

# INVENTORY



The initial step in the preparation of a 20-year master plan is the collection and identification of information pertinent to Hector International Airport and the Fargo area. There have been significant changes in activity at the airport, and the facilities serving this demand, since the last master plan was completed in 1991. This chapter will organize the information, providing a foundation for subsequent planning analyses. Included within this analysis will be airside and landside facilities, nearby airports and vicinity airspace, and socioeconomic information on the Fargo/Cass County area, with special emphasis on changes over the past decade.

The information collected for this chapter was obtained from several sources: on-site inspections, airport records, review of other planning studies, interviews with airport staff, planning associations or tenants, and a

number of on-line (Internet) sites which presently summarize most statistical information and facts about the airport.

As with any airport planning study, an attempt has been made to utilize existing data, or information provided in existing planning documents, to the maximum extent possible.

## AIRPORT SETTING

Hector International Airport serves as a primary commercial service airport for southeastern North Dakota, northeastern South Dakota, and western Minnesota. Situated at the intersection of Interstates 29 and 94, the airport is easily accessible from any direction. The geographical setting has been depicted on [Exhibit 1A](#).

In a regional sense, Fargo is located 235 miles northwest of Minneapolis, 230



miles north of Sioux Falls, 181 miles east of Bismarck, and 75 miles south of Grand Forks.

Located in Cass County, local county population has increased by 17 percent, and the Fargo-Moorhead metropolitan statistical area (MSA) population has increased by 12 percent over the past decade (source: *CEDDS 2000 (The Complete Economic and Demographic Data Source)*). The local county population in 2000 is 120,000, while the population in the local MSA is 173,000 according to *CEDDS 2000*. The North Dakota Data Center estimated the population in a 100-mile radius of Fargo at 576,000, based upon 1996 census figures. This population estimate included 16 counties in North Dakota, 22 counties in Minnesota, and 4 counties in South Dakota.

Fargo is strategically located for reaching domestic and international markets. All major Asian, European, and South American markets may be reached non-stop from Fargo using long-range freighter aircraft. It is also centrally located to reach all North American markets.

At 900 feet above sea level, the local area is identified by four distinct seasons. The normal daily minimum-to-maximum temperatures range from -3.6 to 15.4 degrees Fahrenheit in January (the coldest month) and from 58.8 to 83.4 degrees Fahrenheit in July (the warmest month). The area averages approximately 50 inches of precipitation per year.

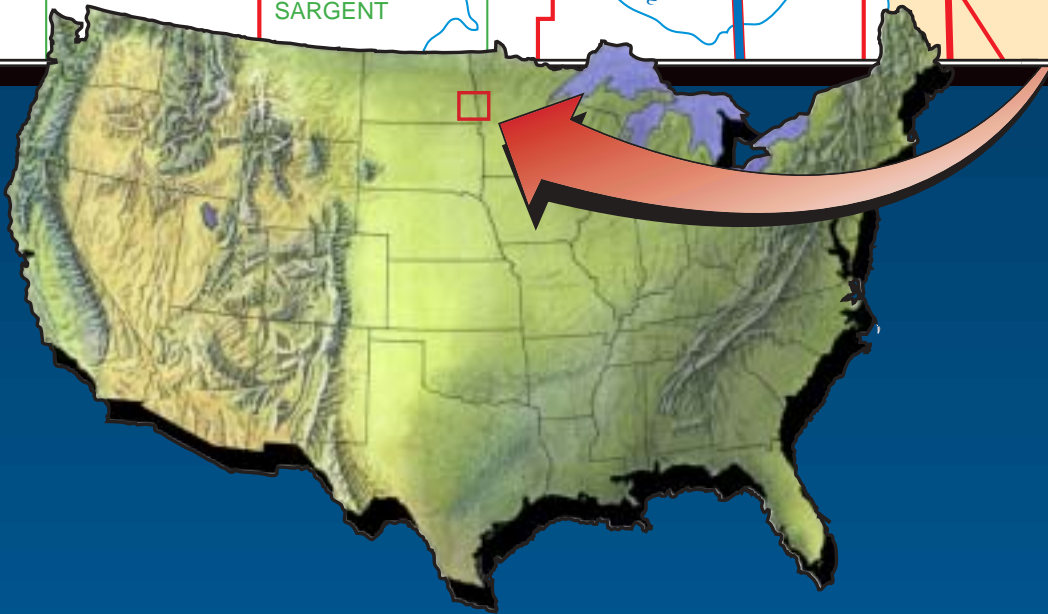
## ***AIRPORT SYSTEM PLANNING ROLE***

Airport planning exists at local, regional, state, and national levels. Each level has a different emphasis and purpose. The update of Hector International Airport's master plan provides the airport authority with planning at the local level. At the state level, the North Dakota Aeronautics Commission provides state-wide planning to airports through its system planning, pavement condition studies, air service evaluations, economic impact, and general aviation studies.

At the national level, Hector International Airport is included in the *National Plan of Integrated Airport Systems 1998-2002 (NPIAS)*. This planning document includes 3,344 existing airports which are significant to national air transportation. It has been estimated that \$35.1 billion in infrastructure development (that is eligible for Federal aid) would be needed over the ensuing five years to meet the needs of all segments of civil aviation, if funding were available. Airports with significant commercial service account for 82 percent of the total development needs.

## ***AIRPORT HISTORY AND ADMINISTRATION***

In 1931, Martin Hector donated 160 acres to the City of Fargo for the exclusive purpose of developing an



NOT TO SCALE



Exhibit 1A  
LOCATION MAP

airport, even though fliers had used property on the outskirts of town for flying exhibitions since the early 1900s. Scheduled service has been provided continuously to the City by Northwest Airlines since 1931. The airport is also served at this time by Mesaba Airlines and United Express (Air Wisconsin and Atlantic Coast). Non-stop hub service is provided to Minneapolis, Chicago, and Denver. All service into the airport is provided on jet aircraft. The present terminal was constructed in 1986.

The North Dakota Air National Guard has been located on the airfield since 1947. Initially supporting a fighter group which flew P-51 Mustangs, the 119<sup>th</sup> Fighter Wing "Happy Hooligans" have transitioned through several different types of fighter aircraft in their history. Today, they fly the F-16 Fighting Falcon. The Governor of North Dakota recently announced that the Air National Guard will be taking on a new mission, converting to a general purpose fighter unit (from a dedicated continental U.S. air defense unit). A general purpose fighter unit provides several roles: air-to-air combat, air defense, bombing, and precision guided air-to-ground munitions.

Air cargo activity has contributed to a significant growth segment at the airport over the last decade. As recently as 1993, the total air cargo landed weight was less than 8,000 tons. By 1999, the landed weight had increased seven-fold, to 55,570 tons. In 1999, ten companies were flying cargo through the airport, although only two were using jets (the DC-9). As more operators transition to jets, the total air cargo landed weights are expected to

continue to grow at significant rates (this will be addressed more thoroughly in the following chapter). Dedicated air cargo facilities were constructed on the north side of the airfield in 1997 to meet increasing demands of Airborne Express.

General aviation activity, attributable to privately owned aircraft which are based at the airport or flying to Fargo from other cities, contribute the remaining aviation-related activity on the airport. New facilities were constructed on the north side of the airfield to meet the growing general aviation demands in 1994-95.

The airport is owned and operated by the Municipal Airport Authority of the City of Fargo. Working through the Executive Director, they are responsible for providing overall guidance and direction of airport operations.

## ***LOCAL HISTORY***

The local area was settled by Scandinavian and European immigrants. The City of Fargo was named for William G. Fargo, a partner in the Wells-Fargo Express Company, while the City of Moorhead was named for William G. Moorhead, an executive with the Northern Pacific Railroad. The downtown area (in Fargo) was devastated by a fire in 1893, which resulted in the development of new fire resistant buildings. The Ford Motor Company constructed an assembly plant downtown in the early part of the century, while the Northern Pacific Railroad chose the local area for the railroad crossing over the Red River.

The physical size of Fargo changed little until after 1950; with the past fifty years witnessing a five-fold increase in the physical size of the city, and more than a doubling in population.

The Red River of the North is one of the few rivers in the contiguous 48 states which flows north, into the Arctic watershed. The river flows into Manitoba, where it ultimately becomes part of the Nelson River drainage into Hudson Bay.

### **AIR TRAFFIC ACTIVITIES**

Air traffic activities are submitted each month to the airport by individual

airlines, while operations recorded by the airport traffic control tower are recorded daily and summarized monthly. Passenger airlines report enplaning and deplaning passengers, air freight, air mail, and landings by each aircraft type. The air cargo airlines report enplaning and deplaning air freight and landings by aircraft type. A summary of annualized activity for airport operations, enplaned passengers, total cargo landed weight (in tons), and based aircraft, have been presented in **Table 1A**, and graphically on **Exhibit 1B**, for the past decade (the total cargo landed weight was only available since 1993).

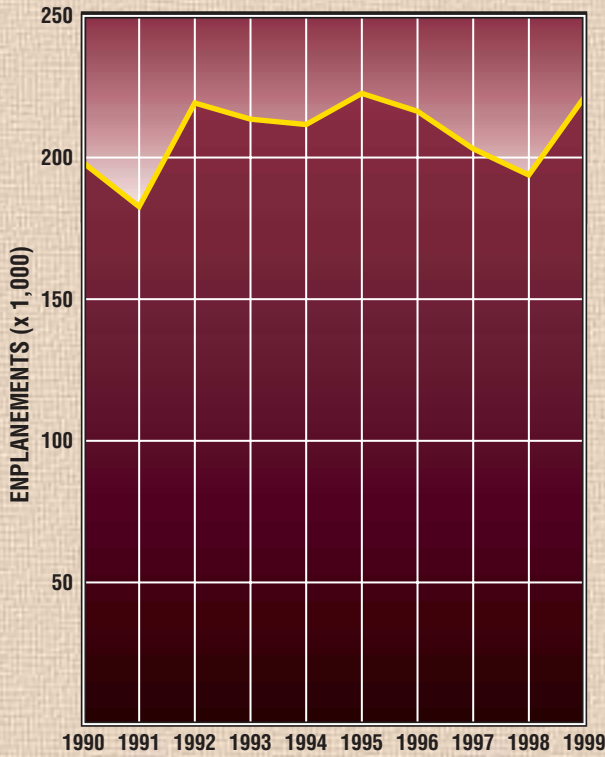
<b>Year</b>	<b>Airport Operations</b>	<b>Enplaned Passengers<sup>1</sup></b>	<b>Total Cargo Landed Weight (tons)</b>	<b>Based Aircraft</b>
1990	102,915	198,117		109
1991	89,286	182,653		125
1992	87,619	219,259		104
1993	89,848	213,550	7,939	123
1994	94,479	211,644	9,459	130
1995	93,437	222,645	16,271	135
1996	81,025	216,333	26,164	141
1997	81,592	203,105	25,918	149
1998	89,591	193,826	40,769	156
1999	91,372	221,368	55,570	163
2000 <sup>2</sup>	97,457	234,667	54,740	
2001 <sup>2</sup>	89,213	216,353	44,243	

Source: Municipal Airport Authority.  
<sup>1</sup> Does not include charter passengers.  
<sup>2</sup> Statistics included prior to final printing.

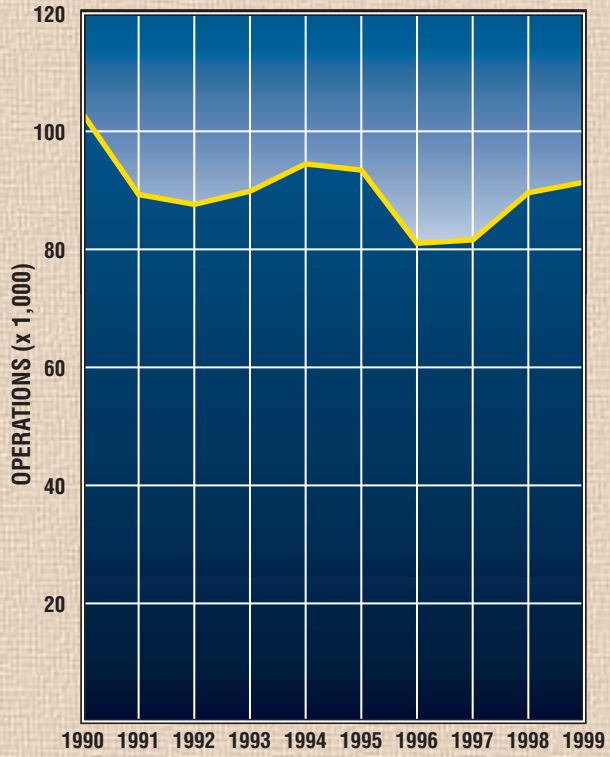
Total airport operations have not changed significantly through the period, although operations within each

category recorded by the control tower (air carrier, air taxi, general aviation, and military) will be examined in more

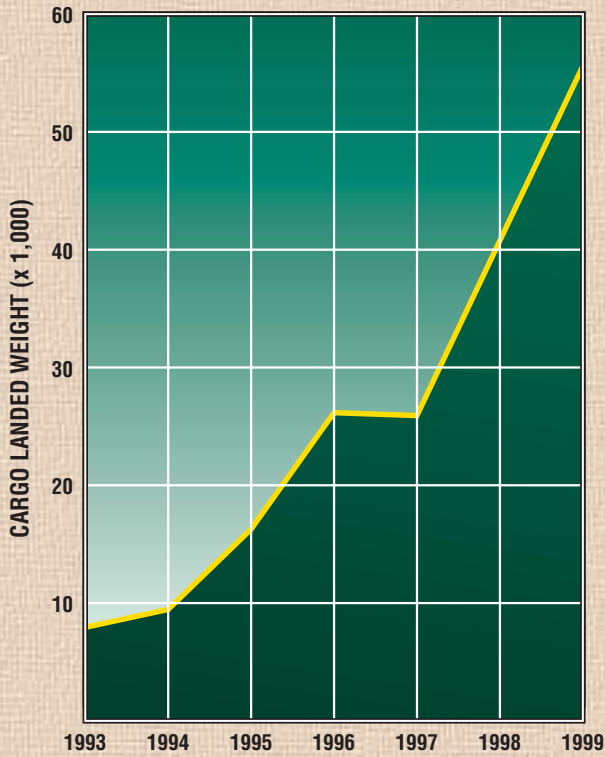
### PASSENGER ENPLANEMENTS



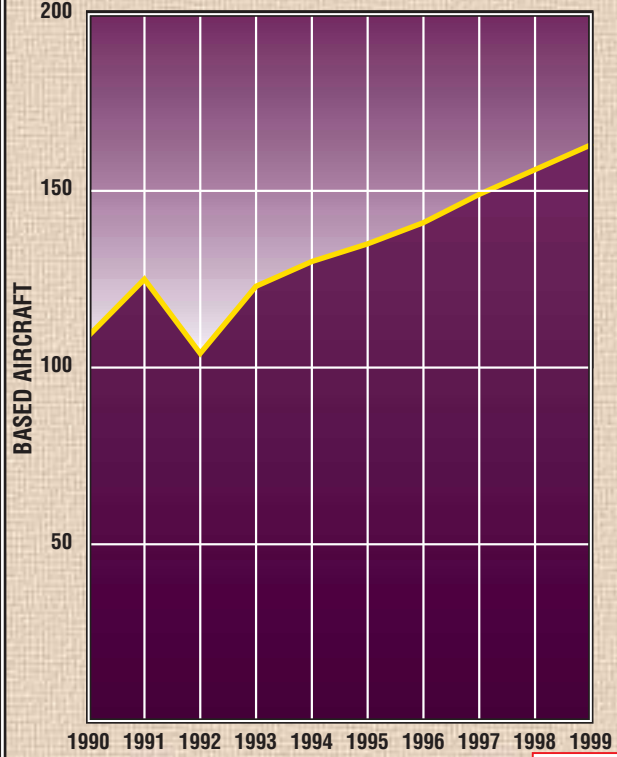
### ANNUAL OPERATIONS



### CARGO TOTAL



### BASED AIRCRAFT





detail within the following chapter. While enplaning passengers have not increased significantly over the period, a number of factors (destinations, frequency, equipment, and cost) have certainly influenced passenger demand. Since recent improvements in service, enplanements have been increasing. The 1999 passenger enplanements were up 14.2 percent over 1998. The latest year-to-date data will be closely examined in preparing the passenger forecasts in the following chapter.

Air cargo landed weight has increased seven-fold from 1993 to 1999. This occurs at the same time as very strong growth in domestic and international air cargo at the national level. However, this tremendous growth in Fargo (which exceeds national growth) is being driven by the decisions made by air cargo companies to substitute larger aircraft into the local market, consolidating freight locally for shipment into their national hubs, and a transition from ground shipment to air shipment for time sensitive freight. In the following chapter, changes occurring in the air cargo industry, and its potential impact on Fargo will be examined in more detail.

Based aircraft are counted each year by the airport and reported to the FAA. Since 1990, the total number of civilian and military aircraft has increased from 109 to 163. The number of military aircraft has remained relatively unchanged (currently at 20); therefore, most of the growth has been in civilian aircraft, with increases in multi-engine and jet aircraft over this period.

The airlines providing scheduled service include: Northwest Airlines, Mesaba, and United Express. Non-stop service is provided to Minneapolis-St. Paul, Chicago-O'Hare, and Denver. Air Wisconsin provides the United Express service to Denver, while Atlantic Coast provides the United Express service to Chicago. Regional jet service to Denver was initiated in March 1999, and to Chicago in December 1998. A decline in passenger volume in 1998 has been partly attributed to the Northwest Airlines pilot strike in September 1998.

The Department of Transportation samples ten percent of all tickets sold to determine the airport of origin and destination. The latest information available is for calendar year 1998. The results of this "origin-destination survey" have been graphically presented on [Exhibit 1C](#). It summarizes the top twenty market destinations from Fargo. The top five markets include: Minneapolis-St. Paul, Chicago, Denver, Phoenix, and Los Angeles.

## ***AIRSIDE FACILITIES***

Airside facilities include runways, taxiways, airfield lighting, and navigational aids. Information relative to the three-runway system has been summarized in [Table 1B](#).

Runway 17-35 serves as the primary runway on the airfield. It is concrete, 9,546 feet in length, and 150 feet in width. It is rated at the following pavement loading strengths on the most

recently published FAA Airport Master Record:

- Single wheel loading of 100,000 pounds.
- Dual wheel loading of 200,000 pounds.
- Dual-tandem wheel loading of 400,000 pounds.
- Double-dual tandem loading of 847,000 pounds.

The runway is equipped with precision instrument approaches from each end, high intensity edge lighting, BAK 14 arresting devices (for military), 4-box visual approach slope indicators, and medium intensity approach lights (MALSR). The landing threshold for Runway 35 is displaced 399 feet (road on south end). The precision instrument approaches provide visibility minimums of one-half mile and 200 feet.

<b>TABLE 1B Airsides Facilities Data</b>						
	<b>Runway 17</b>	<b>Runway 35</b>	<b>Runway 8</b>	<b>Runway 26</b>	<b>Runway 13</b>	<b>Runway 31</b>
Runway length (ft.)	9,546		4,387*		4,199	
Runway width (ft.)	150		100		150	
Surface Material	Concrete/Grooved		Concrete		Asphalt/Concrete	
Surface Condition	Good		Good		Good	
Edge Lighting (intensity)	High		Medium		Medium	
Traffic Pattern	Left	Left	Left	Left	Left	Left
Load Bearing Strength (lbs.)						
Single wheel	100,000		60,000		26,000	
Dual wheel	200,000		75,000		35,000	
Dual tandem	400,000					
Markings	Precision instrument		Basic		NPI	NPI
Runway Latitude	46-55-58.32N/46-54-24.102N		46-55-37.536N/46-55-37.179N		46-54-52.409N/46-54-21.946N	
Runway Longitude	96-48-57.99W/96-48-59.114W		96-49-10.783W/96-48-07.588W		96-49-19.457W/96-48-38.458W	
Elevation (ft. MSL)	898.8	898.3	897.4	897.4	899.9	897.0
Visual Slope Indicator	VASI-4	VASI-4	PAPI-4	PAPI-4	VASI-4	None
Touchdown Elevation (ft. MSL)	—	898.0	899.0	898.0	900.0	898.0
Instrument Approach	ILS	ILS	GPS	None	None	None
Approach Lights	MALSR	MALSR	None	None	None	None
Source: Airport Master Records, 2000.						
* Length of Runway 8-26 increased to 6,300 feet in 2001.						

Runway 8-26 is a medium duty (single wheel loading of 60,000 pounds) crosswind runway, constructed in 1992-93. It is currently 4,387 feet in length, and 100 feet wide, serving the general

aviation facilities which have been constructed on the north side of the airport. The Airport Authority has received environmental approval from the FAA to extend the runway to 6,300





<u>City</u>	<u>Total Passengers</u>
1. MSP - Minneapolis/St. Paul, Minnesota	38,674
2. ORD - Chicago, Illinois	28,076
3. DEN - Denver, Colorado	27,043
4. PHX - Phoenix, Arizona	26,404
5. LAX - Los Angeles, California	17,499
6. DCA - Washington, D.C.	15,124
7. LAS - Las Vegas, Nevada	14,879
8. SEA - Seattle, Washington	13,143
9. LGA - New York, New York	11,279
10. ORF - Norfolk, Virginia	10,907
11. MCO - Orlando, Florida	10,896
12. DFW - Dallas/Fort Worth, Texas	8,989
13. SFO - San Francisco, California	8,521
14. SAN - San Diego, California	8,340
15. PDX - Portland, Oregon	7,946
16. ATL - Atlanta, Georgia	7,008
17. STL - St. Louis, Missouri	6,284
18. MCI - Kansas City, Missouri	6,167
19. MKE - Milwaukee, Wisconsin	5,901
20. BOS - Boston, Massachusetts	5,826



feet. This will allow increased use of the runway by business jets and small commercial regional jets. Federal construction requests are pending.

The runway is equipped with medium intensity edge lighting, 4-box precision approach path indicators and runway end identifier lights. A GPS non-precision approach was approved for Runway 8 this year (2000).

Runway 13-31 is a light duty (single wheel loading of 26,000 pounds) runway serving general aviation users in the southeast quadrant. It is 4,199 feet long and 150 feet wide. The threshold for Runway 13 is displaced 210 feet, while the threshold for Runway 31 is displaced 429 feet. The runway has medium intensity edge lighting, and a 4-box visual approach slope indicator (on Runway 13).

A fully-developed taxiway system supports the airfield system. Taxiway A parallels Runway 17-35 along the west side of the runway. It is 100 feet wide, and serves the terminal and air cargo ramps, which are located on the west side of the airfield. Taxiway B parallels Runway 17-35 along the east side. It is 75 feet wide and provides access to general aviation areas (north and south), and the North Dakota ANG. Taxiway C parallels Runway 8-26 along the north side of the runway. Most of the taxiway is 50 feet wide; however, the portion west of Runway 17-35 is 75 feet wide (and heavy duty pavement) since it also serves commercial aircraft on the west side of the airfield. Taxiway D serves as a connection between the south end of Runway 35 and the military ramp. It is 75 feet

wide. Taxiway G2 is used by general aviation and air freight users in the southeast quadrant, while Taxiways G3 and G4 provide general aviation users a connection between the southeast quadrant and Runway 13-31. Taxiway H provides access to the new storage hangars on the north side (from Taxiway C).

Airside and landside facilities have been depicted on [Exhibit 1D](#).

## ***LANDSIDE FACILITIES***

### **TERMINAL**

The passenger terminal was opened in 1986 on the west side of the airfield. Accessible from 19<sup>th</sup> Avenue North on Joe Parmer Drive, the 76,000-square foot facility provides second-level boarding from four gates to the all-jet fleet which presently serves Fargo. Public parking, a rental car ready/return lot, and employee parking are provided from easily accessible areas near the building. The two-story lobby provides clear segregation of enplaning and deplaning passengers, and access to second-level boarding areas and holdrooms. A restaurant, gift shop, and airport administration offices are also located on the second floor. The terminal layout has been depicted on [Exhibit 1E](#).

### **GENERAL AVIATION**

Two full-service FBOs are located on the airport to provide services to general aviation aircraft. These services include: fueling, storage,

maintenance, flight instruction, and charters. Three other companies provide limited services. Fargo Jet Center and Valley Aviation are both located on the north ramp.

Fargo Jet Center initially constructed offices, pilot facilities, and a 12,000 square foot heated hangar on the north ramp. They have recently added a 23,800 square foot hangar and office addition, and constructed general aviation storage hangars near their facility on the north ramp.

Weather Modification, Inc. also operates from the Fargo Jet Center facility, providing hail suppression and rain enhancement cloud seeding services worldwide with a fleet of 15 twin-engine aircraft based at the airport.

Valley Aviation initially constructed offices, pilot facilities, and a 29,400 square foot heated hangar on the north ramp, which was subsequently expanded with another heated hangar of equal size. They have also constructed general aviation hangars near their facility on the north ramp. In addition, they provide cold storage for aircraft in the southeast quadrant with two hangars totaling 30,100 square feet.

Several other companies support aircraft storage, maintenance, avionics repair, aircraft parts, sales, and rentals in the southeast quadrant. Privately owned hangars are located in both the southeast quadrant and near the north ramp.

## **AIR CARGO**

The airport is served by six air cargo companies on a scheduled basis. Airborne Express and Evergreen provide daily service with DC-9 aircraft. Central Air, Corporate Air, Sioux Falls Aviation, AirCargo Masters, and Superior Aviation fly a variety of propeller aircraft for United Parcel Service, FedEx, and DHL. Emery Worldwide also uses the airport on a regular basis. Airborne Express is located at the air cargo facility in the northwest quadrant. The remaining companies use the ramp in the southeast quadrant.

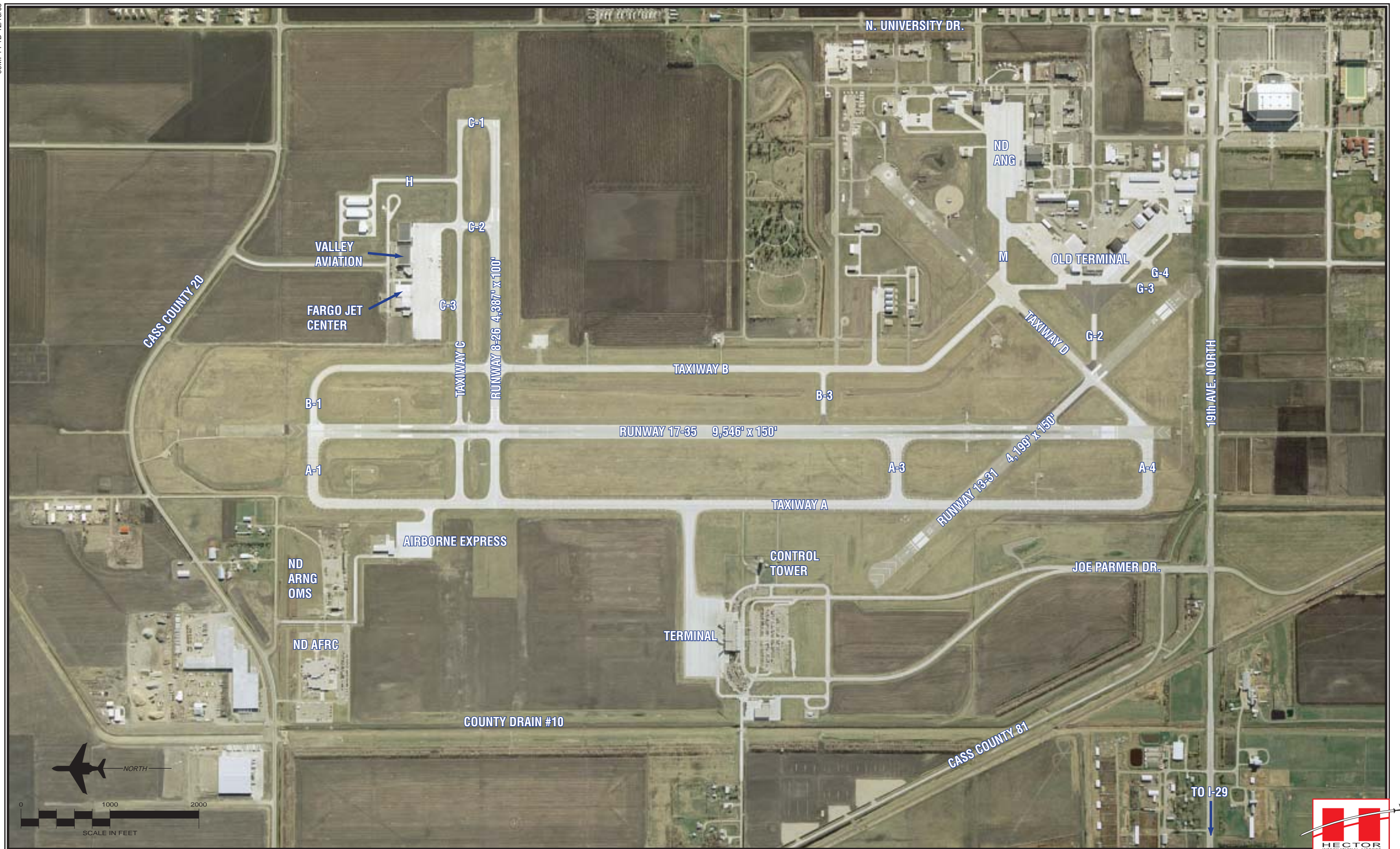
## **AIR NATIONAL GUARD**

The North Dakota Air National Guard fly the F-16 to support their current mission. As indicated earlier, the Governor of North Dakota has indicated recently that their mission will be changing to that of a general purpose fighter unit. All of the Air National Guard facilities are located on the east side of the airfield. Other military aircraft frequent the airport, ranging from T-38s to C-5s.

## ***SUPPORT FACILITIES***

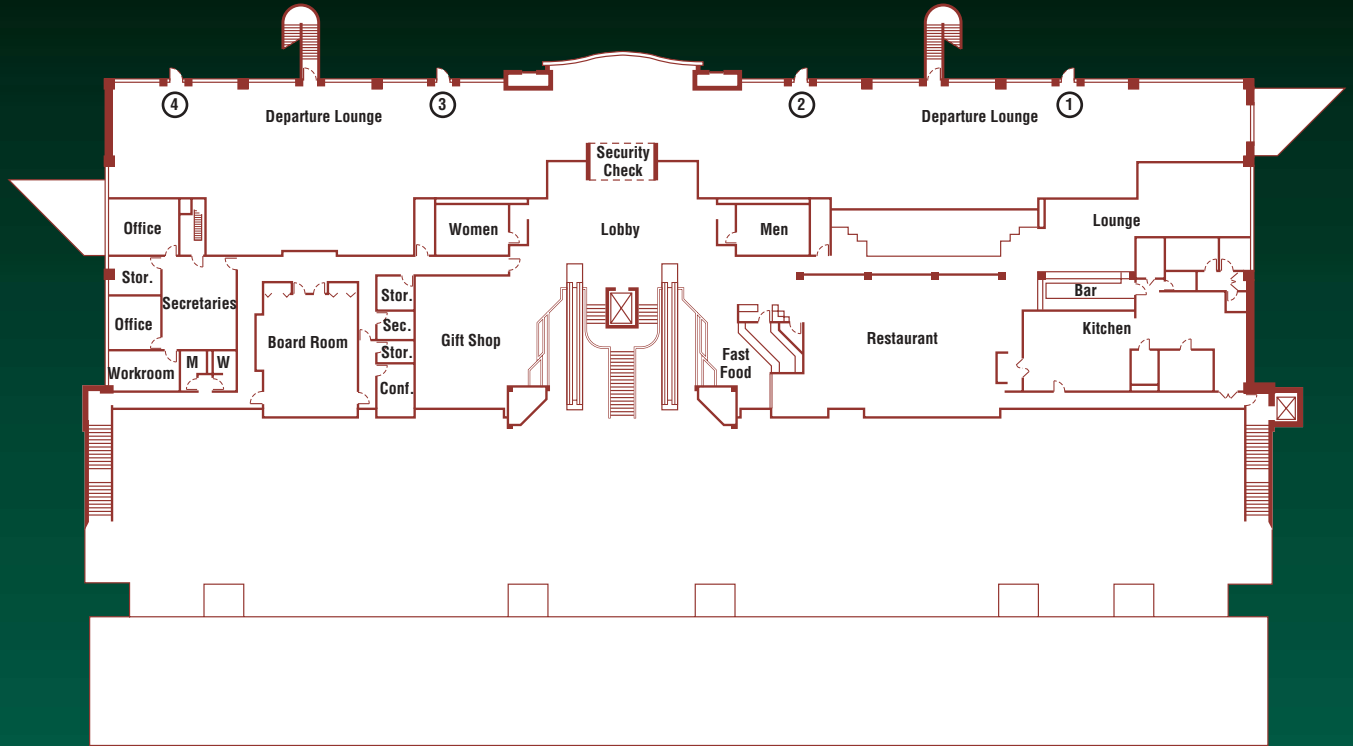
The U.S. Customs Service, FAA Flight Standards District Office, and FAA Airway Facilities lease space in the old terminal building on the southeast ramp.



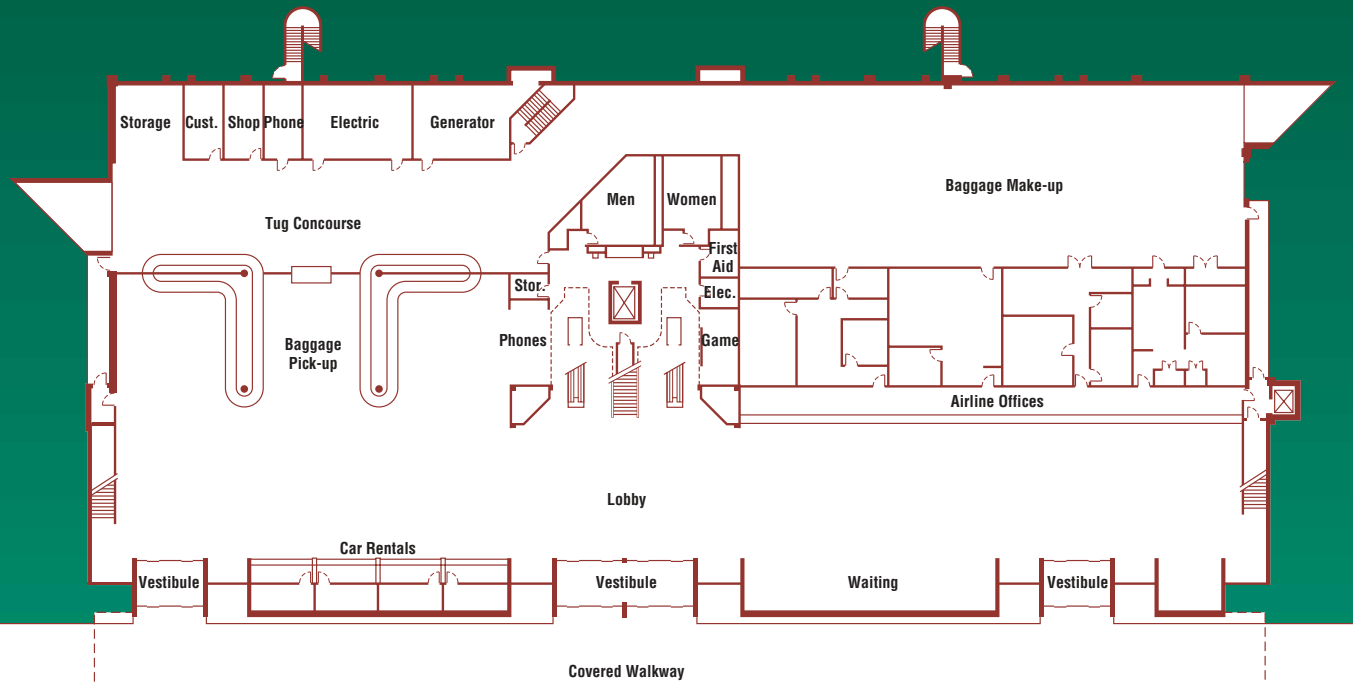




# UPPER LEVEL



# LOWER LEVEL



The airport is required to maintain airport rescue and firefighting capabilities under Federal Aviation Regulation (FAR) Part 139 based upon the seating capacity of the largest aircraft with at least five daily departures. They currently are required to meet the requirements of Index C (aircraft up to 160 feet in length). The North Dakota ANG provides this function for the airport under an agreement with the Airport Authority. The equipment is housed in a facility on the ANG ramp in the southeast quadrant.

Airport maintenance and fuel storage facilities are located on the west side of terminal area, although fuel storage is also maintained in the general aviation service areas.

The airport's water supply is provided from the City of Fargo through a main which runs parallel to North University Drive. Sanitary sewage connects into the City's system. Natural gas and electrical service is available to all quadrants of the airport property.

Surface runoff is carried either to the east, into County Drain 3, or into County Drain 10, which runs north-south along the west side of the terminal area. Both of these drains discharge into the Red River. A portion of County Drain 10 will be culverted as part of the project to extend Runway 8-26.

## ***ENROUTE NAVIGATION AND AIRSPACE***

Several types of navigational aids are available for aircraft enroute to Fargo, including very high frequency omnidirectional range beacons (VOR), nondirectional beacons (NDB), Loran-C, area navigation (RNAV), and the global positioning system. VORs provide azimuth readings to pilots of properly equipped aircraft, transmitting a radio signal at every degree to provide individual navigational courses along each compass point. NDBs provide nondirectional signals to pilots with properly equipped aircraft.

Loran-C is a ground-based system which utilizes a system of transmitters across the U.S., but varies from VOR facilities in that pilots are not required to navigate using a specific facility. RNAV is a method of navigation which permits aircraft operation on any desired flight path using VOR transmitters. Special equipment installed in the aircraft permits direct flights and eliminates the need to fly directly to or from the VOR beacon.

GPS is another enroute navigational (and approach) aid available to pilots. Initially developed by the U.S. Department of Defense, it is being increasingly used in civilian aircraft navigation. A system of satellites has been deployed to transmit electronic

signals which aircraft may in turn use to calculate their relative location. It is similar to Loran-C in that pilots are not required to navigate between navigational facilities. GPS provides the greatest level of accuracy of all enroute navigational aids currently available. The FAA is proceeding with a program to gradually replace all traditional enroute navigational aids with GPS by the year 2020. A non-precision GPS approach has been approved for Runway 8 in 2000.

A wide area augmentation system (WAAS) is being installed to meet navigation performance requirements for domestic enroute, terminal, non-precision approach and precision approach flight phases. WAAS is designed to enhance the accuracy, integrity, and availability of GPS signals, contributing to increased aviation system capacity and efficiency. The augmentation improves signal accuracy from 100 meters to less than 3 meters and provides the availability and integrity needed to use GPS signals as the primary means of navigation.

There are a number of other public and private use airports located within the immediate area which have been depicted within the area airspace on [Exhibit 1F](#).

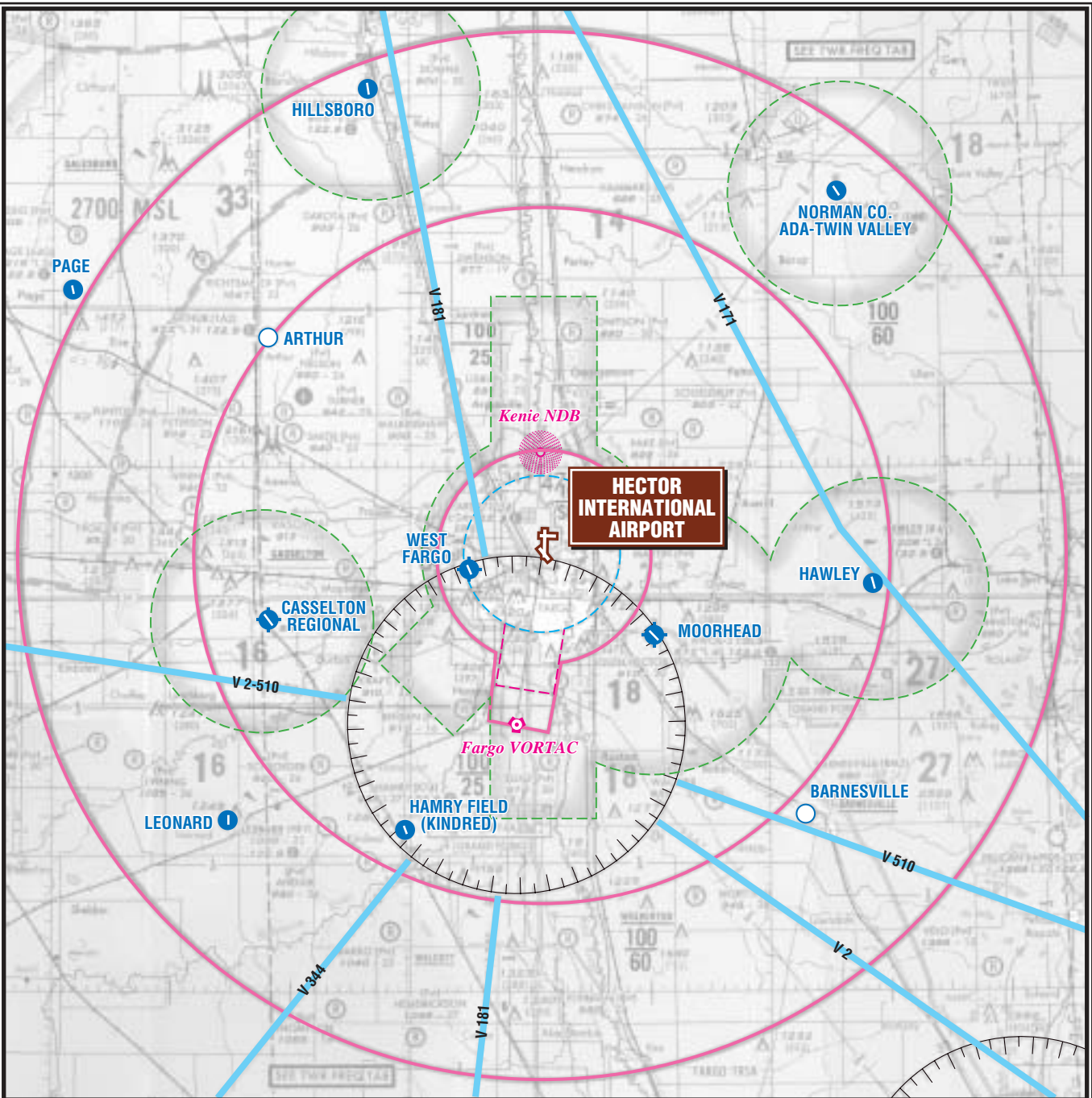
### ***EXISTING LAND USE, ZONING, AND AREA PLANNING***

The airport is located three miles north of the central business district, on












approximately 2,500 acres. The nearest residential areas are located near the Red River, which flows north along the eastern boundary of the airport property. A mobile home park, multi-family housing, and the City's wastewater treatment plant are located on the east side, in the approach to Runway 26. North Dakota State University controls property south and southeast of the airport, with the Fargo Dome located in the approach to Runway 31. Beyond the university property, the area is a mix of commercial and residential uses. Immediately west of the terminal is a small rural housing subdivision, while remaining areas along the western and northern boundaries are either in limited industrial/commercial development or open space/agricultural use. A generalized land use map has been presented on [Exhibit 1G](#).

The City of Fargo has a comprehensive land use plan which includes the current zoning map, airport land use plan, and airspace plan. The latter two items will be updated under the airport master plan update. Future zoning does not differ significantly from existing land use patterns. The City of Fargo Planning Department has supported development actions on the airport, and included previous master plan recommendations in area plans (including runway extensions and Cass County 20 realignments). A Cass County 20 Study is underway. The study is examining future access points onto County Road 20 and ultimate alignment.





**LEGEND**

-  Airport with other than hard-surfaced runways
-  Airports with hard-surfaced runways 1500 ft. to 8069 ft.
-  Airports with hard-surfaced runways greater than 8069 ft. or some multiple runways less than 8069 ft.
-  VORTAC
-  Non-Directional Radiobeacon (NDB)
-  Compass Rose
-  Victor Airways
-  Terminal Radar Service Area (TRSA)
-  Class D Airspace
-  Class E Airspace
-  Class E Airspace with floor 700' above surface

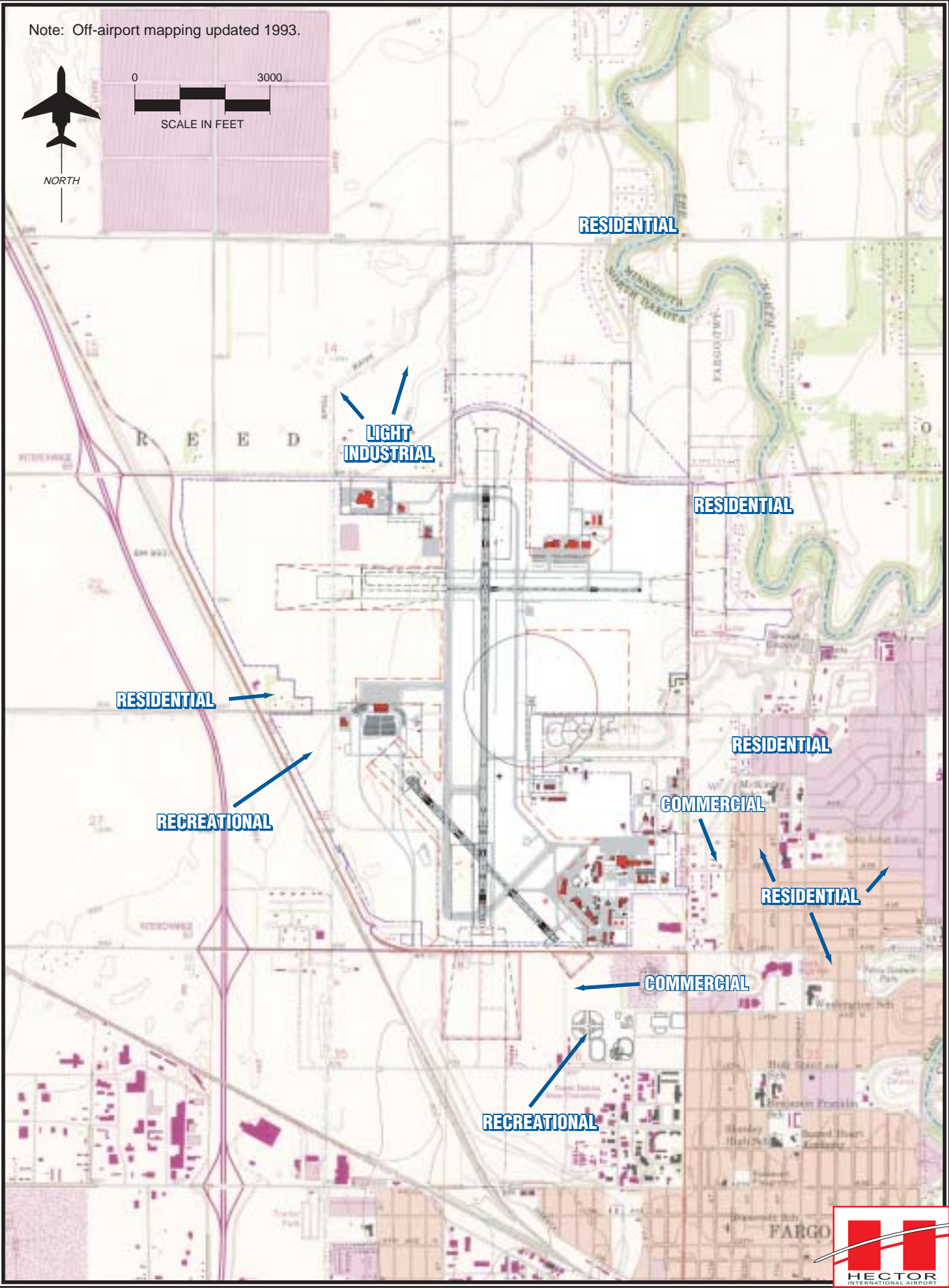
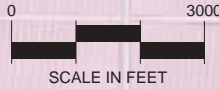


NOT TO SCALE

Source: Twin Cities Sectional Aeronautical Chart  
 National Oceanic and Atmospheric  
 Administration (NOAA)  
 Effective Date: December 30, 1999



Note: Off-airport mapping updated 1993.



## ***SUMMARY***

The information which has been provided on the preceding pages provides a foundation upon which the remaining elements of the planning process will be constructed. Information on current facilities and activities will provide (with additional data collection and analysis) for the development of aviation demand forecasts, demand/capacity analyses, and facility needs assessments. This information will in turn provide guidance for the assessment of potential changes to aviation facilities or procedures necessary to meet goals for long-term facility improvements.

## ***DOCUMENT SOURCES***

A variety of sources were used in the inventory of existing facilities. The following listing presents a partial list of reference documents. The list does not reflect the information collected by airport staff or through interviews with airport personnel.

*Airport Master Plan, Hector International Airport*, Coffman Associates and Ulteig Engineers, July 1991.

*Environmental Assessment for Airport Improvements at Hector International Airport*, Ulteig Engineers, 1999.

*Sectional Aeronautical Charts*, U.S. Department of Commerce, National Oceanic and Atmospheric Administration, current edition.

*U.S. Terminal Procedures, North Central U.S.*, U.S. Department of Commerce, National Oceanic and Atmospheric Administration, current edition.

The following web pages were also visited for information during the preparation of this chapter:

[www.airnav.com](http://www.airnav.com)

[www.gcr1.com](http://www.gcr1.com)

[www.fargomoorhead.org](http://www.fargomoorhead.org)

[www.fargoairport.com](http://www.fargoairport.com)

[www.nasao.org](http://www.nasao.org)

[www.theflightdeck.com](http://www.theflightdeck.com)

[www.faa.org](http://www.faa.org)

[www.fargond.org](http://www.fargond.org)