

# Appendix

## 2021 Annual Report

### QUICK LINKS

This appendix is prepared in accordance with the requirements of Minnesota Statutes Section 473.621. It presents MSP passenger and aircraft operations activity, current airport capacity in terms of operations and passenger enplanements, average length of delay statistics, and technological developments affecting aviation and their effect on operations and capacity at the airport. This appendix also includes the number of operations and based aircraft at each of the MAC's Reliever Airports in 2021 compared with 2020.

MSP Revenue Passenger Summary						
Rank	Airline	2019	2020	2021	Gain/Loss 2020-2021	% Change 2020-2021
1	Delta	27,305,753	9,797,141	17,576,004	7,778,863	79.40%
2	Sun Country	2,873,671	1,508,344	2,430,940	922,596	61.17%
3	American	2,055,211	901,810	1,334,080	432,270	47.93%
4	Southwest	1,821,369	655,981	1,153,629	497,648	75.86%
5	United	1,603,161	570,061	879,559	309,498	54.29%
6	Spirit	1,160,057	443,315	488,601	45,286	10.22%
7	Alaska Airlines	337,892	107,397	216,550	109,153	101.64%
8	Frontier	501,247	173,039	177,307	4,268	2.47%
9	JetBlue	224,595	38,132	61,150	23,018	60.36%
10	Air France	71,946	0	21,245	21,245	--
11	Allegiant	--	--	20,455	20,455	--
12	KLM	97,902	15,968	17,843	1,875	11.74%
13	Icelandair	82,629	2,058	16,678	14,620	710.40%
14	Air Canada	120,308	16,941	13,538	(3,403)	-20.09%
15	Denver Air Connection	--	1,783	12,136	10,353	580.65%
16	Boutique Air	9,830	3,114	1,900	(1,214)	-38.99%
17	Air Choice One	10,413	3,771	471	(3,300)	-87.51%
18	Aer Lingus	45,178	9,622	0	(9,622)	-100.00%
19	Condor	26,102	0	0	0	0%
	<b>Total</b>	<b>38,347,264</b>	<b>14,248,477</b>	<b>24,422,086</b>	<b>10,173,609</b>	<b>71.40%</b>

Source: MAC Year End Operations Reports – 1-27-2022. Note, this chart reflects numbers of paying, non-charter passengers only. Each year's totals are greater if you also count revenue charter passengers and non-revenue passengers such as airline employees with flight benefits.

### MSP Revenue Passenger Market Share

Rank	Airline	2019	2020	2021	Gain/Loss 2020-2021
1	Delta	71.21%	68.79%	71.97%	3.18%
2	Sun Country	7.49%	10.59%	9.95%	-0.64%
3	American/US Airways	5.36%	6.29%	5.46%	-0.83%
4	Southwest/AirTran	3.03%	4.61%	4.72%	0.11%
5	United	4.18%	4.00%	3.60%	-0.40%
6	Spirit	4.75%	3.11%	2.00%	-1.11%
7	Alaska Airlines	0.88%	0.75%	0.89%	0.14%
8	Frontier	1.31%	1.22%	0.73%	-0.49%
9	JetBlue	0.59%	0.27%	0.25%	-0.02%
10	Air France	0.19%	0.00%	0.09%	0.09%
11	Allegiant	--	--	0.08%	0.08%
12	Icelandair	0.22%	0.01%	0.07%	0.06%
13	KLM	0.26%	0.11%	0.07%	-0.04%
14	Air Canada	0.31%	0.12%	0.06%	-0.06%
15	Denver Air Connection	--	0.01%	0.05%	0.04%
16	Boutique Air	0.03%	0.02%	0.01%	-0.01%
17	Aer Lingus	0.12%	0.07%	0.00%	-0.07%
18	Air Choice One	0.03%	0.03%	0.00%	-0.03%
19	Condor	0.07%	0.00%	0.00%	0.00%

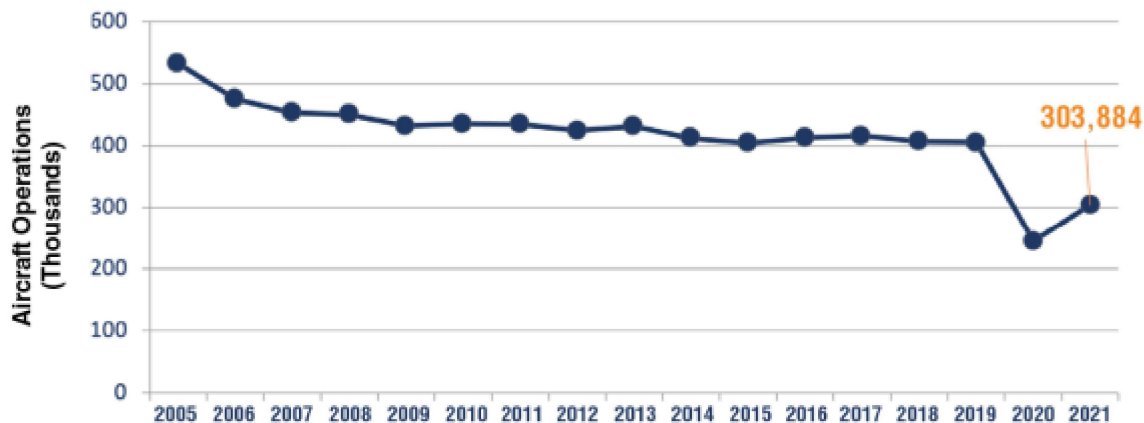
Source: MAC Year End Operations Reports --1-27-22

### MSP Airport Operations

Year	Air Carrier	Air Taxi	Itinerant General Aviation	Military	Total Operations
2014	292,445	105,606	11,272	2,437	411,760
2015	303,357	86,497	11,691	2,829	404,374
2016	311,271	87,198	11,489	2,940	412,898
2017	319,278	82,861	11,521	2,043	415,703
2018	321,650	72,609	10,081	2,573	406,913
2019	329,323	64,980	9,732	2,038	406,073
2020	199,558	38,508	4,935	1,876	244,877
2021	246,474	48,160	6,878	2,372	303,884

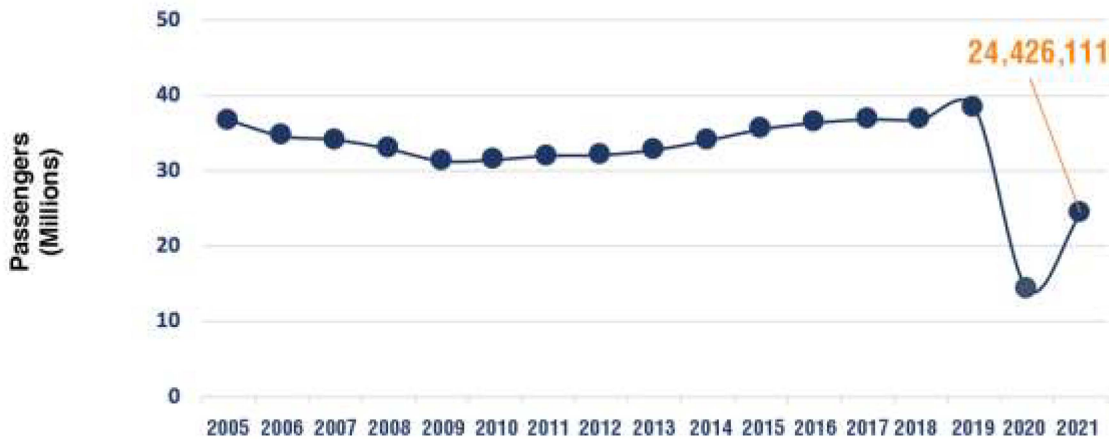
Source: FAA Air Traffic Operations Network (OPSNET)

### MSP Aircraft Operations



Source: FAA Air Traffic Operations Network (OPSNET)

## MSP Revenue Passengers



Source: MAC Year End Operations Reports - 1-27-2022. Note, this chart reflects numbers of paying, charter and non-charter passengers. Each year's totals are greater if you also count non-revenue passengers such as airline employees with flight benefits.

# Airfield Capacity

Airfield capacity is typically described in terms of hourly capacity and annual capacity under various weather conditions. The table below reflects the hourly capacity for MSP in optimum, marginal and poor weather conditions.

MSP's current airfield capacity is 158 aircraft operations in optimum conditions. When instrument flight rules are being used due to low-level, heavy cloud cover and/or low visibility capacity drops to 114 operations.

## MSP Airfield Capacity

Weather Conditions	Operations per hour
Optimal Rate (1).....	158
Marginal Rate (2).....	146
IFR Rate (3).....	114

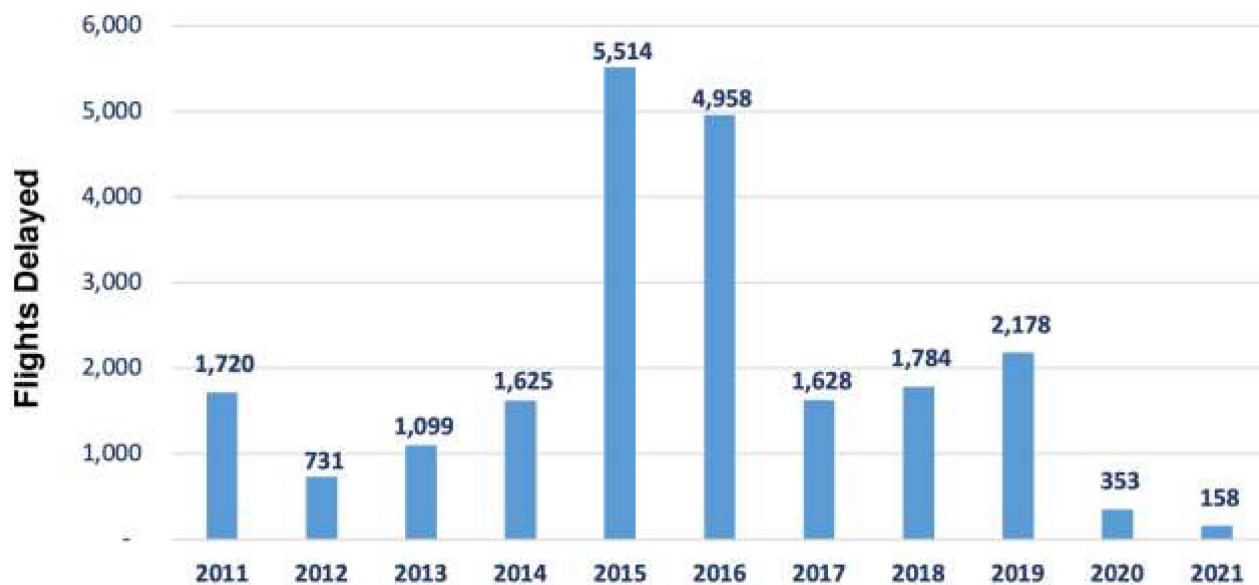
**Notes:**

- (1) Ceiling and visibility above minima for visual approaches.
- (2) Below visual approach minima but better than instrument conditions.
- (3) Instrument flight rules (IFR) are required in meteorological conditions with a cloud ceiling less than 1,000 feet or visibility less than 3 miles.

Source: Federal Aviation Administration Air Traffic Control Tower Analysis

# Airfield Delay

## MSP Flights Delayed By ATC



Notes: Beginning in 2015, RNAV arrival procedures and Converging Runway Operations were implemented at MSP.  
Source: FAA Air Traffic Operations Network (OPSNET)

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. The chart above depicts the annual number of MSP flights delayed by ATC in 2011 through 2021.

The FAA combines arrival and enroute delays into one category, and 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 2021, there were 158 delayed flights at MSP, which is a decrease of 195 flights when compared to 2020.

The MAC has initiated a Long-Term Plan update for MSP that will assess future facility requirements necessary to meet projected passenger and aircraft operation demand. A component of the Plan will quantify current and future airfield delay statistics to determine the capacity of the current MSP airfield. The Plan will also consider potential airfield alternatives designed to efficiently accommodate future demand. The Plan is expected to be completed in 2022.

# Airfield Delay per Aircraft Operation

When calculating the average delay per flight operation, delay is averaged by each flight's taxi time and airborne time. The total averaged delay is expressed in minutes of delay per operation. The current industry standard for estimating delay is established by the FAA Aviation System Performance Metrics (ASPM). 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 metric.[1]

When compared to other large hub U.S. airports as shown in the table below, MSP ranked 39th with an overall average delay of 4.4 minutes in 2021; in 2020 MSP ranked 28th with an overall average delay of 4 minutes.

**Top 20 Large Hub Airports with Highest Average Total Delay per Operation 2020-2021**

Rank	Airport	2021 Total Airports Operations	2021 Average Minutes of Delay per Operation	2020 Average Minutes of Delay per Operation	2020 Rank	Change from 2020 to 2021
1	CLT	514,782	10.3	9.6	1	0.7
2	ORD	684,201	9.9	8.3	3	1.6
3	DFW	651,895	8.6	8.4	2	0.2
4	EWR	292,433	8.6	6.9	4	1.7
5	SEA	374,510	7.8	6.3	7	1.5
6	PHL	268,884	7.5	6.1	8	1.4
7	IAH	395,787	7.4	6.8	5	0.6
8	IAD	245,805	6.9	5.5	9	1.4
9	DEN	588,855	6.6	5.5	10	1.1
10	MIA	387,973	6.2	4.2	21	2.1
11	MCO	319,185	6.2	4.5	17	1.7
12	DAL	211,330	6.0	3.9	30	2.1
13	DCA	173,898	5.9	5.3	11	0.6
14	JFK	303,397	5.7	4.5	18	1.2
15	LGA	187,578	5.7	6.7	6	-1.0
16	LAX	506,769	5.6	4.4	19	1.2
17	PHX	408,285	5.5	4.6	16	0.9
18	BUR	125,429	5.3	4.0	25	1.3
19	MEM	215,789	5.2	5.2	12	0.0
20	ANC	285,887	5.2	5.0	14	0.2
<b>39</b>	<b>MSP</b>	<b>303,884</b>	<b>4.4</b>	<b>4.0</b>	<b>28</b>	<b>0.4</b>

Source: FAA Aviation System Performance Metrics <sup>1</sup>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.

## Technological Developments and Capacity Enhancements at MSP

The FAA continuously explores potential capacity-enhancing development/technology 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 ASDE-X at MSP was completed in 2009 and provides seamless coverage for complete aircraft identification information. This equipment also allows for future implementation and upgrade to Next Generation (NextGen) navigation technology (Automatic Dependence Surveillance – Broadcast, "ADS-B"); ADS-B uses a Global Navigation Satellite System to broadcast critical information.

In 2021, aircraft operating at MSP were equipped with ADS-B/Cockpit Display of Traffic Information (ADS-B/CDTI) technology per federal policy for aircraft operating in capacity-constrained airspace, at capacity-constrained airports (including MSP) or in any other airspace deemed appropriate by the FAA.

## 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 the table below.

Precision Instrument Approaches			
MSP	CAT 1	CAT 2	CAT 3
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  $\frac{3}{4}$  statute miles or as low as 1,800 feet runway visual range (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.*

## The MAC's Reliever Airports

The MAC's six general aviation reliever airports are open for public use 24 hours per day. 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.

The tables below show the 2020 and 2021 reliever airport operations and reliever airport-based aircraft. The operations totals are obtained from the FAA for MAC reliever airports with an air traffic control tower. For the two reliever airports without an air traffic control tower (LVN and 21D), the operations totals are estimated through various methods and available data.

## Reliever Airport Operations

Airport	LVN	21D	MIC	STP	FCM	ANE	ANNUAL TOTAL
2020	31,314	29,799	39,509	30,188	124,382	70,852	<b>326,045</b>
2021	36,259	32,645	37,845	39,196	131,593	74,657	<b>352,195</b>
YY Comparison 2021-2020	4,945	2,846	(1,664)	9,008	7,211	3,805	<b>26,150</b>

Source: MAC Noise and Operations Monitoring System (MACNOMS), MAC Reliever Airports, and FAA Air Traffic Operations Network. Beginning on July 1, 2021, the MACNOMS methodology for counting operations was updated to more accurately reflect total aircraft departures or arrivals at MAC airports.

## Reliever Airports Based Aircraft

Airport	LVN	21D	MIC	STP	FCM	ANE	ANNUAL TOTAL
2020	140	187	161	91	363	365	<b>1,307</b>
2021	140	187	161	102	363	365	<b>1,318</b>
YY Comparison 2021-2020	-	-	-	11	-	-	11

Source: MAC Reliever Airports

**LVN** = Airlake | **21D** = Lake Elmo | **MIC** = Crystal | **STP** = St. Paul Downtown | **FCM** = Flying Cloud | **ANE** = Anoka County-Blaine