

## 2. AIRPORT INVENTORY

A review of existing facilities and conditions provides the baseline for evaluation of the improvements determined necessary to implement future safety and capacity improvements at the airport. This inventory will ultimately result in a plan for the future development of the airport. Collection of both on-airport and off-airport background information is important so the development of the future facilities can be accomplished in partnership with the surrounding community.

### 2.1. LOCATION

South St. Paul is located 15 miles southeast of Minneapolis and six miles south of St. Paul in the southeastern portion of the Twin Cities Metropolitan Area (see **Figure 2-1**, at the end of this chapter). Interstate 494 and U.S. Highway 52 provide access to the City. South St. Paul Municipal Airport - Fleming Field (FAA Identifier: SGS) is located at the southernmost part of the City. The south portion of the main terminal area extends into the northern portion of the Inver Grove Heights City limits (see **Figure 2-2**, at the end of this chapter). The airport is located east of 7<sup>th</sup> Avenue South/Cahill Avenue East, west of County Highway 56 (Concord Boulevard), north of County State Aid Highway 26 (70<sup>th</sup> Street) and south of South Street. The main airport access is located at the corner of Henry Avenue and Airport Road at the northeast corner of airport property.



Field elevation for the airport is 821 feet above mean sea level (MSL). The airport's official location is defined by the airport reference point, which is a calculation of the center area of the usable runways at the airport. The airport reference point for Fleming Field is N 44°51'25.68" latitude and W 93°01'58.27" longitude.

### 2.2. HISTORY OF THE AIRPORT

Fleming Field was named for Richard Fleming, a notable Navy pilot awarded the Congressional Medal of Honor for his service during World War II. The airport was established in 1939 when a group of pilots dissatisfied with Holman Field in St. Paul



rented land for an airfield. At that time it was managed by Alexis Rozawick, a University of Minnesota Aeronautical School graduate and entrepreneur who had established several aviation businesses. The airfield was initially known as "The Hook-Em-Cow Flying Club" and consisted of little more than a grass field.

Adrian McInnis purchased the airfield in 1940 and then sold to the U.S. Navy in 1942 for use as a training base. During the early 1940's the Navy constructed hangars, barracks, maintenance shops, a control/signal tower and two circular 1,500-foot diameter landing pads (one grass, one asphalt). Circular landing pads allowed airplanes to always take-off and land into the wind, simulating conditions pilots would experience on aircraft carriers at sea. Two additional hangars were constructed in support of the U.S. Navy and an assembly and repair shop was also located at the airport. Additions to the water and gasoline storage systems were also completed.

Former President H.W. Bush conducted his flight training with the Naval Reserve Air Base Squadron 1A based at Wold-Chamberlain Field in Minneapolis. Fleming Field was used as an auxiliary field for the Training Squadron.

During World War II approximately 2,100 pilots received training at Fleming Field. The airport is recognized as having a significant contribution to World War II. On January 3, 1944 the base was officially dedicated as Fleming Field in memory of Captain Richard E. Fleming who was killed during the Battle of Midway on June 5, 1942.

After the war, 114.24 acres of surplus property was transferred from the U.S. Navy to the City of South St. Paul for one dollar with the agreement that the airport property continue to be used as an airport. An additional 91 acres of property was acquired through 1960. The airport was named “South St. Paul Municipal Airport” in 1960 with “Richard E. Fleming Field” added in 1965. The Minnesota Wing of the Commemorative Air Force was established in 1971 at Fleming Field.



A multi-phased construction of a paved asphalt runway 4,000-feet long and 100-feet wide was completed through the mid-1960s. The first phase to pave the runway to 3,500 feet was completed in 1952. A 500-foot expansion was constructed in 1964. This same runway configuration remains today. Paved access taxiways and a partial parallel taxiway were also constructed at that time. A full parallel taxiway extension was completed in 1987. A partial west parallel taxiway extension was completed in 2007 when the west hangar area was developed.

A 17,700 square yard asphalt aircraft apron constructed during World War II was expanded to the south in 2003 to its present size of approximately 33,200 square yards with additional aircraft parking tie-downs.

Five dome-style hangars still stand today that were developed in the early 1940s in the main hangar area. In 1972 the airport developed the “north hangar area,” located northwest of the main apron. Due to hangar demand, additional development in the “south hangar area” began southwest of the main apron in the 1980s. The airport constructed a terminal building in 1998 with dedicated space for pilots and airport management. The development of Airport Road, new main hangar area parking lots, and the south hangar access road was completed in 2003 which added additional main hangar area development space. The “west hangar area” was constructed in 2007 after the east hangar area referenced above was fully developed.

### 2.3. AIRPORT SETTING

As can be seen on **Figure 2-2**, Fleming Field is surrounded by urban land uses on all sides of the airport. The predominant use in the area is single-family residential. Multi-family residential, industrial, institutional, parks and recreational, mining, and office uses are also nearby. South Street to the north and 70<sup>th</sup> Street to the south border airport property.

The airport is located at a significantly higher elevation than the land to the east and a significantly lower elevation than the area to the west. Within a mile of the airport, elevations vary from approximately 690 feet mean sea level (MSL) near the Mississippi River, to 970 feet MSL at the Upper 55<sup>th</sup> Street and U.S. Highway 52 interchange.

Fleming Field is in close proximity to a water body often referred to as Bohrer Pond. The area of Bohrer Pond is approximately 18 acres and is located only 570 feet west of the runway centerline. The Mississippi River is about half a mile east of the airport. Pilots operating with floats have been witnessed operating at a private seaplane base on the Mississippi River for water landings near Fleming Field.

Local area drainage patterns generally run from northeast to southwest to Bohrer Pond. Airport property includes culverts under pavement structures and drainage swales to help maintain this drainage pattern. Three stormwater management ponds are located on the west side of the runway to collect surface runoff in the immediate area. The airport has experienced standing water after strong rainfalls that temporarily flood South Gate Road and the nearby hangars in the south hangar area. The one storm sewer pipe near the south end of the terminal area along South Gate Road is not sufficient to collect the surface water to the north, resulting in flooding during larger rain events.

**2.4. SOCIOECONOMIC**

Socioeconomic information provides background on area population, employment and income. These measures indirectly identify trends in the airport service area which may contribute to changes in airport activity. The airport service area includes the southeastern portions of the Minneapolis-St. Paul Metropolitan Area. Long-term, steady growth of population, employment and personal income in the airport service area is generally an indication of a healthy local economy and increased aviation demands.

**2.4.1. POPULATION**

The City of South St. Paul is a fully developed community and significant population growth is not anticipated. The neighboring community of Inver Grove Heights has available development space and, as a result, has seen population growth. Dakota County has seen strong population growth since 1980, and is expected to continue this trend.

The airport influence area includes population outside of the County. Fleming Field draws its patronage from portions of the remaining Minneapolis - St. Paul - Bloomington Metro area. In the next 30 years the State Demographer’s office projects a 26 percent increase in the population of the seven-county metropolitan area. **Table 2-1** and **Table 2-2** provide local, county, and regional population information.

**Table 2-1  
Local Estimated and Forecasted Population**

Year	City of South St. Paul	City of Inver Grove Heights
1990	20,197	22,477
2000	20,167	29,751
2010	20,160	33,880
2020	20,000	40,500
2030	20,700	47,300
<b>Historical Trend (annual growth)</b>	<b>0.00%</b>	<b>2.07%</b>
<b>Forecast Trend (annual growth)</b>	<b>0.13%</b>	<b>1.68%</b>

Source: Metropolitan Council, U.S. Census Bureau, Minnesota State Demographic Center

**Table 2-2  
Regional Estimated and Forecasted Population**

Year	Dakota County	Minneapolis – St. Paul Metropolitan Area <sup>(1)</sup>
1990	275,227	2,288,721
2000	355,904	2,642,062
2010	398,552	2,849,567
2020	453,621	3,144,000
2030	493,195	3,447,000
<b>Historical Trend (annual growth)</b>	<b>1.86%</b>	<b>1.10%</b>
<b>Future Trend (annual growth)</b>	<b>1.07%</b>	<b>0.95%</b>

Source: Minnesota State Demographic Center, Metropolitan Council – 2040 Preliminary Forecasts

(1) Metropolitan Area defined by Hennepin, Ramsey, Scott, Dakota, Carver, Anoka, and Washington Counties

Dakota County and the metropolitan area are projected to continue strong population growth into the future. This compares to Minnesota projected growth rate of 0.76 percent and the United States growth rate of 0.96 percent.

**2.4.2. EMPLOYMENT**

Employment is another socioeconomic measure of the vitality of a regional economy and demand for aviation. Significant employment industries in Dakota County include manufacturing (12.1 percent); retail (11.7 percent); professional, scientific, management, administrative, and waste management services (11.6 percent); and educational services, health care, and social assistance (23.0 percent). The three-year unemployment rate estimate for Dakota County is 5.0 percent, which is lower than the Minnesota rate of 5.5 percent and the United States average of 7.8 percent.

As of 2010, the companies with the most employees in South St. Paul include Sportsman’s Guide (800), South St. Paul School District (450), Waterous Company (387), Dakota Premium (280), American Bottling (160), Stock Yards Meats (150) and Wipaire (142). The largest employers by type in South St. Paul are manufacturing, retail trade, and other services.

The largest employers in Inver Grove Heights include CHS Inc. Agronomy (1,000), Flint Hills Resources Petrochemical Refinery (800), Travel Tags Flexographic Printing (430), Evergreen Nurseries and Tree Products (300), and Wal-Mart Retail (240). The largest employers by type in Inver Grove Heights are wholesale trade, retail trade, and food services.

Employment statistics throughout the metropolitan area represent a growing employment outpacing population increases. This demonstrates that the Twin Cities will continue to retain and create new jobs. Regional employment information and projections are presented in **Table 2-3**.

**Table 2-3  
People Employed – Regional**

Year	Minneapolis – St. Paul Metropolitan Area <sup>(1)</sup>
1980	1,040,000
1990	1,272,773
2000	1,607,916
2010	1,544,613
2020	1,743,000
2030	1,943,000
<b>Historical Trend (annual growth)</b>	<b>1.32%</b>
<b>Future Trend (annual growth)</b>	<b>1.15%</b>

Source: Metropolitan Council

(1) Metropolitan Area defined by Hennepin, Ramsey, Scott, Dakota, Carver, Anoka, and Washington Counties

### 2.4.3. INCOME

Income is a socioeconomic measurement tool which can provide assumptions into new businesses and development. Generally, the higher the income the more likely demand for aviation activities will increase.

The metropolitan area has the fourth highest household income of all metropolitan statistical areas in the United States according to the 2010 Census. Median household income for Dakota and Washington Counties are \$73,723 and \$79,571, respectively, far exceeding the state average of \$58,476, and the United States average of \$52,763, using 2011 data. Overall, the Twin Cities had the second highest year-to-year increase in wages and salaries (3.2 percent) in 2010 of major metropolitan areas around the country.

Minnesota has a per capita personal income of \$30,310 compared to \$27,915 in the United States. Washington County, which includes communities within the airport service area, has the second highest per capita personal income in the State at \$36,248, second to Carver County. Dakota County ranks in the middle of the seven-county metropolitan area.

## 2.5. AIRPORT ROLE

### 2.5.1. FEDERAL NPIAS

The National Plan of Integrated Airport Systems (NPIAS) is made up of 3,330 airports that are open for public use. These airports are considered significant to the national air transportation system and are eligible for Federal funding. Airports are classified as commercial service (primary, non-primary), cargo service, reliever airports, or other general aviation airports. Over 2,900 airports are classified as general aviation airports nationwide.

Fleming Field is classified by the Federal Aviation Administration (FAA) as a general aviation reliever airport to busier commercial airports in a metropolitan area. Fleming Field is one of seven reliever airports serving the Minneapolis-St. Paul metropolitan area aviation system. These airports are critical to the national aviation infrastructure to separate smaller general aviation traffic from the flow of

commercial traffic at larger airports. Fleming Field is the only Twin Cities reliever airport not owned by the Metropolitan Airports Commission (MAC).

General aviation airports economically support local businesses, provide critical community access, allow for emergency response, and provide other specific aviation functions. In 2012, a study titled *General Aviation Airports: a National Asset*, was completed by the FAA in an effort to classify general aviation facilities. These NPIAS airports were classified by the FAA as national, regional, local, basic or unclassified. Fleming Field is classified as a Regional Airport, which is defined as follows:

***Regional Airports** – These airports are located in metropolitan areas and serve relatively large populations. These 467 airports support interstate and some long distance (cross country) flying with more sophisticated aircraft. They account for 37 percent of total flying at the studied general aviation airports and 42 percent of flying with flight plans. There is a substantial amount of charter (air taxi), jet flying, and rotorcraft flights at regional airports.*

### 2.5.2. STATE SYSTEM PLAN

Each state is responsible for developing a more detailed system plan with development objectives. The State of Minnesota classifies airports as key airports, intermediate airports or landing strips. Fleming Field is classified as an Intermediate Airport in the *2012 Minnesota State Aviation System Plan (SASP)*:

***Intermediate Airports** – These airports have paved and lighted primary runways that are less than 5,000 feet long. Intermediate Airports can accommodate all single engine aircraft, some multi-engine aircraft, and some corporate jets. There are 83 Intermediate Airports in Minnesota.*

The SASP identifies airport development facility needs for Fleming Field, which include pavement rehabilitation, a larger transient aircraft apron, enhanced non-precision approaches with vertical guidance, additional T-hangar units, and additional automobile parking spaces. Facility requirements will be discussed in further detail in **Chapter 4.0, Facility Requirement**.

### 2.5.3. METROPOLITAN COUNCIL REGIONAL SYSTEM PLAN

The Metropolitan Council, the designated Metropolitan Planning Organization for the Minneapolis-St. Paul area, developed a Regional Aviation System Plan (RASP) in 1978 to classify airports within the metropolitan area. This plan is updated regularly. Four airport categories currently are defined based on the Transportation Policy Plan (Major, Intermediate, Minor, Special Purpose). Fleming Field is classified as a Minor Airport in the current regional plan:

***Minor Airports** – An airport whose system role is to provide general aviation facilities and services primarily to personal, business, and instructional users. The most common users of these airports fly single-engine and light twin-engine aircraft. These airports provide air service access within the State and across a multi-state region. Minor airports are defined as having runways of 5,000 feet or less in length.*

The RASP recommends installing Runway End Identifier Lights at Fleming Field to enhance safety of instrument flight operations. A Master Plan Update (also known as a Long-Term Comprehensive Plan) five-year update and 20-year horizon plan was recommended per the RASP. Updates every five years are recommended. Short-term projects include obstruction removal, hangar and pavement maintenance, T-hangar building construction, and equipment purchase.

#### 2.5.4. LOCAL ROLE AND AIRPORT USERS/BUSINESSES

Fleming Field is a critical asset for the City of South St. Paul and the surrounding area. The airport supports local pilots, local businesses, and regional aviation needs. The airport serves as an economic development engine supporting local businesses and jobs, as well as helping to attract new businesses to the community. Using MnDOT calculators, the City completed an economic impact study (January 2012) that quantified Fleming Field as having a total economic impact of over \$47 million and airport activities accounting for 464 jobs in 2011.

Fleming Field serves a variety of local users that need local airport access to support their activities. Key users include:

Recreational & Training Users – These local and transient airport users operate their aircraft for recreational purposes from Fleming Field and other local airports. This type of activity accounts for about half of the airport operations at Fleming Field in primarily single-engine piston aircraft. Local users commonly rent hangar storage space or construct hangar buildings on leased airport land. These users generally reside within the south and southeast portion of the Minneapolis/St. Paul metropolitan area. Contributing to recreational use at Fleming Field is the Prescott Flying Club, Minnesota Commemorative Air Force, and the Minnesota Chapter of the U.S. Air Force Auxiliary Civil Air Patrol.

Business Users – Many businesses use the airport for travel or business activities. Known non-aviation businesses that utilize the airport for business travel include Anderson Windows, Sanimax, Toro, and Goodrich. These aircraft types are primarily single-engine piston aircraft, but also include twin-engine and turboprop aircraft.

Other aviation-based commercial businesses at the airport are identified in **Table 2-4**.

**Table 2-4  
Fleming Field Aviation-Related Businesses**

Aviation Business	Aviation Service
Abtec Helicopters, LLC	Aerial photography, helicopter maintenance, and charter flights
Advanced Aviation Inc.	Aircraft maintenance
Alpha Aviation Inc.	Tool specialty company for aircraft maintenance
Alpha-Zulu, LLC	Flight training
Ballistics Recovery Systems	Manufacturer of whole aircraft parachute systems, aircraft sales
Cadotte Aero	Flight training and aircraft maintenance
Lake and Air Pilot Shop (Wipaire, Inc.)	Pilot supplies
Lysdale Flying Service	Aircraft storage and sales
Owen’s Aero, LLC	Aircraft maintenance
Philson Aviation	Aircraft maintenance
Sierra Hotel Aero	Aircraft maintenance and refurbishing
Spectrum	Aircraft charter, private medical operations
Stick-n-Rudder Flight Training, LLC	Flight training
Team Epic Freeride, LLC	Aircraft rides and simulations
Twin Brothers Aviation	Aircraft maintenance
Wipaire, Inc.	Aircraft rental, avionics, FBO services, interiors, maintenance, manufacturing, painting

Source: Airport Management (November 2012)

The largest on-airport business is Wipaire, Inc. This company is headquartered at Fleming Field and is the world’s largest manufacturer of aircraft floats. It has 150 full-time employees based at the airport. Their main offices are located to the west of the terminal building. Wipaire also owns and/or leases space from several hangars at Fleming Field.

Transient Users – Transient users own non-commercial aircraft for the furtherance of a business. These users range from owner-operators to corporate flight departments. They commonly utilize the flexibility and speed offered by general aviation aircraft to meet their day-to-day business travel needs. They have the need to travel to airports that are near their origin and destination without the hassle of larger airport facilities.

Non-Profit Organizations

- Commemorative Air Force – preservation of World War II aircraft
- Minnesota Civil Air Patrol – aircraft search and rescue

Fleming Field strives to attract these types of business users. Transient users, some in larger twin-engine aircraft, are known to utilize Fleming Field for favorable fuel prices on cross-country flights. These aircraft types generally include a mix of single-engine and multi-engine aircraft for owner-operator activities, but also include larger corporate aircraft such as twin-engine turboprop or turbojet business jets.

## 2.6. AIRPORT MANAGEMENT

### Administration

Airport administration consists of a full-time Airport Manager and part-time maintenance staff responsible for the day-to-day operation of the airport. The Airport Manager is responsible for compliance with federal, state and local rules and regulations, annual budgets, the financial well-being of the facility, and for various customer service responsibilities. The Airport Manager is a South St. Paul employee and reports to the City Engineer.

An Airport Advisory Commission was established in 2012 and consists of nine members appointed by the City Council. The Commission's functions include assisting in the hiring of an Airport Manager when a vacancy arises, recommending policies on airport services to the City Council, advising the Airport Manager of problems regarding operations, and reviewing the annual airport budgets before being submitted to City Council.

### Maintenance

Airport maintenance activities are performed by City personnel. The Airport Manager is responsible for monitoring the condition of the airport and reporting any maintenance needs to staff. Examples of these activities include snow removal, grass mowing, building maintenance, periodic minor pavement repair, and overall maintenance of the airfield.

Airport maintenance equipment storage is located on-site. Equipment includes a plow and attachments, mower decks, a sweeper, tractor, loader, and miscellaneous other equipment. Storage of equipment is sufficient but somewhat crowded. Bucket attachments for snow removal are currently stored outside as there is no room for interior storage of this equipment.

## 2.7. AVIATION ACTIVITY

The information below provides a general overview of activity at Fleming Field based on existing published data. Additional detailed information regarding aviation activity and forecasts will be presented in **Chapter 3.0, Aviation Forecasts**.

### 2.7.1. BASED AIRCRAFT

Based aircraft are aircraft that are stored at an airport for the majority of a year. They are typically classified by type of aircraft, including single and multi-engine piston aircraft, jet, and ultralight aircraft. Sources of historical and current based aircraft data include the FAA Terminal Area Forecast, Airport 5010 Master Record, Minnesota State Aviation System Plan, Regional Aviation System Plan, as well as local verified records and counts. The FAA Terminal Area Forecast does not break down the total number of based aircraft by aircraft type.

**Table 2-5** shows that current based aircraft estimates vary from 223 to 261.

**Table 2-5  
Based Aircraft – Existing Sources**

Source	Single Engine	Multi-Engine	Jets	Ultralights/ Other	Total
FAA TAF (2011)*	N/A	N/A	N/A	N/A	223
FAA 5010 Report (2013)	209	17	0	3	229
SASP (2010)	217	17	12	9	248
RASP (2007)	N/A	N/A	N/A	N/A	237
Airport (2011)	N/A	N/A	N/A	N/A	246
Airport (2012)	241	16	0	4	261

Source: FAA, MnDOT Office of Aeronautics, Metropolitan Council, City of South St. Paul

N/A = Not Available

\* FAA TAF was updated in 2013, however 2011 is the most recent non-projected data in the TAF.

The Airport Manager has confirmed that the actual number of based aircraft at Fleming Field is 261 based on hangar inspections conducted in 2012. Based on Airport Management records, this is an increase from 207 aircraft in 2002. This growth equates to a 2.6 percent average annual growth rate. The Metropolitan Council’s Regional Aviation System Plan projects that based aircraft will grow an average of 0.3 percent annually through 2030.

**2.7.2. AIRCRAFT OPERATIONS**

An operation is classified as either a takeoff or a landing. Airport operations are typically split into local and itinerant operations. Local operations are defined in the FAA’s *Forecasting Activity by Airport* as “aircraft operating in the traffic pattern or aircraft known to be departing or arriving from flight in local practice areas or aircraft executing practice instrument approaches at the airport. Itinerant operations are aircraft operations other than local operations.” Aircraft operations are also categorized by use, such as commercial, general aviation, and military operations. Sources of historical and current airport operational data include the FAA Terminal Area Forecast, Airport 5010 Master Record, Minnesota State Aviation System Plan, and Regional Aviation System Plan.

Table 2-6 presents the current airport operations estimates from existing sources.

**Table 2-6  
Annual Operations – Existing Sources**

Source	Itinerant Operations				Local Operations		Total
	Air Carrier	Commercial	General Aviation	Military	General Aviation	Military	
FAA TAF (2011)*	0	0	11,000	0	51,000	0	62,000
5010 Report (2013)	0	0	9,000	0	42,000	0	51,000
SASP (2010)	N/A	N/A	21,700	N/A	40,300	N/A	62,000
RASP (2007)	N/A	N/A	N/A	N/A	N/A	N/A	51,000

Source: FAA, MnDOT Office of Aeronautics, Metropolitan Council

N/A = Not Available

\* FAA TAF was updated in 2013, however 2011 is the most recent non-projected data in the TAF.

The Airport Manager estimates approximately 58,100 annual operations in 2012. The Regional Aviation System Plan projects annual operations will grow an average of 0.3 percent annually through 2030 and the State Aviation System Plan forecasted a 2.3 percent annual growth rate.

The lack of an FAA Air Traffic Control Tower at the airport does not allow for exact aircraft operation counts at a general aviation airport like Fleming Field. Therefore, FAA Instrument Flight Rules (IFR) flight data for 2011 was obtained to get an understanding of the larger corporate users at Fleming Field. IFR flight data is recorded when pilots file a flight plan with FAA. It does not take into account fair weather flights, touch and go operations, or flights where the flight plan is cancelled before landing at the airport. There were 1,682 arrivals and departures reported in 2011.

**2.8. AIRPORT DESIGN STANDARDS & OBSTRUCTIONS**

FAA airport design standards are based on two key components. The first is the critical aircraft family currently using the airport or proposed to use the airport within the next five years. The second is the type of approach developed for each runway end. These components are discussed in the next two sections, respectively, to determine the design standards to be followed when planning future development at Fleming Field.

Obstruction identification for the existing conditions at the airport is based on the published approach types to each runway end. This information is discussed in **Section 2.8.3**.

**2.8.1. CRITICAL DESIGN AIRCRAFT**

**Airport Reference Code**

Development of the existing and future facilities at an airport relies upon the identification of the most demanding aircraft type currently utilizing or projected to utilize the airport. The FAA defines the critical aircraft as an aircraft or a family of aircraft that is expected to conduct at least 500 annual itinerant operations at the airport (one takeoff and one landing is considered two operations).

The Airport Reference Code (ARC) translates the operational and physical characteristics of the critical design aircraft intended to operate at the airport to FAA airport design criteria. The ARC is based on three components which include approach speed, wingspan, and tail height. The approach speeds are divided into four categories and are defined in **Table 2-7**. The wingspan and tail heights are divided into six Airport Design Groups (ADG) and are defined in **Table 2-8**.

**Table 2-7  
FAA Aircraft Approach Category**

Category	Approach Speed (knots)	Example Aircraft Type
A	< 91	Cessna 172, Piper Warrior
B	91 - < 121	Beech King Air, Cessna Citation I & II
C	121 - < 141	Learjet 35, Gulfstream 550, B-737
D	141 - < 166	B-757, B-747, B-777

Source: FAA AC 150/5300-13A *Airport Design*

**Table 2-8  
FAA Aircraft Design Group (ADG)**

Group	Wingspan (feet)	Tail Height (feet)	Example Aircraft Type
I	< 49	< 20	Beech Baron 58, Cessna 172
II	49 - < 79	20 - < 30	Beech King Air, Cessna Citation Series
III	79 - < 118	30 - < 45	B-737, DC-9, CRJ-900
IV	118 - < 171	45 - < 60	A-300, B-757, B-767
V	171 - < 197	60 - < 66	B-747, B-777
VI	197 - < 262	66 - < 80	Lockheed C-5A, A-380

Source: FAA AC 150/5300-13A *Airport Design*

According to FAA AC 150/5300-13A, *Airport Design*, the ARC does not restrict the type of aircraft that can safely use the airport, the ARC is for planning and design purposes only. The existing ARC for Runway 16/34 is B-II.

**Approach Reference Code (APRC) & Departure Reference Code (DPRC)**

An Approach Reference Code (APRC) system is used to determine the current operational capabilities of a runway and associated parallel taxiway with regard to landing operations. An APRC identifies the operational capabilities of a runway using the ARC (aircraft approach category, airplane design group) with planned runway approach visibility minimums to establish design standards. Visibility minimums are expressed in Runway Visual Range (RVR) values, in feet, as defined in **Table 2-9**.

The Departure Reference Code (DPRC) describes the current operational capabilities of a runway and associated parallel taxiway with regard to takeoff operations. It is similar to the APRC and is composed of the airport approach category and the airplane design group, however, not visibility minimums. In addition, a runway may have more than one DPRC designation.

**Table 2-9  
Runway Visual Range (RVR) values**

RVR (feet)	Approach Type	Visibility Minimums
VIS	Visual – no instrument approach	Not applicable
5000	Non-Precision Approach or Approach with Vertical Guidance	No lower than 1 mile
4000	Approach with Vertical Guidance	Lower than 1 mile but not lower than ¾ mile
2400	Precision Approach (Category I)	Lower than ¾ mile but not lower than ½ mile
1600	Precision Approach (Category II)	Lower than ½ mile but not lower than ¼ mile
1200	Precision Approach (Category III)	Lower than ¼ mile

Source: FAA AC 150/5300-13A *Airport Design*

The existing APRC for Runway 16/34 is B-II-5000 and the DPRC is B-II. Both the APRC and DPRC may change over time as improvements are made to the runway such as obtaining lower visibility minimums.

### **Runway Design Code (RDC)**

The Runway Design Code (RDC) signifies the design standards to which the runway is to be built. The RDC is composed of the same three components as the APRC. However, the RDC is based on planned development for each runway and does not have any operational application for the current conditions for each runway as with the APRC and the DPRC. The RDC will be discussed in greater detail at the end of **Chapter 3.0, Aviation Forecasts**, to determine the runway design standards to be used for the critical aircraft proposed to use the airport over the next 20 years.

### **2.8.2. APPROACH TYPES**

Instrument approach procedures provide arriving pilots with guidance to the airport runway environment during periods of low visibility. FAA publishes instrument approach procedures defining the horizontal and vertical flight path to land at an airport. Flight visibility and cloud ceiling height minimums are established for each instrument approach procedure based on available navigational aids, airspace obstructions, aircraft equipment, and pilot certification. Weather minimums change as the approach speed of an aircraft increases. Visual approaches to a runway have no instrument approach procedure nor do they require additional aircraft or ground equipment. There are three types of instrument approaches:

- **Non-Precision Approach** – A standard instrument approach procedure with horizontal guidance but no vertical descent guidance. Types of non-precision approaches include localizer, RNAV/GPS (area navigation/global positioning system), RNAV/RNP (area navigation/required navigation), NDB (non-directional beacon), and VOR/TVOR (very high frequency omni-directional range/terminal very high frequency omni-directional range). These type of approaches require additional equipment in the aircraft but no additional ground-based equipment is needed.
- **Approach with Vertical Guidance** – An instrument approach procedure providing electronic course and vertical descent guidance. These approaches usually require additional aircraft equipment. These approaches can utilize ground-based navigational aids such as a glide slope or can be accomplished with only a satellite based navigational aid such as a Localizer Performance with Vertical Guidance (LPV).
- **Precision Approach** – An instrument approach procedure with both vertical descent guidance and horizontal guidance to the runway. These type of approaches utilize ground based equipment such as an Instrument Landing System (ILS).

Currently Runway 16/34 has an RNAV (GPS) approach to the Runway 34 end. The non-precision approach to Runway 34 has cloud ceiling minimums to 600 feet and one-mile visibility minimums. There is also a localizer at the airport which can be used when landing on Runway 34. The localizer decreases the cloud ceiling minimum to 500 feet. Runway 16 has a visual approach.

The nearest available precision approach is at the St. Paul Downtown Airport – Holman Field (STP) located approximately 4.5 miles north-northwest of Fleming Field. The approaches at STP have reduced cloud ceiling minimums to 250 feet with  $\frac{3}{4}$  mile visibility minimums. These approaches are alternates to Fleming Field if weather conditions are below the minimums provided for the approaches to the airport. Based on weather data, this occurs 0.81 percent of the time.

### **2.8.3. AIRPORT OBSTRUCTIONS**

#### **Federal Aviation Regulations (FAR) Part 77**

Federal Aviation Regulations (FAR) Part 77 *Safe, Efficient Use, Preservation of the Navigable Airspace* defines the standards used in determining obstructions in the navigable space around the airport. Simply

put, FAR Part 77 is an obstruction identification standard. Obstructions are considered to penetrate the imaginary airspace surfaces and can be a hazard to air navigation unless an airspace study would determine otherwise. Imaginary surfaces include approach surfaces, the primary surface, horizontal surface, and conical surface. The slopes and dimensions of these surfaces are determined by the approach type for the runway as discussed in **Section 2.8.2**. Obstructions must be lowered below the FAR Part 77 airspace surfaces, lighted with FAA approved obstruction lighting, or removed unless an FAA airspace study determines otherwise. If obstructions to these surfaces are not mitigated, the published approaches to the airport may be cancelled.

### **Approach/Departure Surfaces**

In addition to FAR Part 77 surfaces, approach/departure surfaces are determined for each runway end based on the type of aircraft and visibility minimums planned for the runway. These surfaces are defined in FAA Advisory Circular 150/5300-13A, *Airport Design*. The surface applicable to Fleming Field is Row 3 from Table 3-2 of the advisory circular and defined as “approach end of runways expected to accommodate instrument approaches having visibility greater than or equal to  $\frac{3}{4}$  statute mile, or expected to serve large airplanes (day or night). Includes circling approaches.” The FAR Part 77 and approach/departure Row 3 surfaces cover very similar areas for Fleming Field; however, Row 3 is not as wide at the base of the surface and the slope is less restrictive than the FAR Part 77 surface on the end with the non-precision approach (Runway 34 end).

### **Airspace Obstructions at Fleming Field – Environmental Assessment**

Numerous airspace obstructions and a few land use incompatible areas currently exist at Fleming Field, and the City has a program in place to mitigate them. An Environmental Assessment (EA) is currently underway for Fleming Field to comply with National Environmental Policy Act (NEPA) environmental documentation requirements. The primary purpose of the EA is to cover actions that are required to mitigate existing obstructions and incompatible land uses at the airport. The analysis performed for this EA comprehensively identified and addressed existing obstructions (Part 77 plus Approach/Departure Row 3), which fall under the following general categories (includes both on- and off-airport property):

- Trees
- Buildings
- Fencing
- Power poles
- Antennas
- Roadways (accounting for 15 feet of clearance for height of vehicles)

The primary obstruction mitigation actions that will be required will be tree removal (or possibly trimming) and lighting of man-made obstructions. Approximately 265 individual tree obstructions were identified. It is anticipated that approximately 40 trees per year will be removed pending FAA and other funding amounts available. If the landowner desires trimming instead of removal, FAA and City funding will cover the initial trimming, but the landowner is responsible for all future trimming for the life of the tree.

Based on analysis performed by FAA, existing Part 77 man-made obstructions can be appropriately mitigated by the installation of designated obstruction lighting on 12 structures on airport property and 13 structures off airport property. This lighting will be installed in 2015 and 2016.

The land use compatibility mitigation actions that are being covered in the EA process are discussed in **Section 2.13, Land Use & Development**.

## 2.9. CLIMATE

Climate considerations for airport planning include wind, temperature, precipitation, cloud cover and visibility. Eastern Minnesota, including South St. Paul, experiences a humid continental climate characterized by large seasonal temperature differences. This climate experiences frigid winters and warm summers. Precipitation is generally distributed year-round.

Wind data is important as it helps define runway characteristics at an airport. Aircraft are designed to take off and land into the wind. Crosswinds and tailwinds can create a hazardous situation for pilots, particularly those flying smaller aircraft. Wind data defines prevailing winds and crosswind components.

The National Climatic Data Center in Ashville, North Carolina collects wind data through an Automated Weather Observation System (AWOS) at Fleming Field. The FAA recommends ten years of wind data be collected for each airport site or from the closest airport where data is available. The wind data gathered at Fleming Field is adequate for the analysis in this Master Plan. This data includes hourly wind direction and speed observations for the period from January 1, 2002 through December 31, 2011.

The existing wind coverage for the primary runway at Fleming Field is summarized in **Table 2-10**. The FAA recommends a particular runway orientation provide 95 percent wind coverage. When this is not achieved, a crosswind runway may be needed. The allowable crosswind component per Runway Design Code (RDC) is 10.5 knots for RDC A-I and B-I, 13 knots for RDC A-II and B-II, 16 knots for RDC A-III, B-III, C-I through C-III, and D-I through D-III, and 20 knots for RDC A-IV and B-IV, C-IV through C-VI, D-IV through D-VI, and E-I through E-VI.

**Table 2-10**  
**All-Weather Wind Coverage**

Runway	Crosswind Component	
	10.5 knots	13.0 knots
16/34	96.45%	98.37%

Source: National Climatic Data Center for South St. Paul MN (2002-2011)

Fleming Field is currently a B-II airport and therefore the crosswind component should not exceed 13 knots. Runway 16/34 is above the recommended 95 percent wind coverage for both 10.5 and 13 knots.

Temperature is important in determining airfield facility requirements because it is a critical factor in calculating required runway length. Warm temperatures cause the air to become less dense, thus requiring aircraft to use longer runway length for takeoff. Precipitation also causes contamination of the runway leading to longer required runway lengths. Cloud cover and visibility influence the need for navigational aids and approach procedures to runways.

The closest observation station with reliable historical temperature data is the Minneapolis/St. Paul International Airport. The mean maximum temperature in the hottest month (July) was measured at 83.2 degrees Fahrenheit from 1891 to 2012. Average total annual precipitation is 27.8 inches annually, with a maximum of 4.25 inches in June. Average annual snowfall is 51.5 inches typically occurring between November and April. Using available data from the Fleming Field weather station, the airport on average experiences weather conditions 8.59 percent of time that would require pilots to operate aircraft with reference to instruments rather than visual landmarks.

## 2.10. AIRSIDE FACILITIES

Airside facilities are defined as the airport features that directly support aircraft operations. These include the runway, taxiways, aprons, navigational aids, and visual aids.

### 2.10.1. RUNWAY

There is one runway at Fleming Field; Runway 16/34 is 4,002 feet in length, 100 feet in width, and is a paved bituminous surface (see **Figure 2-3**, at the end of this chapter). It is marked with non-precision runway markings delineating the centerline and threshold location for each runway end. This runway accommodates a GPS non-precision instrument approach to Runway 34. The runway is relatively flat with an effective gradient, a measure of elevation change, of 0.1 percent.

The runway was originally constructed in 1957 with an extension completed in 1963. The runway pavement underwent a major rehabilitation in 1987. The airport pavement strength is published at 30,000 pounds single-wheel landing gear configuration, and 57,000 pounds dual-wheel landing gear configuration. A runway with this pavement strength is considered an other-than-utility runway.

### 2.10.2. AIRPORT VISUAL AIDS

Airport visual aids are important features that provide visual references for pilots, especially during low visibility or night operations. The visual aids at Fleming Field are summarized below. Please refer to **Figure 2-3** for location information.

Rotating Beacon – identifies airport facilities to pilots in the air. Most civilian general aviation airports alternate white and green lights from dusk until dawn, and during instrument flight rules conditions during the day. A rotating beacon is located to the northwest of the main apron area at Fleming Field and is in fair condition.

Runway Edge and Threshold Lights – outline the edges of runways in low-light and restricted visibility conditions. White lights identify the runway edge, while red/green lights identify the runway threshold at each end. Runway lighting systems have three different intensity levels; low, medium, and high depending on the classification of the runway. Fleming Field has a medium intensity runway lighting system with pilot controlled lighting installed on Runway 16/34. The system was installed in 1990.

Taxiway Edge Lights/Markings – outline the edges of taxiways. Taxiway lights are blue and have the same intensity levels as runway lights. Retro-reflective markers, using reflective blue tape mounted on a pole, may be used in lieu of taxiway lighting as a low cost alternative. Fleming Field does not have taxiway edge lighting installed. Instead, blue taxiway lights are installed along the runway at locations near the taxiway turnoffs to indicate the location of the connecting taxiway.

Runway Markings – are installed for visual identification of a paved runway during all weather conditions. Markings vary in complexity based on the type of approach for a runway; visual, non-precision instrument, and precision instrument. Runway 16/34 at Fleming Field has non-precision runway markings delineating the runway centerline, aiming point, and threshold. The runway markings are in good condition.

Guidance Signs – provide location, direction, and guidance information to pilots. Mandatory signs are to be placed at intersections with runways to indicate critical holding areas. The reverse sides of the mandatory signs are used for directional guidance to other portions of the airfield. Mandatory airfield guidance signs are installed at Fleming Field, and are currently in fair condition. An example of one of the guidance signs at Fleming Field can be seen in the photo to the right of this page.



Runway End Identifier Lights (REILs) – provide rapid and positive identification of the approach end of a runway during night and low visibility conditions. The REIL lighting system consists of two synchronized flashing white strobe lights, located laterally on each side of the runway facing the approach path. To minimize visual impacts to adjacent landowners, Fleming Field does not have REILs installed at either end of Runway 16/34.

Visual Glide Slope Indicators (VGSI) – provide vertical guidance to the runway to ensure the proper glide path is maintained for landing. Short Approach Visual Approach Slope Indicator, Visual Approach Slope Indicator (VASI), and Precision Approach Path Indicator (PAPI) lights are types of visual aids installed to provide guidance information. A four-box PAPI system was installed in 1988 to serve both Runway 16 and 34 approaches. The PAPI's are in need of replacement as the tilt switches have become problematic.

### 2.10.3. NAVIGATIONAL AIDS

Instrument navigation aids are satellite or ground based equipment established to provide pilots with critical guidance information to the airport environment. With the proper equipment and procedures developed, pilots can use the instrument navigational aids for horizontal and/or vertical guidance to a waypoint or a runway. Instrument-based navigation, including approaches to airport runways, is required for flight in Instrument Meteorological Conditions. A summary of navigational aids relevant to Fleming Field operations is provided below.

Very-high frequency Omni-directional Range (VOR) – a system where ground-based facilities provide distance and radial information used for non-precision en-route and terminal navigation. A VOR station is located nine miles to the west in Minneapolis identified as MSP, and broadcasts on a frequency of 115.30 megahertz. This facility also has distance measuring equipment to provide distance information to pilots.

Instrument Landing System (ILS) – provides distance, horizontal and vertical guidance information to capable airport runways using ground-based facilities (Localizer Antenna, Glide Slope Antenna, Approach Lighting System). The closest ILS capable runway is at the St. Paul Downtown Airport – Holman Field where Runways 14 and 32 are served by this navigational aid. Fleming Field has a localizer antenna on the Runway 16 end. The localizer was installed in 2002 and is owned by the State of Minnesota. This type of approach lowers the cloud ceiling minimums from 600 feet to 500 feet when approaching on Runway 34.

Global Positioning System (GPS) – enables pilots to navigate to a waypoint without the need for primary ground-based equipment. GPS provides horizontal guidance, but can also provide vertical guidance for instrument approaches with published procedures. GPS vertical guidance is called Localizer Performance with Vertical Guidance procedure. A straight-in GPS approach procedure to Runway 34 end has been developed at Fleming Field. This procedure does not have vertical guidance capability. A straight-in GPS approach to Runway 16 has not been developed.

Non-Directional Beacon (NDB) – ground-based facilities provide horizontal directional guidance. An NDB identified by name as HOPEY is available for pilot navigation for flights involving Fleming Field.

It is located in Cottage Grove, approximately three miles to the east. A circling instrument approach procedure to the airport has been developed from this NDB.

#### 2.10.4. METEOROLOGICAL FACILITIES

Timely weather information is important to the safety of aircraft operations. Pilots can locally obtain weather information from the following sources:

- Wind Cone – Fleming Field has a wind cone constructed in 1994 located east of the parallel taxiway between the two connector taxiways (see **Figure 2-3**). The wind cone is visible to pilots from either runway end.
- Automated Weather Observation System (AWOS) – measures critical meteorological data on-site at airports including wind speed, wind direction, temperature, dew point, cloud coverage and ceiling, visibility, precipitation, and barometric pressure. Fleming Field has an AWOS-3 weather facility on-site located west of the airport apron (see **Figure 2-3**).

#### 2.10.5. TAXIWAYS AND TAXILANES

The taxiway system at an airport provides access to and from the runways, aircraft apron, and hangar facilities. Taxiways are constructed for safety purposes and consist of parallel taxiways and/or connecting taxiways.

Fleming Field currently has two parallel taxiways (see **Figure 2-3**):

- Full east parallel taxiway providing access from the runway to the apron and north and south hangar areas; and
- Partial west parallel taxiway serving the west hangar area.

The east parallel taxiway was originally constructed as a partial parallel taxiway serving the Runway 34 end. A full parallel taxiway extension was completed in 1987. The last major pavement rehabilitations for the east parallel taxiway were completed in sections in 1976 and 1985. The west parallel taxiway and taxilanes were constructed in 2007. The west parallel taxiway is 2,600 feet in length connecting to the Runway 16 end. It has two mid-field turnoffs allowing access across the runway for fueling operations and use of terminal facilities.

Two access taxiways exist to lead directly to the aircraft apron (see **Figure 2-3**). This configuration is based on the original airport configuration established in the 1940's. The northwest-southeast taxiway had major rehabilitation completed in 1976. The northeast-southwest taxiway was rehabilitated in 2007.

Various taxilanes have been constructed at Fleming Field to provide access to the public and private hangar building areas. These are located in the north, south, and the west hangar areas (see **Figure 2-3**). Most of the taxilanes in the north and south hangar areas have been rehabilitated since their original construction.

**2.10.6. APRONS**

The aircraft apron provides an area for aircraft parking, aircraft movements, fueling operations, and access to the terminal building and other hangars. The approximately 33,200 square yard main apron is located east of the main runway (see **Figure 2-3**). The apron is in the same location as when it was constructed in the 1940’s. An apron expansion of 15,500 square yards was constructed in 2003. There are 13 in-pavement tie-downs available for aircraft parking.



There is also a turf apron located west of the paved apron adjacent to the two connecting taxiways (see **Figure 2-3**). This apron is used for long-term aircraft parking and storage. This apron is approximately 25,000 square yards and has 17 aircraft tie-downs.

**2.10.7. PAVEMENT CONDITION**

In order to continue to receive federal funding, all airports must implement a pavement maintenance program for any pavement constructed or repaired with federal money. The Minnesota Department of Transportation (MnDOT) Office of Aeronautics helps airports with this grant assurance by having a research company prepare pavement evaluation reports. All airports within the state are evaluated on a three year cycle. An evaluation update was completed for Fleming Field in 2011. The evaluation report identifies the Pavement Condition Index (PCI) for each pavement section. The rating is a tool to identify pavement improvement needs. The 0-100 rating represents the condition of airport pavements (0 worst – 100 best). **Figure 2-4**, at the end of this chapter, depicts the PCI map from the report. **Table 2-11** summarizes the PCI rating for each major pavement area.

**Table 2-11  
Pavement Condition**

Pavement Area	Last Construction Date(s)	2011 PCI
Runway 16/34	1987	69-70
Parallel Taxiway A	1976-2003	65-74
Crossover Taxiway A	1976	29
Partial Parallel Taxiway B	2003	99
Connecting Taxiway B	1987	55
Crossover Taxiway C	2007	97
Connecting Taxiway C	1976/2007	31/97
Connecting Taxiway D	1987/2007	77/99
Connecting Taxiway E	1976	71
Original Apron Area	1963	24
Apron Expansion Areas	1987/2003	42/77
North Hangar Area Taxilanes	1975-2008	11-96
South Hangar Area Taxilanes	2001-2008	56-96
West Hangar Area Taxilanes	2007	99

Source: Fleming Field Pavement Evaluation Report (2011), MnDOT Aeronautics

The pavement at Fleming Field ranges from excellent to very poor condition. Generally, the runways and parallel taxiways are in good or better condition. Connecting taxiway A, connecting taxiway C, the older aircraft apron pavement, and two public taxilanes in the north hangar area are in poor or very poor condition. These areas require major rehabilitation and possibly reconstruction in the near-term.

## 2.11. LANDSIDE & SUPPORT FACILITIES

### 2.11.1. TERMINAL BUILDING

A terminal building is utilized at a general aviation airport to provide an area for local and transient pilots and passengers to transition to and from the aircraft operations area.

The Fleming Field terminal building is located at the corner of Henry Avenue and Airport Road on the northwest edge of the aircraft apron east of Runway 16/34 (see **Figure 2-5**, at the end of this chapter). It



was constructed in 1998 with the adjacent parking lot constructed in 2001. The facility is approximately 5,400 square feet in size. Features include dual restrooms, public meeting space, a pilot’s briefing area, a flight planning room, an observation room to watch aircraft, a lobby with lounge space for local and transient pilots, intern/transient pilot apartment, and the Airport Manager’s office. Office and restaurant space are also available for rent. A courtesy car is provided by the City, and rental cars are available from an outside provider.

### 2.11.2. AUTOMOBILE ACCESS & PARKING

Fleming Field has 110 automobile parking stalls in immediate proximity to the terminal building (see **Figure 2-3**). The parking lot is commonly used by employees, visitors, and transient passengers. Airport tenants commonly park their vehicle adjacent to their aircraft storage hangar or airport business. Separate parking lots with access off of Airport Road have been developed for businesses and tenants located in the main hangar area.



Airfield access is controlled. As depicted on **Figure 2-3**, there are four gated vehicle access points located around the airport. They are located west of the terminal building for access to the main hangar area, at Henry Avenue and North Gate Road for the north hangar area, at Crossman Lane off Airport Lane for the south hangar area, and at West Gate Road off Claude Way East for the west hangar area. Access is achieved through a security card issued by the Airport Manager.

### 2.11.3. AIRCRAFT STORAGE HANGARS

Hangars store most of the airport’s based aircraft in a mix between private and public hangars. Hangars typically store single and multi-engine aircraft and helicopters. A few aircraft utilize the outdoor tie-down space in the grass area west of the main apron.

As depicted on **Figure 2-3**, there are four distinct hangar areas at Fleming Field. These include:

- Main apron/hangar area
- North hangar area
- South hangar area
- West hangar area

Further information is provided under the following headings. Mapping information for individual structures is provided on **Figure 2-5**.

Main Apron/Hangar Area – is the original hangar area from the 1940s. Five of the original hangars constructed are still standing today (with modifications) and are leased to businesses to use primarily for aircraft storage. The area has a total of eight lots, five of which are currently available along the south side of the apron within Inver Grove Heights city limits.



North Hangar Area – was developed in the 1960s to satisfy aircraft storage capacity needs during that timeframe. The north hangar area currently consists of 27 hangars. The only public hangar is a 12-unit public T-hangar (380-foot x 35-foot). By 1984 a vast majority of the area was developed with hangars. One small lot remains available for hangar development.

South Hangar Area – fulfilled the need for additional aircraft storage space when the north hangar area reached capacity. This area consists of 52 aircraft storage hangar lots. There are currently 49 aircraft storage hangars in this area. This includes mostly private hangars and aviation business hangars. Public hangars include a 20-unit T-hangar (440-foot x 50-foot), and airport maintenance hangar. The hangar area met capacity in 2008.



West Hangar Area – is the newest hangar development area was constructed in 2007. There are currently four hangars constructed in this area, and space for a total of 46 private aircraft storage hangars lots and one 14-unit public T-hangar building lot.

Hangar Summary - In total, there are 83 aircraft storage hangars housing a majority of the airport’s 261 reported based aircraft. Summary data on all aircraft storage facilities is provided in **Table 2-12**.

**Table 2-12  
Aircraft Storage Facilities**

Pavement Area	Public T-Hangar Building (Units)	Public Conventional Hangar	Non-Public Hangar Building	Tie-Downs
Main Ramp/Hangar Area	0	5	2	13
North Hangar Area	1 (12)	0	26	0
South Hangar Area	1 (20)	1*	43	0
West Hangar Area	0	0	4	0
Grass Apron	0	0	0	17
<b>TOTAL</b>	<b>2 (32)</b>	<b>6</b>	<b>75</b>	<b>30</b>

\*Used as City Maintenance Hangar.

Sources: Bolton & Menk, Inventory (October 2012), Bergerson Photography (October 1, 2012)

All 261 based aircraft at Fleming Field have either hangar or grass tie down space. All existing hangars are at capacity, and there is currently a waiting list which includes ten aircraft. The owners of these aircraft would either like to build a hangar or rent public hangar space at Fleming Field.

**2.11.4. AIRPORT FUELING SYSTEMS**

The City of South St. Paul owns and operates the airport fuel facility located on the southwest corner of the main aircraft apron (see **Figure 2-3**). The facility includes three below ground fuel tanks; one 10,000 gallon Jet A fuel tank, one 10,000 gallon aviation 100 octane low lead fuel tank and one 6,000 gallon automobile (91 octane unleaded) fuel tank. The tanks were installed in 1992. Fuel is dispensed through fueling pumps and two card reader stations. Credit card readers are installed to allow for 24-hour self-fueling operations. There is no fuel truck located at Fleming Field.

**2.11.5. UTILITY & DRAINAGE**

The City of South St. Paul provides potable water service for the airport. Most airport buildings, both public and private, are connected to the City’s water system.

Many airport buildings are served by a City sanitary sewer system. This is seen as an important amenity for many airport businesses and users. Electrical and natural gas service is also available to buildings at the airport.

Telephone service is currently available or an existing conduit could provide for future telephone line hookup if desired. Many hangars are found to have a satellite dish mounted to the building.

Storm sewer structures are present in the main hangar area, north hangar area, west hangar area, and part of the south hangar area. These lines do not have enough capacity to meet demand and occasionally create flooding events. Culverts and swales divert water through the rest of airport property to stormwater retention ponds located to the west of airport property.

**2.11.6. FENCING & SECURITY**

Airport fencing is installed to deter or prevent unauthorized access by persons, vehicles, or animals onto airport property. Fencing is typically installed to prevent wildlife from gaining access to the airfield, as well as define outer airport property boundaries.

The airport perimeter is completely enclosed with fencing. The majority of the fencing is a six-foot high chain link fence topped with barbed wire for wildlife control and to separate the public areas from the airport operational areas. Some locations on the east side of the airport near South Gate Road have only wood privacy fence. Public ramp access is available through the terminal building. Four vehicular access points with gates allow for controlled vehicle access as described in **Section 2.11.2**.

**2.12. FACILITIES SUMMARY**

**Table 2-13** provides summary information regarding existing landside and airside airport facilities at Fleming Field.

**Table 2-13  
Existing Airport Facilities**

Data	Description
Identifier	SGS
Airport Elevation	821 feet
Runway Reference Code	B-II-4000
Runways	Runway 16/34: 4,002' x 100'
Taxiways	East Full Parallel, West Partial Parallel, Two Connecting Taxiways
Apron	33,200 square yards paved, 13 tie-downs; 25,000 square yards grass, 17 tie-downs
Pavement Strength (Runway)	30,000 lbs. Single-Wheel Gear 57,000 lbs. Dual-Wheel Gear
Pavement Condition	Runway 16/34 – Good (PCI: 69-70) Taxiways – Varies (PCI: 29-99) Apron – Varies (PCI: 24-77) Taxilanes – Varies (PCI: 11-99)
Visual Aids	Rotating Beacon, Runway 16/34 MIRL, PAPI
Aircraft Storage Hangars	2 Public T-Hangar Buildings (32 units) 6 Public Conventional Hangars 75 Private Conventional Hangars
Fuel Storage	100LL (10,000 gallon capacity) Jet Fuel (10,000 gallon capacity) Auto 91 Octane (6,000 gallon capacity)
Runway Category	Other-than-utility, non-precision approaches
Instrument Approaches	LOC RWY 34, RNAV (GPS) RWY 34
Approach Minimums	500' cloud ceiling, 1 mile visibility
Weather Equipment	AWOS, Wind Cone

Source: Bolton & Menk Inventory, October 2012

**2.13. LAND USE & DEVELOPMENT**

FAA and MnDOT Office of Aeronautics strongly recommend airport sponsors maintain airspace and land uses compatible with airport operations. Airport land use compatibility means planning and controlling land uses in and around airports to promote use and development that does not create restrictions to the airport, or hazards to persons or property on the ground and the flying public. Maintaining compatible land use is an FAA grant assurance and is driven by the design standards for the airport. Land uses should

be controlled within the airport, runway protection zones, approach areas, and the general vicinity of the airport.

Minnesota State Statute Chapter 360 requires owners of public airports to enact airport land use and airspace safety zoning standards. The *Minnesota Airport Land Use Compatibility Manual* published in 2006 provides more background and resources on this topic.

### 2.13.1. EXISTING LAND USE

#### On-Airport Land Uses

Land uses within airport property are to be protected for aeronautical use. Examples of appropriate uses include runways, hangars, and required protection areas. Protection areas can be open space or agricultural land uses where allowed. Non-aeronautical uses are only allowed with prior FAA approval.

The vast majority of airport property consists of land used for aeronautical, drainage, and open protection space. On-airport stormwater management basins, which can become wildlife hazards, are designed to drain water within the FAA standard of 48 hours. At the beginning of this Airport Master Plan process, an incompatible land use was a City of South St. Paul community garden in the northern portion of airport property. In October 2013 the City closed this site, and in June 2014 opened a replacement site approximately 1.25 miles to the northeast.

#### Off-Airport Land Uses

Land uses off-airport must also be compatible with existing and future airport operations. Fleming Field is located within an urbanized area of South St. Paul and Inver Grove Heights surrounded by roads and development. Existing generalized land uses are shown on **Figure 2-6**, at the end of this chapter.

Fleming Field is primarily surrounded by single-family and some multi-family residential development to the south, east, and north of airport property. An area of ten multi-family apartment buildings immediately borders airport property to the northwest. McMorro Field, a City of South St. Paul park, is adjacent to airport property, north of the North Hangar Area. An aggregate mining operation is located to the northeast of the main terminal area. Union Cemetery is located north of the main apron area, north of Airport Road. Industrial and utility land uses exist immediately adjacent to the west portion of airport property.

### 2.13.2. RUNWAY PROTECTION ZONE

FAA has established land use standards in the form of a Runway Protection Zone (RPZ). The purpose of an RPZ is to enhance protection of persons and property on the ground in the vicinity of the runway approach. An RPZ has a trapezoidal shape centered along the runway centerline. It begins 200 feet beyond the end of each specially prepared hard surfaced runway. The Runway 16/34 RPZs are depicted on **Figure 2-6**. RPZ dimensions are based on the runway design and approach types established for a runway. **Table 2-14** identifies the RPZ dimensions at Fleming Field.

**Table 2-14  
FAA Runway Protection Zone Dimensions**

Runway	RPZ Dimensions (Inner width x length x outer width)
16/34	500' x 1,000' x 700'

Source: FAA AC/150 5300-13A, *Airport Design*

According to FAA requirements, land uses prohibited in the RPZ include residences and other buildings, as well as places of public assembly (i.e. churches, schools, hospitals, office buildings, shopping centers, and other uses with similar concentrations of persons). The FAA in 2012 published interim guidance about land uses within RPZs.

Under certain circumstances, existing incompatible land uses based on FAA requirements may be allowed to remain in an RPZ. However if the RPZ dimensions or location change, or if there is a local development proposal, FAA expects the RPZ to be clear of the following land uses:

- Buildings and structures
- Recreational land uses
- Transportation facilities (including public roads/highways, vehicular parking facilities)
- Fuel Storage facilities
- Hazardous material storage
- Wastewater treatment facilities
- Above-ground utility infrastructure

The City has ownership control over the vast majority of the Runway 34 RPZ. The remaining portion of the RPZ is located on private property. A private shed located within the Runway 34 RPZ needs to be removed. This shed is located on private property, but the City has an aviation easement which will allow the removal of the structure.

South Street, a publicly built and dedicated roadway, runs through the far end of the Runway 16 RPZ. Other known incompatible land uses include structures on two residential parcels on the north side of South Street and parking associated with McMorrow Field that lies within the central portion of the RPZ. The two residential parcels will be acquired and all associated structures will be removed when federal funding becomes available, anticipated to be in 2015. These removals and other land use mitigation actions are being covered by the National Environmental Policy Act (NEPA) Environmental Assessment referenced in **Section 2.8.3** which is currently in process. McMorrow Field parking will be removed from the RPZ under a City of South St. Paul project to redevelop and reconfigure the overall park facility in the 2016 or 2017 timeframe. Parking on South Street will be restricted within the RPZ. The FAA will not require South Street to be removed from the Runway 16 RPZ as long as the location and dimensions of the RPZ are not altered.

**2.13.3. MNDOT CLEAR ZONE**

The MnDOT Office of Aeronautics has developed Clear Zone standards which are adopted as part of department policy. These dimensions match or are greater than the RPZ areas defined by FAA. MnDOT Aeronautics policy expects the Clear Zone to be acquired in fee to continue to receive airport development funding. Dimensions for the MnDOT Clear Zones are defined by runway classification,

instrument approach type, and instrument approach minimums. **Table 2-15** shows the existing MnDOT Clear Zones at Fleming Field, according to the 2007 guidance.

**Table 2-15**  
**MnDOT Clear Zone Dimensions**

Runway	Clear Zone Dimensions (Inner width x length x outer width)
16	500' x 1,700' x 840'
34	500' x 1,700' x 1,010'

Source: MnDOT Office of Aeronautics, Planning & Zoning (2007)

**2.13.4. AIRPORT PROPERTY**

Airport property consists of 221.76 acres, owned in fee title by the airport sponsor, the City of South St. Paul. In the 1990s, fee title airport property was re-platted as a subdivision legally named “Airport Rearrangement.” The airport also has acquired 19.5 acres in aviation easements protecting airport airspace and/or land use compatibility interests. These easements are depicted on **Figure 2-3**. It can be seen that:

- All of the Runway 34 RPZ is owned in fee or easement by the City of South St. Paul as airport property.
- All of the Runway 16 RPZ owned in fee or easement by the City of South St. Paul except for the portion that goes through South Street and portions of four residential parcels located north of South Street. In addition, portions of the McMorro Field parking lot are owned by the City but not dedicated as airport property at this time.

Regarding the wedge of land in the northern portion of the Runway 16 RPZ not currently under City control, the Environmental Assessment for the airport that is currently in process covers this. Two residential properties will be purchased in fee (and all structures removed), and easements will be purchased from portions of the front yards of two more properties to the west. South Street is a City street.

**2.13.5. STATE AIRPORT ZONING**

State of Minnesota Statutes, Chapter 360 requires public airports to enact an overlay airport zoning ordinance to:

- Protect the airport from incompatible land uses that could interfere with the safe operation of the airport.
- Protect public safety by reducing the potential for fatalities, property damage, or noise complaints within the vicinity of the airport.
- Protect the public investment made by taxpayers in their airport and the economic benefits it provides to the region.

MnDOT Office of Aeronautics airport zoning requirements are defined below:

- Safety Zone A extends outward from the end of the primary surface on the extended runway centerline a distance equal to two-thirds of the runway length or planned runway length. This

zone does not allow buildings, temporary structures, uses that create wildlife hazards, or similar land use structural hazards and should be restricted from uses that would create, attract, or bring together an assembly of people. Typical allowed land uses in Zone A include agriculture, cemetery, and automobile parking.

- Safety Zone B extends farther outward from Safety Zone A, a distance equal to one-third the runway length or the planned runway length. This safety zone allows buildings on sites that encompass three or more acres; actual allowable building site area depends on the size of the parcel. Zone B should not create, attract, or bring together an assembly of people that would exceed 15 times the size of the parcel. Zone B cannot have more than one building plot area on which numerous structures can be constructed.
- Safety Zone C encompasses all of the land enclosed within the perimeter of the FAA horizontal surface that is not included in Safety Zone A or Safety Zone B. Zone C shall not contain land uses that create or cause interference with the operation of radio or electronic communications between the airport and aircraft, make it difficult for pilots to distinguish between airport lights and other lights, result in glare, impair visibility of the airport vicinity, or endanger aircraft operations.

Safety Zones A and B are the most important zones to consider in airport planning. These zones for Fleming Field, along with existing land use information, are depicted on **Figure 2-6**.

The South St. Paul Municipal Joint Airport Zoning Board adopted a Zoning Ordinance (Airport Zoning Ordinance) in 1990 to protect the airport from new incompatible airspace and land uses. The ordinance was created by joint action of the City Councils of the Cities of Inver Grove Heights, Newport, St. Paul Park, and South St. Paul.

It can be seen on **Figure 2-6** that there are land uses inconsistent with MnDOT zoning requirements at both runway ends. This is not surprising given that Fleming Field is in a densely developed urban area, development which extends back a number of decades. The Airport Zoning Ordinance provides an “Established Residential Neighborhood” exemption from many requirements associated with Zones A and B. This exemption applies only to structures built prior to 1979. There are height and activity restrictions which are in place for Zones A, B and C in the Airport Zoning Ordinance.

Taking into account the exemption referenced above, the airspace surfaces and land use areas protected meet or exceed the existing airport design of the current 4,000-foot runway with a few exceptions. The outer Zone C and Horizontal Surface for the existing other-than-utility airport facility should extend 10,000 feet rather than the 6,000 feet currently protected.

### 2.13.6. FUTURE LAND USE PLANS

Future land uses for the cities of South St. Paul and Inver Grove Heights are identified in each community’s 2030 comprehensive plan. For South St. Paul, the northern portion of the aggregate extraction area to the northeast of the airport is planned to become light industrial. In addition, high density residential is identified for currently undeveloped lots northwest of the airport. Inver Grove Heights shows medium density residential over the southern portion of the current aggregate extraction area. For both cities, all other land uses are planned to remain as they exist today.

## 2.14. ENVIRONMENTAL OVERVIEW

The purpose of this section is to provide a general overview of environmental features which should be considered in the analysis of airport improvement alternatives. The intent is not to perform detailed analysis, but rather to assemble readily available information in a systematic manner. More comprehensive environmental analysis will be performed during the National Environmental Policy Act

(NEPA) process when a future project becomes justified and triggers this type of review.

Following FAA guidance, the discussion of existing environmental conditions and considerations are provided under the following headings. **Figure 2-7**, at the end of this chapter, depicts environmental information in and around Fleming Field relevant to this Master Plan.

### 2.14.1. AIR QUALITY CLASSIFICATION

The Clean Air Act established National Ambient Air Quality Standards for six pollutants (particulate matter, ground-level ozone, carbon monoxide, sulfur oxides, nitrogen oxides, and lead) termed “criteria pollutants.” Fleming Field is not located in the non-attainment area classified in Dakota County (the City of Eagan is classified as non-attainment for lead). Thus, it is in an attainment area. General conformity regulations do not apply to a Federal action in an area that is designated attainment for all six criteria pollutants.

### 2.14.2. AQUATIC CONCERNS

#### Rivers

As depicted on **Figure 2-7**, the Mississippi River is approximately half a mile east of the airport. The northeastern portion of the airport is drained by intakes and buried conveyance piping. This flow runs into the general City storm sewer system and ultimately drains to the Mississippi River. This segment of the Mississippi River is classified by the Minnesota Pollution Control Agency (MPCA) as an Impaired Water based on turbidity.<sup>1</sup> It is currently being studied as part of the Lake Pepin Total Maximum Daily Load Study. The ultimate load could affect water quality treatment requirements for facilities that drain to this portion of the Mississippi River. However, the study is currently on hold until the MPCA develops general nutrient standards for rivers. Until the Lake Pepin load study is completed, the base control requirements for discharge to Impaired Waters is in place; new impervious areas must have engineered treatment for one inch of runoff as opposed to one half inch, which is the National Pollutant Discharge Elimination System standard for discharge to non-Impaired Waters.

#### Wetlands

Based on a review of National Wetland Inventory information and on information provided in the Fleming Field Stormwater Pollution Prevention Plan, there is only one wetland on or in adjacent to the airport. It is referred to as Bohrer Pond, and it is primarily located in Inver Grove Heights as depicted on **Figure 2-7**. It is classified as a Department of Natural Resources Public Water. Drainage from the northwest, north-central, and western portions of the airport drain overland, ultimately to Bohrer Pond. Upstream treatment is provided by detention basins as can be seen on **Figure 2-7**.

Wetlands are protected by federal, state, and local regulations. It is not anticipated that any of the alternatives to be reviewed in this Master Plan would impact Bohrer Pond.

#### Floodplain

Please refer to **Figure 2-7** for floodplain information. Fleming Field is located above the Mississippi River basin and is not in a floodplain area.

<sup>1</sup> Turbidity is a measure of water clarity. Elevated turbidity (lack of clarity) is typically the result of excess sediments and/or algae.

### 2.14.3. TERRESTRIAL CONCERNS

#### Contaminated Areas

Federal, State, and local laws regulate hazardous materials use, storage, transport, or disposal. These laws may extend liability to future landowners of properties containing contamination. In addition, disrupting sites containing hazardous materials or contaminants may cause significant impacts to soil, surface water, groundwater, air quality, and the organisms using these resources.

The MPCA database was reviewed to identify potential contaminated sites within or near the airport. This database includes known information on solid waste and hazardous waste disposal sites, fuel spills, environmental cleanup actions, and other types of potential contamination. The only site that is identified on or adjacent to Fleming Field is the previous community gardens site located approximately 300 feet southeast of Runway 34. Based on MPCA information, this site was entered into the Voluntary Investigation and Cleanup program (VP14810) in 2002. The investigation is no longer active. Airport staff has identified that this area once contained approximately 30 waste tires that have since been removed.

There is buried heating piping on the airport dating back to the 1940's which is wrapped with asbestos materials. This piping is within a concrete conduit structure from that era, and generally parallels the more recent water supply piping serving the airport. This asbestos does not need to be addressed at this time since it is buried. However if development actions require the piping to be removed or otherwise disturbed, appropriate testing, management and disposal actions would be required as directed by applicable asbestos regulations.

#### Habitat-Endangered/Threatened Species

US Fish and Wildlife Service (USFWS) information identifies that there are two Endangered species in Dakota County: the Higgin's Eye Pearlymussel (*lamprolaima higginsii*), and the Northern Long-Eared Bat (NLEB – *Myotis septentrionalis*). The Higgin's Eye is a freshwater mussel of larger rivers where it is usually found in deep water with moderate currents. The relevant habitat in the context of Fleming Field is the Mississippi River. According to USFWS information, the largest current threat to Higgin's Eye Pearlymussels is the presence of invasive zebra mussels. As long as NPDES stormwater control requirements are met, development and operations at Fleming Field are not anticipated to impair the habitat for this protected species.

The NLEB was listed as Endangered in April 2015. During the winter, members of this species hibernate in caves and mines. During summer, they roost singly or in colonies underneath bark, in cavities, or in crevices of both live and dead trees. Based on Center for Biological Diversity information, this species is generally associated with mature, interior forest environments rather than above valley-bottom streams and along the edges of riparian forests. An Environmental Assessment process for Fleming Field covering obstruction removal and land use compatibility actions was concluded with a Finding of No Significant Impact (FONSI) in February of 2015. During this process, the FAA, the City of South St. Paul, and the USFWS agreed to a mitigation measure for the NLEB which includes a prohibition of tree removal or trimming activities between April 1 and September 30. The USFWS granted contingency conditions on this prohibition until April 30 for 2015 only.

### 2.14.4. CULTURAL RESOURCES

#### Residential

As depicted on **Figure 2-2** and **Figure 2-7**, Fleming Field is located within a developed urban area. There is residential land use directly to the northwest, north, east, south, and southwest of the airport. While most of this housing is single family, there is an area of ten multi-family apartment buildings, the

closest of which is approximately 700 feet north-northwest of Runway 16. The closest residential dwellings within the flight path of Runway 16 are approximately 1,200 feet to the north-northwest. The closest residential dwellings within the flight path of Runway 34 are approximately 1,500 feet to the south-southeast. Overall, the closest homes to aircraft operating surfaces are approximately 290 feet east of Runway 34 (approximately 160 feet east of the easterly parallel taxiway).

**Historic and Archaeological**

Section 106 of the National Historic Preservation Act, as implemented through 36 CFR Part 800, requires Federal and sponsor agencies to consider the effects of their undertakings on historic properties. A “Historic Property” is “any prehistoric or historic district, site, building, structure, or object included in or eligible for inclusion in the National Register of Historic Places maintained by the Secretary of the Interior.” FAA has established procedures for review of potentially historic structures or areas, which requires FAA review and approval along with concurrence from the State Historic Preservation Office.

The oldest structures on the airport are the hangars around the Main Apron east and south of the airport terminal building. However, these buildings have been substantially modified over the years and thus have lost much of their historic integrity. A review of State Historic Preservation Office files indicates that there are no known historic structures or significant archaeological sites on the airport. The closest known resource is over one quarter mile northeast of the airport.

Prior to implementation of proposed actions which result from this master planning process, further NEPA review will be required, including Section 106 evaluation.

**Parks**

As identified on **Figure 2-6**, the two closest parks to Fleming Field are McMorrow Field and Skyview Park. McMorrow Field abuts the airport property to the north. At 20 acres, it is one of South St. Paul’s larger parks. Programmed athletic activity is the major use, and it is very actively used, particularly in the summer months. As discussed previously, McMorrow Field will be reconstructed and reconfigured in the 2016/2017 timeframe. It will transition from an emphasis on multiple ballfields (softball and youth baseball) to “flat fields” (four full-sized soccer fields and a full-sized football field).

Skyview Park is in Inver Grove Heights. It is eight acres, and includes a playground, baseball/softball fields, soccer fields, lighted tennis courts, a lighted skating rink and warming house.

**2.14.5. LAND USE CONCERNS**

**Zoning**

As discussed previously in this Master Plan, land use control for Fleming Field is provided by a Joint Airport Zoning Ordinance dated 1990. This ordinance provides appropriate controls to minimize airport hazards consistent with FAA and MnDOT requirements for Fleming Field in its current configuration and classification. If physical changes are made to aircraft operating surfaces and/or if the airport classification is changed, the current ordinance would likely have to be reopened and updated.

**Lighting**

Under NEPA review guidelines, “Light emissions” refers to airport-based lighting facilities and activities and how they may negatively affect nearby residents and other receptors. “Visual effects” deal broadly with the extent to which airport development may contrast with the existing environment, architecture, historic or cultural setting, or land use planning. There are no federal statutory or regulatory requirements for light emissions or visual effects. However, they must be considered and evaluated in the NEPA review process.

Lighting is an essential component of airport operations to aid pilots in visual identification of airport infrastructure. Fleming Field has been in operation since the 1940's, serving the City of South St. Paul and the region. While airport lighting, structures, and operations are an established part of the community, consideration needs to be given to the potential for impacts resulting from improvement projects and/or changed operations.

**Environmental Justice**

Environmental Justice considers the potential of Federally-funded actions to cause disproportionate and adverse effects on low-income or minority populations. This is under Executive Order 12898, *Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations*, February 11, 1994, and US Department of Transportation Order 5610.2, *Environmental Justice in Minority and Low-Income Populations*, April 15, 1997. In general, multi-family structures have more potential than single family residences to be Environmental Justice properties. There is a group of ten apartment buildings approximately 700 feet northwest of runway 16 that have the potential to be Environmental Justice properties (see **Figure 2-7**). If future airport actions affect these structures, it is anticipated that further Environmental Justice evaluation would be required as part of the overall NEPA review process.