Chapter Two – Inventory of Existing Conditions

2 | Section 1 – Existing Conditions Inventory

This chapter provides an overview of existing conditions at Hector Airport. Sources of information referenced for this chapter include, but are not limited to:

- 2003 ALP
- 2009 ALP Update
- U.S. Census Bureau
- MnDOT Pavement Condition and Analysis
- Hector Historical Society
- Airport Master Record 5010
- Previous construction project plans and specifications
- Municipal plans and ordinances
- County plans and ordinances
- 1D6 Airport Records
- On-site visusal inspection of 1D6

2 | Section 2 – Airport Background

2.2.1 Airport Role and Classification

The Hector Airport is a non-certificated General Aviation airport serving the aviation needs of Renville County and the municipalities of Hector, Buffalo Lake, and other surrounding communities. 1D6 (the FAA's 3-letter identifier for the Hector Municipal Airport) serves its communities by providing quality airside and landside facilities, and private and public aircraft storage facilities.

1D6 is not a 14 CFR Part 139-certificated airport. Certification through 14 CFR Part 139 is required for airports that host scheduled passenger-carrying operations using aircraft originally designed with more than nine passenger seats, or an unscheduled passenger-carrying operation using an aircraft originally designed with more than 30 passenger seats.

1D6 is classified as a non-certificated Basic General Aviation Airport according to the National Plan of Integrated Airport Systems.

For the purpose of defining 1D6's role in the context of the national aviation systems, the 2017-2021 **National Plan of Integrated Airport Systems** (NPIAS) Report lists the airport as a *Basic General Aviation Airport*. "Basic" airports have moderate levels of activity, with 10 or more based propeller-driven aircraft and no jets, and no instrument operations. The current report states, "Basic airports fulfill the principal role of a community airport providing a means for private general aviation flying, linking the community with the national airport system, and making other unique contributions…. In some instances, the airport is the only way to access the community and provides emergency response access such as emergency medical or firefighting and mail delivery." As a "General Aviation" airport, 1D6 does not receive scheduled commercial service, nor does it meet the criteria for a commercial service airport.

MnDOT classifies 1D6 as an Intermediate Airport.

As of 2019, there were 133 publicly-funded airports in the state of Minnesota. MnDOT classifies 1D6 as an "Intermediate" airport because it has a paved runway of less than 5,000 feet in length, one of 82 in the state. An "Intermediate" classification indicates that the airport facility meets certain criteria, including characteristics of the runways and taxiways, NAVAIDS and lighting, weather reporting, hangars and aprons, terminals, parking, fencing, and fueling facilities.

A copy of the 2019 Airport Master Record (FAA 5010) for Hector Municipal Airport is included in the Appendix.

Understanding Airport Classifications

Federal airport classifications are published within the National Plan of Integrated Airport Systems (NPIAS) as required by the Airport and Airways Improvement Act of 1982. This FAA planning document is updated biannually in an effort to identify the nation's airport needs over a 10-year planning period and classify airports based on their significance to the air transportation system.

Only those airports within the NPIAS are eligible to receive federal Airport Improvement Program (AIP) funding. According to the 2017-2021 NPIAS, there are 5,136 public-use airports in the United States. Of these airports, 3,332 have been deemed significant to air transportation and therefore have been included in the NPIAS.

The State of Minnesota also classifies the role of airports within the State Aviation System Plan (SASP).

Commercial Service - Primary

- Airports that enplane less than 0.05 percent of all commercial passenger enplanements but have more than 10,000 annual enplanements.

Commercial Service - Non-primary

- Airport that have between 2,500 and 10,000 annual passenger enplanements.

Cargo Airport

- Served by aircraft providing air transportation of only cargo with a total annual landed weight of more than 100 million pounds.

Reliever Airport

- High-capacity general avaiation airports in major metropolitan areas that are open to the public, have 100 or more based aircraft, or have 25,000 annual itinerant operations.

General Aviation Airport

- Do not receive scheduled commercial service or do not meet the criteria for commercial service airport. Classification in the NPIAS typically requires at least 10 based aircraft and at least 20 miles from the nearest NPIAS airport.

2.2.2 Airport Location

The City of Hector is part of Renville County, located in south-central Minnesota, approximately 60 miles west of the Twin Cities metropolitan area and 160 miles northeast of Sioux Falls, South Dakota. In the 2010 U.S. Census, Hector reported 1,151 residents. The airport is located less than one mile south of downtown Hector.

Hector is part of Renville County in south-central Minnesota.

U.S. Route 212 and Minnesota State Highway 4 are two of the main arterial routes in the city. U.S. Route 212, functionally classified by MnDOT as a Principal Arterial, serves as a main arterial route in the community, with a right-of-way (ROW) width of 150 feet running east-west between the City and the airport. State Highway 4 (100-foot ROW), a Minor Arterial, also provide access to Hector, bisecting the city from north to south, providing access from both directions and forming the western border of the airport. These well-used routes make 1D6 easily accessible to the public and connect Hector to regions throughout the State of Minnesota. The Twin Cities & Western Railroad line serves the city as a connection to both Minneapolis and St. Paul and points west.

Figure 2-1: Airport Location in State; Source: Minnesota-map.org

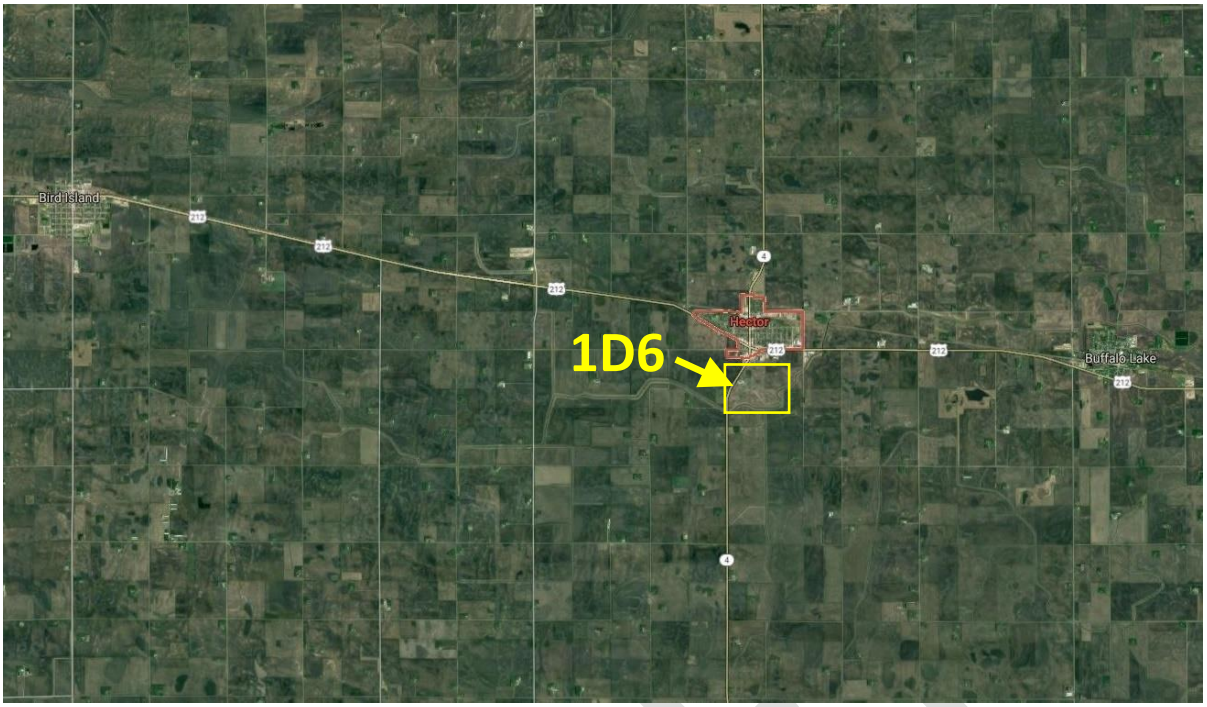


Figure 2-2: Airport Location in Region; Source: Google Earth

The surrounding topography is comprised of flat and rolling terrain with agriculture fields, grassy meadow remnants, and some small wetlands present at lower elevations. The airport's site and surrounding land slopes gently to the southeast, away from the City of Hector. Numerous streams drain the area away to the east, including a judicial drainage ditch in a ravine that runs around the south and east sides of the airport property and at the end of Runway 12/30. This ditch flows underneath the Runway Safety Area in a large box culvert in that location.

2.2.3 Airport History

When the first successful airplane flight in Minnesota occurred at the State Fair in 1910, several Hector residents were present to witness the event. Sometime in 1914-15, school superintendent Mr. Wismen released entire classrooms of students into the outdoors for 15 minutes to witness a momentous occasion, the first airplane known to fly over Hector. As children turned their eyes skyward, dreams of flying began to form in their young, eager minds. When the first aircraft to be based in Hector was delivered in 1928, the high school band was there to celebrate with fanfare, accompanied by enthusiastic townsfolk.

Over the course of a few short years, airplanes became a more common site over Hector. Farmer's fields in the surrounding area were often used for take offs and landings. As aviation was embraced in the community, specific sites were developed for aircraft use. Airplanes were purchased by locals, hangars were built, and flight instruction, aircraft mechanic services, and crop spraying services were offered.

In 1939, a flying club was formed in Hector. By September of 1940, the Minneapolis Star Journal reported 40 percent of Hector men between the ages of 18 and 40 were either active pilots or training to become pilots. Hector began inviting other aircraft to the area, holding their first official Flight Breakfast in 1940 with 14 planes, 200 cars, and 600 people in attendance. Hector became known as "The most Air Minded City in the U.S.," drawing the attention of popular newspapers and magazines of the day, including Life, the Readers Digest, and Flying and Popular Aviation.

When community airports were shut down during World War II, Hector Airport became an official Designated Landing Area in 1942. It was allowed to stay open with the stipulation it remain under continuous armed guard. At first, the state provided men for the duty, but then the responsibility fell to Hector residents who organized about 20 citizens to volunteer for the 24/7 guard. When restrictions for general aviation were lifted, Hector Airport resumed normal activity, including its Flight Breakfasts which attracted many visiting aircraft and aviation groups.

Working with the flying club, city officials supported general aviation, contributing to land purchase and management of a permanent airport location. In the summer of 1949, Hector Municipal Airport was dedicated. It had two grass runways, a gas pump with an underground tank, three hangars, and an office building. The first zoning regulations were published by the village, establishing control over the structure, tree height, and use of properties in the vicinity around the airport. Also in 1949, John Rice made aerial crop spraying first available for area farmers, an additional and continuing benefit to the community provided through aviation.

As improvements to the airport were made, such as in the '60's when the hard surface "All-Weather" runway and lighting system were constructed, its importance to the community became more apparent.

A fixed-based operator (FBO) was established in 1981 when Ed Newberg started Newberg Sky Spray LLC, offering agricultural services to area farmers and employing several residents in his airport-based business. In late 2016, Newberg sold most of his spray business, including his territory and customers, to Nic and cousin Sam Heiderscheidt, a former employee of Newberg Sky Spray. Together, they formed Sky Apply LLC, making it another family-owned business offering agricultural services based at Hector Airport. Newberg Sky Spray continues to offer independent spraying services.

Advocates of general aviation, including the FBO and the flying club, along with the Hector Lions Club, have carried on the tradition of the Annual Flight Breakfast, adding components to the event like a featured aircraft, airport history display, a ping-pong ball drop for children, and donating proceeds to local charities. The Flight Breakfasts have exceeded 175 visiting aircraft (depending on weather conditions), and have served over 1,460 breakfasts per event. Through this annual event and its everyday operations, the airport continues to bolster Hector's thriving community.

Nearly 100 years of flight at 1D6.

Source: Google Earth

1925-28: Hector's airport is established and the first hangar is built.

1939: Hector Flying Club organized with 20 members. Airport grows and 3 more hangars are built.

1940: First Flight Breakfast – 14 planes, 200 cars, and 600 people present.

1941: First gas pump and tank installed. Wind indicator installed. 2 more hangars built.

1942: Became an official "Designated Landing Area" and was allowed to stay open during the war with continuous armed guard – small gas station moved in 1944 to use as "Guard Shack."

1946: Plains Aero Service sets up shop at the airport.

1947: City receives a grant to renovate the airport and build an office.

1948: Airport expands and two grass runways are rebuilt (current orientation versus N-S & E-W).

1949: Dedication of Hector Municipal Airport; first zoning regulations are published.

1960: Lights installed on main grass runway.

1965: MnDOT approves lengthening and paving main runway (to 2,800').

1968: Runway Lighting System complete on the new "All-Weather" runway.

1980: T-33 Jet Memorial dedication.

1986: Small Pilot Lounge built.

2000: Airport gets major runway renovation.

2003: Formal Hector Airport Commission formed and regular meetings commence.

2005: New City Rental Hangars built – 2 buildings, 7 rental units total.

2006: SRE Maintenance Equipment storage hangar built.

2008: Current AD Building built.

2011: Culvert put in at east end of paved runway.

2013: County and Township Zoning around the Hector Airport property. MnDOT says it was a failed attempt.

2017: Electric Vault built south of AD Building.

2018: AV Gas Fuel System built with credit card capability. New fence with cement base built along sidewalk.

Figure 2-3: Timeline of airport history

2.2.4 Summary of Commercial Service

Hector does not currently support commercial airline service.

2.2.5 Ownership and Management

The Hector Airport is owned and operated by the City of Hector. The Airport Advisory Committee (AAC) advises the City Council of Hector as to the management and operation of the Airport. The AAC is composed of five voting members and two non-voting members for a total of seven members. One member is represented by the City Council and is appointed by the Mayor, with the remaining voting members appointed by the City Council. The City Administrator serves as the non-voting secretary and the Airport Manager serves as a non-voting member (except to decide a tie). The City Council has ultimate authority over all decisions regarding the airport finances and management, but the AAC plays a strong advisory role to the Council. The AAC meets the first Monday of each month at 5:30 p.m. in the Airport A/D building.

The Airport Manager is hired directly by the City but is responsible to both the City and the Airport.

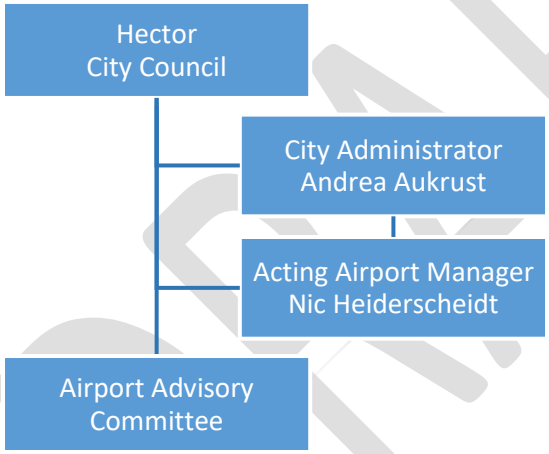


Figure 2-4: Organizational Chart

The AAC completed a Minimum Standards for Aeronautical Activity document for the airport in September 2018, which is included in this Master Plan's Appendix.

2 | Section 3 – Regional Context

2.3.1 Surrounding Airports

Within the state of Minnesota, there are 96 public use airports included in the federal National Plan of Integrated Airport Systems. Of these, seven are Reliever airports, eight are Primary Commercial Service airports, and the remainder are considered General Aviation airports. As can be seen in the following figure, several General Aviation airports are located within close proximity to 1D6. The city of Olivia, the Renville County seat, approximately 14 miles west of Hector, is home to the Olivia Regional Airport (OVL). Olivia's airport includes paved runway 11/29, hangars, fuel facilities, courtesy car, camping, and a service building with restrooms.

The airport is open to the public and services air freight, agricultural operations (aerial spraying), charter flights, flight instruction, aircraft rental, and aircraft sales.

Airports in adjacent counties are found in Redwood Falls, Granite Falls, Montevideo, Willmar, Litchfield, Hutchinson, Winsted, Glencoe, New Ulm, Springfield, and Sleepy Eye. Of these, Willmar's airport has the longest runway at 5,500', accommodating the largest aircraft, and has the greatest number of operations, with an average of 17,885 annually. Winsted and Springfield's airports have lighted turf runways and fewer operations and based aircraft. None of the nearby airports are considered eligible for the Essential Air Service Program (EAS).

The nearest commercial services airport is Minneapolis-Saint Paul International Airport. It is a joint civil-military public use international airport and is considered a Large Hub Primary Airport in the NPIAS Report.

Olivia Regional Airport (KOVL)	Hutchinson Municipal Airport-Butler Field (KHCD)
Longest Runway: 3498 x 75 ft, asphalt Lighting/NAVAIDS: LIRL / Beacon, Lighted wind indicator Instrument Approaches: RNAV(GPS), VOR Fuel: 100LL Total Based Aircraft/Operations: 10 / 4,680	Longest Runway: 4000 x 75 ft, asphalt Lighting/NAVAIDS: MIRL / Beacon, Lighted wind indicator, REIL, PAPI Instrument Approaches: RNAV (GPS), VOR Fuel: 100LL, Jet-A Total Based Aircraft/Operations: 29/ 12,410
Redwood Falls Municipal Airport (KRWF)	**Litchfield Municipal Airport (KLJF)**
Longest Runway: 4001 x 100 ft, asphalt Lighting/NAVAIDS: MIRL / Beacon, Lighted wind indicator, REIL, PAPI Instrument Approaches: RNAV (GPS), VOR Fuel: 100LL, Jet-A Total Based Aircraft/Operations: 10 / 9,800	Longest Runway: 4002 x 100 ft, asphalt Lighting/NAVAIDS: MIRL / Beacon, Lighted wind indicator, REIL, PAPI Instrument Approaches: RNAV (GPS), VOR Fuel: 100LL, Jet-A Total Based Aircraft/Operations: 25 / 6,968
New Ulm Municipal Airport (KULM)	**Glencoe Municipal Airport (KGYL)**
Longest Runway: 5401 x 100 ft, asphalt Lighting/NAVAIDS: MIRL / Beacon, Lighted wind indicator, REIL, PAPI, MALSF Instrument Approaches: RNAV (GPS) Fuel: 100LL, Jet-A Total Based Aircraft/Operations: 18 / 15,330	Longest Runway: 3300 x 75 ft, asphalt Lighting/NAVAIDS: MIRL / Beacon, Lighted wind indicator, REIL, PAPI Instrument Approaches: RNAV (GPS), NDB Fuel: 100LL Total Based Aircraft/Operations: 33 / 10,585

Figure and Table 2-5: Surrounding Airports with instrument procedures near 1D6; Source: Skyvector.com

Notes: LIRL/MIRL/HIRL = Low/Medium/High Intensity Runway Light
REIL = Runway End Identifier Light
PAPI = Precision Approach Path Indicator
NDB = Non-directional (radio) Beacon
RNAV = Area Navigation
VOR = Radio Navigation
MALSF = Medium intensity approach lighting system with sequenced flashers

2.3.2 Climate and Topography

1D6 is located on the plains of Minnesota surrounded by rich farmland at an elevation of 1077 feet above mean sea level. According to a 2018 aerial survey, its reference point is N44°43'52.23" and W94° 42'49.44".

The surrounding topography is comprised of flat and rolling terrain with agriculture fields, grassy meadow remnants, and some small wetlands present at lower elevations. The County's drainage system is a distinctive and important feature of its landscape. The extensive tiling of individual fields and the network of drainage ditches have transformed the landscape. Drainage ditches, some of which are twenty-five feet deep, carry vast quantities of water from former wetlands and lakes drying the land to create very fertile farm fields.

The airport's site and surrounding land slopes gently to the southeast, away from the City of Hector. Average wind speeds are variable, usually around 10 miles per hour, gusting higher. According to the Monthly Normals Report for 1981-2010 from the National Oceanographic and Atmospheric Administration (NOAA), the Renville County station located nearby in Olivia averages 27.43 inches of precipitation per year. Hector has a hot-summer humid continental climate with hot summers and cold winters. The lowest temperatures are seen in January, with an average low of 3°F, and the highest temperatures occur in July, with an average high of 82°F.

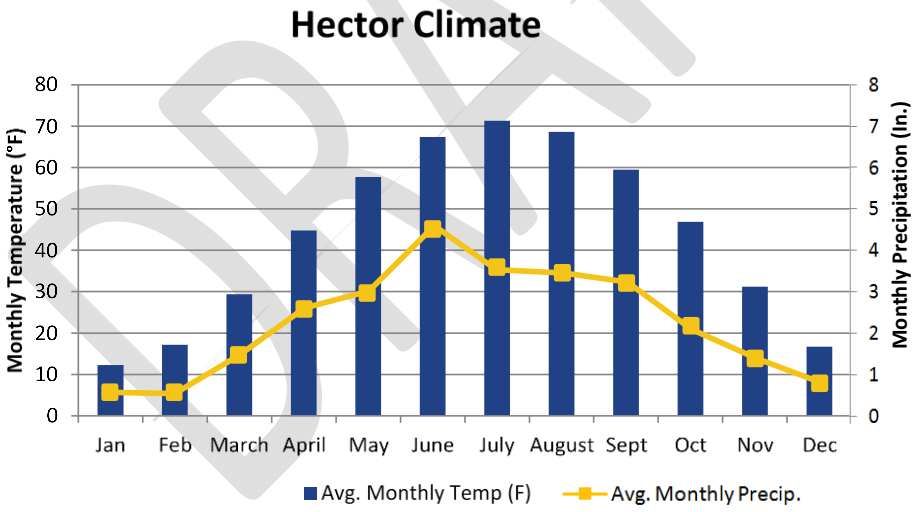


Figure 2-6: Average Monthly Precipitation and Temps in Hector Area
Source: www.ncdc.noaa.gov/cdo-web/datatools/normals, Olivia Station

Figure 2-7: Aerial Photograph of Topography; Source: Woolpert, Inc.

2.3.3 Service Area and Demographic Profile

Hector Municipal Airport's service area includes all of Renville County.

2.3.3.1 Population, Employment, and Income

According to the Minnesota State Demographic Center, Renville County's population is expected to continue to slowly decline over the next 30 years. Employment rates have correspondingly dropped, and even with a few small annual gains, they are forecasted to continue to trend downward. Median incomes have risen and are projected to continue to rise steadily.

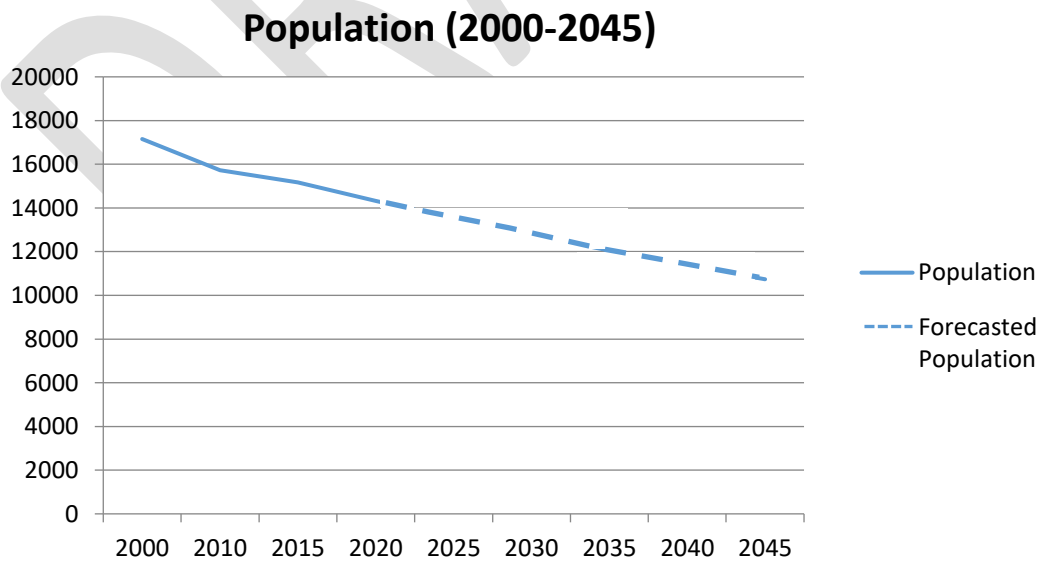


Figure 2-8: Population Growth/Forecast
Source: Factfinder.census.gov, US Census Bureau

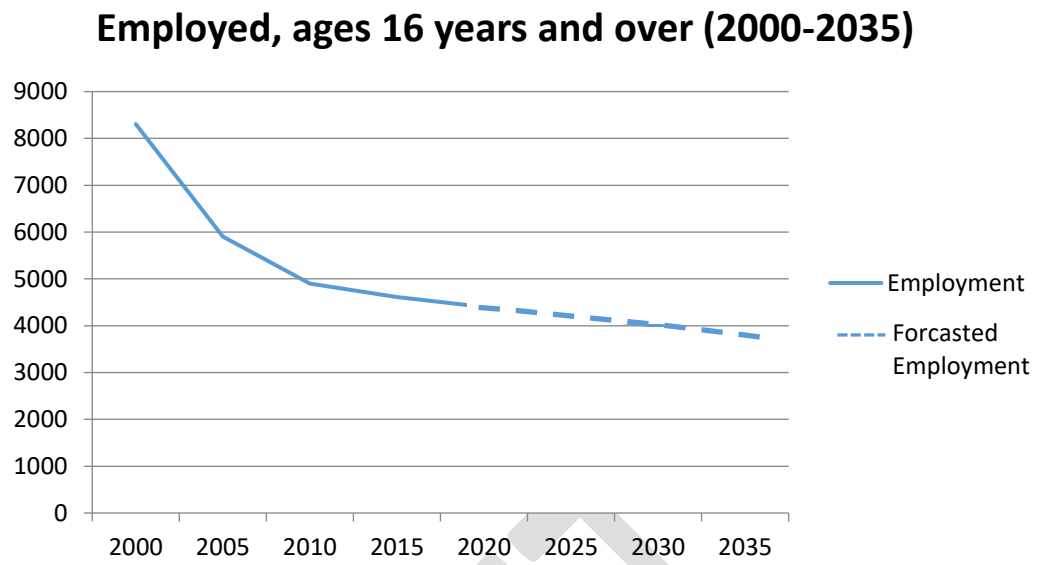


Figure 2-9: Employment Growth/Forecast
Source: Factfinder.census.gov, US Census Bureau

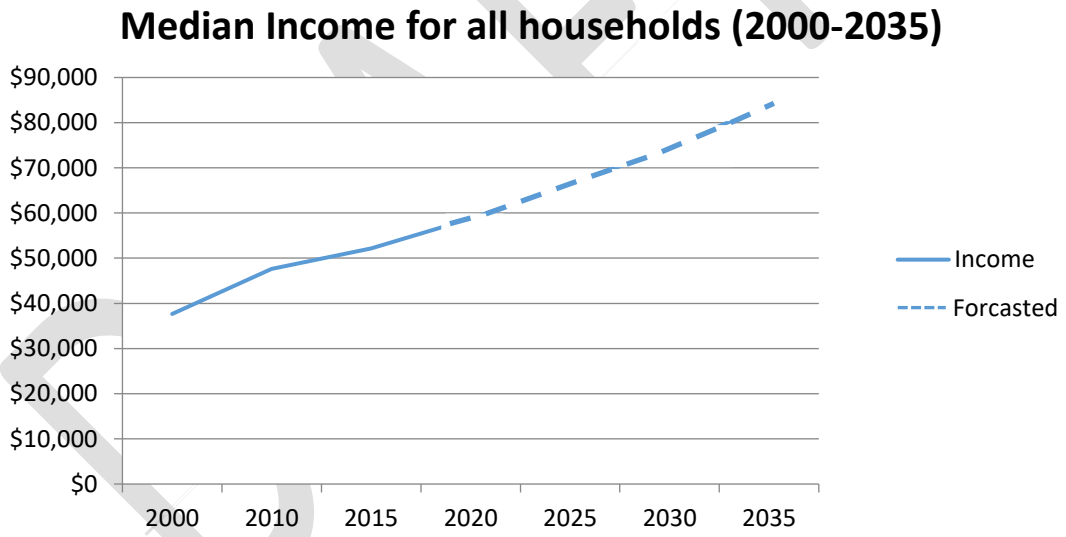


Figure 2-10: Median Household Income Growth/Forecast
Source: Factfinder.census.gov, US Census Bureau

Year	Population	Employment	Median Income
2010	16,007	4,902	47,623
2011	15,834	4,529	48,442
2012	15,653	4,385	49,800
2013	15,499	4,400	50,802
2014	15,326	4,765	52,000
2015	15,171	4,616	52,149
2016	14,995	4,632	54,824
2017	14,798	-	56,721
AAGR	**-1.12%**	**-0.94%**	**2.53%**

Table 2-11: Socioeconomic Trends within 1D6 Service Area/Renville County
Note: AAGR-Average Annual Growth Rate

2.3.3.2 Local Economy

Renville County is best known for its agricultural industry, which joins with multiple manufacturing, construction, and healthcare facilities to sustain the local economy. According to the US Census Bureau's *2012 Survey of Business Owners*, there are 1,148 businesses in Renville County, which has declined from 2007's total of 1,525. Most Renville County residents are employed in education or healthcare and social assistance services; in manufacturing; in agriculture; and in retail trade (*Factfinder.census.gov, 2013-2017 American Community Survey 5-year estimates*). While many of the county's largest employers are located in the County Seat of Olivia and served by the Olivia Regional Airport, these industries are also supported by the Hector Airport.

The 1D6 market area supports a diversified array of manufacturing, retail, health care, and small business interests including service industries, cafes, restaurants, law offices, auto shops, grocery stores, salons, and more. Businesses such as Sky Apply, Central Region Cooperative, Willmar Air Service, Renville County Beet Co-op, Blue House Veterinary Clinic and Triple J Family Farms regularly use the airport. This area's history, cultural and recreational amenities, and local shops and businesses drive transportation needs as well. Major employers in the immediate area include Suttle Solutions, Buffalo Lake-Hector-Stewart School District, and Central Region Cooperative (Table 2-12).

Business	Industry	Employees
Suttle Solutions	Communications Equipment Manufacturing	180
Buffalo Lake-Hector-Stewart Schools	Elementary & Secondary Schools	80
Central Region Cooperative	Miscellaneous Nondurable Goods Merchant Wholesalers	54
Schweiss Doors	Bifold and Hydraulic Doors	50
Loftness Specialized Equipment	Machinery, Equipment, & Supplies Merchant Wholesalers	42
Olinger Sales and Service Inc.	General Freight Trucking	25
Interstate Telcom Consulting Inc	Wired Telecommunications Carriers	17
Hector Cenex and Convenience Store	Gasoline Stations	16
Prairie View	Community Care Facilities for the Elderly	15
Frandsen Bank & Trust	Depository Credit Intermediation	9
United Farmers' Cooperative	Ag Service Center	9
City of Hector	Executive, Legislative, & Other Gen. Govt. Support	8
Hector Tile Company	Concrete Pipe Mfg.	7

Table 2-12: Major Employers within 1D6 Market Area;
Source: http://www.lakesnwoods.com/Hector.htm*, with updates from businesses*

2.3.4 Surrounding Land Use

Airport operations often impact adjoining properties and land uses, so it is important to integrate Airport Master Plans with local land use development plans. Due to its location in Hector and Renville County, any City or County zoning ordinances or comprehensive plans must be considered. All current airport property falls within Hector city limits.

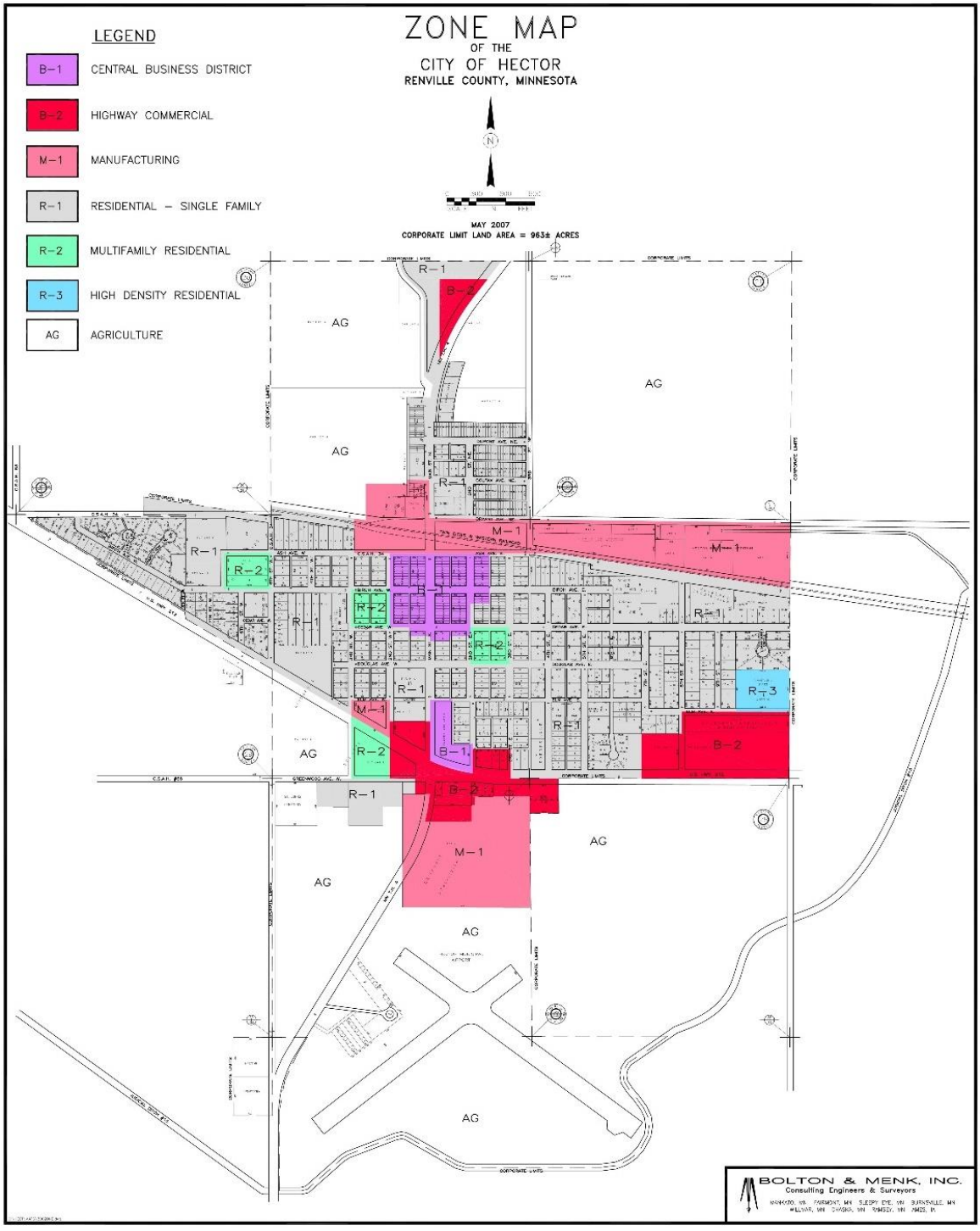


Figure 2-13: City of Hector Zoning Map

Figure 2-13 is the Zoning Map for the City of Hector which shows the airport vicinity zoned as AG, Agriculture, for which it is included as a "Conditional Use."The City does not have a Municipal or Comprehensive Plan. Renville County has been zoned county-wide. Hector Township does not have a Comprehensive Plan but uses the County for planning and zoning services. The ordinances and regulations currently in effect regarding land use and influencing future work at the airport include:

- Renville County Comprehensive Plan (2002, revised in 2010)
- Renville County Land Use Ordinance (2018)
- Renville County Zoning Map (2019)
- Hector Municipal Airport Minimum Standards for Aeronautical Activity (2018)
- Hector City Code (2003)
  - Chapter 150: Building Regulations
  - Chapter 151: Zoning Regulations
    - Sections 151.120 – 151.999: Municipal Airport Zoning

The Airport access road, State Highway 4, is lined with manufacturing and agricultural properties. The Airport and the cemetery across the highway are both zoned agricultural. These properties are not negatively impacted by automobile traffic to and from the airport.

Renville County Comprehensive Plan. A Comprehensive Plan helps the County to prevent the development of incompatible land uses. This kind of management plan could encourage the viability, development and growth of the Hector Municipal Airport, including the coordination of adjacent land uses and transportation improvements to best facilitate the full use of the airport. At this time, land uses around the airport are primarily agricultural, with limited areas of manufacturing use to the north. Renville County's Comprehensive Plan is a "long-range vision intended to guide the growth and development of Renville County into the future... provid(ing) strategies to accomplish the vision in areas including land use, transportation, housing, community development, parks and recreation, natural resources, housing, and economic development….and establish(ing) policy for Renville County rules and regulations, including the Zoning Ordinance, as well as a guide for long-term investments in our County's infrastructure." It includes chapters on land use, community development, transportation and infrastructure, housing, community facilities, natural resources, parks, trails, and historic resources. Each chapter ties the vision statements for the County, delineated as the "themes" of Growth and Economic Vitality, Community, and Unique Character, to a policy plan containing Goals and Policies, expressing the County's aspirations for the future.

Chapter 5 of the Comprehensive Plan is devoted to Transportation and Infrastructure, including airports. The Goals for transportation set forth in the chapter include:

- Goal 1: Provide for a high level of personal and commercial mobility through and within the County, good access for land uses, and safety for all road users.
- Goal 2: Assure that roads are under the jurisdiction and system designation appropriate to the types of trips they serve, volume of traffic, functional classification, and maintenance ability.
- Goal 3: Manage the road system to maximize road life, be cost-effective, and provide consistent direction over time.
- Goal 4: Coordinate road planning and improvement efforts with the state, region, and local municipalities.
- Goal 5: Ensure good rail service to support agriculture and economic development.
- Goal 6: Increase the overall effectiveness of the transit system in Renville County.

While this chapter does not specifically address airports, Goal 1 specifically states that that a "high level of personal and commercial mobility through and within the County," to which well-developed airports can make a major contribution.

Renville County Zoning Ordinance. The zoning ordinance has many purposes set forth in its introduction, some of which are distinctly related to airports:

- To define the allowable uses in zoning districts within the unincorporated areas of the County.
- To regulate the location, construction, reconstruction, alteration, and use of structures and land within the unincorporated areas of the County.
- To provide for the compatibility of different land uses and the most appropriate use of land throughout the County.
- To regulate the alteration and grading of land and natural vegetation.
- To limit congestion on public roads and to foster public safety and convenience in travel and transportation.
- To protect area needed for future public use from further development through Official Maps.
- To prevent the creation or establishment of hazards adjacent to airports.

in the zoning ordinance are descriptions of each of the district types (such as Agricultural, Urban Expansion, and Rural Residential, Healthcare/Mixed Use, and Commercial/Industrial) and the districts' purpose, their permitted, conditional, and accessory uses, and density, lot size, setback, yard and height requirements. Overlay districts such as Floodplain, Shoreland, Scenic River, and Project River Bend districts are also described.

The Ordinance also addresses general regulations and specific issues, such as:

- Signs regulations
- Shoreland Standards
- Essential Services

- Animal Feedlot Regulations
- Towers
- Renewable Energy
- Conditional Uses
- Non-conforming Structures, Uses, and Lots
- Subsurface Sewage Treatment Systems, and
- Zoning Administration issues and procedures.

Chapter 12 includes the County's Airport Zoning Regulations, which addresses both airports within Renville County – Olivia and Hector. Airspace obstruction and land use safety zoning is addressed in a manner similar to the model zoning ordinance provided by the MnDOT Office of Aeronautics. It also contains sections describing non-conforming uses, permitting, variances, hazard marking and lighting, and administrative bodies such as the Airport Zoning Administrator and Board of Adjustment. Finally, it addresses appeal and judicial review procedures; violations, penalties and remedies; conflicts between regulations, and separability of the ordinance.

Renville County Zoning Map. This map was adopted to regulate the use and orderly development of Renville County, and applies to the unincorporated areas of the County. The map depicts townships, cities, and areas planned for land uses such as Agriculture, Commercial/Industrial, Health Care/Mixed Use, Incorporated Cities, Rural Residential, Shoreland, and Urban Expansion areas. It also depicts highways, roads, lakes, ditches and streams.

The Airport is included as part of the City of Hector, within Hector Township. The Township Zoning Map is included in the Appendix of the Master Plan.

Hector City Code, Chapter 151: Zoning Regulations. This document sets forth provisions for buildings and land use within the City. Lawful uses existing prior to the adoption of the ordinance but in accordance with the 1979 ordinance may be continued, subject to the regulations of this section. It defines the minimum requirements and standards of property design, construction, and materials in applications for building permits relating to housing in the City. It establishes the creation of the following zoning districts:

Zoning Districts	
B-1	Central Business
B-2	Highway Commercial
M-1	Manufacturing
R-1	Residential – Single Family
R-2	Residential – Multifamily
R-3	Residential – High Density
AG	Agriculture

Table 2-14: City of Hector Zoning Districts

The ordinance defines the requirements for all uses within each district. Airports are included in zoning district AG as a conditional use.

Hector City Code, Section 151.120 Municipal Airport Zoning. This chapter deals largely with airport hazards, noting that such hazards endanger the lives and property of airport users and the property or occupants of the land in its vicinity. Such hazards may also destroy or impair the utility of the airport. Thus, the chapter endeavors to prevent the creation or establishment of airport hazards, and the elimination, removal, alteration, mitigation or marking and lighting of existing airport hazards.

Structures such as cell towers, wind turbines, vegetation, terrain, and tall buildings can inhibit airport operations and pose a safety concern. This chapter protects the safety and utility of the airport, the safety of the public and property, and prohibits hazards in certain areas by establishing Safety Zones A, B, and C centered around the runway centerline. The designated Safety Zones have guidelines for land use and building or structure construction for each zone to prevent the development of obstructions which are a hazard to air navigation.

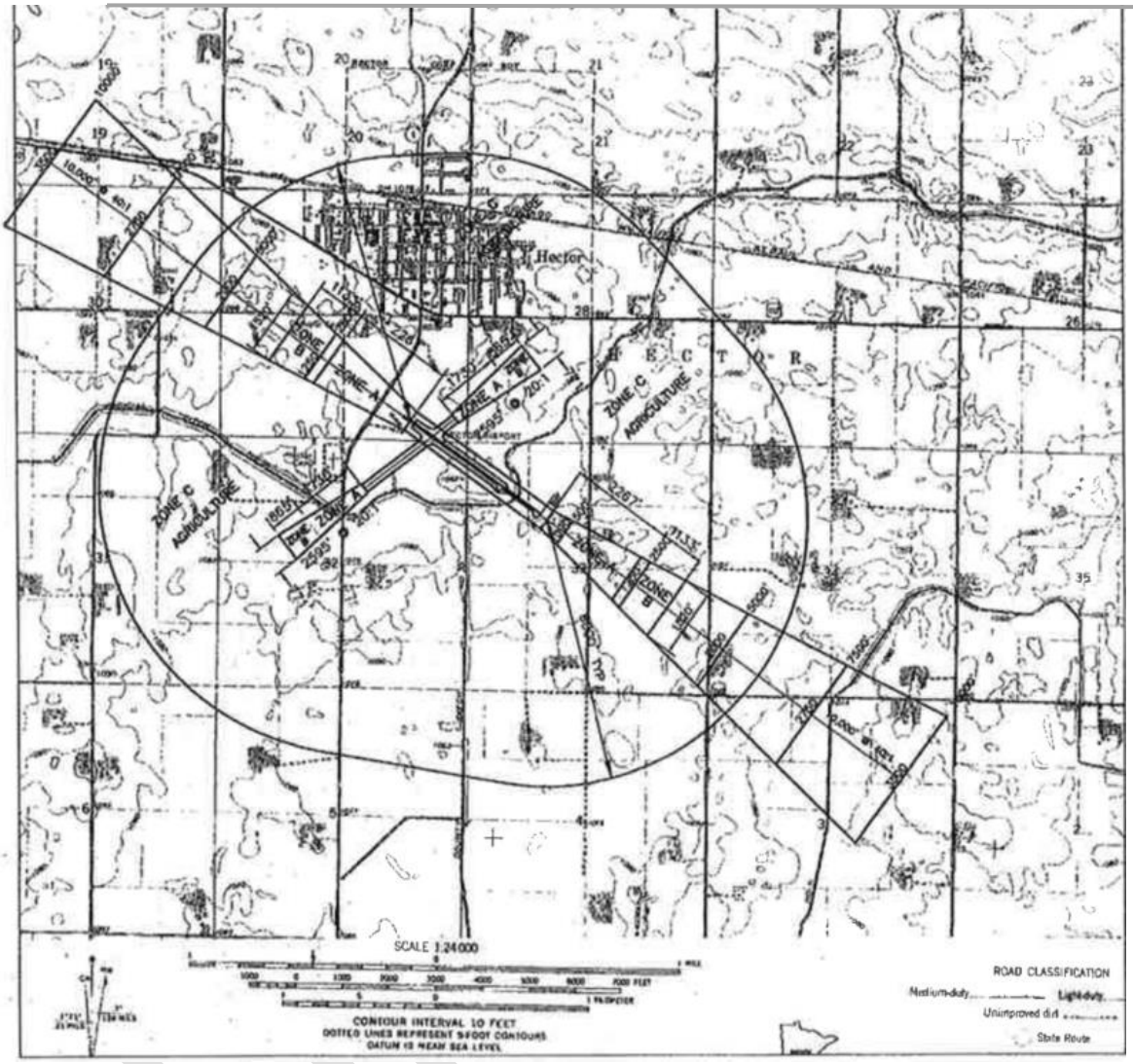


Figure 2-15: 1D6 Safety Zones A, B, and C
Source: 2003 ALP Land Use and Airspace Zoning Plan

The Safety Zones are superimposed over specific areas of airspace, defined in the ordinance, which impose height limitations according to the airspace being protected. It delineates the scope of the ordinance in relation to existing conditions or structures (meaning that they may be "grandfathered in") though they are nonconforming uses. Hazards that cannot be removed must be marked and lighted. The ordinance also addresses light or lighting devices, glare, or dust which may also restrict visibility in the Safety Zones.

The City's Airport Zoning ordinance, created as part of their larger Zoning document, was adopted in 1984. The ordinance was adopted by a Joint Airport Zoning Board, created and established by joint action of the City Council of the City of Hector, the Board of County Commissioners of Renville County, and Hector and Melville Townships. Since that time, many improvements have been made to the airport, including a pilot lounge, new hangars, a snow removal equipment building, and electrical vault. These improvements can impact the relevance of the current

ordinance, but further, it is vitally important that the Airport Zoning ordinance and associated map be updated to reflect the desired Ultimate Facility in order to protect the area surrounding the airport for future development by 1D6. Representatives of MnDOT are prepared to assist 1D6 in the completion of this document and expect the adoption of an updated ordinance and map upon completion of the Master Plan.

Additionally, it appears that there are conflicts between the official airport zoning ordinances of the County, City, and the Joint Airport Zoning Ordinance. These conflicts were identified in 2013, but an invitation to discuss the conflicts was not extended to the concerned parties (City, State, and Townships) until 2016. MnDOT's Zoning Information Warehouse database notes that Hector's Airport Zoning Ordinance is "In progress." *These conflicts should be resolved in concert with the completion of the Master Plan.*

1D6 Zoning conflicts between the official airport zoning ordinances of the County, City, and the Joint Airport Zoning Ordinance should be resolved in concert with the completion of the Master Plan.

Hector City Code, Section 151.131 Airport Board of Adjustment. This chapter establishes the creation of a Board of Adjustment, describing who should be a member, their meetings and responsibilities, and their powers. Section XII of the Airport Zoning Ordinance is coordinated verbatim with this definition for the Airport Zoning Board of Adjustment.

Taken overall, there is little in any of the documents described above that limits development around the airport. Adjacent land development could impact current or future planned expansion of airport surfaces unless the proper zoning documents are put in place to protect the airport safety zones or FAR Part 77 surfaces.

2 | Section 4 – Description of Existing Facilities

2.4.1 Existing Airport Layout

Figure 2-16: Aerial View of Existing Facilities; Source: Woolpert, Inc.

The Hector Airport property consists of 155 acres. The key elements and current amenities include:

- Paved runway 12/30
- Turf runway 05/23
- Taxiway and apron areas
- 4 Aircraft tie-downs
- 2 Public T-hangars – 7 units
- Snow Removal Equipment Building
- 10 private hangar buildings, 13 owners (not included in this review)
- Arrival/departure building
- Fuel facility
- Navigational aids
- Automobile parking areas
- Aeronautical Business Office building

These features are depicted in the Airport Layout Drawing (Figure 2-17).

Figure 2-17: Airport Layout Drawing of Existing Facilities

2.4.2 Existing Design Criteria

2.4.2.1 Existing Conditions

The current aircraft using 1D6 are primarily single-engine such as the Piper PA22 and J3C, Cessna 140 and 172, Aeronca 7AC and other similarly-sized craft. The Beechcraft Barron 55 is the only multi-engine aircraft on the field. Agricultural spray aircraft, which play a large role in the number of operations at 1D6, include craft such as the Air Tractor 502, which has a wingspan of 52', a height of 10'-3", and has a maximum takeoff weight of 9,400 pounds. Until recently, it was common to see Beechcraft King Air aircraft supporting Medivac flights. Lately, these medivac roles have been carried out by Pilatus type aircraft. Medivac flights occur approximately once per month according to airport management.

A review of the existing facility indicates that 1D6 is currently designed to accommodate aircraft in Approach Category "A - Small Aircraft" and Aircraft Design Group "II," resulting in an ARC of **A-II (Small).**

Airfield design standards are based upon an **Airport Reference Code** (ARC) for the most demanding aircraft with greater than or equal to 500 annual operations currently using or forecasted to use the airport. The type of approaches offered at the airport (in this case, visual only) also affect design criteria. The ARC is used for planning only and does not limit the aircraft that may be able to operate safely on the airport.

A review of the existing facility indicates that 1D6 is currently designed to accommodate aircraft in Approach Category "A (Small) Aircraft" and Aircraft Design Group "II," resulting in an ARC of *A-II (Small)*. However, a great majority of the aircraft that use the airport are those with an approach speed of less than 91 knots, wingspans less than 49 feet, and tail heights of less than 20 feet, which fall into the A-I (Small) category.

Understanding Design Criteria

The Airport Reference Code (ARC) is used for planning and design. Unlike the Runway Design Code (RDC), it does not limit the aircraft that may be able to operate safely on an airport.

The ARC consists of two components. The first component is the Aircraft Approach Category (AAC) which relates to approach speed of the aircraft. The second relates to either the aircraft wingspan and/or tail height and is known as the Airplane Design Group (ADG). According to the FAA AC 150/5300-13A, *Airport Design*, the following criteria determine the AAC and ADG.

Aircraft Approach Category (AAC):

Approach Speed (V_{REF})	
A	Less than 91 knots
B	91 knots - 120 knots
C	121 knots - 140 knots
D	141 knots - 165 knots
E	166 knots or more

Airplane Design Group (ADG):

	Tail Height (feet)	Wingspan (feet)
Group I	Less than 20	Less than 49
Group II	20 - 30	49 - 79
Group III	30 - 45	79 - 118
Group IV	45 - 60	118 - 171
Group V	60 - 66	171 - 214
Group VI	66 - 80	214 - 262

Hector's Current ARC: A-II (Small)

The following table describes the typical aircraft based at 1D6 or using their facilities along with their associated ARC.

Aircraft	ARC	Approach Speed (knots)	Wingspan (feet)	Height (feet)	Max. Takeoff Weight (lbs)
Aeronca 7AC Champion	A-I	43	35	7	1,220
Air Tractor Inc AT-301	A-I	74	45	8.5	5,000
Air Tractor Inc AT-502	A-II	77	52	10.25	9,400
Monnett Monerai S (glider)	N/A	N/A	36	4.25	450
Beech V35B	A-I	72	33.5	7.58	3,125
Beech Baron	B-I	95	37.9	9.6	5,100
Boeing Stearman A75N1 (PT-17) (biplane)	A-I		32.2	9.7	2,635
Cessna 150	A-I	55	33.17	8.5	1,600
Cessna 172K	A-I	62	36.08	8.92	2,550
Cessna 177B	A-I	52	35.5	8.58	2,500
Cessna 195A	A-I	52	36.17	7.17	3,350
Cirrus SR20	A-I	73	38.25	8.92	3,050
Bellanca Eagle DW-1	A-II	62	55	10.9	5,400
Mooney M20K	A-I	77	35	8.33	2,740
Murphy Rebel	A-I	52	30		1,650
Piper PA-28-140	A-I	60	30	7.29	2,150
Piper PA-31T	B-I	98	42.69	12.75	9,000
Spartan 7W			39	8	4,400
Taylorcraft BC-12-D	A-I	49	36		
Timm N2T-1	A-I		36		1,236
W.B.C. Flying Club Inc. Flybaby-1A (Ultralight)	A-I	58	28		924

Table 2-18: Typical Aircraft Operating at 1D6

Figure 2-19: Air Tractor 502 operating at 1D6

If a third component, the **Visibility Minimum** (RVR), is added to the ARC, the code then becomes a **Runway Design Code** (RDC), which signifies the design standards to which a runway is to be built. These RVR values are expressed in feet as noted in the table below. Runways designed for visual approach only are designated "VIS." **Both Runway 12/30 and turf runway 5/23 are Visual Approach only.**

RVR (feet)	Instrument Flight Visibility Category (statue mile)
5000	Not lower than 1 mile
4000	Lower than 1 mile but not lower than ¾ mile
2400	Lower than ¾ mile but not lower than ½ mile
1600	Lower than ½ mile but not lower than ¼ mile
1200	Lower than ¼ mile
VIS	Visual approach only

Table 2-20: FAA Visibility Minimums; Source: AC 150/5300-13A

The existing taxiway, at 50 feet wide, conforms to a TDG-3 standard.

In addition, the **Taxiway Design Group** (TDG) must be considered. The TDG is used to determine taxiway width, shoulder width, fillets, and in some cases, taxiway to taxiway separation. The TDG is based on the outer-to-outer main gear width (MGW) and the cockpit to main gear distance (CMG). **The existing taxiway, at 50 feet wide, conforms to a TDG-3 standard.**

2.4.2.2 Airport Operating Certificate

Hector is not a commercial airport and does not have a Part 139 Airport Operating Certificate, though it is a licensed public airport through MnDOT.

2.4.2.3 Wind Analysis

Winds are the traditional factor in determining runway orientation, generally aligning with the direction of the prevailing wind.

Wind data analysis considers wind speed and direction related to the existing and forecasted operations, both during VFR and IFR weather conditions. An ideal runway is aligned with the prevailing wind for the greatest percentage of time. A crosswind runway is recommended by the FAA when the primary runway orientation provides less than 95% wind coverage. In this case, a crosswind runway may be justified and eligible for Federal funding.

Wind coverage is the percent of time that crosswind components are below an acceptable velocity in a certain direction. This coverage is calculated based on the crosswind component not exceeding the allowable value listed in Table 3-1 of AC 150/5300-13A. Appropriate application of data from the wind analysis will enhance the safety and utility of the airport.

The crosswind component of wind direction and velocity is defined as the resultant vector which acts at a right angle to the runway centerline, and is equal to the wind velocity multiplied by the sine of the angle between the wind direction and the runway direction.

Runway 12/30 provides sufficient wind coverage in a 10.5 knot, 13 knot, and 16 knot crosswind 93 to 99% of the time. Due to the multiple runway orientations at 1D6, pilots have options when preparing to land or take off to compensate for crosswinds.

The existing Runway Design Code for Runway 12/30 is currently A-II (Small)-1 mile, but smaller aircraft regularly use the runway. Based on FAA standards for A-II, the allowable crosswind component for this runway is 13 knots. Generally, smaller aircraft are more affected by wind conditions, contributing to accidents, and given the significant number of slightly smaller aircraft (A-I) anticipated to visit 1D6 in the foreseeable future, the runway has been evaluated for 10.5, 13, and 16 knot crosswind components.

Based on this analysis, Runway 12/30 provides coverage between 93.44% and 98.95% of the time for the reviewed crosswind components in all weather conditions. Runway 05/23 provides coverage between 79.76% and 94.61%. When the runways are analyzed together, wind coverage improves to between 97.51% and 99. 91%. Due to the multiple runway orientations at 1D6, pilots have options when preparing to land or take off to compensate for crosswinds.

The FAA considers the National Oceanic and Atmospheric Administration's (NOAA) National Climatic Data Center (NCDC) as the best source of wind data for these calculations. Hector Municipal Airport does not have an Automated Weather Observing System (AWOS), so wind data has been collected at Olivia Municipal Airport (KOVL), which is the nearest airport with an AWOS, only 14 nautical miles distant, and used in the calculations below.

2009-2018 Wind Data	10.5 knots	13 knots	16 knots
Paved Runway 12/30			
IFR	92.96%	96.36%	98.92%
VFR	93.51%	96.71%	98.99%
All Weather	93.44%	96.65%	98.95%
Turf Runway 05/23			
IFR	76.04%	83.19%	91.26%
VFR	80.18%	87.25%	95.01%
All Weather	79.76%	86.83%	94.61%
Combined Runway Analysis			
IFR	97.9%	99.53%	99.94%
VRF	97.49%	99.42%	99.91%
All Weather	97.51%	99.41%	99.91%

Table 2-21: Wind Coverage; Source: National Climatic Data Center FAA Standard wind analysis tool. Wind data from Oliva Municipal Airport, September 2019.

2.4.2.4 Approach Procedures

In a **Visual Flight Rules** (VFR) approach, the pilot is responsible for maintaining aircraft separation, navigation, and choosing the arrival and departure flight paths to and from and airport. The results of individual pilot navigation for sequencing and collision avoidance are that aircraft do not fly a precise flight path to and from the airport. Therefore, aircraft can be found flying over a wide area around the airport for sequencing and safety reasons.

While aircraft can be expected to operate over most areas of the airport, the density of aircraft operations is higher near the airport. This is the result of aircraft following the established traffic patterns for the airport. The **traffic pattern** is the traffic flow that is prescribed for aircraft landing or taking off from an airport. The components of a typical traffic pattern are upwind leg, crosswind leg, downwind leg, base leg, and final approach, which essentially define which side of the runway aircraft will operate.

- **Upwind Leg:** A flight path parallel to the landing runway in the direction of the landing.
- **Crosswind Leg:** A flight path at right angles to the landing runway off its departure end.
- **Downwind Leg:** A flight path parallel to the landing runway in the direction opposite to landing. The downwind leg normally extends between the crosswind leg and the base leg.
- **Base Leg:** A flight path at right angles to the landing runway at its approach end. The base leg normally extends from the downwind leg to the intersection of the extended runway centerline.
- **Final Approach:** A flight path in the direction of landing along the extended runway centerline. The final approach normally extends from the base leg to the runway.

Under VFR conditions, pilots may approach each of the runways from any direction, using a standard left visual pattern with an altitude of 2000 feet above mean sea level.

While the traffic pattern defines the direction of turns that an aircraft will follow on landing or departure, it does not define how far from the runway an aircraft will operate. The distance an aircraft operates laterally from the runway centerline or the distance from the end of the runway is at the discretion of the pilot, based on the operating characteristics of the aircraft, number of aircraft in the traffic pattern, and meteorological conditions. The actual ground location of each leg of the traffic pattern varies from the aircraft operation to aircraft operation for reasons of safety, navigation and the sequencing described above. The distance that the downwind leg is located laterally from the runway will vary based mostly on the speed of the aircraft. Slower aircraft can operate closer to the runway as their turn radius is smaller.

The direction in which aircraft approach and depart is generally dependent on wind conditions. Both approaches and departures should be performed into the predominant wind direction. When wind is not a factor, approach and departure runways are typically at the discretion of the pilot unless there are local flight regulations prescribing otherwise.

At this time, 1D6 has no Instrument Approaches. **Instrument Flight Rules** (IFR) will be discussed in Section 2.4.4.7, *Navigational Aids.*

2.4.3 Airspace

2.4.3.1 Airspace Description

The Federal Aviation Administration Act of 1958 established the FAA as the responsible agency for the control and use of navigable airspace within the United States. The FAA established the **National Airspace System** (NAS) to protect people and property on the ground and establish a safe and efficient airspace environment for civil, commercial, and military aviation. This includes the network of airspace such as air navigation facilities, airports and landing areas, aeronautical charts, associated rules, regulations and procedures, and technical information.

Airspace is broadly classified as "controlled" or "uncontrolled," the difference being primarily related to requirements for pilot qualifications, ground-to-air communications, navigation and air traffic services, and weather conditions. See Figure 2-23: *Understanding Airspace* for a description of the five classes of "controlled" airspace, A-E. Class G airspace is considered "uncontrolled." In Class G airspace, federal aviation regulations still apply, and there is no specific equipment or air traffic control communications needed to enter the airspace.

According to the Federal Register… Hector's airspace is considered Class G. Controlled airspace is necessary to accommodate Area Navigation (RNAV) Standard Instrument Approach Procedures at the airport, enhancing the safety and management of Instrument Flight Rule (IFR) operations.

According to the Federal Register (www.federalregister.gov) Class E Airspace has not been established at 1D6 per 14 CFR Part 71 standards, so Hector's airspace is considered **Class G.** *Controlled airspace is necessary to accommodate Area Navigation (RNAV) Standard Instrument Approach Procedures at the airport*, enhancing the safety and management of Instrument Flight Rule (IFR) operations.

Victor airways are low-altitude airways, defined in straight-line segments, each of which is based on a straight line between either two VHF omnidirectional range (VOR) stations or a VOR and a VOR intersection. The nearby Victor airways can be seen in Figure 2-24.

2.4.3.2 Air Traffic Control (ATC) Procedures and Communications

The Hector airport does not have an FAA Air Traffic Control Tower (ATCT), therefore approach and departure service is provided by the Minneapolis Air Route Traffic Control Center via the Darwin Flight Service Center. The service provides radar separation on all aircraft operating on IFR fight plans within controlled airspace, and principally during the enroute phase of flight. Ground control and separation of the VFR aircraft operating near 1D6 is performed by the pilot under visual flight rules, who states his or her intentions via the CTAF.

Airport Communications	Frequencies
CTAF	122.8
Minneapolis ARTCC	125.5/323.1
AWOS-3 at OVL (Olivia)	119.275
AWOS-3 at HCD (Hutchinson)	118.525
ASOS at RWF (Redwood Falls)	126.575
AWOS-3 at LJF (Litchfield)	109

Table 2-22: Airport Communications

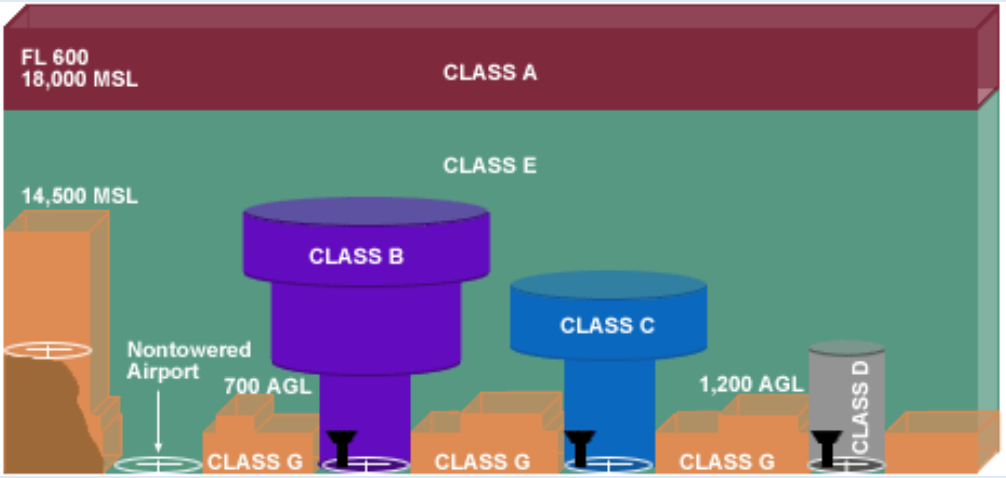
Notes:
CTAF-Common Traffic Advisory Frequency
ARTCC-Air Route Traffic Control Center
AWOS-Automated Weather Observing System
ASOS-Automated Surface Observing System

Understanding Airspace

The airspace over the United States, to an altitude of approximately 60,000 feet MSL (Flight Level – FL600), is separated into two parts, *terminal* and *en route* airspace. Terminal airspace is that area around the nation's major airports extending to a specified altitude that may encompass an area of 60 miles in diameter and include several airports. En route airspace is the area within which aircraft transit from one terminal airspace to another. There is no specified bottom altitude for en route airspace and the top extends to the upper performance limits of civil aircraft. U.S. airspace is further divided into several different categories, each with its own rules and regulations.

The airspace categories are designated Class A, B, C, D, E, and G, transition areas and continental control area. The Class B, C, and D areas are ascribed to Airport Traffic Areas (ATA). Each class of ATA has a given radius, with Classes B and C having extensions (transition areas) to encompass the final portion of an instrument approach procedure.

Victor airways are low altitude airways, used by both VFR and IFR aircraft traffic, defined in straight line segments between either two very high frequency omnidirectional range (VOR) stations, or a VOR and a VOR intersection. Victor airways have a floor of 1,200 feet above ground level (AGL) and a ceiling of 17,999 feet MSL. They are normally eight nautical miles wide.



Airspace Features	Class A	Class B	Class C	Class D	Class E	Class G
ATC Facility	ARTCC	TRACON	TRACON or ATCT	ATCT	ARTCC	None
Operations Permitted	IFR	IFR & VFR	IFR & VFR	IFR & VFR	IFR & VFR	IFR & VFR
Entry Requirements	ATC Clearance	ATC Clearance	ATC Clearance for IFR. All require radio contact	ATC Clearance for IFR. All require radio contact	ATC Clearance for IFR. All require radio contact	None
VFR Minimum Distance from Clouds	N/A	Clear of clouds	500' below, 1,000' above, and 2000' horizontal	500' below, 1,000' above, and 2000' horizontal	500' below, 1,000' above, and 2000' horizontal	Clear of clouds
Aircraft Separation	All	All	IFR, SVFR, and runway operations	IFR, SVFR, and runway operations	IFR and SVFR	None

Figure 2-23: Federal Airspace Classifications; Source: Federal Aviation Administration

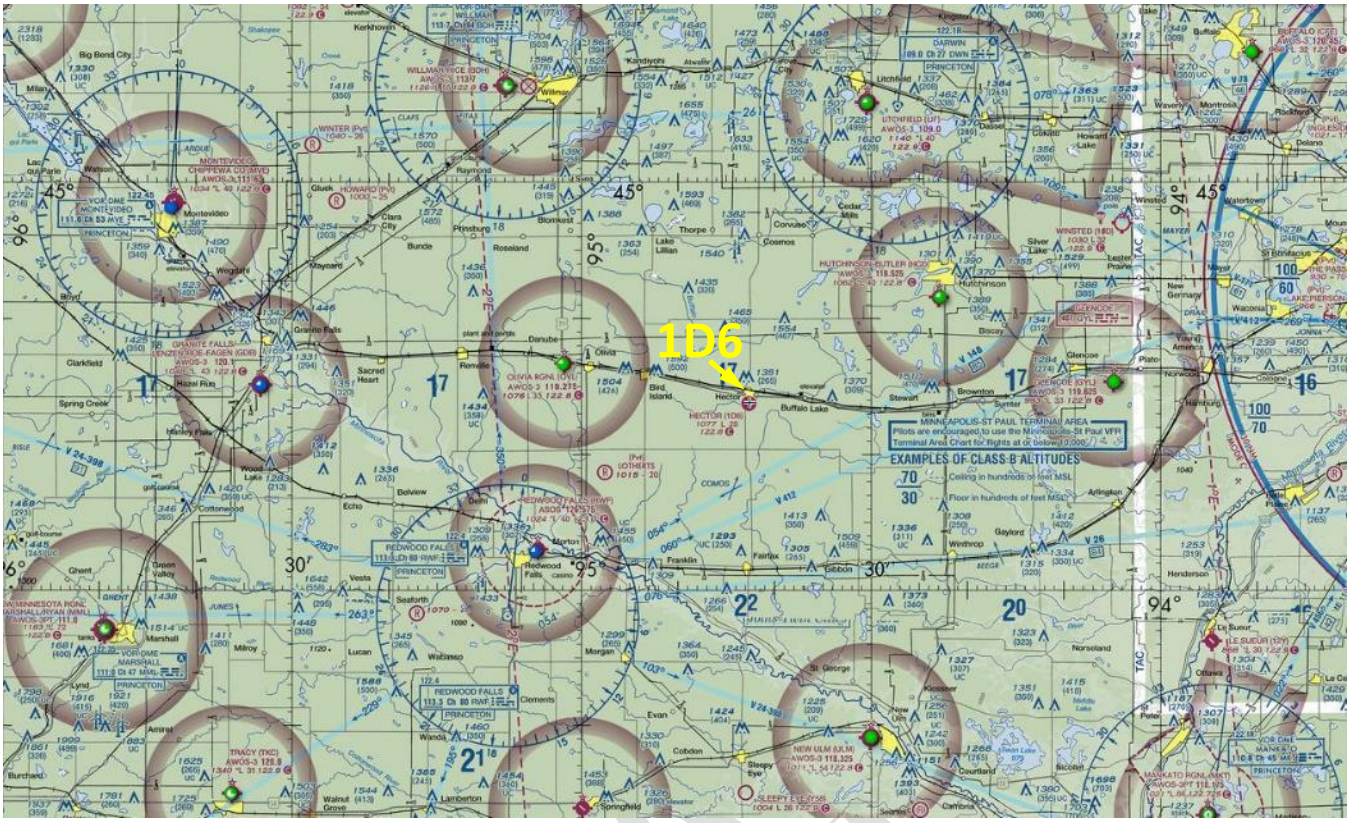


Figure 2-24: VFR Airspace and Airspace surrounding 1D6; Source: vfrmap.com

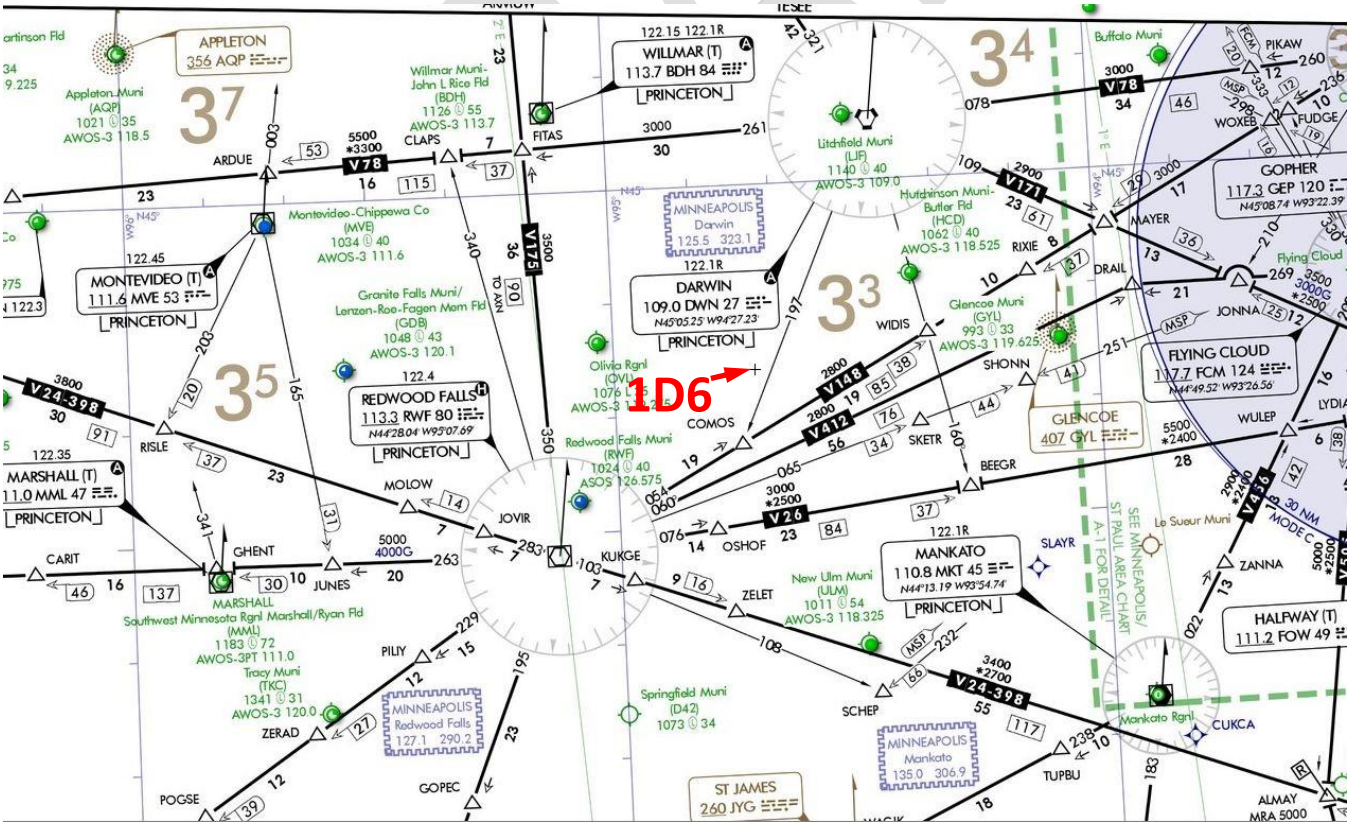


Figure 2-25: IFR Airspace and Air Traffic Control around 1D6; Source: Skyvector.com

2.4.3.3 FAR Part 77 Imaginary Surfaces

The FAA has established standards for determining obstructions to airports in Part 77 of the Federal Aviation Regulations. These standards identify "civil imaginary surfaces" which are described below.

Primary Surface. The Primary Surface is a surface longitudinally centered on the runway. When the runway has a specially-prepared hard surface, the primary surface extends 200 feet beyond either end of the runway, but when the runway has no specially-prepared surface (such as turf), the primary surface ends at the physical end of the runway. The elevation of any point on the primary surface is the same as the elevation of the nearest point on the runway centerline. Primary surface widths vary with the classification of the runway; however, the width is uniform throughout and is based on the most precise approach existing or planned for either end of that runway.

Approach Surfaces. Approach Surfaces extend outward from the primary surface at each end of the runway. The Visual approach surfaces for Runways 5/23 extend outward and upward at a 20:1 slope from the center point of the runway threshold, because it is not a paved runway. This means that for every 20 feet measured outward (horizontally), the Approach Surface slopes upward (vertically) one foot. The surface expands outward from an inner width of 250 feet to a width of 1,250 feet at a distance of 5,000 feet.

The Visual approach surfaces for Runways 12/30 extend outward and upward at a 20:1 slope from a point which is located 200 feet beyond the threshold (which is the end of the Primary Surface) and at the same elevation as the threshold. Their Approach Surfaces have an inner width of 250 feet with an outer width of 1,250 feet at a distance of 5,000 feet.

Horizontal Surface. A horizontal plane 150 feet above the established Airport Elevation, the perimeter of which is constructed by swinging arcs of specified radii from the center of each end of the Primary Surface of each runway. Tangents then connect the adjacent arcs. The size of arcs are as follows: For all runways designed Visual or Utility, the radius of each arc is 5,000 feet. For PIR and Non-Precision Instrument runways, the radius of each arc is 10,000 feet. The radius of the arcs specified for each end of a runway will have the same numerical value, that value being the highest determined for either end of the runway. When a 5,000 foot arc is encompassed by tangents connecting two adjacent 10,0000 arcs, it shall be disregarded.

Conical Surface. This surface extends upward and outward from the outer limits of the Horizontal Surface for a horizontal distance of 4,000 feet. The slope of the conical surface is 20:1 measured in a vertical plane.

Transitional Surfaces. Surfaces extending outward and upward, at right angles to the runway centerline, from the sides of the primary surface and the approach surfaces. The slopes of the transitional surfaces are 7:1 and the surface extends until it intersects the Horizontal or Conical Surface. A PIR Approach Surface projects beyond the limits of the Conical Surface and extends a distance of 5,000 feet measured horizontally from the edge of the Approach Surface, sloping at 7:1.

Understanding FAR Part 77 Imaginary Surfaces

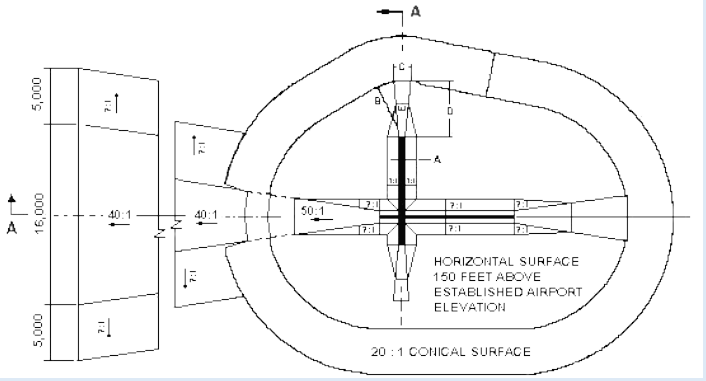
FAR Part 77:

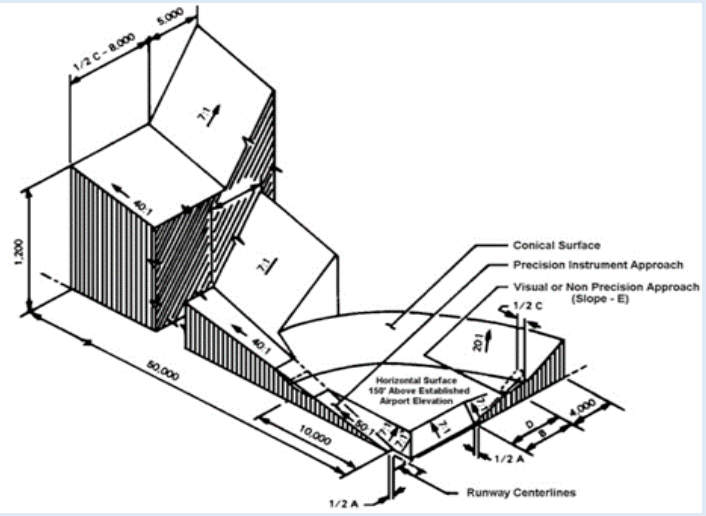
1. **Establishes standards for determining obstructions in navigable airspace.**
2. **Sets forth the requirements for notice to the Administrator of certain proposed construction or alteration.**
3. **Provides for aeronautical studies of obstructions to air navigation to determine their effect on the safe and efficient use of airspace.**
4. **Provides for public hearings on the hazardous effect of proposed construction or alteration on air navigation.**
5. **Provides standards for establishing antenna farm areas.**

Obstructions to air navigation are any existing or proposed objects, fixed or mobile. In greater height than the imaginary surfaces outlined within FAR Part 77.23. Civil airport imaginary surfaces established under FAR Part 77 for each runway include:

- **Primary Surface**
- **Approach Surface**
- **Transitional Surface**
- **Horizontal Surface**
- **Conical Surface**

Existing penetrations to the FAR Part 77 surfaces are considered hazards unless they have been studied by FAA and determined not to be hazards. The determination of whether a proposed obstruction is a hazard is accomplished through an aeronautical study. The standards apply to all objects, whether manufactured, natural growth, or terrain.





Fixed or mobile objects which are of greater height than the surfaces described in FAR Part 77 are considered "obstructions to navigation" until they have been reviewed by the FAA, and which may be required to be removed or marked and lighted, depending on the nature of the obstruction and the feasibility of its removal. To fully protect 1D6 from these potential hazards to air navigation, an obstruction analysis will be conducted to evaluate penetrations based on Part 77 Imaginary Surfaces. This analysis will be performed as part of the Master Planning effort.

Dimensional criteria related to the imaginary surfaces can vary depending on the critical aircraft (weight and approach speed) using the airport. Both Runway 12/30 and Turf runway 5/23 are considered Visual Runways.

OBSTRUCTION IDENTIFICATION SURFACES
FEDERAL AVIATION REGULATIONS PART 77

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

- A - UTILITY RUNWAYS
- B - RUNWAYS LARGER THAN UTILITY
- C - VISIBILITY MINIMUMS GREATER THAN 3/4 MILE
- D - VISIBILITY MINIMUMS AS LOW AS 3/4 MILE
- * - PRECISION INSTRUMENT APPROACH SLOPE IS 50:1 FOR INNER 10,000 FEET AND 40:1 FOR AN ADDITIONAL 40,000 FEET

Figure 2-26: Dimensional Standards for Obstruction Identification Surfaces
Source: www.ngs.noaa.gov/AERO/oisspec.html
Note: Runways 12/30 and 5/23 are currently Visual approach only.

Runway 12/30 and Turf Runway 5/23 are both considered **Visual Runways:**

> "… A runway intended solely for the operation of aircraft using visual approach procedures, with no straight-in instrument approach procedure and no instrument designation indicated on an FAA approved airport layout plan, a military service approved military airport layout plan, or by any planning document submitted to the FAA by competent authority."

They are also considered **Utility Runways**:

> "… A runway constructed for and intended to be used by propeller-driven aircraft of 12,500 pounds maximum gross weight and less."

Each runway has its own set of surfaces with unique dimensions which will be examined in greater detail later in this document.

2.4.3.4 Runway Protection and Clear Zones

Runway Protection Zones (RPZs) are airfield design elements intended to protect airspace, prevent incompatible land uses, and protect people and property on the ground within the vicinity of a runway end. These zones are trapezoidal areas located at both the approach and departure ends of the runway within the innermost portion of the FAR Part 77 Approach Surface. The dimensions of these areas are based upon the types of aircraft expected to use a runway and its approach visibility minimums. The FAA requires airports to control, to the greatest extent possible, the land within the RPZs to prevent the creation of hazards to arriving and departing aircraft in the future. Per AC 150/300-13A, "Control is preferably exercised through the acquisition of sufficient property interest in the RPZ and includes clearing RPZ areas (and maintaining them clear) of incompatible objects and activities." This means that the airport should own the RPZ areas if possible, but if not possible, avigation easements are acceptable.

The RPZs for each of the runways are not completely owned in fee simple title, which is contrary to FAA guidance regarding airport control of RPZs. While the innermost portions of the RPZs fall within the bulk of the airport property, the outermost portions of some of them cross Highway 4 or into private property. In the case of the RPZs for Runways 12 and 30, any area not owned by the airport are protected by avigation easements. In the case of the RPZs for Runways 5 and 23, there are no avigation easements. Recommendations to gain control of those RPZ areas in fee or easement will be included in *Chapter 4, Facility Requirements.*

The FAA issued a Memorandum on September 27, 2012 titled *Interim Guidance on Land Uses within a Runway Protection Zone.* It was issued to help clarify issues raised with the new Airport Design Advisory Circular (150/5300-13A) regarding new guidance on runway protection zones. The memorandum discusses land use with respect to existing conditions verses proposed or modified conditions. Referring to this memorandum, while limited farming, irrigation channels, airport service roads, and certain NAVAIDs are acceptable in the RPZ, there are incompatible uses in the existing RPZs of runways 5 and 12.

Runway Designation	Known Incompatible Land Use	Disposition
5	State Highway 4	On airport property
12	State Highway 4	On airport property
23	none	
30	none	

Table 2-27: Incompatible Land Uses within Runway RPZs

The memorandum notes that the FAA will work with the airport sponsor to remove or mitigate the existing incompatible land uses where practical. Any proposed changes to the RPZs must consider the incompatible land uses outlined in the memorandum. This Master Plan will evaluate opportunities to eliminate incompatible land uses from the RPZs, as may be practicable, in Chapter 5, *Alternatives Analysis.*

Clear Zones, as established by the Minnesota Department of Transportation Office of Aeronautics in *Policy Statement No. 1, Clear Zone Requirements*, are another way the state restricts land uses which may be hazardous to the operational safety of aircraft and protects life and property in runway approach areas. These areas are similar in function to RPZs but have slightly different dimensions as indicated in the figure and table below. The actual dimensions are determined according to the type of aircraft served, the landing aids available, and the approach minimums planned or established.

The figures below depict the airport data included in the 2003 ALP and 2009 ALP update. Appropriate design standards will be considered after establishing the Existing and Ultimate Critical Design Aircraft in Chapter 3, *Aviation Demand Forecasts.*

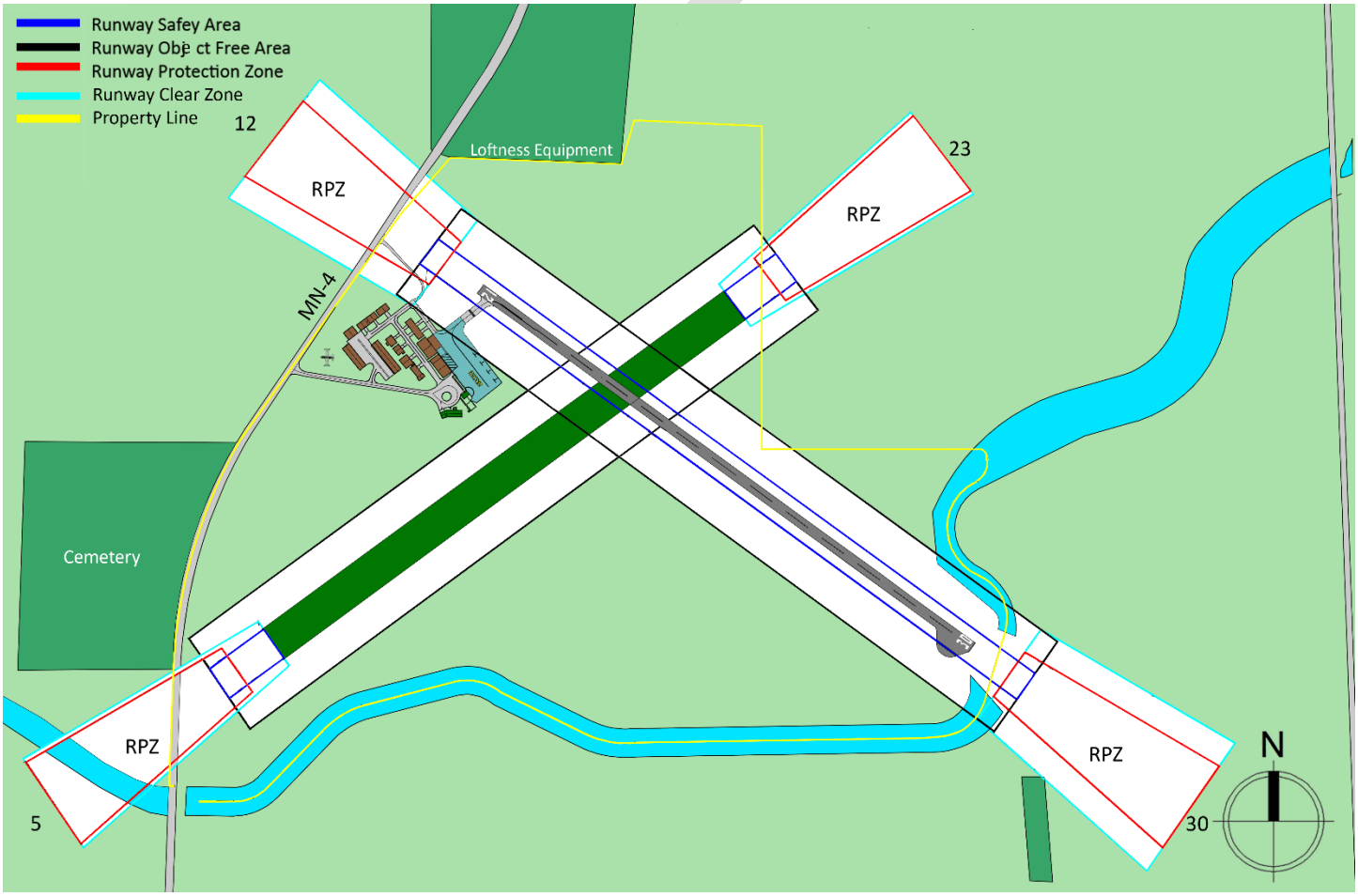


Figure 2-28: Existing Runway Protection Zones and Clear Zones

Runway End	Length (ft)	Inner Width (ft)	Outer Width (ft)
Runway Protection Zones			
Runway 5	1,000	250	450
Runway 12	1,000	250	450
Runway 23	1,000	250	450
Runway 30	1,000	250	450

Runway End	Length (ft)	Inner Width (ft)	Outer Width (ft)
Clear Zones			
Runway 5	1,200	250	490
Runway 12	1,000	500	700
Runway 23	1,200	250	490
Runway 30	1,000	500	700

Table 2-29: Existing Runway Protection and Clear Zones

Figure 2-30: Existing Airside Facilities per the 2003 ALP

2.4.4 Airside Facilities

Airside Facilities at Hector include:

- Primary Runway 12/30
- Turf Runway 5/23 (Spring, Summer and Fall only with favorable conditions)
- Taxiway A and Taxilanes
- Airfield Markings
- Aprons
- Airfield electrical and lighting components
- NAVAIDs

In this section, each of these components have been inventoried and assessed for the existing condition using Good, Fair, or Poor condition designations. A facility rated as "Good" may be assumed to be substantially adequate throughout the planning period, with normal maintenance. A "Fair" rating means the item will likely require major upgrades or replacement sometime during the period, and a "Poor" rating indicates the item is not adequate for its intended use at the present time.

2.4.4.1 Primary Runway

Hector's Runway 12/30 is 2,768 feet long and 50 feet wide. It is oriented in a northwest-southeast direction and its characteristics are listed in Table 2-31. The runway is open all year long and is plowed in the winter months. Approaches for this runway are VFR only. It should be noted that the minimum recommended runway width for Federal airports is 60' wide, while the Minnesota airport licensing standard is 75' wide.

Runway numerals for each runway end are determined from the approach direction to the runway end and should be equal to one-tenth the magnetic azimuth of the runway centerline, measured in the clockwise direction from magnetic north. Although the true bearing of the runway will not change over time, the magnetic bearing will change as the location of magnetic north shifts.

Table 2-31 provides a summary of the true (geographic) compass readings for each runway end and notes the magnetic declination required to adjust to the magnetic compass readings. Based on an analysis performed on September 13, 2019 using the online calculator for the National Centers for Environmental information (NCEI), formerly known as the National Geophysical Data Center, the rate of change to the magnetic declination in this area is 0.08°W per year. At this rate, 1D6's runway designation will remain stable into the foreseeable future.

	Runway 12	Runway 30
Length x Width	2,768 feet x 50 feet	
Surface	Asphalt	
Displaced Threshold	None	
Runway End - Elevation (MSL)	1078.05	1077.76
Runway End - Latitude	44°44'00.39"N	44°43'44.35"N
Runway End - Longitude	94°42'58.37"W	94°42'27.34"W
Lighting	LIRL	
Marking	Visual	Visual
Visual Aid	None	None
Instrument Approach	None	
Magnetic Declination	1.35°E	1.35°E
Magnetic Heading	124.59°	304.6°
Approach Surface Slope (AC 150/5300-13A Table 3-2)	20:1	20:1

	Runway 12	Runway 30
Approach Type	VFR	VFR

Table 2-31: Existing Runway 12/30 Data
Source: AGIS Analysis, Woolpert – August 2018

2.4.4.2 Turf Runway

Hector's Turf Runway 5/23 is 2,570 feet long and 165 feet wide, and it is oriented in a northeast-southwest direction. The runway's characteristics are listed in Table 2-32. This runway is not open in the winter months. Approaches for this runway are VFR only.

Runway numerals for each runway end are determined from the approach direction to the runway end and should be equal to one-tenth the magnetic azimuth of the runway centerline, measured in the clockwise direction from magnetic north. Although the true bearing of the runway will not change over time, the magnetic bearing will change as the location of magnetic north shifts.

Table 2-32 provides a summary of the true (geographic) compass readings for each runway end and notes the magnetic declination required to adjust to the magnetic compass readings. Based on an analysis performed on September 13, 2019 using the online calculator for the National Centers for Environmental information (NCEI), formerly known as the National Geophysical Data Center, the rate of change to the magnetic declination in this area is 0.08°W per year. At this rate, 1D6's turf runway designation will remain stable into the foreseeable future.

	Runway 5	Runway 23
Length x Width	2,570 feet x 165 feet	
Surface	Turf	
Displaced Threshold	None	
Runway End - Elevation (MSL)	1077.1	1077.2
Runway End - Latitude	44°43'44.48"N	44°43'59.65"N
Runway End - Longitude	94°43'10.80"W	94°42'42.26"W
Lighting	None	
Marking	Cones	Cones
Visual Aid	None	None
Instrument Approach	None	
Magnetic Declination	1.35°E	1.35°E
Magnetic Heading	51.94°	231.94°
Approach Surface Slope (AC 150/5300-13A Table 3-2)	20:1	20:1
Approach Type	VFR	VFR

Table 2-32: Turf Runway 5/23 Data
Source: AGIS Analysis, Woolpert – August 2018

2.4.4.3 Taxiways and Taxilanes

Runway 12/30 is accessed by a single taxiway (Connecting Taxiway A) which is located at the north (12) end of the runway and is 40 feet wide, which is wider than the FAA recommended 35 feet. It connects to a taxilane which provides access to the apron and both public and private hangars. The taxiway has minimal lighting and the pavement is in good condition, but it provides direct access to the runway, which is not recommended for pilot situational awareness and increases the likelihood of runway incursions.

Section 1 of Taxilane A, which connects the apron to the existing hangar buildings, is in fair condition between the apron and the hangar areas per the 2018 Pavement Condition Report (see Section 2.4.4.9, *Pavement Condition*). Section 2 of Taxilane A is in excellent condition. Otherwise, the Taxilane functionally serves the accessibility of the hangars from the main apron.

2.4.4.4 Airfield Markings

Runways 12 and 30 have Visual markings which are in good condition.

2.4.4.5 Apron

The apron is that part of the airport intended to accommodate the loading and unloading of passengers and cargo, refueling, servicing, maintenance, and parking of aircraft, and any movement of associated aircraft, vehicles, and pedestrians.

There is one apron area at 1D6 equaling approximately 50,050 square feet and providing access to two private hangars, the fuel station, and the Arrival/Departure building. This apron includes space for taxiing, parking, and contains four tie-down spaces. Aircraft may temporarily park in front of the private hangars as needed. The fueling station is on the south end of the apron.

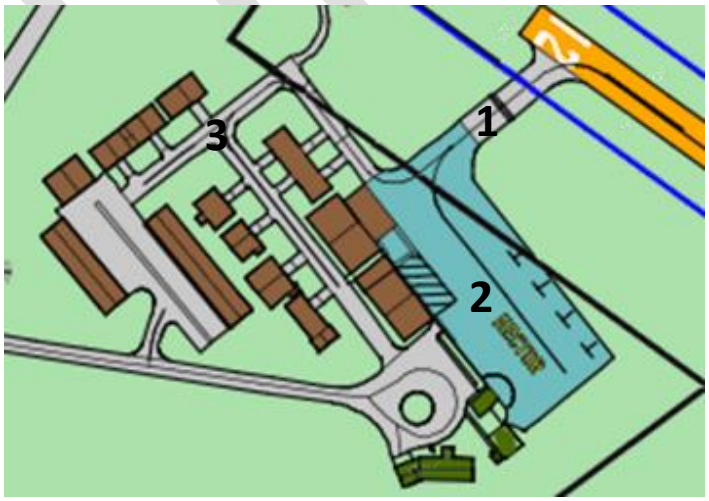


Figure 2-33 depicts the apron, taxiway, and taxilane as identified by the 2018 Pavement Condition Report. Please see Section 2.4.4.9, *Pavement Condition*, for more information about the apron's condition.

ID	Component	Area (SF)
1	Connecting Taxiway A	7,625
2	Apron w/4 Tiedowns	50,150
3	Taxilane A	37,430

Figure 2-33: Existing Aprons, Taxiways, and Taxilanes
Source: 1D6 2018 Pavement Condition Report

2.4.4.6 Airfield Electrical and Lighting

Airfield electrical and lighting systems at the Hector Airport aid the pilot in locating and operating on the airport. All airport lighting should be inspected on a daily and monthly basis. Please see the following descriptions of commonly used airfield electrical and lighting components.

Understanding Electrical and Lighting

- **Runway Lighting**: Outline the edges of runways during periods of darkness or restricted visibility conditions. These light systems are classified according to the intensity or brightness they can produce and are identified as High Intensity Runway Lights (HIRL), Medium Intensity Runway Lights (MIRL), or Low Intensity Runway Lights (LIRL).
- **Taxiway Lighting**: Outline the edges of taxiways during periods of darkness or restricted visibility conditions.
- **Airfield Signage**: Not typically associated as a NAVAID but serves as an important navigational element for movement of aircraft on the ground. Airfield signage indicates distance remaining on a runway, and identifies the location of runways, taxiways, aprons, and other airfield destinations.
- **Segmented Circle**: A ground-based marking indication the traffic pattern, wind direction, and wind strength to pilots en route. A segmented circle features a series of white or orange markings arranged in a circle with traffic pattern indicators protruding from the circle to specify the direction of the traffic pattern. A lighted wind indicator is placed inside the segmented circle markings to indicate the direction and intensity of the wind.
- **Wind Cone**: Orange fabric cones that indicate the strength and direction of the wind. These NAVAIDs assist pilots in making navigational corrections to adjust for surface prevailing winds moments before touchdown or prior to departure.
- **Rotating Beacon**: A high-intensity light that rotates 360 degrees and is operated at night and in inclement weather conditions to assist pilots in identifying the location of an airport from a distance in the air. The beacon is equipped with a green and a white lens separated 180 degrees from one another that emits alternating white and green flashes indicating an airport is available for public use.
- **MALSR**: A 2,400-foot approach lighting system that provides visual reference to the runway end. The first 1,400 feet are steady burning lights and the last 1,000 feet are synchronized flashing lights.
- **Runway End Identifier Lights (REIL)**: A pair of synchronized flashing lights located on each side of the runway threshold. REILs provide a rapid and positive identification of the approach end of a particular runway. REILs may be either omnidirectional or unidirectional.
- **Precision Approach Path Indicator (PAPI)**: A system of lights arranged to provide visual descent guidance information during the approach to a runway. These lights are visible from three to five miles during the day and up to 20 miles at night. The visual glide path of the PAPI provides safe obstruction clearance within plus or minus 10 degrees of the extended runway centerline and to 4 nautical miles for the runway threshold. The basic principle of the PAPI is that of color differentiation between red and white. Each light unit projects a beam of light having a white segment in the upper part of the beam and a red segment in the lower part of the beam. The light units are arranged so that the pilot using the PAPIs during an approach will see a combination of the red and white light segments to determine the glide slope the aircraft is flying.

a. Runway Edge Lighting *(1992, 2000)*

Runway 12/30 is equipped with white omnidirectional Low Intensity Runway Lighting (LIRL) with frangible connections. However, the system is non-standard, with the lamps being "set" in the tops of yellow turf cones rather than a more typical pipe "stem" installation in 2000. The runway lighting system is in fair condition.

Turf runway 5/23 has no runway lighting but instead uses yellow turf cones alone to define the runway's edges.

b. Taxiway Lighting *(1992, 2000)*

The Connecting Taxiway A accessing Runway 12/30 has blue omnidirectional LIRL lighting with frangible connections, and only present just at the junction of the taxiway and runway. However, the system is non-standard, with the lamps being "set" in the tops of yellow turf cones rather than a more typical pipe "stem" installation in 2000. The taxiway lighting system is in fair condition.

Turf runway 5/23 has no taxiways or taxiway lighting.

c. Airfield Signage

1D6 has no sign identifying Runway 12/30 at the hold position for the taxiway/runway intersection. 1D6 does not have an FAA-approved Signage Plan at this time.

d. Segmented Circle

1D6 does not currently have a segmented circle.

e. Wind Cone *(2016)*

The wind cone, which is lighted, is located between the apron and Runway 5/23. The wind cone is in good condition.

f. Rotating Beacon

1D6 does not currently have a rotating beacon.

g. Threshold Lighting *(1992, 2000)*

Runway 12/30 has a set of six threshold lights at each end. The blue-red lights are bidirectional, are powered from the Runway 12/30 lighting circuit and tied to the lighting control system for the runway. However, the system is non-standard, with the lamps being "set" in the tops of yellow turf cones rather than a more

typical pipe "stem" installation in 2000. These units have non-standard frangible connections and are in fair condition.

h. Airfield Electrical Equipment *(2016)*

The airport's electrical systems are fed from an electrical vault building located near the AD building. The vault uses constant current regulators (CCRs) that power the runway and taxiway lights. There is no backup generator system for the airport. The equipment is in good condition.

2.4.4.7 Navigational Aids

Hector's navigational aids, other than lighting, are minimal. 1D6 does not provide a localizer, glide scope, non-directional beacon or other approach guidance. There are no approach plates or departure procedures for either runway.

Understanding NAVAIDS

Navigational aids (NAVAIDs) are designed to assist pilots in identifying and navigating to an airport. NAVAIDs are most useful in nighttime conditions or when a pilot's visibility is limited. While most NAVAIDs are ground-based equipment that are installed on an airfield, some are satellite-based that provide navigational signals for properly equipped aircraft.

- **Instrument Landing System/Localizer (ILS)**: a precision approach landing system designed to provide an approach path for exact alignment with the runway and a vertical guidance system to provide descent information for an aircraft on final approach to a runway. The ILS is used when instrument meteorological conditions (IMC) require the pilot to employ instrument flying rules (IFR).
- **The Non-direction Beacon (NDB)**: the least complicated and least expensive of the types of electronic NAVAIDs available. The NDB antenna radiates a "non-directional" signal similar to that of a commercial AM radio station. This signal is received by the automatic direction finder (ADF) indicator on the aircraft which has a needle pointing toward the NDB station.
- **Global Positioning System (GPS)**: a space-based radio-navigation system. It consists of 24 satellites, which orbit the earth at 12,500 miles, as well as ground stations. GPS provides users with accurate information on position, velocity, and time anywhere and in all weather conditions. There are three GPS airport instrument approach procedures: the overlay approach, the GPS-only approach, and the Area-Navigation (RNAV) approach.
- **Area Navigation (RNAV)**: is used to fly point to point and on non-precision approaches. An onboard navigation data base and a flight management system are required to use this approach. This method of navigation allows the pilot to choose any path within a network of navigation beacons, rather than navigating to and from them directly, conserving flight distance, reducing congestion, and allowing flights into airports without beacons.
- **Wide Area Augmentation System (WAAS)**: developed by the FAA to augment GPS navigation to improve its accuracy, integrity, and availability, and enabling pilots to reply on GPS for all phases of flight, including approaches. It uses a network of ground-based and satellite stations to measure small variations in the GPS satellites' signals, make corrections in that data, and transmit the corrected data to WAAS-enabled GPS receivers. These receivers then use the corrections while computing their positions to improve accuracy of the data provided to pilots.

NAVAID	Year	Condition	Owner
AWOS	N/A		
Beacon	N/A		
Runway Lighting	1992	Fair/Poor	1D6
Taxiway Lighting	1992	Fair/Poor	1D6
Threshold Lighting	1992	Fair/Poor	1D6
Signage	N/A		
Wind Cone	2016	Good	1D6

Figure 2-36: NAVAIDs Age, Condition, and Ownership Summary

2.4.4.8 Instrument Approaches

Hector Municipal Airport does not currently have any Instrument Approach Procedures.

Instrument Approach Procedures are a series of predetermined maneuvers established by the FAA, using electronic navigational aids that assist pilots in locating and landing at an airport, especially during instrument flight conditions. The capability of an instrument approach is defined by the visibility and cloud ceiling minimums associated with the approach. **Visibility minimums** define the horizontal distance the pilot must be able to see in order to complete the approach. **Cloud ceilings** define the lowest height a cloud layer (defined in feet above ground) can be for a pilot to complete the approach.

The **Global Positioning System** (GPS) was initially developed by the United States Department of Defense for military navigation around the world, but is now used extensively for a wide variety of civilian uses, including civil aircraft navigation. GPS uses satellites placed in orbit around the globe to transmit electronic signals, which pilots with properly-equipped aircraft can use to determine their altitude, speed, and other navigational information. This tool allows the pilot more freedom in flight planning and more direct routing from one place to another.

The FAA has augmented the GPS signal to improve accuracy, coverage, availability, and integrity. This includes the development of the **Wide Area Augmentation System** (WAAS), instituted in 2003. WAAS uses a system of reference stations to fine-tune signals from GPS satellites for improved navigation and approach capabilities, including en route navigation and instrument approaches with course and vertical navigation. The WAAS system allows for approaches with lower cloud ceilings and visibilities restricted to ¾ mile.

As noted above, 1D6 does not currently have instrument approach procedures, so does not employ an instrument landing system/localizer, a non-directional beacon, or Area Navigation (RNAV) in conjunction with GPS and the FAA's WAAS.

2.4.4.9 Pavement Condition

The most recent study in Hector was conducted in 2018.

Airfield pavements are designed, constructed, and maintained to support the critical loads imposed on them and produce a smooth and skid-resistant riding surface necessary for the safe operation of aircraft in all weather conditions. Immediately after construction, these pavements begin to gradually degrade over time due to surface weathering, fatigue effects, and differential movement in the underlying sub-base. With this in mind, pavements require continual routine maintenance, rehabilitation, and reconstruction. The FAA has issued Advisory Circular AC 150/5380-7B, *Airport Pavement Management Program (PMP),* in October 2014 to guide pavement management planning.

The PMP serves as a quantifiable basis to guide the formation and implementation of programs aimed at effectively and efficiently maintaining and preserving airfield pavement. The Minnesota Department of Transportation Office of Aeronautics requires pavement condition studies for Minnesota's airports. The most recent study in Hector was conducted in 2018 by Applied Research Associates, Inc. (ARA). The paving surfaces were visually inspected in June of that year, with distress type, severity, and quantity recorded for each of the sample units. The data was then entered into the MicroPAVER database and a Pavement Condition Index (PCI) calculated for various locations around the airfield, ultimately determining overall pavement grades for specific pavement areas of the airport. This 2018 Pavement Condition Report is included as an Appendix to the Master Plan document.

Per the PMP criteria, pavement condition is assessed using the PCI, a value range from 0 (Failed) to 100 (Excellent). If a PCI rating for a particular area of pavement falls below 60, routine crack sealing and patching may no longer be adequate. Between the ratings of 40 and 60, major repairs such as overlays are needed, while below 40, reconstruction is typically the required activity.

Reviewed pavement areas included Runway 12/30, the connector Taxiway A, Apron A, and Taxilane A equaling 243,405 square feet. Some of these areas were considered in more than one "section," which is the smallest management unit used for maintenance and rehabilitation. Table 2-38 illustrates the various pavement branches with their area and the number of sections in each branch.

The largest pavement area at 1D6 is Runway 12/30 at 148,200 square feet, which was determined to be in Fair condition.

All pavement evaluated at 1D6 is asphalt cement (AC) for a total of 243,405 square feet of surface area.

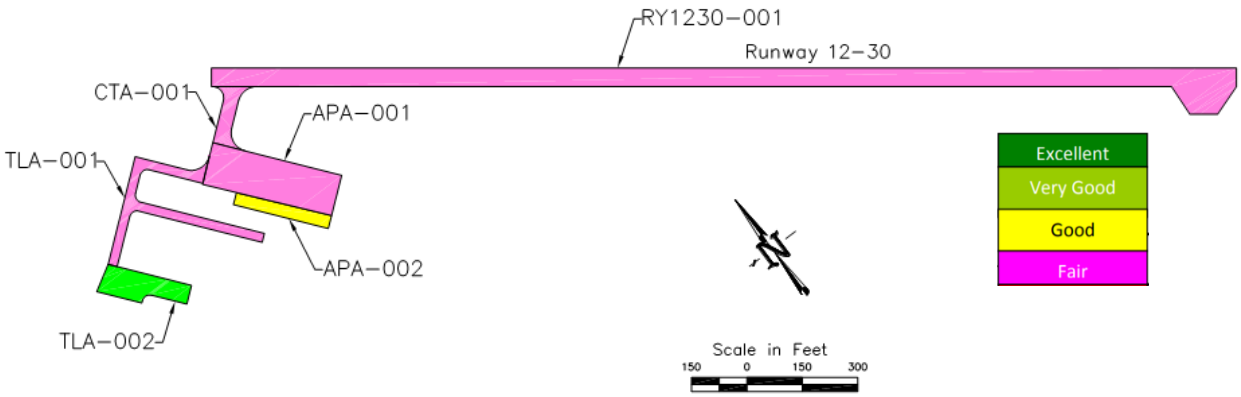


Figure 2-37: PCI Map; Source: 2018 Pavement Condition Report by ARA, Inc.

Branch ID	Name	Surface Type	Number of Sections	Area (SF)
APA	Apron A	AC	2	50,150
CTA	Connecting Taxiway A	AC	1	7,625
RY1230	Runway 12/30	AC	1	148,200
TLA	Taxilane A	AC	2	37,430
			Airport Total	**243,405**

Table 2-38: Pavement Area, Type, and Number of Sections by Branch
Source: 1D6 2018 Pavement Condition Report

Table 2-39 illustrates the age of the last construction date of pavement sections and indicates the overall percentage of pavement at the given age. All pavements at 1D6 are more than 10 years old.

LCD	No. of Sections	Percent of Total Area	Area (SF)
1985	4	90%	218,505
1986	1	4%	9,150
2005	1	6%	15,750

Table 2-39: Pavement Area by Age, Source: 1D6 2018 Pavement Condition Report
LCD = Last Construction Date (original construction, last overlay, or reconstruction – whichever is most recent)

According to the Pavement Condition Report, Runway 12/30 has a PCI of 47. The Apron, divided in to two sections, have PCIs of 52 and 61. Connecting Taxiway A has a PCI of 49, and Taxilane A's two sections have PCIs of 44 and 79. Most sections are therefore considered to be in Good or Fair condition, the exception is Taxilane A, Section 2, which is considered Very Good.

Regular maintenance such as crack sealing and patching are recommended for all sections of pavement; however, most will still require major repairs or reconstruction in the near future.

The overall area-weighted PCI for 1D6 is 50, which indicates that most airfield pavement at 1D6 is in Fair condition. There are no areas which are in Poor or Very Poor condition, and there is no Failed pavement. The PCI ratings for individual sections of pavement are illustrated below in Figure 2-40.

Overall pavement condition at 1D6 is Fair with a PCI of 50.

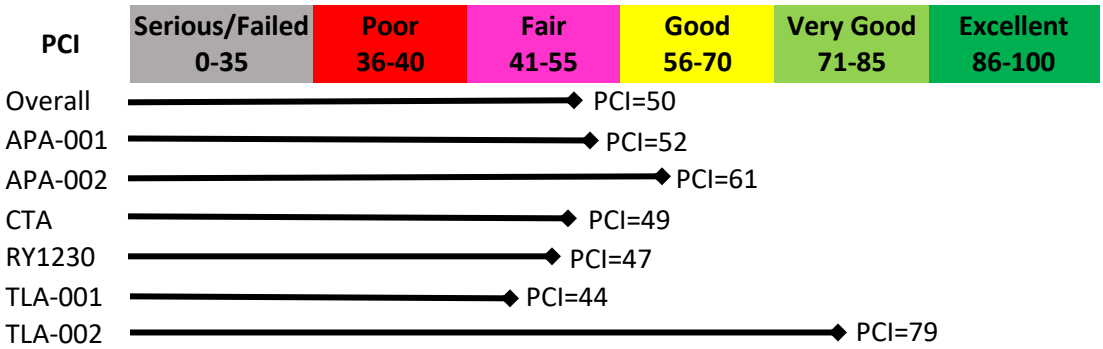


Figure 2-40: PCI per paving section, Source: 1D6 2018 Pavement Condition Report

Most of 1D6's pavements will require major rehabilitation within the next five years, including Runway 12/30, Connecting Taxiway A, and Taxilane A section 1. To ensure that 1D6's pavement investment remains in the best condition for as long as possible, near term maintenance is needed as recommended in the Pavement Condition Report. This maintenance includes crack sealing and deep patching. As deterioration continues and repairs are made, pavements should be routinely inspected and the maintenance plan re-evaluated.

2.4.4.10 Non-Standard Conditions

FAA Advisory Circular 150/5300-13A, *Airport Design*, provides design standards for airport geometrical layout, runway and taxiway/taxilane design, and associated elements. The guidance provided by this AC references many other AC documents for specific applications and is complemented by FAR Part 77, which establishes standards for determining obstructions in navigable airspace and provides for aeronautical studies of potential hazards to air navigation. As part of the master planning process, non-standard conditions will be reviewed for recommendations to bring the elements into compliance with FAA standards.

The FAA's 5010 currently reports 1D6's Runway Lights Edge Intensity as a Non-standard Lighting System: Non-Standard Lights Mounted in Yellow Cones. This and any other non-standard conditions discovered during the course of this study will be documented and addressed later in this plan.

2.4.4.11 Weather Equipment

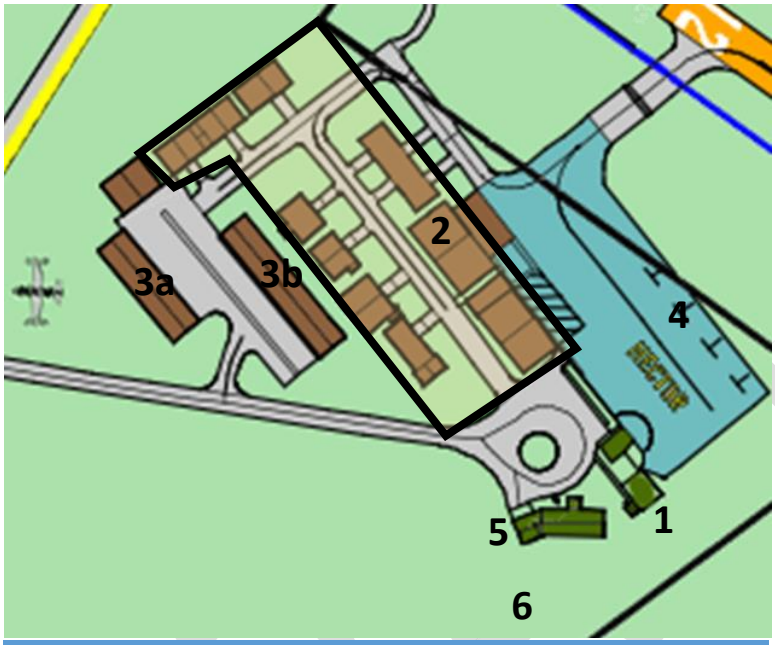
Hector does not currently have an Automated Weather Observation System (AWOS). This system would report present weather such as current wind data, temperature, dew point, density altitude/barometric pressure, visibility, cloud/ceiling data, type of precipitation, and lightning strike data. It provides real-time weather data to pilots via a recorded message accessed by a specified radio frequency or telephone number. The nearest AWOS is located at the Olivia Municipal Airport.

2.4.5 Landside Facilities

Airside facilities at Hector Airport include:

- Arrival/Departure Building
- Aircraft Storage

Within this section, each of these components has been inventoried and assessed for the existing condition as Good, Fair, or Poor condition designations.



ID	Component	Year Built	Area (SF)
1	A/D Building	2008	660
2	Private Hangars	Varies	24,240
3	City Owned Hangars (2)	2005	10,800
4	Tiedowns (4)	2000	
5	Aeronautical Offices	1985	4,850
6	Septic Tank and Drainfield	2008	

Figure 2-41: Existing Landside Facilities

2.4.5.1 Arrival/Departure Building *(2008)*

ID #1: ● ○ ○

The Arrival/Departure building is located on the southwest corner of the apron and includes an office, restroom, pilot information bulletin board, electrical/mechanical room, and pilot's lounge. The one-story building is adequate to serve current demand at approximately 660 square feet.

The building is in good condition. Our assessment is that the roof cladding, siding, and windows are in good condition. On the interior, finishes are simple but in good condition. Lighting is adequate, supplemented by abundant natural light from the large apron-facing windows. Heating and cooling is provided with a forced air unit. Hot water for the restroom is provided by a point source water heater. The restroom appears to comply with the Minnesota

Accessibility Code. The amenities to pilots are minimal with only a dorm-sized refrigerator for drinks and snacks. No kitchenette is available.

2.4.5.2 Aircraft Storage

a. Private Hangars *(age varies)* ID #2:

1D6 includes a variety of hangars that are owned privately, including several single-occupant box hangars and one 4-aircraft hangar which is owned by four people. Some hangars house one aircraft, while others have multiple aircraft per storage unit. Most are simple steel structures that may or may not even have their own floor or perimeter foundation system. Heating and electrical service quality varies considerably, as well as finishes and amenities. The condition of this collection of private hangars varies from Good to Poor.

Hangars	ID	Area (SF)	No. of Units
Private Hangars	2	24,420	10

Table 2-42: Size and Description of Private Hangars

b. City Owned Hangars *(2005)* ID #3:

These two hangars are in good condition. Built in 2005 of post-frame construction, the buildings include concrete floors, prefinished steel siding and roofs, and bifold hangar doors. Lighting is provided by incandescent lamps at the roof structure and the rooms are well-lit. Electrical service is supplied with a panel at each tenant's space, and a duplex receptacle on each wall of the room. There are no floor drains or other plumbing and no heat in these hangars.

Hangars	ID	Area (SF)	No. of Units
City-Owned Hangar	3a	4,680	3
City-Owned Hangar	3b	6,120	4

Table 2-43: Size and Description of City-Owned Hangars

c. Tie-Downs *(2000)* ID #4:

Four aircraft tie-down positions on the aircraft parking apron are provided at 1D6 for temporary use. Tie-downs on the apron vary slightly in size, but average approximately 23' wide by 17' long. Larger spray planes can use these tiedowns if needed. The location of these tie-downs is shown in Figure 2-41.

The condition of the tie-downs are poor due to the state of the wing and tail anchor points. In some cases, the anchor has a short loop of rope to tie off to, rather than a steel eye bolt or loop. Other anchor points are simply a length of rusty chain or are non-existent.

2.4.5.3 Aeronautical Offices *(1985)*

ID #5: 

Originally a home and office for the airport manager, this building is now being used as aeronautical offices for the FBO Sky Apply, LLC. It is in poor condition, with many maintenance activities needed. A manufactured home, it was moved on to the site in 1985, and is nearing the end of its useful life. A septic tank and drain field were installed on the south side of the building to serve the office and A/D building.

2.4.6 Support Facilities and Services

Support Facilities and Services at Hector include:

- Fuel Storage and Dispensing
- Apron Security Fence
- Ground Support Equipment and Storage
- Ground Access
- Parking

Within this section, each of these components has been inventoried and assessed for the existing condition as Good, Fair, and Poor condition designations.

ID	Component	Remarks
1	Fuel Facility	5,000 gal. 100LL
2	Apron Security and Apron Fence	160 LF
3	Public Parking	6 spaces
4	Ground Support/Snow Removal Equipment Building	2,000 SF

Figure 2-44: Existing Support Facilities

2.4.6.1 Fuel Storage and Dispensing *(2016)*

1D6's 24-hour self-service fuel station is located north of the A/D building, on the west side of the apron. This facility is owned and operated by the City of Hector. The 5,000-gallon 100LL above-ground tank is triple-walled with an interstitial space monitor which is alarmed and placed on the tank itself. There are no additional containment measures. Staff test the fuel tank monitor once a month. The fuel facility is inspected by MnDOT for conformance to 14CFR Part 139 for safe handling, storage, and dispensing of aviation fuel and by the Minnesota Pollution Control Agency. The fuel is purchased from Dooley's Petroleum in Willmar, MN, and delivered to 1D6 via bulk container vehicles from Wayne's Transport. A staff member unlocks the fill port and remains with the fuel delivery personnel while the product is being offloaded into the fuel tank.

Pilots purchase fuel from the 24-hour pump with a credit card. The payment machine with receipt printer was new in 2016 and remains in good condition. A marked emergency shut-off button is located nearby on the wall of the A/D building. The fuel station equipment is in good condition.

2.4.6.2 Air Rescue and Fire Fighting (ARFF)

1D6 does not currently have air rescue or firefighting equipment. Fire protection service is provided by the city of Hector's Fire Department, stationed approximately 1 ½ miles from the airport.

2.4.6.3 Maintenance/Snow Removal Equipment *(2004, '05, '07)*

The airport has a small inventory of equipment to maintain the airport grounds and facilities. Due to the climate and geographic location of 1D6, the City of Hector uses an airport-owned New Holland tractor for the removal of snow and ice from airfield surfaces. The airport's small mower is not currently in working order, and the personal Grasshopper mower of the airport manager is being used. As of September 2019, a grant request for a 2019 Grasshopper 725KT mower is being reviewed by MnDOT for approval. All equipment purchased with state or federal funds is kept on-site in the airport's Snow Removal Equipment building.

An FAA-approved Snow Removal Plan is not required at 1D6 because it is not a Part 139 certificated airport and does not accommodate passenger service. Snow Removal Plans guide the use of personnel, equipment and supplies in removing snow and ice from airfield surfaces. These plans prioritize areas for removal of snow, assignment of personnel, and use of equipment and apparatus during snow removal operations.

2.4.6.4 Ground Support/Snow Removal Equipment Storage *(2006)*

1D6's equipment storage building is in good condition. Currently, all equipment, such as the mower and tractor for snow removal, are stored in the airport's Snow Removal Equipment building. The building is insulated. Equipment purchased by MnDOT or FAA grant money is for airport use only and should be kept on site.

2.4.6.5 Airport Board Meeting Space

While there are no designated Airport Board Offices at 1D6, the airport board holds their meetings in the pilot's lounge. The pilot's lounge is sometimes used for informal meetings if needed. Board records and files are stored at City Hall.

2.4.6.6 Airport Security and Apron Fence *(2018)*

Airfield Security is minimal. A short length of chain link fence with a gate is present at the edge of the apron, separating the parking area from the aircraft movement areas. While the condition of the fence is good, the level of security provided by the fencing is fair to poor. The addition of secure perimeter fencing will be studied in this Master Plan document.

The A/D building is unlocked 24 hours a day, but all computer, weather, and NAVAID equipment are behind locked doors. Entry to the office is via an interior door from the pilot's lounge, which requires the user to know the CTAF and input it on the keypad.

2.4.6.7 Electrical Vault *(2016)*

The electrical vault building contains equipment for the runway lighting. It is in good condition.

2.4.6.8 Ground Access

US Highway 212 and State Highway 4 run through Hector, connecting it to many of the cities the airport might serve. The Twin Cities and Western Railroad cargo line runs between the main body of the city and the airport. These well-used routes make 1D6 easily accessible to the public and connect Hector to regions throughout the State of Minnesota.

2.4.6.9 Parking

Six parking spaces are provided on a bituminous surface adjacent to the apron and A/D building. There is no charge for the use of this parking area.

2.4.7 Utilities

2.4.7.1 Electrical Power

120/240v single-phase electrical power to the Airport is supplied by Xcel Energy. The airport does not have an emergency generator in case of power outages. Electrical power to the airport comes via underground lines along State Highway 4.

The airport manager reports that electrical service has been unreliable over the past summer, requiring Xcel to conduct repairs twice over the last few months

due to power outages. An Xcel representative noted that the connectors that tie the highline to the line that powers the hangars are old and starting to get brittle.

2.4.7.2 Gas

1D6 uses electricity supplied by Xcel Energy for heating needs at the A/D building. There are no natural gas lines serving the airport.

2.4.7.3 Telephone and Internet

1D6's telephone and internet service is provided by Frontier, paid for by the State of Minnesota. The airport manager reports that the internet speed is slow and unreliable, but that there are no issues with the telephone lines.

2.4.7.4 Potable Water

Potable water for the airport is supplied by the City water system. No problems have been reported.

2.4.7.5 Sewer

There is no municipal sewer system at the airport. A septic tank with a drainfield has been installed on the south side of the manager's residence to serve the residence and the A/D building. There are no drains, sinks, or restrooms in any of the hangars.

2.4.7.6 Solid Waste and Recycling

The airport has no trash pickup service. The Airport Manager currently puts any trash on airport grounds into his personal trash container. Without passenger service at 1D6, the creation of solid waste is low and easily manageable. However, the Airport Manager will soon be moving out of the residence on the site. It is recommended that the City contract with a trash removal company for regularly scheduled trash pickup.

All vehicle and equipment maintenance is completed by Lano Equipment, at their shop, and they are responsible for disposing of used oil and filters. The only building with a floor drain is the SRE building, which has a trench drain and flammable waste trap. Household Hazardous Waste, such as fluorescent lighting or paint, can be taken to the Redwood County Household Hazardous Waste Facility, a joint facility serving Redwood and Renville Counties, for proper disposal.

There is no established recycling program at 1D6, but when household recyclables are collected, they are taken to the Renville County Recycling Center.

2 | Section 5 – Historic Levels and Trends of Aviation Demand

In order to accurately predict the future demand at Hector Municipal Airport, it is useful to review the number of enplanements, based aircraft, and operations counts during the life of the airport. This information will be briefly summarized here, with greater detail provided in Chapter 3, *Aviation Demand Forecast.*

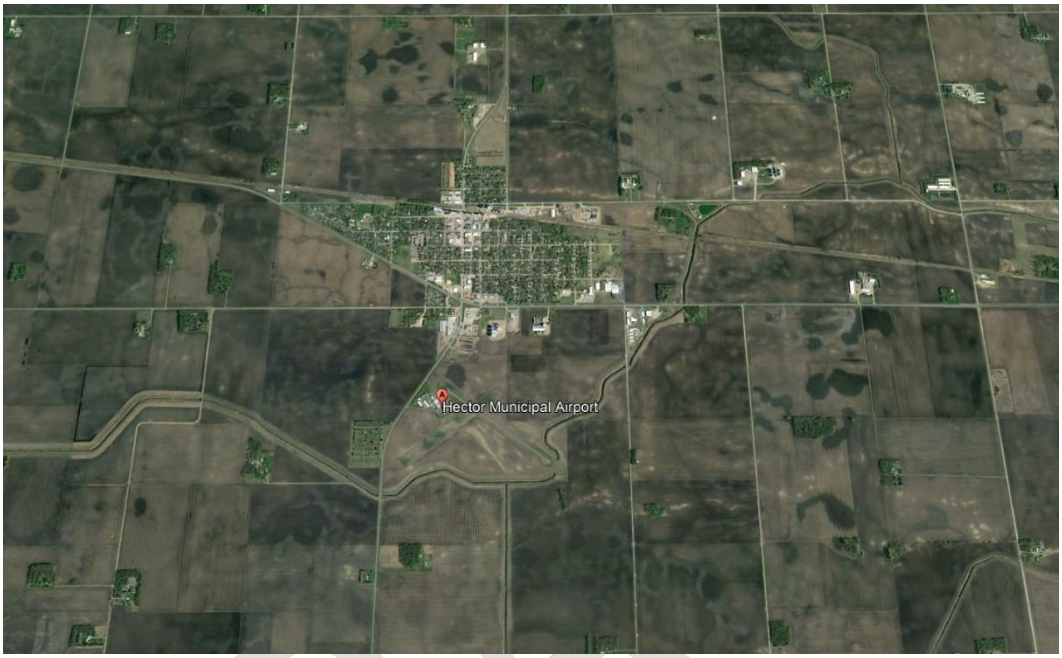


Figure 2-45: Aerial View of 1D6 in Local Context; Source: Google Earth

2.5.1 Enplanements

Enplanements are passenger boardings of commercial service aircraft for both scheduled and unscheduled service. Hector does not accommodate any regular commercial service, therefore has no enplanement counts to report.

2.5.2 Based Aircraft

General Aviation capacity demand is most often determined by aircraft storage space for based aircraft. A **based aircraft** is an aircraft that is operational and air worthy, which is typically based at a facility for the majority of the year. In November 2018 there were 28 based aircraft at 1D6 as reported on the *basedaircraft.com* website. For additional information related to historic rates of based aircraft at 1D6, please see Chapter 3, *Aviation Demand Forecast*.

2.5.3 Operations

Because there is no control tower or reliable operations record keeping at 1D6, counts must be estimated. In the absence of this sort of direct counting method, the number of operations occurring on a yearly basis must be calculated using information gathered from the airport manager, sponsor, tenants, fuel sales, and other sources of state and federal documentation. Chapter 3 investigates historic operations at 1D6 in greater detail.

2 | Section 6 – Environmental Review

This section provides an overview of environmental baseline conditions at 1D6. It identifies existing environmental sensitivities, provides a benchmark of existing environmental impacts, and will inform potential environmental considerations during the creation of the proposed development alternatives during the master planning effort.

A review of publicly available data and previous environmental analyses serves as the source of information used in this section. No environmental field studies were conducted during this master planning effort. This section includes a review of each of the environmental impact categories included in FAA Order 1050.1F, *Environmental Impacts: Policies and Procedures* which are listed below. While the thresholds which determine whether an impact is considered significant are discussed in this section, the assessment of impacts is not included here.

2.6.1 Air Quality

Significance Threshold: The action would cause pollutant concentrations to exceed one or more of the National Ambient Air Quality Standards (NAAQS), as established by the Environmental Protection Agency under the Clean Air Act, for any of the time period analyzed, or to increase the frequency or severity of any such existing violations.

The U.S. Environmental Protection Agency (EPA) has established two primary laws that apply to air quality: The **Clean Air Act** (CAA) and the **National Environmental Policy Act** (NEPA). Per review of the EPA's website (https://www.epa.gov/outdoor-air-quality-data) and confirmed by Richard Angelbeck of EPA Region 5 on October 22,2019, no Federal air quality studies have been conducted in the Hector or Renville County area. The Minnesota Pollution Control Agency issues a "State of the Air" report every other year, and their website includes information on Minnesota's air quality at: https://www.pca.state.mn.us/air/air-we-breathe.

Understanding Air Quality

The National Ambient Air Quality Standards (NAAQS) has six air pollutant criteria:

- **Carbon Monoxide (CO)**
- **Ozone (O3)**
- **Lead (PB)**
- **Particulate Matter (PM)**
- **Nitrogen Dioxide (NO2)**
- **Sulfur Dioxide (SO2)**

Geographical areas are classified as attainment, non-attainment, and maintenance areas based on whether they are meeting, above, or have recently-improved to within the NAAQS standards respectively. Federal agencies cannot fund or approve projects within non-attainment and maintenance areas unless they demonstrate general conformity with the State Improvement Plan (SIP).

2.6.1.1 Clean Air Act

In accordance with the CAA, Renville County meets the levels of the six criteria air pollutants (Ozone, Particulate Matter, Sulfur Dioxide, Lead, Carbon Monoxide, and

Nitrogen Dioxide) which make up the National Ambient Air Quality Standards (NAAQS). This status was verified using the EPA's website https://www.epa.gov/green-book/green-book-national-area-and-county-level-multi-pollutant-information in September 2019.

Being located within Renville County, 1D6 is within an attainment area, and therefore is not subject to further demonstration of general conformity with the Minnesota State Implementation Plan (SIP) in order to be eligible for federal funding and approval.

2.6.1.2 National Environmental Policy Act (NEPA)

The National Environmental Policy Act (NEPA) of 1969 was one of the first laws to establish the national framework for protecting the environment. Through NEPA, congress has required federal agencies to consider the environmental effects of airport projects using Environmental Assessments or Environmental Impact Statements to assess alternative courses of action. There are also public involvement requirements prescribed in the document.

NEPA requires consideration of air quality impacts for reasonable alternatives throughout the planning period. According to the FAA Aviation Emissions and Air Quality Handbook, NAAQS analysis would be required if 1D6's proposed project required FAA involvement, if the project would cause or create a foreseeable increase in air emissions, if the area is considered Non-attainment or Maintenance Status, and if there are any agency or public concerns regarding air quality. A search of the EPA's EnviroMapper database (https://enviro.epa.gov/enviro/em4ef.home) in September 2019 indicated that Renville County is not in Non-attainment or Maintenance Status for the six criteria air pollutants. Since the airport is within an attainment area, no further analysis is required.

2.6.2 Biological Resources: Fish, Wildlife, and Plants

Significance Threshold: The U.S. Fish and Wildlife Service or the National Marine Fisheries Service determines that the action would be likely to jeopardize the continued existence of a federally listed threatened or endangered species, or would result in the destruction or adverse modification of a federally designated critical habitat.

Section 7 of the **Endangered Species Act** requires federal agencies to ensure that any proposed action does not jeopardize the continued existence of any endangered or threatened species or result in the destruction or adverse modification of associated habitat.

A data search conducted in September 2019 on the USFWS Information, Planning, and Conservation (IPaC) system (https://ecos.fws.gov/ipac) listed one Threatened animal species that could be potentially affected by development at the airport: the Northern Long-eared Bat (Myotis septentrionalis). The Prairie Bush-clover (Lespedeza leptostachya) is also listed as a Threatened flowering plant in the area. The Midwest Region Endangered Species website

(https://www.fws.gov/midwest/endangered/lists/minnesot-cty.html) was also referenced, but it did not report additional threatened species.

The search did not identify any critical habitats within the vicinity of the airport.

Migratory birds are not expected to be impacted. Certain birds are protected under the Migratory Birds Treaty Act of 1918 and the Bald and Golden Eagle Protection Act of 1940.

A Wildlife Hazard Site Visit was completed at 1D6 in September 2018 by Timothy Pugh, a Qualified Airport Wildlife Biologist of Midwest Wildlife Services, LLC. In the resulting report, Mr. Pugh made several recommendations regarding mitigation practices that 1D6 can employ in order to make the airport and the flying public safer and more secure. These include, but are not limited to:

- Follow grass management guidelines to discourage foraging and loafing birds;
- Enclose the airfield with a deer-proof perimeter fence;
- Modify the land along the drainage ditch and remove the dirt/concrete mount around the windsock so the area can be mowed;
- Improve airfield drainage to remove standing water, cattails, or other wetland vegetation;
- Remove trees and covert the natural habitat on the SE side of the airport to grass;
- Low areas in surrounding airport cropland should be filled or drained so they do not hold standing water;
- Secure permits from USFWS and MNDNR to take certain birds off the airfield and stabilization ponds; and

While wildlife strikes at 1D6 are rare, the airport manager should report any strikes to FAA's database at https://wildlife.faa.gov/strikenew.aspx.

The final Wildlife Hazard Site Visit Report with complete analysis and recommendations will be included in the Appendix of this document. Active steps such as harassment, pest management, invertebrate control, waterfowl control, and waste management (both food and mulch waste) are recommended. As a last resort, depredation and controlled hunting can be employed. Coordination with the appropriate agencies (including the USFWS and Mn DNR) should be conducted before any proposed development takes place.

A Wildlife Hazard Management Plan, created collaboratively by 1D6, Midwest Wildlife Services, and Bollig Inc will also be completed in the Master Plan process and will be included in the Appendix. Any findings in the report will be considered during the upcoming Facility Requirements and Alternatives Analysis chapters.

2.6.3 Coastal Resources

Significance Threshold: None established.

Federal activities involving or affecting coastal resources are governed by the **Coastal Barriers Resources Act** (CBRA), the **Coastal Zone Management Act** (CZMA), and Environmental Order (EO) 13089, *Coral Reef Protection*. Renville County is not located within any coastal zone, therefore future development on the airport is not anticipated to affect federally or state-protected coastal areas.

2.6.4 Department of Transportation Act: Section 4(f)

Significance Threshold: The action involves more than a minimum physical use of a Section 4(f) resource or constitutes a "constructive use" based on an FAA determination that the aviation project would substantially impair the Section 4(f) resource.

The resources that are protected by Section 4(f) are publicly owned land from a public park, recreation area, or wildlife and waterfowl refuge of national, state, or local significance; and publicly or privately-owned land from an historic site of national, state, or local significance. Substantial impairment occurs when the activities, features, or attributes of the resource that contribute to its significance or enjoyment are substantially diminished.

Within Hector, there are currently three city parks encompassing approximately 13 acres. Facilities include a municipal outdoor swimming pool offering swimming lessons during the summer months, hockey/skating rinks, football fields, baseball/softball fields, a volleyball court, picnic facilities, general playground equipment, and various community education programs. The combination of these services provides a complete park and recreation system throughout the city and within the Airport's vicinity. The United States Fish and Wildlife Service (USFWS) lists 22 Wildlife Refuges and Wetland Management Districts within the state of Minnesota (www.fws.gov/refuges), none of which are in Renville County.

Understanding DOT Section 4(f)

Section 4(f) of the Department of Transportation Act of 1966 states that a federally-funded project requiring the use of land from:

- **A publicly-owned land from a public park or recreation area**
- **A national or state wildlife or waterfowl refuge**
- **A historic site of national state, or local significance**

…Shall not be approved unless there is no feasible and prudent alternative for the use of such land. A significant impact would occur pursuant to NEPA when a proposed project either involves more than a minimal physical use of a Section 4(f) property or is deemed a "constructive use" substantially impairing the 4(f) property.

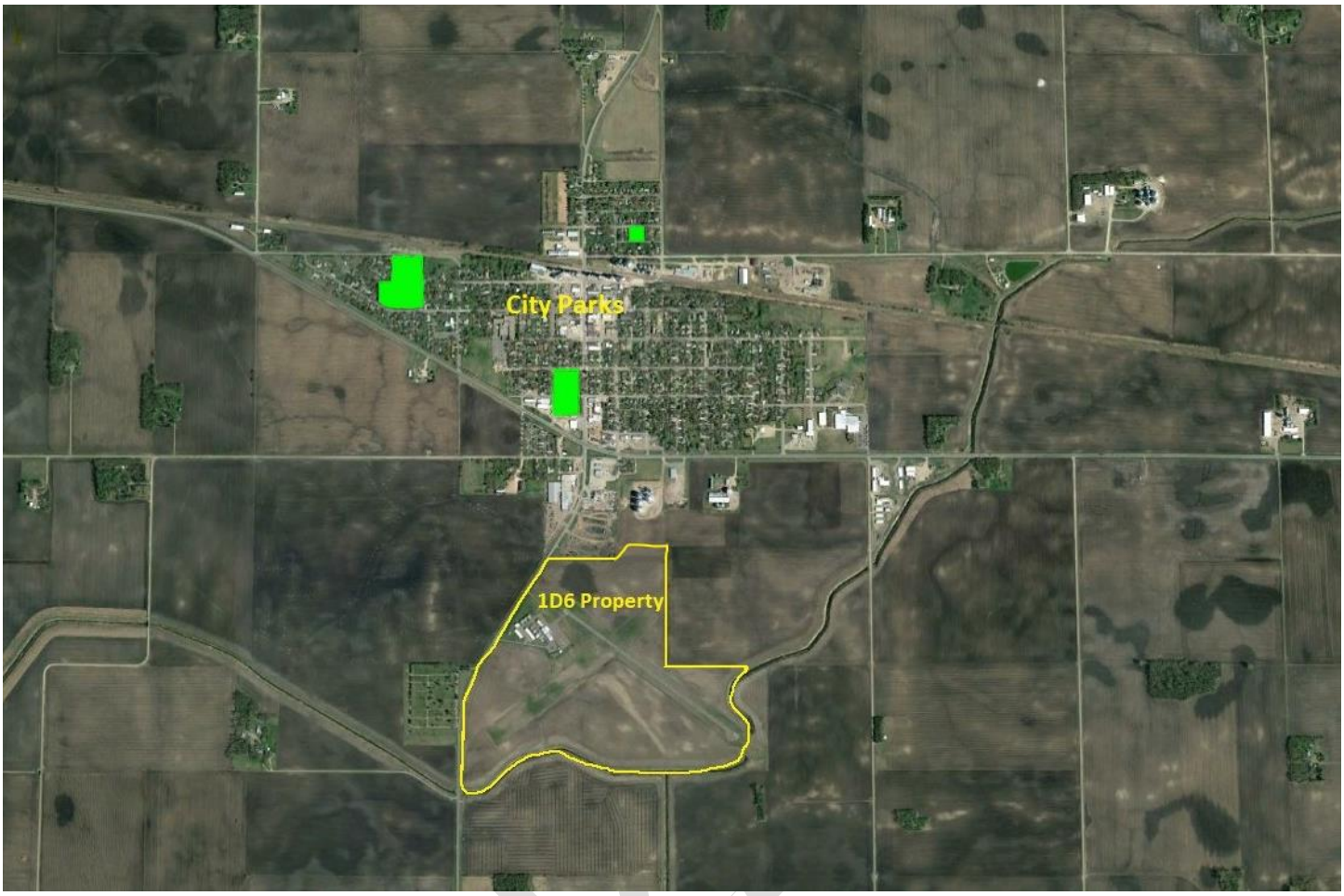


Figure 2-46: Nearby Section 4(f) Properties

The state of Minnesota also maintains waterfowl refuges and sanctuaries, which were established to:

- Protect production, migration, and wintering habitats;
- Provide security, feeding, and resting areas;
- Maintain traditions of bird use;
- Distribute birds, hunters, and harvest; and
- Support limited forms of public use compatible with the primary purpose of the refuge.

According to the state DNR website (www.dnr.state.mn.us/wildlife/shallowlakes/refuges.html) a 1985 inventory of all refuge types in Minnesota documented 116 waterfowl refuges totaling slightly over one million acres, or 2% of land in the state. A new inventory is currently ongoing. These include State Game Refuges, Migratory Waterfowl Refuges, State Duck Refuges, and State Wildlife Sanctuaries.

There are over 1,600 Wildlife Management Area units in Minnesota (www.dnr.state.mn.us/wmas/index.html) equaling 1.29 million acres of habitat. Renville County includes 19 of these, but the nearest properties to the airport are Schmalz WMA and Preston Lake WPA, over 7 miles away, east of Buffalo Lake.

2.6.5 Farmlands

Significance Threshold: The total combined score on Form AD-1006, "Farmland Conversion Impact Rating," ranges between 200 and 260 points.

The **Farmland Protection Policy Act** (FPPA) of 1981 regulates federal actions with the potential to convert farmland to non-agricultural uses. While the Airport property does not meet the definition of farmland contained in the FPPA, there are prime farmlands near the airport property. Coordination with the US Department of Agriculture (USDA) may be necessary for any development proposed on farmlands adjacent to the airport.

2.6.6 Hazardous Materials, Solid Waste, and Pollution Prevention

Significance Threshold: None established.

2.6.6.1 Airport Property

Hazardous substances on the airport property include aircraft fuel, ground equipment fuel and oil. Fuel is transported to the site by mobile tankers. There are no floor drains or flammable waste traps in most hangars, except for the City hangar used as a Snow Removal Equipment building. Vehicle and equipment maintenance is completed off site by a local mechanic who is responsible for disposal of hazardous products properly. Pilots are required to remove any waste from their hangars on their own.

Two petroleum tank releases or spills occurred on or near airport property, in 1990 and 1993, as documented in the "What's in My Neighborhood" website of the Minnesota Pollution Control Agency (MPCA) (http://pca-gis02.pca.state.mn.us/wimn2/index.html) in October 2019. Both spills were considered minor, were addressed, and are now considered closed by the MPCA.

2.6.6.2 Airport Vicinity

A search of the EPA's EnviroMapper database (www.epa.gov/emefdata/em4ef.home) conducted in October 2019 indicated that there are 21 facilities in the Hector area reporting to the EPA. The programs in which they are enrolled are for air pollution (3), hazardous waste (16), water discharge (1), and the Toxic substances Control Act (1). The nearest of these sites is 0.4 miles away from airport property.

The MPCA "What's In My Neighborhood" website (https://cf.pca.state.mn.us/wimn/search.cfm) indicates there are 78 Minnesota Pollution Control Agency (MPCA) sites in the Hector area. There are no Superfund or brownfield sites. There are a number of facilities generating small amounts of hazardous waste, such as gas stations, industrial sites, and medical/dental centers.

There is one active solid waste site northwest of Hector on the Charles Melberg Farm.

Hector's solid waste dump site, north of City limits, was closed in 1973. Hector's Compost Facility does not meet the volume threshold for needing a permit, according to Chris Green, MN Pollution Control Marshall Area Compliance Manager, in October 2019.

2.6.7 Historical, Architectural, Archaeological and Cultural Resources

Significance Threshold: None established (based on current surveys completed as of April 2019).

The **National Historic Preservation Act** of 1966, as amended, and the **Archeological and Historic Preservation Act** of 1974 are the two laws that establish the requirements for determining historic, architectural, archaeological, and cultural resource significance within the airport vicinity.

There are no properties in Hector listed on the National Register of Historic Places. No historic structures or archaeological sites have been previously identified within a 1.5-mile radius of the airport. The nearest properties included in the State's Cultural Resources database are listed below. Note that the properties may no longer exist or may be known by other names.

Property Name	Address	Twp-Range-Sec	ID#
Creamery	220 2nd St. E.	115-32-29	RN-HCC-001
United Methodist Church	300 2nd St. W.	115-32-29	RN-HCC-002
house	137 3rd St. W.	115-32-29	RN-HCC-003
house	140 3rd St. W.	115-32-29	RN-HCC-004
school	SW corner 3rd St. W. & Birch Ave.	115-32-29	RN-HCC-005
house	265 3rd St. W.	115-32-29	RN-HCC-006
Berry House	311 Ash Ave. W.	115-32-29	RN-HCC-007
church	Birch Ave.	115-32-28	RN-HCC-008
St. Paul's Lutheran Church	SE corner Cedar Ave. E. & 5th St. E.	115-32-28	RN-HCC-009
house	NE corner Douglas Ave. E. & 2nd St. E.	115-32-29	RN-HCC-0010
Chicago Milwaukee St. Paul Pacific Railroad Depot	Main St.	115-32-29	RN-HCC-0011
commercial building		115-32-29	RN-HCC-0012
Farmers' & Merchants' State Bank	SW corner Main St. & Birch Ave.	115-32-29	RN-HCC-0013
bank	SE corner Main St. & Birch Ave.	115-32-29	RN-HCC-0014
bank	Main St.	115-32-29	RN-HCC-0015
commercial building		115-32-29	RN-HCC-0016
house	NE corner Main St. & Douglas Ave.	115-32-29	RN-HCC-0017

Property Name	Address	Twp-Range-Sec	ID#
house	137 3rd St. W.	115-32-29	RN-HCC-0018
house	140 3rd St. W.	115-32-29	RN-HCC-0019

Table 2-47: Historic Properties in Airport Vicinity not listed in NRHP
Source: MN State Historical Society

The first runway at the airport, a grass strip, was built in the 1920's. Depending on the type of projects in the future, particularly if there is ground disturbance in a new area, a cultural resources survey may need to be completed prior to construction.

2.6.8 Land Use

Significance Threshold: None established.

2.6.8.1 Public Safety and Noise Compatibility

As summarized within the Airport Background and Regional Context, Section 2.3.4, *Surrounding Land Use*, the land uses around the airport are for the most part Agricultural and Manufacturing. See Figure 2-13. The above-mentioned land uses are generally considered to be compatible with airport operations. The presence of Residential uses can create a conflict with noise impacts which will be further investigated in Section 2.6.10, *Noise and Noise-Compatible Land Use.*

The Runway Protection Zones (RPZs) for all four runways (12 and 23) are only partially controlled by the airport through fee-simple acquisition per FAA guidelines. The remaining portions of the RPZs include property owned by others.

The state of Minnesota has adopted aeronautics Statues and Rules regarding the safety of the public and property on the ground.

MN Statues – Chapter 360, Airports and Aeronautics. This Chapter describes the prevention of Airport Hazards, "which endanger the lives and property of users of the airport and of occupants of land in its vicinity, and may reduce the size of the area available for the landing, takeoff, and maneuvering of aircraft, thereby impairing the utility of the airport and the public investment therein. It is also found that the social and financial cost of disrupting existing land uses around airports in built up urban areas, particularly established residential neighborhoods, often outweigh the benefits of a reduction in airport hazards that might result from the elimination or removal of those uses." It further gives authority to create airport zoning boards who are granted the ability to establish rules to prevent airport hazards in the zoning areas while working to ensure the minimum disruption of existing land uses to the extent consistent with reasonable standards of safety. It describes the required conditions for the issue of permits and of variances, as well as hazard marking and lighting, and the conditions for the acquisitions of air rights as a means to prevent airport hazards.

MN Administrative Rules – Chapter 8800, Aeronautics. Section 8800.1200, *Criteria for Determining Air Navigation Obstructions,* describes in a prescriptive way how obstructions to navigation are identified in relation to the Primary Surface, Horizontal Surface, Conical Surface, Approach Surfaces, and Transitional Surfaces, as well as marking and lighting of those items deemed obstructions that cannot be removed. Section 8800.2400, *Airport Zoning Standards*, describes both Airspace Zones and Land Use Safety Zones A, B, and C. Each of these safety zones includes corresponding land use restrictions, creating sufficient open space so as to protect life and property in case of an accident, and to prevent land uses which create or cause interference with the safe communications and operation of an aircraft during landing, taking off, or maneuvering of the aircraft. This section also addresses the establishment of noise sensitivity zones when requested by the commissioner or governmental unit having airport zoning powers.

2.6.8.2 Operational Safety

Wildlife and bird attractants, such as wetlands, bodies of open water, waste disposal sites, and certain crops, can cause safety hazards at airports. A review of the MN DNR Wildlife Management Areas (*www.dnr.state.mn.us/wmas*) shows that 19 WMAs are found in Renville County, although the closest sites, Schmalz WMA and Preston Lake Wildlife Protection area (WPA) are 8 miles east of Hector and beyond Buffalo Lake.

A check of the **National Wetlands Inventory** (NWI) data indicates that 1D6 is surrounded by minimal wetland environments, primarily consisting of emergent wetlands. The City's water treatment ponds are located in the northeast corner of Hector, away from the airport. Each of these are attractants to wildlife, especially birds, at all times of the year, but their impact on the airport is small. Greater detail regarding attractants and mitigation solutions are discussed in the Wildlife Hazard Site Visit Report, found in the Appendix of this document.

2.6.9 Natural Resources and Energy Supply

Significance Threshold: None established.

Executive Order 13123, *Greening the Government through Efficient Energy Management*, encourages federal agencies to expand the use of renewable energy within its facilities and in their activities and to encourage the development of facilities that exemplify the highest standards of design including the principles of sustainability. Any proposed development at 1D6 should be examined to identify any proposed major changes in stationary facilities or the movement of aircraft and ground vehicles that would have a measurable effect on local supplies of energy or natural resources.

The on-airport electrical vault supplies the electricity needed for airport lighting and operations. Sustainable measures will be further discussed within the proposed alternatives described in Chapter 5, *Alternatives Analysis.*

2.6.10 Noise and Noise-Compatible Land Use

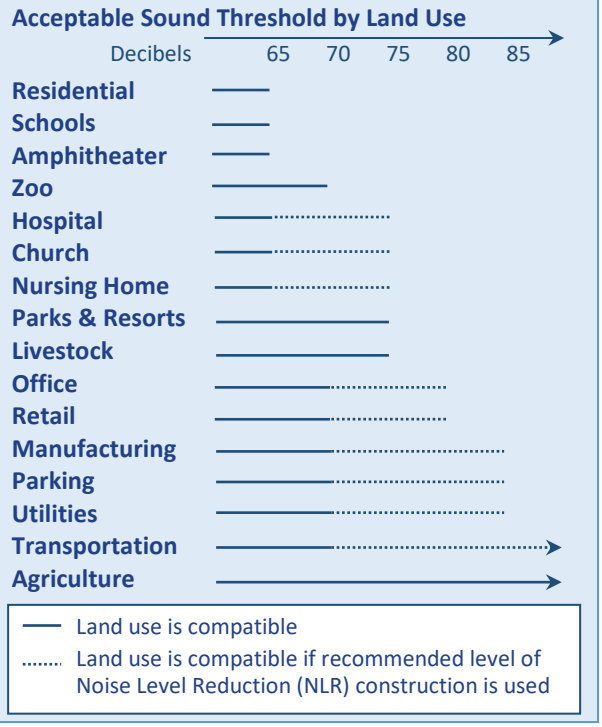
Significance Threshold: The action would increase noise by ***Day-Night Average Sound Level*** *(DNL) 1.5 dB or more for a noise sensitive area that is exposed to noise at or above the DNL 65 dB noise exposure level, or that will be exposed at or above the DNL 65 dB level due to a DNL 1.5 dB or greater increase, when compared to the no-action alternative for the same timeframe.*

Generally, the FAA considers DNL 75 and higher to be incompatible with most land uses, while below 65 is compatible with most land uses. Above 65 DNL, noise sensitive land uses (such as residential, schools, churches, and hospitals) are typically discouraged. At this time, there have been no noise impact studies conducted at the airport. Noise impacts to surrounding agricultural and manufacturing properties are minimal and there should not be any issues with non-compatible land use.

The FAA's 1050.1F *Desk Reference* indicates no noise analysis is required for projects involving Design Group I and II aircraft in Approach Categories A through D, operating at airports whose forecast operations do not exceed 90,000 annual propeller operations. This number well exceeds any expected future number of operations at 1D6, thus a noise analysis is not required at this time.

Understanding Noise Impacts

Noise is typically the most significant off-airport environmental impact associated with aircraft operations. Noise is measured in decibels (dB). The Day Night Average Sound Level (DNL or Ldn) is an average cumulative sound level that provides a measure of the total sound energy during a 24-hour period.



2.6.11 Socioeconomics, Environmental Justice, and Children's Environmental Health and Safety Risks

Significance Threshold: None established.

Executive Order 12898, *Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations*, and the accompanying Presidential Memorandum, and Order DOT 5610.2, *Environmental Justice*, require the FAA to provide for meaningful public involvement by minority and low-income populations, and analysis that identifies and addresses potential impacts on these populations which may be disproportionately high and adverse. In addition, pursuant to Executive Order 13045, *Protection of Children from Environmental Health Risks and Safety Risks*, federal agencies are directed as appropriate to prioritize environmental health risks which may disproportionately affect children. Any proposed development at 1D6 must be analyzed to assess impacts to low-income or minority populations, or to children's health and safety.

The USEPA EJSCREEN tool (https://www.epa.gov/ejscreen) was used to determine detailed information about the area within a one-mile buffer around the airport in October 2019. The EJSCREEN tool combines and displays demographic indicators with a single environmental indicator using publicly available data, including US Census Bureau Data from 2010.

The demographic indicators studied with this tool include:

- Percent low-income,
- Percent minority,
- Less than high school education,
- Linguistic isolation,
- Individuals under age 5, and
- Individuals over age 64.

The population within this one-mile buffer is reported to be 1,090 people, of which 8% are determined to be of a minority group, and 21% are considered low-income. 75% of the housing units in the area are owner-occupied, with 58% reporting a yearly base income of $50,000 or more. This data suggests that minority and low-income households may not be disproportionately affected by any proposed development at the airport.

2.6.12 Visual Effects: Light Emissions and Visual Resources/Visual Character

Significance Threshold: None established.

Larger airports emit a significant amount of light, especially from the approach lighting systems. Visual impacts are difficult to assess due to their subjectivity and may be annoying to people in the vicinity or interfere with their normal activities. The airport property is immediately surrounded by agricultural and industrial land uses, which are generally considered compatible with airport operations involving lighting. There are no residences near the airport which should be considered during future development at the airport. Any project involving installation,

replacement, or relocation of airfield lighting should be evaluated for adverse light emissions and visual impacts to the surrounding community.

2.6.13 Water Resources: Wetlands, Floodplains, Surface Waters, Groundwater, and Wild and Scenic Rivers

The **Clean Water Act** provides the authority to establish water quality standards, control discharges, develop waste treatment management plans and practices, and prevent or minimize the loss of wetlands. Water quality regulations and the issuance of permits before construction projects at 1D6 will normally identify any deficiencies in the proposed development with regard to water quality or any additional information necessary to make judgments on the significance of impacts.

2.6.13.1 Wetlands

Significance Threshold: The action would:

- *Adversely affect a wetland's function to protect the quality or quantity of municipal water supplies, including surface waters, and sole source and other aquifers;*
- *Substantially alter the hydrology needed to sustain the affected wetland system's values and functions or those of a wetland to which it is connected;*
- *Substantially reduce the affected wetland's ability to retain floodwaters or storm runoff, thereby threatening public health, safety or welfare (the term welfare includes cultural, recreational, and scientific resources or property important to the public);*
- *Adversely affect the maintenance of natural systems supporting wildlife and fish habitat or economically important timber, food, or fiber resources of the affected or surrounding wetlands;*
- *Promote development of secondary activities or services that would cause the circumstances listed above to occur; or*
- *Be inconsistent with applicable state wetland strategies.*

The USFWS **National Wetland Inventory** (NWI) data consulted in October 2019 reports a riverine on airport property and several freshwater emergent wetland areas within the airport vicinity. There are a few small freshwater ponds on the east side of Hector, one Lake, and some freshwater emergent wetland areas, as well as a riverine habitat which crosses the south end of Runway 12/30. There have been no wetland delineations in the airport area. An updated delineation to ascertain current wetland location and extents is recommended before any airport construction begins.

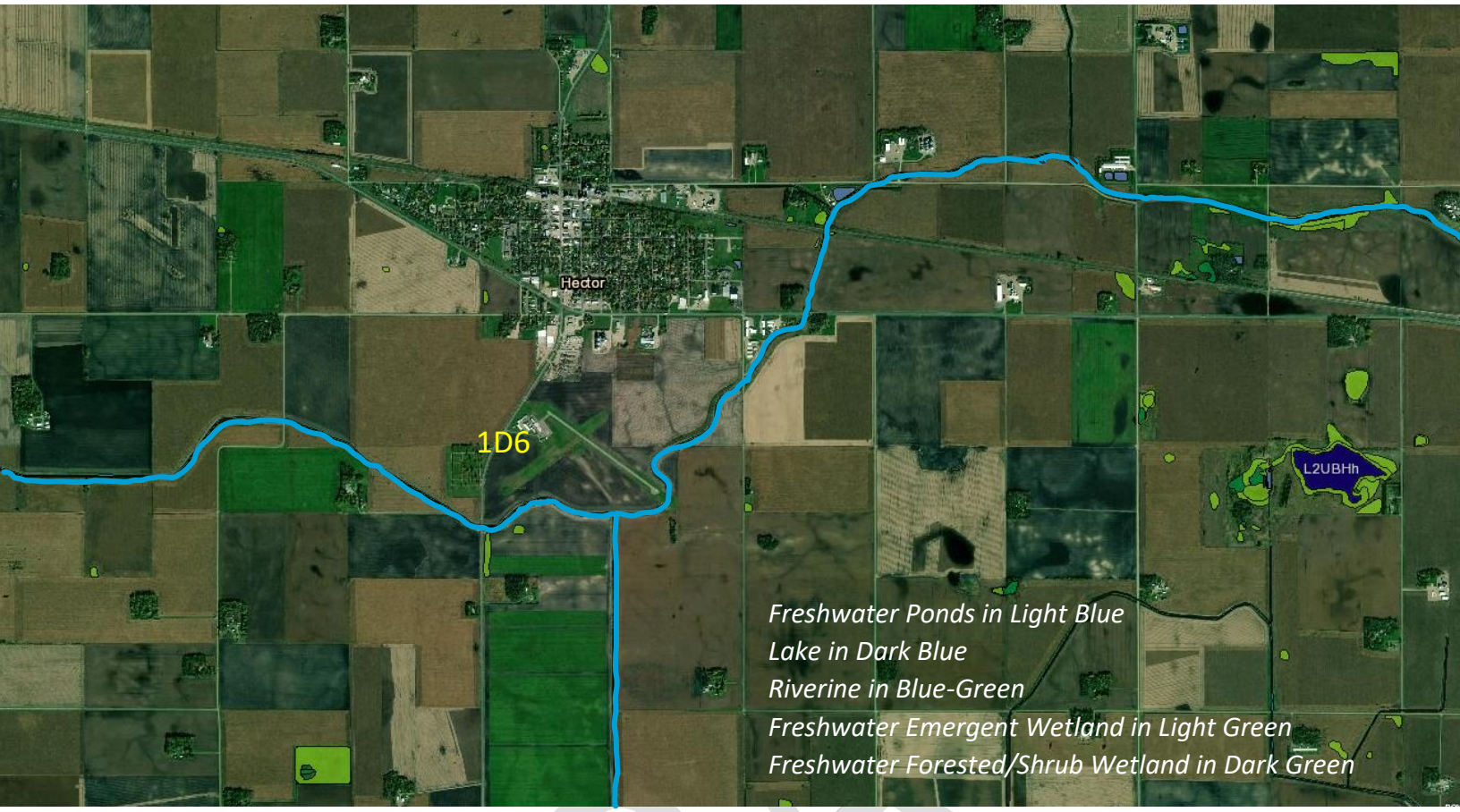


Figure 2-48: Wetlands near 1D6
Source: USFWS National Wetlands Inventory Mapper, July 2019

The City of Hector and Renville County have no shoreland ordinances that place restrictions on land use and construction on or near wetlands, such as the riverine that runs along the south border of the airport property.

There are no MnDNR Protected Waters basins or watercourses on or off airport property impacted by proposed development at 1D6.

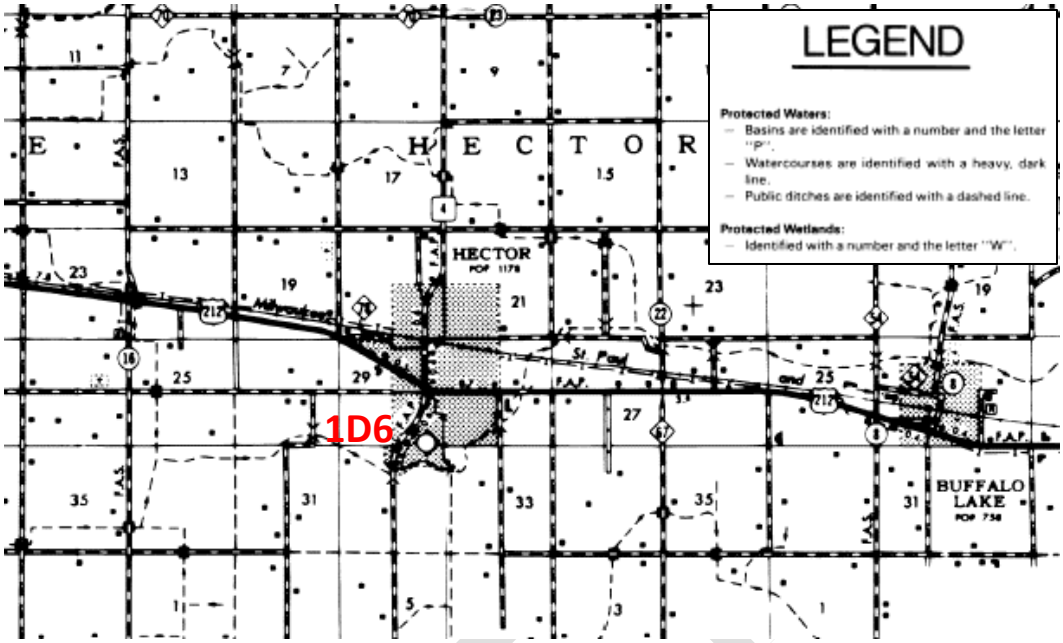


Figure 2-49: DNR Protected Waters and Wetlands in Renville County (https://files.dnr.state.mn.us/waters/watermgmt_section/pwi/RENV1OF1.pdf)

2.6.13.2 Floodplains

Significance Threshold: The action would cause notable adverse impacts on natural and beneficial floodplain values.

Executive Order 11988 directs federal agencies to take action to reduce the risk of flood loss, minimize the impact of floods on human safety, health and welfare, and restore and preserve the natural and beneficial values served by floodplains. The Federal Emergency Management Agency (FEMA) creates flood maps and makes them accessible at the Flood Map Service Center (https://msc.fema.gov/portal/home). The FEMA map 27129C0625C (October 2019) indicates that the City of Hector has been determined to be an Area of Minimal Flood Hazard, Zone X.

2.6.13.3 Surface Waters

Significance Threshold: The action would:

- *Exceed water quality standards established by Federal, state, local, and tribal regulatory agencies; or*
- *Contaminate public drinking water supply such that public health may be adversely affected.*

The City of Hector has no ordinances that place restrictions on land use and construction on or near shorelines for lakes and rivers.

The City of Hector has no ordinances that place restrictions on land use and construction on or near shorelines for lakes and rivers.

Bollig spoke with Garry Bennett, Region 4 Area Hydrologist for the Hutchinson, MN area, on October 4, 2019. The only surface water in this area is Judicial Ditch 15, which runs on the east and south side of airport property. The DNR has no jurisdiction on this surface water. Mr. Bennett stated that this is not a Protected

Public Water under the Minnesota Department of Natural Resources (DNR), and that there are no public protected waters within miles of Hector.

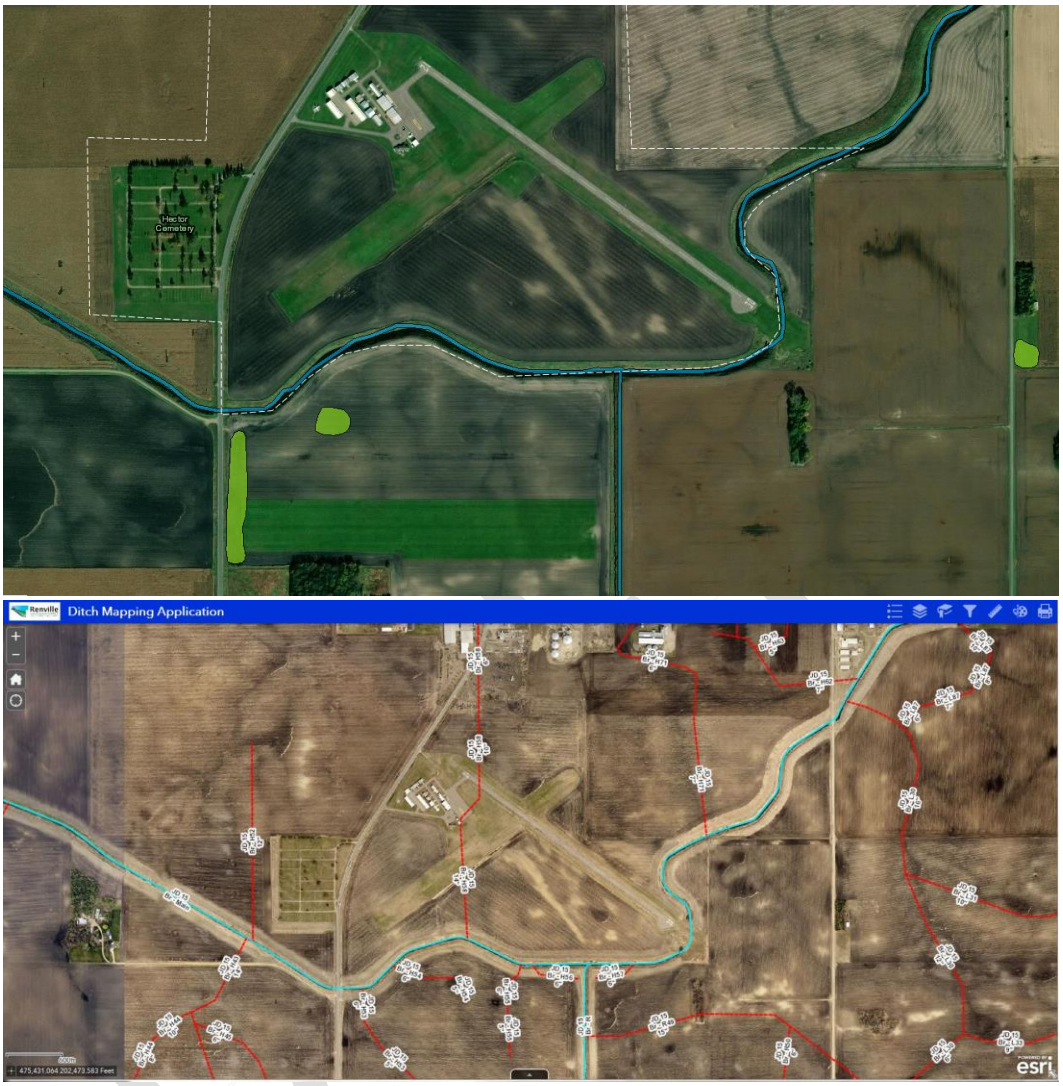


Figure 2-50: DNR Public Ditch; Source: MN DNR Public Waters Inventory Maps (www.dnr.state.mn.us/waters/watermgmt_section/pwi/maps.html)

Bollig also spoke with Seth Sparks, Drainage Systems Manager with the Renville County Drainage Authority. He noted that in 2018, Renville County did major repair work with washouts at the intake/drop pipe located east of the ditch and the east bank of the ditch, north of the box culvert. Additional riprap was added to control erosion. The repairs to both areas are expected to be permanent.

Mr. Spark's only concern about development at the airport was to note that there is a drain tile that runs underneath the runway from the south edge of the property. In 1923, a perpetual access easement was established for this tile line, and it is not subordinate to airport use. He would like that line to be re-routed at the next convenient opportunity. The city should file a petition to the board to approve the re-route when development is desired.

2.6.13.4 Ground Water

Significance Threshold: The action would:

- *Exceed groundwater quality standards established by Federal, state, local, and tribal regulatory agencies; or*
- *Contaminate an aquifer used for public water supply such that public health may be adversely affected.*

A review of the Minnesota Pollution Control Agency's groundwater data (https://pca-gis02.pca.state.mn.us/eda_groundwater/index.html) in October 2019 revealed that the nearest Drinking Water Supply Management Areas (DWSMA) is the Hector DWS area. The nearest border of the Hector DWSMA is less than 1 mile north of the airport. The MPCA maintains groundwater monitoring stations in areas that are remote from Hector, the closest being 4.2 miles away from the airport.

The City of Hector has no ordinances that place restrictions on land use and construction near aquifers, other than prohibiting groundwater from entering the municipal sanitary sewer system.

Future construction at the airport is not expected to impact the drinking water of Hector or any other municipality. Any work in this area should be in concert with the Minnesota Wetland Conservation Act and reviewed with the Hydrologist and the US Army Corps of Engineers.

Future construction at the airport is not expected to impact the drinking water of Hector or any other municipality.

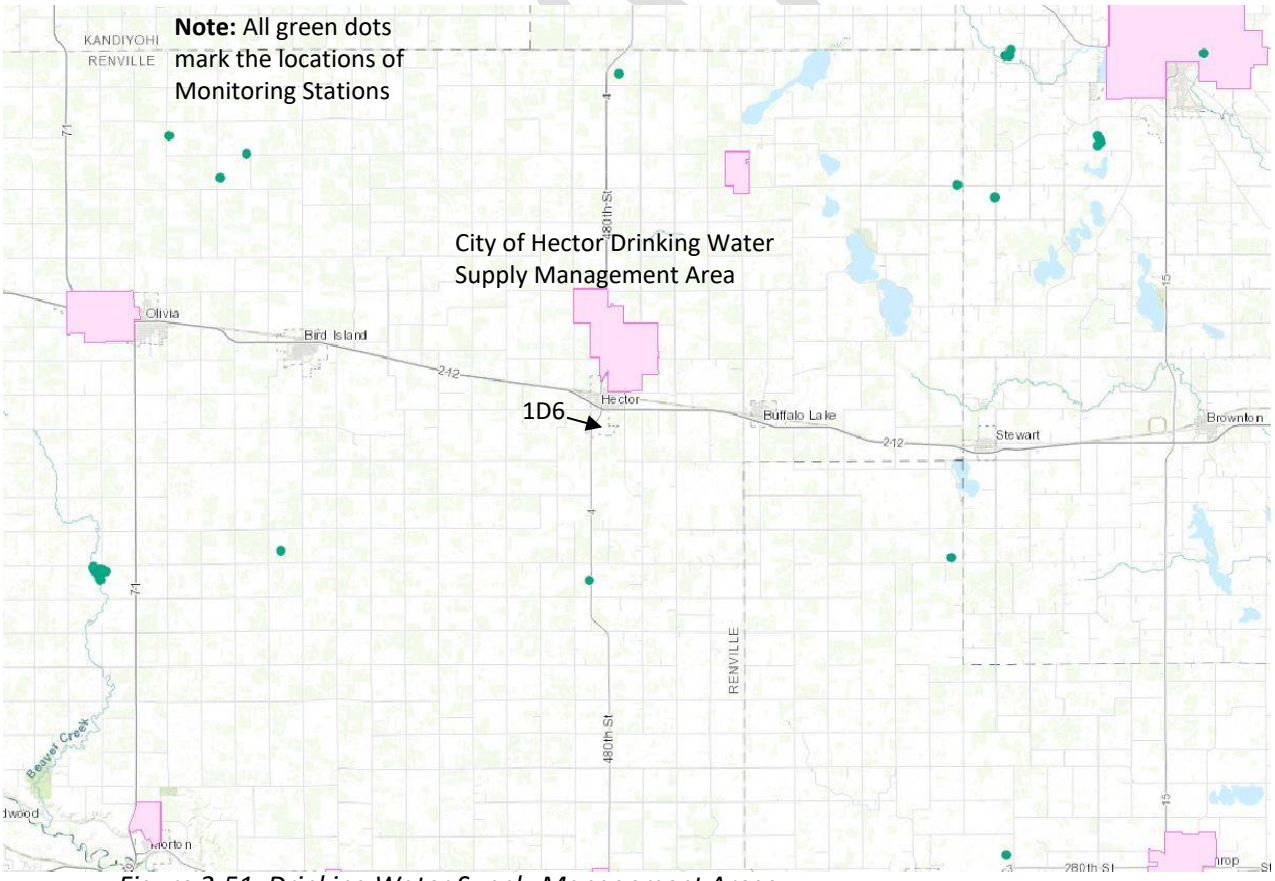


Figure 2-51: Drinking Water Supply Management Areas
Source: MPCA Groundwater Monitoring Data

2.6.13.5 Wild and Scenic Rivers

Significance Threshold: None established.

The **Minnesota State Wild and Scenic Rivers Program** was established in 1973 to protect rivers which have outstanding natural, scenic, geographic, historic, cultural, and recreational value. The six rivers currently designated in Minnesota are the Minnesota, North Fork Crow, Mississippi, Rum, Kettle, St. Croix, and Cannon Rivers. The Minnesota River is the only designated Minnesota State Wild and Scenic river in Renville County. Forming most of the county's southern border, its closest point is over 17 miles away from the airport. The St. Croix River also carries a National Wild and Scenic Rivers designation, but it is not located in Renville County.

Projects at Hector Airport are not anticipated to impact any Wild and Scenic rivers, or other federally-listed river segment.

2.6.14 Other Construction Impacts

Airport construction may cause various environmental effects primarily due to dust, aircraft, and heavy equipment emissions, storm water runoff containing sediment and/or spilled or leaking petroleum product, among other impacts. Significant construction impacts would most likely occur when unusual circumstances exist (e.g., excavating environmentally sensitive areas, construction-induced traffic congestion that would substantially degrade air quality). A significant impact would occur when the severity of construction impacts cannot be mitigated below FAA's threshold levels for the affected resource (i.e., air quality, water quality, etc.). The anticipated construction impacts of the proposed development must be considered during the environmental effort.

2.6.15 Secondary (Induced) Impacts

Major development proposals can involve the potential for induced or secondary impacts on surrounding communities. Examples of these impacts include shifts in patterns of population movement and growth, public service demands, and changes in business and economic activity to the extent influenced by airport development. The nature of expected projects at 1D6 are not anticipated to create secondary impacts on nearby communities.

2 | Section 7 – Financial Data, Businesses, and Tenants

Hector's City Administrator, under the supervision of the Hector City Council, acts as the fiscal agent for the airport and is responsible for maintaining it's budgetary as well as revenue and expenditure accounts. The designated Airport Advisory Committee offers guidance to the City Council in financial and management matters.

Each year, the City Administrator prepares an annual budget for consideration and ultimate adoption by the City Council. The City of Hector operates the Airport out of its own fund and relies on revenue sources to support operation, maintenance, and development of the airport. The City does not make an annual distribution to the airport fund. Any expenses come out of the Airport Fund, and any income from fuel, rental fees, or crop land leases or other sources goes back into this fund.

The City offers hangar space for rental, the rates for which are set by the Airport Advisory Committee (AAC) and approved by City Council on an as-needed basis. The AAC looks at other area hangar rental rates as a guide but ultimately decides what is fair for hangars at Hector.

At this time, there are multiple commercial tenants at 1D6, including Sky Apply, Newberg Sky Spray, Loftness Manufacturing and Blue House Veterinary and Laboratory.

Current Hangar Monthly Rental Rates	
City-Owned Hangars	$100
Privately-Owned Hangars ($0.06/SF)	Varies by SF
City Owned Hangars/Newberg	$45

Figure 2-53: 1D6 Hangar Rental Rates

The City holds land leases which allow agricultural activity meeting FAA guidance for land use to be conducted on airport property. They advertise in the local newspaper for bids to lease the land for crop cultivation. Sealed bids are opened at an AAC meeting, and the AAC makes a recommendation to the City Council on which bid to accept. The Council will officially make a selection at the next Council meeting, and a contract is signed between the City and the leaseholder. At this time, the lease is a one-year term with the option to renew annually. Eighty-eight acres are currently being leased for $228/acre/year from April 1, 2019 through March 30, 2020.

This analysis offers the airport a baseline evaluation of revenues and expenses in order to provide a framework for understanding future expenditure and revenue streams. It is not intended to serve as a true airport profit and loss statement; instead, it offers insight to emerging trends that could impact the future financial performance of 1D6. The techniques utilized in this analysis are consistent with industry practices for similar studies. While it is believed that the approaches and assumptions are reasonable, it should be recognized that some assumptions regarding future trends and events may not come to pass.

2.7.1 Historical Airport Revenues

Hector is part of the National Plan of Integrated Airport Systems (NPIAS) and is eligible to receive Federal grants under the Airport Improvement Program (AIP). It also includes estimates of the amount of AIP money needed to fund infrastructure development projects that will bring the included airports up to current design standards and add capacity to congested airports. The FAA is required to provide Congress with a five-year estimate of AIP eligible development every two years.

Hector is currently categorized as a Basic General Aviation Airport which is eligible for up to $150,000 in entitlements each fiscal year. This entitlement could change in the future depending on Congressional action. Under the Entitlement Program, Hector can obtain more grant allocation if other airports do not use their funding in each of the fiscal years, and they are successful in obtaining a transfer of another airport's entitlement funds.

1D6 is also eligible for State grants through the Minnesota Department of Transportation including the Airport Construction Grant Program, the Airport Maintenance and Operation Program, and the Hangar Loan Revolving Account Program. The programs are described below.

Airport Construction Grant Program. The State Construction Grant Program funds most capital improvements at state system airports based on a determination that the improvement is a justifiable benefit to the air-traveling public. State funding participation may vary from year to year.

The Construction Grant Program funds projects such as airport infrastructure, revenue-generating facilities, fencing, obstruction removal, land purchase for clear zones, and some utilities.

Airport Maintenance and Operation Program. The State Airport Maintenance and Operation Grant Program has in the past provided 2/3 State reimbursement to the state system airports for their documented, routine maintenance expenses up to a certain ceiling amount that is categorized by airport infrastructure. This amount has been increased to 75% for FY2020. The day-to-day labor, material, equipment, and utility expenses of maintaining airport pavements, airport grounds, lighting systems, buildings, and maintenance equipment are eligible costs.

Hangar Loan Revolving Account Program. The State Hangar Loan Revolving Account Program provides an 80% interest-free loan to State system airports for building new hangars. The loans are paid back in equal monthly installments over 20 years. Payment receipts, as they become available, are then loaned out again to other airports needing hangars. The hangar loan may be used to fund hangar site preparation as well as the hangar building. Hangar site preparation, including the hangar floor, may also be funded with a State grant at current participation rates, if funds are available. However, for site prep to be considered for this grant, it must be shown as a proposed project in the Sponsor's Airport CIP in the fiscal year of proposed construction.

Year	MnDOT Grant History	MnDOT, FAA or Combined Funding
1948	Grading, Seeding, Marking, Drainage	MnDOT only
1950	Building, Water, Sewer, Fencing	MnDOT only
1950	Fill and Reseed	MnDOT only
1954	Well	MnDOT only
1956	Bituminous Apron, Concrete Sidewalk	MnDOT only
1966	Runway, Taxiway, & Apron Construction	MnDOT only
1968	Runway Lighting	MnDOT only
1969	Land Purchase	MnDOT only
1972	Seal Coat	MnDOT only
1979	Slurry Seal	MnDOT only
1986	Overlay and Apron Expansion	MnDOT only
1988	Arrival/Departure Building	MnDOT only
1990	Concrete Ag-Spray Pad	MnDOT only
1991	Aircraft Fuel Truck	MnDOT only
1994	Stormwater Pollution Prevention Plan	MnDOT only
2000	Runway, Taxiway, and Apron Overlay, Update ALP	MnDOT only
2004	Tractor w/10’ Blade and Blower	MnDOT and FAA
2005	Mower	MnDOT only
2006	Construction Taxilane and Apron	MnDOT and FAA
2006	Construct 3- and 4- Unit Hangars	MnDOT and FAA
2006	Hangars and Taxilanes	MnDOT and FAA
2007	SRE and SRE Building	MnDOT and FAA
2007	Purchase 46” Hydrostatic Mower	MnDOT only
2008	SRE (Broom) and Construction A/D Bldg.	MnDOT and FAA
2009	Environmental Study – Judicial Ditch	MnDOT and FAA
2010	A/D Building Furnishings	MnDOT only
2010	Acquire 520ft of Box Culvert	MnDOT and FAA
2012	Install Box Culvert and Acquire Land	MnDOT and FAA
2015	Snow Pusher and Radio	MnDOT only
2015	Runway Pavement Repairs, Fuel System, Electric Design, Zoning, Taxiway Design	MnDOT and FAA
2016	New Mower	MnDOT only
2017	Fuel System, Wind Cone, Electrical Modifications	MnDOT and FAA
2017	Stormwater Pollution Prevention Plan Update	MnDOT only
2018	Fence and Gate Replacement	MnDOT only
2019	Master Plan and ALP update	MnDOT and FAA

Figure 2-54: MnDOT Grants Awarded to 1D6

Each year the MnDOT Office of Aeronautics establishes the Grant Rates at which it will offer funding for the year. Please see an excerpt of the current letter, shown below in Figure 2-57.

Airport Funding Rates FY 2020

May 31, 2019

STATE GRANT, STATE SHARE PERCENTAGE

PROJECT TYPE	NPIAS				NON-NPIAS			
	Under 5000		Over 5000		Under 5000		Over 5000	
	Existing FYs 18/19	New FY 2020	Existing FYs 18/19	New FY 2020	Existing FYs 18/19	New FY 2020	Existing FYs 18/19	New FY 2020
Construction, Planning, Zoning, Environmental, Land, Navigational Systems, AWOS*	75	**75**	70	**70**	95	**95**	95	**95**
Air Service Marketing	70	**70**	70	**70**	70	**70**	70	**70**
M & O	75	**75**	75	**75**	75	**75**	75	**75**
Fuel Systems and Fuel Trucks	70	**70**	70	**70**	70	**70**	70	**70**
Equipment (requires justification)	75	**75**	70	**70**	90	**90**	85	**85**

* Beginning in FY 2020 Navigational System projects, including AWOS installations and relocations need to be entered in the CIP for consideration as grant offers. This will allow correlation of equipment installations and approach procedure design with construction project staging rather than planned independently.

FEDERAL GRANT, STATE SHARE PERCENTAGE

PROJECT TYPE	NPIAS			
	Under 5000		Over 5000	
	Existing FYs 18/19	New FY 2020	Existing FYs 18/19	New FY 2020
90% FAA Participation	5	**5****	5	**5****
95% Federal Participation	2.5	**2.5****	2.5	**2.5****

** **Match will be limited based on total project funding**

- When all items are FAA eligible, the State 5% will be capped for projects over $8M. Exceptions may be made for Supplemental Appropriation AIP projects.
- When SAF are requested for any FAA ineligible or unfunded items in the same State FY as the related FAA project, the State will participate in those items at the state rate with funding approval. The State 5% will then be reduced by an amount equal to the FAA ineligible / unfunded items, if the amount exceeds $400,000, the 5% will reduce to zero.

Figure 2-55: Airport Funding Rates letter; Source: Minnesota Department of Transportation; Office of Aeronautics and Aviation, dated May 31, 2019

Hector has been the recipient of several grants from the FAA to be used for airport development, maintenance, and planning. The following table outlines these grants from the FAA.

Grant Number/Year	FAA Grant Description	Amount
001-2004	SRE Tractor, Blower, and Blade	$84,684
002-2005	3 & 4 Unit Hangars with Taxilane/Apron	$413,587
003-2006	Truck w/Snowplow & SRE Bldg.	$177,500
004-2008	SRE (Broom) and Construct A/D Bldg.	$27,974
005-2009	Environmental Study – Judicial Ditch	$28,500
006-2010	Acquire 520 ft of Box Culvert	$489,372
007-2011	Install Culvert and Acquire Land	$392,079
008-2014	Rehabilitate Runway 12/30 (crack seal), design electrical vault, Fuel system EA	$90,000
009-2016	Install fuel system, construct electrical vault, install windcone	$243,000
010-2017	Project Canceled	
011-2018	Conduct airport master plan study with ALP	$369,211

Table 2-56: FAA Grant History; Source: FAA

The date of the first grant awarded to the City by FAA is the benchmark for FAA Grant Assurances. Only the property which is owned by the airport on that date shall be encumbered by the FAA's Grant Assurances. Those properties will be identified during research for the Exhibit A document as part of this Master Plan.

Other sources of revenue for the airport include leases for hangar storage space, land leases, a profit on each gallon of aviation fuel sold at the airport, and a maintenance grant which is in addition to the previously-mentioned grants from the MnDOT and the FAA.

1D6's fuel system includes a 5,000 gallon tank. At each re-fill, which usually happens once every 12 months, 4,000 gallons are purchased. The price of fuel is currently $4.50 per gallon, which includes a 60-cent markup. This profit is offset by credit card processing fees, which equal approximately 10 cents per gallon. The price is set by the Airport Advisory Committee at the time of each tank fill.

As demonstrated in Table 2-57 below, fuel sales have increased over the last three years.

Year	Quantity Sold (gal.)	Avg. Price/gallon	Value of Fuel Sold	Quantity Purchased	Fuel Expenditure
2017	5000	$4.00	Unknown	5000	$17,135
2018	6653	$4.50	$29,939	4000	$15,655
2019	6286	$4.50	$28,287	8000	$30,105

Table 2-57: Fuel Sales; Source: City of Hector Revenue/Expenditure Audit

In 2019, approximately 2,000 gallons of 100LL fuel was sold to Heiderscheidt Aerial, LLC, a commercial spray applicator in Sleepy Eye, 300 gallons were sold to Sky Apply, and the rest was sold to based and itinerant pilots. The fuel being purchased by Heiderscheidt Aerial and Sky Apply contributed to the significantly increased sales in 2019.

Aerial spraying companies who base out of 1D6 during spraying season bring their own Jet A fuel, since 1D6 cannot provide it. There is no fee charged for temporary commercial use of the airport, such as during spraying season.

Maintenance and operations money from State of Minnesota has equaled between $15,000 and $16,000 in 2016, 2017, and 2018. The M&O money available to 1D6 is $15,901 for State FY2019. Improvements are reimbursed by State Airport Fund (SAF) to 75%, to be matched 25% by the City. New state match rates maximized the use of FAA AIP dollars at federally eligible airports in Minnesota. In addition, Minnesota airports not eligible for federal funds also experienced rate increases for their projects.

The FAA's Airport Improvement Program (AIP) covers 90% to 95% of eligible costs, with a 5% match from the City.

Source of Revenue	Comments	Annual Amount
State Airport Aid	State Grants	$10,200
Airport Hangar Rent	All units currently rented	$10,800
Airport Fuel Sales	60-cent markup per gallon sold	$7,500
Land Lease (Crops)	Renters pay for land lease	$17,300
MnDOT	2018-2019 Maintenance Grant	$15,900
	Total Revenues	**$82,700**

Table 2-58: 2019 Airport Revenue Sources

In addition, the airport receives $150,000 in entitlements each year from the FAA through the Airport Improvement Program.

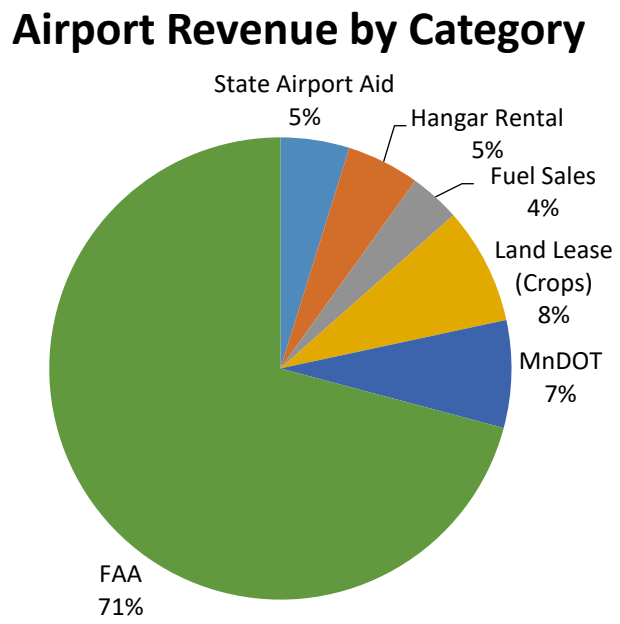


Figure 2-59: Airport Revenue by Category (Historical used to project 2020)

2.7.2 Historical Operating Expenses

The City of Hector budgets for airport needs within their General Fund each year. These expenditures include all necessary maintenance activities, utilities, outside contracted labor, legal expenses, fuel purchases, and annual grant matches.

Source of Expense	Comments	Annual Amount
Repairs and Maintenance	Includes labor, parts and supplies	$13,400
Utilities and Telephone	All Utilities	$4,000
Insurance, License, Taxes	Property, Liability, and Equipment Insurance	$8,100
Fuel Purchases	Average 2017-2019	$16,500
Staff Expenses	Wages, Benefits	$17,600
MnDOT	Maintenance Grant Match (25%)	$5,300
Office Expenses	Supplies, Postage, Printing	$1,200
Professional Fees	Engineering, Accounting, Legal	$9,300
	Total Expenditures	**$75,400**

Table 2-60: 2019 Airport Operating Expenses

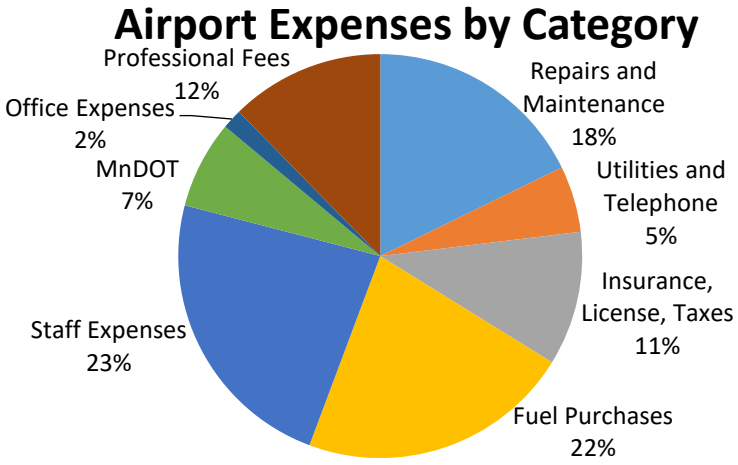


Table 2-61: Airport Operating Expenses by Category (Historical used to project 2020)

2 | Section 8 – Summary of Existing Conditions

Information collected during the inventory effort of the master planning process provides a method to evaluate the conditions of existing airport facilities and provide a baseline to measure how well current infrastructure will be able to accommodate future aviation demand. Through a review of the inventory information presented in this chapter, subsequent study tasks can be conducted to determine what improvements will be necessary at 1D6 to meet the air transportation requirements of the region over the next 20 years. In comparison with future aviation demand projection and demand/capacity analyses, alternatives can be developed to identify a plan for how 1D6 will address the required improvements. This study effort will help direct the prospective growth and expansion of existing facilities at 1D6 to meet future aviation needs.