between FY 2017-2021.

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Table 1-3 Airport Revenues

Revenues	Fiscal Year				
	2017	2018	2019	2020	2021
Aeronautical Operating Revenue					
Airlines	\$337,114	\$353,039	\$383,214	\$385,998	\$283,244
FBO Revenue	\$221,444	\$213,111	\$259,067	\$220,171	\$235,579
Cargo and Hangar Rentals	\$100,568	\$109,030	\$110,057	\$120,526	\$118,930
Fuel Flowage Fees	\$61,852	\$58,763	\$59,311	\$43,822	\$54,467
Security Reimbursement from Federal Govt	\$0	\$0	\$17,957	\$12,491	\$12,075
Total Aeronautical Operating Revenue	\$720,978	\$733,943	\$829,606	\$783,008	\$704,295
Non-Aeronautical Operating Revenue					
Land and Building Rent (Not Terminal)	\$630,144	\$641,312	\$704,341	\$689,725	\$593,434
Terminal - Food and Beverage	\$84,756	\$40,995	\$30,625	\$26,473	\$13,219
Terminal - Retail Stores and Duty Free	\$26,513	\$11,734	\$0	\$0	\$0
Terminal Services and Other	\$0	\$0	\$0	\$0	\$3,076
Rental Cars - Excludes CFCs	\$230,549	\$231,719	\$266,327	\$236,791	\$112,812
Parking and Ground Transportation	\$346,501	\$340,768	\$371,357	\$271,057	\$103,917
Other	\$0	\$0	\$16,617	\$9,342	\$177,648
Total Non-Aeronautical Operating Revenue	\$1,318,463	\$1,266,528	\$1,389,267	\$1,233,388	\$1,004,106
Total Operating Revenue	\$2,039,441	\$2,000,471	\$2,218,873	\$2,016,396	\$1,708,401
Nonoperating Revenue (Expenses)					
Interest Income	\$6,698	\$4,467	\$80,031	\$8,014	\$580
Interest Expense	(\$71,371)	(\$103,213)	(\$151,678)	(\$173,736)	(\$115,499)
Grant Receipts	\$2,241,937	\$3,060,192	\$944,360	\$8,132,049	\$8,684,730
Passenger Facility Charges	\$186,348	\$173,286	\$193,159	\$193,159	\$77,506
Other	\$0	\$0	(\$180,246)	(\$20,376)	\$675,482
Total Nonoperating Revenue (Expenses)	\$2,363,612	\$3,134,732	\$885,626	\$8,139,110	\$9,322,799
Total Revenues	\$4,403,053	\$5,135,203	\$3,104,499	\$10,155,506	\$11,031,200

Source: FAA CATS Form 127, Compiled by RS&H, 2022

Keeping an airport operational requires great expenditure in both the support of daily activities as well as to ensure operational compliance with FAA requirements and federal regulations. Payroll expenses for airport staff and the depreciation of assets were the largest expenses for the Airport between FY 2017-2021. See **Table 1-4** for operating expenses at SUX.

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Table 1-4 Airport Expenses

Expenses	Fiscal Year				
	2017	2018	2019	2020	2021
Operating Expenses					
Depreciation	\$2,253,602	\$2,315,332	\$1,904,087	\$1,923,897	\$1,764,655
Salaries and related payroll expenses	\$1,129,024	\$1,186,706	\$1,229,292	\$1,229,499	\$1,141,078
Supplies and Materials	\$288,741	\$221,343	\$124,734	\$90,278	\$111,691
Contractual Services	\$0	\$0	\$24,474	\$27,750	\$67,455
Communications and Utilities	\$108,439	\$117,898	\$0	\$135,528	\$141,001
Insurance Claims and Settlements	\$0	\$0	\$0	\$0	\$83,541
Other	\$0	\$0	\$0	\$849,013	\$1,570,885
Total Operating Expenses	\$1,526,204	\$1,525,947	\$1,378,500	\$2,332,068	\$3,115,651

Source: FAA CATS Form 127, Compiled by RS&H, 2022

Note: Total operating expenses less depreciation

1.5.2 Sources and Uses of Capital Funds

This section outlines the usage of Federal, State and Capital funds to improve and develop the airport environment to meet its current and future needs.

1.5.2.1 Federal Funding

Federal funding is made available to domestic airports through the FAA's Airport Improvement Program (AIP). The amount of funding available is dependent upon the airport's category and role within the NPIAS and the priority of the improvement as determined within the national priority ranking system. FAA Order 5100.38D, *Airport Improvement Program Handbook*, details the grant process, project eligibility, allowable costs, and other information relevant to grant acceptance. Entitlement grants are offered annually based on the number of passenger enplanements and the amount of enplaned cargo at a given airport. The projects deemed eligible for federal funding at SUX are 90 percent financed through FAA AIP grants. The remaining 10 percent comes from the airport or from other grants. **Table 1-5** summarizes SUX's AIP grant history from 2010-2022.

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Table 1-5 AIP Grant History

Grant Year	Project Description	Federal AIP Entitlement	Federal AIP Discretionary	Supplemental Discretionary	AIG Airport Infrastructure	CARES ACT	CARES Act Local Funds	COVID Relief General	COVID Relief Local Match	TOTAL Federal AIP Funds
2010	Install Airfield Guidance Signs	\$394,301								\$394,301
2011	Aquire Snow Removal Equipment	\$539,213								\$539,213
2011	Update Airport Master Plan Study	\$362,194								\$362,194
2012	Rehabilitate Apron	\$875,190								\$875,190
2012	Rehabilitate Taxiway	\$255,005								\$255,005
2013	Aquire Snow Removal Equipment	\$821,529								\$821,529
2013	Security Enhancements	\$419,128								\$419,128
2015	Construct Taxiway	\$2,284,338	\$376,502							\$2,660,840
2016	Rehabilitate Taxiway	\$1,000,000	\$736,345							\$1,736,345
2017	Reconstruct Runway	\$1,000,000	\$555,899							\$1,555,899
2018	Reconstruct Runway	\$1,000,000	\$11,886,896	\$7,640,781						\$20,527,677
2019	Reconstruct Taxiway	\$1,000,000	\$2,496,949							\$3,496,949
2020	CARES Act Funds					\$1,184,246				\$1,184,246
2020	Reconstruct Taxiway	\$999,999					\$111,111			\$1,111,110
2021	Construct/Extend/Improve Safety Area	\$1,000,001	\$4,673,011						\$630,333	\$6,303,345
2021	CRRSA Act Concessions							\$10,091		\$10,091
2021	CRRSA Act Funds							\$1,016,074		\$1,016,074
2021	Seal Runway Pavement Surface/Pavement Joints		\$2,250,000						\$250,000	\$2,500,000
2022	Aquire Snow Removal Equipment	\$625,922								\$625,922
2022	General ARPA					\$1,232,219				\$1,232,219
2022	Large Concessions					\$40,364				\$40,364
2022	Update Airport Master Plan Study				\$998,640					\$998,640
Totals		\$12,576,820	\$22,975,602	\$7,640,781	\$998,640	\$2,456,829	\$111,111	\$1,026,165	\$880,333	\$48,666,281

Source: FAA. Compiled by RS&H, 2022

1.5.2.2 State Funding

Funding allocation and contribution towards airports at the state level is handled by the Iowa Department of Transportation (IDOT) Aviation Bureau and approved by the Iowa Transportation Commission. Applications for most state aviation grants are accepted on an annual basis. Currently, there are three major categories of aviation funding in the state of Iowa: The Iowa Airport Improvement Program (Iowa AIP), the Commercial Service Vertical Infrastructure program, and the Iowa Commercial Aviation Infrastructure Fund.

The Iowa AIP uses revenues generated from aircraft registration and fuel taxes to support aviation projects involving airport development and security, air service development, immediate safety enhancements, wildlife hazard mitigation, and land use planning/zoning. In FY 2022, the IDOT Aviation Bureau awarded \$4,040,038 to 23 state airports included in the Iowa AIP.⁸

The Commercial Service Vertical Infrastructure (CSVI) program provides funding for aviation projects focused on landside development and distributes funds to airports across the state using a 50/40/10 formula: "One half of the funds are allocated equally between each airport, 40 percent of the funds are allocated based on the percentage of enplaned passengers at each airport versus the total number of enplaned passengers in the state, and 10 percent of the funds are allocated based on the percentage of the air cargo tonnage at each airport versus the total tonnage in the state"⁹. \$1,900,000 was awarded to eight commercial service airports in FY 2022 under this program, \$134,800 of which was provided to SUX for terminal improvements.

IDOT introduced the Iowa Commercial Aviation Infrastructure Fund (ICAIF) in March 2022, a temporary source of funding intended to aid the state's economic growth and recovery efforts in response to the COVID-19 pandemic. There are eight public-owned commercial service airports in the State of Iowa, including Sioux City Gateway Airport, that are eligible for this program. The ICAIF offers \$100 million in reimbursable grants to be used for projects related to terminal construction/renovation, parking structure construction, and hangar construction. \$10 million is distributed evenly between the eligible airports while the remaining 90% is distributed based on 2019 enplanements. The distribution for SUX is \$3,149,582.¹⁰

⁸ *State Funding Programs*. Iowa DOT. (n.d.). Retrieved April 7, 2023, from <https://iowadot.gov/aviation/airport-managers-and-sponsors/state-funding/state-funding-programs>

⁹ *State Funding Programs*. Iowa DOT. (n.d.). Retrieved April 7, 2023, from <https://iowadot.gov/aviation/airport-managers-and-sponsors/state-funding/state-funding-programs#551192635-commercial-service-vertical-infrastructure>

¹⁰ *Iowa Commercial Aviation Infrastructure Fund*. Iowa DOT. (n.d.). Retrieved April 7, 2023, from <https://iowadot.gov/aviation/Iowa-Commercial-Aviation-Infrastructure-Fund>

1.5.2.3 Airport Capital Improvement Program (ACIP)

As part of the AIP and NPIAS, all airports receiving federal funding for development projects must develop an Airport Capital Improvement Program (ACIP). According to FAA Order 5100.39A, *Airports Capital Improvement Program*, the ACIP serves as the primary planning tool for systematically identifying, prioritizing, and assigning funds to critical airport development and associated capital needs for the National Airspace System (NAS). The ACIP for the next fiscal year is discussed annually between the Airport sponsor and FAA Airports District Office (ADO) staff and is then revised and submitted for budgeting within the FAA's capital program.

As a primary non-hub airport, the ACIP for SUX reflects the intended use of federal primary entitlement, PFCs, and discretionary funds. Additionally, the anticipated contribution of state and local matching funds, as well as costs that are not expected to be eligible for AIP funding, are outlined in the ACIP. **Table 1-6** shows the ACIP for the Airport, submitted in 2021, for federal FY 2022-2026.

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Table 1-6 FY 2022-2026 Airport Capital Improvement Program

Year	Project Description	Federal	State	Local	ANG	Total
5-Year FAA Approved CIP						
2022	South Public Ramp Reconstruction	\$7,650,000		\$850,000		\$8,500,000
2022	Taxiway A 31 Connector	\$5,850,000		\$650,000		\$6,500,000
2022	Snow Removal Equipment - Broom	\$675,000		\$75,000		\$750,000
2022	Snow Removal Equipment - Blower	\$765,000		\$85,000		\$850,000
2022	Commercial Service Vertical Infru.		\$120,000			\$120,000
2022	Airport Capital Improvements		\$200,000	\$200,000		\$400,000
2023	Full Master Plan EALP/AGIS PCI Study	\$900,000		\$90,000		\$990,000
2023	Taxiway D D Between Runway 31 aand Runway 36	\$1,980,000		\$220,000		\$2,200,000
2023	Replace Jetbridge #2	\$1,000,000		\$100,000		\$1,100,000
2023	Commercial Service Vertical Infru.		\$120,000			\$120,000
2023	Airport Capital Improvements		\$200,000	\$200,000		\$400,000
2024	Runway 13-31 Reconstruction	\$20,000,000		\$2,000,000	\$43,000,000	\$65,000,000
2024	Commercial Service Vertical Infru.		\$150,000			\$150,000
2024	Airport Capital Improvements		\$200,000	\$200,000		\$400,000
2025	Taxiway A, Taxiway C and Terminal Apron Pavement Rehab, Saw & Seal Joints	\$804,600		\$89,400		\$894,000
2025	Commercial Service Vertical Infru.		\$120,000			\$120,000
2025	Airport Capital Improvements		\$200,000	\$200,000		\$400,000
2026	North Ramp Reconstruction	\$9,000,000		\$1,000,000		\$10,000,000
2026	Commercial Service Vertical Infru.		\$120,000			\$120,000
2026	Airport Capital Improvements		\$200,000	\$200,000		\$400,000
Totals		\$48,624,600	\$1,630,000	\$6,159,400	\$43,000,000	\$99,414,000

Source: Airport Records, Compiled by RS&H, 2022

Note: ANG - Air National Guard

1.6 Airfield Facilities

The airfield facilities at the Airport include the runways, taxiways, navigational aids, visual aids, and the aeronautical environment. The airfield facilities are identified in **Figure 1-6**.

1.6.1 Runways

The orientation and number of the runways depends on the direction of the prevailing wind patterns, the size and shape of the area available for development, and land-use or airspace restrictions that exist in the vicinity of the airport. In general, the runway and connecting taxiways are arranged to allow for the adequate separation and sequencing of aircraft in the traffic pattern and on the ground to maximize the efficiency of taxiing, takeoff, and landing operations. Taxiway layout is also heavily dependent on the location of the apron/ramp and its distance to the runway ends.

The runway system at SUX consists of two intersecting runways: Runway 13-31 and Runway 18-36. The primary runway, Runway 13-31, is 9,002 feet long by 150 feet wide and constructed of grooved concrete. The pavement strength for Runway 13-31 is 100,000 pounds for a single wheel gear, 120,000 pounds for dual wheel gears, and 220,000 pounds for dual tandem gears. Runway 13-31 has precision markings on both ends to support ILS approaches. This runway accommodates most of the commercial takeoff and landing operations at SUX and is the primary runway for Air National Guard KC-135 operations.

The crosswind runway, Runway 18-36, is 6,401 feet long by 100 feet and constructed of grooved asphalt. The pavement strength for Runway 18-36 is 65,000 pounds for a single wheel gear, 80,000 pounds for dual wheel gears, and 130,000 pounds for dual tandem gears. Runway 18-36 has non-precision markings on both ends.

Per the Airport Layout Plan previously updated in 2018, Runway 13-31 is categorized as D-III while Runway 18-36 is categorized as C-II. Runways designed to D-III standards can accommodate regular use of aircraft with a wingspan of less than 118 feet, a tail height of less than 45 feet, and an approach speed of less than 165 knots. An example of a D-III aircraft is a Boeing 737-800. Runways designed to C-II standards can accommodate aircraft with a wingspan of less than 79 feet, a tail height of less than 30 feet, and an approach speed of less than 141 knots. An example of a C-II aircraft is a Bombardier CRJ 100/200 or Embraer ERJ-145.

1.6.1.1 Land and Hold Short Operations

Land and Hold Short Operations (LAHSO) is a procedure initiated by air traffic control that involves aircraft landing and holding short of an intersecting taxiway or runway. LAHSO operations are available on Runway 13, (the hold short point is Runway 18-36), and Runway 18, (aircraft must

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land and hold short of Runway 13-31). Pilots must consider the decreased available landing distance before accepting a LAHSO clearance issued by airport traffic control (ATC). LAHSO for Runway 13 and Runway 18 decreases the available landing distance by 3,602 feet and 1,661 feet respectively.

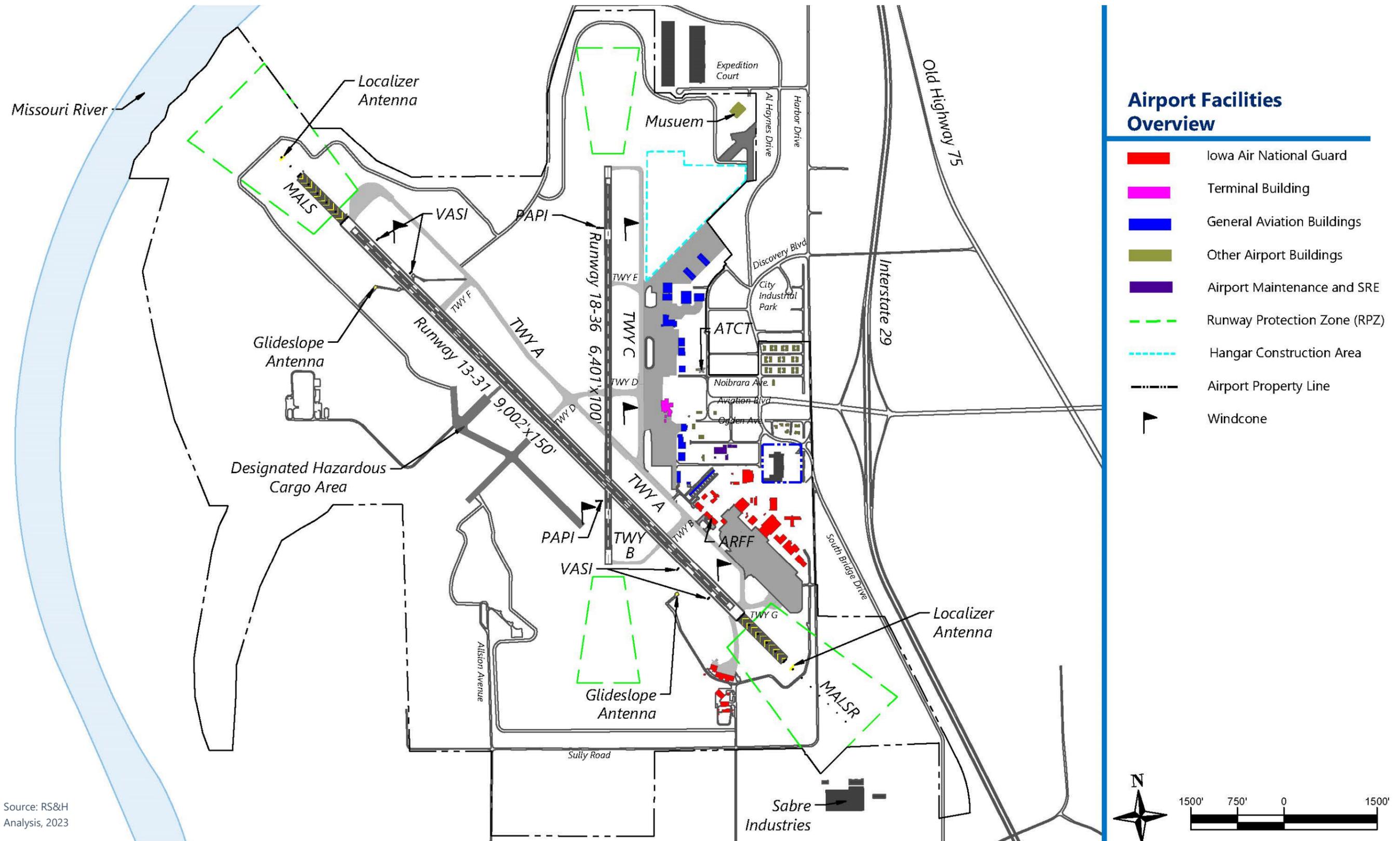
A complete summary of the runway system at SUX is provided in **Table 1-7**.

Table 1-7 Runway Data Summary

Characteristic	Runway			
	13	31	18	36
Length (feet)	9,002'	9,002'	6,401'	6,401'
Width (feet)	150'	150'	100'	100'
Effective Runway Gradient	0.00%	0.00%	-0.04%	0.04%
Runway Elevation (MSL)	1,093.1'	1,093.3'	1,097.6'	1,095.3'
Displaced Threshold (feet)	0'	0'	0'	0'
AAC	Category D	Category D	Category C	Category C
Design Group	III	III	II	II
Surface Type	Concrete - Grooved		Asphalt-Grooved	
Pavement Strength				
Single Wheel (S)	100,000 lbs	100,000 lbs	65,000 lbs	65,000 lbs
Dual Wheel (D)	120,000 lbs	120,000 lbs	80,000 lbs	80,000 lbs
Dual Tandem Wheel (2D)	220,000 lbs	220,000 lbs	130,000 lbs	130,000 lbs
Markings	Precision	Precision	Non-Precision	Non-Precision
Lighting	HIRL	HIRL	MIRL	MIRL
Visual Aids	MALS, VASI	MALSR, VASI	PAPI, REIL	PAPI
Approach Ratio	50:1	50:1	34:1	34:1
Runway Protection Zone	1,000' X 2,500' X 1,750'	1,000' X 2,500' X 1,750'	500' X 1,700' X 1,010"	500' X 1,700' X 1,010"
Distance Remaining Signs	Yes	Yes	Yes	Yes

Source: FAA 5010 Master Record, Airport Records, Prepared by RS&H, 2022

Figure 1-6 SUX Airfield Facilities



Source: RS&H Analysis, 2023

1.6.2 Taxiways

The primary function of a taxiway system is to connect the runway environment to the apron/ramp in the most efficient and practical way possible. The proper layout of taxiways expedites aircraft departures and arrivals as well as increases operational safety and efficiency.

A complete summary of the taxiway system is shown in **Table 1-8**.

Table 1-8 Taxiway Data Summary

Taxiway Designator	Width	Type	Lighting
A	75'	Parallel for RWY 13/31	MITL
B	50'	Crossover	MITL
C	50'	Parallel for RWY 18/36	MITL
D	50'	Crossover	MITL
E	50'	Connector	MITL
F	50'	Connector	MITL
G	75'	Connector	MITL

Source: Airport Records, Prepared by RS&H, 2022

1.6.3 Airfield Hot Spots

The FAA has defined specific locations within an airport’s movement area that have an increased risk of collision and/or runway incursion as “hot spots” to help alert airport users of those areas. There are two hot spots at SUX. **Figure 1-7** shows the airport diagram and the location of hot spots on the airfield. Plans for addressing airfield hot spots will be analyzed in the airfield alternatives development chapter.

Hot Spot 1

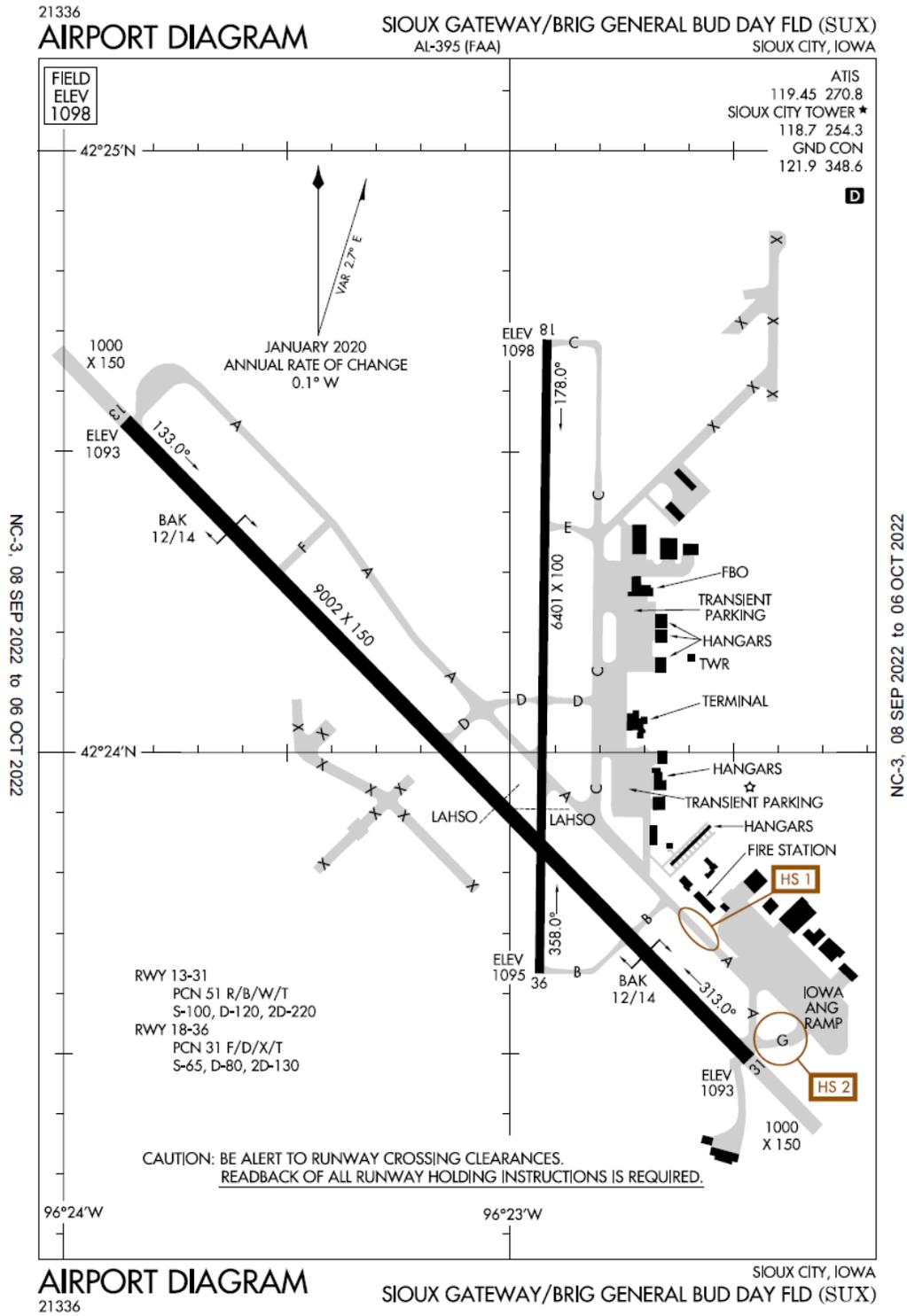
- » Portions of Taxiway A southeast of Taxiway B are not visible by control tower.

Hot Spot 2

- » The control tower has limited visibility of Taxiway A near ARFF building and of Taxiway G.

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Figure 1-7 FAA Airport Diagram



Source: Federal Aviation Administration

1.6.4 Pavement

The Airport’s civilian public-use paved airfield surfaces total roughly 133 acres, with pavement conditions ranging from excellent to failed. The Airport conducts Pavement Condition Index (PCI) surveys, with the most recent survey performed in July 2010. The PCI is a visual analysis of the existing pavement surface conditions and serves as the baseline for progressive PCI projections. PCI values range from 0, representing pavement that has failed and is no longer usable, to 100, which represents new pavement in pristine condition. PCI values are further broken-down into a numeric index indicating the type of pavement repair anticipated including reconstruction (0 to 40), major rehabilitation (40 to 75), and preventative maintenance (75 to 100).

The runway, taxiway, and apron pavement conditions resulting from the most recent PCI inspection are illustrated in **Figure 1-8**. The sections of pavement that have been improved since the last PCI inspection are listed in **Table 1-9** and shown in **Figure 1-8**.

Table 1-9 Airfield Improvements

Map No.	Year	Description
1	2017	<ul style="list-style-type: none"> Crossover portion of Taxiway F was removed and Taxiway F connector to Runway 13 was moved northwest
2	2018	<ul style="list-style-type: none"> Yellow portion of entrance Taxiway onto Runway 13
3	2020	<ul style="list-style-type: none"> Runway 18/36 extended south Dark green and light green portion of Taxiway C Taxiway B moved to accommodate new Runway 36 entrance Taxiway E
4	2021	<ul style="list-style-type: none"> Yellow portion of Taxiway D and Taxiway C Peach portion of Taxiway A
5	2022	<ul style="list-style-type: none"> Runway 13/31 South Apron
6	2023	<ul style="list-style-type: none"> Taxilane to north hangars North Apron Terminal Apron Apron for north hangars

Source: RS&H, 2023

There are new surfaces that have been constructed since the last inspection that are not shown in **Figure 1-8** such as Taxiway G and Taxiway M.

Figure 1-8 2010 Pavement Condition Index Map



Source: SUX ALP Narrative Report, Compiled by RS&H, 2010

1.6.5 Navigation Aids and Lighting

Navigational aids, often referred to as NAVAIDs, are categorized into three types: visual aids, electronic aids, and meteorological aids. SUX features all three types of NAVAIDS, which can be used by pilots to safely navigate to and from the Airport in varying types of weather. The NAVAIDS at SUX are detailed in the following sections and shown in **Table 1-10**.

1.6.5.1 Visual Aids

Visual aids and airfield lighting play a pivotal role in safe flight operations during periods of inclement weather and/or darkness by providing guidance to pilots both in the air and on the ground.

Runway 13-31 is equipped with High Intensity Runway Lighting (HIRL) with five-step intensity control and four-light Visual Approach Slope Indicators (VASI). A Medium Intensity Approach Lighting System with Runway Alignment Indicator Lights (MALSR) is installed on Runway 31. Runway 13 features a Medium Intensity Approach Lighting System (MALS). Runway 13-31 is a precision runway that includes the following markings: the runway designator, centerline, threshold, aiming point, touchdown zone, edge, and taxi-line.

Runway 18-36 is equipped with Medium Intensity Runway Lighting (MIRL) with three-step intensity control and four-light Precision Approach Path Indicators (PAPI). Runway End Identifier Lights (REIL) provide further visual guidance to pilots at the end of Runway 18. Runway 18-36 is a non-precision runway that includes the following markings: the runway designator, centerline, threshold, and aiming point. Outside of the operational hours of the control tower, pilots can activate the approach and runway lighting on the tower frequency.

Other visual aids at the Airport include a rotating beacon, five lighted wind direction indicators (windcones), and lighted runway distance remaining signs.

1.6.5.2 Electronic Aids

Electronic Aids include devices and equipment used for the instrument approaches available at the Airport, which are listed in **Table 1-10**.

Instrument Landing System (ILS) approaches serve both ends of Runway 13-31. An ILS is a precision approach that provides highly accurate course and distance guidance used to navigate to the runway. The key components of an ILS include the localizer, which provides horizontal guidance, and the glideslope antenna, that provides vertical guidance. The TOMMI NDB serves as the locator outer marker and initial approach fix for the ILS approach to Runway 13 and the missed approach holding fix for Runway 31.

The Airport's RNAV approaches for all ends of Runway 13-31 and Runway 18-36 rely on Global Positioning System (GPS). GPS is a space-based satellite system that enables the position determination of aircraft during all phases of flight. The system relies on GPS satellites that are owned by the United States Government and controlled by the Department of Defense.

There is a combined Very High Frequency Omni-Directional Range (VOR) and tactical air navigation system (TACAN) station that sits approximately four miles southeast of the Airport named the "Sioux City VORTAC." A VOR is a ground-based facility that transmits high frequency radio signals 360 degrees in azimuth to help pilots navigate to/from the station directly or on a pre-selected course. A TACAN provides similar but more accurate information to military aircraft. The Sioux City VORTAC also includes Distance Measuring Equipment (DME) which allows pilots to determine their distance from a ground station. The VORTAC is used for general navigation but not featured in any instrument approach at SUX.

The Airport also features Runway Visual Range (RVR) equipment on Runway 13-31 which uses advanced sensors to determine the horizontal distance a pilot can expect to see down the runway. This data is then used to help determine whether it is safe to take off or land in times of limited visibility.

1.6.5.3 Meteorological Aids

The primary meteorological aid at the Airport is an Automated Surface Observing System (ASOS) located to the southeast of the Runway 36 threshold which provides real time weather conditions to air traffic control personnel and pilots, as well as recording data used by the National Weather Service. An ASOS is capable of reporting basic weather elements including the sky condition, visibility, precipitation, pressure, temperature, and wind.

Table 1-10 Navigational Aids

	Runway			
	13	31	18	36
Visual Aids				
Lighting System	HIRL	HIRL	MIRL	MIRL
Approach Lighting	MALS	MALSR	REIL	No
Visual Slope Indicator	VASI-4	VASI-4	PAPI-4	PAPI-4
Runway Markings	Precision	Precision	Non-Precision	Non-Precision
Runway Centerline Lights	No	No	No	No
Electronic Aids (Approaches)				
ILS or LOC DME	Yes	Yes	No	No
RNAV (GPS)	Yes	Yes	Yes	Yes
VOR/DME	Yes	Yes	No	No

Source: ADIP, FAA 5010, Airport Records, Prepared by RS&H, 2022

1.6.6 Airspace

This section contains a summary of the airspace surrounding SUX, the responsibilities of various air traffic control facilities, and limitations imposed on the flight paths of individual aircraft by the geography and surrounding airspace. In addition, it describes the preferred runway uses, aircraft approaches and departures, special air traffic rules, and noise mitigation strategies.

1.6.6.1 Air Traffic Control Facilities

The Sioux Gateway Airport Traffic Control Tower (ATCT), completed in 1992, operates under the control of FAA personnel daily from the hours of 6:00 AM – 9:30 PM CST (7:00 AM – 10:30 PM CDT). When the ATCT is in operation, air traffic controllers are responsible for directing the ground movement of all aircraft and vehicles on the runway and taxiway system as well as provide instruction and clearances to aircraft within the Class D airspace that surrounds SUX. The tower consistently handles more than 15,000 aircraft operations annually. The ATCT is located off Mitchell Street on the east side of the Airport, adjacent to the FBO ramp. Due to its

positioning, air traffic controllers have limited visibility of the southeastern portion of Taxiway A and Taxiway G near the Iowa Air National Guard Ramp.

The Sioux Gateway Terminal Radar Approach Control (TRACON) facility is co-located with the ATCT and provides pilots with radar services and traffic separation during the initial descent towards the Airport and after clearing the Airport traffic pattern upon departure. Generally, TRACON controllers will handle aircraft requesting radar services within a 30- to 50-mile radius from the surface up to 10,000 feet MSL. Once an aircraft is within five miles and below 2,500 feet MSL prior to landing, the TRACON controller will request that the aircraft switch frequencies and establish two-way radio communication with the ATCT.

1.6.6.2 Airport Traffic Control Procedures

The national airspace system consists of various classifications of airspace that are regulated and controlled by several layers of FAA air traffic control facilities. The Sioux Gateway Terminal Radar Approach Control (TRACON) facility, located within the Sioux Gateway Airport Traffic Control Tower (ATCT), provides pilots with radar services and traffic separation during the initial descent towards the Airport and after clearing the Airport traffic pattern upon departure. The ATCT is responsible for aircraft on the ground, taking off, and on final approach before landing. The Minneapolis Air Route Traffic Control Center (ARTCC), one of 22 ARTCC facilities in The United States, handles aircraft during the enroute phase of flight in this area.

Airspace classification ensures the safety of all aircraft using the facilities during periods of inclement weather by providing separation of IFR and VFR traffic. **Figure 1-9** depicts the airspace surrounding SUX. The Airport lies within Class D airspace (depicted by the dashed blue circle) when the ATCT is operational between 0600-2130. This airspace is controlled by the ATCT and extends from the surface up to 3,600 feet Mean Sea Level (MSL). When the ATCT is closed, the airspace becomes uncontrolled and converts to Class E. When Class E airspace is in effect, pilots and vehicle operators that are approved to operate in the movement area state their intentions on the Common Traffic Advisory Frequency (CTAF). The magenta keyhole around SUX shown in **Figure 1-9** indicates Class E airspace beginning at 700 feet Above Ground Level (AGL). IFR clearances are available when the ATCT is closed through The Sioux Gateway TRACON facility. IFR clearances allow pilots to fly in instrument meteorological conditions and maneuver their aircraft solely based on referencing the instrumentation in the cockpit.

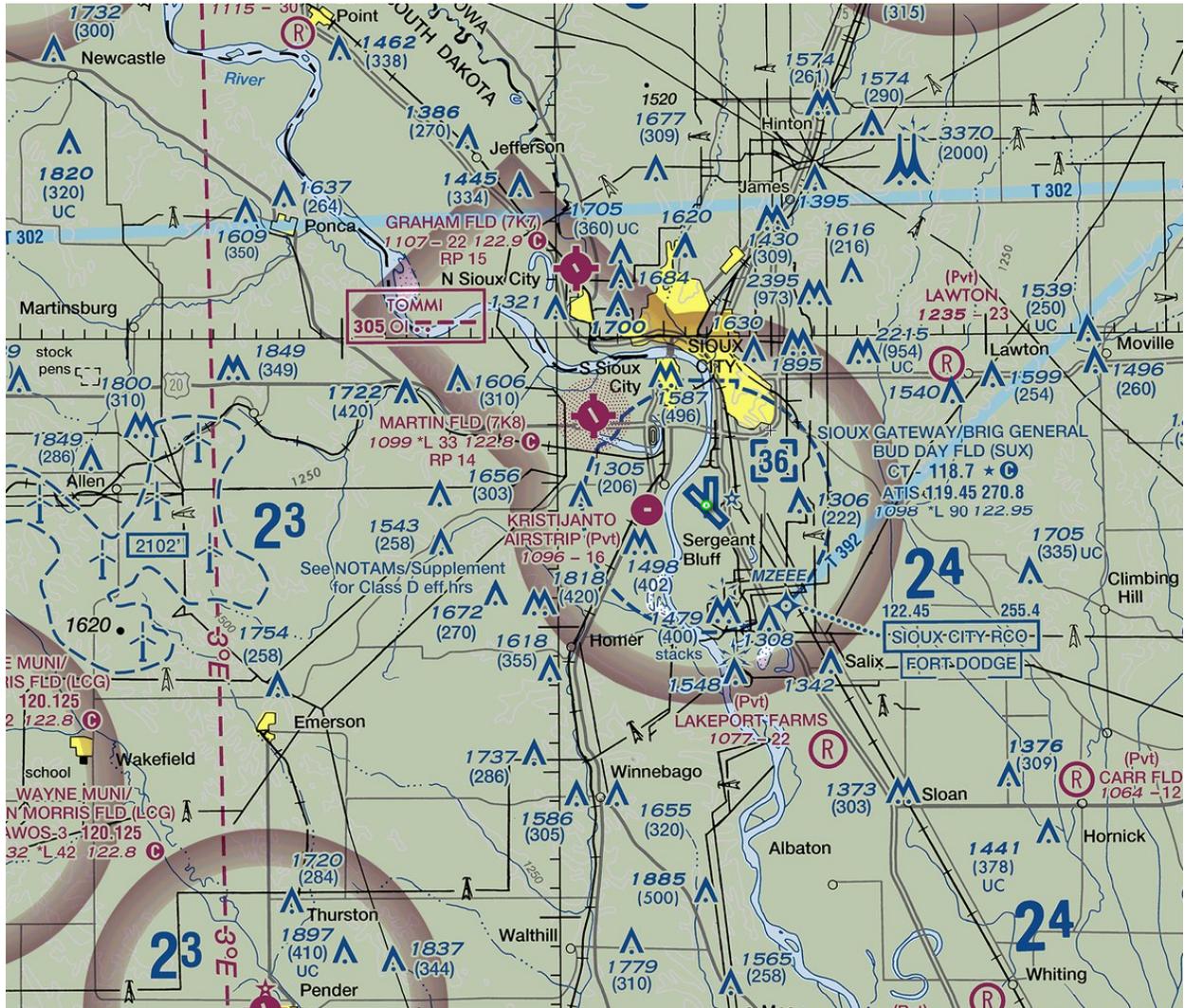
1.6.6.3 Approach Procedures

Air traffic operations fall within two categories: those flying under Visual Flight Rules (VFR) and those under Instrument Flight Rules (IFR). Under VFR, aircraft operating in favorable weather conditions do so by using “see and avoid” practices outlined in FAR Part 91 to avoid conflicts with other aircraft. VFR aircraft are given instructions and clearances from Air Traffic Controllers

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(ATC) while inside Class B, C, or D airspace, but otherwise are relatively free to choose their own route and altitude. When the prevailing weather conditions permit, general aviation aircraft typically choose to operate under VFR.

Figure 1-9 Airspace Surrounding Sioux Gateway Airport



Source: www.skyvector.com

Transport category aircraft, as well as many charter aircraft and high-performance general aviation aircraft that are properly equipped and staffed, operate under IFR. Aircraft flying under IFR are required to comply with routes and altitudes given by ATC during all phases of flight. Under IFR, ATC is responsible for ensuring the adequate separation of aircraft, as they may be flying in clouds, snow, or other conditions conducive to poor visibility.

Aircraft approaching the Airport in poor weather use standardized Instrument Approach Procedures (IAPs) that outline a set of maneuvers designed to provide navigational guidance to a point from which a visual landing can be made. The pilot’s ability to land without seeing the runway landing zone is determined by several factors, including the approach lighting, navigational aids, aircraft equipment, and pilot qualifications.

Table 1-11 summarizes the instrument approaches available at the Airport and the minimum Runway Visual Range (RVR)/visibility and decision altitude associated with each approach. The decision altitude is the pre-determined height above the runway surface in which a missed approach must be executed if the pilot does not have the runway environment in-sight.

Table 1-11 Instrument Approaches

Instrument Approaches	Minimum Visibility	Decision Altitude
Primary Runway		
Runway 13		
ILS or LOC RWY 13	4,000' RVR	200'
RNAV (GPS) RWY 13	4,000' RVR	200'
Runway 31		
ILS or LOC RWY 31	2,400' RVR	200'
RNAV (GPS) RWY 31	2,400' RVR	200'
Crosswind Runway		
Runway 18		
RNAV (GPS) RWY 18	3/4 SM	300'
Runway 36		
RNAV (GPS) RWY 36	3/4 SM	200'

Source: FAA Facility Directory

Definitions: GPS – Global Positioning System, ILS – Instrument Landing System, LOC – Localizer, RNAV – Area Navigation, RVR – Runway Visual Range, SM – Statute Miles

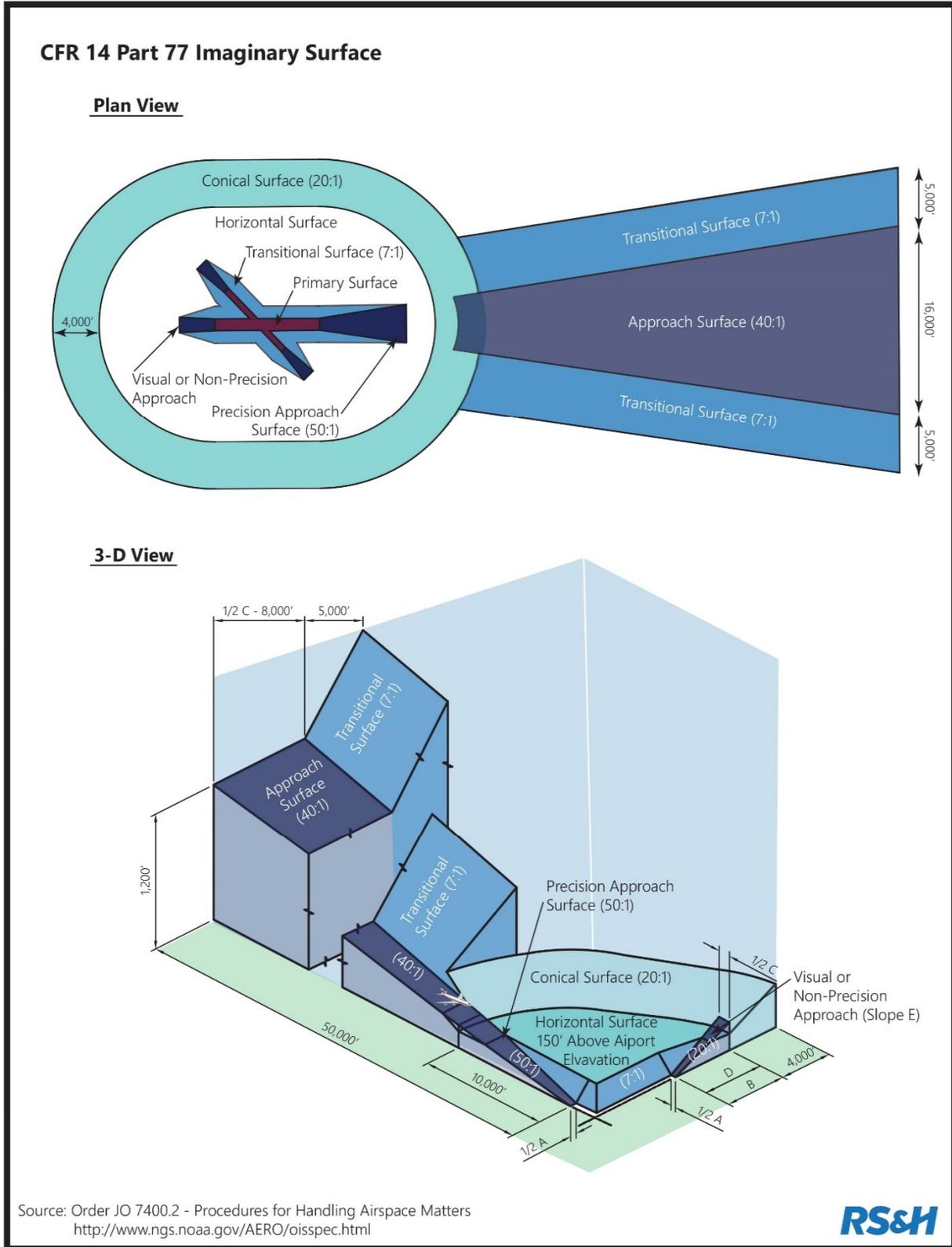
1.6.6.4 Part 77 Safe, Efficient Use, and Preservation of the Navigable Airspace

The airspace surrounding the Airport should be kept clear of obstructions to the furthest extent possible. Title 14 of the Code of Federal Regulations (CFR) Part 77, *Objects Affecting Navigable Airspace*, keeps essential airspace free and clear of obstructions that could be hazardous to aircraft on an approach to an airport. If an object, naturally occurring or erected structure, penetrates any of the five surfaces established by Part 77 or imaginary surfaces, that object is declared an obstruction with action to be taken to either remove the obstacle or publish information to alert pilots as to the location of the obstacle.

The five sections of Part 77 airspace are broken out into the following surfaces: Primary Surface, Approach Surface, Transitional Surface, Horizontal Surface, and Conical Surface. A description of each surface along with their dimensions are listed below and shown in **Figure 1-10**:

- » **Primary Surface** – This surface is centered on the runway, extending 200 feet beyond the edge of the runway. The width of the surface is dependent upon the type of approach to the runway. Since Runways 13 and 31 have an instrument landing approach, the primary surface width of Runway 13-31 is 1,000 feet. The width of the primary surface for Runway 18-36 is also 1,000 feet since it has visibility minimums of $\frac{3}{4}$ of a mile.
- » **Approach Surface** – The approach surface is a sloped plane that begins at the edge of the primary Surface and extends horizontally in the shape of a trapezoid. The slope horizontal length, and the width of the surface are dependent upon the approach to the runway. Runway 13 and Runway 31 are precision instrument runways with an approach surface length of 50,000 feet and a width at the end of the surface of 16,000 feet. The first 10,000 feet of the approach surface has a slope of 50:1, while the remaining 40,000 feet has a slope of 40:1. Runway 18 and Runway 36, both non-precision runways, have an approach surface length of 10,000 feet with a width of 4,000 feet at the end of the surface. For these runways, the approach surface has a slope of 34:1.
- » **Transitional Surface** – This surface is a plane sloped at 7:1 from the primary surface and approach surfaces. The surface terminates when it intersects with the horizontal surface at 150 feet above the airport elevation.
- » **Horizontal Surface** – This surface is a horizontal plane 150 feet above the airport elevation. The geometry of the surface is created by arcs centered on the edge of the primary surface with defined radii and then connected by tangents. The radius of the horizontal surface, based on the approaches at Sioux Gateway Airport, is 10,000 feet.
- » **Conical Surface** – This surface is a plane sloped at 20:1 extending upward from the periphery of the horizontal surface by 4,000 feet.

Figure 1-10 Part 77 Surfaces



1.6.6.5 Airspace Obstructions

The location of relevant Part 77 airspace obstructions for Runway 13-31 and Runway 18-36, as they are published at the time of this writing, are detailed in **Table 1-12**. The protection of local airspace is the sponsor's utmost priority to ensure the continued safe use of the airport and the Part 77 imaginary surfaces were established to provide a reference point for obstacles that could pose a hazard to airspace navigation. Obstacles that pose an obstruction to one or multiple airspace surfaces, even when recorded and/or marked, can still require the airport to modify their aircraft approach procedures and operating minimums. This can reduce the utility of the airfield, nullifying previous investment and making the airport less accommodating and appealing to operators.

Table 1-12 Airspace Obstructions

Runway	Obstruction	Height MSL	Location	Penetrated Surface
13	Trees	1,162'	2,242' from end, 920' right of centerline	Approach Surface
13	Tree	1,209'	4,517' from end, 1,664' left of centerline	Approach Surface
18	Sign	1099'	29' from end, 212' left of centerline	Approach Surface
31	Trees	1171'	3,018' from end, 122' left of centerline	Approach Surface
31	Trees	1173'	3,100' from end, 431' right of centerline	Approach Surface
31	Tree	1174'	3,205' from end, 669' right of centerline	Approach Surface
31	Trees	1,209'	4,622' from end, 1,700' left of centerline	Approach Surface
36	Trees	1172'	1,504' from end, 495' right of centerline	Approach Surface

Source: FAA Published Departure Procedure, 2022

Note: MSL – Mean Sea Level

1.7 Commercial Passenger Facilities

The commercial passenger facilities at the Airport include the passenger terminal building, terminal gates and apron. These areas are specifically designed to serve passengers using the commercial airline services at SUX.

1.7.1 Passenger Terminal Building

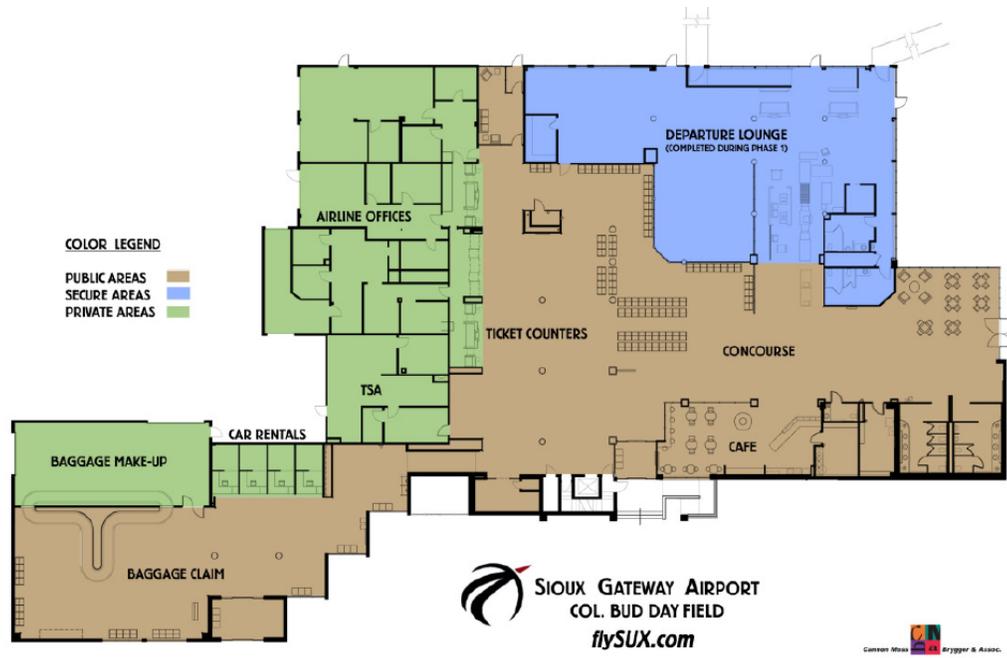
The passenger terminal building is located on the Airport's east side, immediately east of Taxiway C and Runway 18-36. The terminal building was constructed in 1953 and has undergone several renovations since with the most recent taking place in 2011. The first level of the 38,000¹¹ square foot (sq ft) building consists of airline ticket counters, a baggage claim carousel, several

¹¹ Square footage is approximate and based on 2001 Master Plan Inventory calculations.

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car rental counters, a departure lounge, airline offices, and space for the Transportation Security Administration (TSA). There is a conference room on the second floor while the third floor is reserved for administration offices. The terminal building also boasts free wi-fi/internet access, personal workstations, a gift shop, and a popular cafe that serves breakfast, lunch, and spirits. The layout of the first floor of the passenger terminal is shown in **Figure 1-11**.

Figure 1-11 Passenger Terminal Layout



Source: Terminal Info | City of Sioux City website (sioux-city.org)

1.7.2 Passenger Terminal Gates and Apron

There are two gates served by passenger loading bridges at the Airport. Located on the northwest side of the terminal, these two gates as currently installed can serve commercial passenger aircraft with a capacity of 19-130 passengers. There is also one decommissioned commuter gate on the southwest side of the terminal.

The apron used for commercial passenger aircraft is approximately 198,000 sq ft concrete pavement.

1.8 Landside Facilities

The landside facilities at the airport provide the intermodal connection between a variety of ground transportation modes and the aircraft. These facilities include regional access and on-airport circulation roadways, the terminal curb roadway, public and employee parking facilities,

rental car ready/return storage and service areas, and commercial ground transportation facilities for taxis, shuttles, et al.

1.8.1 Airport Regional Access

Regional vehicular access to all landside accessible areas of the Airport is provided via the intersection of 1st Street and Interstate Highway 29 located immediately east of the Airport. After exiting the highway, arriving traffic must head west on 1st Street, which becomes Aviation Boulevard until it connects with Pershing Street, the terminal curb roadway. On the south side of the terminal, Pershing Street leads to Ogden Avenue which can be followed east back to Aviation Blvd., 1st Street, and Interstate 29.

1.8.2 Passenger Terminal Curbfront

Pershing Street is the section of the terminal loop road that includes the curbfront directly outside of the terminal and has a one-way traffic flow with two lanes. The inner lane supports passenger pick-up/drop-off while the outer lane is a through lane that provides access to Airport parking facilities. This road segment is intersected by two pedestrian crosswalks, one which is covered, that connect both short- and long-term parking to the terminal building. Overall, there is roughly 400 feet of curbfront with sidewalk available for passenger drop-off and pick-up.

1.8.3 Passenger and Employee Vehicle Parking

Vehicle parking at SUX includes a short- and long-term parking lot for commercial passengers, and a separate employee lot.

The parking lot, located immediately east of the passenger terminal building is divided into two sections, but both have the same rate. The first hour is free and then charge \$3 an hour with a \$9 max per day. The fee transactions are managed electronically by an automated credit card exit. These are the largest parking lots at the Airport and account for a total of 389 parking spaces between them.

To the north of the passenger terminal building is a 33,000 sq ft employee parking lot that is currently striped for 50 spaces.

1.8.4 Ground Transportation Services

The Sioux Gateway Airport is served by several ground transportation providers including five permitted taxi companies, two Transportation Network Companies (TNCs), and the Sioux City Transit System.

The taxi companies that service the airport on a continuous basis include Action Taxi, Dadi Taxi, EZ Cabs, Siouxland Taxi, and Taxi Express. Airport users are also encouraged to use the services of approved TNCs, including Lyft and Uber, to meet their need for local transportation.

The Sioux City Transit System offers bus service to and from the Airport via airport route #6 and airport route #11 Monday – Saturday from 6:00 AM to 6:00 PM. Airport route #11, which was added in November 2022, is an express service with a limited number of stops that connects the Airport to the nearby city of Sergeant Bluff and an industrial area directly to the south of SUX.

1.8.5 Rental Car Facilities

There are four rental car companies (Avis, Enterprise, Hertz, and National) that serve passengers at SUX from customer service counters adjacent to baggage claim. The companies have 63 rental car ready/return spaces located in a small lot southeast of the terminal. Since the lot is not access controlled, customers return and pick up keys at the counters inside the terminal building. The proximity of the ready-return spaces to the terminal enables both customers and staff to walk between the two areas rather than having to be shuttled.

Additionally, there is a quick turnaround lot located father south, immediately east of the south apron, which is used for the fueling, washing, and storage of rental cars.

1.9 General Aviation and Support Facilities

This section describes the location and condition of general aviation and airport support facilities. These facilities include fixed based operators (FBOs), hangars, apron areas, air cargo operators, aircraft rescue and firefighting (ARFF), FAA facilities, maintenance, deicing operations, and fuel storage. See **Figure 1-6** for a layout of general aviation and support facility locations.

1.9.1 Fixed Based Operator

SUX is currently served by one full service FBO, Hawthorne Global Aviation Services, located directly north of the terminal building near the intersection of Taxiway C and E. The FBO, which is open daily from 5:00 AM to 8:00 PM, features a multitude of amenities and services including aircraft ground handling support, parking, fueling, car rental, and access to a pilot lounge and conference room.

At the time of this writing, Oracle Aviation is in the process of building a facility on the north side of the airfield, which will be home to the airport's second FBO.

1.9.2 Hangars

The quantity and type of hangar space at an airport is driven by many different factors including the total number of based aircraft, fleet mix, local weather conditions, airport security, user preferences, and other various market forces. There are three different kinds of general aviation hangar facilities that can be found at SUX: conventional hangars, corporate hangars, and T-hangars. These hangar types are general terms used to describe different hangar sizes with somewhat different uses. The following outlines broad definitions for how each hangar space is programmed within the context of this Master Plan:

- » **T-hangars** – Small hangars typically arranged so small aircraft are “nested” next to each other in alternating directions. One “T” can require 6,500 sq ft and approximately 65,000 sq ft of airside land is required to develop a 10-unit nested T-hangar facility. A small hangar may have a door height of 12 feet.
- » **Conventional hangars** – Hangars larger than a T-hangar that can potentially house multiple smaller aircraft. A conventional hangar itself can range from 5,000-30,000 sq ft. Additional space is required for apron frontage needs, landside/parking areas, and other various site development elements. A conventional hangar may have a door height of 19 to 30 feet.
- » **Corporate hangars** – Large hangars, containing one or more aircraft, with associated office space for flight crews, corporate passenger staging, and maintenance. Corporate hangars alone typically range from 30,000-60,000 sq ft, or more. In addition, incorporated office elements, landside areas, and other site development aspects can vary greatly depending on the preference of the owner. A corporate hangar may have a door height of 20 to 40 feet.

The current FBO at the Airport, Hawthorne Global Aviation Services, uses three conventional hangars for small - to medium-size aircraft storage and maintenance. Oracle Aviation will operate out of two hangars that are yet to be constructed on the north side of the airfield.

1 Vision Aviation, a FAR Part 145 Repair Station, makes use of a 32,000 sq ft hangar facility for its operations. There are two 10-unit T-hangar facilities used for small aircraft storage on the airfield; one on the far south side of the airfield near the IANG ramp and another on the north side. Two more 10-unit T-hangar facilities, which will be located adjacent to the north ramp, are currently under construction. There are multiple corporate hangars near both the south and north apron area that are used to house larger corporate aircraft. All hangar facilities on the airfield can be accessed via Taxiway C and the apron areas.

1.9.3 Aircraft Apron

The apron/ramp areas are located on the east side of the airfield and support varied transport and general aviation aircraft parking for Airport tenants, commercial operators, and transient users. The set of aprons at SUX consist of the following paved areas:

- » North apron
- » FBO apron
- » Commercial/Terminal apron
- » South apron
- » Iowa Air National Guard apron

These areas total about 50 acres. The north and south apron are used by general aviation aircraft. The Iowa Air National Guard apron is off-limits to civilian aircraft.

1.9.4 Air Cargo

The Airport does not have an operator that provides dedicated air cargo service to the area. Due to the Airport's proximity to Omaha Eppley Airfield (OMA) and Joe Foss Field (FSD) in Sioux Falls, which are both served by several major air cargo carriers, SUX has historically not been able to attract dedicated air cargo service.

1.9.5 Aircraft Rescue and Firefighting

The purpose of an aircraft rescue and firefighting (ARFF) facility is to save lives by maximizing emergency response and intervention during an airport crisis. ARFF provides emergency assistance, inspection of fuel farms, fuel trucks, and commercial sites, guidance relative to compliance with FAA standards on safety equipment, and training, and is the medical first responder for an aircraft accident or incident.

Air carrier ARFF facilities are assigned an index group based on the length of the air carrier aircraft that use the airport regularly. The 14 CFR Part 139 index determination for an airport is defined by a combination of the length of air carrier aircraft and average daily departures of air carrier aircraft. A listing of the index determinations is provided in **Table 1-13**.

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Table 1-13 FAR Part 139 ARFF Index Determinations

Index Group	Aircraft length
A	Aircraft less than 90 feet
B	Aircraft at least 90 feet but less than 126 feet
C	Aircraft at least 126 feet but less than 159 feet
D	Aircraft at least 159 feet but less than 200 feet
E	Aircraft greater than 200 feet

Source: FAR Part 139.315

Through an agreement, all firefighting operations at SUX are managed by the Iowa Air National Guard and operated 24 hours a day. The IANG maintains the ARFF facility located in the southwest portion of the airport near the IANG ramp and is in charge of its associated operations in accordance with all FAA and military requirements. Based on the largest air carrier aircraft that has historically operated at SUX, the Bombardier CRJ900, the Airport is assigned an ARFF Index B, but is able to accommodate Index E upon request. To support these requirements, the IANG has eleven ARFF vehicles that are stored in a heated fire station near the south end of Taxiway A. Two Oshkosh P-23s (“Crash 3” and “Crash 11”) and one Oshkosh P-19R (“Crash 10”) serve as the Airport’s primary ARFF vehicles while the other eight are classified as backup equipment. These backup vehicles ensure the Airport maintains ARFF Index B requirements even if the primary ARFF vehicles become inoperative. See **Table 1-14** for the ARFF vehicle inventory.

Table 1-14 SUX ARFF Inventory

Year	Make/Model	Water Capacity/Rate (GAL)	Chemical (GAL)
Primary Equipment			
1995	Oshkosh P-23	3,300	500
2007	Oshkosh P-19R	1,500	210
1996	Oshkosh P-23	3,300	500
Backup Equipment			
2002	Ford Excursion	N/A	N/A
2008	Ford F-350 Super Duty	N/A	N/A
2014	E-One Typhoon	530	30
2004	Ford F-250 Ligth Rescue	N/A	N/A
2014	KME Rapid Intervention Vehicle	410	70
2011	International Water Tanker	4,000	N/A
UKN	ARFF Trailer	1,000	N/A
UKN	USAR Response Trailer	N/A	N/A

Source: Airport records, Compiled by RS&H, 2022

1.9.6 Maintenance and SRE

SUX owns and operates a variety of maintenance equipment needed for snow removal, ground maintenance, pavement and facilities maintenance, and general repairs. The airport maintenance and snow removal equipment (SRE) facilities are located southeast of the terminal building and directly east of the south apron. The combined space of approximately 31,500 sq ft houses all maintenance equipment including mowers, snow blowers, snowplows, and trucks. A complete list of maintenance and snow removal equipment at the Airport is shown in **Table 1-15**.

Table 1-15 SUX Snow Removal Equipment Inventory

Year	Make	Model	Type
2021	Halliday RFT	RDT-3	Runway Friction Tester
N/A	Bowmonk	AFM2 Mark3	Airfield Friction Meter
1993	Oshkosh/MB	H Series	Runway Broom
2012	Oshkosh/MB	H Series	Runway Broom
2013	Wausau	SnoDozer	Runway Broom
2013	Wausau	SnoDozer	Runway Broom
2003	Oshkosh/MB	H-Series	Snow Blower
2023	Oshkosh/MB	P Series	Snow Blower
2003	Oshkosh/MB	P Series	Plow Spreader
2005	Oshkosh/MB	P-Series	Plow Spreader
2008	International		Liquid Spray Rig
1997	Case	921B	Loader with Blade
2004	John Deere	444	Loader with Ramp Blade

Source: Airport Records, Compiled by RS&H, 2022

1.9.7 Fuel Storage

Hawthorne Global Aviation Services is responsible for the fueling of all general aviation and commercial aircraft at SUX. The FBO offers Jet A, which is used by aircraft powered by gas-turbine engines, and avgas (100LL), which is used by smaller, piston driven aircraft primarily within the general aviation community. The Airport’s fuel storage is located west of the airport maintenance facilities and is comprised of two 20,000-gallon tanks reserved for jet fuel storage as well as one 10,000-gallon 100LL avgas tank. There is also one privately-owned 10,000-gallon Jet A tank on the airfield servicing a corporate hangar north of the terminal building and adjacent to the ATCT. The Iowa Air National Guard owns and operates their own fuel storage

facilities and oversees the fueling of all military aircraft operations. Oracle Aviation plans on constructing their own fueling facilities which will sit near Hawthorne's three conventional hangars to the north of the terminal.

There is currently no sustainable aviation fuel (SAF) located at SUX. SAF is similar to conventional JetA fuel, but with a smaller carbon footprint. It is produced using non fossil resources such as corn grain, oil seeded, algae, agricultural residues, etc. and reduces the amount of greenhouse gases emitted through aviation.¹² With the growing trend of sustainability at airports, SAF may be something the Airport can potentially implement in the future.

1.10 Utilities

The availability of water, sanitary sewer, gas, electric and storm water drainage to an airport must be considered while evaluating the existing utility conditions and determining available capacity for future growth of the Airport.

MidAmerican Energy, which oversees more than 12,000 miles of natural gas pipelines throughout Iowa, Illinois, Nebraska, and South Dakota, is responsible for the Airport's electric power and gas supply. These services are provided to SUX via MidAmerican Energy's network of underground electrical lines and 4-inch main gas pipes in the area. Historically, this service has been very consistent and reliable resulting in very few electrical outages at SUX.

Water service is provided by the City of Sioux City Water Department through the means of a 16-inch main while sanitary sewer services are provided by the Sioux City Environmental Services Department. The Airport also has a National Pollutant Discharge Elimination System (NPDES) permit which allows for the discharge of stormwater linked with industrial activity within set limits. NPDES permits ensure the legislation established by the Clean Water Act of 1972 is upheld and both federal and state mandatory standards for clean water are met. Stormwater at SUX is discharged into the nearby Missouri River.

1.11 Iowa Air National Guard (IANG)

The IANG facilities sit on approximately 400 acres of land leased to the unit from the City of Sioux City on the southeastern portion of the Airport. These 400 acres are reserved for the exclusive use of the IANG. The IANG apron consists of approximately 78,000 sq ft of concrete pavement located immediately northeast of Taxiway B and Runway 13-31. There are approximately 45 buildings located on the property, most of which are directly adjacent to the ramp. There are a few buildings on the southwest side of Runway 13-31 including the IANG's Petroleum, Oil, and Lubricants (POL), paint, and fueling facilities.

¹² *Sustainable Aviation Fuels*. (n.d.). Energy.gov. <https://www.energy.gov/eere/bioenergy/sustainable-aviation-fuels>

The Sioux Gateway Airport has been the home to the 185th Tactical Fighter Group of the Iowa Air National Guard (IANG) since 1946. In 2003, the wing was redesignated as the 185th Air Refueling Wing (ARW). For the last twenty years, the unit has solely operated the KC-135, a multi-engine refueling tanker. The mission of the 185th ARW is to provide ready airmen to support global strategic competition, nuclear deterrence, and aerial refueling across federal and state missions.¹³ Within a year of its establishment, the 185th ARW began flying NATO refueling missions in Germany. In 2005, multiple missions to the Gulf Coast were conducted to support the disaster relief effort in the aftermath of Hurricane Katrina. The 185th was recently recognized by the Air Force with the “Outstanding Unit Award” in 2020 thanks to its outstanding performance and demonstrated resiliency in response to the challenges presented by the COVID-19 pandemic.

In addition to the 185th ARW, the 113th Cavalry Support Unit, 334th Brigade Support Battalion, Headquarters and Headquarters Troop, and a detachment from the 2168th Transportation Company make use of these facilities for training purposes and to conduct various administrative functions. The unit as a whole is made up of more than 1,000 combined full-time and part-time employees.

1.12 Environmental Conditions

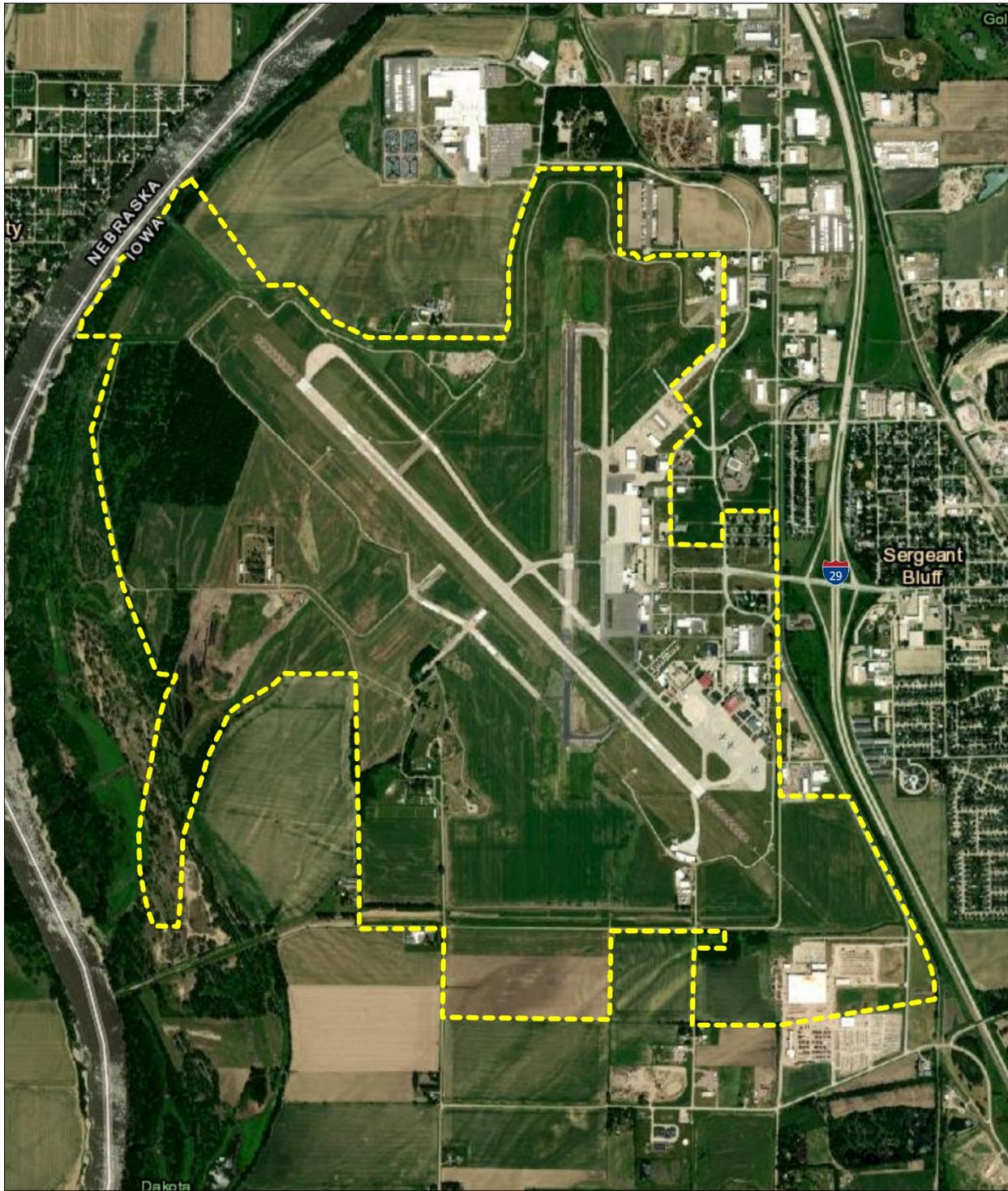
Federal Aviation Administration (FAA) Advisory Circular (AC) 150/5070-6B Change 2, *Airport Master Plans*, provides guidance for the preparation of master plans for airports. The purpose of considering environmental factors in airport master planning is to help the Airport Sponsor to thoroughly evaluate airport development alternatives and to provide information that will help expedite subsequent environmental processing. Future development plans at the Sioux Gateway Airport (Airport) take into consideration environmental resources that are known to exist at, and in the vicinity of, the future development. Early identification of these environmental resources helps to avoid impeding development plans in the future. For a comprehensive description of the existing environmental conditions at the Airport, environmental resource categories described in FAA Order 1050.1F, *Environmental Impacts: Policies and Procedures*, were used to identify and describe potential environmental effects during this planning process.

This section provides an overview of resource categories defined in FAA Order 1050.1F, Chapter 4, as it applies to the environs at the Airport. **Figure 1-12** shows the Airport property boundary and **Table 1-16** provides a summary of the environmental resource categories that were reviewed at the Airport.

¹³ About Us. (n.d.). 185th Air Refueling Wing. Retrieved April 4, 2023, from <https://www.185arw.ang.af.mil/About-Us/>

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Figure 1-12 Sioux Gateway Airport Property



Sioux Gateway Airport Property Boundary



Sources: Esri, 2023; RS&H, 2023

Table 1-16 Summary of Environmental Resource Categories at Sioux Gateway Airport

Environmental Resource	Summary
Air Quality	The Airport is in attainment for all air quality criteria pollutants. See Section 1.12.1 for more details.
Biological Resources	Federal- and state-threatened and -endangered species, as well as migratory birds have the potential to occur at the Airport. No critical habitat exists at the Airport. See Section 1.12.2 for more details.
Climate	Greenhouse gas (GHG) emissions are produced at the Airport. See Section 1.12.3 for more details.
Coastal Resources	The Airport is not within a coastal zone and there are no Coastal Barrier Resource System (CBRS) segments on Airport property. See Section 1.12.4 for more details.
Department of Transportation Act, Section 4(f)	No Department of Transportation Act, Section 4(f) resources exist on Airport property. See Section 1.12.5 for more details.
Farmlands	The Airport contains prime farmlands and farmlands of statewide importance. Most of the Airport is classified as an Urbanized Area and is exempt from the Farmland Protection Policy Act (FPPA). However, some land on the southeastern end of the Airport would be subject to the provisions in the FPPA. See Section 1.12.6 for more details.
Hazardous Materials, Solid Waste, and Pollution Prevention	No Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) superfund sites exist at the Airport. The Airport transports solid waste to the Northwest Iowa Area Sanitary Landfill. The Airport has National Pollutant Discharge Elimination System (NPDES), Stormwater Pollution Prevention Plan (SWPPP), and Spill Prevention, Control, and Countermeasure (SPCC) permits. See Section 1.12.7 for more details.
Historical, Architectural, Archaeological, and Cultural Resources	No historic resources listed on the National Register of Historic Places (NRHP) are located on Airport property. See Section 1.12.8 for more details.
Land Use	The Airport is zoned as business park, general industrial, and general commercial. Existing land uses around the Airport generally include industrial to the north, agricultural land and the Missouri River to the west, agricultural land and industrial to

	the south, and residential to the east. See Section 1.12.9 for more details.
Natural Resources and Energy Supply	Electricity and natural gas are supplied to the Airport by MidAmerican Energy. See Section 1.12.10 for more details.
Noise and Noise-Compatible Land Use	There are no noise-sensitive land uses within the updated day-night (DNL) 65 dBA noise contours. See Section 1.12.11 for more details.
Socioeconomics, Environmental Justice, and Children’s Environmental Health and Safety Risks	The Airport is in Sioux City, Iowa within Woodbury County. The Airport is in U.S. Census Bureau Census Tract 36, Block Group 4. There are minority and low-income populations within the Airport Census Tract. There are no schools or daycare facilities located within 0.5-mile of the Airport. See Section 1.12.12 for more details.
Visual Effects	Light emissions at the Airport currently result from airfield lighting, buildings, access roadways, and parking area lighting fixtures required for the safe and secure movement of people, vehicles, and aircraft. The visual resources and visual character of the Airport currently matches that of an urbanized area and an Airport. See Section 1.12.13 for more details.
Water Resources	According to the National Wetlands Inventory, there are wetlands present at the Airport. There are floodplains located on Airport property. The Airport is within the Bacon Creek-Missouri River watershed (HUC 12 ID: 102300010305). There are surface waters located on Airport property. No wild or scenic rivers, or rivers within the National River Inventory are present at the Airport. See Section 1.12.14 for more details.

Source: RS&H, 2023

1.12.1 Air Quality

The U.S. Environmental Protection Agency (USEPA) sets National Ambient Air Quality Standards (NAAQS) for specific air pollutants to protect public health and welfare through Section 109 of the Clean Air Act (CAA), which is the primary statute for air quality. The USEPA identifies the following six criteria air pollutants and has set NAAQS for each: Carbon Monoxide (CO), Lead (Pb), Nitrogen Dioxide (NO₂), 8-Hour Ozone (O₃), Particulate Matter (PM₁₀ and PM_{2.5}), and Sulfur Dioxide (SO₂).

Areas found to be in violation of one or more NAAQS of these pollutants are classified as “nonattainment” areas. States with nonattainment areas must develop a State Implementation Plan (SIP) demonstrating how the areas will be brought back into attainment of the NAAQS within designated timeframes. Areas where concentrations of the criteria pollutants are below (i.e., within) these threshold levels are classified as “attainment” areas. Areas with prior nonattainment status that have since transitioned to attainment are known as “maintenance” areas.

The Airport is in Woodbury County, which is in an “attainment” area for all six criteria pollutants.¹⁴

1.12.2 Biological Resources

Biological resources include terrestrial and aquatic plant and animal species; game and non-game species; special status species; and environmentally sensitive or critical habitats. The following are federal laws, regulations, Executive Orders (EOs), and guidance that protect biotic communities:

- » Endangered Species Act (ESA) (16 U.S.C. §§ 1531-1544);
- » Bald and Golden Eagle Protection Act (16 U.S.C. §§ 668 et seq.);
- » Magnuson-Stevens Fishery Conservation and Management Act (16 U.S.C. § 1801 et seq.);
- » Fish and Wildlife Coordination Act (16 U.S.C. § 661-667d);
- » Executive Order (EO) 13112, Invasive Species (64 FR 6183);
- » Marine Mammal Protection Act (16 U.S.C. § 1361 et seq.);
- » Migratory Bird Treaty Act (MBTA) (16 U.S.C. §§ 703 et seq.);
- » EO 13186, Responsibilities of Federal Agencies to Protect Migratory Birds (66 FR 3853);
- » Council on Environmental Quality (CEQ) Guidance on Incorporating Biodiversity Considerations into Environmental Impact Analysis under NEPA; and
- » EO 13751, Safeguarding the Nation from the Impacts of Invasive Species (81 FR 88609).

According to the U.S. Fish and Wildlife Service (USFWS) Information for Planning and Conservation (IPaC), there is one federally listed endangered species, the Pallid Sturgeon (*Scaphirhynchus albus*), two federally listed threatened species, the Piping Plover (*Charadrius melodus*) and the Northern Long-Eared Bat (*Myotis septentrionalis*), and one federal candidate species, the Monarch Butterfly (*Danaus plexippus*) with the potential to occur at the Airport.¹⁵ Additionally, there are ten migratory birds protected under the Migratory Bird Treaty Act with

¹⁴ U.S. Environmental Protection Agency, Air Quality Green Book, Iowa. Accessed: https://www3.epa.gov/airquality/greenbook/anayo_ia.html, January 2023.

¹⁵ U.S. Fish and Wildlife Service, Information for Planning and Consultation. Accessed: <https://ipac.ecosphere.fws.gov/location/EQCYONSGNFFH7GO634KEMY6QOU/resources>, January 2023.

the potential to occur at the Airport.¹⁶ According to the Iowa Department of Natural Resources (DNR), there are 44 state threatened and endangered species with the potential to occur in Woodbury County.¹⁷ Additionally, according to IPaC, the Airport does not contain any critical habitat for any of these species.¹⁸

1.12.3 Climate

Relevant federal laws, regulations, and EOs that relate to climate include:

- » CAA (42 U.S.C. §§ 7408, 7521, 7571, 7661 et seq.);
- » EO 13514, *Federal Leadership in Environment Energy and Economic Performance* (74 FR 52117);
- » EO 13653, *Preparing the United States for the Impacts of Climate Change* (78 FR 66817); and
- » EO 13693, *Planning for Federal Sustainability* (80 FR 15869).

Greenhouse gases (GHG) are gases that trap heat in the earth's atmosphere. Both naturally occurring and man-made GHGs primarily include water vapor, carbon dioxide, methane, nitrous oxide, hydrofluorocarbons, perfluorocarbons, and sulfur hexafluoride. Activities that require fuel or power are the primary stationary sources of GHGs at airports. Aircraft and ground access vehicles that are not under the control of an airport, typically generate more GHG emissions than airport-controlled sources.

Research has shown there is a direct correlation between fuel combustion and GHG emissions. In terms of U.S. contributions, the Government Accountability Office (GAO) reports that "domestic aviation contributes about three percent of total carbon dioxide emissions, according to EPA data¹⁹ compared with other industrial sources, including the remainder of the transportation sector (20%) and power generation (41%).²⁰ The International Civil Aviation Organization (ICAO) estimates that GHG emissions from aircraft account for roughly three percent of all anthropogenic GHG emissions globally.²¹

¹⁶ U.S. Fish and Wildlife Service, Information for Planning and Consultation. Accessed: <https://ipac.ecosphere.fws.gov/location/EQCYONSGNFFH7GO634KEMY6QOU/resources>, January 2023.

¹⁷ Iowa Department of Natural Resources, Natural Areas Inventory, Listed Species in a County, Woodbury County, IA. Accessed: <https://programs.iowadnr.gov/naturalareasinventory/pages/RepDistinctSpeciesByCounty.aspx?CountyID=97>, January 2023.

¹⁸ U.S. Fish and Wildlife Service, Information for Planning and Consultation. Accessed: <https://ipac.ecosphere.fws.gov/location/EQCYONSGNFFH7GO634KEMY6QOU/resources>, January 2023.

¹⁹ U.S. Government Accountability Office, Report to Congressional Committees, *Aviation and Climate Change*, June 2009. Accessed: <https://www.gao.gov/products/gao-09-554>, January 2023.

²⁰ U.S. Government Accountability Office, Report to Congressional Committees, *Aviation and Climate Change*, June 2009. Accessed: <https://www.gao.gov/products/gao-09-554>, January 2023.

²¹ Melrose, Alan, *European ATM and Climate Adaptation: A Scoping Study*, ICAO Environmental Report, 2010. Accessed: http://www.icao.int/environmental-protection/Documents/EnvironmentReport-2010/ICAO_EnvReport10-Ch6_en.pdf, January 2023.

1.12.4 Coastal Resources

The primary statutes, regulations, and EOs that protect coastal resources include:

- » Coastal Barrier Resources Act (16 U.S.C. § 3501 et seq.);
- » Coastal Zone Management Act (CZMA) (16 U.S.C. § 1451-1466);
- » National Marine Sanctuaries Act (16 U.S.C. §1431 et seq.);
- » EO 13089, *Coral Reef Protection* (63 FR 32701); and
- » EO 13547, *Stewardship of the Ocean, Our Coasts, and the Great Lakes* (75 FR 43021-43027).

Iowa is not a coastal state. As such, the Airport is not within a coastal zone. Additionally, there are no Coastal Barrier Resource System (CBRS) segments within Airport property. The closest CBRS segment is approximately 365 miles northeast of the Airport.²²

1.12.5 Department of Transportation Act, Section 4(f)

Relevant federal laws, regulations, and EOs that protect Section 4(f) resources include:

- » U.S. Department of Transportation (USDOT) Act, Section 4(f) (49 U.S.C. § 303.);
- » Land and Water Conservation Fund Act of 1965 (16 U.S.C. §§ 4601-4604 et seq.);
- » Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users (SAFETEA-LU) – Section 6009 (49 U.S.C. § 303.); and
- » U.S. Department of Defense Reauthorization (Public Law (P.L.) 105-185, Division A, Title X, Section 1079, November 18, 1997, 111 Stat. 1916).

The USDOT Act, Section 4(f) (Section 4(f)) provides that no project that requires the use of any land from a public park or recreational area, wildlife and waterfowl refuge, or historic site be approved by the Secretary of Transportation unless there is no feasible and prudent alternative and provisions to minimize any possible harm are included in the planning. Similarly, the Land and Water Conservation Fund (LWCF) Act prevents the conversion of lands purchased or developed with Land and Water Conservation funds to non-recreation uses, unless the Secretary of the Interior, through the National Park Service, approves the conversion. Conversion may only be approved if it is consistent with the comprehensive statewide outdoor recreation plan when the approval occurs. Additionally, the converted property must be replaced with other recreation property of reasonably equivalent usefulness and location, and at least equal fair market value. There are no Section 4(f) resources located on Airport property.²³ The closest Section 4(f) resource is Strikers Field, over 0.5-mile northeast of the Airport. The closest Section 6(f) property is Park Development, located about a 0.5-mile northwest of the Airport.²⁴

²² U.S. Fish and Wildlife Service, Coastal Barrier Resources System Mapper. Accessed: <https://www.fws.gov/cbra/Maps/Mapper.html>, January 2023.

²³ Sioux City, Iowa, Parks & Recreation. Accessed: <https://www.sioux-city.org/government/departments-g-p/parks-recreation/parks/-npage-3>, January 2023.

²⁴ Land Water Conservation Fund, Projects Funded by LWFC. Accessed: <https://lwcf.tplgis.org/mappast/>, January 2023.

1.12.6 Farmlands

The following statutes, regulations, and guidance pertain to farmlands:

- » Farmland Protection Policy Act (FPPA) (7 U.S.C. §§ 4201-4209);
- » CEQ Memorandum on the Analysis of Impacts on Prime or Unique Agricultural Lands in Implementing the National Environmental Policy Act (45 FR 59189); and
- » State and local regulations.

The FPPA of 1981 regulates federal actions that have the potential to convert farmland to non-agricultural uses. The FAA requires consideration of “important farmlands,” which it defines to include “all pasturelands, croplands, and forests (even if zoned for development) considered to be prime, unique, or of statewide or local importance.”²⁵ According to Section 523.10(B) of the FPPA, lands identified as urbanized areas by the U.S. Census Bureau are not subject to the provisions of the FPPA.

According to the Natural Resource Conservation Service (NRCS), portions of the Airport contain soil rated as prime farmland and farmland of statewide importance, as defined above.²⁶ Most of the Airport is in an urbanized area²⁷ and therefore, is not subject to the FPPA. However, there are some areas on the southwestern end of Airport property that are outside of the urbanized area, and therefore, these areas are subject to the FPPA (see **Figure 1-13**).

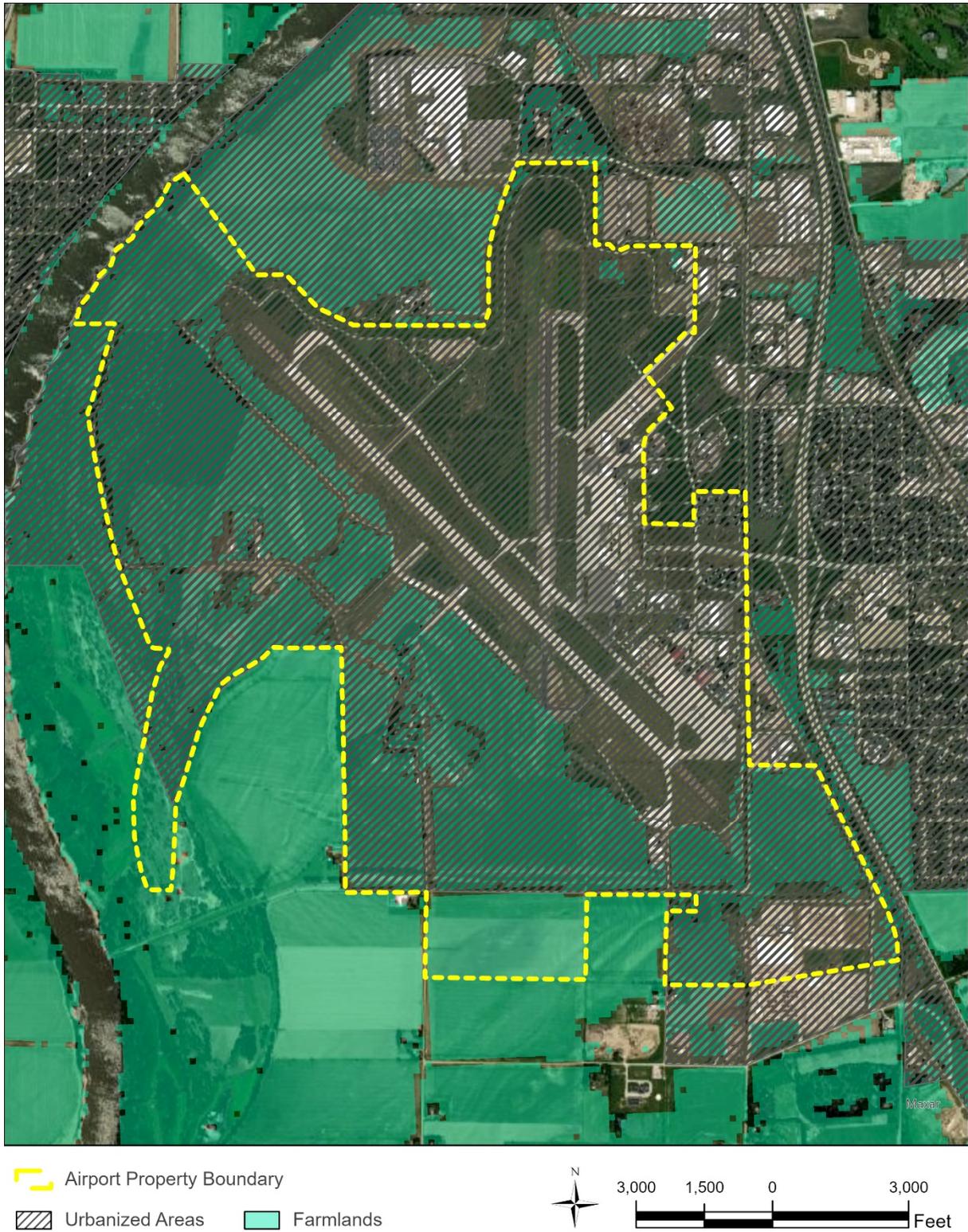
²⁵ Federal Aviation Administration, Order 1050.1F Desk Reference, February 2020. Accessed: January 2023.

²⁶ Natural Resources Conservation Service, Web Soil Survey. Accessed: <https://websoilsurvey.nrcs.usda.gov/app/WebSoilSurvey.aspx>, January 2023.

²⁷ U.S. Census Bureau, Urbanized Area Reference Map, Sioux City, IA--NE--SD. Accessed: https://www2.census.gov/geo/maps/dc10map/UAUC_RefMap/ua/ua82225_sioux_city_ia--ne--sd/DC10UA82225.pdf, January 2023.

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Figure 1-13 Sioux Gateway Airport Farmlands



Sources: Esri, 2023; NRCS, 2023; RS&H, 2023

1.12.7 Hazardous Materials, Solid Waste, and Pollution Prevention

Federal laws, regulations, and EOs that relate to hazardous materials, solid waste, and pollution prevention include:

- » Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) (42 U.S.C. §§ 9601-9765);
- » Emergency Planning and Community Right to Know Act (42 U.S.C. §§ 11001-11050);
- » Federal Facilities Compliance Act (42 U.S.C. § 6961);
- » Hazardous Materials Transportation Act (49 U.S.C. §§ 5101-5128);
- » Oil Pollution Act of 1990 (33 U.S.C. §§ 2701-2762);
- » Pollution Prevention Act (42 U.S.C. §§ 13101-13109);
- » Toxic Substances Control Act (TSCA) (15 U.S.C. §§ 2601-2697);
- » Resource Conservation and Recovery Act (RCRA) (42 U.S.C. §§ 6901-6992k);
- » EO 12088, *Federal Compliance with Pollution Control Standards* (43 FR 47707); and
- » EO 12580, *Superfund Implementation* (52 FR 2923), (63 CFR 45871), and (68 CFR 37691).

1.12.7.1 Hazardous Materials

In a regulatory context, the terms “hazardous wastes,” “hazardous substances,” and “hazardous materials” have very precise and technical meanings:

Hazardous Wastes. Subpart C of the RCRA defines hazardous wastes (sometimes called characteristic wastes) as solid wastes that are ignitable, corrosive, reactive, or toxic. Examples include waste oil, mercury, lead, or battery acid. In addition, Subpart D of the RCRA contains a list of specific types of solid wastes that the USEPA has deemed hazardous (sometimes called listed wastes). Examples include degreasing solvents, petroleum refining waste, or pharmaceutical waste.

Hazardous Substances. Section 101(14) of the CERCLA defines hazardous substances broadly and includes hazardous wastes, hazardous air pollutants, or hazardous substances designated as such under the Clean Water Act and TSCA and elements, compounds, mixtures, solutions, or substances listed in 40 CFR Part 302 that pose substantial harm to human health or environmental resources. Pursuant to the CERCLA, hazardous substances do not include any petroleum or natural gas substances and materials. Examples include ammonia, bromine, chlorine, or sodium cyanide.

Hazardous Materials. According to 49 CFR Part 172.101, hazardous materials are any substances commercially transported that pose unreasonable risk to public health, safety, and property. These substances include hazardous wastes and hazardous substances, as well as

petroleum and natural gas substances and materials. As a result, hazardous materials represent hazardous wastes and substances. Examples include household batteries, gasoline, or fertilizers.

Aircraft fuel constitutes the largest quantity of hazardous substances stored and consumed at the Airport. Fuel is stored at the Airport in above ground storage tanks located west of the Airport maintenance facilities. The Airport contains two 20,000-gallon tanks reserved for Jet A fuel storage as well as one 10,000-gallon avgas tank. There is also one privately-owned 10,000-gallon Jet A tank on the airfield.

There are no CERCLA superfund sites on Airport property. The closest superfund site to the Airport, Mid-America Tanning Co. (Site EPA ID: IAD085824688), is located over three miles south of the Airport.²⁸

1.12.7.2 Solid Waste

Solid waste is defined by the implementing regulations of RCRA and includes refuse and scrap metal and spent materials. Solid waste generated at the Airport is disposed of at the Northwest Iowa Area Sanitary Landfill, located over 60 miles northeast of the Airport.²⁹ According to the USEPA Landfill Methane Outreach Program (LMOP), the landfill is projected to be operational until 2082.³⁰

1.12.7.3 Pollution Prevention

Pollution prevention includes methods used to avoid, prevent, or reduce pollutant discharges. The Airport has a National Pollutant Discharge Elimination System (NPDES), Stormwater Pollution Prevention Plan (SWPPP), and a Spill Prevention and Countermeasure Plan (SPCC).

1.12.8 Historical, Architectural, Archaeological, and Cultural Resources

The National Historic Preservation Act (NHPA) (54 U.S.C. §§300101 et seq.) establishes the Advisory Council on Historic Preservation (ACHP). The ACHP oversees federal agency compliance with the NHPA. The NHPA also established the National Register of Historic Places (NRHP) that the National Park Service (NPS) oversees. Other applicable statues and EOs include:

- » American Indian Religious Freedom Act (42 U.S.C. § 1996);
- » Antiquities Act of 1906 (54 U.S.C. §§320301-320303);
- » Archeological and Historic Preservation Act (54 U.S.C. §§ 312501-312508);

²⁸ U.S. Environmental Protection Agency, Superfund National Priorities List (NPL) Where You Live Map. Accessed: <https://www.epa.gov/superfund/search-superfund-sites-where-you-live#map>, January 2023.

²⁹ Iowa Department of Natural Resources, Solid Waste Permitting. Accessed: <https://www.iowadnr.gov/Environmental-Protection/Land-Quality/Solid-Waste/Solid-Waste-Permitting#Transfer-Stations-and-Citizen-Convenience-Center-139>, January 2023.

³⁰ U.S. Environmental Protection Agency, Landfill Methane Outreach Program (LMOP). Accessed: <https://www.epa.gov/lmop/project-and-landfill-data-state>, January 2023.

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- » Archeological Resources Act (16 U.S.C. §§ 470aa-470mm);
- » USDOT Act, Section 4(f) (49 U.S.C. § 303);
- » Historic Sites Act of 1935 (16 U.S.C. §§ 461-467);
- » Native American Graves Protection and Repatriation Act (25 U.S.C. §§ 3001-3013);
- » Public Building Cooperative Use Act (40 U.S.C. §§ 601a, 601a1, 606, 611c, and 612a4);
- » EO 11593, *Protection and Enhancement of the Cultural Environment* (36 FR 8921);
- » EO 13006, *Locating Federal Facilities on Historic Properties in Our Nation's Central Cities* (61 FR 26071);
- » EO 13007, *Indian Sacred Sites* (61 FR 26771);
- » EO 13175, *Consultation and Coordination with Indian Tribal Governments* (65 FR 67249);
- » Executive Memorandum, Government-to-Government Relations with Native American Tribal Governments (April 29, 1994);
- » Executive Memorandum on Tribal Consultation (Nov. 5, 2009) (65 FR 67249); and
- » USDOT Order 5650.1, *Protection and Enhancement of the Cultural Environment*.

There are no resources listed on the NRHP located on Airport property. The closest NRHP-listed resource is the Emmanuel Lutheran Church located over 0.5 miles west of the Airport.³¹ However, there is a chapel and 19 residences on the eastern portion of the Airport property that are eligible for listing in the NRHP but have not been formally listed on the NRHP.

1.12.9 Land Use

Various statutes, regulations, and EOs relevant to land use include:

- » Airport and Airway Improvement Act of 1982, and subsequent amendments (49 U.S.C. 47107(a)(10));
- » Airport Improvement Program (49 U.S.C. 47106(a)(1));
- » Airport Safety, Protection of Environment, Criteria for Municipal Solid Waste Landfills (40 CFR § 258.10); and
- » state and local regulations.

The Airport is located within the city of Sioux City in Woodbury County. The majority of the Airport is zoned as business park, with the remainder zoned as general industrial, and general commercial.³² Existing land uses around the Airport generally include industrial to the north, agricultural land and the Missouri River to the west, agricultural land and industrial to the south, and residential to the east (See **Figure 1-11**).

³¹ National Park Service, National Register of Historic Places. Accessed: <https://www.nps.gov/maps/full.html?mapId=7ad17cc9-b808-4ff8-a2f9-a99909164466>, January 2023.

³² Sioux City, Planning and Zoning. Accessed: <https://www.sioux-city.org/business/maps>, January 2023.

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Figure 1-14 Zoning at Sioux Gateway Airport



1.12.10 Natural Resources and Energy Supply

Statutes and EOs that are relevant to natural resources and energy supply include:

- » Energy Independence and Security Act (42 U.S.C. § 17001 et seq.);
- » Energy Policy Act (42 U.S.C. § 15801 et seq.); and
- » EO 13834, *Efficient Federal Operations* (83 FR 23771).

Natural resources (e.g., water, asphalt, aggregate, etc.) and energy use (e.g., fuel, electricity, etc.) at an airport is a function of the needs of aircraft, support vehicles, airport facilities, support structures, and terminal facilities. Energy use at the Airport is primarily in the form of electricity required for the operation of Airport-related facilities (e.g., FBO, hangars, airfield lighting) and fuel for aircraft, aircraft support vehicles/equipment, and Airport maintenance vehicles/equipment. MidAmerican Energy supplies electricity and natural gas to the Airport.³⁴

1.12.11 Noise and Noise-Compatible Land Use

Statutes and EOs relevant to noise and noise-compatible land use include:

- » The Control and Abatement of Aircraft Noise and Sonic Boom Act of 1968 (49 U.S.C. § 44715);
- » The Noise Control Act of 1972 (42 U.S.C. §§ 4901-4918);
- » Aviation Safety and Noise Abatement Act of 1979 (49 U.S.C. § 47501 et seq.);
- » Airport and Airway Improvement Act of 1982 (49 U.S.C. § 47101 et seq.);
- » Airport Noise and Capacity Act of 1990 (49 U.S.C. §§ 47521-47534, §§ 106(g));
- » Section 506 of the FAA Modernization and Reform Act of 2012, *Prohibition on Operating Certain Aircraft Weighting 75,000 Pounds or Less Not Complying with Stage 3 Noise Levels* (49 U.S.C. §§ 47534); and
- » State and local noise laws and ordinances.

Day-Night Sound Level (DNL) is based on sound levels measured in relative intensity of sound, decibels (or dB) on the "A-weighted scale" (or dBA) over a time-weighted average normalized to a 24-hour period.³⁵ DNL has been widely accepted as the best available method to describe aircraft noise exposure. The USEPA identifies the DNL as the principal metric for aircraft noise analysis. The FAA requires DNL as the noise descriptor for use in aircraft noise exposure analysis and noise compatibility planning. DNL levels are commonly shown as lines of equal noise exposure, similar to terrain contour maps, referred to as noise contours. All residential areas are considered compatible with cumulative noise level below DNL 65 dBA.

³⁴ Iowa Utilities Board, List of Utility Service Providers by Town (Iowa) – Town Provider List. Accessed: <https://iub.iowa.gov/sites/default/files/documents/2018/06/town-provider-list.pdf>, January 2023.

³⁵ Federal Aviation Administration, *Technical Support for Day/Night Average Sound Level (DNL) Replacement Metric Research, Final Report*, June 14, 2011.

As shown in **Figure 1-15** there are no noise-sensitive resources in the DNL 65 dB noise contour.

1.12.12 Socioeconomic, Environmental Justice, and Children’s Environmental Health and Safety Risks

The primary considerations of socioeconomic analysis are the economic activity, employment, income, population, housing, public services, and social conditions of the area. The Uniform Relocation Assistance and Real Property Acquisitions Policy Act of 1970 (42 U.S.C. § 61 et seq.), implemented by 49 CFR Part 24, is the primary statute related to socioeconomic impacts.

The Airport is in Sioux City, Iowa, which is within Woodbury County. The Airport is located within U.S. Census Tract 36, Block Group 4 (see Figure 1-16)

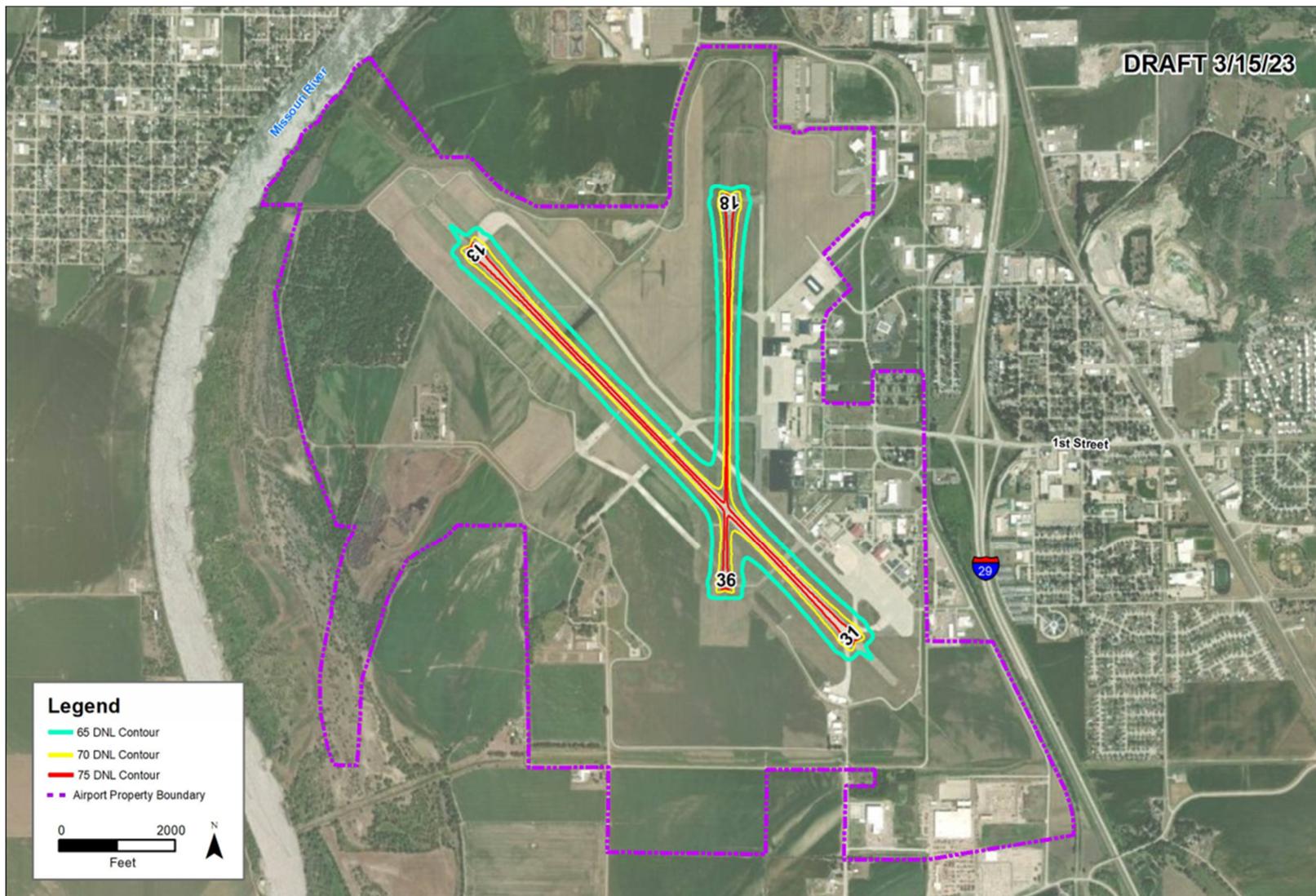
1.12.12.1 Socioeconomics

1.12.12.1.1 Population and Housing

Table 1-17 compares population and housing data for the census tract that the Airport is located in (Airport Census Tract) compared to Sioux City, Woodbury County, and the state of Iowa, which were included for comparison purposes. Housing occupancy and average persons per household for the Airport Census Tract is generally similar compared to Sioux City, the county, and the state.

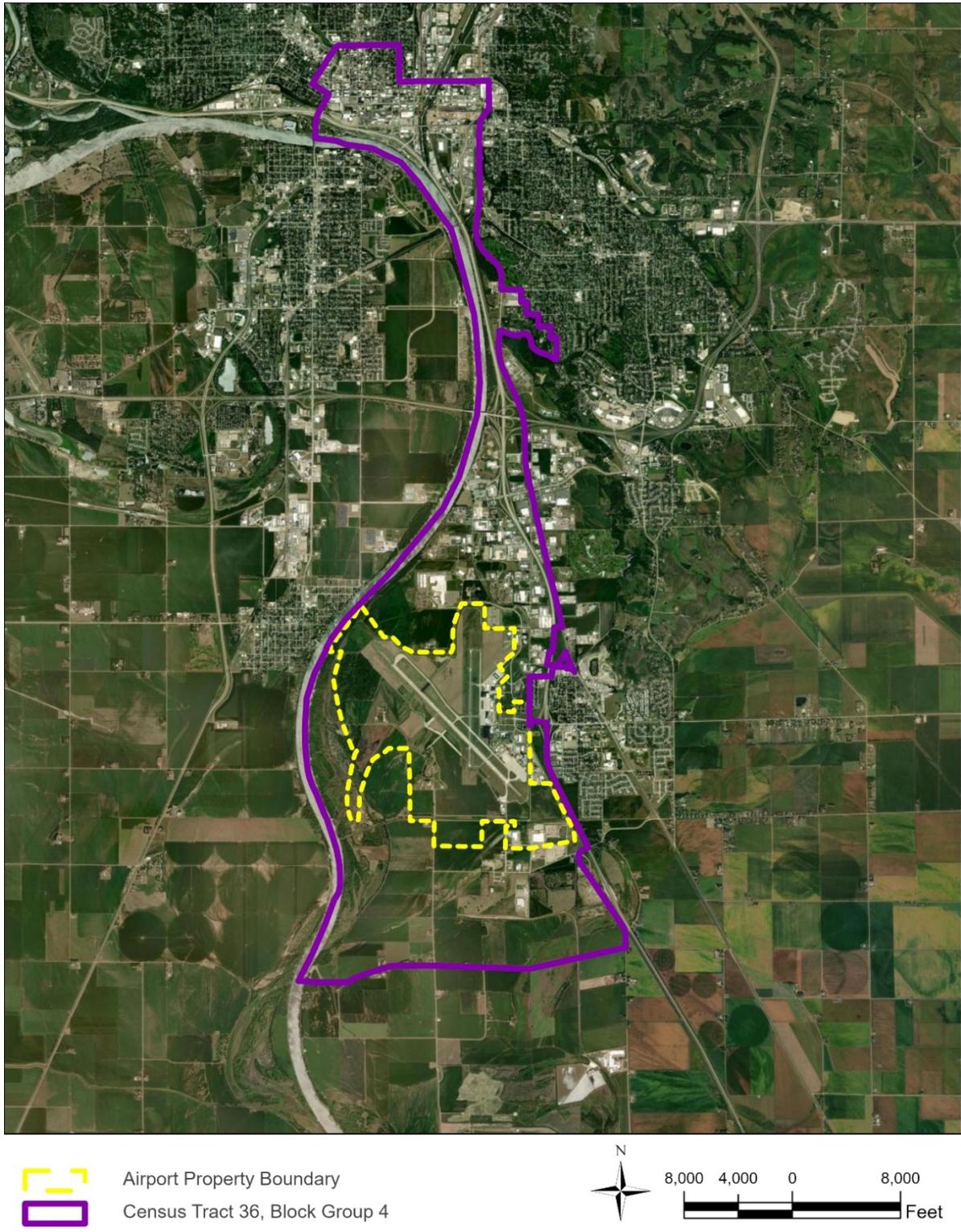
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Figure 1-15 Sioux Gateway Airport Noise Contours



Source: RS&H 2023

Figure 1-16 Sioux Gateway Airport Census Tract



Sources: Esri, 2023; U.S. Census Bureau, 2023; RS&H, 2023

Table 1-17 Population and Housing Characteristics

Characteristic	Airport Census Tract ^{a/36}	Sioux City ³⁷	Woodbury County ³⁸	Iowa ³⁹
Total Population	840	85,797	105,941	3,190,369
Total Households	364	34,331	42,701	1,412,789
Percent Households Occupied	93.7	93.7	93.4	91.2
Average Persons Per Household	2.31	2.50	2.48	2.26

Note: /a/ - Airport Census Tract is the census tract the Airport is located in; Census Tract 36, Block Group 4
 Source: U.S. Census Bureau, 2020

1.12.12.1.2 Employment

Table 1-18 compares employment rates for the Airport Census Tract compared to Sioux City, Woodbury County, and the state of Iowa. Unemployment in the Airport Census Tract is the lowest (1.21%) compared to Sioux City (4.03%), Woodbury County (4.38%), and Iowa (3.72%).

Table 1-18 Employment Statistics

Characteristic	Airport Census Tract ^{a/40}	Sioux City ⁴¹	Woodbury County ⁴²	Iowa ⁴³
Percent Unemployed	1.21	4.03	3.48	3.72

Note: /a/ - Airport Census Tract is the census tract the Airport is located in; Census Tract 36, Block Group 4
 Source: U.S. Census Bureau, 2021

³⁶ U.S. Census Bureau – Block Group 4, Census Tract 36, Woodbury County, Iowa. Accessed: https://data.census.gov/profile/Block_Group_4_Census_Tract_36_Woodbury_County_Iowa?g=1500000US191930036004, January 2023

³⁷ U.S. Census Bureau – Sioux City, Iowa. Accessed: https://data.census.gov/profile/Sioux_City_city_Iowa?g=1600000US1973335, January 2023

³⁸ U.S. Census Bureau – Woodbury County, Iowa. Accessed: https://data.census.gov/profile/Woodbury_County_Iowa?g=0500000US19193, January 2023

³⁹ U.S. Census Bureau – Iowa. Accessed: <https://data.census.gov/profile/Iowa?g=0400000US19>, January 2023

⁴⁰ U.S. Census Bureau – Block Group 4, Census Tract 36, Woodbury County, Iowa: Employment Status for the Population 16 Years and Over. Accessed: <https://data.census.gov/table?t=Employment+and+Labor+Force+Status&g=1500000US191930036004&tid=ACSDT5Y2021.B23025>, January 2023

⁴¹ U.S. Census Bureau – Sioux City, Iowa: Selected Economic Characteristics. Accessed: <https://data.census.gov/table?t=Employment+and+Labor+Force+Status&g=1600000US1973335&tid=ACSDP1Y2021.DP03>, January 2023

⁴² U.S. Census Bureau – Woodbury County, Iowa: Selected Economic Characteristics. Accessed: <https://data.census.gov/table?t=Employment+and+Labor+Force+Status&g=0500000US19193&tid=ACSDP1Y2021.DP03>, January 2023

⁴³ U.S. Census Bureau – Iowa: Selected Economic Characteristics. Accessed: <https://data.census.gov/table?t=Employment+and+Labor+Force+Status&g=0400000US19&tid=ACSDP1Y2021.DP03>, January 2023

1.12.12.1.3 Public Services

Sioux City Fire Rescue services emergencies at the Airport. Sioux City Fire Station #5 is located over two miles northeast of the Airport.⁴⁴ The Sioux City Police Department provides police services to the Airport and surrounding community with the police station located about 5.5 miles north of the Airport.⁴⁵ Emergency services are available at multiple locations in Sioux City, with the closest urgent care center located 1.5 miles north of the Airport.⁴⁶

1.12.12.2 Environmental Justice

Statutes, EOs, memorandums, and guidance that are relevant to environmental justice include:

- » Title VI of the Civil Rights Act, as amended (42 U.S.C. §§ 2000d-2000d-7);
- » EO 12898, *Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations* (59 FR 7629);
- » Memorandum of Understanding on Environmental Justice and EO 12898;
- » USDOT Order 5610.2(a), *Environmental Justice in Minority and Low-Income Populations* (77 FR 27534);
- » CEQ Guidance: *Environmental Justice: Guidance Under the National Environmental Policy Act*;
- » Revised USDOT Environmental Justice Strategy (77 FR 18879); and
- » Promising Practices for EJ Methodologies in NEPA Reviews, Report of the Federal Interagency Working Group on Environmental Justice & NEPA Committee

Table 1-19 shows environmental justice characteristics of the Airport Census Tract compared to Sioux City, Woodbury County, and the state of Iowa. As shown, the Airport Census Tract has a larger minority population (23.9%) compared to Woodbury County (20.3%) and Iowa (10.5%) and a smaller minority population when compared to Sioux City (24.4%). The Airport Census Tract has the highest percentage of the population living below the poverty line (24.3%) compared to Sioux City (17.4%), Woodbury County (16.3%) and Iowa (11.1%).

⁴⁴ Sioux City – Fire Rescue. Accessed: <https://www.sioux-city.org/government/departments-a-f/fire-rescue>, January 2023

⁴⁵ Sioux City Police Department. Accessed: <http://www.siouxcitypolice.com/>, January 2023.

⁴⁶ Sioux City – Emergency Medical Services. Accessed: <https://www.sioux-city.org/government/departments-a-f/fire-rescue/divisions/emergency-medical-services>, January 2023.

Table 1-19 Environmental Justice Characteristics

Characteristic	Airport Census Tract ^{/a/}	Sioux City	Woodbury County	Iowa
Percent Minority	23.9% ⁴⁷	24.4% ⁴⁸	20.3% ⁴⁹	10.5% ⁵⁰
Percent Living Below Poverty Line	24.3% ⁵¹	17.4% ⁵²	16.3% ⁵³	11.1% ⁵⁴

Note: /a/ - Airport Census Tract is the census tract the Airport is located in; Census Tract 36, Block Group 4
 Source: U.S. Census Bureau, 2020-2021

1.12.12.3 Children’s Health and Safety

Statutes, EOs, memorandums, and guidance that are relevant to Children’s health and safety include:

- » EO 13045, Protection of Children from Environmental Health Risks and Safety Risks (62 FR 19885).

There are no schools, daycares, or childcare facilities on Airport property. The closest school to the Airport is Sergeant Bluff-Luton Elementary and Primary School, which is located over 0.5-mile east of the Airport.⁵⁵ The closest daycare and childcare facilities to the Airport are Little Steps Daycare and Bluff’s Little Thinkers, located 0.5-mile east of the Airport.⁵⁶ There are no schools, daycares, and childcare facilities located in the DNL 65 dBA noise contour. **Table 1-20**

⁴⁷ U.S. Census Bureau – Block Group 4, Census Tract 36, Woodbury County, Iowa: Race. Accessed: <https://data.census.gov/table?g=1500000US191930036004&tid=DECENNIALPL2020.P1>, January 2023

⁴⁸ U.S. Census Bureau – Sioux City, Iowa: Race. Accessed: <https://data.census.gov/table?g=1600000US1973335&tid=DECENNIALPL2020.P1>, January 2023

⁴⁹ U.S. Census Bureau – Woodbury County, Iowa: Race. Accessed: <https://data.census.gov/table?g=0500000US19193&tid=DECENNIALPL2020.P1>, January 2023

⁵⁰ U.S. Census Bureau – Iowa: Race. Accessed: <https://data.census.gov/table?g=0400000US19&tid=DECENNIALPL2020.P1>, January 2023

⁵¹ U.S. Census Bureau – Block Group 4, Census Tract 36, Woodbury County, Iowa: Poverty Status of Individuals in the Past 12 Months by Living Arrangement. Accessed: <https://data.census.gov/table?t=Official+Poverty+Measure&g=1500000US191930036004&tid=ACS5Y2021.B17021>, January 2023

⁵² U.S. Census Bureau – Sioux City, Iowa: Poverty Status in the Past 12 Months by School Enrollment by Level of School for the Population 3 Years and Over. Accessed: <https://data.census.gov/table?t=Official+Poverty+Measure&g=0400000US19&tid=ACS1Y2021.B14006>, January 2023

⁵³ U.S. Census Bureau – Woodbury County, Iowa: Poverty Status in the Past 12 Months by School Enrollment by Level of School for the Population 3 Years and Over. Accessed: <https://data.census.gov/table?t=Official+Poverty+Measure&g=0500000US19193&tid=ACS1Y2021.B14006>, January 2023

⁵⁴ U.S. Census Bureau – Iowa: Poverty Status in the Past 12 Months by School Enrollment by Level of School for the Population 3 Years and Over. Accessed: <https://data.census.gov/table?t=Official+Poverty+Measure&g=0400000US19&tid=ACS1Y2021.B14006>, January 2023

⁵⁵ NEPAassist. Accessed: <https://www.epa.gov/nepa/nepassist>, January 2023

⁵⁶ Department of Health and Safety, Homeland Infrastructure Foundation-Level Data (HIFLD): Child Care Centers. Accessed: <https://hifld-geoplatform.opendata.arcgis.com/datasets/child-care-centers/explore?location=42.403969%2C-96.399574%2C13.99>, February 2023

shows children age distribution of the Airport Census Tract compared to Sioux City, Woodbury County, and the state of Iowa.

Table 1-20 Children Age Distribution

Child Age Group	Airport Census Tract ^{1a/57}	Sioux City ⁵⁸	Woodbury County ⁵⁹	Iowa ⁶⁰
Population under 5	39	5,947	6,985	187,257
Population ages 5-9	80	6,694	8,160	201,486
Population ages 10-14	80	5,782	7,529	216,296
Population ages 15-19	25	6,690	8,201	225,888
Total	224	25,113	30,875	830,927

Note: 1a/ - Airport Census Tract is the census tract the Airport is located in; Census Tract include Census Tract 36, Block Group 4
 Source: U.S. Census Bureau, 2021

1.12.13 Visual Effects

There is no federal statutory or regulatory requirement for adverse effects resulting from light emissions or visual impacts. FAA Order 1050.1F describes factors to consider for light emissions and visual resources/visual character.

1.12.13.1 Light Emissions

Various lighting features currently illuminate portions of the Airport, such as buildings, access roadways, automobile parking areas, and airfield lighting, such as taxiway lighting and runway lighting, for the safe and secure movement of people and vehicles (e.g., aircraft, passenger cars, etc.).

1.12.13.2 Visual Resources and Visual Character

Structures at the Airport include, but are not limited to, FBOs, hangars, and maintenance buildings. The closest residence is located on Airport property on Doolittle Street and has direct line of sight to the Airport facilities. The visual character of the developed areas of the Airport are consistent with surrounding commercial and industrial developed areas while the current undeveloped areas of the Airport are consistent with the surrounding agricultural land.

⁵⁷ U.S. Census Bureau – Block Group 4, Census Tract 36, Woodbury County, Iowa: Sex by Age. Accessed: <https://data.census.gov/table?t=Age+and+Sex&g=1500000US191930036004&tid=ACSDT5Y2021.B01001>, January 2023

⁵⁸ U.S. Census Bureau – Sioux City, Iowa: Age and Sex. Accessed: <https://data.census.gov/table?t=Age+and+Sex&g=1600000US1973335&tid=ACSST1Y2021.S0101>, January 2023

⁵⁹ U.S. Census Bureau – Woodbury County, Iowa: Age and Sex. Accessed: <https://data.census.gov/table?t=Age+and+Sex&g=0500000US19193&tid=ACSST1Y2021.S0101>, January 2023

⁶⁰ U.S. Census Bureau – Iowa: Age and Sex. Accessed: <https://data.census.gov/table?t=Age+and+Sex&g=0400000US19&tid=ACSST1Y2021.S0101>, January 2023

1.12.14 Water Resources

Water resources include wetlands, floodplains, surface waters, groundwater, and wild and scenic rivers. These resources typically function as a single, integrated natural system that are important in providing drinking water in supporting recreation, transportation and commerce, industry, agriculture, and aquatic ecosystems.

1.12.14.1 Wetlands

Statutes and EOs that are relevant to wetlands include:

- » EO 11990, *Protection of Wetlands* (42 FR 26961);
- » Clean Water Act (33 U.S.C. §§ 1251-1387);
- » Fish and Wildlife Coordination Act (16 U.S.C. § 661-667d) ;
- » USDOT Order 5660.1A, *Preservation of the Nation's Wetlands*; and
- » State statutes protecting wetlands.

The Clean Water Act defines wetlands as "...those areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions."⁶¹ The U.S. Army Corps of Engineers' (USACE) wetland delineation manual requires that positive indicators of a wetland be present for hydrophytic vegetation, hydric soil, and hydrology. Wetlands are defined by their hydrology, abundance of hydrophytic plants and abundance of hydric soils.⁶²

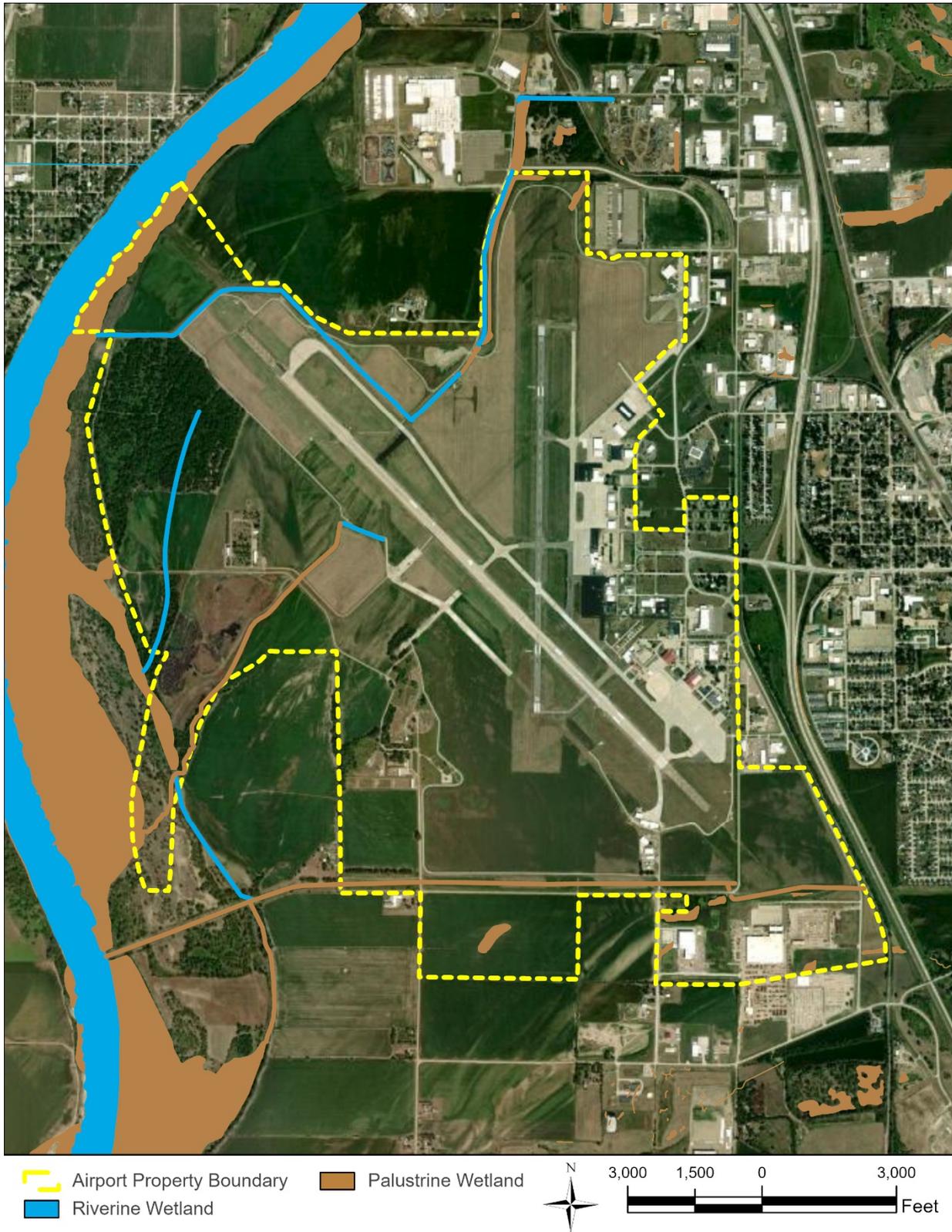
According to the USFWS National Wetland Inventory (NWI) there are wetlands present in the vicinity of the Airport, including on Airport property (See Figure 1-17).⁶³

⁶¹ U.S. Environmental Protection Agency, Section 404 of the Clean Water Act. Accessed: <https://www.epa.gov/cwa-404/section-404-clean-water-act-how-wetlands-are-defined-and-identified>, January 2023.

⁶² U.S. Army Corps of Engineers, Corps of Engineers Wetland Delineation Manual. Accessed: <https://www.lrh.usace.army.mil/Portals/38/docs/USACE%2087%20Wetland%20Delineation%20Manual.pdf>, February 2023.

⁶³ U.S. Fish and Wildlife Service, National Wetlands Inventory, Surface Water and Wetlands. Accessed: <https://fwsprimary.wim.usgs.gov/wetlands/apps/wetlands-mapper/>, January 2023.

Figure 1-17 Wetlands at Sioux Gateway Airport



Source: Esri, 2023; USFWS, 2023; RS&H, 2023

1.12.14.2 Floodplains

Statutes and EOs that are relevant to floodplains include:

- » EO 11988, *Floodplain Management* (42 FR 26951);
- » National Flood Insurance Act (42 U.S.C. § 4001 et seq.);
- » U.S. Department of Transportation (USDOT) Order 5650.2, *Floodplain Management and Protection*; and
- » State and local statutes protecting floodplains

Floodplains are "...lowland areas adjoining inland and coastal water which are periodically inundated by flood waters, including flood-prone area of offshore islands." ⁶⁴ Floodplains are often referred to in terms of the 100-year floodplain, rather, the one percent chance of a flood occurring in any given year. The USDOT Order 5650.2 outlines the policies and procedures for ensuring that proper consideration is given to the avoidance and mitigation of adverse floodplain impacts in agency actions, planning programs, and budget requests. Therefore, the objective is to avoid, to the extent practicable, any impacts within the 100-year floodplain.

According to the Federal Emergency Management Agency (FEMA) Flood Insurance Rate Maps (FIRMs), there are floodplains present in the vicinity of the Airport, including on Airport property (see Figure 1-18).⁶⁵

1.12.14.3 Surface Waters

Statutes that are relevant to surface water include:

- » Clean Water Act (33 U.S.C. §§ 1251-1387);
- » Fish and Wildlife Coordination Act (16 U.S.C. § 661-667d);
- » Rivers and Harbors Act (33 U.S.C. § 401 and 403);
- » Safe Drinking Water Act (42 U.S.C. §§ 300(f)-300j-26; and
- » State statutes protecting surface waters.

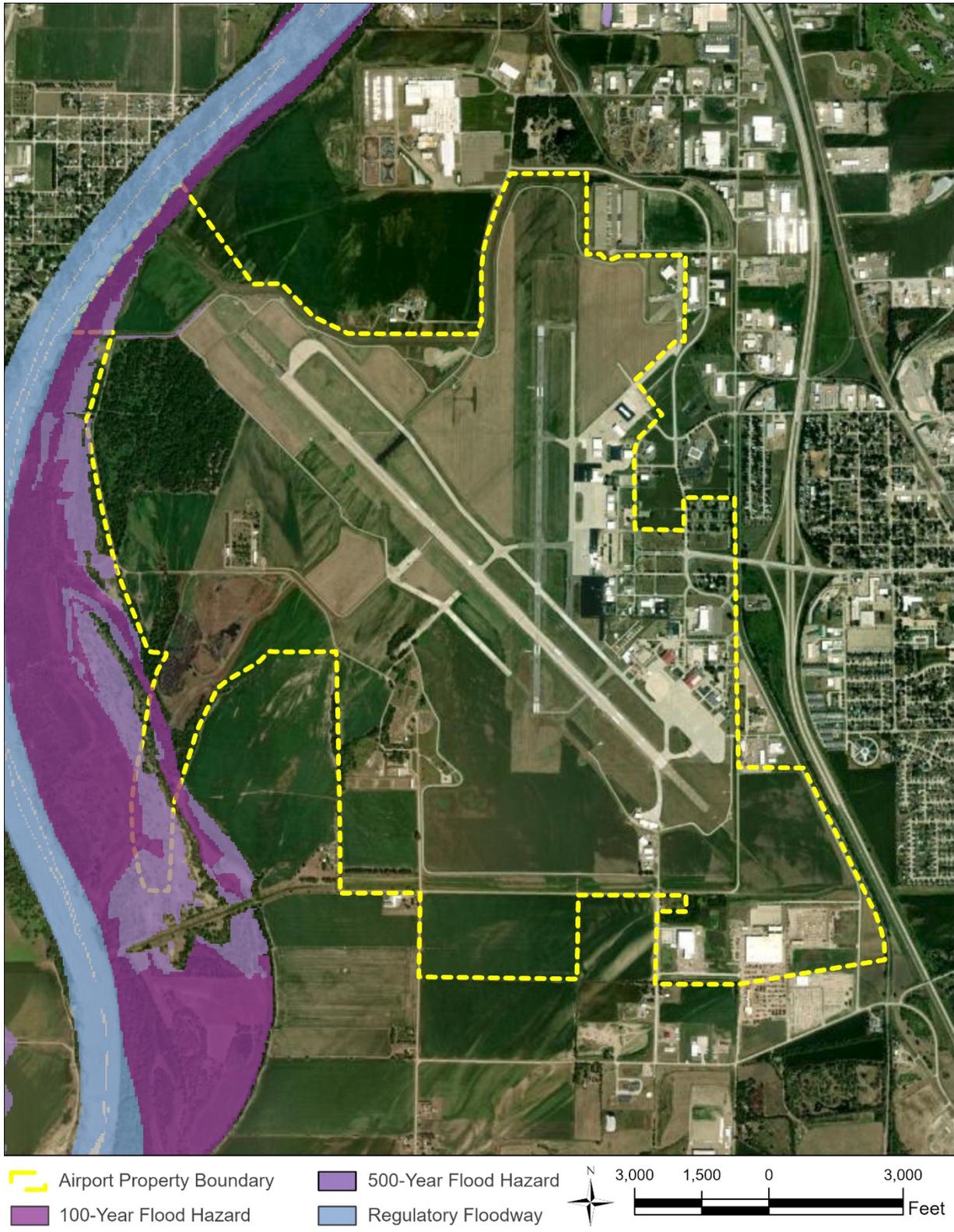
Surface waters include areas where water collects on the surface of the ground, such as streams, rivers, lakes, ponds, estuaries, and oceans. There are surface waters present in the vicinity of the Airport, including on Airport property (see Figure 1-19).⁶⁶

⁶⁴ Federal Aviation Administration, Order 1050.1F Desk Reference, February 2020. Accessed: February 2023.

⁶⁵ Federal Emergency Management Agency, Flood Map Service Center, Flood Insurance Rate Maps 19193C0194D (effective 9/29/2011), 19193C0192D (effective 9/29/2011), 19193C0213D (effective 9/29/2011), 19193C0211D (effective 9/29/2011), 19193D0191D (effective 9/29/2011) and 19193C0193D (effective 9/29/2011). Accessed: <https://msc.fema.gov/portal/search#searchresultsanchor>, February 2023.

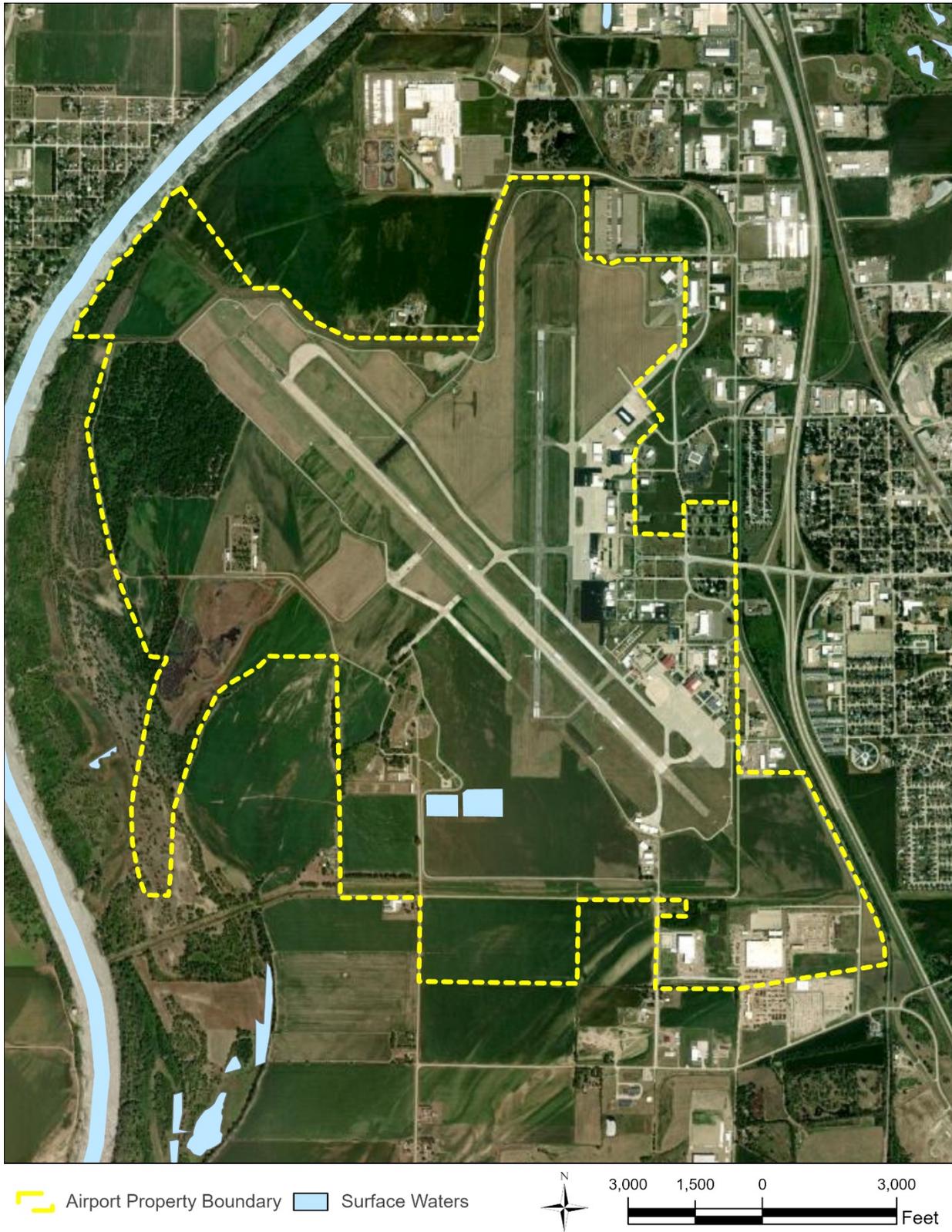
⁶⁶ USEPA, NEPAAssist. Accessed <https://nepassistool.epa.gov/nepassist/nepamap.aspx?wherestr=2403+Aviation+Blvd%2C+Sioux+City%2C+IA+51111>, January 2023.

Figure 1-18 FEMA Floodplains at Sioux Gateway Airport



Source: Esri, 2023; FEMA, 2023; RS&H, 2023

Figure 1-19 Surface Waters at Sioux Gateway Airport



Source: Esri, 2023; RS&H, 2023

1.12.14.4 Groundwater

Statutes relevant to groundwater include:

- » Safe Drinking Water Act (42 U.S.C. §§ 300(f)-300j-26); and
- » State statutes protecting groundwater.

Groundwater is described as the “subsurface water that occupies the space between sand, clay, and rock formations.”⁶⁷ The Airport is within the Bacon Creek-Missouri River watershed (HUC 12 ID: 102300010306).⁶⁸ The Airport is not within a sole source aquifer.⁶⁹

1.12.14.5 Wild and Scenic Rivers

Statutes relevant to wild and scenic rivers include:

- » Wild and Scenic Rivers Act (16 U.S.C. §§ 1271-1278).

Wild and scenic rivers are defined as “outstanding natural, cultural, and recreational values in a free-flowing condition for the enjoyment of present and future generations.”⁷⁰ There are no wild and scenic river segments within the Airport. There are no designated wild and scenic rivers in the state of Iowa. The closest wild and scenic river segment is the Missouri River, located 20 miles northwest of the Airport.⁷¹ The closest river on the Nationwide Rivers Inventory is Big Sioux River located 85 miles north of the Airport.⁷² The closest State protected river is the Little Sioux River Protected Water Area, approximately 40 miles northeast of the Airport.⁷³

⁶⁷ Federal Aviation Administration, 1050.1F Desk Reference, Section 14.4 *Groundwater*. July 2020.

⁶⁸ U.S. Environmental Protection Agency, How’s my Waterway. Accessed: <https://mywaterway.epa.gov/community/2403%20Aviation%20Blvd,%20Sioux%20City,%20IA%2051111/overview>, January 2023.

⁶⁹ USEPA, NEPAAssist. Accessed <https://nepassisttool.epa.gov/nepassist/nepamap.aspx?wherestr=2403+Aviation+Blvd%2C+Sioux+City%2C+IA+51111>, February 2023.

⁷⁰ National Wild and Scenic Rivers System, About the WSR Act. Accessed: <https://www.rivers.gov/wsr-act.php>, February 2023.

⁷¹ National Wild and Scenic Rivers System, Iowa. Accessed: <https://www.rivers.gov/iowa.php>, January 2023.

⁷² National Park Service, U.S. Department of the Interior, Nationwide Rivers Inventory. Accessed: <https://www.nps.gov/maps/full.html?mapId=8adbe798-0d7e-40fb-bd48-225513d64977>, January 2023.

⁷³ Iowa Department of Natural Resources, Iowa’s Protected Water Areas. Accessed: <https://www.iowadnr.gov/Things-to-Do/Canoeing-Kayaking/Caring-for-our-Rivers>, January 2023.