

2015 ANNUAL REPORT TO THE LEGISLATURE



PREPARED BY THE METROPOLITAN AIRPORTS COMMISSION
MARCH 2016



TABLE OF CONTENTS

1. METROPOLITAN AIRPORTS COMMISSION (MAC)	1
1.1 OVERVIEW	1
1.2 2015 MAC HIGHLIGHTS	2
1.3 MAC STRATEGIC PLAN	2
1.4 MAC SUSTAINABILITY PROGRAM	3
2. MINNEAPOLIS-ST. PAUL INTERNATIONAL AIRPORT (MSP)	4
2.1 OVERVIEW	4
2.2 MSP AIRPORT FACILITIES	5
2.2.1 Airfield.....	5
2.2.2 Terminal 1-Lindbergh.....	7
2.2.3 Terminal 2-Humphrey.....	8
2.2.4 Light Rail and Bus Transit.....	8
2.3 AIRPORT ACTIVITY AND SERVICE TRENDS	9
2.3.1 Passenger Originations/ Destinations and Connections.....	11
2.3.2 Annual Revenue Passengers.....	11
2.3.3 Annual Aircraft Operations.....	11
2.3.4 Nonstop Markets.....	12
2.4 COMPARISON OF MSP FORECAST WITH ACTUAL ACTIVITY	15
2.5 TECHNOLOGICAL AND CAPACITY ENHANCEMENTS	17
2.5.1 FAA Area Navigation (RNAV) Procedure Implementation at MSP.....	17
2.5.2 Ongoing Precision Instrument Approach Capabilities.....	18
2.5.3 Converging Runway Operations.....	19
2.6 AIRFIELD CAPACITY AND DELAY	20
2.6.1 Airfield Capacity.....	20
2.6.2 Airfield Delay.....	20
2.7 MSP LONG TERM COMPREHENSIVE PLANNING AND MSP 2020 IMPROVEMENTS	25
2.7.1 MSP 2035 Long Term Comprehensive Plan.....	27
2.8 AIRCRAFT NOISE MITIGATION PROGRAM DEVELOPMENT	27
3. RELIEVER AIRPORTS	30
3.1 OVERVIEW	30
3.2 RELIEVER AIRPORT FACILITIES	30
3.2.1 Airlake Airport (LVN).....	30
3.2.2 Anoka County-Blaine Airport (ANE).....	31
3.2.3 Crystal Airport (MIC).....	31
3.2.4 Flying Cloud Airport (FCM).....	31
3.2.5 Lake Elmo Airport (21D).....	32
3.2.6 St. Paul Downtown Airport (STP).....	32
3.3 HISTORIC AND FORECAST ACTIVITY LEVELS	33
3.4 DEVELOPMENT PROGRAMS	37
3.4.1 Airlake Airport (LVN).....	37
3.4.2 Anoka County-Blaine Airport (ANE).....	37
3.4.3 Crystal Airport (MIC).....	37
3.4.4 Flying Cloud Airport (FCM).....	37
3.4.5 Lake Elmo Airport (21D).....	37
3.4.6 St. Paul Downtown Airport (STP).....	38

1. METROPOLITAN AIRPORTS COMMISSION (MAC)

1.1 OVERVIEW

The Metropolitan Airports Commission (MAC) was created in 1943 by the Minnesota Legislature to promote air transportation in the seven-county metropolitan area. The MAC's 15-member board of commissioners, which sets the MAC's policies, consists of 13 appointments by Minnesota's Governor and one appointment each by the mayors of Minneapolis and St. Paul. The MAC's policies are implemented by the MAC's Executive Director/Chief Executive Officer and staff.

The MAC airport system is comprised of seven airports: Minneapolis-St. Paul International Airport (MSP) and six reliever airports. The reliever airports include Airlake, Anoka County-Blaine, Crystal, Flying Cloud, Lake Elmo and St. Paul Downtown. **Figure 1-1** shows each MAC airport location.

In 1989, the Minnesota Legislature adopted the Metropolitan Airport Planning Act. This legislation required the MAC and the Metropolitan Council to complete a comprehensive and coordinated program to plan for major airport developments in the Twin Cities. The planning activities were designed to compare the option of expanding MSP at its current site with the option of building a new airport elsewhere.

The analysis, known as the Dual-Track Airport Planning Process, was completed in March 1996. On April 2, 1996, legislation was passed by both the House and Senate and signed by Governor Arne Carlson that terminated further study of a new airport and directed the MAC to implement the MSP 2010 Long Term Comprehensive Planning process.

This same legislation requires the MAC to prepare an Annual Report to the Legislature that describes recent MSP activity, current and anticipated capacity and delay for its airfield and terminals, and technological developments that could improve airport efficiency.

In 2006, the 1996 legislation was amended to require the MAC to include an update on its six reliever airports in the annual report and to submit the report to the Legislature by March 30 each year.

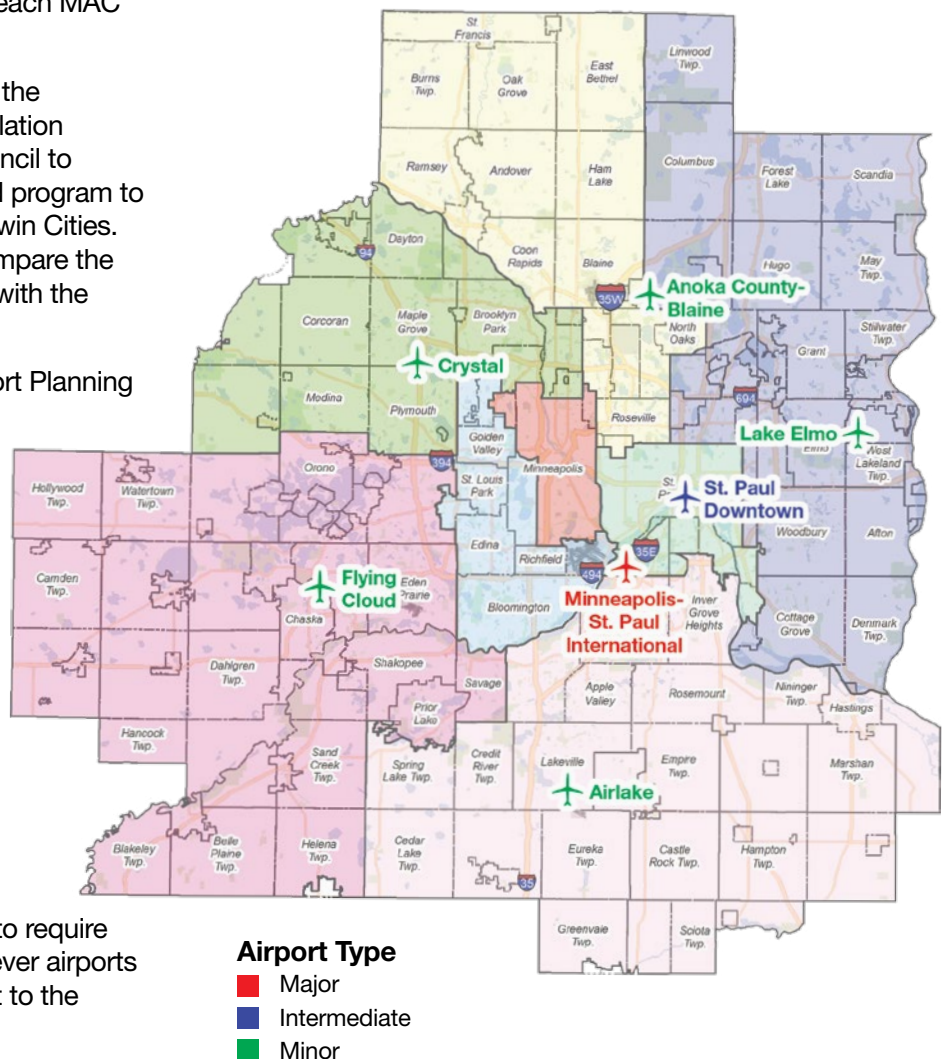
The 2015 Annual Report to the Legislature is divided into three sections:

1. Metropolitan Airports Commission (MAC)
2. Minneapolis-St. Paul International Airport (MSP)
3. Reliever Airports

These sections are further subdivided into sub-sections pertinent to the various facilities.

METROPOLITAN AIRPORTS COMMISSION AIRPORTS IN THE SEVEN-COUNTY TWIN CITIES METROPOLITAN AREA

Figure 1-1



1.2 2015 MAC HIGHLIGHTS

Leadership Change

In 2015, The MAC initiated a national search for a new Executive Director/CEO after the current standing MAC Executive Director/CEO Jeff Hamiel announced his intentions to retire in 2016.



Mr. Hamiel is the nation's longest serving hub airport CEO; serving in his current role since 1985. As the CEO, Mr. Hamiel has steered the MAC through a series of airline bankruptcies and mergers, the \$3 billion MSP 2010 expansion program, development of the most extensive airport noise mitigation program in

the nation, implementation of historic new aviation security measures following the 2001 terrorist attacks, and planning for \$2.5 billion in improvements aimed at meeting MSP's infrastructure needs for the next 20 years.

Mr. Hamiel joined the MAC in 1977 as the organization's first Noise Program manager, and he is a Minnesota native.

Emmy Award

In January 2015, a giant hockey rink was erected at St. Paul Downtown Airport in order to host 2015 Hockey Day Minnesota events. More than 10,000 people converged on the airport for the games, which earned a regional Emmy Award. The event was sponsored by FOX Sports North in conjunction with the National Hockey League's Minnesota Wild, Minnesota Hockey, Serving Our Troops, and Wells Fargo.

Communication On-Demand

The MAC expanded its public outreach and customer communication tools in 2015, with new subscription-based email news and information service and an in-terminal texting program that enables travelers at MSP to communicate with MAC representatives in real time via text. These new tools, coupled with live streaming and video-on-demand viewing of MAC board meetings, are part of a larger effort to enhance communication and transparency in the MAC board policy deliberations and decision-making.

1.3 MAC STRATEGIC PLAN

The MAC's core mission is to provide and promote safe, convenient, environmentally-sound and cost-competitive aviation services for its customers. The organization's strategic plan provides a framework for fulfilling that mission.

¹ The Metropolitan Airports Commission 2016-2017 Strategic Plan

STRATEGIES FOR MOVING THE ORGANIZATION FORWARD¹:

1. Provide a Safe and Secure Environment

Ensure that all our employees and customers experience a safe and secure environment.

2. Assure Financial Viability

Ensure the MAC has the financial resources necessary to operate our airport system, meet all debt service obligations in any scenario and maintain our existing bond ratings.

3. Provide a Great Customer Experience

Ensure all the MAC's customers can enjoy the best airport experience in North America.

4. Develop Employee Talent

Have the right people with the right skills and experience in the right place to fulfill the MAC's mission and achieve its vision.

5. Enhance Air Service at MSP

Provide airlines and the traveling public with expanded alternatives by enhancing domestic, regional and international air service at MSP.

6. Leverage Resources and Technology

Take full advantage of resources and technology to improve performance, increase productivity and deliver cost-effective services.

7. Strengthen Partnerships and Relationships

Expand effectiveness through internal teamwork and strengthened external relationships and partnerships with tenants, concessionaires, airlines, neighboring communities, regional businesses and governmental entities.

8. Integrate Sustainability into Our Culture

Formally incorporate sustainability into the way the MAC does business.

Additionally, three "Wildly Important Goals" (WIGs), crafted in keeping with Franklin Covey's Four Disciplines of Execution. The MAC's WIGs are:

1. Maintain MSP's "overall Satisfaction with the Airport" Airport Service Quality score (based on customer surveys) at 4.28 or better as we redesign and enhance the MSP customer experience through 2017.
2. Use implementation of Microsoft SharePoint to improve internal MAC communications and collaboration and foster a single-enterprise culture by December 2017.
3. Support the long-term financial viability of the reliever airports system by increasing new tenant aeronautical and non-aeronautical investments a minimum of \$6 million by December 2017.

1.4 MAC SUSTAINABILITY PROGRAM

The MAC defines sustainability as a positive approach that recognizes the social, environmental and economic impact of MAC actions and their importance to the wellbeing of the MAC airport system, now and into the future. Since its kick-off in 2014, the MAC Sustainability Program has been working to develop and deliver the organization's first Sustainability Management Plan (SMP).

The strategy framework for the SMP was developed through extensive coordination efforts during 2015, and included organization-wide facilitation workshops with MAC staff and Commissioners, and hosting stakeholder interviews to gather feedback and insight on the top issues and solutions. These efforts and contributions were essential for benchmarking local and national sustainability achievements.

In addition to establishing a foundation for its sustainability program, the MAC joined several collaborative initiatives to better engage with the sustainability community and experts external to the MAC including the Interagency Climate Adaptation Team (ICAT), the Sustainability Practitioner's Roundtable, and the Sustainable Growth Coalition.

The SMP is anticipated to be completed in 2016, and is grant-funded by the Federal Aviation Administration.



Beekeeping for Veterans partnership project pollinator site.



Energy-saving LED technology light fixtures in MSP parking ramps.



Solar Energy installation at Terminal 1-Lindbergh's parking facility.

2. MINNEAPOLIS-ST. PAUL INTERNATIONAL AIRPORT (MSP)

2.1 OVERVIEW

MSP is the only large hub airport in Minnesota, drawing heavily from a five-state region that includes Minnesota, Iowa, North Dakota, South Dakota and Wisconsin. Funding for operations at MSP and the entire system of MAC airports is generated through rents and fees paid by airport users; the MAC receives no appropriation from the State's General Fund. Although the MAC has authority to issue property taxes in the seven-county metropolitan area, it has not done so since 1969.

Economic Impact

The 2013 Minneapolis-St. Paul International Airport Economic Impact Study² found that MSP generates more than \$10.1 billion annually for the Twin Cities economy and supports more than 76,000 jobs, including nearly 20,000 jobs related directly to MSP operations and development. The average salary among the dozens of businesses and organizations operating at MSP is more than \$66,000 a year, well above Minnesota's median household income.

Visitors arriving via MSP spend \$1.9 billion in the local economy per year, generating 24,500 direct jobs. The airport also contributes significant funding for federal, state and local government programs by producing more than \$600 million a year in tax revenues

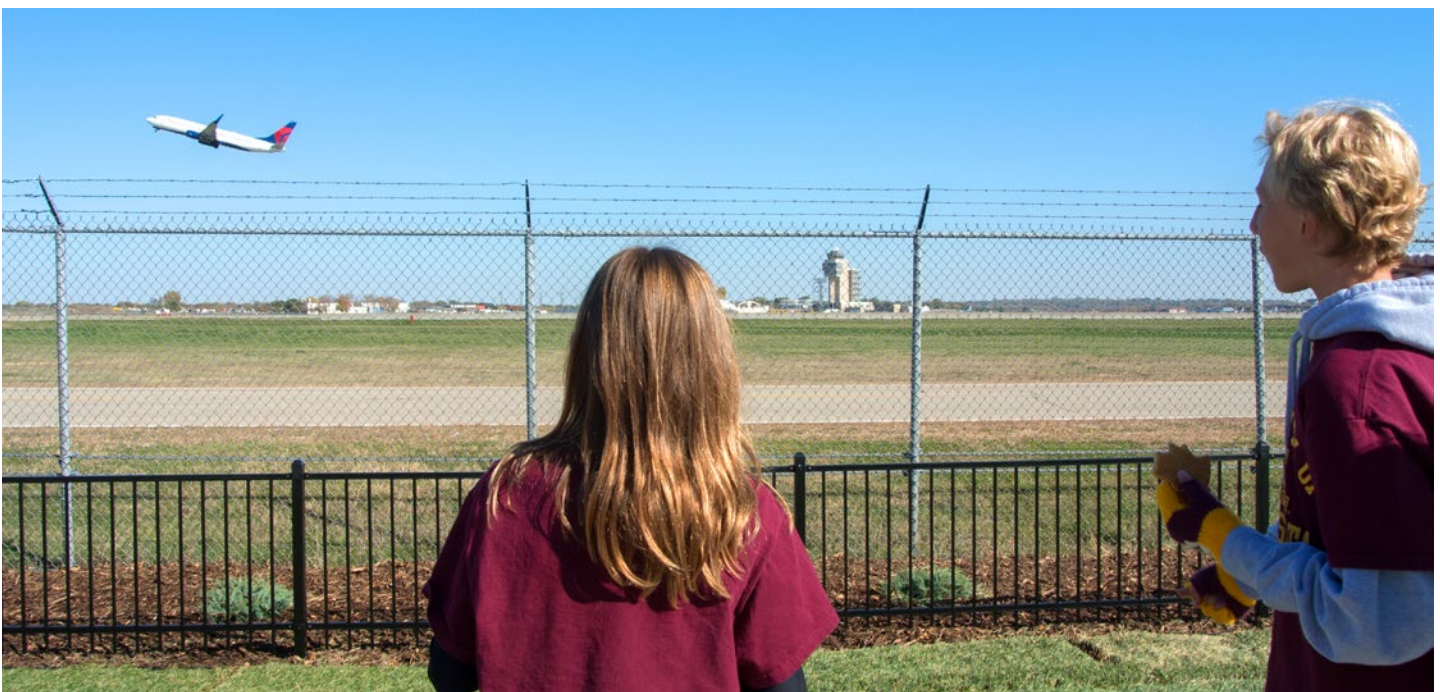
Noteworthy Accomplishments

A new outdoor aircraft viewing area opened to the public in October 2015. Located across from the FedEx cargo facility in the heart of MSP's airfield, the facility provides spectacular views of aircraft landings and takeoffs. Picnic tables and benches enable aviation enthusiasts to relax and watch activities on the nation's 17th busiest airfield.³

In December 2015, the largest solar energy generation system in Minnesota was commissioned at MSP. Constructed atop two parking ramps at Terminal 1, the 3-megawatt facility will reduce the airport's demand for energy from non-renewable sources. As part of the project, the MAC also converted more than 7,700 metal halide light fixtures to energy-saving LED technology and added four additional electric vehicle chargers for use by customers parking in the airport's ramps. The solar project will reduce greenhouse gas emissions by an estimated 6,800 metric tons annually – the equivalent of taking 1,435 vehicles off the road each year. The program will be expanded to Terminal 2 in 2016, where a 1.3-megawatt solar energy system will be built atop the Purple parking ramp.

² The Minneapolis-St. Paul International Airport Economic Impact Study was prepared and published by InterVISTAS (March 15, 2013)

³ Airports Council International, North America, Top North American Airports – 2014 Traffic Count (<http://www.aci-na.org/content/airport-traffic-reports>).



The outdoor aircraft viewing area opened to the public in October 2015.

2.2 MSP AIRPORT FACILITIES

2.2.1 Airfield

The MSP airfield is approximately 3,400 acres in size and consists of two parallel runways, one north-south runway and one crosswind runway. Runway 4-22 is 11,006 feet long; Runway 12R-30L is 10,000 feet long; Runway 12L-30R is 8,200 feet long; and Runway 17-35 is 8,000 feet long. **Figure 2-1** shows MSP's current layout, and **Table 2-1** summarizes the major airport components.

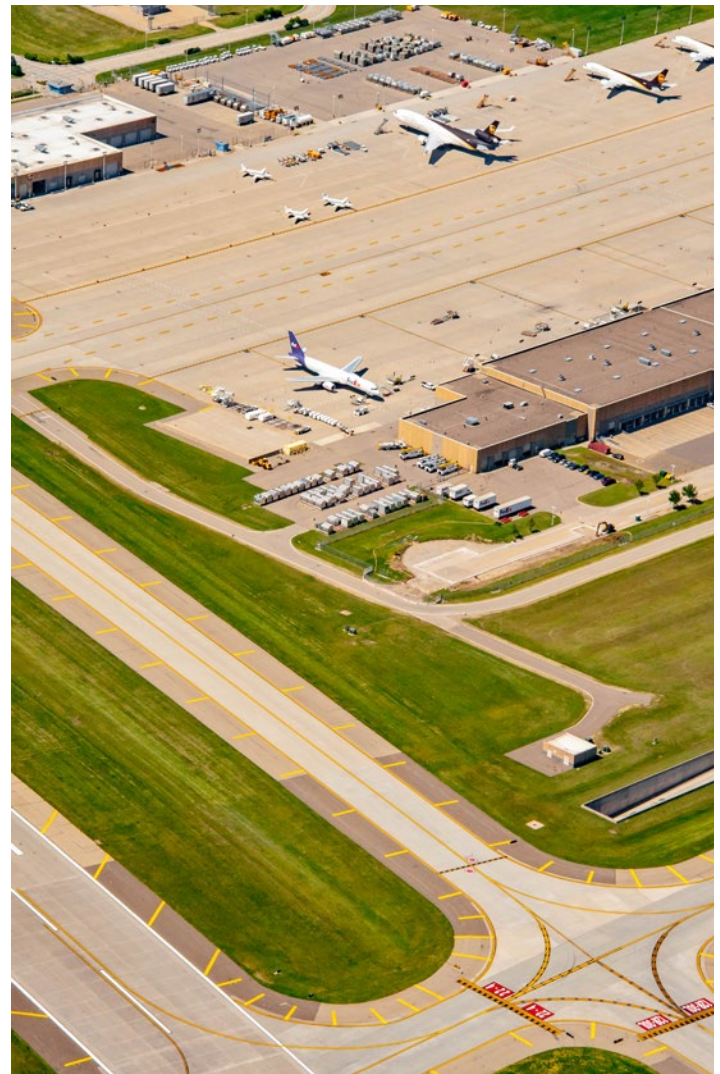
Deicing pads are located near the ends of each parallel runway. Runway 17-35 has a seven-position deicing pad near its north end to accommodate departures to the south. Each of these deicing pads have facilities

nearby for recharging deicing trucks and for providing a rest area for deicing crews. A combined operations and maintenance facility adjacent to the Runway 12L deicing pad serves to coordinate deicing operations on all pads.

There are two cargo aprons (50 acres total) located at MSP: Infield Cargo Apron and West Cargo Apron. The Infield Cargo Apron is situated between Runway 12R-30L and Runway 17-35 and supports a FedEx cargo sort facility and a UPS facility. The West Cargo Apron accommodates a multi-tenant cargo facility. Three aircraft maintenance hangars are located on an apron on the western edge of the airfield.

TABLE 2-1 EXISTING AIRPORT FACILITIES

Airport Components	Quantity
Runways	
East-West Parallel (Runways 12L-30R and 12R-30L)	2
North-South (Runway 17-35)	1
Crosswind (Runway 4-22)	1
Total Runways:	4
Terminal Building Facilities	
Terminal 1-Lindbergh million sq. ft.	2.8
Terminal 2-Humphrey million sq. ft.	0.6
Total Terminal Square Footage (millions):	3.4
Gates	
Terminal 1-Lindbergh Gates	111
Terminal 2-Humphrey Gates	10
Total Gates:	121
Public Auto Parking	
Terminal 1-Lindbergh	14,420
Quick Ride Ramp ⁴	1,319
Terminal 2-Humphrey	8,861
Total Public Auto Parking Spaces:⁵	24,600



⁴ MSP Quick Ride Ramp was opened in March 2015.

⁵ These data reflect revenue-control equipped public parking.

Note: These data may fluctuate slightly throughout the year. Counts reflected represent available facilities as of December 2015.

Source: Metropolitan Airports Commission.

MINNEAPOLIS-ST. PAUL INTERNATIONAL AIRPORT (MSP)

FIGURE 2-1

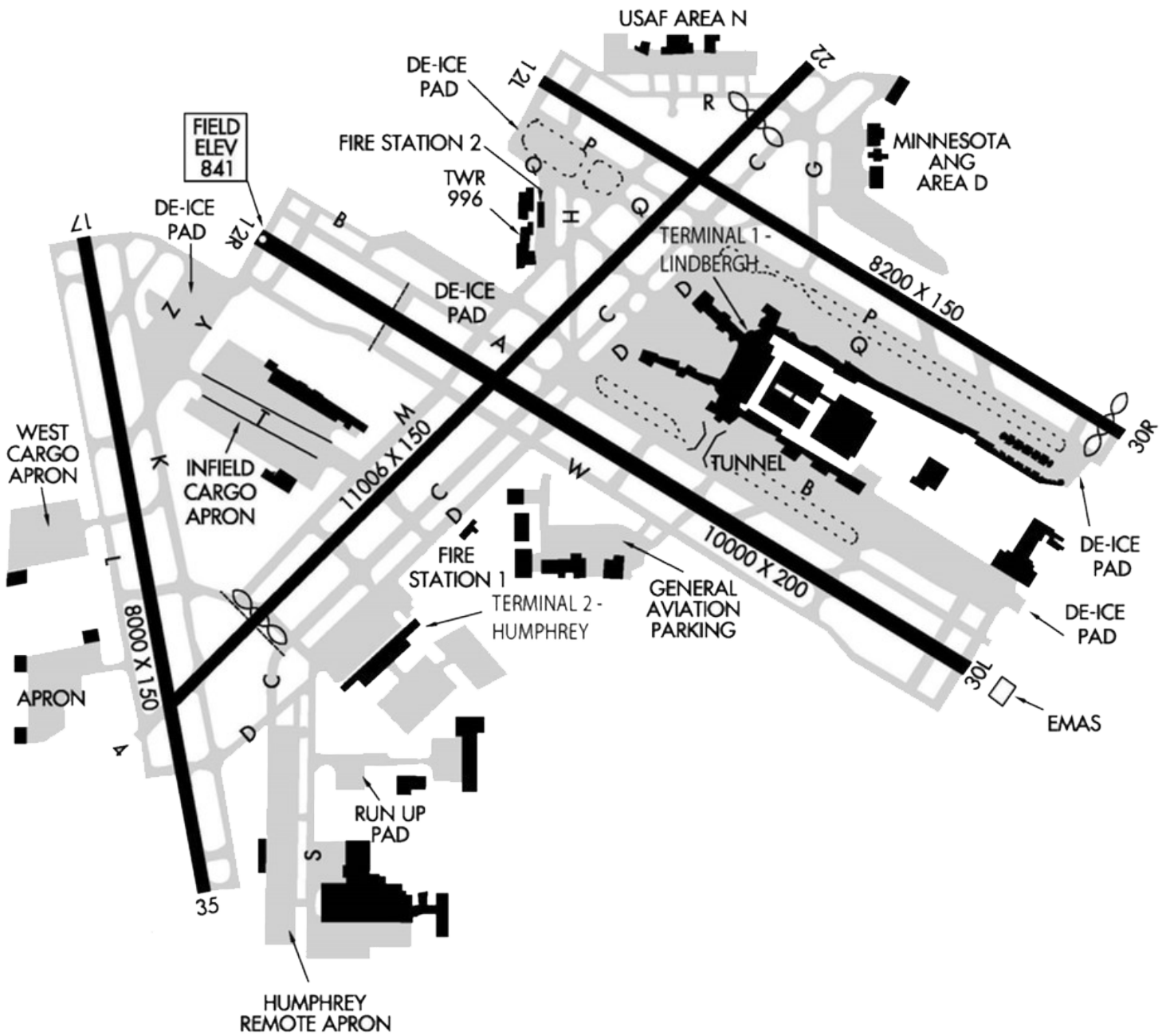
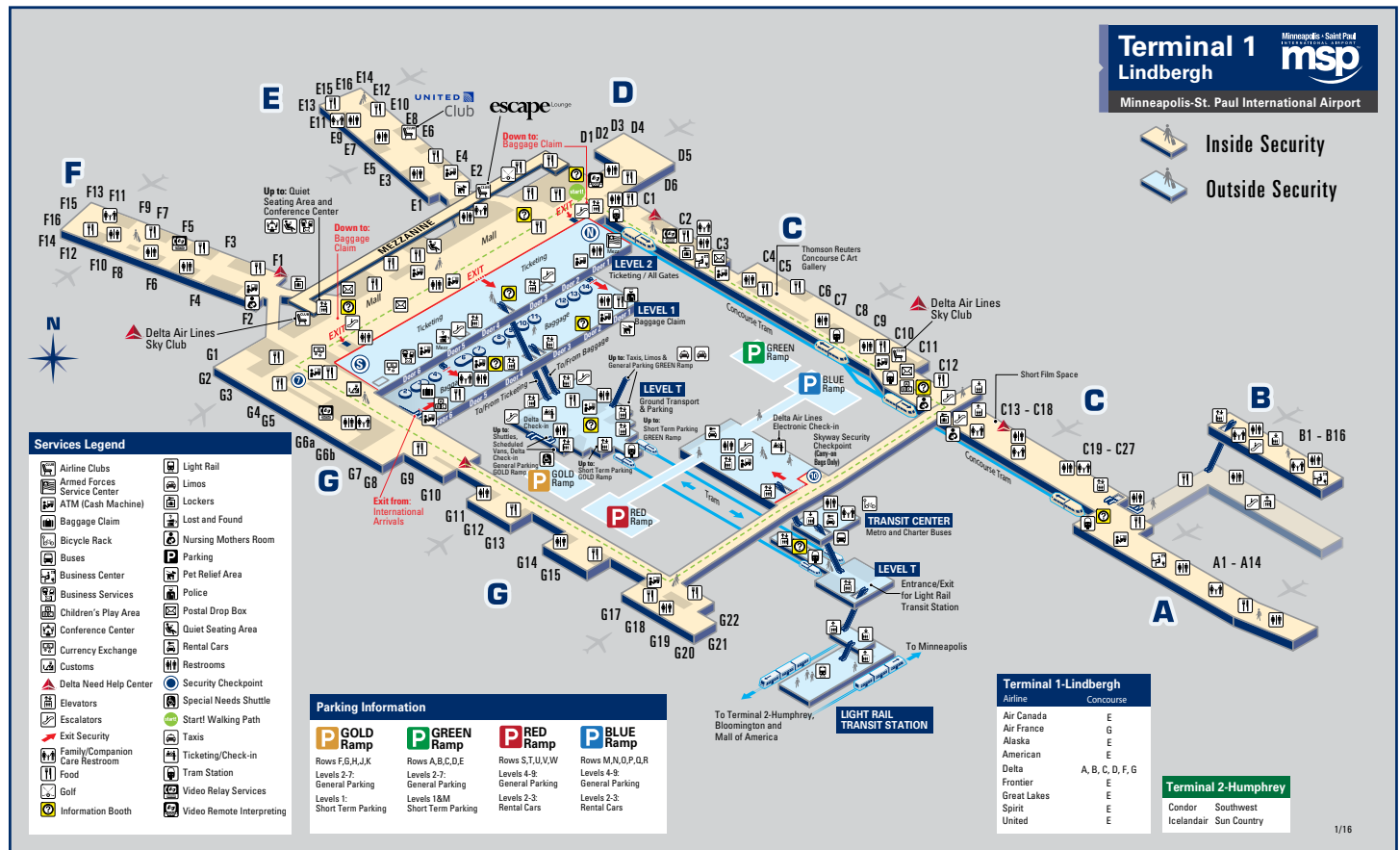


Figure 2-2



2.2.2 Terminal 1-Lindbergh

Terminal 1-Lindbergh is the largest terminal at MSP. It opened in 1962 and was named the Charles A. Lindbergh Terminal in 1985. Since 2010 this terminal is referred to as Terminal 1-Lindbergh (Terminal 1).

Terminal 1 is located between the north and south parallel runways, east of the crosswind runway. **Figure 2-2** displays a layout of the facilities, which house single-loaded and double-loaded concourses and 111 gates. Ten of those gates support international arrivals into the International Arrival Facility.

Nine airlines operated out of Terminal 1 in 2015: Air Canada, Air France, Alaska Airlines, American Airlines, Delta Air Lines, Frontier Airlines, Great Lakes Airlines, Spirit Airlines, and United Airlines.



The MAC took action to address parking congestion at Terminal 1 by opening a Quick Ride Ramp in March 2015. This new public parking option was developed in a former Northwest Airlines employee parking ramp and provides 1,319 lower-cost parking spaces to accommodate overflow traffic from Terminal 1 ramps. Quick

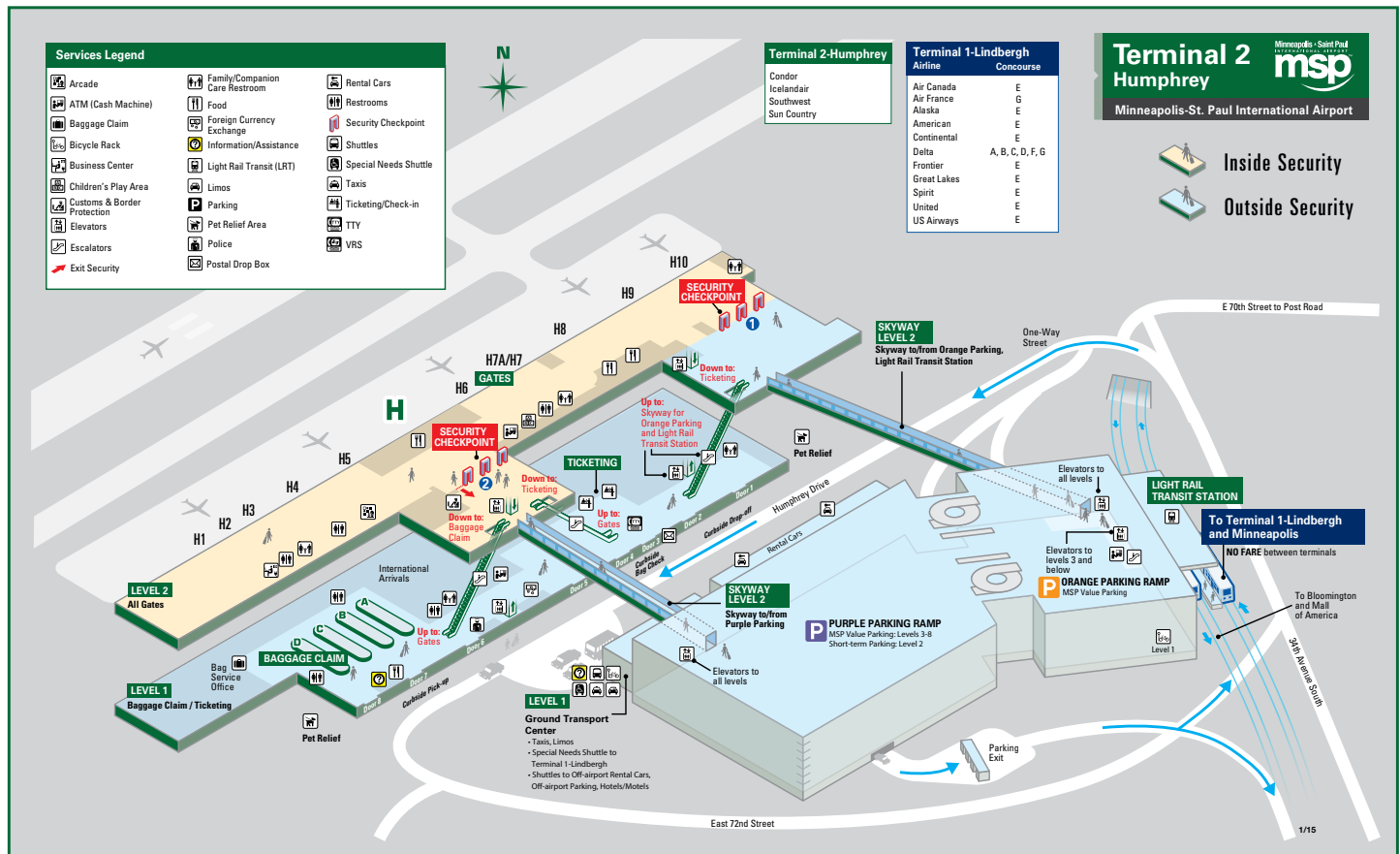
Ride parking shuttles pick up passengers at their vehicles and transport them to Terminal 1 and back, a five-minute ride each way. Longer term, the MAC plans to construct a new 5,000-space parking ramp adjacent to the current Red and Blue ramps attached to Terminal 1 to accommodate increased parking demands projected into the future.

Two lactation rooms for nursing mothers opened in Terminal 1 in 2015, and 50 new food and retail concepts were selected through a competitive public proposals process. The new concessions will be constructed in phases throughout 2016 and 2017. MSP's concessions program has been widely recognized as one of the best in North America, and the renovations are designed to build on that success with modern new venues that showcase Minnesota fare and appeal to a wide range of tastes.

2.2.3 Terminal 2-Humphrey

Terminal 2-Humphrey originally opened in 1977 with four gates and was named for Hubert H. Humphrey. A new terminal replaced the original terminal in 2001. Since 2010 this terminal is referred to as Terminal 2-Humphrey (Terminal 2). The building layout of Terminal 2 is depicted in **Figure 2-3**, and includes an International Arrival Facility.

Figure 2-3



Terminal 2 is located southwest of the parallel runways and consists of 10 common-use gates that were used by four airlines in 2015: Condor, Icelandair, Southwest Airlines, and Sun Country Airlines.



Green roof installation at Terminal 2-Humphrey.

In order to ease congestion at Terminal 2 and to provide additional capacity for competitive air service, in January 2015 the MAC moved Spirit Airlines from Terminal 2 to Terminal 1. Spirit’s move provided space for the carrier’s continued rapid growth and opened gate capacity at Terminal 2 for additional service by Southwest and hometown carrier Sun Country Airlines.

To address longer term capacity issues at Terminal 2, the MAC began constructing four additional aircraft gates in 2015. The project includes new passenger amenities such as an indoor pet relief area, facilities for nursing mothers and MSP’s first green roof. The expansion will be completed in late 2016.

2.2.4 Light Rail and Bus Transit

The Metro Transit METRO Blue Line provides light rail transit (LRT) for MSP travelers and visitors commuting between terminals and off-airport locations from Target Field in downtown Minneapolis to the Mall of America in Bloomington, MN.

The Terminal 1 Station at MSP is located below ground at the south end of the Terminal 1 parking complex, and the Terminal 2 Station is located directly east of Terminal 2. Free service is provided for travel between the two airport LRT stations. A bus station at ground level above the Terminal 1 Station provides additional transit service and connectivity between the LRT and bus systems.

Metro Transit estimates daily average rides at MSP in 2015 rose 23.9 percent from 2014. There were approximately 5,881 rides per weekday at MSP in 2015, compared with 4,746 in 2014.


2.3 AIRPORT ACTIVITY AND SERVICE TRENDS


This section highlights an overview of the airline and passenger activity, and aircraft operations trends at MSP in 2015.

The airline industry experienced a very profitable year in 2015. MSP's passenger total increased to 36,582,854, a 4.0 percent increase over the 2014 passenger total of 35,163,190. This represents the sixth consecutive year MSP's total passenger activity has grown over the previous year. Total passenger activity for 2015 was the second highest in MSP's history, trailing 2005 – the peak year – when 37,663,664 total passengers utilized MSP.


Total originating revenue passengers increased to 9,791,389 in 2015, up 5.3 percent from the 2014 total of 9,298,618. This sets 2015 as the peak year for originating revenue passengers. Total connecting revenue passengers also increased to 7,939,017 in 2015, up 3.0 percent from the 2014 total of 7,709,095. The peak year for connecting revenue passengers was 2004 with 9,247,016.

 Delta Air Lines is the largest service provider at MSP and operates out of Terminal 1. Delta Air Lines and its regional partners averaged approximately 380 flights per day from MSP to more than 130 destinations worldwide in 2015. Delta's market share of MSP passengers in 2015 was 72.8 percent, less than its market share of 74.0 percent in 2014. In 2015, Delta added service to Honolulu, HI (HNL); Manzanillo, MX (ZLO); and St. Maarten, SX (SXM), and grew existing service to Boston, MA (BOS); Philadelphia, PA (PHL), Seattle, WA (SEA); Paris, FR (CDG), New York-JFK, NY (JFK); Cleveland, OH (CLE); and Oklahoma City, OK (OKC).


 Frontier added service to Atlanta, GA (ATL) and Philadelphia, PA (PHL) in 2015; however, Frontier is not resuming service to these markets in 2016.

 Sun Country again experienced double-digit growth at MSP in 2015, operating 10.7 percent more departures than 2014, increasing the number of departing seats by 14.6 percent. Sun Country Airlines added service to Savannah, GA (SAV); Gulfport-Biloxi, MS (GPT); Manzanillo, MX (ZLO); and Nassau, BS (NAS). In addition, Sun Country grew existing service to essentially every destination it serves. Sun Country provides service to 36 destinations from MSP. Twenty-five of Sun Country's destinations are operated on a seasonal basis with the following destinations receiving year-round service: Boston, MA (BOS); Cancun, MX


(CUN); Washington-National, DC (DCA); Dallas-Fort Worth, TX (DFW); New York-JFK, NY (JFK); Las Vegas, NV (LAS); Los Angeles, CA (LAX); Orlando, FL (MCO); Fort Myers, FL (RSW); San Diego, CA (SAN); and San Francisco, CA (SFO).

 United Airlines, due mostly to up-gauging, operated 17.6 percent more seats at MSP than 2014. In 2014, United averaged about 74 seats for each departing aircraft, in 2015 it averaged about 94 seats. Service to San Francisco, CA (SFO), Newark, NJ (EWR), and Los Angeles, CA (LAX) increased by 49.4 percent, 33.8 percent, and 28.7 percent respectively.

 American Airlines and US Airways officially became one airline, upon conversion to a single reservation system on October 17, 2015. Overall passengers for the combined airline increased by about 2.5 percent over total passengers in 2014.

 Spirit Airlines continued to operate 13 routes from MSP in 2015, which are the same destinations they served in 2014. Spirit Airlines operates four of these routes year-round and five routes operate on a spring-summer basis; the remaining four routes operate on a fall-winter basis.

 Icelandair increased service by about 40.9 percent in 2015, by expanding service through December 2015, compared to suspending service in October 2014.

 Great Lakes Airlines continued to manage the effects of the industry-wide pilot shortage resulting from federal regulatory changes to Airline Transport Pilot (ATP) certification requirements. Great Lakes Airlines eliminated service to Essential Air Service (EAS) market Watertown, SD (ATY). This follows the elimination of six EAS markets in 2014. Great Lakes continued serving Thief River Falls, MN (TVF) and Huron, SD (HON) in 2015.

Tables 2-2 and 2-3 depict the revenue passenger activity comparison for all air carriers serving MSP markets in 2015. **Table 2-2** shows the ranking of airlines based on MSP Revenue Passengers gain/loss between 2013 and 2015. **Table 2-3** indicates the ranking of airlines based on their market share at MSP in 2015. Delta Air Lines experienced the highest passenger gain from 2013 to 2015, and shows the highest revenue market share in 2015.

TABLE 2-2 MSP REVENUE PASSENGER SUMMARY

Rank	Airline	2013	2014	2015	Gain/Loss	% Change
					2013-2015	2013-2015
1	Delta	24,502,530	25,216,478	25,844,791	1,342,261	5.48%
2	Sun Country	1,515,394	1,672,881	2,051,647	536,253	35.39%
3	Spirit	612,438	996,858	1,029,510	417,072	68.10%
4	United	1,238,473	1,297,274	1,567,854	329,381	26.60%
5	Frontier	354,257	456,105	453,762	99,505	28.09%
6	Southwest/AirTran	1,810,118	1,885,779	1,884,704	74,586	4.12%
7	Icelandair	40,657	40,263	56,795	16,138	39.69%
8	Air France	45,739	41,957	60,100	14,361	31.40%
9	Air Canada	70,010	63,503	82,726	12,716	18.16%
10	Condor	-	9,825	10,581	10,581	---
11	Alaska Airlines	189,928	185,017	193,548	3,620	1.91%
12	Great Lakes	50,045	11,462	8,765	(41,280)	-82.49%
13	American/US Airways	2,329,063	2,188,969	2,244,409	(84,654)	-3.63%
Total		32,758,652	34,066,371	35,489,192	2,730,540	8.34%

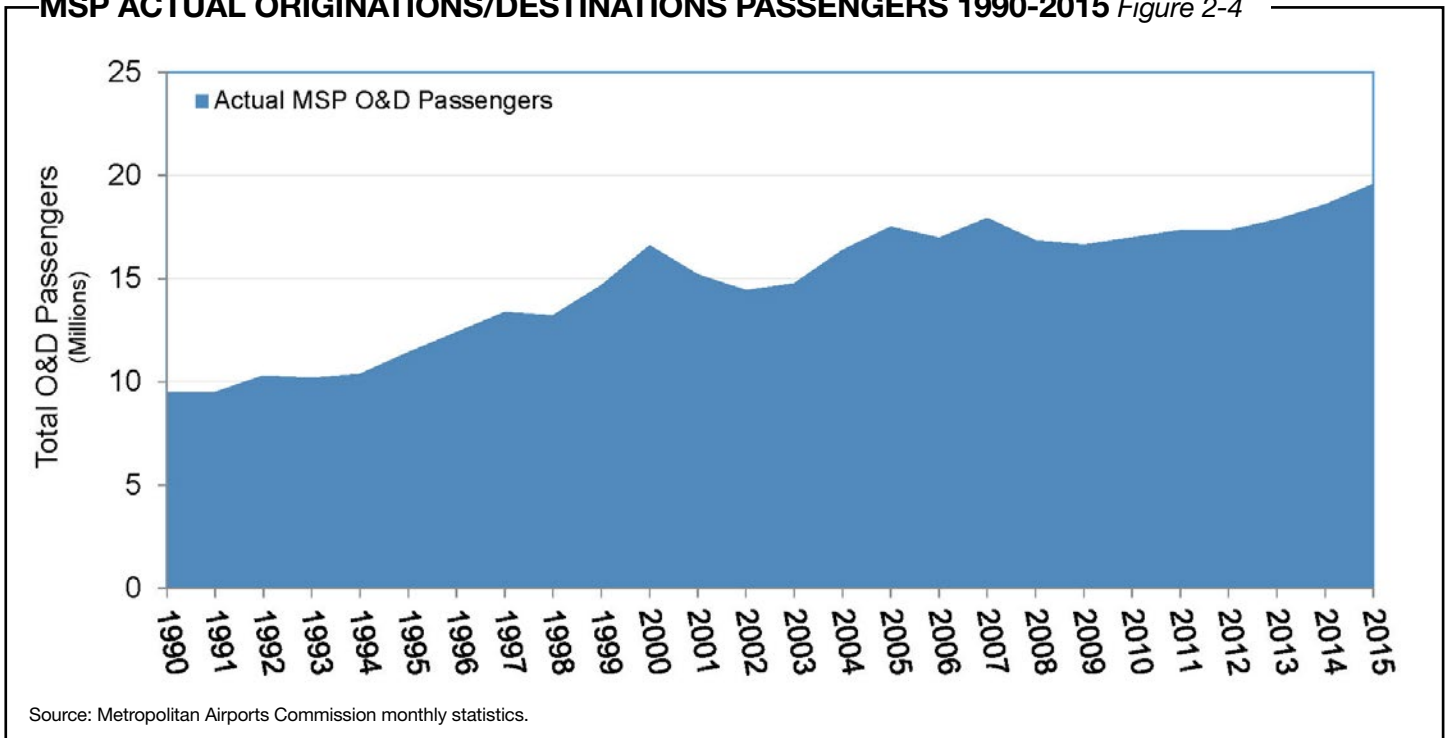
Source: MAC Operations Report-01-26-2016

TABLE 2-3 MSP REVENUE PASSENGER MARKET SHARE

Rank	Airline	2013	2014	2015	Gain/Loss	% Change
					2013-2015	2013-2015
1	Delta	75.06%	74.02%	72.82%	-2.24%	-2.98%
2	American/US Airways	7.11%	6.43%	6.32%	-0.79%	-11.05%
3	Sun Country	4.63%	4.91%	5.78%	1.15%	24.86%
4	Southwest/AirTran	5.53%	5.54%	5.31%	-0.22%	-3.97%
5	United	3.52%	3.81%	4.42%	0.90%	25.51%
6	Spirit	1.87%	2.93%	2.90%	1.03%	55.13%
7	Frontier	1.08%	1.34%	1.28%	0.20%	18.39%
8	Alaska Airlines	0.58%	0.54%	0.55%	-0.03%	-5.95%
9	Air Canada	0.21%	0.19%	0.23%	0.02%	9.05%
10	Air France	0.14%	0.12%	0.17%	0.03%	21.27%
11	Icelandair	0.12%	0.12%	0.16%	0.04%	33.36%
12	Condor	-	0.03%	0.03%	---	---
13	Great Lakes	0.15%	0.03%	0.02%	-0.13%	-83.53%

Source: MAC Operations Report-01-26-2016

MSP ACTUAL ORIGINATIONS/DESTINATIONS PASSENGERS 1990-2015 Figure 2-4



2.3.1 Passenger Originations/Destinations and Connections

Figure 2-4 depicts the annual historical passenger originations/destinations (O&D) data for MSP for the years 1990 through 2015. O&D passengers are those who begin or end their trip at MSP. O&D passenger demand is driven primarily by local socioeconomic factors.

The following information details MSP O&D and connecting passenger data for 2015:

- There were 19,582,778 O&D passengers in 2015, which is 5.4 percent higher than the level of 18,587,428 O&D passengers in 2014.⁶
- Between 1990 and 2015, O&D passengers at MSP rose from 9.5 million to over 19 million, which represents an estimated annual compounded growth rate of 2.9 percent.

Connecting passengers are those who travel through the airport enroute to another destination. There were 15,878,034 connecting passengers in 2015, which is 3.0 percent more than the level of connecting passengers in 2014. In 2014, there were 15,418,190 connecting passengers at MSP.

2.3.2 Annual Revenue Passengers

The revenue passenger level at MSP reported by the airlines in 2015 grew 4.2 percent from 2014 levels. In 2015, there were 35,489,192 revenue passengers compared to 34,066,371 in 2014.

Total annual revenue passenger levels are shown in Figure 2-5 and include O&D and connecting passengers. Between 1990 and 2015, total annual revenue passengers grew from 19.2 million to nearly 35.5 million, an annual compounded growth rate of 2.5 percent.

2.3.3 Annual Aircraft Operations

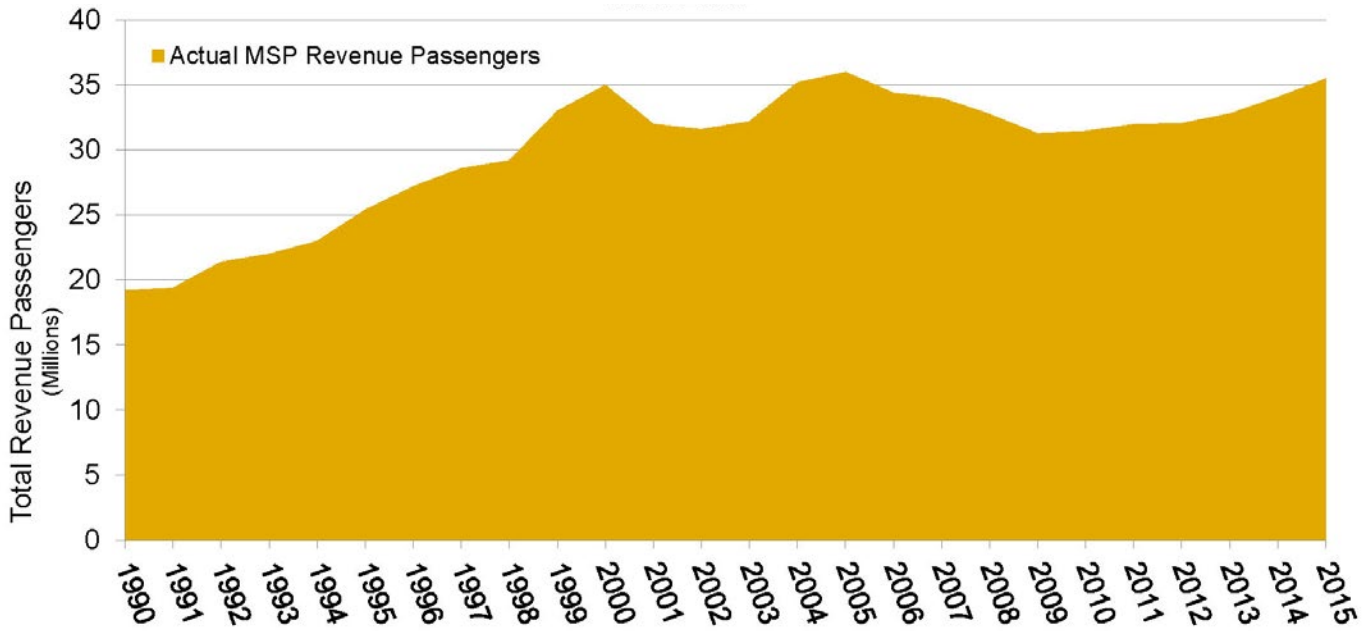
The FAA reported aircraft operations at MSP decreased nearly 1.8 percent in 2015 compared to 2014. According to the FAA’s air traffic counts, there were 404,374 aircraft arrivals and departures at MSP compared to 411,760 in 2014. Annual MSP aircraft operations are presented in Figure 2-6.

Total annual aircraft operations at MSP generally increased between 1990 – 2001 before declining as a result of the terrorist attacks on September 11, 2001. The year 2001 ended with 501,252 total operations at MSP. In 2002 and 2003 operations rose approximately 1.2 percent over the level in 2001, but then jumped 6.0 percent in 2004. Total operations at MSP peaked in 2004 at 540,727.

The years that followed 2004 were challenging for the aviation industry with increasing fuel prices and an overall struggling economy. For the past decade, the aircraft activity levels at MSP have been consistently decreasing. The MSP aircraft operations activity in 2015 is approximately 25.2 percent lower than the peak activity year, and represents the lowest level of aircraft activity since 1991.

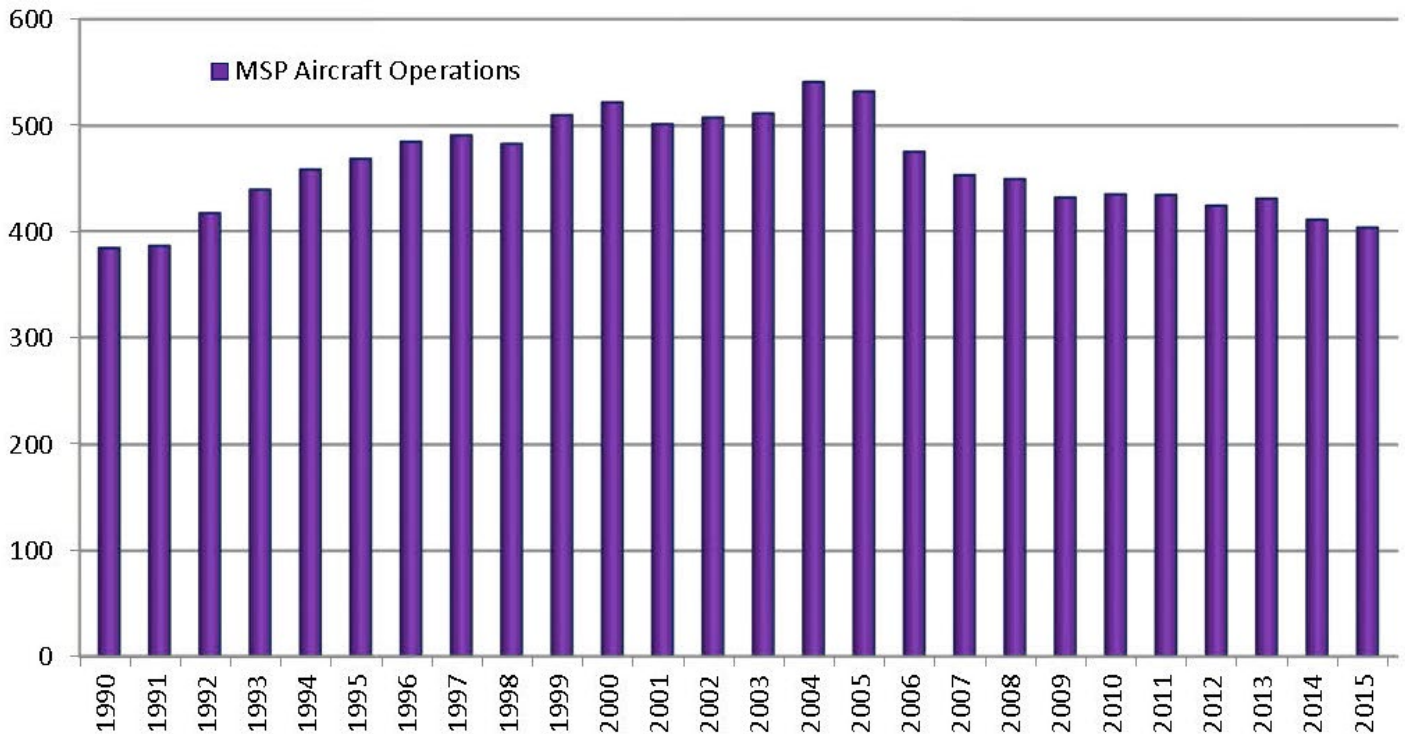
⁶ Because of prior Detroit Metro Airport comparison requirements, the data from 1990-2008 were obtained from the U.S. DOT and HNTB analysis. The airport comparison is no longer required in this report; therefore, the 2009 through 2015 numbers were derived from Metropolitan Airports Commission year-end reports, which are updated monthly and provide the most accurate MSP-specific statistics.

MSP ACTUAL REVENUE PASSENGERS 1990-2015 Figure 2-5



Source: Metropolitan Airports Commission monthly statistics.

MSP AIRCRAFT OPERATIONS 1990-2015 Figure 2-6



2.3.4 Nonstop Markets

Figure 2-7 shows the number of nonstop domestic and international (including Canadian) markets served from MSP from 2006 through 2015. The domestic markets included in these totals are those that are served by an annual average of at least five weekly nonstop flights. The international markets include those that are served by

an annual average of at least one weekly nonstop flight. Some of these markets are served only seasonally.

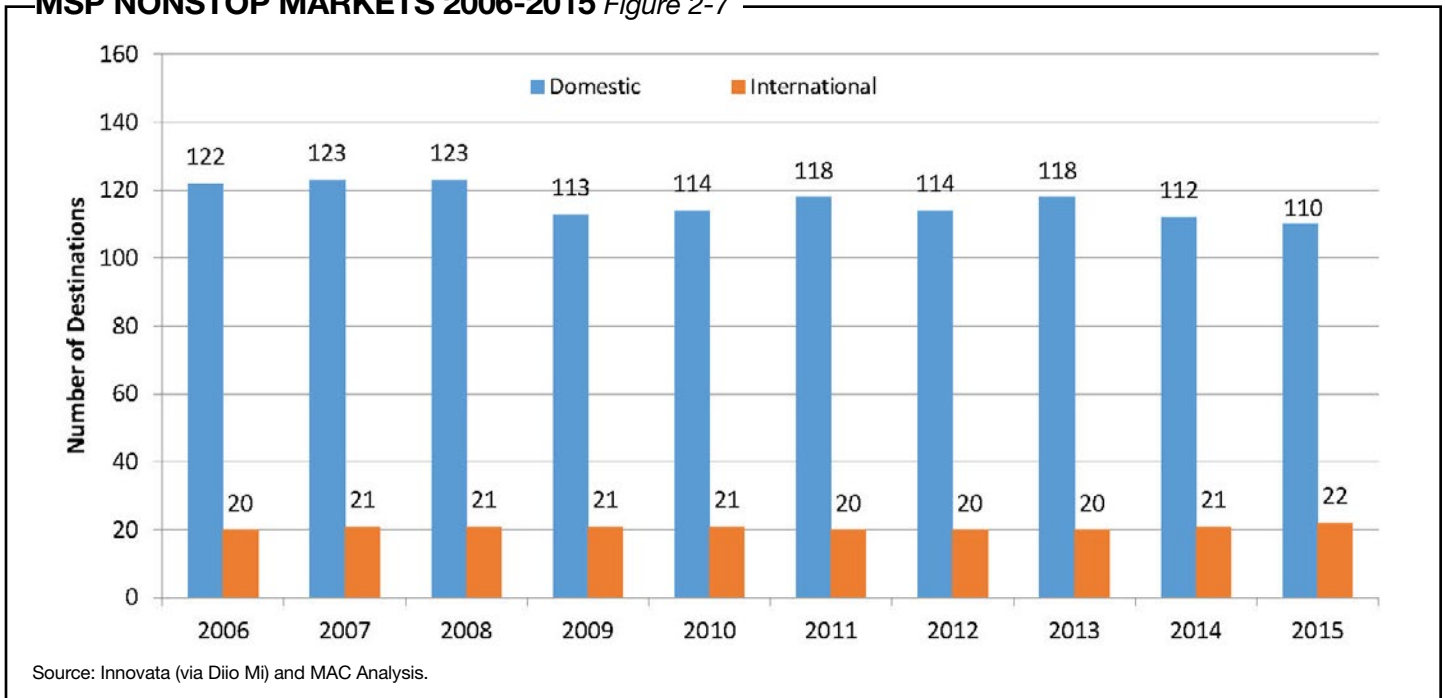
Based on airline schedule data obtained through Innovata, LLC (via Diio Mi), there were 132 nonstop markets served by MSP in 2015—110 domestic and 22 international—that met the above criteria. In 2014 there were 133 nonstop markets: 112 domestic and 21 international.

Figure 2-8 summarizes the use of various types of aircraft that serve MSP's nonstop markets. In 2015, approximately 24.2 percent of the nonstop markets were served exclusively by air carrier jets (e.g., A320, B757, etc.) compared with 22.6 percent in 2014. The percentage of nonstop markets served by regional air carrier aircraft (e.g., CRJ, E170, etc.) was 27.3 percent in 2015 compared with 28.6 percent in 2014. Turboprop aircraft utilizing MSP (e.g., Beechcraft 1900, etc.)

accounted for 2.3 percent of nonstop markets in 2015, up from 0.8 percent in 2014.

Some nonstop markets are flexible and utilize aircraft types based upon market demand and seasonal fluctuations; 46.2 percent of MSP nonstop markets were served by a mixture of air carrier jets and regional-type aircraft in 2015. In 2014, 48.1 percent of MSP nonstop markets were served by mixed aircraft types.

MSP NONSTOP MARKETS 2006-2015 *Figure 2-7*



MSP NONSTOP MARKETS BY AIRCRAFT TYPE 2015 *Figure 2-8*

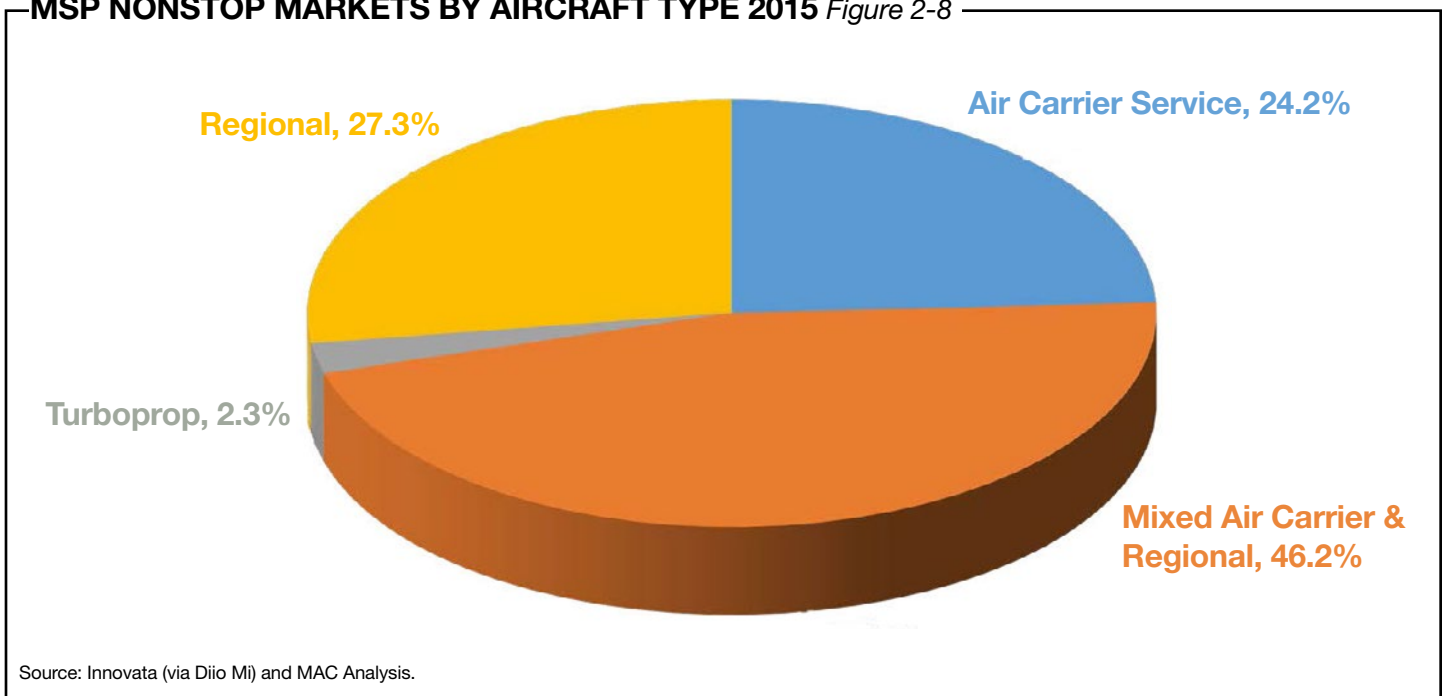


Table 2-4 ranks Minneapolis-St. Paul among other major metropolitan areas in terms of population and compares the number of nonstop markets served by each airport.

TABLE 2-4 NONSTOP MARKET BY METROPOLITAN AREA 2015

2015 Rank	Name	Populations (millions) ⁽¹⁾	Nonstop Markets ^{(2) (3)}	Markets/Population (millions) Ratio
1	Charlotte	2.54	143	56.3
2	Denver	3.35	156	46.6
3	Las Vegas	2.32	95	41.0
4	Orlando	3.05	111	36.4
5	Salt Lake City	2.42	84	34.7
6	Minneapolis - St. Paul	3.84	132	34.4
7	Atlanta	6.26	213	34.0
8	Houston	6.69	180	26.9
9	Dallas - Ft. Worth	7.35	194	26.4
10	Miami - Fort Lauderdale	6.56	173	26.4
11	Detroit	5.32	124	23.3
12	Tampa-St. Petersburg	2.92	65	22.3
13	Chicago	9.93	214	21.6
14	Seattle	4.53	97	21.4
15	Phoenix	4.49	92	20.5
16	St. Louis	2.91	57	19.6
17	Portland	3.06	55	18.0
18	Philadelphia	7.16	125	17.4
19	Kansas City	2.41	42	17.4
20	Raleigh-Durham	2.08	36	17.3
21	Cincinnati	2.21	38	17.2
22	San Diego	3.26	53	16.2
23	Washington D.C - Baltimore	9.55	147	15.4
24	Pittsburgh	2.65	40	15.1
25	Milwaukee	2.04	30	14.7
26	San Francisco - Oakland	8.61	112	13.0
27	Boston	8.10	105	13.0
28	Indianapolis	2.35	30	12.7
29	Columbus	2.40	30	12.5
30	Sacramento	2.51	28	11.1
31	New York	23.63	223	9.4
32	Cleveland	3.50	33	9.4
33	Los Angeles	18.55	146	7.9

⁽¹⁾ U.S. Census Bureau; Annual Estimates of Population of Metropolitan and Micropolitan Statistical Areas: April 1, 2010 - July 1, 2014 (CBSA-EST2014-01); Annual Estimates of the Population of Combined Statistical Areas: April 1, 2010 to July 1, 2014 (CBSA-EST2014-02)

⁽²⁾ Metropolitan areas served by more than one airport are counted once.

⁽³⁾ Markets include those receiving an average of at least five weekly nonstop domestic flights or one weekly nonstop international flight during CY 2015.

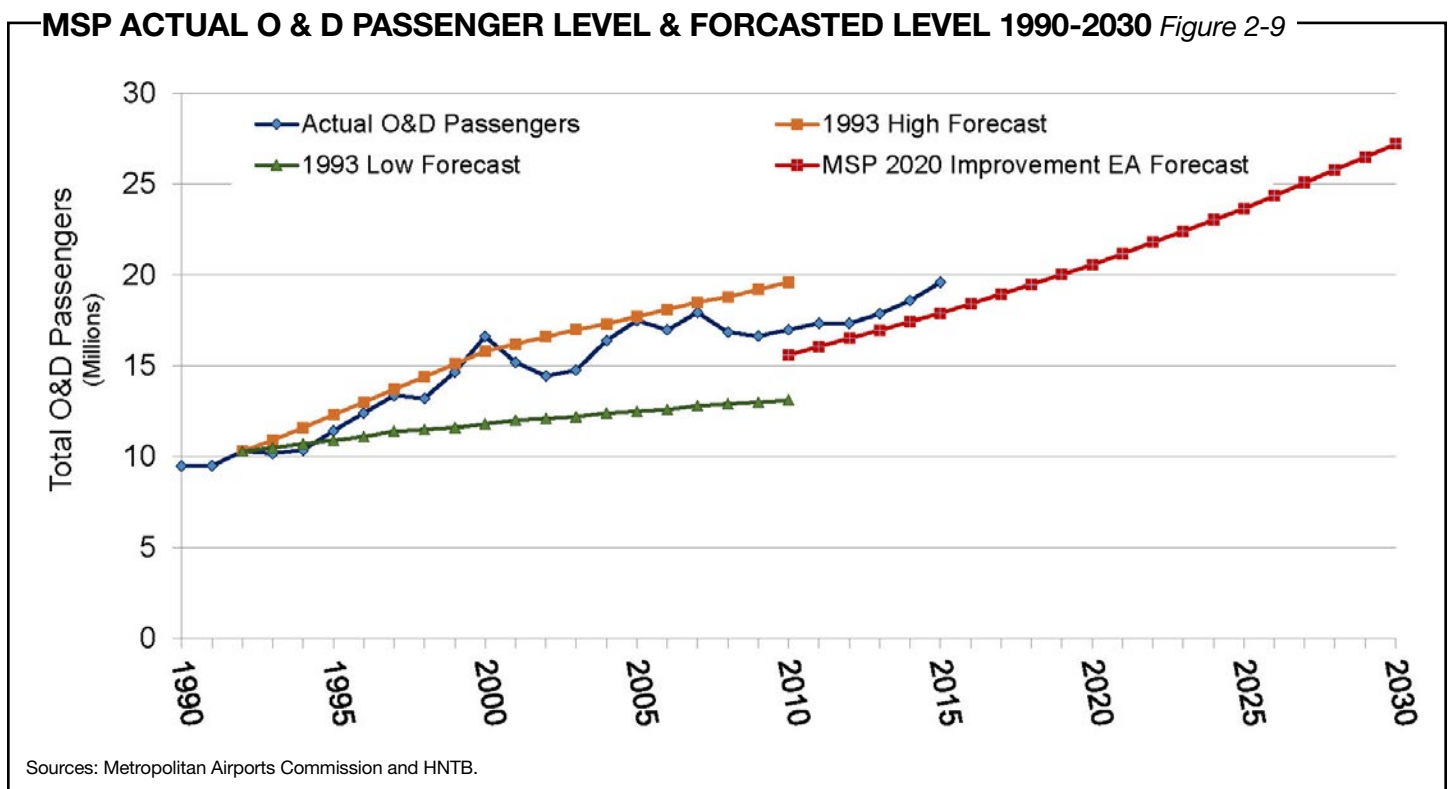
Sources: US Census Bureau, Innovata CY2015, MAC analysis

2.4 COMPARISON OF MAC FORECAST WITH ACTUAL ACTIVITY

As part of the MAC update to the Long Term Comprehensive Plan (LTCP) for MSP in 2010, revised forecasts were approved and published. The forecasts were updated in 2012 as part of the MSP 2020 Improvements Environmental Assessment/Environmental Assessment Worksheet (EA/EAW) process, and again in 2015 in concert with the 2035 MSP LTCP.

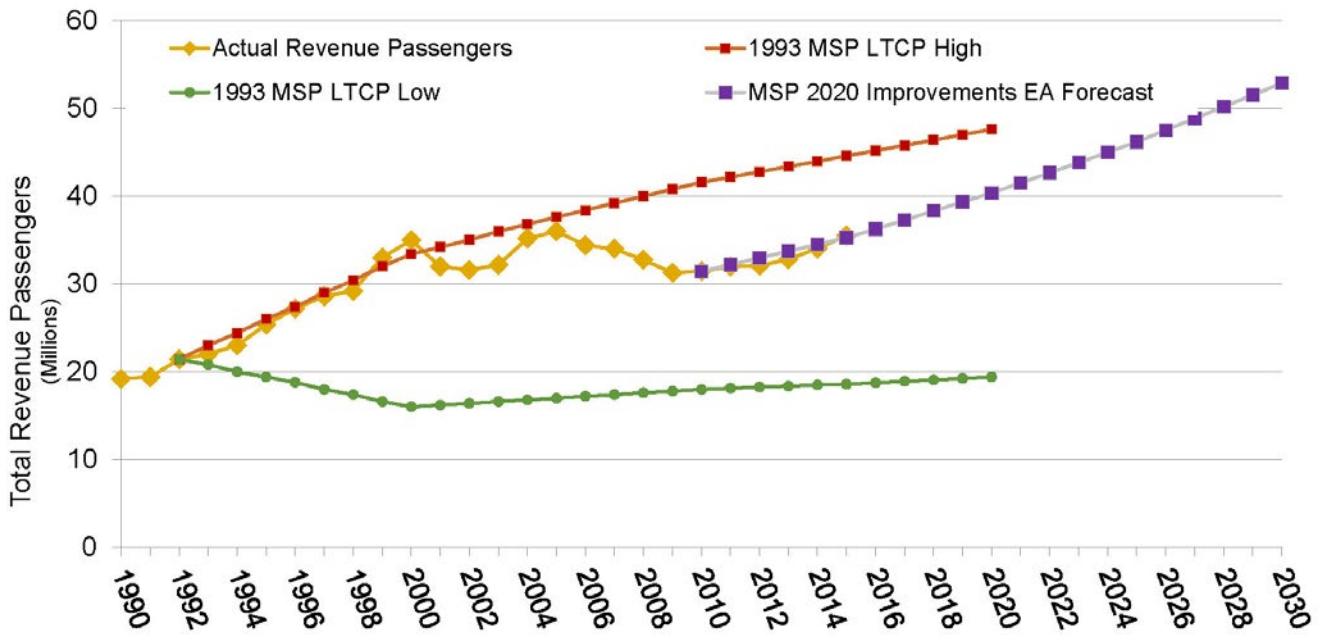
The 2035 LTCP forecast analysis provides the annual activity forecast levels at MSP for the years 2015-2035. A comparison of actual 2015 activity and forecasted activity for the Origination and Destination (O&D) passengers, revenue passenger enplanements, and aircraft operations is provided in Figures 2-9 through 2-11. For reference, the 2015 forecasted levels from the MSP 2020 Improvements EA/EAW and the 1993 MSP Long Term Comprehensive Plan are provided in the comparison figures.⁷

- **Figure 2-9** shows a comparison of actual and forecasted O&D passengers. Actual O&D passengers in 2015 were approximately 19.6 million, which is approximately 9.5 percent above the 2015 forecast level of 17.9 million O&D passengers.
- **Figure 2-10** shows a comparison of the actual revenue passenger level of 35.5 million in 2015 and the 2015 forecasted level of 35.3 million. The actual number of revenue passengers in 2015 is 0.6 percent higher than the forecasted level.
- **Figure 2-11** compares the actual number of aircraft operations as counted by the Federal Aviation Administration of 404,374 in 2015 with the forecasted level of 441,932. The level of actual operations is approximately 8.5 percent lower than the forecasted level.



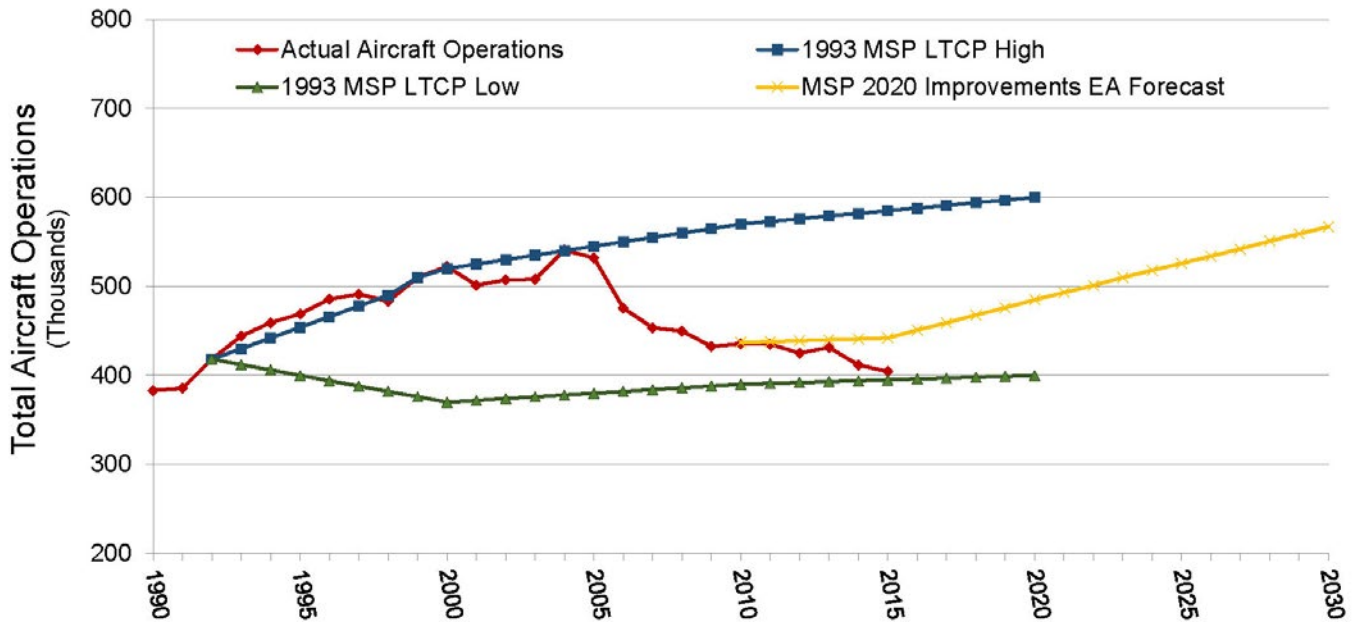
⁷Data were obtained from the MSP 2020 Improvements EA/EAW Aviation Activity Forecast 2012, Metropolitan Airports Commission records, Federal Aviation Administration Opsnet, and HNTB analysis.

MSP ACTUAL REVENUE PASSENGER LEVEL & FORECASTED LEVELS 1990-2030 *Figure 2-10*



Sources: Metropolitan Airports Commission and HNTB.

MSP ACTUAL AIRCRAFT OPERATIONS & FORECASTED LEVEL 1990-2030 *Figure 2-11*



Sources: Metropolitan Airports Commission and HNTB and Federal Aviation Administration.

2.5 TECHNOLOGICAL AND CAPACITY ENHANCEMENTS

The FAA continuously explores potential capacity-enhancing development/technology in an effort to increase airport efficiency and reduce delay. When advances are identified, efforts are made to implement the technology at the busiest airports. This section describes these efforts as they apply to MSP.

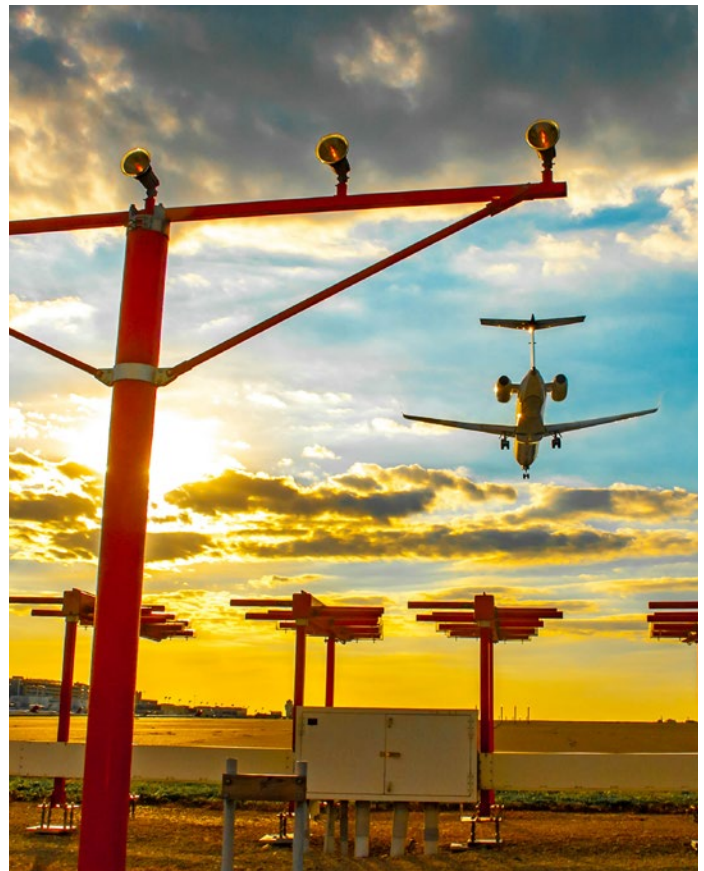
- Installation of Airport Surface Detection Equipment/ Model X (ASDE-X) at MSP was completed in 2009, which provides seamless coverage for complete aircraft identification information, and allows for future implementation and upgrade to Next Generation (NextGen) navigation technology (Automatic Dependence Surveillance – Broadcast, “ADS-B”). Use of ADS-B, which uses a Global Navigation Satellite System to broadcast critical information, is anticipated at MSP by 2020.
- Federal policy requires aircraft operating in capacity-constrained airspace, at capacity-constrained airports or in any other airspace deemed appropriate by the FAA, to be equipped with Automatic Dependent Surveillance-Broadcast/Cockpit Display of Traffic Information (ADS-B/CDTI) technology by 2020. ADS-B identifies the location of other aircraft and displays their position in the cockpit. Aircraft operating at MSP use this technology to maintain safe operating separation more precisely. The ADS-B system requires equipment to be installed in aircraft to facilitate the transfer of air traffic information from ground-based sensors at MSP to aircraft going to or from MSP runways. The ground-based sensors and equipment were installed at MSP in September 2010.
- Installation of a Runway Status Light System (RWSL) was completed at MSP in 2013 and commissioned in 2014. This technology is intended to prevent inadvertent runway crossing with indicators at the runway hold-short demarcation. Indicators will flash to alert pilots and surface vehicle operators of the presence of an aircraft or vehicle using the runway.

2.5.1 FAA Area Navigation (RNAV) Procedure Implementation at MSP

As part of the FAA’s NextGen initiative to modernize the national airspace system, in 2011 the agency began to pursue advanced aircraft navigation technology at MSP in the form of Performance Based Navigation (PBN) flight procedures. By 2015 the FAA focused these efforts on implementing Area Navigation (RNAV) and Required Navigation Performance (RNP) arrival procedures at MSP. The following provides a chronology of the public discussions that are related to the FAA’s RNAV implementation efforts at MSP.

In August 2012 the FAA finalized the package of draft RNAV departure and arrival procedure tracks. At the September 19, 2012 MSP Noise Oversight Committee (NOC) meeting the FAA presented the procedures, highlighting the considerations given to NOC procedure noise design criteria. Additionally, the FAA requested an accelerated process that would provide the MAC’s support for the procedures by the end of November 2012. Subsequently, by a unanimous vote, the NOC directed MAC staff to move forward with a public information program, including two public open houses to be conducted in early- to mid-November 2012.

NOC-sponsored RNAV informational open houses were held on November 8, 2012 in Minneapolis and November 13, 2012 in Eagan. Information about the procedures and open houses was published on the MAC’s Noise Program Office website and given coverage by local print and television news media. The FAA and MAC



staff conducted briefings with several communities as requested, including the city councils of Richfield, Eagan and Mendota Heights; with Minneapolis policy makers, Apple Valley and Burnsville city staffs; with participants in the fourth quarter 2012 MSP Public Input Meeting; and with multiple individual residents.

Depending on where people lived, feedback on the proposed RNAV procedures ranged from positive to very concerned. The predominant concern was with

the concentration of departures over certain residential areas. The FAA's implementation of the procedures was placed on the November 19, 2012 MAC Board of Commissioners meeting agenda in an attempt to meet the FAA's deadline for MAC support by the end of November 2012.

Prior to the November 19 Commission meeting, a large volume of communication was received from residents and elected officials expressing concern about concentrating departure flights over certain residential areas in South Minneapolis and Edina, the speed of the process and other matters.

Based on that input, the MAC Board of Commissioners took action during its meeting on November 19, 2012 to support only partial implementation of the FAA's proposed procedures, withholding support for the departure procedures proposed for Runways 30L and 30R, which would direct departure operations over areas of South Minneapolis, Richfield and Edina. As a result, the FAA indicated it would need to conduct a safety risk management evaluation for partially implementing the federal RNAV plan at the airport.

On February 19, 2014, the results of the FAA's safety risk management evaluation concluded partial implementation of RNAV departures introduces unsafe risk factors. Specifically, moving forward with implementation of RNAV departure procedures for Runways 12L, 12R and 17 without implementation of RNAV departure procedures on Runways 30L and 30R was determined unsafe.

Therefore, the FAA made the determination that RNAV departure procedures would not be implemented at MSP. However, the FAA has moved forward with the approved RNAV arrival procedures incorporating Optimized Profile Descents (OPD).

In response to the FAA's safety analysis findings, on March 6, 2014 the NOC passed Resolution 01-2014 (Appendix A) regarding future RNAV standard departure procedure design and implementation efforts at MSP. On

March 17, 2014 the MAC Board of Commissioners took unanimous action supporting NOC Resolution 01-2014 and forwarded it to the FAA. The resolution specifically expressed support for the implementation of the RNAV arrival procedures for all runways at MSP, except Runways 17, 4 and 22.

FAA publication of the RNAV and RNP arrival flight procedures and air traffic control implementation began in March 2015 and was fully implemented by April 2015. With the incorporation of OPD, the new arrival procedures increase fuel efficiency compared to traditional approach procedures. Instead of following a step-down approach to the airport, where pilots would descend and level off at the direction of Air Traffic Control, OPDs allow for a smooth and continuous descent from cruise altitude (approximately 35,000 feet) down to approximately 7,000 feet. These procedures are known to reduce fuel burn and carbon emissions.

The MAC Environment Department has partnered with the FAA and Delta Air Lines and is in the process of developing a method to quantify the fuel and carbon emission benefits.

2.5.2 Ongoing Precision Instrument Approach Capabilities

In addition to runway separation and configuration, airfield capacity can be affected greatly by how the runways are equipped for inclement weather. A number of precision instrument approaches continue to be available at MSP as summarized in **Table 2-5**.

**TABLE 2-5
PRECISION INSTRUMENT APPROACHES**

MSP	CAT I	CAT II	CAT III
Runways:	30R	30L	12L
			12R
			35

Notes: The term decision height is defined as the height at which a decision must be made during a precision approach to either continue the landing maneuver or execute a missed approach.

Precision approaches are categorized based on decision height and the horizontal visibility that a pilot has along the runway. Visibility values are expressed in statute miles or in terms of runway visual range (RVR) if RVR measuring equipment is installed at an airport.

The different classes of precision instrument approaches are:

- i. Category I (CAT I) – provides approaches to a decision height down to 200 feet and a basic visibility of ¼ statute miles or as low as 1,800 feet RVR.
- ii. Category II (CAT II) – provides approaches to a decision height down to 100 feet and an RVR down to 1,200 feet.
- iii. Category IIIa (CAT IIIa) – provides approaches without a decision height (down to the ground) or a decision height below 100 feet and an RVR down to 700 feet.
- iv. Category IIIb (CAT IIIb) – provides approaches without a decision height or a decision height below 50 feet and an RVR down to 150 feet.
- v. Category IIIc (CAT IIIc) – provides approaches without a decision height and RVR. This will permit landings in "0/0 conditions," that is, weather conditions with no ceiling and visibility as during periods of heavy fog.

Source: MSP Airfield Operations, FAA

2.5.3 Converging Runway Operations

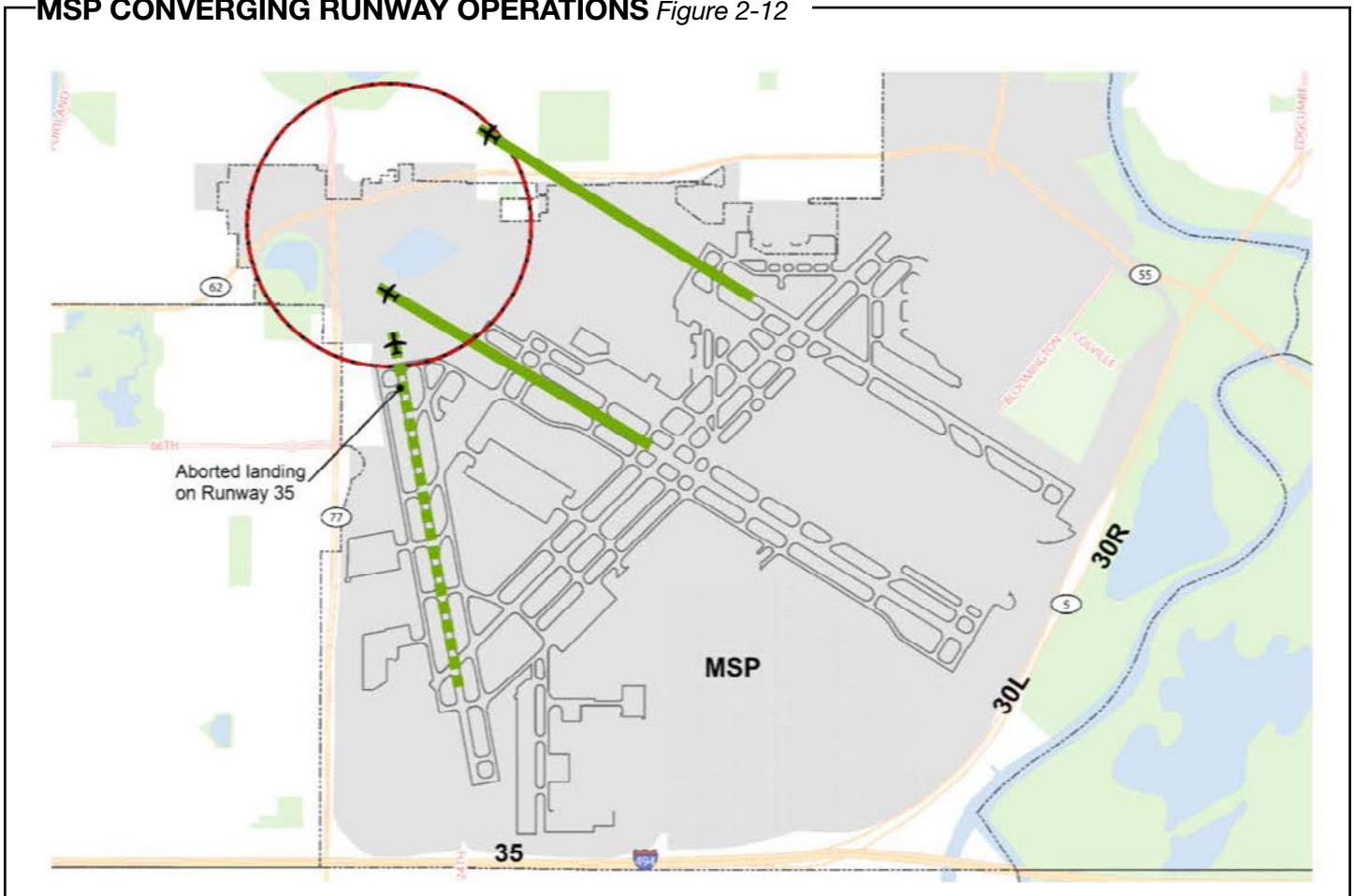
In 2013, the National Transportation Safety Board (NTSB) recommended modifications to arrival and departure procedures for airports with Converging Runway Operations (CRO). A converging runway operation exists when runways that do not physically intersect have flight paths that could intersect within one mile of the runway ends. At MSP, the extended centerline of Runways 35 intersects within one mile with the extended centerlines of both Runway 30L and 30R. Since Runway 35 is only used for arrivals from the south, potential convergence in flight paths would only occur if an aircraft executes an aborted landing (go around) on Runway 35. CRO procedures prevent an aircraft that aborts its landing on Runway 35 from conflicting with aircraft departing Runways 30L or 30R, as shown in **Figure 2-12**.

The FAA used a phase-in approach to introduce new safety requirements at U.S. airports identified by the NTSB. Beginning in July 2015, the FAA temporarily suspended arrivals on Runway 35 at MSP while it focused on developing procedures to comply with the converging runway requirements for Runways 35 and 30L. Runway 30L was identified as a higher priority over Runway 30R to comply with the new requirements, due to the proximity of the converging flight paths.

The temporary suspension lasted about a month and reduced the airport's capacity when flights are landing and departing in a northerly direction to a maximum hourly arrival rate between 60 and 64 aircraft, down from a previous maximum of 90 aircraft. In August 2015 the FAA developed a strategy to comply with the new requirements by alternating arrivals on Runway 35 with departures on Runway 30L and lifted the temporary suspension to arrivals on Runway 35. Through these methods, the FAA was able to regain some, but not all, of the arrival capacity with a maximum hourly arrival rate of 75 aircraft.

The FAA then began to focus on the Runway 30R departure and Runway 35 aborted landing separation requirements. In February 2016, the FAA began applying procedures similar to those used for Runway 30L to alternate between 30R departures and arrivals to Runway 35, eliminating the potential for crossing flight paths. The FAA reported that these adjustments provided the needed separation requirements with minimal, if any, further impacts to the hourly arrival rate at MSP.

MSP CONVERGING RUNWAY OPERATIONS *Figure 2-12*



2.6 AIRFIELD CAPACITY AND DELAY

This section describes the airfield capacity at MSP. Aircraft delay analysis is also provided.

2.6.1 Airfield Capacity

Airfield capacity is typically described in terms of hourly capacity and annual capacity under good and poor weather conditions. **Table 2-6** reflects the hourly capacity for MSP in optimum, marginal and poor weather conditions.

**TABLE 2-6
MSP AIRFIELD CAPACITY**

Hourly Airfield Capacity	Existing
Optimum Rate ⁽¹⁾	141
Marginal Rate ⁽²⁾	135
IFR Rate ⁽³⁾	114

Source: Federal Aviation Administration (FAA) Air Traffic Control Tower Analysis

⁽¹⁾ Ceiling and visibility above minima for visual approaches.

⁽²⁾ Below visual approach minima but better than instrument conditions.

⁽³⁾ Instrument conditions (cloud ceiling less than 1,000 feet or visibility less than 3 miles).

As a result of converging runway operations measures implemented in 2015 (see section 2.5.3), MSP's current airfield capacity is about 141 aircraft operations in

optimum conditions and 135 operations in marginal conditions. When instrument flight rules (IFR) are being used, typically during periods of low-level clouds and/or low visibility, the airfield capacity at MSP is about 114 operations per hour.

2.6.2 Airfield Delay

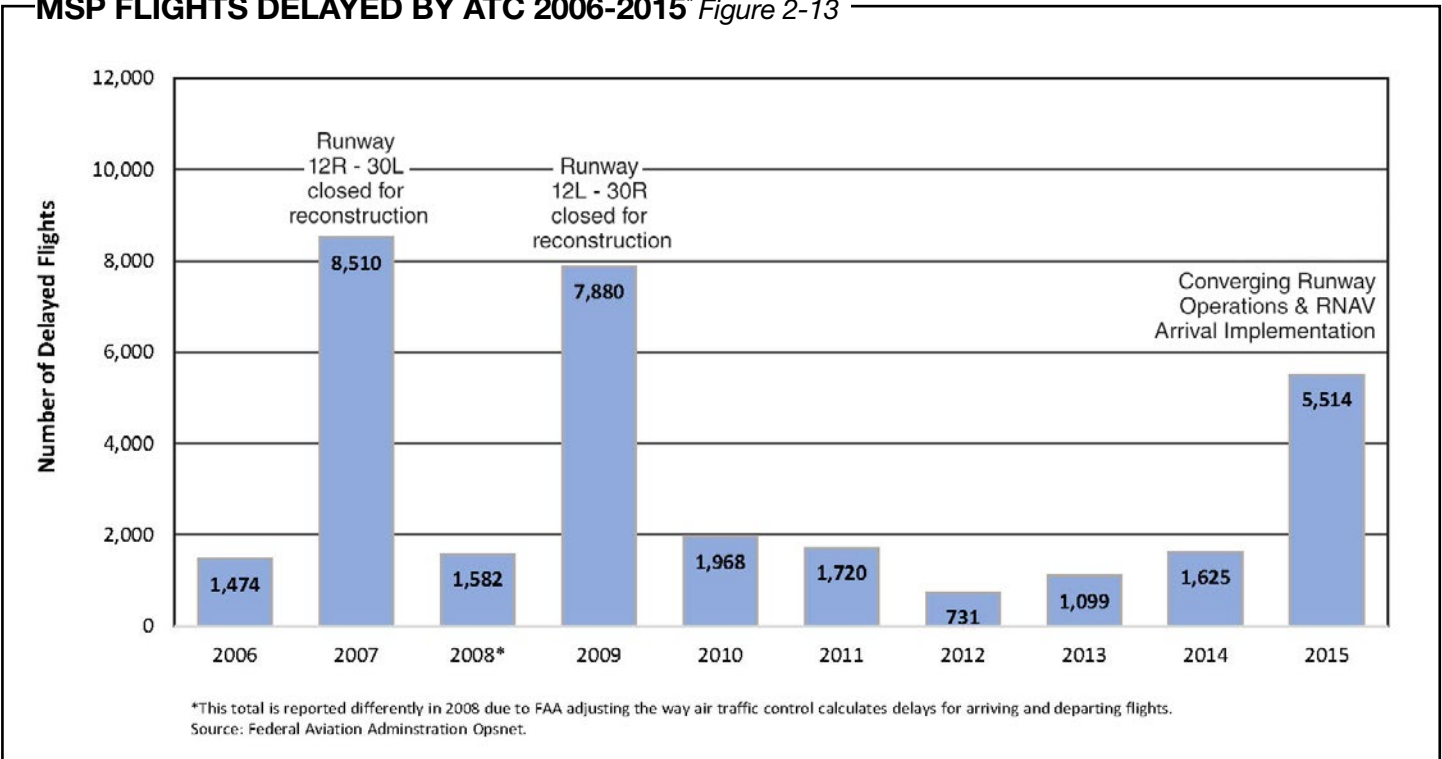
Delay can be measured in several ways. This section reviews various delay measures as they are reported by the FAA and apply to MSP.

Number of Delayed Flights as Reported by the FAA

The FAA Air Traffic Operations Network (OPSNET) database counts flights that were reported by Air Traffic Control (ATC) to be delayed for more than 15 minutes. **Figure 2-13** depicts the number of MSP flights delayed by ATC.

In 2008, the FAA made significant modifications to its reporting rules that affect historical data comparisons. The FAA now combines arrival and enroute delays into one category, and now reports delays for aircraft that accumulate 15 minutes or more holding delay at each facility throughout the entire route of flight. Delays of fewer than 15 minutes are not counted, nor are delays not initiated by ATC. In addition, since delays are reported by each airport facility, a flight that was delayed by 13 minutes at one airport facility and 12 minutes by another airport facility (for a total delay of 25 minutes) was not included in the OPSNET database prior to

MSP FLIGHTS DELAYED BY ATC 2006-2015* Figure 2-13



October 1, 2008. These data limitations should be kept in mind when reviewing OPSNET delay.

There were 5,514 delayed flights at MSP in 2015, an increase from 2014. This increase is attributed to implementation of RNAV/RNP arrival procedures in March and April 2015, and implementation of new CRO requirements and halting arrivals on Runway 35 from July 24 - August 28, 2015.

The level of delays in 2015 is the third highest at MSP since 2006. In 2007, the closure of Runway 12R-30L for two months due to reconstruction contributed to the highest level of reported delays during the past 10 years. The second highest level of recorded delayed flights occurred in 2009 with the closure of Runway 12L-30R for two months while it was being reconstructed.

Percentage of Flights Arriving On-time

The data series used to calculate on-time performance for arrivals is the FAA's Aviation System Performance Metrics (ASPM) database. Within this data set, aircraft must be airborne enroute to their scheduled destination in order for them to be considered delayed; therefore, cancelled and/or diverted flights are not considered late in this system. Scheduled flight times typically include some cushion for delay, especially for arrivals operating during peak periods. Factors that can cause a flight to be delayed may be related to mechanical problems, lack of crew, weather or airfield capacity constraints.

MSP on-time performance in 2015 began at 83.8 percent in January and ended with 84.9 percent in December. MSP tracked about 3 percent higher than the national average in 2015. **Figure 2-14** shows average on-time gate arrival performance for domestic air carrier flights at MSP. Data used to calculate delay are extracted from the FAA ASPM database and compares MSP's moving 12-month average for on-time performance with the national average. **Figure 2-15** provides a comparison of monthly on-time gate arrivals and percent of good weather.

Average Delay per Aircraft Operation

When calculating the average delay per aircraft operation, airport-attributable delay is estimated by comparing a flight's actual air and taxi times with estimated unconstrained times. The total cumulative amount of delay experienced by all scheduled flights in the database is then divided by the total number of flights in the database for the same time period. The output is usually expressed in minutes of delay per operation.

The current industry standard for estimating delay relies on the FAA's ASPM data, which provide a comprehensive analysis of airport delay and capacity. The FAA uses ASPM results to create performance benchmarks for airports each year. Since 2005, use of ASPM data has been a well-supported methodology to calculate aircraft delays, accepted by both government and industry, as the most valid, accurate and reliable metric⁸.

Figure 2-16 shows the average delay per operation for MSP compared to the national average. MSP activity was below the national average for delay per operation throughout 2015, averaging about 4.3 minutes of delay from January-August. From September through December 2015 the average delay per operation at MSP was 4.4 minutes.

Figure 2-17 provides a comparison of MSP average delay per aircraft operation and percent of poor weather. The monthly comparison shows the percentage of time MSP operated in poor weather conditions⁹ along with a 12-month moving average for MSP and 77 high-delay airports tracked by the FAA.

When compared to other large hub U.S. airports as shown in **Table 2-7** MSP ranked 25th overall in 2015 in terms of highest average delay per operation.

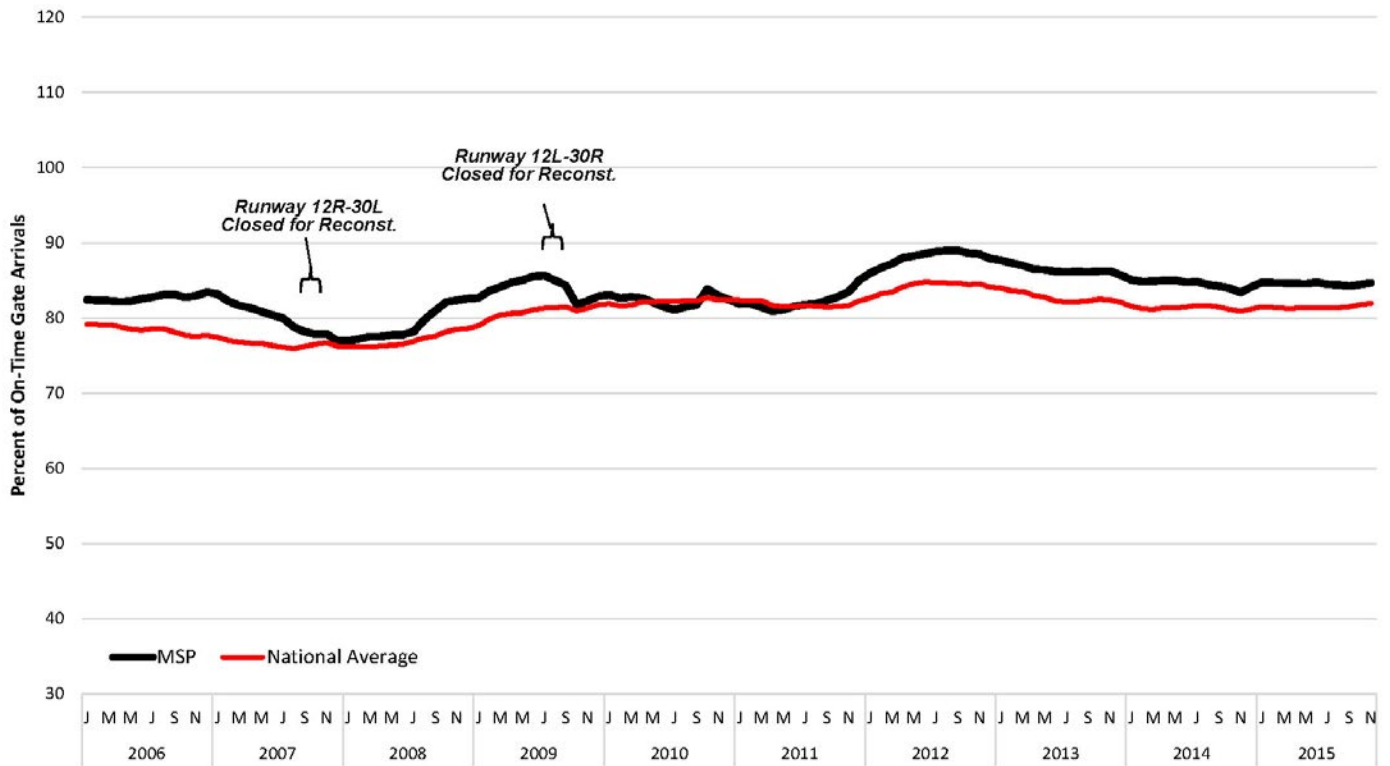


⁸ Prior to 2005, the industry standard was the FAA's Consolidated Operations and Delay Analysis System (CODAS); the U.S. Department of Transportation (DOT) Airline Service Quality Performance (ASQP) data were used to compare optimal versus actual taxi and flight times for MSP.

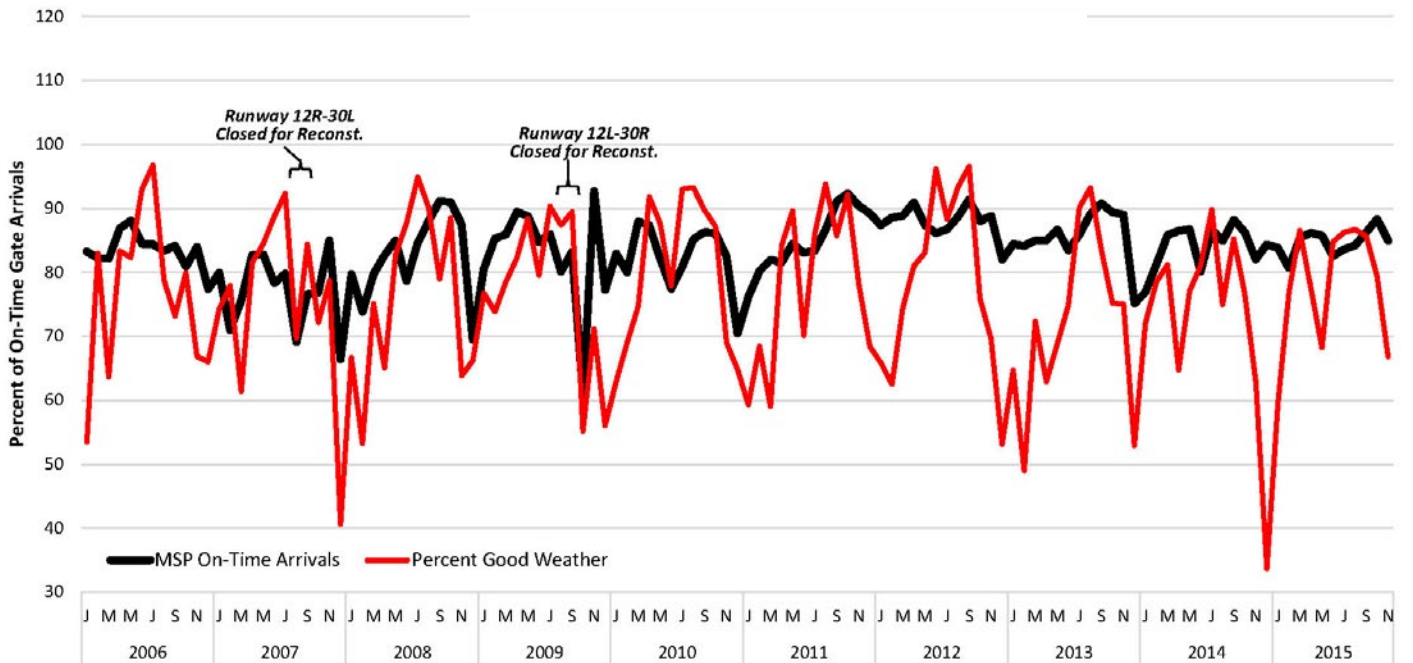
⁹ Historically, weather and wind - while not the only causes of delay - are one of the primary causes of delay at MSP.

ON-TIME GATE ARRIVALS, MSP VS. NATIONAL AVERAGE¹

(12-MONTH MOVING AVERAGE) 2006-2015 Figure 2-14



COMPARISON OF MSP MONTHLY ON-TIME GATE ARRIVALS¹ & PERCENT OF GOOD WEATHER² 2006-2015 Figure 2-15



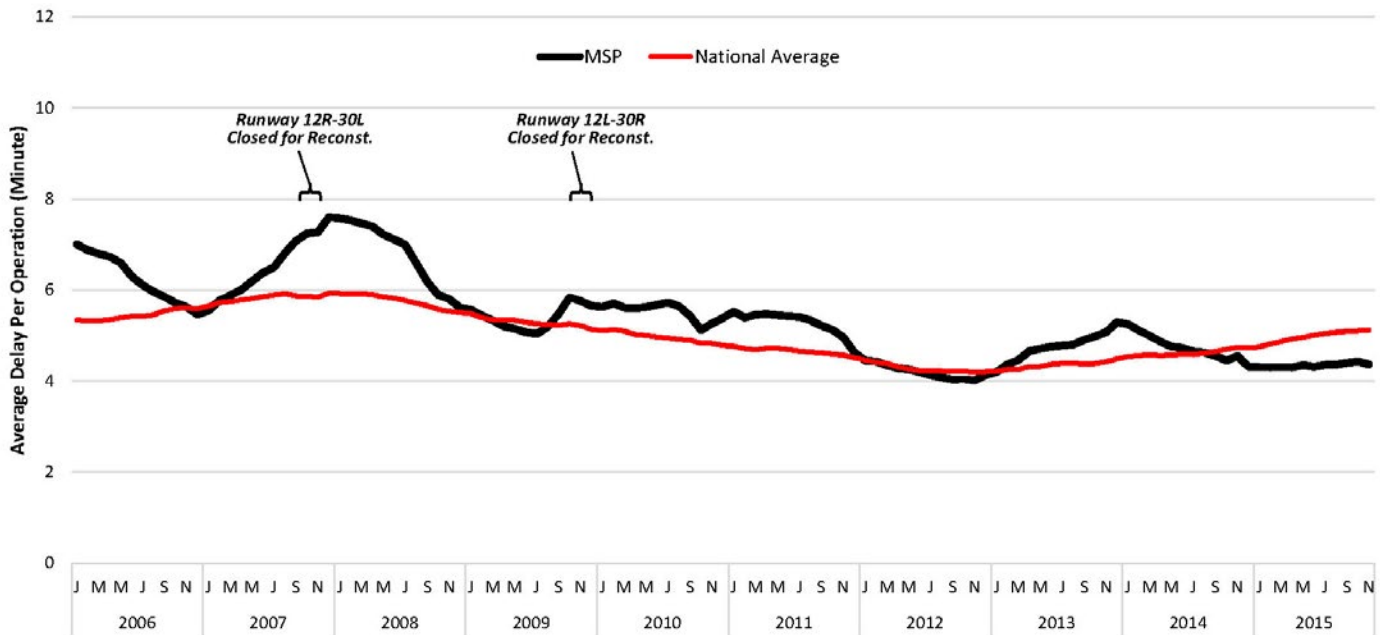
⁽¹⁾ Percentage of flights arriving within 15 minutes of scheduled arrival time.

⁽²⁾ Good weather is defined as when conditions may allow visual approaches; actual separation standards used at time of observation are not available in ASPM database.

Sources: Federal Aviation Administration Aviation System Performance Metrics (ASPM).

MSP AVERAGE DELAY PER AIRCRAFT OPERATION¹ COMPATED TO NATIONAL AVERAGE²

(12-MONTH MOVING AVERAGE) 2006-2015 Figure 2-16

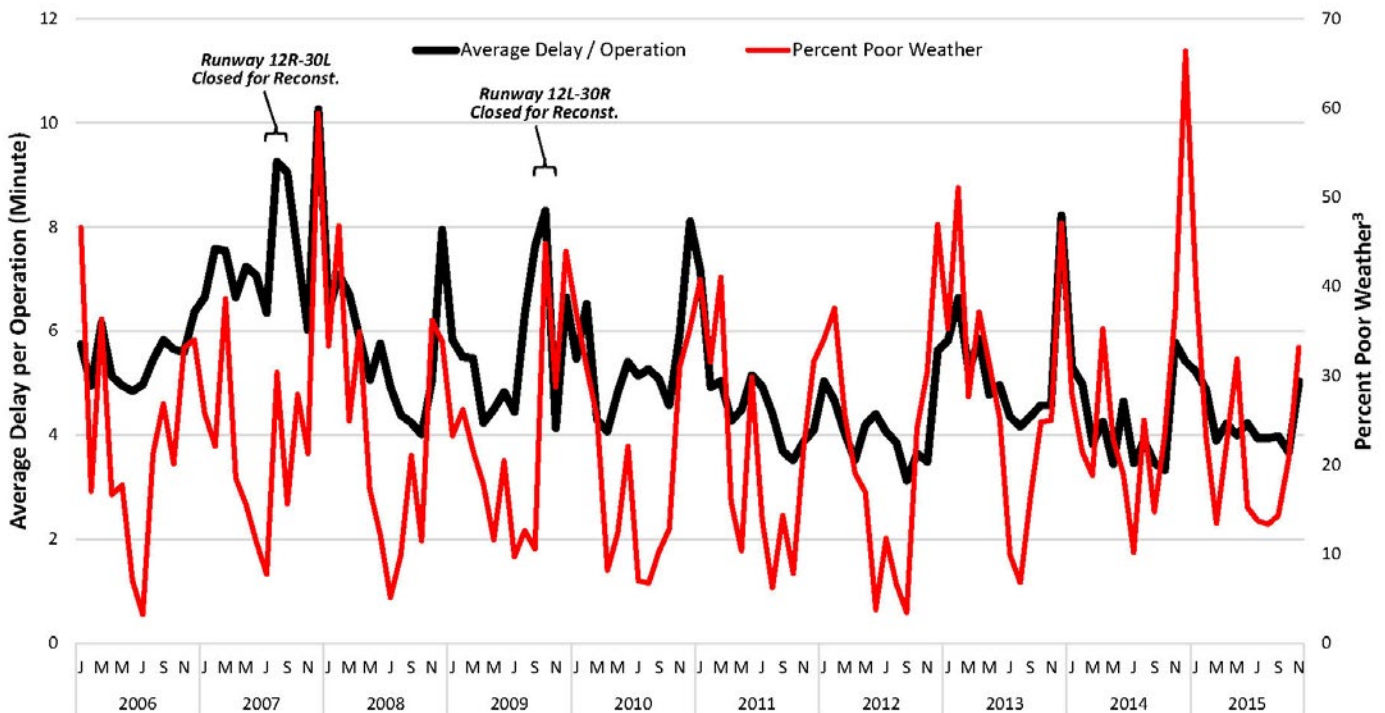


⁽¹⁾ An operation is either a landing or a takeoff.

⁽²⁾ National average consists of top 77 airports in ASPM database.

Source: Federal Aviation Administration Aviation System Performance Metrics (ASPM)

COMPARISON OF MSP AVERAGE DELAY PER AIRCRAFT OPERATIONS¹ & PERCENT POOR WEATHER 2006-2015 Figure 2-17



⁽¹⁾ An operation is either a landing or a takeoff.

⁽³⁾ Poor weather is defined as when aircraft must make instrument approaches; actual separation standards used at time of observation are not available in ASPM database.

Source: Federal Aviation Administration Aviation System Performance Metrics (ASPM)

TABLE 2-7

TOP 25 LARGE HUB AIRPORTS WITH HIGHEST AVERAGE TOTAL DELAY PER OPERATION

Rank	Airport	2015 Total Airport Operations	2015 Average Minutes of Delay per Operation	2014 Average Minutes of Delay per Operation	2014 Rank	Change from 2014 to 2015
1	LGA	368,362	10.2	9.4	1	0.9
2	ORD	875,136	8.6	6.0	5	2.6
3	JFK	446,644	7.7	7.7	3	0.0
4	CLT	543,944	7.4	5.4	7	2.0
5	DFW	416,947	7.1	4.9	11	2.2
6	EWR	681,261	7.0	7.7	2	-0.7
7	PHL	411,368	6.7	6.5	4	0.2
8	IAH	655,564	6.2	4.7	12	1.5
9	LAX	502,844	6.2	5.2	10	1.0
10	DCA	378,013	5.5	4.6	14	0.9
11	MDW	297,095	5.5	4.0	22	1.5
12	BOS	253,519	5.5	5.2	9	0.3
13	MIA	882,497	5.3	4.3	18	1.0
14	ATL	412,915	5.3	5.8	6	-0.5
15	BWI	440,411	5.2	4.1	20	1.1
16	SEA	381,408	5.2	3.5	27	1.7
17	PHX	440,411	5.1	4.6	15	0.6
18	SFO	430,518	5.1	5.3	8	-0.2
19	DEN	547,648	4.9	4.5	17	0.4
20	IAD	294,807	4.7	4.1	19	0.5
21	DTW	379,376	4.6	4.7	13	0.0
22	MCO	314,616	4.4	3.7	25	0.7
23	MEM	219,171	4.4	2.2	69	2.2
24	DAL	216,099	4.4	2.9	39	1.5
25	MSP	404,374	4.3	4.5	16	-0.2

Source: FAA OPSNET for airport operations data, FAA Aviation Performance Metrics for average minutes of delay per operation (taxi-in, taxi-out, and airborne delay).

2.7 MSP LONG-TERM COMPREHENSIVE PLANNING AND MSP 2020 IMPROVEMENTS

Periodic planning assessments are conducted by the MAC for MSP airfield, landside, and roadway facilities in the form of a Long Term Comprehensive Plan (LTCP). The most recent MSP LTCP was completed and approved by the MAC’s Board of Commissioners in July 2010. Preparation of the 2035 LTCP is ongoing.

The 2010 LTCP anticipated future development activities at MSP from those outlined previously as part of the Dual-Track Airport Planning Process (concluded in 1996) and specifically determined that the airfield capacity at MSP is adequate to sustain aircraft operations to the year 2030. However, the 2010 LTCP analysis concluded that substantial landside and terminal building improvements are needed to achieve the following goals:

- Provide sufficient, environmentally-friendly facilities to serve existing and future demand;
- Provide improved energy efficiencies;
- Encourage increased use of public transportation;
- Minimize confusion associated with having two terminals and multiple access points;
- Allow for flexibility in growth;
- Utilize and maintain existing facilities to the fullest extent possible; and
- Enhance aircraft operational safety and efficiency.

Based on existing conditions and the capacity demands

placed on the facility as passenger numbers grow, the 2010 LTCP determined that development activities that focus on the enhancement of the arrival curb, passenger processing facilities, parking and international arrival facilities at Terminal 1, and gate capacity at Terminal 2 to accommodate existing seasonal demand and new carrier entrants at MSP, would be necessary. In general, the 2010 LTCP also determined that the terminal environment at MSP will need enhancement in the form of gates, ticket counters, passenger check-in areas, security screening checkpoints and baggage claim areas.

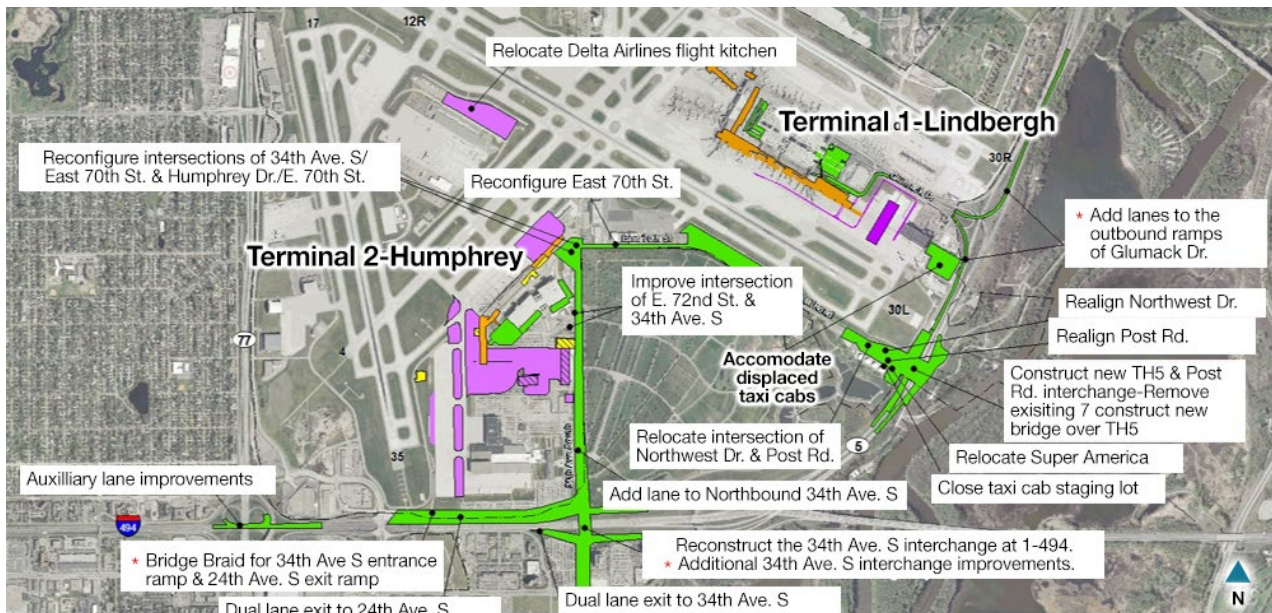
Environmental analyses associated with the MSP 2020 Improvements were conducted in compliance with both the National Environmental Policy Act (NEPA) and the Minnesota Environmental Policy Act (MEPA).

Preparation of a federal Environmental Assessment (EA) and state Environmental Assessment Worksheet (EAW) began in September 2010 and was concluded in March 2013 with a Finding of No Significant Impact/Record of Decision (FONSI/ROD) by the FAA and in April 2013 with a Negative Declaration on the need for an Environmental Impact Statement (EIS) by the MAC.

Three development options were evaluated: the No Action Alternative, Alternative 1 - Airlines Remain; and Alternative 2 - Airlines Relocate.

Alternative 2 - Airlines Relocate is the Preferred Alternative that best meets the purpose and need for enhanced airport services and outlines projected improvements needed through 2020, presuming that the

MSP 2020 IMPROVEMENTS EA/EAW ALTERNATIVE 2-AIRLINES RELOCATE Figure 2-18



LEGEND

- Proposed Terminal Projects
- Proposed Airside Projects
- Proposed Landside/Roadway Projects
- Projects that are underway
- Remove and/or relocate MAC Property
- Planned Post 2020

non-SkyTeam airlines currently located in Terminal 1 are relocated to Terminal 2. This alternative was conceived in recognition of the fact that MSP's two-terminal system could be utilized more efficiently by relocating all airlines other than Delta and its SkyTeam partners from Terminal 1 to Terminal 2. This would relieve some of the capacity constraints at Terminal 1 while balancing the mix of

passengers who are beginning and ending their trips at MSP between the two facilities.

The improvements included in Alternative 2 are listed in **Table 2-8**, and an illustration of the Alternative 2 concept is presented on **Figure 2-18**.

TABLE 2-8
ALTERNATIVE 2-AIRLINES RELOCATE

Terminal 1-Lindbergh	Terminal 2-Humphrey
<p>Terminal</p> <ul style="list-style-type: none"> • Expand and remodel Concourse G <ul style="list-style-type: none"> -Construct new International Facility -Install new Concourse G tram • Remodel and reconfigure the terminal lobby • Reconfigure and expand baggage claim area • Remodel Concourse E 	<p>Terminal</p> <ul style="list-style-type: none"> • Expand terminal
<p>Landside / Roadway</p> <ul style="list-style-type: none"> • Expand terminal arrivals curb and relocate commercial Ground Transportation Center • Construct a new parking ramp <ul style="list-style-type: none"> - Relocate portions of Glumack Drive - Extend underground hub tram tunnel 	<p>Landside / Roadway</p> <ul style="list-style-type: none"> • Expand terminal curb • Expand existing and construct new parking ramps • Reconstruct 34th Avenue South interchange at I-494 • Add Lane to Northbound 34th Avenue South • Improve intersection of East 72nd Street and 34th Avenue South • Reconfigure the intersections of 34th Avenue South / East 70th Street and Humphrey Drive / East 70th Street • Reconfigure East 70th Street • Construct new Trunk Highway (TH) 5 and Post Road Interchange <ul style="list-style-type: none"> - Remove existing and construct new bridge over TH 5 - Realign Post Road and Northwest Drive - Relocate the intersection of Northwest Drive and Post Road - Relocate SuperAmerica - Close taxi cab staging lot and accommodate displaced taxi cabs
<p>Airside</p> <ul style="list-style-type: none"> • Relocate Runway 30L deicing pad • Relocate airfield service road • Extend AOA tunnel and A Street • Relocate Concourse G Fuel Main Line 	<p>Airside</p> <ul style="list-style-type: none"> • Expand terminal apron • Construct Remain Overnight (RON) aircraft apron <ul style="list-style-type: none"> - Construct new taxiway - Demolish Building F • Relocate run-up pad • Demolish and relocate Delta Air Lines Flight Kitchen • Relocate Ground Service Equipment facility

Source: MSP 2020 Improvements EA/EAW

2.7.1 MSP 2035 Long-Term Comprehensive Plan

In 2010, at the behest of the communities surrounding MSP and the Metropolitan Council, the MAC committed to updating the MSP LTCP on five-year intervals. The process to develop the 2035 LTCP was initiated in mid-2014 with preparation of aviation activity forecasts, and continued in earnest through 2015 with the intent of finalizing the draft plan by the end of the year.

In late July 2015 - with the draft 2035 LTCP document nearly finished - the FAA announced the temporary suspension of aircraft arrivals on Runway 35 (over Apple Valley, Burnsville and Bloomington) in conjunction with an evaluation of new Converging Runway Operations (CRO) requirements (see **Section 2.5.3**). As a result, the MAC elected to defer publication of the draft MSP LTCP report - this decision was made in support of numerous requests from residents and elected officials -- until the impacts of the CRO issue could be more fully understood and incorporated into the forecast runway use assumptions used to generate the 2035 noise contour in the plan. Although the noise contours in the LTCP do not factor into determination of the preferred alternative, nor determine noise mitigation eligibility around the airport, they provide information that is important to the MAC's community stakeholders.

It was originally anticipated by MAC staff that sufficient data would be available by the end of December 2015 in order to determine if use of the new procedures would necessitate adjustments to the runway use assumptions that were used to generate the 2035 LTCP noise contour. However, in early 2016 FAA announced that additional changes to the CRO procedures will be developed and implemented. Given this development, publication of the draft LTCP document and initiation of the public comment period will be deferred until a later date.

2.8 AIRCRAFT NOISE MITIGATION PROGRAM DEVELOPMENT

The issue of noise at MSP includes a long history of local efforts to quantify and mitigate noise impacts in a manner responsive to concerns raised by the communities around the airport and consistent with federal policy. In 1992, the Metropolitan Airports Commission (MAC) embarked on a 14 CFR Part 150 Program at MSP, which included a noise mitigation program for single-family and multi-family residences and schools, as well as property acquisition and relocation based on mitigation eligibility defined by the 1996 forecast 65 decibel (dB) Day-Night Average Sound Level (DNL) noise contour.¹⁰ When the original Part 150 Program was completed in 2006, noise mitigation had been provided to over 7,800 single-family homes, 1,327 multi-family units, 18 schools and 437 residential properties were acquired around MSP at a cost of approximately \$385.6 million.

In 1999 the MAC began an update to the Part 150 Program at MSP. The resulting program used 2007 forecast operations to produce a 2007 forecast noise contour (a 2005 forecast noise contour was also developed as part of this process but was ultimately not used due to the length of the planning process and associated changes in forecasting variables). One of the largest discussion items in the Part 150 Update process focused on the mitigation program the MAC would offer in the 2007 64 to 60 DNL noise contour area. Expansion of noise mitigation efforts beyond the federally-recognized level of 65 DNL was outlined as part of the Dual-Track Airport Planning Process. Through the Part 150 Update, the MAC detailed a specific mitigation package to be offered in the 64 to 60 DNL noise contour area, proposing central air-conditioning to single-family homes that did not have it, with a homeowner co-pay based on the degree of noise impact.

Airport Noise Litigation and the Consent Decree

Some cities located around MSP expressed dissatisfaction with the Part 150 Update mitigation proposal for the 64 to 60 DNL noise contour area. In early 2005, the cities of Minneapolis, Eagan, and Richfield and the Minneapolis Public Housing Authority filed suit in Hennepin County District Court against the MAC on the grounds that the MAC violated environmental quality standards and the Minnesota Environmental Rights Act by failing to provide a 5-decibel noise reduction package (as was provided in the 1996 65 DNL noise contour) to single-family homes in the 64 to 60 DNL contours. In September 2005, plaintiffs seeking class action certification filed a separate action against the MAC alleging breach of contract claims associated with mitigation in the 64 to 60 DNL contours.

In 2007, the MAC and the cities of Minneapolis, Eagan, and Richfield and the Minneapolis Public Housing Authority entered into a Consent Decree that settled the cities and class action litigation. The 2007 Consent Decree provided the 5-decibel noise mitigation package to single-family homes in the 2007 forecast 63+ DNL noise contours and lesser noise mitigation package options to single family-homes located in the 2007 forecast 62 to 60 DNL noise contours, with a noise mitigation reimbursement option for single-family homes located between the forecast 2007 and 2005 60 DNL noise contours. Multi-family structures were offered a uniform package in the 2007 forecast 60+ DNL noise contours.

All phases of the 2007 Consent Decree noise mitigation program have been completed at a cost of approximately \$95 million. Completion of the 2007 Consent Decree increased the total number of single-family homes

that have received noise mitigation around MSP to over 15,000, and multi-family units to 3,303. The total cost of the MAC's noise mitigation programs to date is approximately \$480 million.

MSP 2020 Improvements EA/EAW

In January 2013, the MAC published the Final MSP 2020 Improvements Environmental Assessment/Environmental Assessment Worksheet (EA/EAW), which reviewed the potential and cumulative environmental impacts of MSP terminal and landside developments needed through the year 2020. A new noise mitigation plan was proposed in the EA/EAW leading to an amendment to the 2007 Consent Decree.

First Amendment to the 2007 Consent Decree

The First Amendment to the 2007 Consent Decree establishes noise mitigation eligibility based on actual noise contours that the MAC prepares for MSP on an annual basis. For a home to be considered eligible for mitigation it must be located in the actual 60+ DNL noise contour, within a higher noise impact mitigation eligibility area when compared to its status relative to the 2007 Consent Decree noise mitigation program, for a total of three consecutive years, with the first of the three years beginning no later than 2020. The noise contour boundary is based on the block intersect methodology. Homes will be mitigated in the year following their eligibility determination. The First Amendment mitigation program eligibility assessment began with the 2013 actual noise contour. An additional chapter was added to the 2013 Annual Noise Contour Analysis to assess the mitigation area and eligibility per the amended Consent Decree. The 2015 Annual Noise Contour Analysis marks the third consecutive year of noise mitigation eligibility analysis and the first time a home can become eligible for noise mitigation under the terms of the First Amendment to the 2007 Consent Decree.

Noise Mitigation Eligibility Status under the First Amendment to the 2007 Consent Decree

Based on the 404,374 total operations at MSP in 2015, the actual 60 DNL contour is approximately 37.8 percent smaller than the 2007 forecast contour and the 65 DNL contour is approximately 46.3 percent smaller than the 2007 forecast contour. The predominant contraction in the contours from the 2007 forecast to the 2015 actual noise contour scenario is driven largely by fleet mix changes, including a significant reduction in Modified – “Hushkit” – Stage 3 aircraft operations and a significant reduction in total aircraft operations. However, there is a small area in South Minneapolis where the 2015 actual noise contours extend beyond the 2007 forecast noise contours establishing impacts in certain residential areas above the noise mitigation impact area under the

terms of the 2007 Consent Decree. The small expansion of noise impacts can largely be attributed to nighttime runway use variances between what was forecasted for 2007 and what actually occurred in 2015, particularly an increase of the nighttime arrival operations on Runway 12R. This same trend existed in 2013 and 2014.

In the third year of actual noise contour mapping, as established by the terms of the First Amendment to the 2007 Consent Decree, there are a total of 483 single-family homes that meet the first-year eligibility criteria of the three consecutive year higher noise impact mitigation eligibility requirement. Of the 483 single-family homes, 72 were previously eligible for the homeowner reimbursement noise mitigation program (located between the 2007 and 2005 forecast 60 DNL contours) and another 177 homes were outside the program, under the terms of the 2007 Consent Decree. These homes are now within the 2015 actual 60-62 DNL noise contour. If these homes remain within the actual 60-62 DNL noise contour for three consecutive years, they will be eligible for one of two mitigation options, as detailed in Section 9.5(b) of the First Amendment to the 2007 Consent Decree. Additionally, there are 234 single-family homes previously in the 60-62 DNL contour under the terms of the 2007 Consent Decree that meet the first year eligibility criteria of the three consecutive year higher noise impact mitigation eligibility requirement within the 63 DNL contour. If these homes remain within the actual 63+ DNL noise contour for three consecutive years, they will be eligible for mitigation upgrades necessary to achieve the 5-decibel noise reduction package.

All single-family and multi-family units that met the first year of the higher noise impact mitigation eligibility requirement by virtue of the 2014 actual noise contour achieve a second consecutive year of increased noise impact with the 2015 actual noise contour. There are a total of 285 single-family homes that meet the second consecutive year of higher noise impact. Of the 285 single-family homes, 39 homes were previously eligible for the homeowner reimbursement noise mitigation program (located between the 2007 and 2005 forecast 60 DNL contours) and another 126 homes were previously outside the program and are now within the 2015 60-62 DNL noise contour. If these single-family homes remain within the 60-62 DNL actual noise contour for another year, they will be eligible for one of two mitigation options, as detailed in Section 9.5(b) of the First Amendment to the 2007 Consent Decree. Additionally, there are 120 single-family homes previously in the 60-62 DNL contour under the terms of the 2007 Consent Decree that meet the second year eligibility criteria of the three consecutive year higher noise impact mitigation eligibility requirement within the 63 DNL contour. If these

homes remain within the actual 63+ DNL noise contour for three consecutive years, they will be eligible for mitigation upgrades necessary to achieve the 5-decibel noise reduction package.

All single-family and multi-family units that met the second year of the higher noise impact mitigation eligibility requirement by virtue of the 2014 actual noise contour achieve a third consecutive year of increased noise impact with the 2015 actual noise contour. There are a total of 137 single-family homes and 88 multi-family units that meet the third consecutive year of higher noise impact. Of the 137 single-family homes, 119 homes were previously eligible for the homeowner reimbursement noise mitigation program (located between the 2007 and 2005 forecast 60 DNL contours) and another 18 homes were previously outside the program and are now within the 2015 60-62 DNL noise contour. These single-family homes are eligible for one of two mitigation options, as detailed in Section 9.5(b) of the First Amendment to the 2007 Consent Decree. Additionally, there are 88 multi-family units which were not included in the 2007 Consent Decree noise mitigation program that are located within the 2015 actual 60-64 DNL contours establishing their third consecutive

year at a higher noise impact mitigation eligibility level. These multi-family units are eligible for the Multi-Family Home Mitigation Package as defined in Section 9.6 of the First Amendment to the Consent Decree.

The MAC will offer additional mitigation to single-family homes and multi-family units achieving their third and final year of eligibility by virtue of the 2015 actual noise contour beginning in 2017.

Homeowners are able to establish their home's location within the first-year, second-year and third-year eligibility map by reviewing the 2015 Annual Noise Contour Analysis report or contacting the MAC's Noise Program Office at www.macnoise.com/contact-noise-program-office.



¹⁰ The federally-established threshold for mitigating aircraft noise impacts is 65 decibels DNL according to 14 CFR Part 150.

3. RELIEVER AIRPORTS



3.1 OVERVIEW

The Metropolitan Airports Commission (MAC) owns and operates six reliever airports throughout the metropolitan area that surrounds Minneapolis-St. Paul International Airport. (MSP) Reliever airports are defined by the Federal Aviation Administration (FAA) as airports designated to relieve congestion at commercial service airports and to provide general aviation access to the overall community. This system of airports generates an estimated \$1.4 billion annually for the Twin Cities economy, while reducing general aviation operations at MSP. The MAC reliever airports are Airlake, Anoka County-Blaine, Crystal, Flying Cloud, Lake Elmo and St. Paul Downtown.

3.2 RELIEVER AIRPORT FACILITIES

According to the Metropolitan Council 2040 Transportation Policy Plan, adopted January 15, 2015, all but one of the MAC reliever airports are classified as minor airports. This means that primary runway lengths are between 2,500 and 5,000 feet. St. Paul Downtown Airport is classified as an intermediate airport, which means its primary runway is between 5,000 and 8,000 feet long.

Airport users at the MAC reliever airports include air taxi, business aviation, general aviation, flight training, recreational aviation and military aviation. Each of the reliever airports is open for public-use 24 hours per day, in keeping with federal regulations. The following sections outline the existing airport facilities at each location.

3.2.1 Airlake Airport (LVN)

Airlake Airport (LVN) consists of approximately 595 acres, and the airfield includes one northwest-southeast runway and one full-length parallel taxiway. Runway 12-30 is 4,098 feet long by 75 feet wide. The airport has a precision instrument approach to Runway 30 and a non-precision approach to Runway 12. **Figure 3-1** shows the general airport layout and facilities. One Fixed Base Operator (FBO) at the airport provides fueling and aircraft maintenance services. The airport had 136 based aircraft in 2015; an estimated level of 42,341 aircraft operations occurred at LVN in 2015, up nearly 28 percent from the operations level in 2014. There is no Air Traffic Control Tower located at the airport. Aircraft operators utilize common traffic advisory procedures while flying to and from the airport.



Airlake Airport (LVN) Figure 3-1



Anoka County-Blaine Airport (ANE)

Figure 3-2

3.2.2 Anoka County-Blaine Airport (ANE)

Anoka County-Blaine Airport (ANE), also known as Janes Field, consists of approximately 1,900 acres, and the airfield includes one east-west runway and one north-south runway. Both runways have full-length parallel taxiways. Runway 9-27 is 5,000 feet long by 100 feet wide and Runway 18-36 is 4,855 feet long by 100 feet wide. The airport has a precision instrument approach to Runway 27 and non-precision instrument approaches to Runways 9, 18 and 27. **Figure 3-2** shows the general airport layout and facilities. Two FBOs at the airport provide fueling, flight training and aircraft maintenance services for aircraft and helicopters. The airport had 396 based aircraft in 2015; 89,708 aircraft operations occurred at ANE in 2015, up nearly 31.6 percent from the operations level in 2014. A non-federal Air Traffic Control Tower is located at the airport and operates each day in the months of October through April from 7 am to 9; pm, from May through September, the tower is open from 7 am to 10 pm.



Crystal Airport (MIC) *Figure 3-3*

3.2.3 Crystal Airport (MIC)

Crystal Airport (MIC) consists of approximately 436 acres and includes two northwest-southeast runways and two southwest-northeast runways. Runway 12R-32L has a

full-length parallel taxiway. Runway 14L-32R is 3,263 feet long by 75 feet wide, Runway 12R-32L is 3,266 feet long by 75 feet wide and Runway 6L-24R is 2,499 feet long by 75 feet wide. The turf runway (6R-24L) is 2,122 feet long by 150 feet wide, and is closed during the winter months. The airport has two non-precision instrument approaches. **Figure 3-3** shows the general airport layout and facilities. One FBO at the airport provides fueling, flight training and aircraft maintenance services. The airport had 175 based aircraft in 2015; 39,659 aircraft operations occurred at MIC in 2015, down 3.5 percent from the operations level in 2014. An FAA-operated Air Traffic Control Tower is located at the airport and operates each day from 7 am to 9 pm, during October through April, and 7 am to 10 pm during May through September.

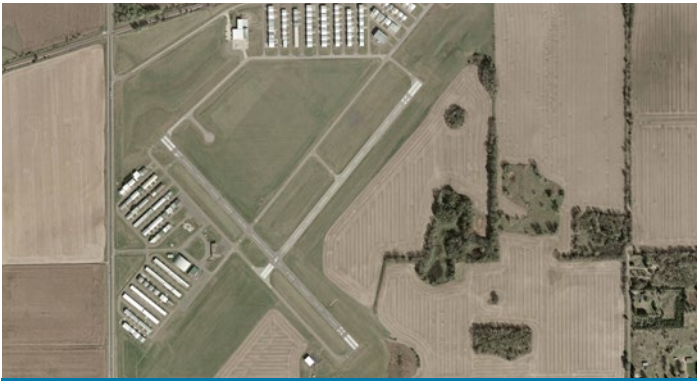


Flying Cloud Airport (FCM) *Figure 3-4*

3.2.4 Flying Cloud Airport (FCM)

Flying Cloud Airport (FCM) consists of approximately 860 acres and includes two east-west runways and one north-south runway. All runways have full-length parallel taxiways. Runway 10R-28L was extended to 5,000 feet long and widened to 100 feet in 2009; Runway 10L-28R was extended to 3,900 feet in 2008 and is 75 feet wide; and Runway 18-36 is 2,691 feet long by 75 feet wide. The airport has a precision instrument approach to Runway 10R and non-precision instrument approaches to Runways 10L, 28L, 28R and 36. It also has a published precision instrument approach procedure for helicopters. **Figure 3-4** shows the general airport layout and facilities. Six FBOs at the airport provide fueling, flight training and aircraft maintenance services for aircraft and helicopters. The airport had approximately 373 based aircraft in 2015; 87,493 aircraft operations occurred at FCM in 2015, up nearly 18.8 percent from the operations level in 2014. An FAA-operated Air Traffic Control Tower is located at the airport and operates each day from 6 am to 9 pm, except during daylight savings time when the tower stays open until 10 pm.

^{13 14 15} The FAA Air Traffic Control Tower revised the methodology used to count aircraft operations in 2013, therefore adjustments were applied to historical counts as necessary.



Lake Elmo Airport (21D) *Figure 3-5*

3.2.5 Lake Elmo Airport (21D)

Lake Elmo Airport (21D) consists of approximately 640 acres and includes one northwest-southeast runway and one southwest-northeast runway. Both runways have full-length parallel taxiways. Runway 14-32 is 2,850 feet long by 75 feet wide, and Runway 4-22 is 2,497 feet long by 75 feet wide. The airport has two non-precision instrument approaches to the airport. **Figure 3-5** shows the general airport layout and facilities. One FBO at the airport provides fueling, flight training and aircraft maintenance services. The airport had 200 based aircraft in 2015; an estimated 32,845 aircraft operations occurred at 21D in 2015, up nearly 27.7 percent from the level of aircraft operations in 2014. There is no Air Traffic Control Tower located at the airport. Aircraft operators utilize common traffic advisory procedures while flying to and from the airport.

3.2.6 St. Paul Downtown Airport (STP)

St. Paul Downtown Airport (STP) is commonly referred to as Holman Field. The land area measures approximately 576 acres, and the airfield consists of two northwest-southeast runways and one east-west runway. Runway 14-32 has a full-length parallel taxiway. Both of the other runways have partial parallel taxiways. Runway 14-32 is 6,491 feet long by 150 feet wide; Runway 13-31 is 4,004 feet long by 150 feet wide; and Runway 9-27 is 3,642 feet long by 100 feet wide. The airport has precision instrument approaches to Runways 14 and 32 and non-precision instrument approaches to Runways 14, 31 and 32. It also has a published precision instrument approach procedure for helicopters. **Figure 3-6** shows the general airport layout and facilities. Two FBOs at the airport



St. Paul Downtown Airport (STP)
Figure 3-6

provide fueling, flight training and aircraft maintenance services for aircraft. The airport had 85 based aircraft in 2015; 56,676 aircraft operations occurred at STP in 2015, down 12.2 percent from the level of operations in 2014. An FAA-operated Air Traffic Control Tower is located at the airport and operates from 7 am to 10 pm on weekends and 6 am to 10 pm on weekdays.

3.3 HISTORIC AND FORECAST ACTIVITY LEVELS

Aircraft operators must choose an airport at which to base their aircraft. Airports in Minnesota are required to submit to the State a report that identifies the aircraft based at their facilities for 180 days or more. **Figure 3-7** shows historical based aircraft trends for the MAC reliever airports from 1980 through 2015. Total based aircraft peaked at 1,864 aircraft in 1999. While the general trend continues to decline, based aircraft totals fluctuate each year. In 2015 the total number of based aircraft at MAC reliever airports was 1,365.

The data in **Table 3-1** are the best available historical totals for based aircraft, but these data should be viewed purely as estimates. Numbers that remained unchanged over periods of several years suggest that data limitations were likely and that updated information may not be available.

Historically, the total number of aircraft based at MAC reliever airports has accounted for less than one percent of the U.S. active fleet.

Historical data on aircraft operations at the reliever airports are presented in **Table 3-2**. An operation is either an arrival or a departure. Therefore, one arrival and one departure together equal two operations. Aircraft operations totals reported for each airport are generally obtained from the Air Traffic Control Towers located at each airport. Of the six reliever airports, ANE, FCM, MIC and STP have control towers. However, aircraft operations are counted only while the towers at those airports are operational. It should be noted that these airports are open 24 hours per day, but the control towers are closed during late night and early morning hours. The aircraft operations totals in **Table 3-2** do not include operations that occurred while the towers were closed. At airports where there is no air traffic control tower, such as LVN and 21D, the operations totals are estimated through various methods and available data. The operations totals presented for LVN and 21D are airport staff estimations calculated from actual aircraft operations counts completed in 2015.

TOTAL BASED AIRCRAFT AT MAC RELIEVER AIRPORTS 1980-2015 *Figure 3-7*

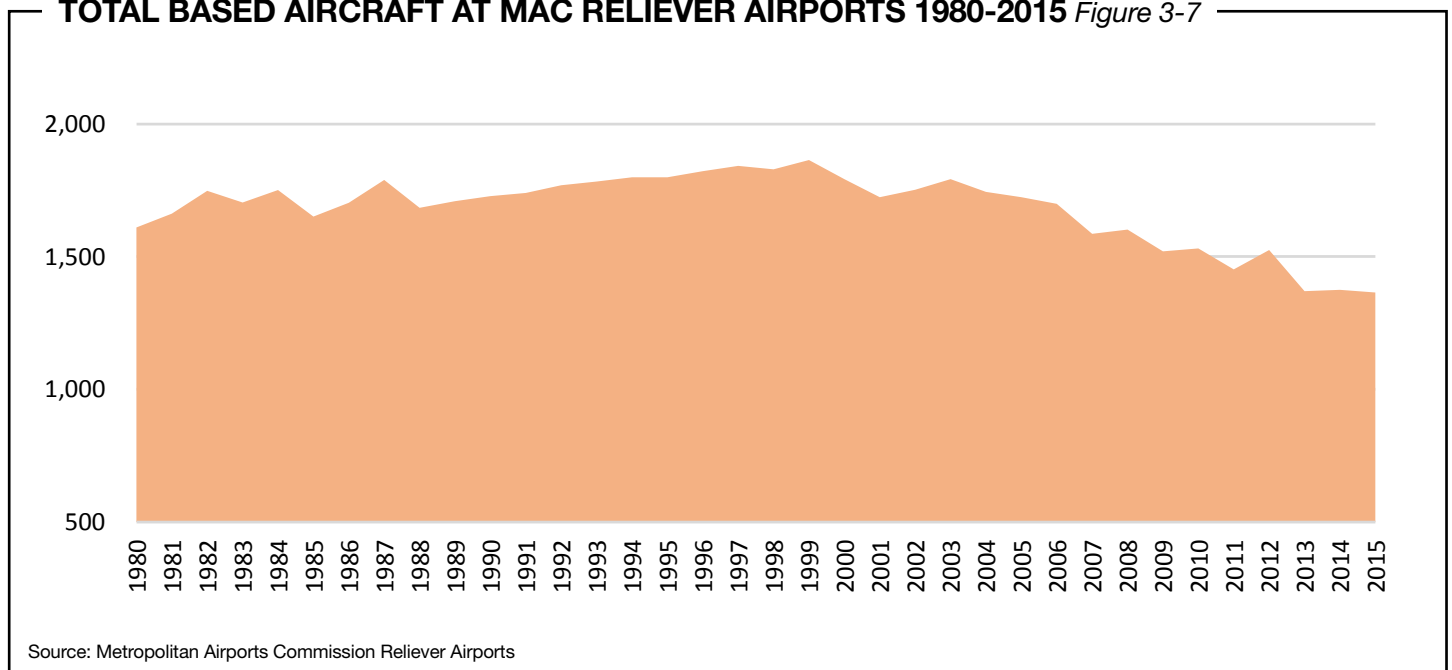


TABLE 3-1**HISTORICAL VIEW OF BASED AIRCRAFT AT MAC RELIEVER AIRPORTS**

Year	Airlake (LVN)	Anoka Cty-Blaine (ANE)	Crystal (MIC)	Flying Cloud (FCM)	Lake Elmo (21D)	St. Paul Downtown (STP)	Total Based Aircraft
1980	N/A	353	315	582	170	190	1,610
1981	N/A	360	297	580	220	205	1,662
1982	N/A	384	337	608	238	181	1,748
1983	N/A	362	327	615	236	164	1,704
1984	61	361	352	568	244	165	1,751
1985	63	390	338	568	145	147	1,651
1986	93	412	333	560	145	160	1,703
1987	153	408	345	565	150	168	1,789
1988	153	384	325	492	149	181	1,684
1989	140	405	320	485	171	188	1,709
1990	140	411	324	485	177	191	1,728
1991	140	414	327	487	179	193	1,740
1992	165	408	327	482	189	198	1,769
1993	179	408	327	482	189	198	1,783
1994	179	415	327	482	198	198	1,799
1995	179	415	327	482	198	198	1,799
1996	179	431	327	482	205	198	1,822
1997	179	441	327	482	210	203	1,842
1998	179	451	327	482	210	180	1,829
1999	178	472	309	509	250	146	1,864
2000	175	454	296	485	245	137	1,792
2001	170	447	280	461	235	131	1,724
2002	170	464	278	473	237	130	1,752
2003	190	490	288	463	237	124	1,792
2004	177	488	263	456	236	124	1,744
2005	163	482	265	451	239	124	1,724
2006	159	475	261	447	233	124	1,699
2007	162	437	244	421	229	93	1,586
2008	158	439	238	413	230	124	1,602
2009	147	433	219	403	229	89	1,520
2010	147	433	219	403	229	100	1,531
2011	131	423	199	389	216	94	1,452
2012	147	433	219	403	229	94	1,525
2013	127	405	189	357	192	100	1,370
2014	129	403	185	363	195	100	1,375
2015	136	396	175	373	200	85	1,365

Source: MAC Records, and MSP Reliever Airports Activity Forecasts Technical Report, April 2009.

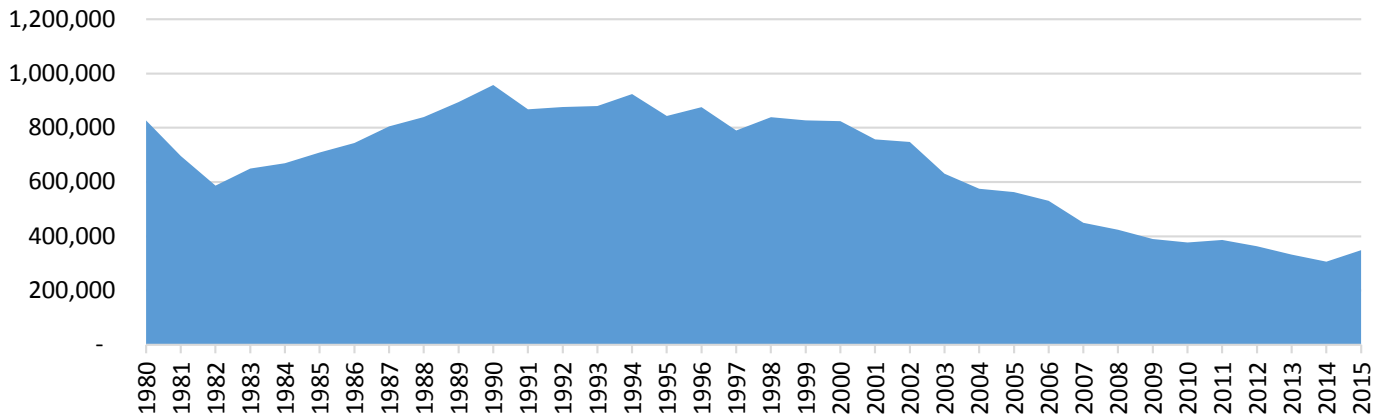
TABLE 3-2

HISTORICAL VIEW OF AIRCRAFT OPERATIONS AT MAC RELIEVER AIRPORTS

Year	Airlake (LVN)	Anoka Cty-Blaine (ANE)	Crystal (MIC)	Flying Cloud (FCM)	Lake Elmo (21D)	St. Paul Downtown (STP)	Total
1980	N/A	190,000	183,840	218,975	100,000	134,286	827,101
1981	N/A	150,000	154,436	194,229	90,000	107,305	695,970
1982	N/A	150,000	123,577	145,718	90,000	77,509	586,804
1983	20,000	140,000	136,314	166,266	90,000	97,118	649,698
1984	23,000	145,000	140,704	165,542	92,000	103,118	669,364
1985	35,000	160,000	143,665	176,246	82,000	112,019	708,930
1986	40,000	165,000	152,773	191,350	70,000	124,786	743,909
1987	52,000	180,000	165,367	209,423	63,000	135,397	805,187
1988	64,000	200,000	172,074	186,699	65,000	151,869	839,642
1989	66,000	212,000	177,679	207,661	65,000	166,436	894,776
1990	67,980	215,000	189,910	227,410	66,950	190,507	957,757
1991	74,745	195,650	173,150	186,503	69,650	168,450	868,148
1992	81,087	195,650	179,546	198,306	69,650	152,378	876,617
1993	81,087	195,650	183,554	218,643	69,950	131,388	880,272
1994	82,500	199,000	185,991	239,038	71,000	146,839	924,368
1995	75,397	181,866	171,478	216,309	64,887	133,686	843,623
1996	75,397	192,600	187,957	212,695	68,400	139,056	876,105
1997	72,382	143,063	175,728	198,199	65,664	135,079	790,115
1998	76,725	143,981	179,186	210,908	69,604	158,705	839,109
1999	76,725	149,769	178,342	192,746	70,996	158,808	827,386
2000	76,418	156,546	176,554	186,078	70,687	158,216	824,499
2001	70,229	136,892	156,801	185,593	64,962	142,794	757,271
2002	69,176	138,935	127,095	176,408	64,529	171,628	747,771
2003	58,108	132,145	98,612	155,837	54,205	131,794	630,701
2004	53,309	109,853	75,023	159,648	49,855	127,478	575,166
2005	51,678	101,272	72,205	157,710	48,329	131,708	562,902
2006	48,014	92,947	65,528	144,178	44,903	135,156	530,726
2007	41,292	80,517	53,038	118,178	38,617	117,977	449,619
2008	39,021	69,403	49,244	119,139	37,612	109,512	423,931
2009	35,802	68,534	42,311	117,180	34,509	91,507	389,843
2010	35,662	79,589	44,229	94,244	34,374	88,995	377,093
2011	34,270	73,292	43,986	114,574	33,032	87,229	386,383
2012	34,560	79,190	48,220	88,663	33,319	79,238	363,190
2013*	31,346	76,721	42,308	79,511	33,220	69,277	332,383
2014	33,178	68,157	41,117	73,634	25,727	64,539	306,352
2015	42,341	89,708	39,641	87,493	32,842	56,676	348,701

*Note: The FAA Air Traffic Control Tower revised the methodology used to count aircraft operations in 2013.
Source: MAC Records, FAA Ops net, and MSP Reliever Airports Activity Forecast Technical Report, April 2009.

TOTAL AIRCRAFT OPERATIONS AT MAC RELIEVER AIRPORTS 1980-2015 *Figure 3-8*



Source: MAC Reliever Airports and Federal Aviation Administration data.

The combined total for aircraft operations estimated at the reliever airports in 2015 is 348,725. This total represents an increase of 13.8 percent when compared with a total operations level of 306,352 in 2014. **Figure 3-8** shows the historical operations trend for MAC reliever airports from 1980-2015.

Table 3-3 and **Table 3-4** show forecasts for based aircraft and operations at the six MAC reliever airports through 2035. More detailed analyses of forecasted based aircraft and forecasted operations were done as part of the 2013 Long Term Comprehensive Plan (LTCP) reliever airports activity forecast updates.

TABLE 3-3

SUMMARY OF BASED AIRCRAFT FORECASTS AT MAC RELIEVER AIRPORTS 2020-2035

Year	Airlake (LVN)	Anoka Cty-Blaine (ANE)	Crystal (MIC)	Flying Cloud (FCM)	Lake Elmo (21D)	St. Paul Downtown (STP)	Total
2020	135	403	180	360	218	105	1,401
2025	134	397	177	362	209	109	1,388
2030	133	393	171	364	211	119	1,391
2035	131	396	171	378	208	136	1,420

Source: HNTB Reliever Airports Activity Forecasts (2015), Base Case Scenarios for LVN, ANE, MIC, FCM, and STP; Draft 2035 LTCP Forecast for 21D

TABLE 3-4

SUMMARY OF FORECAST OPERATIONS AT MAC RELIEVER AIRPORTS 2020-2035

Year	Airlake (LVN)	Anoka Cty-Blaine (ANE)	Crystal (MIC)	Flying Cloud (FCM)	Lake Elmo (21D)	St. Paul Downtown (STP)	Total
2020	34,811	84,192	39,495	81,516	24,232	68,091	332,337
2025	34,642	83,857	39,025	83,623	23,908	69,997	335,052
2030	35,106	84,576	38,578	86,068	25,200	71,961	341,489
2035	35,658	88,025	39,904	93,255	26,138	78,787	361,767

Source: HNTB Reliever Airports Activity Forecasts (2015), Base Case Scenarios for LVN, ANE, MIC, and STP; Draft 2035 LTCP Forecast for 21D

3.4 DEVELOPMENT PROGRAMS

This section outlines the status of major development programs at each of the reliever airports. It is important to note that the MAC is investigating revenue-generating development at the reliever airports as a way to help make the reliever airport system as financially self-sustaining as possible.

The MAC has an ongoing program to rehabilitate aircraft operational areas (runways, taxiways, aprons) through bituminous overlays and seal coats; in some instances, reconstruction is necessary to restore the surfaces to a smooth, even condition for optimum operating conditions. Projects vary from year to year, depending on available funding and airport needs. In 2015, pavement rehabilitation was completed at FCM, 21D, and STP. Also, a Building Condition Assessment was initiated for all MAC-owned structures at the relievers. This assessment will help to prioritize funding for building maintenance and repair activities.

3.4.1 Airlake Airport (LVN)

No Capital Improvement Program (CIP) projects were undertaken at LVN in 2015.

The LVN 2008 Long Term Comprehensive Plan (LTCP) update recommends that the airfield's only runway (Runway 12-30) be extended to 5,000 feet at some point in the future to coincide with industrial/commercial development in Lakeville and potentially in Eureka Township. The runway extension shown in the proposed airfield requires relocation of a portion of Cedar Avenue. In 2010 the MAC completed a Draft Scoping Decision Document and a Draft Environmental Assessment Worksheet (EAW) for the proposed development activity. An Environmental Impact Statement (EIS) is required before the project can begin. Based on FAA's updated guidance on compatible land uses within a Runway Protection Zone (RPZ), this configuration will now require a full Alternatives Analysis to assess a range of development options that minimize RPZ incompatibilities. This effort will include high-level coordination with the FAA, and they will be the approval authority over any configuration that includes a public roadway traversing the RPZ.

Preparation of the 2035 LTCP for LVN is underway and is expected to be completed in early 2017, pending the timeline for the RPZ Alternatives Analysis. As part of this effort, additional concepts are being evaluated to determine if it is feasible to provide additional useable runway pavement without having to relocate Cedar Avenue.

3.4.2 Anoka County-Blaine Airport (ANE)

In 2015, the MAC completed a project to improve airfield signage and electrical infrastructure at ANE and initiated

equipment upgrades in the Air Traffic Control Tower. The Long Term Comprehensive Plan (LTCP) update was completed in 2010 for ANE. This plan analyzed existing facilities, forecasted future activity, and outlined development needed to meet the projected demand. Based upon the forecasts and existing airfield configuration, there is currently no demonstrated need for longer runways, additional runways, additional hangar areas or expanded landside areas at ANE.

Preparation of the 2035 LTCP for ANE will be initiated in 2016.

3.4.3 Crystal Airport (MIC)

No Capital Improvement Program (CIP) projects were undertaken at MIC in 2015.

The MAC completed the Long Term Comprehensive Plan (LTCP) update for MIC in 2008. The adopted LTCP recommends that two runways at ANE be closed to "right-size" the airport, and suggests keeping the original paved runway (Runway 14L-32R) and the paved crosswind runway (Runway 6L-24R) intact. The MAC is evaluating the process for implementing the runway closure recommendations.

Preparation of the 2035 LTCP for MIC is underway and is expected to be completed in 2016. Based on updated forecasts, it is anticipated that this LTCP will validate the "right-sizing" findings of the previous plan and present an updated timeline for implementation of the proposed airfield changes.

3.4.4 Flying Cloud Airport (FCM)

In 2015, the MAC completed the first phase of a multi-year project to reconstruct Taxiway A at FCM. This phase included the full-depth reconstruction of the portion of the taxiway on the east side of Runway 18-36.

The Long Term Comprehensive Plan (LTCP) update for FCM was completed in 2010. This plan analyzed existing facilities, forecasted future activity, and outlined development needed to meet projected demands. The primary project recommended in the plan involved shifting the crosswind runway at FCM (Runway 18-36) to the north. This project was completed in 2013 and provides a fully compliant runway safety area at FCM.

Preparation of the 2035 LTCP for ANE will be initiated in 2016.

3.4.5 Lake Elmo Airport (21D)

The MAC rehabilitated alleyways in the north building area at 21D in 2015, and reconstructed a portion of the crosswind runway's parallel taxiway.

Preparation of the 2035 LTCP 21D was initiated in 2014 and remains in process. The Draft LTCP was published

in June 2015 for public review and comment. Based on feedback received during the first public comment period, the MAC developed a Refined Preferred Alternative to address some items of community concern while preserving the desired objectives for improving airport facilities.

The Refined Preferred Alternative recommends a relocated and lengthened primary runway (Runway 14-32), which necessitates a realignment of a public roadway (30th Street N) to remain clear of the Runway Protection Zone (RPZ). Further details about the Draft 2035 LTCP for the Lake Elmo Airport can be found on the MAC's website at: <http://metroairports.org/General-Aviation/Airports/Lake-Elmo.aspx>

3.4.6 St. Paul Downtown Airport (STP)

In 2015, the MAC reconstructed the section of Taxiway Echo from the end of Runway 13 to the end of Runway 27.

The Long Term Comprehensive Plan (LTCP) update for STP was completed in 2010. This plan analyzed existing facilities, forecasted future activity and outlined development needs in order to meet projected demand. Based upon the forecasts and existing airfield configuration, there is currently no demonstrated need for longer runways, additional runways, additional hangar areas or expanded landside areas.

Preparation of the 2035 LTCP for STP will be initiated in 2016.

