

## CHAPTER 3 ISSUES AND EXISTING CONDITIONS

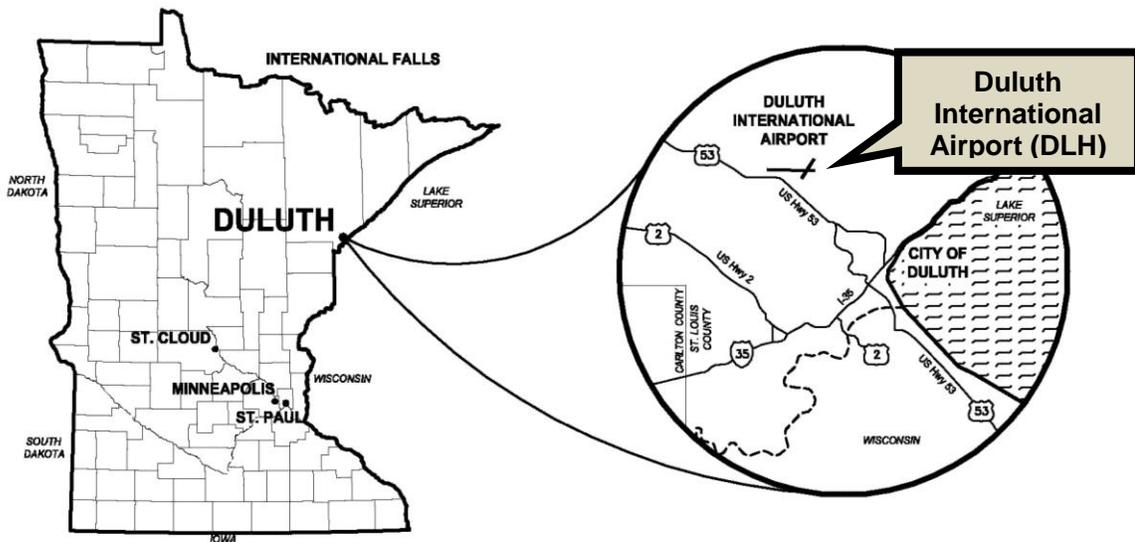
### 3.1 INVENTORY ISSUES AND CONDITIONS

The inventory provides a comprehensive understanding of aviation factors and community trends, and forms the basis for recommendations throughout the Duluth Airport Master Plan study.

#### 3.1.1 Airport Location and Setting

Exhibit 3-1 depicts the Airport's geographic proximity. The Airport is five miles northwest of the City of Duluth, located in northeastern Minnesota along Lake Superior, 150 miles north of Minneapolis in St. Louis County. The metropolitan area, which includes Duluth and Superior, combines nearly 275,000 residents and is the third largest in the State of Minnesota. Jurisdictions adjoining the Airport include the City of Duluth in which the airport is located, the City of Hermantown, Canosia Township and Rice Lake Township. The four political jurisdictions are within St. Louis County, in which the County does not assume zoning authority for the surrounding government entities.

Exhibit 3-1  
LOCATION & VICINITY MAP



Source: RS&H, 2010.

#### 3.1.2 Airport Ownership and Administration

The Duluth International Airport is operated by the Duluth Airport Authority, established in 1969, with a Board of Directors overseeing administration of the Duluth International Airport and Sky Harbor Airport. The Board of Directors is appointed by the Mayor of Duluth, and comprised of seven members: a President, Vice President, Secretary and four Board Members. A full-time professional Airport Director

serves as the day-to-day administrator to the Board of Directors, supported by an administrative and operational staff.

### **3.1.3 Airport Development History**

The Airport was initially constructed as a municipal airfield, and has since developed into a facility to serve both civilian and military interests. In 1929, the City of Duluth purchased 640 acres of property from St. Louis County to construct the current airport site, which consisted of three 2,650-foot turf runways. Named the Williamson-Johnson Municipal Airport, the airfield was dedicated as a public airport in 1930. Also in 1930, an air mail route was established by the US Postal Service, and in 1940 Northwest Airlines began service at Duluth.

In 1942, the three turf runways (3-21, 9-27 and 13-31) were each paved to 4,000 x 150 feet. In 1945, the Corps of Engineers extended Runway 9-27 and Runway 3-21 to 5,699 feet. After World War II, the U.S. Air Force constructed permanent and semi-permanent facilities on City leased land, and in 1948 the Minnesota Air National Guard constructed permanent facilities east of the field. The following year, the headquarters of the 179<sup>th</sup> were moved from the Duluth Armory to the current location on the Northeast Quadrant. In 1951, Runway 9-27 was extended by the U.S. Air Force to 9,000 feet, including 1,000-foot overruns, and an air traffic control tower constructed the same year. In 1954, the original 14,200 square foot terminal building was constructed southwest of the runway intersection. That same year, the Air Force received its first based jet fighter aircraft at Duluth. In 1956, Runway 9-27 was completely reconstructed, and in 1966 extended to 10,152 feet. In July 1960, the 148<sup>th</sup> Fighter Group was formed and the 179<sup>th</sup> Fighter Squadron began operating on 24-hour alert status as part of the 148<sup>th</sup> Fighter Wing under the Air Defense Command.

The following is a historical summary of military mission at Duluth:

- 1948 179th Fighter Squadron formed and assigned P-51 Mustangs
- 1954 Squadron converted to the F-94A/B Starfirejet
- 1957 Squadron converted to the F-94C
- 1959 Squadron converted to the F-89J Scorpion
- 1960 Unit re-designated as the 148th Fighter Group
- 1967 Group converted to the F-102 Delta Dagger
- 1971 Group converted to F-101 Voodoo
- 1976 Group re-designated as 148th Tactical Reconnaissance Group/Converted to RD-4C Phantom
- 1983 Group re-designated the 148th Fighter Interceptor Group/Converted to the F-4D
- 1991 Group converted to F-16 ADF Falcon
- 1992 Group re-designated as the 148th Fighter Group
- 1995 Unit re-designated the 148th Fighter Wing

The Airport was renamed the Duluth International Airport in 1961. In 1974, a 52,400 square foot passenger terminal building and U.S. customs facility was constructed southeast of the runway intersection, at the present terminal building site. Consequently, Runway 13-31 was shortened to 2,578 feet to accommodate building construction, then subsequently converted into a taxiway, and eventually closed in 1980. The former terminal building, southwest of the runway intersection, was then converted for use as offices for general aviation, the FAA, and the U.S. Weather Bureau.

In 1989, the three-story passenger terminal building was interconnected to form a single enclosure totaling 106,000 square feet. With the post September 11 era of new federal security requirements and proximity to runway airspace surfaces, the passenger terminal building became functionally obsolete. In 2010 the replacement passenger terminal, expanded apron, new auto circulation and vehicle parking facilities were constructed.

### **3.1.4 Airport Service Role**

The Duluth International Airport is a public-use facility providing aeronautical services for commercial, general aviation and military users. The Airport is classified by the Federal Aviation Administration (FAA) *National Plan of Integrated Airport Systems (NPIAS)* as a 'non-hub primary commercial service airport', certified as a Class I FAA Part 139 facility intended to serve passenger aircraft with 30-plus seats. The Airport is designated as an FAA D-V Airport Reference Code (ARC) for serving heavy wide-body transports which including B-747s, and is classified by the 2006 Mn/DOT-Aeronautics State Aviation System Plan as a 'Key Airport'.

### **3.1.5 Summary of Airport Activity**

As of 2010, the Duluth International Airport processed approximately 306,400 scheduled commercial passengers, 5,000 charter passengers, experienced about 57,000 annual aircraft operations (takeoffs and landings), and based 66 aircraft excluding Cirrus and MN Air National Guard. Duluth is ranked the 202<sup>nd</sup> busiest airport in the nation in terms of passenger enplanements, and the second busiest commercial service airport in Minnesota. While a commercial service facility, the Duluth International Airport also supports a substantial level of general aviation activity within the region, accounting for around 40 percent of the based aircraft and 55 percent of the general aviation operations. In the past 10 years, Airport activity trends have generally been increasing, with aircraft traffic remaining proportionally consistent amongst the commercial (15%), general aviation (70%) and military (15%) users.

## **3.2 AIRPORT FACILITIES**

This section is an inventory of the major airport facilities, equipment and services. Exhibit 3-2 is a diagram of the Airport vicinity depicting the general layout of airfield and terminal area facilities. The Airport property totals approximately 3,020 acres in fee-simple ownership, including the airfield, terminal and landside areas.

### **3.2.1 Airfield**

The airfield facilities described below are core aeronautical components which include the runways, taxiways and navigational aids used to support air traffic operations.

#### **3.2.1.1 Runway System**

The major runway facilities are listed in Table 3-2. The airfield consists of two intersecting runways aligned in an east-west and northeast-southwest orientation, with the runway pavements total nearly 3.2 million square feet.

**Primary Runway:** Runway 9-27 is 10,162' x 150' with precision instrument capabilities to both ends, and serves as the primary runway with an Airport Reference Code (ARC) of D-V. The runway, with 40' paved shoulder per side, is grooved concrete construction with a gross weight bearing strength of 650,000 pounds for dual tandem wheel gear aircraft. Runway 9-27 is installed with a gear arresting system for military aircraft use.

**Secondary Runway:** Runway 3-21 is 5,718' x 150' with non-precision instrument capabilities to both ends, and serves as a secondary runway with an Airport Reference Code (ARC) of C-III. Runway 3-21, with intermittent paved shoulders, is asphalt construction with a gross weight bearing strength of 360,000 pounds dual tandem wheel gear aircraft.

### 3.2.1.2 Taxiway System

The Airport's taxiway facilities are summarized on Table 3-1. The taxiway system includes six designated taxiway segments ('A', 'B', 'C', 'D', 'E', and 'F') totaling nearly 30,000 linear feet and comprising of 2.1 million square feet of pavement.

**Runway Taxiway System:** Taxiway 'A' is a 75-foot wide full-length parallel serving Runway 9-27, and includes four exit taxiways. The Taxiway 'A' runway-to-taxiway centerline separation ranges from about 500 to 840 feet. The 1,000-foot (990' published) overrun beyond the Runway 27 end is designated as Taxiway 'E', an in-line taxiway with three entry taxiways and an in-pavement lighting system. Taxiway 'C' is a 50-foot wide full-length parallel taxiway serving Runway 3-21, with three exit taxiways. The Taxiway 'C' runway-to-taxiway centerline separation ranges from about 275 to 500 feet.

**Terminal Taxiway System:** Each terminal apron is served by connecting and exit taxiways adjoining the main parallel taxiway system. Taxiways 'A', 'A2', 'A3', 'C' and 'D' primarily serve the general aviation and air cargo areas. Taxiway 'B', at 75 feet wide, serves the North Business Development Area. Taxiways 'E1', 'E2' and 'F' serve the Minnesota Air National Guard Base.

Table 3-1  
**TAXIWAY FACILITY TABLE**

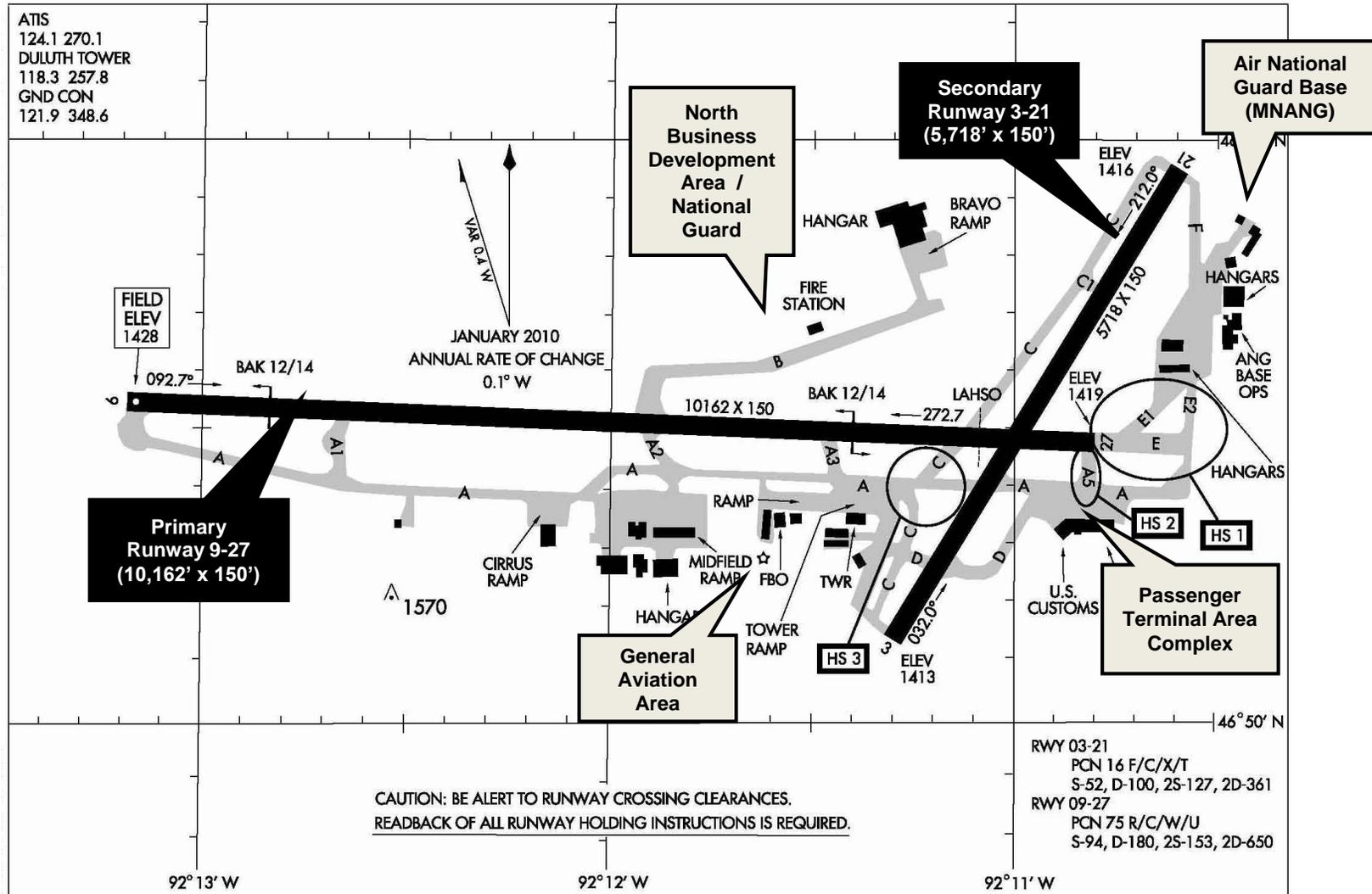
Item	Taxiways (By Major Designation Grouping)					
	A	B	C	D	E	F
Areas Served	Rwy 9/27 (Parallel)	Apron	Rwy 3/21 (Parallel)	Apron	Rwy 27 End, Apron	Apron
Associated Taxiways	A, A1, A2, A3, A5	B	C, C1	D	E1, E2	F
Taxiway Length (Linear Feet)	14,730	3,950	6,100	1,785	975	1,135
Taxiway Width (Feet)	75	75	50	75	150	75
Taxiway Area (Square Feet)	1,104,750	296,250	305,000	133,875	146,250	85,125
Taxiway Area (Square Yards)	122,750	32,917	33,889	14,875	16,250	9,458
Taxiway Shoulder Width	35' (Partial)	35'	None	None	35'	None
Taxiway Edge Lighting	MITL	MITL	MITL	MITL	MITL	MITL
Runway to Taxiway Centerline	500' to 840'	575'	275' to 500'	515'	N/A	N/A
FAA Standard Deficiency	Hot Spot: Txy A5	None	Hot Spot: Txy A, C	None	Hot Spot: Txy E, E1, E2	None

Note: Reference appendix for abbreviations and acronyms.

Note: Taxiway 'A4' has been removed.

Source: FAA Airport Facility Directory.

Exhibit 3-2  
 AIRPORT DIAGRAM



Source: FAA Airport/Facility Directory

*Table 3-2*  
**RUNWAY FACILITY TABLE**

<u>Facility Item</u>	<u>Runway Facilities</u>	
<b>Runway 9-27</b>	<b>Rwy 9 End</b>	<b>Rwy 27 End</b>
Runway Length x Width / Surface	10,162' x 150' Concrete (Grooved)	
Paved Shoulders	80' (40' Per Side)	
Airport Reference Code (ARC)	ARC D-V (Widebody Transport Critical Aircraft)	
Pavement Strength (Gear Type)	94,000 (SWG)   180,000 (DWG)   650,000 (DTWG)	
Pavement Condition	PCN 75 R/C/W/U	
Displaced Threshold	None	None
Overrun / Blast Pad	400' x 220' Blast Pad	1,000' x 150' Overrun
Runway Type / Marking	Precision	Precision
Instrument Approach Aids	ILS CAT-II   NDB   RNAV (GPS)	ILS CAT-I   RNAV (GPS)   TACAN
Instrument Approach Minimums	1,200' RVR   100' DH	4,000' RVR   200'
PART 77 Approach / Slope	1,000' x 50,000' x 16,000' @ 50:1	1,000' x 50,000' x 16,000' @ 50:1
Visual Approach Aids	ALSF-2   PAPI-4L	MALSR   TDZL   PAPI-4L
Runway Edge Lighting	High Intensity Runway Lights (HIRL) / Centerline Lights (CL)	
Taxiway System / Separation	Full-Parallel (500' to 850' Separation)	
Land and Hold Short Operations	Yes	No
Aircraft Arresting System (BAK)	Yes	Yes
<b>Runway 3-21</b>	<b>Rwy 3 End</b>	<b>Rwy 21 End</b>
Runway Length x Width / Surface	5,718' x 150' Asphalt (Grooved)	
Paved Shoulders	70' (35' Per Side) - Between Rwy 9-27 and Taxiway 'A'	
Airport Reference Code (ARC)	ARC C-III (Narrowbody Transport Critical Aircraft)	
Pavement Strength (Gear Type)	52,000 (SWG)   100,000 (DWG)   361,000 (DTWG)	
Pavement Condition	PCN 16 F/C/X/T	
Displaced Threshold	None	None
Overrun / Blast Pad	None	None
Runway Type	Non-Precision	Non-Precision
Instrument Approach Aids	VOR   TACAN   RNAV (GPS)	TACAN   VOR/DME   RNAV (GPS)
Instrument Approach Minimums	1-Mile   ±500'	1-Mile   ±500'
PART 77 Approach / Slope	500' x 10,000' x 3,500' @ 34:1	500' x 10,000' x 3,500' @ 34:1
Visual Approach Aids	PAPI-4L   REIL	PAPI-4L   REIL
Runway Edge Lighting	High Intensity Runway Lights (HIRL)	
Taxiway System / Separation	Full-Parallel (275' to 500' Separation)	
Land and Hold Short Operations	No	No
Aircraft Arresting System (BAK)	No	No

Note: Reference appendix for abbreviations and acronyms.  
Source: FAA Airport/Facility Directory | FAA AVN Database.

### **3.2.2 Airfield Pavement Condition Index (PCI)**

The Airport's surface pavement conditions resulting from a Pavement Condition Index (PCI) inspection performed in September 2010 are illustrated on Exhibit 3-3. The PCI is a visual pavement analysis of surface distresses, and assigns a pavement rating between 0 and 100 points (0 representing failed to 100 for newer pavements in pristine condition), and is further indexed by color-code in order to correspond with the types of pavement repairs anticipated:

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

The PCI inspection involved the runways, all taxiway movement area, and apron pavements, which totaled 7.3 million square feet. Pavements less than three (3) years old were not inspected consistent with Mn/DOT Aeronautics inspection procedure, which included the general aviation taxiways, general aviation aprons and hangar ramp pavements constructed since 2008. The entire airside pavements were considered as one pavement network.

The Airport taxiway network consists of two full length parallel taxiways and several taxiway connectors. There are five apron pavement branch sections such as the General Aviation Ramp, Terminal Ramp, Run-up pads for 'A1'. Runway 9-27 east and west run-up pads were also inspected. Runway 9-27 pavements, Taxiway 'B' pavements, portions of Taxiway 'A' and 'A1', Taxiway 'A5', and Runway 9-27 West Run-up Pad have shoulders associated with them and those shoulder pavements were also inspected as part of this project. Runway 9/27 was constructed in the late 1940's. The pavement structure consists of 10" of Portland Cement Concrete (PCC) on 7" of aggregate base, on a 4" filter course aggregate, on select subgrade fill.

The PCI analysis included an assessment of the existing 2010 base case pavement conditions, and also an extrapolation of pavement conditions projected during the next 5 and 10-year periods. The projected PCI values indicate a pattern of progressive taxiway and apron pavement deterioration from the 2010 base year.

The analysis concluded that the Runway 9/27 pavement was some of the lowest scoring pavement on the airfield and the west side of the runway was the lowest scoring out of the runway pavement. Over the runway ranged from fair to poor on the west side and very good to excellent on the east side. Runway 9/27 was constructed in the late 1940's. The pavement structure consists of 10" of Portland Cement Concrete (PCC) on 7" of aggregate base, on a 4" filter course aggregate, on select subgrade fill.

Pavement cores were taken at various locations on Runway 9/27. American Engineering and Testing conducted an engineering analysis to determine the pavement condition of Runway 9/27. The study included a field investigation of pavement condition and falling weight deflectometer testing of the runway. The results of the investigation are summarized in the "Report of Pavement Testing and Engineering Analysis" dated June 24, 2009.

The findings of the analysis indicated that the runway concrete panels are on the low side of adequacy in structural strength and load transfer. Large voids exist under the concrete panels in corners where subgrade support needs improvement. It is anticipated that the concrete panels will perform adequately for a limited time period, but structural improvements should be planned in the near future. It is anticipated that the pavement will be beyond its useable life in 5 to 10 years and will require reconstruction.

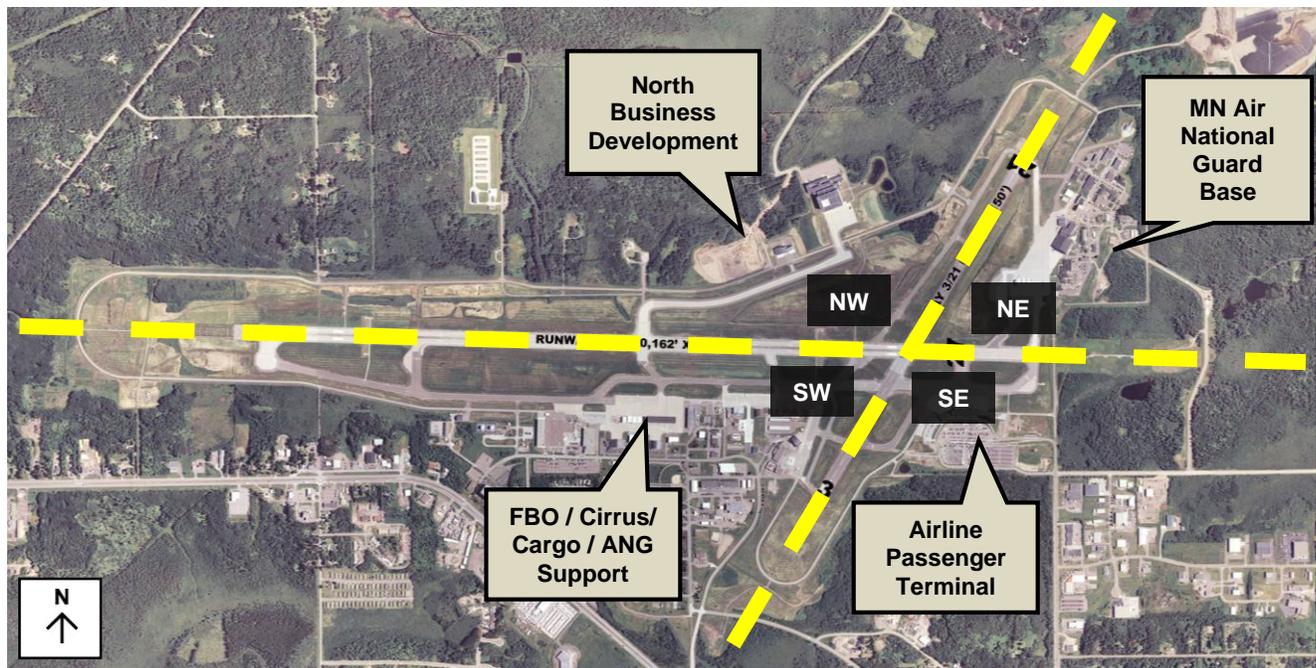


### 3.3 AIRPORT QUADRANTS

The Airport is geographically segregated into four quadrants, by virtue of the runway orientation as shown on Exhibit 3-4. Each of the quadrants, as described below, is predominately characterized by distinct aeronautical uses and tenant activities.

Southeast Quadrant	Passenger Terminal Area (Building, Airline Ramp and Auto Parking)
Southwest Quadrant	General Aviation (Fixed Base Operator, Special Aviation Service Organizations, Air Cargo, Air Traffic Control, and Air National Guard Support Facilities)
Northwest Quadrant	Large Commercial and General Aviation Business Tenants, Airport Support and Navigational Facilities.
Northeast Quadrant	Minnesota Air National Guard Complex

Exhibit 3-4  
AIRPORT AREA QUADRANTS

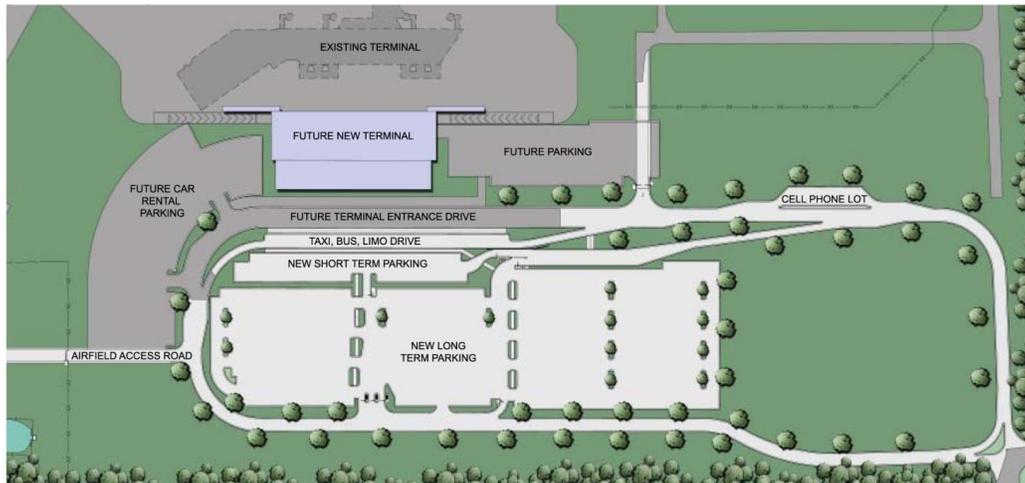


Source: Airport Aerial Image, June 2010.

#### 3.3.1 Southeast Quadrant

The Southeast Quadrant, which comprises about 55 acres currently dedicated exclusively to the passenger terminal facility is depicted on Exhibit 3-5. As depicted, this area underwent re-development in 2010 for construction of a new terminal building, auto circulation and vehicle parking.

*Exhibit 3-5*  
**NEW TERMINAL AREA FACILITIES & LOCATION**



Source: RS&H Site Rendering, 2010

### **3.3.2 Southwest Quadrant**

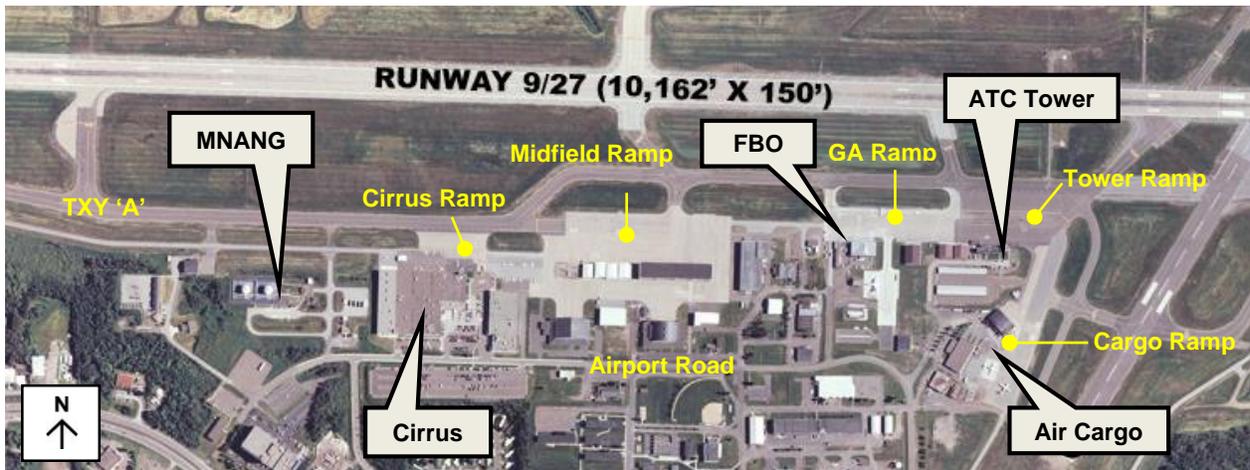
The Southwest Quadrant located southwest of the runway intersection is shown on Exhibit 3-6. This quadrant, once the location of the US Air Force base property and former passenger terminal, now serves as the core for general aviation, air cargo, and includes other special aviation service organizations with varied aeronautical interests. Facilities within the southwest quadrant include:

- General Aviation facilities
  - Fixed Base Operator Buildings/Hangars
  - Special Aviation Service Organizations Buildings/Hangars
  - Individual Aircraft Hangars (various types, size and uses)
  - FBO Fuel Farm
- Air Traffic Control Tower
- Air Cargo / Cargo Sortation Facilities
- Airport Maintenance / Electrical Buildings
- MNANG Air National Guard Support Facilities / Fuel Storage

Nearly all of the facilities north of Airport Road are aviation-related, and have airfield access. To the south of Airport Road is a mixed development area, which includes the leased Federal Prison Camp, and a leased area west of Taylor Street under lease by the Minnesota Air National Guard. The MN Air National Guard (MNANG) also has an area located in the southwest quadrant which once housed support facilities.

The Southwest Quadrant, which includes aviation and non-aviation land uses developed following the closure of the USAF facility in 1982, is characterized as being relatively flat and served by sufficient utilities and drainage systems, but offers limited expansion capability. The curvature of the parallel Taxiway 'A' constrains developable areas bound by Airport Road, the major arterial corridor route through this area. Consequently, the Southwest Quadrant has been the focus of various re-development studies, including sub-area options to construct new buildings, hangars, aprons and roadway re-alignments upon the renovation and removal of select infrastructure, and providing new vehicle circulation and access.

*Exhibit 3-6*  
**SOUTHWEST QUADRANT AREA**



Source: Martinez Aerial Image, June 2010.

### **3.3.3 Northwest Quadrant**

The location and major facilities included in the Northwest Quadrant are illustrated on Exhibit 3-7. This area, located north of Runway 9-27, is largely undeveloped when compared to the southwest quadrant. The facilities located in the northwest quadrant include the North Business Development Area, the Aircraft Maintenance Center, the Airport Aircraft Rescue and Fire Fighting building, Airport Surveillance Radar, and an Air National Guard munitions facility. Primary access to existing facilities is provided via North Stebner Road.

**North Business Development Area:** A 15-acre site located along Taxiway 'B', intended for larger, high-end general aviation facilities, including hangars serving businesses with public auto access. The 120,000 square foot apron is planned to support a mix of large common building/hangars, within hangar development sites ranging from 12,000 to 80,000 square feet.

**Aircraft Maintenance Center:** An 18-acre site located along Taxiway 'B', comprised primarily of a large clearspan hangar and associated ramp area. Northwest Airlines constructed the 189,000 square foot Maintenance, Repair and Overhaul (MRO) facility in 1996, in which the hangar is capable of simultaneously accommodating up to three A319/320 transport aircraft. The hangar includes a 140,000 square foot ramp (Bravo Ramp) with a dedicated earthen berm area to minimize noise during engine run-ups. Since being operated as a MRO, ownership of the facility has reverted to the City of Duluth Economic Development Authority (DEDA).

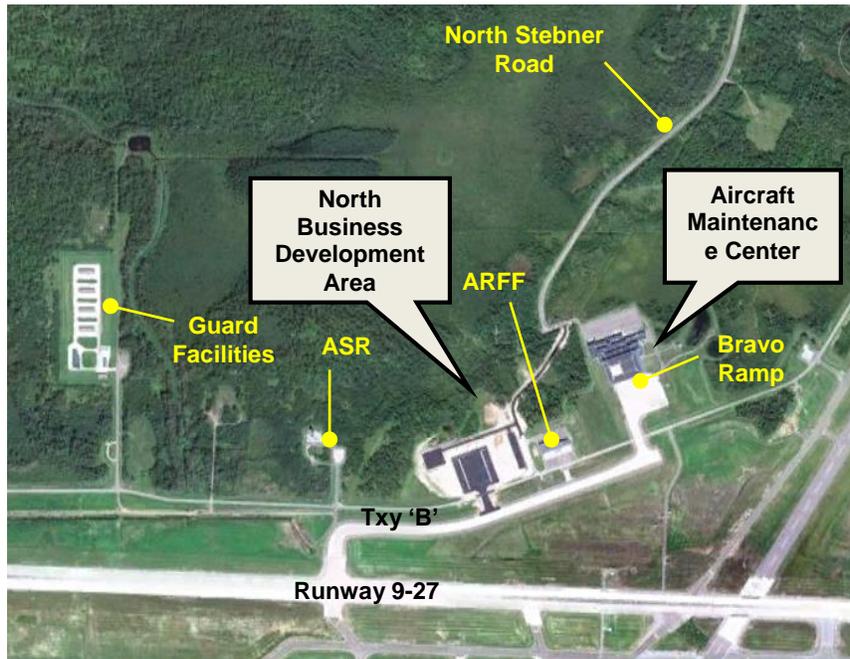
**Aircraft Rescue and Fire Fighting Building (ARFF):** The 3-acre ARFF building site is located along Taxiway 'B', west of the Aircraft Maintenance Complex. Operated by the MNANG, the 19,000 square foot building is in excellent condition, and contains eight vehicle bays with equipment and services for providing military and civilian purposes. The Duluth International Airport is currently classified as a Class I Index B Part 139 facility, however the ARFF equipment and staffing meets the requirements for Index D, including first responder medical services in the airline terminal area. A listing of the FAR Part 139.315 index specifications is provided in Table 3-3.

*Table 3-3*  
**FAR PART 139 INDEX SPECIFICATIONS**

Airport Status	Airport Index	Aircraft Length	Number of Vehicles	Scheduled Daily Departures	Agent and Water Foam Requirements
	A	< 90 Feet	1	1 or more	500 Pounds of DC/HALON 1211 <u>or</u> 450 Pounds of DC and 100 Gallons of Water
<b>Part 139 Certified</b>	B	90 to 126 Feet	1	5 or more	Index A equipment and 1,500 Gallons of Water
			2	Less than 5	Index A equipment and 1,500 Gallons of Water
	C	126 to 159 Feet	2	5 or more Less than 5	Index A and 3,000 Gallons of Water Index A and 3,000 Gallons of Water
<b>Equipped</b>	D	159 to < 200 Feet	3	5 or more Less than 5	Index A and 4,000 Gallons of Water Index A and 4,000 Gallons of Water
	E	200 Feet and Greater	3	5 or more	Index A and 6,000 Gallons of Water

Source: FAR Part 139.315 – Aircraft Rescue and Firefighting Index Specifications

*Exhibit 3-7*  
**NORTHWEST QUADRANT AREA**

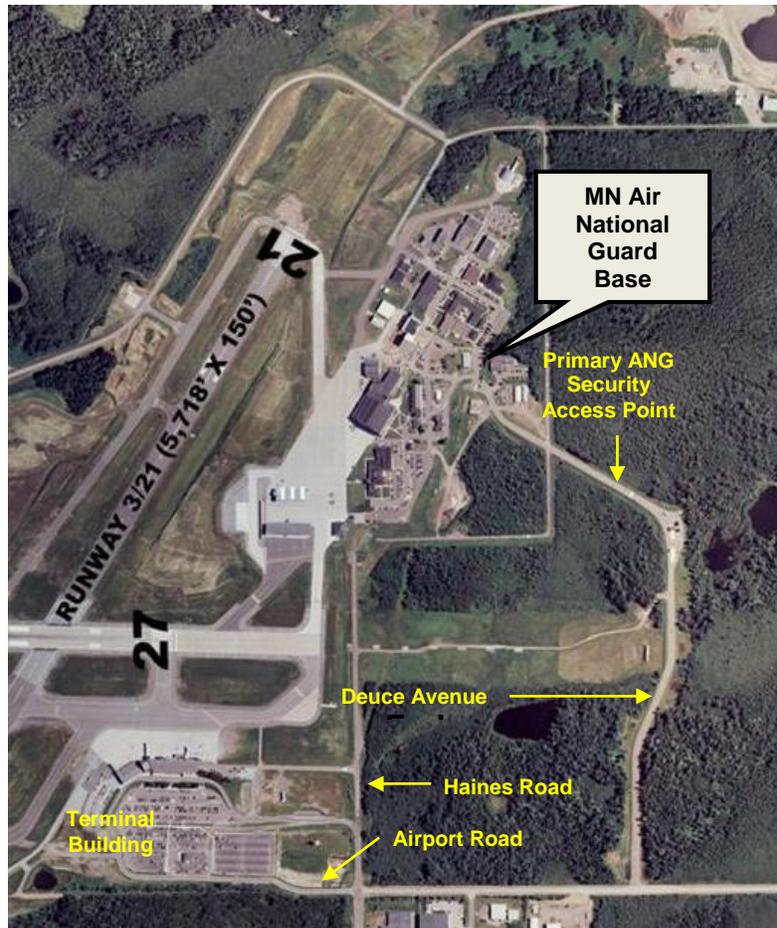


### **3.3.4 Northeast Quadrant**

The Northeast Quadrant contains the Minnesota Air National Guard (MNANG) base facilities as shown on Exhibit 3-8. The Air National Guard's 179<sup>th</sup> Fighter Squadron is the flying component of the 148<sup>th</sup> Fighter Wing, an Air Combat Command unit under control of the 1<sup>st</sup> Air Force. The MNANG has operated the F-16C at Duluth since 2003. In 2010, the Air Wing converted the F-16 Block 50 models to extend the life of the F-16C mission at Duluth.

Airfield access to the MNANG base is via Taxiway 'E1' and 'E2' to the Runway 27 end, and Taxiway 'F' to the Runway 21 end. The secured MNANG vehicle access is provided via Duece Avenue. The Guard leases about 140 acres from the State of Minnesota, which includes the majority of the 60 to 70 buildings operated by the MNANG. In addition MNANG leases a 16-acre site from the Duluth Airport Authority for munitions storage, and a precision measurement equipment lab in the Northwest Quadrant. A Tactical Air Navigation system (TACAN) located about 1,200 feet northwest of the runway intersection is maintained by the MNANG. Also, the Guard operates a snow removal equipment (SRE) building located on the Base, which sometimes supports Airport operations during exceptional snow clearing situations.

*Exhibit 3-8*  
**NORTHEAST QUADRANT AREA**



### **3.4 PASSENGER TERMINAL COMPLEX**

The 30-acre passenger terminal complex is located in the southeast quadrant, and contains the airline passenger building, airline parking ramp, vehicle access routes, and auto parking lots for patrons and tenants.

#### **3.4.1 Former Passenger Terminal Building**

The former 106,000 square foot passenger terminal building was built in 1974, in which the building layout and space allocation became functionally obsolete in the September 11 era of federal security requirements. Additionally, the terminal building was located less than 850 feet from the Runway 9-27 centerline, which often resulted in the tails of parked aircraft penetrating the FAR Part 77 imaginary surfaces extending outward from the runway. As a result, the Duluth Aviation Authority elected to construct a new modern terminal building as a larger and more efficient replacement to the former building. The old terminal building will be demolished and the space converted to aircraft ramp parking in completing the new replacement building.

#### **3.4.2 New Replacement Passenger Terminal Building**

Construction of the new 113,000 square foot passenger terminal began in 2010. The new terminal building, built about 200 feet south of the former building, also involved the expansion of the aircraft ramp parking positions, expansion of the auto parking facilities and realignment of the roadway circulation and curbfront. Exterior images of the new terminal are shown by Exhibit 3-5 and Exhibit 3-9. The layout of the new terminal building is shown by Exhibit 3-10, as described below by level.

**Level 1** - Vehicles approaching the landside of the terminal have the opportunity to drop-off and pick up passengers under a continuous canopy that cantilevers above the sidewalk and the inside drop off/pick up lane. Two vestibules connect the building interior with the curb front, one vestibule leading into the ticketing lobby, and the other leading out of the baggage claim area. Once inside the terminal, the passengers experience a two story high open space with a curved ceiling. Passengers are able to see ticketing counters, baggage claim areas and car rental counters from any point of the lobby. Security screening of all checked bags take place in a room behind the check-in counters. The baggage claim area is designed to accommodate both domestic and international flights. A full U.S. Customs and Border Protection facility is provided adjacent to the westernmost conveyor which can be separated from the rest of the terminal by means of movable partitions.

**Level 2** - Passengers access the second floor of the terminal via the centralized stairs, escalators, and elevator. Departing passengers proceed from the central landside space into the passenger screening zone. This zone allows for the processing of travelers and the inspection of their carry-on bags and directs passengers into the passenger boarding lounge, which is a continuous space that serves the four aircraft gate positions. A food concession, a bar, and two sets of restrooms serve the passenger boarding lounge.

**Level 3** - The third level of the terminal primarily consists of administration office spaces and TSA office spaces. Mechanical rooms contain the housing of heating, ventilation, and air condition equipment provided at each end of the central service core.

The terminal building square footage and percentage of occupancy by major functional area is identified in Table 3-4.

*Table 3-4*  
**NEW PASSENGER TERMINAL BUILDING FUNCTIONAL AREAS**

<b>Major Terminal Building Functional Areas</b>	<b>Area (SF)</b>	<b>Area (%)</b>
Airline Functional Areas	22,520	20%
Security Areas	4,750	4%
Terminal Concessions	3,050	3%
Public Areas	20,810	18%
Non-Public Areas	38,010	33%
Miscellaneous/Additional Areas	24,460	22%
<b>Total Area (SF)</b>	<b>113,600</b>	<b>100%</b>

*Exhibit 3-9*  
**NEW PASSENGER TERMINAL BUILDING**

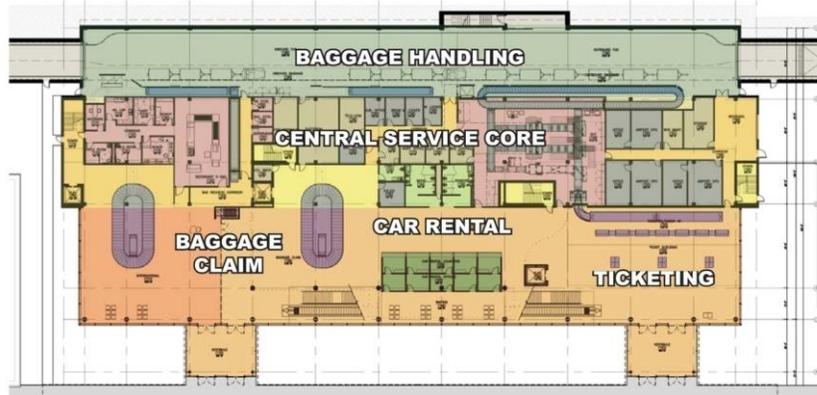


*VIEW OF PASSENGER TERMINAL BUILDING ENTRANCE – CURBSIDE*

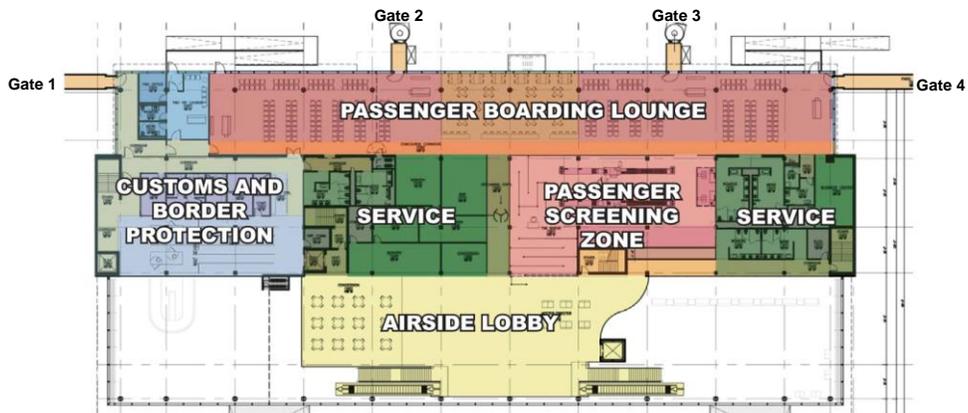


*VIEW OF PASSENGER TERMINAL BUILDING ENTRANCE – AIRSIDE*

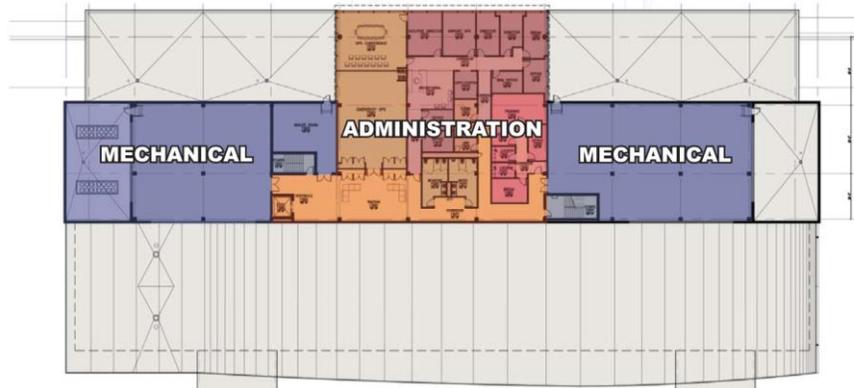
Exhibit 3-10  
**PASSENGER TERMINAL FLOORPLAN  
(FIRST, SECOND, THIRD FLOOR LEVELS)**



FIRST FLOOR PLAN



SECOND FLOOR PLAN



THIRD FLOOR PLAN

### **3.4.3 New Replacement Terminal Gates**

The terminal building is configured with four contact gates utilizing enclosed passenger boarding bridges. While not simultaneously, all gates (Gate #1, #2, #3 and #4) are configured to accommodate narrowbody aircraft up to the size of a Boeing 757, which encompasses all domestic air carrier aircraft anticipated to operate at the Duluth International Airport. In addition, Gate #1 is designated to accommodate international flights, including aircraft larger than the Boeing 757. Gate #1 is connected to the U.S. Customs and Border Patrol terminal building facilities, for the processing of international passenger arrivals.

### **3.4.4 New Replacement US Customs**

The location of the US Customs and Border Protection facilities within the new terminal building is illustrated in Exhibit 3-10. At Duluth, these facilities are used to process passenger flights, techstop cargo operators and military lift flights. Arrival flights requiring federal inspection services are typically accommodated at the Customs Apron, which is located on the west side of the terminal building. Passengers processed through customs typically deplane the aircraft through the west passenger boarding bridge. Arriving military aircraft requiring customs service typically park on the Terminal Apron when the Guard ramp is closed.

### **3.4.5 New Replacement Vehicle Access and Auto Parking**

Grinden Drive (formerly Airport Road) provides terminal access connecting with the intersection of Haines Road and Airport Road. The 4,200 linear foot two-lane entrance roadway provides a one-way loop with access to the terminal building, public auto parking lots, rental car lots, cell phone lot and other secured points of access. The entrance road, with 12-foot at-grade lanes, separates into a divided multi-lane curbfront spanning 750 along the terminal building. The north divided curbfront has three lanes for accommodating passenger loading and unloading, including one outer passing through-lane. The south divided curbfront contains two lanes dedicated to livery transportation, including taxi cabs and shuttle buses.

The auto parking for the new terminal building is summarized in Table 3-5, including the number and percentage of spaces dedicated to various parking functions. Parking totals about 1,300 spaces for both public and private use, including short and long term (economy) parking, a combined rental car ready-return lot, employee-permit parking and a cell phone lot. The inter-connected short and long-term parking have two gated-carded points of access, and are revenue lots with a single collection booth location. Auto parking layouts and lot sizes are sufficient for the existing airline passenger levels.

*Table 3-5*  
**NEW TERMINAL AUTO PARKING (SPACES)**

<b>Auto Parking Lot(s)</b>	<b>Spaces (#)</b>	<b>Spaces (%)</b>
Public Auto - Short Term	90	7%
Public Auto - Long Term	780	60%
Rental Car Lot	280	22%
Employee Lot	140	11%
Cell Phone Lot	10	1%
<b>Total</b>	<b>1,300</b>	<b>100%</b>

### **3.5 AIR CARGO-MAIL FACILITIES**

Scheduled express air cargo operations are conducted by FedEx and UPS, operating daily service using turboprop aircraft (2010), as described below:

FedEx: FedEx typically operates an ATR 42 twin-turboprop aircraft between Duluth and Minneapolis five days a week, or about 520 operations per year. If weather is severe in Minneapolis, an ATR 42 departs Memphis to Duluth and returns to Memphis with a payload reduction to accommodate fuel range. FedEx Air cargo processing facilities are located west of the Runway 3 end, and consist of a 20,000 square foot sort facility with an attached 2,700 square foot office (Building 612), and a 11,300 square foot air operations/equipment storage structure (Building 622) located north of Building 612. Building 622 is an old hangar, in poor condition, energy inefficient, and located within the Runway 3-21 Building Restriction Line (BRL).

UPS: UPS operates daily aircraft service at Duluth as contracted under Bemidji Airlines using a Fairchild Metroliner, conducting about 730 operations per year. UPS does not have cargo sort or processing facilities located on the Airport, but rather processes enplaned and deplaned express package cargo on the FBO/General Aviation ramp using delivery trucks.

Other Cargo – US Mail is transported under contract by the air carrier as belly cargo, and is processed through the air carrier terminal building. Other non-scheduled air cargo and freight is normally processed through the Fixed Base Operator (FBO) facilities.

### **3.6 AIRPORT MAINTENANCE FACILITIES**

The Airport owns and operates a variety of snow removal equipment and general maintenance vehicles which is kept in closed storage. Airport maintenance equipment is stored in four separate locations on the Airport, primarily located in the southwest quadrant. The primary Snow Removal Equipment is Building 303. This building is in good condition and has direct access to the airfield. Sand storage is also kept in Building 303. Building 306, located adjacent to the primary SRE building, is a secondary storage building for SRE equipment and general airport maintenance storage and does not have airfield access. Building 306 is in good condition. The Airport utilizes Building 603 located adjacent to the cargo sortation facility, as a cold storage building. The cold storage building is in poor condition and has airfield access. Also, small maintenance equipment is kept in the terminal building basement.

### **3.7 GENERAL AVIATION FACILITIES**

General aviation facilities are concentrated primarily in the southwest terminal area. While there are multiple aeronautical businesses located on the Airport, most aircraft and pilot services are provided by the Fixed Base Operator (FBO) and other Special Aviation Service Organizations (SASO).

#### **3.7.1 Fixed Base Operator (FBO)**

The Airport is served by a single FBO with core operations located on the General Aviation ramp, south of Runway 9-27. The FBO operates from a 13,500 square foot 2-story building (Building 609), which includes a business center and two attached hangar bays. The FBO also leases and manages other buildings located with the southwest quadrant, including common box and T-hangar units, and assumes a lease to develop hangars and aviation related facilities at the North Business Development Area. Recently the FBO facilities have been expanded to accommodate additional growth, including expansion of the FBO apron towards Taxiway 'A', construction of a new taxilane for additional aircraft parking and to serve new hangars, and roadway improvements.

The FBO provides support for the following general aviation services:

- Aircraft fuel storage & dispensing (100LL and Jet-A) to air carrier operators, charter (techstops) and general aviation operators.
- Aircraft airframe maintenance, engine repair and avionics (Cessna and Cirrus Authorized Service Station and Parts Distributor)
- Aircraft line service and hangar storage
- Pilot and passenger accommodations (lounge, flight planning and office / support space)
- Certified aircraft parachute services

**FBO Techstops:** Techstops are an FBO service which involves a quick-turn of fuel, crew and passenger accommodations, aircraft catering, and other processing for international long-haul passenger and freight flights. Techstops usually represent the largest aircraft using the Airport and typically include on-demand freight operators, charter passenger operators and other contract and ferry flights. Duluth is an attractive techstop Airport because of its geographic proximity to great-circle routes between the Southwest United States and Europe, the 10,000-plus primary runway length, uncongested airspace, and ease of clearing US Customs. Nearly 80 percent of all the Duluth techstop flights are being served on both their inbound and outbound trip segments. Business jet aircraft comprise of 60 to 80 percent of techstops. About 80 percent of the techstops involve clearing US Customs, most clearing customs on the airline ramp. Transport aircraft needing to clear customs typically park on the Airline Terminal Ramp. Techstops are typically accommodated within several hours, and some for 24 hours to provide crew rest. The techstop aircraft range from larger-cabin corporate jets, heavy widebody passenger transports to ultra-large cargo transport aircraft. On average, the FBO receives one business jet techstop per day and one to two large transport techstops per month.

In 2010 when this was written, the FBO was expanding its contract techstop business for serving transport size aircraft, and intended to increase the techstop business to 400 arrivals per year, including three to five international transports per week; and more frequent flights by the Boeing-747 and Antonov aircraft. However, there are several Airport facility limitations in expanding the techstop business at Duluth. This includes the need for a longer secondary runway, and a larger dedicated apron to accommodate multiple and simultaneous techstop parking positions, including de-icing. The secondary runway has insufficient length to accommodate the larger techstop traffic, which is an issue when the Runway 9-27 crosswind component is exceeded, resulting in techstop traffic having to divert or operate from another airport. The FBO estimates a secondary runway length of about 8,500 feet is needed to accommodate large aircraft techstops and diverted aircraft during strong crosswind conditions. These large aircraft techstops would represent approximately 5 percent of the aircraft techstops throughout the year.

**FBO Hangars:** The FBO occupies and manages multiple types of hangars in the Southwest Quadrant, used for a variety of general aviation purposes. The primary FBO building (#609), which contains the FBO offices and attached hangar bays used for aircraft maintenance and transient aircraft storage. The largest aircraft able to be stored in the FBO hangars is a medium to large-cabin business jet, with insufficient hangar width and door clearance height to accommodate the ultra-large cabin jets operating at the Airport (i.e., Gulfstream 400/500, Global Express). The FBO maintains a waiting list of 10 to 12 individual based aircraft prospects, typically demanding small box hangar units.

**FBO Apron:** The FBO aprons serve as aircraft parking, de-icing and maneuvering area, which combined totals 870,000 square feet. The FBO experiences a shortage of aircraft parking space during peak operating periods of the year, and when large techstop aircraft occupy the ramp area, which is compounded by the lack of a connecting apron taxiway between the General Aviation Ramp and the Midfield Ramp, and ATCT line-of-sight issues associated with Taxiway A.

FBO Auto: The primary FBO auto parking is south of FBO building (#609).

### **3.7.2 Special Aviation Service Organizations (SASO)**

There are three Special Aviation Service Organizations located at the Airport, which are involved in aeronautical facilities, but not providing direct pilot and passenger services to Airport customers. A description of their facilities is provided below.

- Cirrus Design: A manufacturer of high performance single-engine piston aircraft headquartered at the Airport since 1994, with facilities located west of the Midfield Ramp. The Cirrus facilities are accessed via Taxiway 'A', with auto access via Airport Road. Cirrus occupies multiple buildings; including a 170,000 square foot aircraft production facility, a 64,000 square foot customer service center and paint building, and a storage hangar (#102) on the Midfield Ramp. In recent years, Cirrus flight activity, which entails testing, familiarization, and pilot training/proficiency, accounts for about 8,000 to 10,000 Duluth operations per year, which equates to about 30 operations per aircraft produced. About 20 percent of the Cirrus flights are conducted at surrounding airports.
- Lake Superior College's Center for Advanced Aviation (CAA): Lake Superior College provides a FAA certified professional pilot degree program as well as traditional flight instruction. The college conducts ground classroom training in Building 616, and stores six fixed-wing aircraft (single and twin piston engine) and one helicopter in the FBO hangar (#7). With an average of 30 enrolled flight students, eight to ten flight training sessions occur per day. The College estimated during an interview that it conducts 10,000 to 12,000 training operations annually at the Duluth International Airport, in addition to flights conducted at surrounding airports. Auto parking for faculty, staff, and students is typically limited and must be shared with other Building 616 tenants and the FAA tower staff.
- Jet Duluth: A based operator with a 9,700 square foot hangar (#117).

### **3.7.3 Aircraft Aprons**

The Airport has nine separate aircraft apron areas used for civilian purposes, as summarized on Table 3-6. The aprons total over 2.0 million square feet and accommodates up to about 95 aircraft parking spaces. The apron areas, all beyond the air traffic control non-movement area, are used by various operators and a broad range of aircraft purposes, including commercial and general aviation users, helicopter landing/parking areas, loading of passengers and cargo, and hangar access.

### **3.7.4 GA Aircraft Hangars**

Aircraft hangar information, including building type, size and ownership is listed on Table 3-7. The hangars, which total over 300,000 square feet, are mostly located in the Southwest Quadrant, and vary from older WW-II era common clearspan hangars to newer individual box and T-hangars. The majority of the hangar buildings are owned by the Airport, with the FBO managing nearly 66,000 square feet of hangar building space. Limited space is available within the southwest quadrant to construct new hangars, particularly for larger turbine and jet aircraft. Planning has been undertaken to identify re-development options for hangar and apron expansion within the southwest quadrant, which includes options for building removal and relocation. The inadequate space has prompted development of new larger hangar facilities on the northwest side of the Airport, along Taxiway B.

*Table 3-6*  
**APRON AREAS (CIVILIAN)**

Apron Name / Designation	Terminal Quadrant	Apron/Ramp Use	Apron Size (SF)	Apron Parking Spaces
Air Carrier - Existing	Southeast	Total Air Carrier (Existing Building)	300,000	4 to 5
Air Carrier - New	Southeast	Total Air Carrier (New Building)	374,000	5 to 6
Midfield Hangar Ramp	Southwest	GA Hangar Ramp / General Parking	552,100	10 to 15
Tower Ramp	Southwest	GA Rental Tie-Down / General Parking	320,250	4 to 8
General Aviation Ramp	Southwest	GA/FBO Tie-Down / General Parking	154,200	10 to 12
Air Cargo Ramp	Southwest	Tenant Aircraft/Hangar Ramp Parking Area	221,300	2
Cirrus Ramp	Southwest	Tenant Aircraft/Hangar Ramp Parking Area	202,000	15 to 20
Bravo Ramp	Northwest	Tenant Air Maintenance Center	140,000	3 to 10
North Development Area	Northwest	GA Hangar Ramp / General Tie-Down	71,550	5 to 15
Subtotal Air Carrier (New Building)			374,000	5 to 6
Subtotal Tenant			563,300	20 to 32
Subtotal General			1,098,100	30 to 50
<b>Total</b>			<b>2,035,400</b>	<b>58 to 95</b>

Note: Parking spaces dependent on aircraft size.  
Source: 2010 PCI Report, Duluth Terminal Apron Expansion Plans (2010).

*Table 3-7*  
**HANGAR BUILDING LIST**

Hangar #	Hangar Type	Hangar (SF) (Building Area)	Building Owner	Tenant (Leasee)
4	Box Hangar	5,700	Monaco (FBO)	--
6	Box Hangar	6,300	Monaco (FBO)	--
7	Box Hangar	6,300	Monaco (FBO)	Lake Superior College
101	Common Hangar	20,000	Confederate Air Force	Confederate Air Force
102	Box Hangar	13,300	Cirrus	Cirrus
103	Common Hangar	23,000	Duluth Airport Authority	--
104 (7/8)	Box Hangar	9,500	Duluth Airport Authority	Cirrus
104 (9/10)	Box Hangar	9,500	Duluth Airport Authority	--
104 (11/12)	Box Hangar	9,500	Duluth Airport Authority	--
104 (13/14)	Box Hangar	9,500	Duluth Airport Authority	--
105	Box Hangar	4,200	Duluth Airport Authority	--
106	Box Hangar	4,200	Duluth Airport Authority	Individual
107	Box Hangar	4,200	Duluth Airport Authority	Individual
108	Box Hangar	3,700	Goldschmidt / Kundel	Goldschmidt / Kundel
117	Box Hangar	9,700	Jet Duluth	Jet Duluth
608	T-Hangar	12,000	Duluth Airport Authority	Monaco (FBO)
609	FBO (Facility/Hangar)	11,600	Monaco (FBO)	Monaco (FBO)
611	Old SRE/Monaco Storage	8,000	Duluth Airport Authority	Monaco (FBO)
612	Fed Ex - Sortation Facility	19,000	FedEx	FedEx
614	Hangars (Ranch Hangars)	10,000	Duluth Airport Authority	Monaco (FBO)
615	T-Hangars	14,000	Duluth Airport Authority	Monaco (FBO)
622	FedEx - Sortation Facility	10,200	Duluth Airport Authority	FedEx
N/A	Airport Maintenance Center	80,500	Duluth Economic Development Authority	--
<b>Total</b>		<b>303,900</b>		

Note: Hangar building areas include all building and and hangar storage area.  
Note: Airport Maintenance Center does not have an assigned Hangar/Building number.  
Source: Duluth Airport Authority

### 3.7.5 Airport Fuel Facilities

The capacity of the FBO owned and operated fuel farm, which includes five tanks totaling 110,000 gallons is summarized in Table 3-8. There are two fuel farm facilities in the Southwest Quadrant area. These facilities include the general aviation fuel farm located behind the FBO (Building 609), and the Air National Guard fuel facilities discussed in the Southwest Area Guard Facilities section. The FBO has a contract with all airlines to refuel aircraft. Primary access from the fuel farm to the airfield is through the FBO T-Hangar site to the general aviation ramp. The fuel farm is in good physical condition, as there is no immediate storage capacity or dispensing deficiencies.

*Table 3-8*  
**AIRCRAFT FUEL STORAGE**

<b>Fuel Tank Owner</b>	<b>Tank Location</b>	<b>Tank Type <sup>1</sup></b>	<b>Fuel Type</b>	<b>Capacity (Gallons)</b>
FBO	Tank Farm - SW Quadrant	AST	Jet-A	25,000
FBO	Tank Farm - SW Quadrant	AST	Jet-A	25,000
FBO	Tank Farm - SW Quadrant	AST	Jet-A	25,000
FBO	Tank Farm - SW Quadrant	AST	Jet-A	25,000
FBO	Tank Farm - SW Quadrant	AST	100LL	10,000
<b>TOTAL</b>				<b>110,000</b>

<sup>1</sup> AST - Above Ground Storage Tank

FBO / Other Auto Parking: The FBO public-use auto parking lot is located directly south of the FBO building. Access to the FBO auto parking lot is provided via a dedicated entrance from Airport Approach Road. Other major commercial/business leaseholders have dedicated auto parking lots available adjacent to their own building/facility.

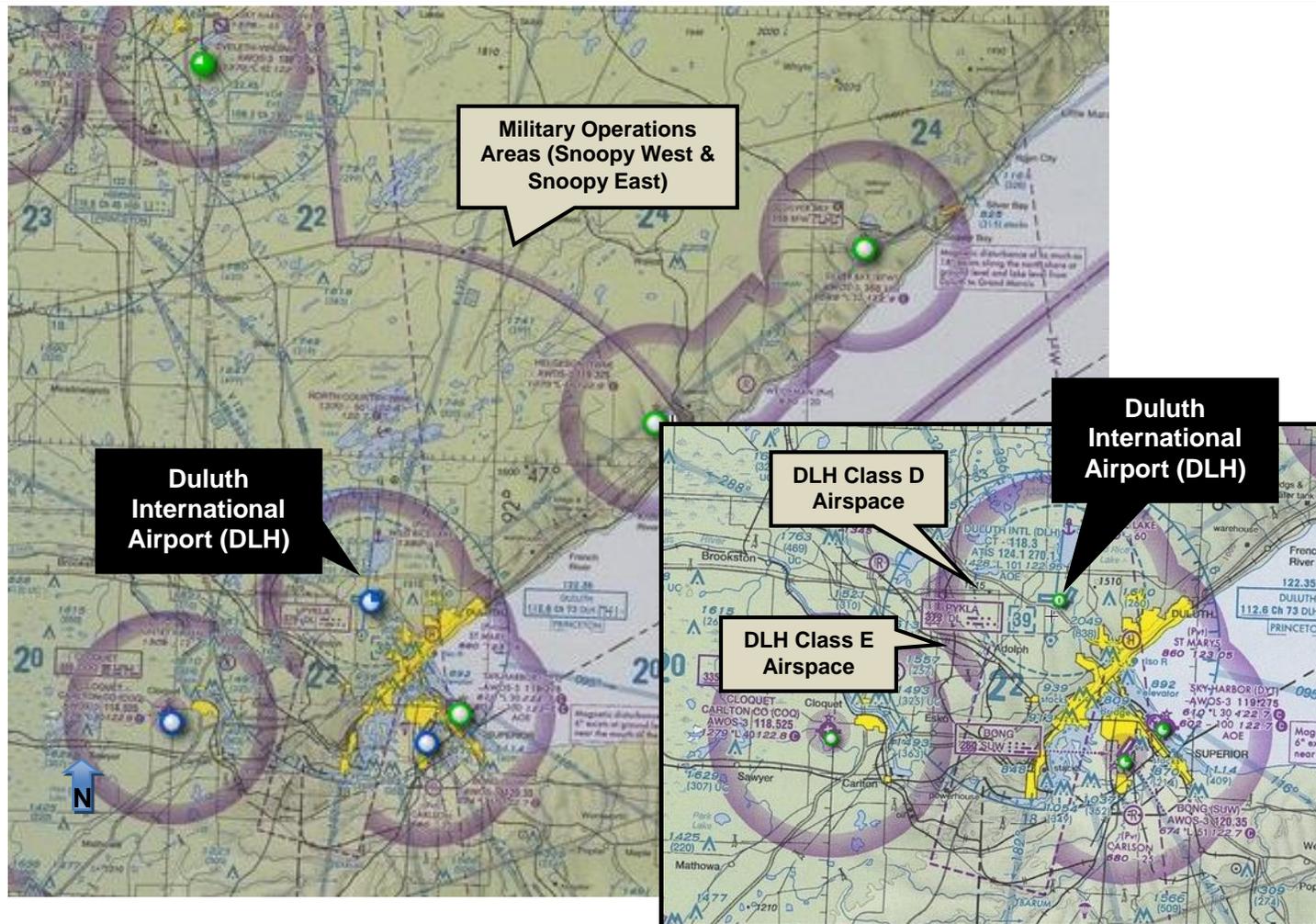
### 3.8 AIRSPACE / AIR TRAFFIC CONTROL

The airspace and navigation system surrounding the Duluth International Airport is depicted in Exhibit 3-11. The types and location of the navigational aids equipment provided at the Airport is listed on Table 3-9. This equipment provides electronic and visual guidance reference to pilots, and supports the instrument procedures at the Airport.

Controlled Class D airspace associated with the Air Traffic Control Tower (ATCT) extends from the surface to 3,900' mean sea level within a 5-nautical mile radius of the Airport, with Class E airspace extending to the south to accommodate an instrument approach corridor, and the controlled airspace associated with instrument procedures at surrounding airports; Sky Harbor Airport (DYT); Bong Airport (SUW) and Cloquet Carlton County Airport (COQ). Multiple visual and jet airway routes transition over the Duluth high-altitude VORTAC, located 4.9 miles south of the Airport.

Duluth air traffic services are conducted under jurisdiction of the level-six Air Traffic Control Tower (ATCT), Terminal Approach Control Facility and Minneapolis Air Route Traffic Control Center. The 24-hour tower and radar facilities are housed in the federal ATCT located 1,800 feet southwest of the runway intersection, in which radar service is provided through an Airport Surveillance Radar (ASR 7) located north of the midfield of Runway 9-27. Due to building age and line-of-sight issues, the ATCT building is under consideration for replacement/relocation.

Exhibit 3-11  
AIRSPACE STRUCTURE (LOCATION & VICINITY)



Source: U.S. DOT and Federal Aviation Administration – Aeronautical Chart.

### 3.8.1 Local Airport Traffic Patterns

The Airport has a standard left-hand traffic pattern (downwind, base and final) for Runway 9-27 and Runway 3-21. The Airport does not impose special traffic patterns/regulations for noise abatement procedures. Any noise complaint issues are typically the result of military operations and originate from residents located approximately two miles west of the Airport or five miles southeast of the Airport.

*Table 3-9*  
**AIRPORT NAVIGATIONAL AID (NAVAID) EQUIPMENT**

Airport NAVAID	Airport Location/Proximity (Safety Area Buffer)
VORTAC (High Altitude)	? 3 Miles South of the Airport (1,000' to 1,500 Buffer) – FAA Owned
TACAN (Military Use)	? 1,200' NW of Runway Intersection (Military) – Military owned
ILS-CAT 2	Runway 9 Glideslope/Localizer (FAA Critical Area) - //fFAA owned
ILS-CAT 1	Runway 27 Glideslope/Localizer (FAA Critical Area) – FAA Owned
NDB (OM)	? 5.2 NM from Runway 27 (FAA Critical Area) – FAA Owned
NDB (OM)	? 5.4 NM from Runway 9 (FAA Critical Area) – FAA Owned
NDB (IM)	? 0.2 NM from Runway 9 (FAA Critical Area) – FAA Owned
RVR	Three locations on the northside of Runway 9-27 – FAA Owned
NDB	? 8.5 NM SW of the Airport (FAA Critical Area) – FAA Owned
RCO	? 4,300' NW of Runway Intersection (FAA Critical Area) – FAA Owned
ASOS	? 1,100' NW of Runway Intersection (500' to 1,000' Buffer) – FAA Owned
ASR-7	? 4,200' NW of Runway Intersection   80' Tall (1,500 Buffer) – FAA Owned
Airport Beacon	? 2,900' SW of Runway Intersection (Clear Line-of-Sight) – Airport Owned

Runway End	Runway Lighting NAVAIDs (Ownership)
9	ALSF-2 (FAA owned), PAPI-4L <sup>/1</sup> HIRL-CL In-pavement <sup>/1</sup>
27	MALSR (FAA owned), PAPI-4L <sup>/1</sup> HIRL-CL In-pavement <sup>/1</sup>
3	PAPI-4L (FAA owned), REIL (FAA owned), HIRL <sup>/1</sup>
21	VASI-4L (FAA owned), REIL <sup>/1</sup> HIRL <sup>/1</sup>

Table Note: NAVAID - Navigational Aid | NM - Nautical Mile | See Appendix for other abbreviations.  
 Table Note:<sup>/1</sup> Owned by the Duluth Airport Authority.  
 Source: FAA Datasheet, Airport Site Visit, U.S. Terminal Procedures Charts.

The following describes specific airspace and air traffic procedural matters at the Duluth International Airport:

**Runway Usage:** The ATCT estimates that over the period of a year, Runway 9-27 is the predominate runway used about 70 percent of the time, and Runway 3-21 about 30 percent. The Airport does experience heavy flight training activity, in which both runways are used simultaneously, as a single runway does not afford efficient traffic pattern separation due to the varying approach speeds. Typically, flight training traffic uses the runway with the most favorable wind conditions; or take-off and landing into the wind. However, during increased levels of traffic, flight training shifts more so to the runway that least disrupts traffic, which tends to be Runway 3-21. Also during periods of heavy Airport activity flight training will shift some operations to surrounding Airports. Land and Hold Short Operations are invoked for civilian traffic only, mainly during periods when the military arresting system is activated.

Airspace: FAA published airspace obstruction information notes objects (trees) within the approach and departure areas. These objects are noted for pilot obstacle clearance purposes as part of the instrument runway departure take-off minimums, for each end. In addition, alternate minimums are published for Runway 9, 27 and 3, but only affect Category E aircraft.

Instrument Approach Procedures: Instrument procedures at the Airport, including approach type minimums, and applicable aircraft categories are listed on Table 3-10. The Airport is served by 15 published instrument approaches, with a straight-in procedure to each of the four runway ends. Visibility is typically at its lowest during the morning hours and tends to affect the first scheduled airline arrivals and departures. The Runway 9 end has the lowest instrument approach minimums with a Category II Precision Instrument Landing System. As part of the instrument procedures, both special alternate minimums and departure procedures apply. The ATCT estimates runway usage for actual instrument approaches between Runway 9 and 27 is about equal, while the instrument procedures to Runway 3 and 21 are critical during strong and gusty wind events to Runway 9-27.

*Table 3-10*  
**INSTRUMENT PROCEDURES**

Runway End	Approach Type	Primary NAVAID	Minimum Visibility (RVR or Miles)	Minimum Ceiling (AGL feet)	Aircraft Category
9	ILS CAT II	ILS	1,200' RVR	100'	A, B, C, D
	ILS or LOC	ILS	1,800' RVR	200'	A, B, C, D, E
	RNAV (GPS)	GPS	2,400' RVR	200'	A, B, C, D, E
	TACAN	TACAN	2,400' RVR	500'	A, B, C, D, E
	HI-TACAN	TACAN	4,000' RVR	500'	C, D, E
	COPTER ILS	ILS	1,200' RVR	200'	COPTER
27	ILS or LOC	ILS	4,000' RVR	200'	A, B, C, D, E
	RNAV (GPS)	GPS	2,400' RVR	250'	A, B, C, D, E
	HI-TACAN	TACAN	4,000' RVR	500'	C, D, E
	TACAN	TACAN	2,400' RVR	500'	A, B, C, D, E
	COPTER ILS or LOC	ILS	2,000' RVR	200'	COPTER
3	VOR or TACAN	VORTAC	1 Mile	400'	A, B, C, D, E
	RNAV (GPS)	GPS	1½ Miles	404'	A, B, C, D
21	RNAV (GPS)	GPS	1 Mile	288'	A, B, C, D
	VOR/DME or TACAN	VORTAC	1 Mile	440'	A, B, C, D, E

NAVAID - Navigational Aid | RVR - Runway Visual Range | Mile - Statute Miles | AGL - Above Ground Level  
 Note: See appendix for other abbreviations.

Source: U.S. Terminal Procedures, U.S. Government Flight Information Publication

### **3.9 MAJOR AIRPORT UTILITIES**

Table 3-11 summarizes the key on-Airport utilities. The Airport electrical vault (Building 301) west of the FBO houses a 2,400 volt diesel generator for standby power for runway and taxiway lights, the Runway 9 PAPI, Runway 3-21 PAPI and the arresting system barriers. Standby power is provided by a 2,400 volt diesel generator located in Building 301 adjacent to the Tower Ramp. It provides back-up power for runway and taxiway lights, the Runway 9 PAPI, the Runway 3-21 PAPI and the arresting system barriers. Independent electrical back-up systems handle the Air Traffic Control Tower, TACAN, and Airport Surveillance Radar (ASR). The Runway 9 and 27 ILS outer and middle markers are served by battery back-up.

*Table 3-11*  
**AIRPORT UTILITIES**

Utility	Utility Provider (Company Name)	Systems/Capacity
Water / Natural Gas	City of Duluth Water and Gas	Water and natural gas services are provided by the City of Duluth Water and Gas. A 10" water main as well as a 10" gas main provide service and cross onto airport property at the intersection of Haines Road and Grinden Drive. These closed loop systems provide service to all areas of the airport, north, south, east, and west of the airfield, and includes DLH airport facilities, MNANG, businesses, local residents, the Federal prison camp, and the Airpark Business District. These systems were extended to provide service to the Airport Maintenance Center north of Runway 9-27. Both lines have the capacity for expanded service for future development. Additionally, a water pressure booster station has been added to the water system extending along the southerly portion of the loop, along airport facilities, to provide adequate fire protection. The terminal is served by a 8" line off this loop.
Electric Power	Minnesota Power	Electric service at the airport is provided by Minnesota Power, which has satisfactory capacity to meet airport needs and development. The primary feed to the terminal area comes from a 3-phase 13.8 KV overhead line, which runs along Haines Road. This overhead line then goes underground at the intersection of Haines and Cargo Roads. Within the terminal itself, three 250 ampere transformers supply power to the terminal facilities. Loads on these systems are adequate to support further expansion as may be required. The MNANG facilities are served by a separate 13.8 KV cable which also runs along Haines Road. Further development of MNANG facilities, or Terminal area, will have no impact on the capacities of the other. Service to the General Aviation and FBO area of the airport are likewise served by a 3-phase, 13.8 KV cable that runs along Stebner Road to those facilities. This line is capable of handling further expansion as required. Other buildings and hangars adjacent to Cirrus and Midfield Ramps are served by another 3-phase, 13.8KV line which shares service with the United States Prison Camp located south of the General Aviation area. The North Development Area and Airport Maintenance Center, is served from a 3-phase, 13.8 KV cable, which runs from Haines Road, underground across the airfield, to that area and facility.
Telecommunications	US West Communications	Telephone service is provided by U.S. West Communications which has adequate capacity to serve existing and any future development at the Airport.
Stormwater and Sanitary Sewer	City of Duluth	Storm water drainage and sanitary sewer systems are provided by the City of Duluth Engineering Department. The sanitary sewer system in place is adequate for existing facilities in the General Aviation and Terminal areas as well as for the future expansion of airport facilities. A new sanitary sewer addition was included to provide necessary service to the Airport Maintenance Center on the northwest area of the airport, as well as future development.
Airfield Drainage	--	Drainage patterns north of Runway 9-27 generally convey surface waters to the north, through a collection basin and further north into Wild Rice Lake (Reservoir). Drainage patterns northeast, south and west of Runway 9-27 convey surface waters converging along Miller Creek Floodway near Arrowhead Road, then continuing southward.
Firefighting (ARFF)	MN Air National Guard (MNANG)	Firefighting is provided by the MN Air National Guard ARFF located north of Runway 9-27. The Airport is currently classified by the FAA as a Class I Index B Part 139 facility, but existing MNANG ARFF equipment and staffing meets the requirements FAA for Index D.

Source: Duluth International Airport (2010).

The Airport utilities provide sufficient coverage and capacity to serve Airport aeronautical and non-aeronautical purposes.

### **3.10 AIRPORT VEHICLE ACCESS**

Convenient, simple, and efficient access to the passenger terminal and other airport facilities is an integral part of the airport system. Airport access is comprised of the off-airport access roadway system and the on-airport road circulation.

### **3.11 OFF-AIRPORT ROADWAY SYSTEM**

The major roadways in the Airport vicinity are described in Table 3-12. State Highway 53 is the principal arterial roadway providing access between the Airport and the City, with a network of surrounding two-lane City and County roads connecting the various airport terminal facilities. Transportation planning occurs at the Duluth-Superior Metropolitan Interstate Council which is the Metropolitan Planning Organization for the Duluth-Superior area, providing planning for the major roadways surrounding the airport. The major roadways listed are also documented on the Transportation Improvement Plan which does not identify any major roadway expansion or realignment improvements within the Airport vicinity. The Airport Layout Plan can be referenced for the other surrounding roadways.

Airport livery vehicle transportation includes on-demand taxi service, rental cars, and public bus service to the Airport provided by the Duluth Transit Authority and schedule bus shuttle service provided by Jefferson Lines.

*Table 3-12*  
**MAJOR ROADWAYS (AIRPORT VICINITY)**

Major Roadways (Ownership)	Road Description	Road Functional Classification	Future Road Plans
U.S. Interstate 35 (Federal/State)	4-Lane Divided Highway	Interstate	N/A <sup>1/</sup>
State Highway 53 (State)	4-Lane Divided Highway	Principal Arterial	None
State Highway 194 (State)	4-Lane Undivided Arterial	Principal Arterial	None
Haines Road (County)	2-Lane Undivided Arterial	Minor Arterial	None
Martin Road (County)	2-Lane Undivided Arterial	Minor Arterial	N/A <sup>1/</sup>
County Highway 48 - Lavaque Road (County)	2-Lane Undivided Roadway	Urban Collector	None
County Highway 4 - Rice Lake Road (County)	2-Lane Undivided Roadway	Minor Arterial	N/A <sup>1/</sup>
Airport Road (City)	2-Lane Undivided Roadway	Minor Arterial	None

<sup>1/</sup>Airport vicinity roadway not affected.

Source: Duluth Metropolitan Transportation Improvement Program (TIP) (2009), City of Duluth Thoroughfare Plan (1998).

#### **3.11.1 On Airport Roads and Circulation**

Grinden Road (formerly Airport Road) is a two-lane loop road that provides access to the passenger terminal curbside and parking and is the point gated access to the airfield perimeter service road. This section of roadway is owned and maintained by the Duluth Airport Authority. Within the southeast quadrant, primary access and circulation is provided by Airport Road and Airport Approach Road which connects with State Highway 53. Within the northwest quadrant, Stebner Road provides primary access to the North Business Development Area. The Airport Layout Plan depicts the on-Airport network of roadways.

### **3.12 METEOROLOGICAL CONDITIONS**

Prevailing meteorological conditions are used to summarize the region's climate for airport planning and aircraft performance purposes, including temperature, precipitation, winds, visibility and cloud ceiling heights. Wind patterns are an important meteorological factor in assessing runway utilization, and for determining runway design requirements in accordance with FAA aircraft category standards.

The average annual temperature for Duluth is 39° Fahrenheit, ranging from 66°F in July to 8°F in January, with an average mean maximum temperature of 76°F occurring during July. There are 2 days that the

temperature exceeds 90°F, and 140 days exceeding 59°F (standard temperature). The average annual rainfall is 31 inches, and 81 inches of snow. The area receives rainfall events totaling more than 0.10" over a 24-hour period on average of 27 days per year, justifying the use of 'wet and slippery' runway length computations. Annually, marginal VFR conditions (less than 3,000' and/or 5 miles) are experienced 30 percent of the time (110 days), with IFR (less than 1,000' and/or 3 miles) occurring 17 percent (62 days).

Exhibit 3-11 graphs the wind patterns plotted from the past 10-years of all-weather wind data observations taken at the Duluth International Airport, with the strongest winds occurring as peaks indicated by the percent of observations. As illustrated, the prevailing winds are generally from the northwest and southeast, with the stronger gusty winds (11-knots and greater) from the east and west. Individually, neither Runway 9-27 nor Runway 3-21 achieves 95 percent crosswind coverage at 10.5-knots; by FAA design standards, this substantiates the need for a secondary runway during all-weather and instrument conditions.

### **3.13 REGIONAL SETTING AND LAND USE**

The regional setting and land use describes the community and land use patterns, the political jurisdictional boundaries and zoning districts in the vicinity of the Airport.

#### **3.13.1 Community Economic Overview**

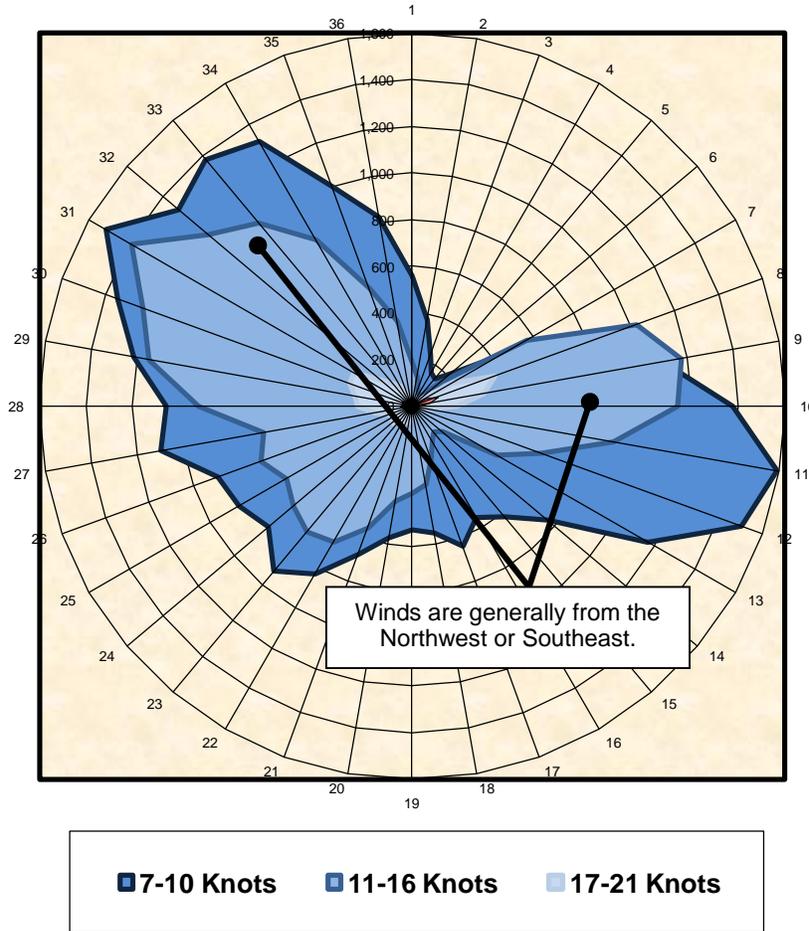
The Duluth International Airport is a major transportation facility in terms of providing an essential public service to domestic and international destinations, and generating significant economic impacts through spending and jobs. The Airport generates over \$3.1 billion in annual impacts to the local economy (2010), including the MN Air National Guard Base. The on-Airport employment totals nearly 768 full time people, in addition to the 771 at the MN Air National Guard.

The Airport, which is a key facility for the transport of people, goods and services, is within a larger regional economic hub encompassing northeastern Minnesota, northwestern Wisconsin, and the western Upper Peninsula of Michigan. Also an important transportation hub, the Duluth-Superior seaport is the largest and farthest-inland freshwater seaport in North America, and one of the leading bulk cargo ports in North America. The region remains a major center for the transshipment of coal, taconite, agricultural products, steel, limestone and cement.

Principal manufacturing firms in Duluth include heavy and light manufacturing plants, food processing plants, woolen mills, lumber and paper mills, cold storage plants, fisheries, grain elevators, and oil refineries. The City is also a regional center for banking, retailing, and medical care for northern Minnesota, northern Wisconsin, northern Michigan, and southwestern Ontario, Canada. The region offers research and development advantages from laboratories that create new economic potential in energy savings, forestry, mining, water and rapid prototyping. Duluth is also an epicenter of aquatic biology and aquatic science, home to the US EPA's Mid-Continent Ecology Division Laboratory and the University of Minnesota Duluth.

The region offers exceptional arts, entertainment and tourism, and 3.5 million visitors contribute to the tourist industry annually. For recreation, Duluth serves as a base for trips to the scenic North Shore, or to fishing and wilderness expeditions in Minnesota's far north, including the Superior National Forest, Boundary Waters Canoe Area Wilderness, and Voyageurs National Park.

Exhibit 3-12  
**WIND PATTERNS / CROSSWIND COVERAGE**



CROSSWIND DATA TABLE				
RUNWAY	10.5 KNOTS	13 KNOTS	16 KNOTS	20 KNOTS
RUNWAY 9-27 (ALL WEATHER)	91.20%	95.81%	99.16%	99.88%
RUNWAY 3-21 (ALL WEATHER)	80.85%	88.91%	96.58%	99.13%
RUNWAY COMBINED (ALL WEATHER)	96.33%	99.03%	99.79%	99.98%
RUNWAY 9-27 (IFR)	91.78%	95.97%	99.13%	99.86%
RUNWAY 3-21 (IFR)	75.80%	85.75%	94.72%	98.60%
RUNWAYS COMBINED (IFR)	95.66%	98.89%	99.71%	99.94%

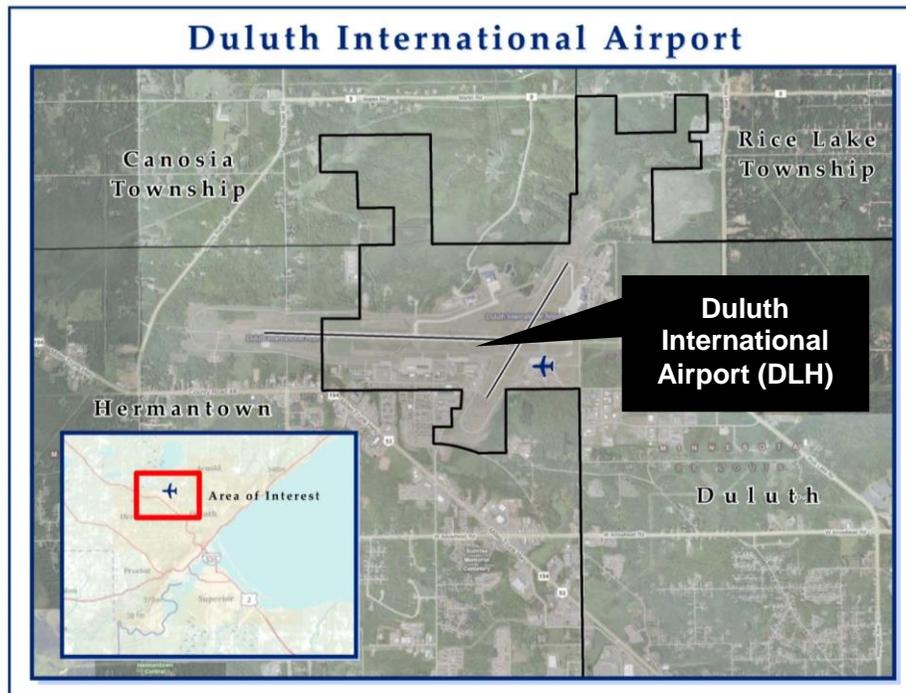
DATA SOURCE: NATIONAL CLIMATIC DATA CENTER, STATION: DULUTH INTERNATIONAL AIRPORT (ASOS).  
 PERIOD OF RECORD: 2000-2009 (ALL WEATHER OBSERVATIONS: 84,636)  
 PERIOD OF RECORD: 2000-2009 (IFR OBSERVATIONS: 8,975)

Source: National Climatic Data Center – Duluth International Airport Observations

### **3.13.2 Political Boundaries**

The Duluth International Airport is operated under the auspice of an Airport Authority which has autonomous jurisdiction within the boundary of the Airport property interests. As shown in Exhibit 3-13, there are four political jurisdictions surrounding the Airport, with some jurisdictional boundaries intersect with the Airport property.

*Exhibit 3-13*  
**SURROUNDING AIRPORT JURISDICTIONAL BOUNDARIES**



Source: Duluth-Superior Metropolitan Interstate Council

The government entities surrounding the Airport include the City of Duluth towards the southeast, the City of Hermantown to the southwest, Canosia Township to the northwest, and Rice Lake Township northeast of the Airport. These entities, through their land use and zoning regulations, have various influences on the land uses surrounding the Airport. The four political jurisdictions are within St. Louis County, in which the County does not assume zoning authority for the surrounding government entities.

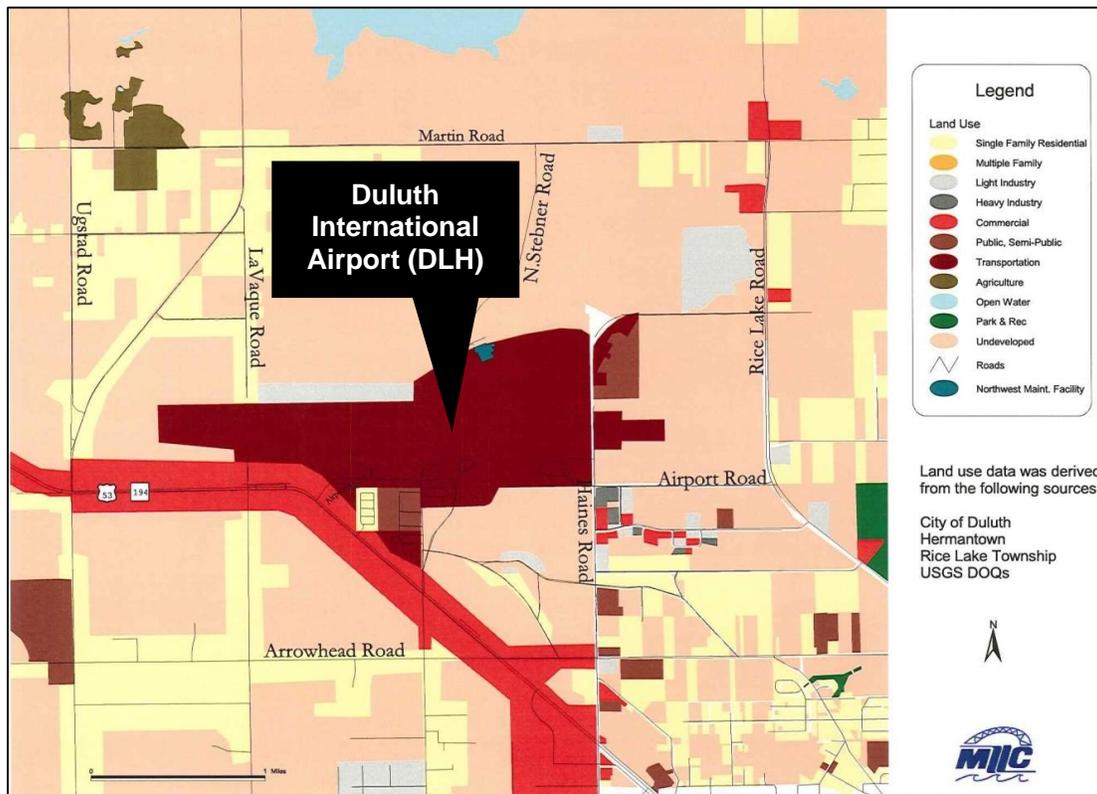
### **3.13.3 Airport Land Uses**

The Duluth Airport Authority controls land use within the Airport boundaries, in which the Airport proper is generally characterized as a public, commercial and transportation land use by the surrounding governmental entities. Existing Land uses in the vicinity of the Airport are generally depicted by Exhibit 3-14. This general exhibit does not include detailed land use such as the mobile homes that are located off of the Runway 3 approach. The Airport is generally surrounded by undeveloped, commercial, and residential land uses. Residential and undeveloped areas generally lie west to Ugstad Road. North of the Airport to Martin Road largely consists of undeveloped land use. Land uses east of the Airport include a mix of undeveloped and residential. South of the Airport includes a mix of commercial, undeveloped, and residential land uses. More dense commercial land uses are located along Highway 53, south of the Airport.

There are currently two facilities located on Airport property that also require safety buffers; the 1,250-foot no-build buffer for the Minnesota Air National Guard Munitions Maintenance Facility (MMF) and the 1,500-foot no-build buffer for the FAA Airport Surveillance Radar (ASR).

More specific information regarding military facilities and future plans is available from the MN Air National Guard which prepares and updates its own Base Master Plan document.

*Exhibit 3-14*  
**AIRPORT VICINITY LAND USE MAP**



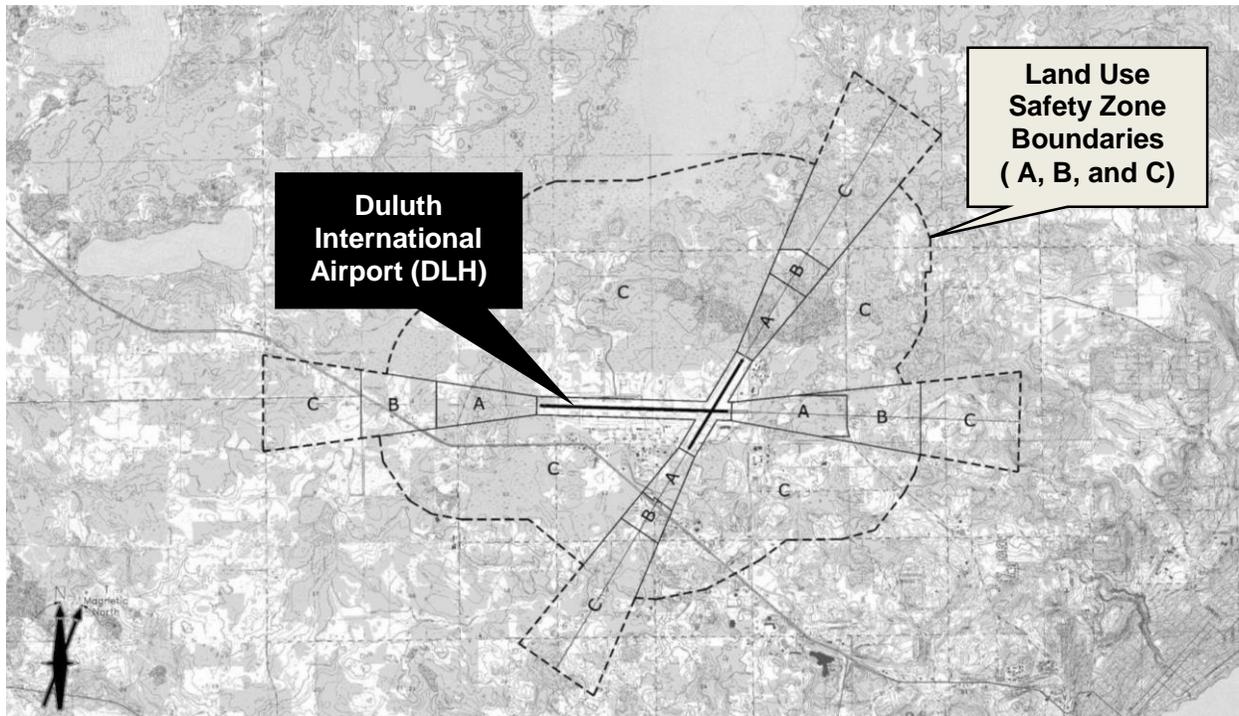
Source: Duluth-Superior Metropolitan Interstate Council.

**3.13.4 Airport Zoning, Land Use & Regulations**

Airport land uses are regulated by the Duluth International Airport Zoning Ordinance, as adopted by the Duluth International Airport Joint Zoning Board in June 1988, pursuant to Minnesota Statutes 360.061 – 360.074. The Joint Airport Zoning Board is comprised of the City of Duluth, City of Hermantown, Canosia Township, Rice Lake Township, and St. Louis County. Overall, the Ordinance regulates the heights of structures and trees through Airspace Obstruction Zones modeled from Federal Aviation Regulation Part 77 Imaginary Surfaces. Land Use Safety Zones A, B, and C are established per Minnesota Rules Chapter 8800.2400 and limits population and building densities as prescribed. The Ordinance regulates Land Use Safety Zones A, B, and C as shown on Exhibit 3-15.

Each governmental jurisdiction whose land is affected by this Ordinance, as specified by sections of land, is responsible for designating a local representative from their zoning or building inspection department who shall serve as Deputy Zoning Administrator, who shall coordinate with the Chief Zoning Administrator and who shall administer and enforce within his jurisdiction the regulations. In addition, the Ordinance contains information on non-conforming uses, permits, variance and administrative procedures.

*Exhibit 3-15*  
**DULUTH INTERNATIONAL AIRPORT – LAND USE SAFETY ZONES**

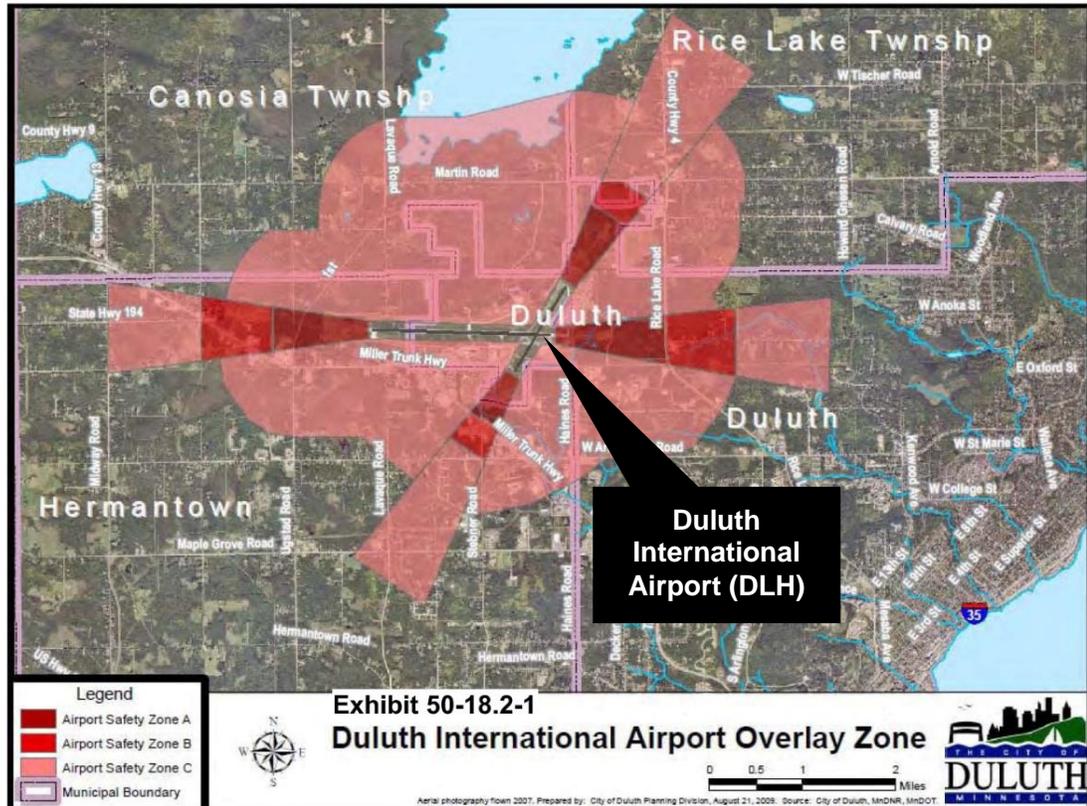


Source: Duluth International Airport Layout Plan, Minnesota Land Use Safety Zones, Sheet 15 (January 2000)

The City of Duluth's Unified Development Chapter from the City's Legislative Code Section 50-18.2 (Airport Overlay; Adopted August 2010) incorporates the Duluth International Airport Zoning Ordinance, as amended, created by the Duluth Airport Authority and the Duluth International Airport Zoning Board under the laws of Minnesota. The ordinance is modeled on the Duluth International Airport Zoning Ordinance adopted in 1988, and revised in May 1996. The Airport Overlay establishes height regulations through Air Space Obstruction Zones modeled from Federal Aviation Regulation Part 77 Imaginary Surfaces and land use compatibility through Mn/DOT Land Use Safety Zones for both Duluth International Airport and Sky Harbor Municipal Airport. The Airport Overlay for the Duluth International Airport is illustrated in Exhibit 3-16.

The Duluth International Airport has undertaken planning efforts in an attempt to implement recommendations from the FAR Part 150 Noise Study conducted in June 1999, and develop strategies to decrease noise impacts to adjacent communities. The Part 150 study developed a Noise Compatibility Program (NCP) for the Airport based on recommended noise abatement and mitigation measures based on the Noise Exposure Map (NEM).

Exhibit 3-16  
DULUTH INTERNATIONAL AIRPORT OVERLAY ZONE  
(CITY OF DULUTH)



Adopted August 16, 2010

Source: City of Duluth

### 3.14 ENVIRONMENTAL SETTING

FAA Order 5050.4B, *The Airport Environmental Handbook*, requires the evaluation of airport development projects as they relate to specific environmental impact categories by outlining types of impacts and the thresholds at which the impacts are considered significant. Table 3-13 provides an overview of each category as it applies to the environs surrounding Duluth International Airport. Early identification of these environmental factors may help to avoid impeding development plans in the future.

*Table 3-13*  
**ENVIRONMENTAL OVERVIEW**

Category	Threshold	In Airport Environ
Air Quality	New development on or adjoining the airport should not significantly offset the air quality in the area. Current light industrial development in the area, strong winds, and the fact that the airport is located in Duluth's higher elevations are factors mitigating the development of conditions conducive to the development of air pollution.	No
Coastal Resources	The site is located in inland areas and would not have an impact on the Coastal Zone Management Program, therefore no impacts under this category are anticipated.	No
Compatible Land Use	The Duluth Airport Authority owns a substantial amount of land around the Airport. Any proposed expansions for the next several years will require very little land acquisition. In addition, the Airport Noise Overlay Zone is in place to minimize future impacts produced by expansion. Any expansion or relocation of Runway 3/21 would need substantial further review in a formal environmental analysis. It should be noted that currently there is commercial and mobile homes built up around the Runway 3 approach and landfills/mining operations in the Runway 21 approach which are not shown on the existing land use map Exhibit 3-14 prepared by the Duluth-Superior Metropolitan Interstate Council.	Yes
Construction Impacts	During the major pavement reconstruction projects, noise impacts during the daylight hours could be expected. Air emissions could temporarily increase due to the presence of constantly running internal combustion engines. Some erosion and subsequent sedimentation in the vicinity of the proposed projects may occur due to earthwork involved. However, adverse impacts relating to noise, air emissions, or dust from the delivery of materials through residential areas, are not anticipated to occur for any proposed development.	Yes
Section 4(f) Land	Section 4(f) lands include historic sites and parks, recreation areas, and wildlife and waterfowl refuges. None of these types of lands are within the boundaries of the Airport, or nearby. Any impacts to Section 4(f) lands that would result from the implementation of the master plan projects will be analyzed in the subsequent environmental documentation.	No
Farmlands	Prime and unique farmland is considered to be available land that is best suited for producing food, feed, forage, and other types of crops. There are no prime and unique farmlands in the vicinity of the Airport.	No
Fish, Wildlife, and Plants	Correspondence from the U.S. Fish and Wildlife Service indicates that no endangered or threatened species are located within the airport property limits; therefore no impact under this category is expected. Coordination is required with the Minnesota Department of Natural Resources if any state-listed species have been identified in this same area as part of an EA or EIS for a major improvement project. Miller Creek represents protected headwaters of a trout stream. Minnesota environmental standards do not allow construction within 250 feet of Miller Creek due to its environmental classification as protected headwaters.	No

Floodplains	Flood plains are defined as lowland and relatively flat areas adjoining inland and coastal waters. Any project that impacts Miller Creek will need an individual evaluation to determine the potential flood plain impact. It is recommended that a hydraulic detailed survey of the Miller Creek flood plain area be conducted should an eastward extension of Runway 9/27 occur in the long term. All other proposed airport projects appear to have a minimal impact on waterways.	Yes
Hazardous Materials, Pollution Prevention, and Solid Waste	A complete analysis of hazardous materials, chemicals, substances, and waste will be completed as part of a formal environmental analysis. This analysis will include identification of any known or likely sites and appropriate review regarding the hazardous nature of any materials or wastes to be used, generated, or disturbed by airport development.	Yes
Historical, Architectural, Archeological, and Cultural Resources	No historic sites are known to be located on airport or in the airport vicinity, and therefore no impacts under this category are anticipated. No sites in this area appear to be eligible for inclusion on the National Register for Historic Places. If historic sites are discovered during the formal environmental analysis and it is anticipated that a possible adverse effect may be imposed on this site, a Determination of Adverse Effect will be required as part of the EA.	No
Light Emissions and Visual Impacts	Light emissions which may create an annoyance to residents in the vicinity of the airport must be taken into account. Currently, impacts from the airport's existing light emissions are confined to on-airport property. The impacts from the installation of future airfield lighting equipment should be minimal. Once the layout of new airfield lighting is known, it should be evaluated to minimize any and all impacts to the surrounding area.	Yes
Natural Resources and Energy Supply	Expansion of airport facilities, such as general aviation, minor adjustment of terminal space over time, or any air cargo facility expansion would increase source energy consumption. Aircraft are the primary users of fuel. If operation forecasts indicate an increase in activity during the planning period, additional fuel will be consumed.	Yes
Noise	A significant noise impact would occur if noise sensitive areas were to experience an increase in the day/night noise level (DNL) of 1.5 decibels or more at or above a DNL of 65 decibels when compared to the no action alternative for the same timeframe. The subsequent environmental documentation will provide an analysis of noise impacts that would occur as a result of the implementation of master plan projects. Recommendations from the prior Part 150 Study show a strong pro-active position has been taken to prevent future non-compatible land use around the Airport. Development of the runway system may change the current noise counters. Noise studies may be necessary to determine if there is a significant change.	Yes
Secondary (Induced)	For major airport development proposals, there is a potential for induced or secondary impacts on surrounding communities. Implementation of improvements identified in the Airport Master Plan Update for the Airport is expected to have a positive economic impact on the communities of south St. Louis County.	Yes
Socioeconomic, Environmental Justice, and Children's Environmental Health and Safety Risks	It is necessary to evaluate the impacts of the acquisition on the surrounding communities such as the mobile homes in the Runway 3 approach. If the proposed development necessitates relocation or community disruptions, further analysis is required. It is expected that proposed projects in the Master Plan will result in a positive long-term socioeconomic impact for the area.	Yes

Water Quality	Although proposed airport developments will generally increase the amount of airport impervious surfaces at the Airport, water quality of the surface or subsurface waters should not be adversely affected as long as a detailed storm water management plan is developed and all permit requirements and local regulations are met. Further review in any formal environmental analysis will be necessary for each project on an individual basis. The FBO deices aircraft on a designated area on the Terminal Ramp. Deicing also takes place on the Midfield Ramp and the General Aviation Ramp. There is no deicing pad with a glycol recovery system installed to meet EPA requirements nor is any required by the EPA at this time.	No
Wetlands	Proposed construction in the vicinity of the wetlands requires a permitting process involving preliminary wetlands assessments. Wetland impacts will occur if Runway 3-21 is extended or Taxiway 'C' extended to the northeast. This proposed project (2,400' Runway 3-21 extension northeast with parallel Taxiway 'C') would impact up to 12 acres of wetlands which would require replacement off of the airport and clear of aircraft flight paths and movement areas. These wetlands have a large value to the surrounding community, but tshe extent of this impact will need to be evaluated during development layout to minimize the impact. There are several wetlands areas on the northwest area that can be found in the National Wetlands Inventory database. Therefore future development in this area is strictly limited.	Yes
Wild and Scenic Rivers	No rivers appear to be located within the vicinity of the Airport. For this reason, there would be no impacts to wild and scenic rivers.	No

Sources: FAA Order 1050.1E, Change 1; FAA Order 5050.4B.