AIR TRAFFIC BY THE NUMBERS

May 2024

Federal Aviation Administration

FAA Contributors to ATO By the Numbers

- **Air Traffic Organization (ATO)**
  - **AJR - System Operations**
    - **AJR-G Performance Analysis**
    - **AJR-B Flight Service**
  - **AJI - Safety and Technical Training Services**
    - **AJI-3 Policy and Performance**
  - **AJM – Program Management Organization**
    - **AJM-33 Aviation Weather & Aero Services**
  - **AJT – Air Traffic Services**
  - **AJV – Mission Support Services**
    - **AJV-A370 US NOTAM Operations Team**
- **Non-ATO**
  - **AOC – Office of Communications**
  - **ABP-230 – Data Analysis and Reporting Services Branch**
  - **APO – Aviation Policy & Plans**
  - **AST – Office of Commercial Space Transportation**
  - **AVS – Aviation Safety**

Data Sources

Database Name	Owned/Managed by
Aviation System Performance Metrics (ASPM)	AJR-G
Operations Systems Network (OPSNET)	AJR-G (archive), AJM and AJW
National Traffic Management Log (NTML)	AJR-G (archive), AJM and AJW
Traffic Flight Management System (TFMS)	AJR-G (archive), AJM and AJW
National Offload Program (NOP)	AJR-G (archive) and AIT
U.S. Civil Airmen Statistics	APO
Runway Incursion Data	AVS
BTS T-100 Market and Segment Data	Bureau of Transportation Statistics

Table of Contents

Introduction

Air Traffic By the Numbers, or the *ATO Fact Book*, is a source book containing annual U.S. airport and air traffic control operations and performance data from the Federal Aviation Administration (FAA). It also includes information on air passenger travelers, runway incursions, commercial space launch activity, the economic impact of aviation, and so on.

The *ATO Fact Book*, first published by the Office of Performance Analysis, Air Traffic Organization (ATO) of the FAA in 2017, is updated annually, with data now current up until FY2023. This document represents the eighth edition of *Air Traffic By the Numbers*.

The storyline behind this year's *Fact Book* is the ongoing recovery from the impact of the COVID-19 global pandemic on air traffic. This impact, which began during FY2020 (specifically, March 2020) and continues through FY2023, is waning as air traffic continues to return to pre-pandemic levels.

The format of this edition is unchanged from last year. Section 1 includes some overall aviation-related statistics. NAS demand and efficiency measures appear in Section 2. Delay, diversion, go-around, and cancellation information follow in Section 3. Section 4 includes the latest data on various traffic management initiatives (TMI). Updated safety metric results are reported in Section 5. Other ATO Topics of interest, such as flight service and commercial space, are available in Section 6. The *ATO Fact Book* also includes historical annual airport tower and center operations for 1946-2023 (Appendix III).

Below are brief selected results for FY2023.

- Core 30 airport operations rose by 3.8 percent, to 12.2 million; operations handled by stand-alone TRACONS rose by 1.8 percent, to 19.2 million, while operations handled by centers rose by 2.1 percent, to 42.3 million (Section 2). Airport, TRACON, and center operations were higher before the pandemic, at 13.2 million, 20.3 million, and 43.7 million, respectively.
- IFR flights in the U.S. rose by 1.8 percent, to 15.7 million (Section 1). Before the pandemic, IFR flights numbered 16.4 million in FY2019.
- The number of passengers flown by air carriers increased by 13.9 percent, to 1,044.8 million (or about 1 billion) in FY2023 (Section 1). This is slightly below the pre-pandemic level of 1,057.6 million passengers in FY2019.
- The number of air traffic controllers increased by 1.2 percent, to 13,853 (in Section 1).
- The number of pilot certificates increased by 6.6 percent in CY2023 to 806,939; and remote (or drone) pilot certificates increased by 21.2 percent, to 368,633 (Section 1).

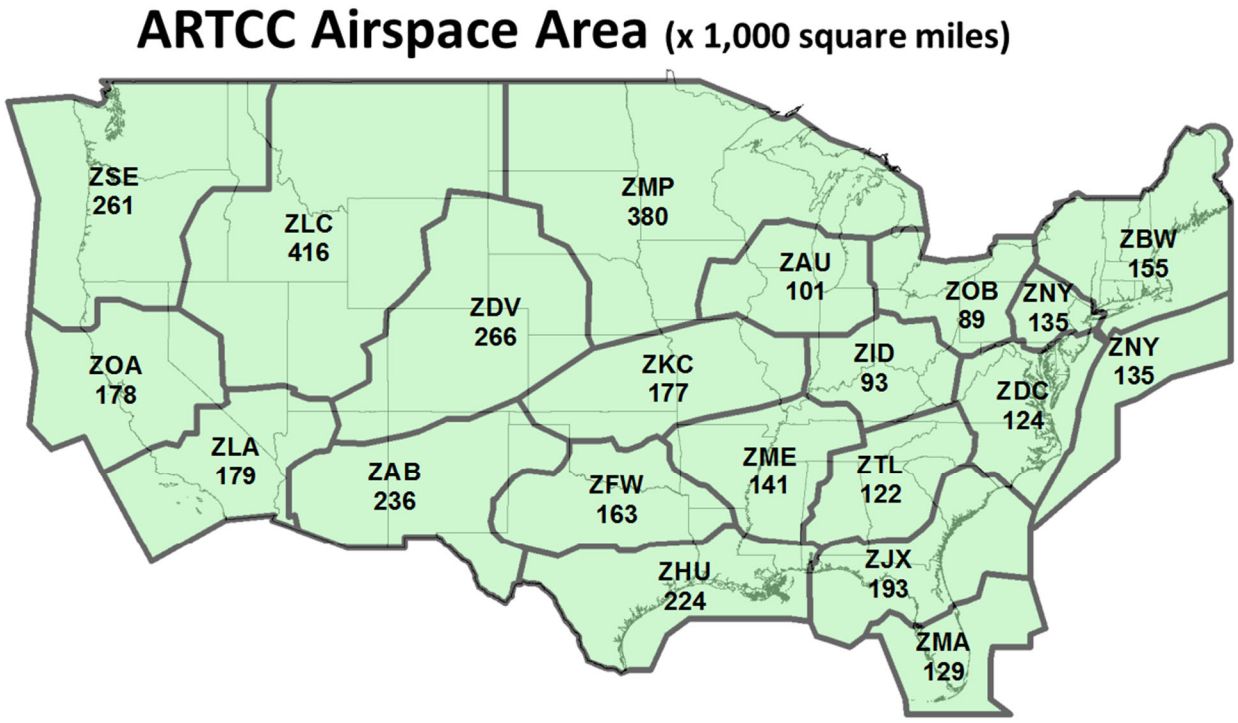
This publication benefited from the contributions of many offices and individuals throughout the Air Traffic Organization and the Federal Aviation Administration. As always, we thank everyone who participated in this effort.

System Events and Analysis Group (AJR-G3)
Office of Performance Analysis
System Operations Services
Air Traffic Organization
Federal Aviation Administration
U.S. Department of Transportation

May 2024

Air Traffic Organization Leadership

www.faa.gov/about/office_org/headquarters_offices/ato/leadership



Section 1. FAA Air Traffic Management System Overview for FY2023

ATO Program and Financing Operations Budget Estimate (in $billions) (FY2023)	**$8.8**
Flights Handled	**15,712,724**
Scheduled	9,278,293
Unscheduled	6,434,431
Airspace (in millions of sq mi)	**29.4**
Oceanic	24.1
Domestic	5.3
Airports	**19,623**
Public Use Airports	5,165
Private Use Airports	14,458
Federal Air Traffic Control Facilities 1/	**313**
Stand-Alone ATC Tower Facilities	142
Stand-Alone TRACON Facilities	25
Combined ATC Tower/TRACON Facilities 2/	121
Centers and Combined Control Facilities	25
ARTCC	21
CCFs	4
Contract Air Traffic Control Towers 3/	**262**
NAVAIDS	**12,799**
Alaska Weather Cameras	**238**
Controllers	**13,853**
GA Aircraft (CY2022)	**209,540**
Fixed Wing	164,567
Rotorcraft	9,769
Experimental/Lightcraft/Other	35,204
GA Flight Hours (CY2022)	**26,953,000**

1/ These facility counts are consistent with page 13 of the 2023 FAA Air Traffic Controller Workforce Plan (https://www.faa.gov/air_traffic/publications/controller_staffing/). For FY2023, stand-alone towers rose from 139 to 142 and combined TRACONs fell from 124 to 121 as three combined TRACONs were consolidated into two other existing TRACONs.

2/ Combined ATC towers and TRACONs are located within the same building.

3/ Includes two new contract towers introduced during FY2023.

Sources:

ATO Program and Financing: U.S. Dept. of Transportation, Budget Estimates: FY2024, Federal Aviation Administration, Exhibit II-2.

Flights Handled: Federal Aviation Administration, Air Traffic Organization, Office of Performance Analysis (AJR-G), December 15, 2023; Innovata, Flight Schedule Database, accessed April 1, 2024.

Airspace: Federal Aviation Administration, Air Traffic Organization, Office of Performance Analysis (AJR-G).

Airports and **NAVAIDS**: Federal Aviation Administration, Air Traffic Organization, Airport Safety, Airport Data and Information Portal (ADIP), March 29, 2024. https://adip.faa.gov/agis/public/#/airportSearch/advanced; Federal Aviation Administration, Air Traffic Organization, Technical Operations (AJW), Monthly NAS Operational Facilities Inventory, October 1, 2023. https://my.faa.gov/org/linebusiness/ato/operations/ajw1/noag/nas_policy/fsep/media/NOF.pdf

ATC Towers, TRACONs, and **En Route Centers & CCFs**: Federal Aviation Administration, Air Traffic Organization, Air Traffic Services (AJT).

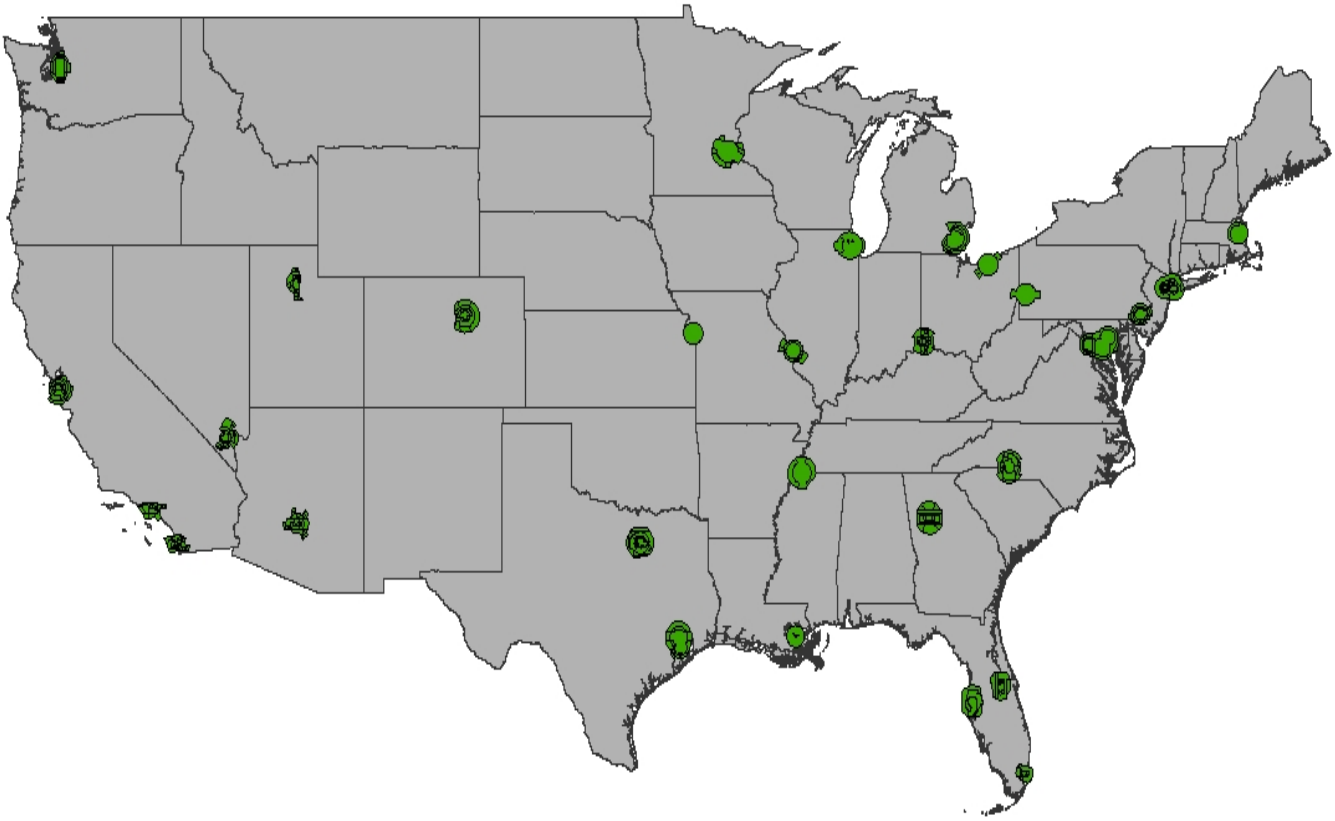
Alaska Weather Cameras: Federal Aviation Administration, Air Traffic Organization, Aviation Weather & Aeronautical Services (AJM-33), FAA Aviation Weather Cameras, accessed January 30, 2024. https://weathercams.faa.gov

Controllers: Federal Aviation Administration, Office of Finance and Management, Data Analysis and Reporting Services Branch (ABP-230), Air Traffic Controller and Academy Movement Report - September FY2023, September 29, 2023.

GA Aircraft and **GA Flight Hours**: Federal Aviation Administration, Aviation Safety (AVS), General Aviation and Part 135 Activity Surveys – CY2022, Tables 1.1 and 1.3, January 8, 2024. https://www.faa.gov/data_research/aviation_data_statistics/general_aviation/

Class B Airspaces (Airspace around Busiest US Airports)

Note: Airspaces accurately represented for coverage area

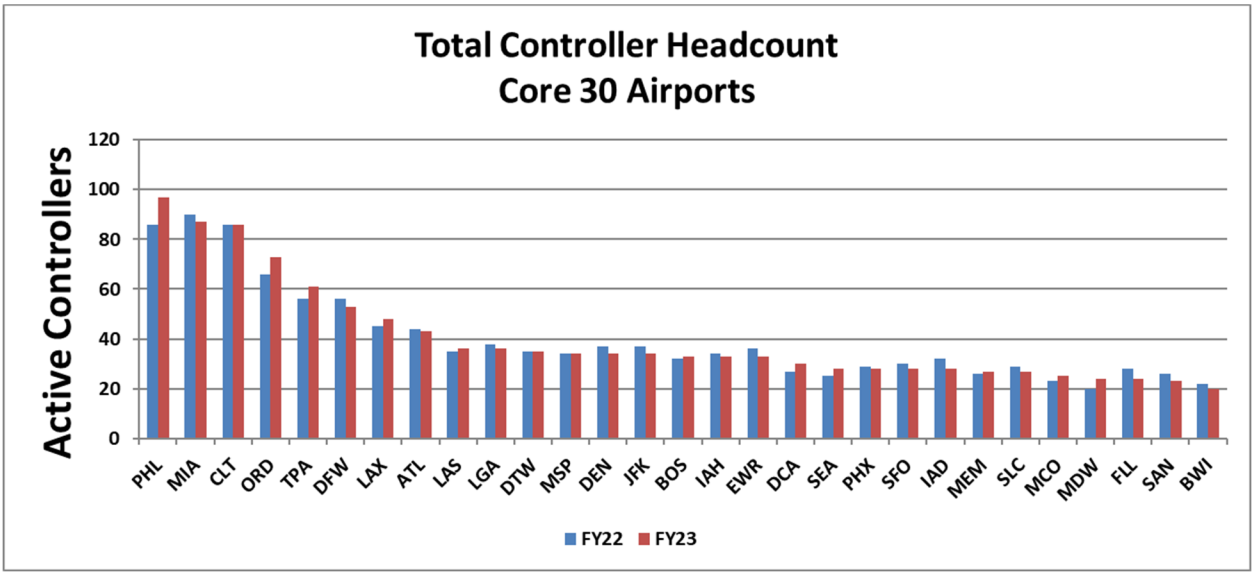


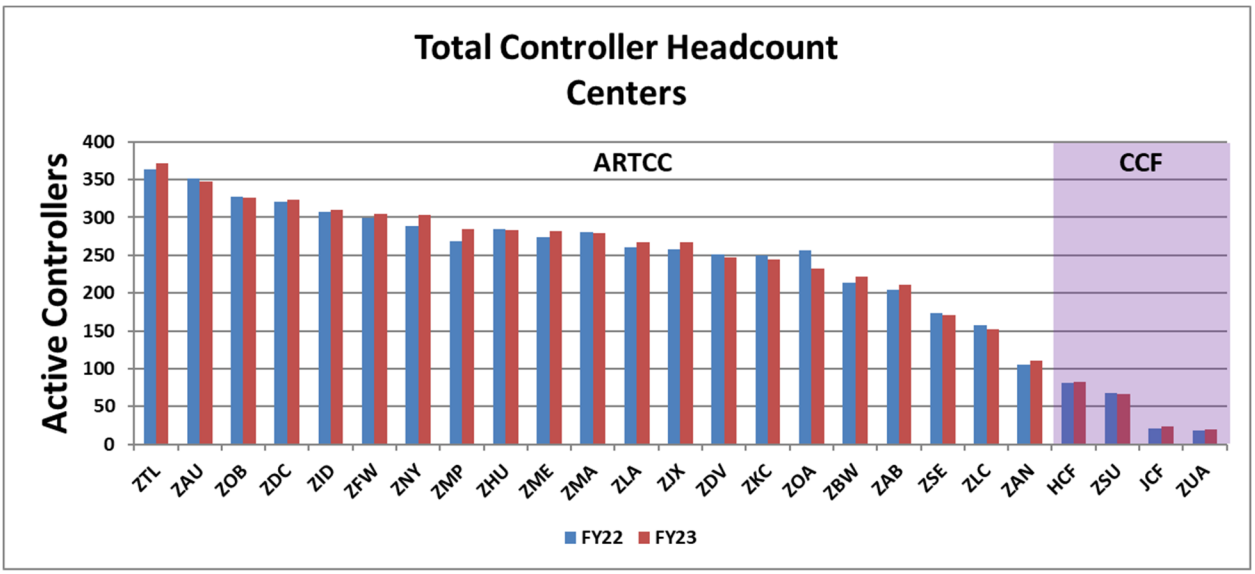
Air Traffic Controllers

As of the end of FY2023, the FAA air traffic controller total was 13,853, an increase from 13,693 at the end of FY2022.

	FY2022	FY2023
Academy Graduate (AG)	643	762
Developmental (D1)	207	144
Developmental (D2)	596	477
Developmental (D3)	451	487
Certified Professional (CPC)	10,578	10,593
Certified Professional in training (CPCIT)	943	985
Controllers	**13,418**	**13,448**
Academy	**275**	**405**
Total Head Count	**13,693**	**13,853**

Among Core 30 airports, Philadelphia (PHL), Miami (MIA), and Charlotte (CLT) reported large headcounts because these are combined ATCT TRACONs. PHL had the highest net gain of controllers at 11, while Fort Lauderdale (FLL) and Washington Dulles (IAD) had the highest net losses at 4. (*See*, Appendix I for explanations of the Core 30 airport and Center codes.)





Source: Federal Aviation Administration, Office of Finance and Management, Data Analysis and Reporting Services Branch (ABP-230), Air Traffic Controller and Academy Movement Report - September FY2023, September 29, 2023.

Pilot Certificates

The table below shows the number of pilot certificates held by age group (upper panel below) and by year (lower panel). The upper panel illustrates that student, commercial, and remote (or drone) pilots tend to be younger, while airline transport pilots tend to be older. The lower panel informs us that the number of total active pilot certificates held in the U.S. increased by 6.6 percent, from 756,927 in CY2022 to 806,939 in CY2023, mainly due to an increase in student pilot certificates from 280,582 to 316,470. Further, the number of remote pilot certifications (which began in August 2016) increased by 21.2 percent, from 304,256 in 2021 to 368,633 in 2023. (Note, the pilot total does not include flight instructors and remote pilots.)

Estimated Active Pilot Certificates Held by Category and Age Group of Holder, as of December 31, 2023

By Age Group	Type of Pilot Certificates							Certified Flight Instructor 2/	Remote Pilot 2/
	Total	Student	Sport	Recre-ational	Private 1/	Commercial 1/	Airline Transport 1/		
Total	**806,939**	**316,470**	**7,144**	**72**	**180,233**	**122,282**	**180,738**	**131,577**	**368,633**
14-15	820	820	0	0	0	0	0	0	0
16-19	34,049	25,915	8	2	7,513	611	0	214	6,146
20-24	88,348	47,689	55	1	22,074	16,584	1,945	10,061	22,527
25-29	100,033	55,336	139	1	15,906	19,045	9,606	15,292	45,026
30-34	91,183	50,706	237	5	13,967	12,937	13,331	13,488	52,460
35-39	81,434	38,204	316	2	14,049	10,836	18,027	14,228	52,022
40-44	71,879	28,240	372	1	13,297	8,964	21,005	13,927	45,357
45-49	57,904	19,275	396	4	11,084	6,835	20,310	11,521	36,328
50-54	58,429	15,208	486	5	12,666	7,203	22,861	11,565	32,762
55-59	58,875	12,030	777	4	13,920	7,360	24,784	10,642	26,214
60-64	57,140	9,657	964	11	16,229	7,768	22,511	9,520	21,238
65-69	44,130	6,535	1,133	12	16,347	7,636	12,467	8,123	14,887
70-74	29,963	3,820	999	11	12,077	6,563	6,493	5,983	8,447
75-79	19,618	2,016	717	9	7,005	5,497	4,374	4,386	3,814
80 & over	13,134	1,019	545	4	4,099	4,443	3,024	2,627	1,405

By Year									
2015	**590,038**	122,729	5,482	191	186,786	116,291	158,559	102,628	N/Ap
2016	**584,361**	128,501	5,889	178	174,517	112,056	163,220	104,382	20,362
2017	**609,306**	149,121	6,097	157	174,516	114,186	165,228	106,692	69,166
2018	**633,316**	167,804	6,246	147	175,771	115,776	167,572	108,564	106,321
2019	**664,563**	197,665	6,467	130	173,080	116,572	170,649	113,445	160,302
2020	**691,689**	222,629	6,643	107	172,945	119,245	170,120	117,558	206,322
2021	**720,603**	250,197	6,801	86	173,606	119,827	170,086	121,270	254,587
2022	**756,927**	280,582	6,957	80	176,328	119,832	173,148	125,075	304,256
2023	**806,939**	316,470	7,144	72	180,233	122,282	180,738	131,577	368,633

1/ Includes pilots with an airplane and/or a helicopter and/or a glider and/or a gyroplane certificate. Pilots with multiple ratings are reported under highest rating. For example a pilot with a private helicopter and commercial airplane certificates are reported in the commercial category.

2/ Not included in total active pilots.

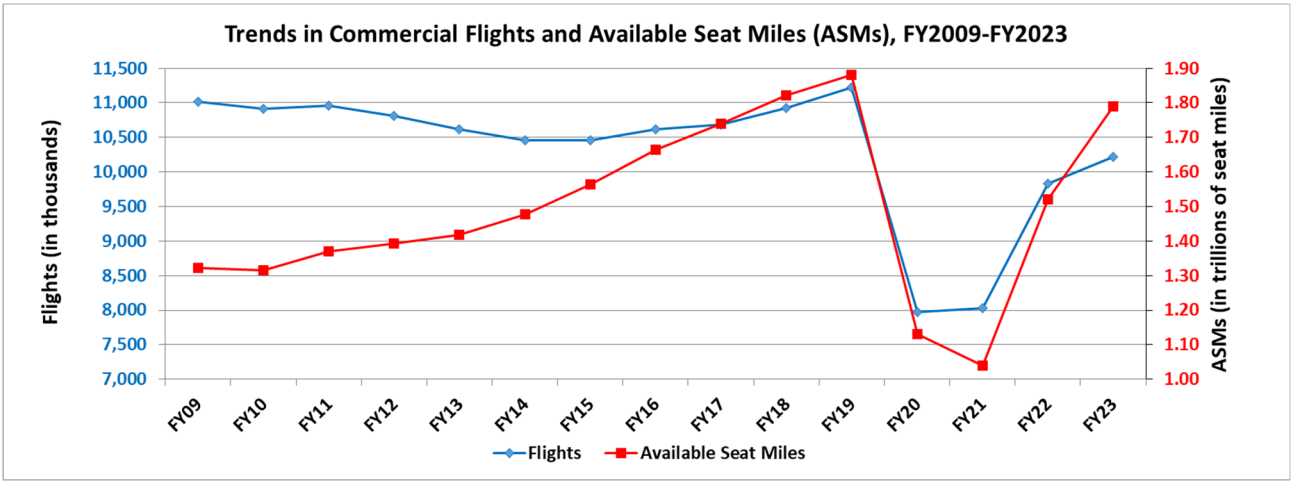
N/Ap Not applicable.

Source: Federal Aviation Administration, Office of Aviation Policy and Plans (APO), U.S. Civil Airmen Statistics, 2023, Table 12, March 12, 2024. https://www.faa.gov/data_research/aviation_data_statistics/civil_airmen_statistics/

Commercial Flight and Available Seat Mile (ASM) Trends

Commercial air passenger travel continues to recover from the impact of the COVID-19 pandemic. Thus far, the pandemic affected travel numbers from FY2020 through FY2023 (graph and first table below). From FY2022 to FY2023, the number of scheduled commercial flights rose by 4 percent to 10.2 million (graph) and the number of passengers rose by 13.9 percent to over one billion (table). Revenue passenger miles (RPMs) and available seat miles (ASMs) also increased, by 24.1 and 17.6 percent, to 1.49 and 1.79 trillion, respectively (first table). Therefore, load factor, the percentage of available seat miles flown by paying commercial passengers rose (from 78.72 to 83.06 percent). The table below shows passenger numbers for the five most recent fiscal years.

The second table shows the economic impact of civil aviation during the first year of the pandemic, in terms of jobs, earnings, and overall impact in dollar and percentage terms. The impact fell from 4.9 percent in CY2019 to 2.3 percent in CY2020, the first year of the pandemic. (Estimates for more recent years are not yet available.)



Source: U.S. Dept. of Transportation, Bureau of Transportation Statistics, T100 Segment Data, April 5, 2024.

Passengers					
	FY 2019	**FY 2020**	**FY 2021**	**FY 2022**	**FY 2023**
Yearly Passengers	1,057,645,399	576,945,674	590,356,608	917,515,405	1,044,764,461
Average Daily Passengers	2,897,659	1,576,354	1,617,415	2,513,741	2,862,368
Revenue Passenger Miles (trillions)	1.57	0.78	0.66	1.20	1.49
Available Seat Miles (trillions)	1.88	1.13	1.04	1.52	1.79
Passenger Load Factor (%)	83.36%	69.05%	63.84%	78.72%	83.06%

Economic Impact of Civil Aviation		
	CY2019*	**CY2020***
Aviation in US generates # jobs	10,393,000	4,931,000
Earnings of (billions)	$541.10	$259.10
Aviation contributes annually (trillions)	$1.92	$0.91
Constitutes % of GDP	4.9%	2.3%

*Estimates for more recent years are not yet available.

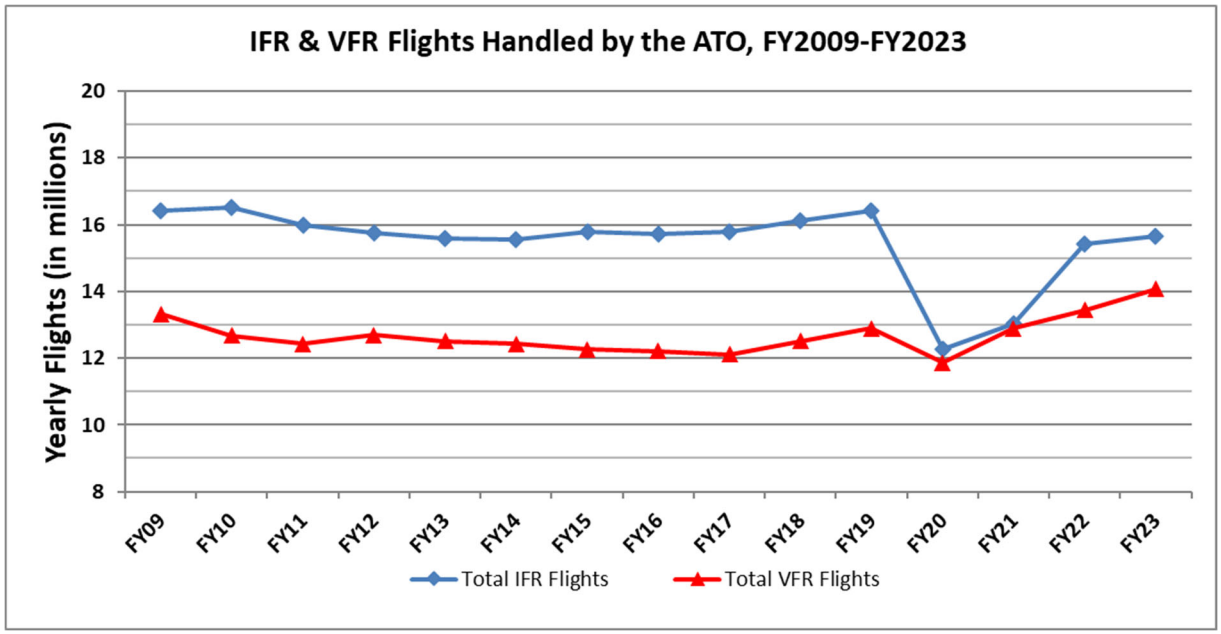
Sources:

Passenger Statistics: U.S. Dept. of Transportation, Bureau of Transportation Statistics, T100 Segment Data, April 5, 2024.

Economic Impact of Civil Aviation: Federal Aviation Administration, Office of Aviation Policy and Plans, Forecast and Performance Analysis Division (APO-100), Economic Impact of Civil Aviation on the U.S. Economy, August 2022. https://www.faa.gov/sites/faa.gov/files/2022-08/2022-APL-038%202022_economic%20impact_report.pdf

Instrument Flight Rule (IFR) and Visual Flight Rule (VFR) Flights across the NAS*

By FAA Order, *Air Traffic By the Numbers*, published by the Office of Performance Analysis (AJR-G), is the official source of IFR flights counts.** During FY2023, the number of IFR flights was 15,712,724. AJR-G data show the number of IFR flights rose by 1.8 percent, and the number of VFR flights rose by 4.7 percent to 14.1 million. (During FY2019, prior to the COVID pandemic, IFR and VFR flights numbered 16.4 million and 12.9 million, respectively.)



*Note: Total VFR activity is approximated as airport arrival plus departure operations, divided by 2; plus VFR overflights. Editions of the ATO Fact Book prior to April 2023 did not include VFR overflights.

**FAA Order JO 7200.24, "Authority to Define and Report Operational Metrics"; effective December 26, 2018.

Total numbers of fiscal year annual IFR and VFR flights also appear in the table below.

Year	IFR Flights	VFR Flights
FY2005	18,645,898	14,489,723
FY2006	18,066,360	14,043,414
FY2007	17,970,314	14,121,870
FY2008	17,908,487	13,831,268
FY2009	16,428,893	13,314,949
FY2010	16,522,406	12,678,715
FY2011	15,992,536	12,433,620
FY2012	15,760,241	12,693,012
FY2013	15,576,396	12,504,343
FY2014	15,546,452	12,425,953
FY2015	15,782,675	12,265,462
FY2016	15,724,478	12,203,468
FY2017	15,800,679	12,104,334
FY2018	16,122,488	12,507,815
FY2019	16,416,056	12,887,828
FY2020	12,270,055	11,864,718
FY2021	13,028,643	12,882,339
FY2022	15,436,595	13,439,378
FY2023	15,712,724	14,066,291

Source: Federal Aviation Administration, Air Traffic Organization, Office of Performance Analysis (AJR-G), February 28, 2024 (for IFR), December 15, 2023 (for VFR).

Section 2. Demand and Efficiency in the NAS

The NAS is composed of 521 airport towers (263 Federal and 262 contract towers), 146 terminal radar control (TRACON) facilities (25 stand-alone and 121 combined ATCT), and 25 control centers (21 air route traffic control centers (ARTCC) and 4 combined control facilities (CCF)).

TRACONs handle descending flights received from a center or ascending flights received from an ATC tower (see figure below). Of the 146 TRACONs in the NAS, 121 of them are combined such that the TRACON exists in the same location as the ATC tower. Such facilities include the Miami, Charlotte, and El Paso towers.

Centers handle all en route flights operating on Instrument Flight Rule (IFR) flight plans. Centers receive flights from or hand off flights to other centers throughout the flight's en route phase of operation. They also receive flights or hand off flights to TRACONs when flights enter or exit the en route phase of operation.

This report reveals the demand observed at some of the busiest facilities, represented by the Core 30 airport towers, the 25 stand-alone TRACONs, and all 25 centers (which include 4 CCFs). Efficiency is also reported based on the following metrics:

Number of Flights at Any Given Minute

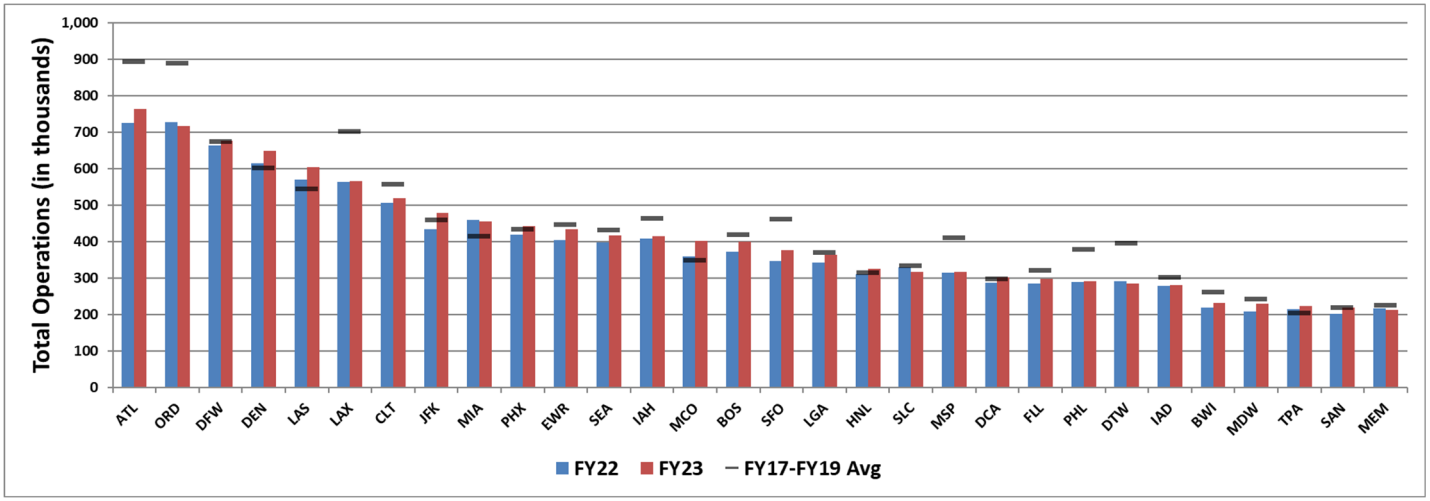
Average Hourly Capacity

Average Daily Capacity

Core 30 Airport Operations

Airport operations are the sum of the number of airport arrivals and departures. Airport traffic controllers handle such operations. Each flight has a departure and arrival, meaning each flight roughly consists of two airport operations. In FY2023, Core 30 airport operation numbers rose by 3.8 percent, from 11.8 million in FY2022 to 12.2 million (table below). During the three years before the pandemic (FY2017-FY2019), Core 30 airport operations averaged 13 million; therefore, operations remain below this pre-pandemic level. (Among all airports operating FAA towers, operations rose by 3.2 percent, to 37.3 million. Among all 523 Federal towers (including 260 contract towers), operations rose by 3.7 percent, to 54.5 million.)

Also shown below are airport operations for each Core 30 airport. In FY2023, Atlanta (ATL), Chicago O'Hare (ORD), and Dallas-Fort Worth (DFW) had the highest number of operations; operations rose at ATL and DFW by 5.3 and 1.9 percent but fell at ORD by 1.4 percent. Operations returned to pre-pandemic levels at ten airports (DFW, Denver (DEN), Las Vegas (LAS), JFK, Miami (MIA), Phoenix (PHX), Orlando (MCO), Honolulu (HNL), Washington National (DCA), and Tampa (TPA).) (*See*, Appendix I for explanations of the Core 30 airport codes.)



Total Core 30 Airport Operations			
FY17-19Avg	**FY22**	**FY23**	**%Change**
13,014,040	11,758,471	12,206,459	3.8%

Airport	Rank*	FY17-19Avg	FY22	FY23
ATL	**1**	892,531	724,226	762,526
BOS	**15**	418,820	371,622	399,843
BWI	**26**	262,185	218,649	231,933
CLT	**7**	556,837	506,290	518,205
DCA	**21**	297,834	286,580	301,002
DEN	**4**	602,692	613,679	647,440
DFW	**3**	674,069	663,426	675,807
DTW	**24**	394,476	292,174	285,448
EWR	**11**	446,791	403,583	433,363
FLL	**22**	322,202	285,994	297,197
HNL	**18**	314,595	311,135	324,429
IAD	**25**	301,318	279,429	281,198
IAH	**13**	462,986	409,248	415,518
JFK	**8**	458,526	433,538	479,050
LAS	**5**	543,391	570,513	603,015

Airport	Rank*	FY17-19Avg	FY22	FY23
LAX	**6**	701,467	564,083	565,995
LGA	**17**	369,527	342,587	364,561
MCO	**14**	348,469	358,854	402,248
MDW	**27**	243,601	208,805	229,425
MEM	**30**	225,764	216,521	212,023
MIA	**9**	414,830	459,270	455,361
MSP	**20**	410,011	315,152	316,496
ORD	**2**	889,128	727,018	716,920
PHL	**23**	378,600	288,474	291,642
PHX	**10**	433,000	419,532	442,858
SAN	**29**	218,941	201,184	218,538
SEA	**12**	431,030	397,095	416,651
SFO	**16**	462,422	346,585	376,900
SLC	**19**	334,366	328,920	317,158
TPA	**28**	203,632	214,305	223,709

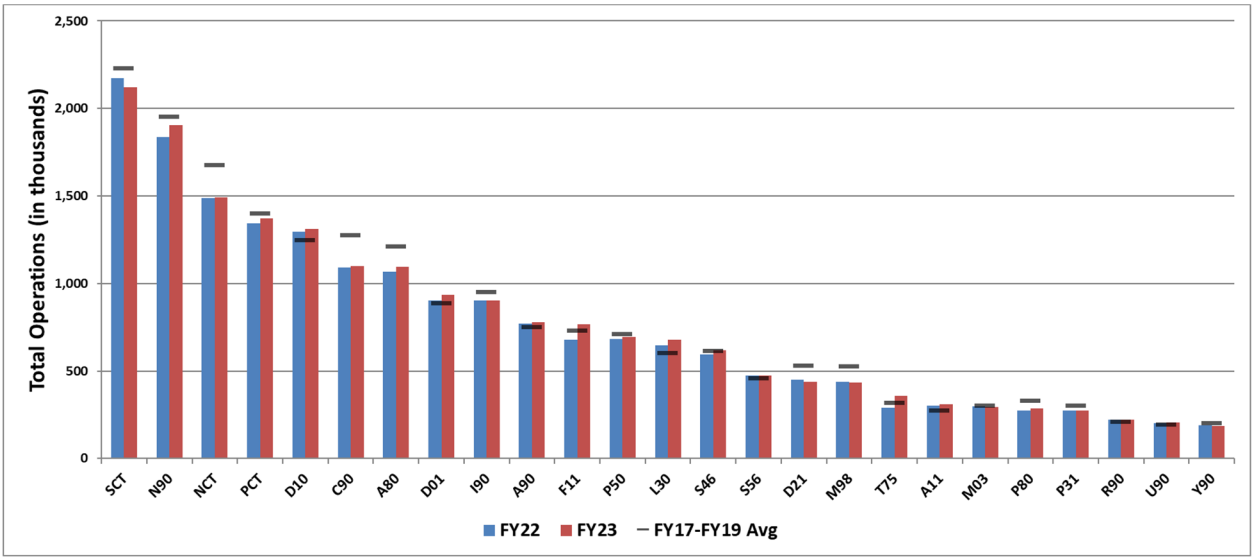
*Ranked by FY23 operations.

Source: Federal Aviation Administration, Air Traffic Organization, Office of Performance Analysis (AJR-G), Operations Network (OPSNET), November 17, 2023.

Stand-Alone Terminal Radar Control (TRACON) Facilities

TRACON operations are IFR and VFR itinerant operations passed to and from area airports, other TRACONs, or centers, including overflights through TRACON airspace. In FY2023, among the 25 stand-alone TRACONs, operations rose by 1.8 percent to 19.2 million. Before the pandemic (FY2017-FY2019), stand-alone operations averaged 19.9 million, meaning operations remain below pre-pandemic levels (table below). Among the 124 combined TRACONs, operations numbered 18.7 million in FY2023 (not shown below). Across all 146 TRACONs (stand-alone, plus combined), operations rose by 0.8 percent, from 37.7 to 38.0 million in FY2023. Before the pandemic, operations averaged 38.5 million (not shown below).

Below are operation counts for each of the 25 stand-alone TRACONs for the pandemic years FY2022 and FY2023 and the pre-pandemic annual average (FY2017-FY2019). In FY2023, Southern California (SCT) New York (N90), and Northern California (NCT) had the highest number of operations with more than 1.4 million each. At 11 of the 25 TRACONs, operations recovered to FY2017-FY2019 pre-pandemic levels (graph and table below). (*See*, Appendix I for explanations of the TRACON facility codes.)



Total Stand-Alone TRACON Operations			
FY17-19 Avg	FY22	FY23	%Change
19,940,704	18,892,526	19,240,916	1.8%

TRACON	Rank*	FY17-19 Avg	FY22	FY23
A11	19	275,585	302,421	308,176
A80	7	1,213,101	1,067,921	1,093,853
A90	10	750,414	771,789	777,434
C90	6	1,277,423	1,091,896	1,098,161
D01	8	885,750	900,930	936,779
D10	5	1,247,768	1,295,129	1,311,316
D21	16	530,295	449,916	436,755
F11	11	730,043	677,008	765,784
I90	9	951,472	904,424	902,679
L30	13	602,603	646,219	679,238
M03	20	301,072	298,687	294,867
M98	17	526,313	436,649	434,505
N90	2	1,953,783	1,838,109	1,903,319

TRACON	Rank*	FY17-19 Avg	FY22	FY23
NCT	3	1,674,540	1,489,120	1,492,119
P31	22	300,023	274,095	275,554
P50	12	708,956	683,380	695,344
P80	21	329,709	273,620	285,697
PCT	4	1,400,750	1,343,486	1,370,604
R90	23	209,962	223,383	220,698
S46	14	615,142	594,336	618,816
S56	15	457,064	474,131	472,467
SCT	1	2,230,827	2,173,998	2,119,849
T75	18	316,870	289,442	358,540
U90	24	193,273	202,936	203,960
Y90	25	201,964	189,501	184,402

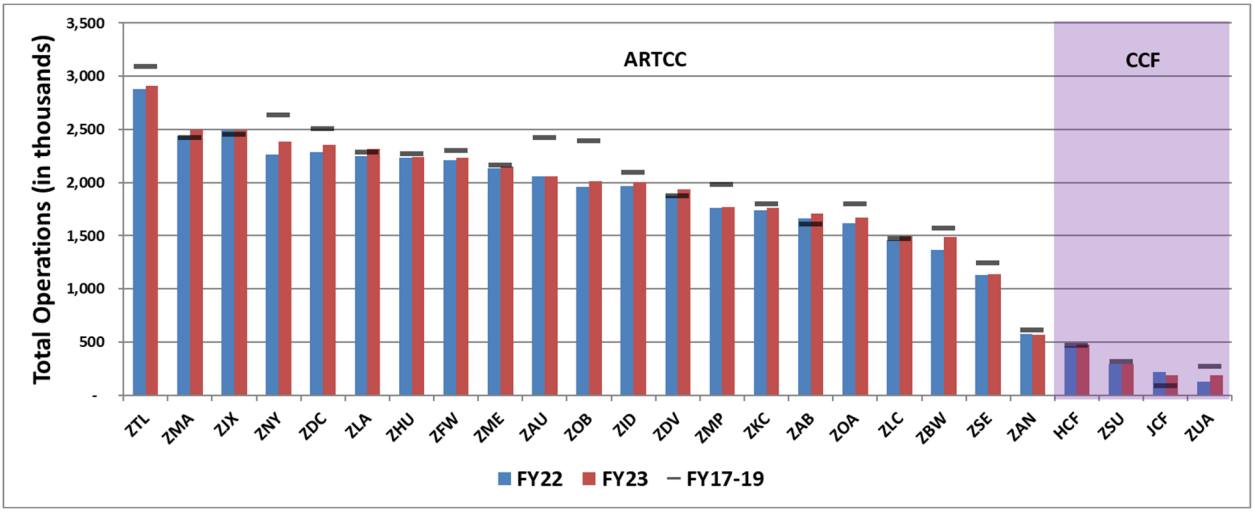
*Ranked by FY2023 operations.

Source: Federal Aviation Administration, Air Traffic Organization, Office of Performance Analysis (AJR-G), Operations Network (OPSNET), November 20, 2023.

Air Route Traffic Control Centers (ARTCC) and Combined Control Facilities (CCF)

Air route traffic control centers (ARTCC) or en route operations are the number of IFR and VFR itinerant operations passing from a TRACON to a center, or from one center to another center, or from a center to a TRACON. It includes U.S. overflights and oceanic traffic through center air space that do not arrive at or depart from U.S. territory. In FY2023, en route operation numbers for the 21 ARTCC and 4 CCFs (combined control facilities) rose by 2.1 percent, from 41.4 to 42.3 million; however, operations have yet to recover to the FY2017-FY2019 pre-pandemic average levels of 44.1 million (table below).

Also shown below are operation counts for FY2022 and FY2023 and the pre-pandemic averages for FY2017-FY2019 by center. In FY2023, the Atlanta (ZTL), Miami (ZMA), and Jacksonville (ZJX) centers reported the highest number of operations among the centers, each with more than 2.4 million. Center operations for Miami, Jacksonville, Los Angeles (ZLA), Denver (ZDV), Albuquerque (ZAB), Salt Lake City (ZLC), Honolulu (HCF), have recovered to pre-pandemic levels (graph and table below). (*See*, Appendix I for explanations of the ARTCC and CCF codes.)



Total ARTCC & CCF Operations			
FY17-19 Avg	**FY22**	**FY23**	**%Change**
44,147,204	41,436,609	42,312,939	2.1%

Center	Rank*	FY17-19 Avg	FY22	FY23
HCF	**22**	466,374	459,957	476,934
JCF	**24**	87,067	218,089	188,922
ZAB	**16**	1,609,158	1,665,476	1,710,409
ZAN	**21**	611,191	571,677	570,946
ZAU	**10**	2,421,304	2,054,628	2,053,984
ZBW	**19**	1,574,246	1,369,330	1,484,095
ZDC	**5**	2,509,288	2,285,412	2,351,499
ZDV	**13**	1,874,490	1,878,702	1,934,737
ZFW	**8**	2,301,123	2,207,777	2,231,636
ZHU	**7**	2,271,141	2,228,825	2,243,556
ZID	**12**	2,092,253	1,967,633	2,002,184
ZJX	**3**	2,452,192	2,492,247	2,494,032
ZKC	**15**	1,800,362	1,739,180	1,759,811

Center	Rank*	FY17-19 Avg	FY22	FY23
ZLA	**6**	2,282,499	2,247,809	2,313,101
ZLC	**18**	1,471,415	1,454,448	1,492,549
ZMA	**2**	2,424,266	2,440,120	2,499,387
ZME	**9**	2,162,893	2,135,332	2,151,988
ZMP	**14**	1,983,224	1,759,386	1,770,122
ZNY	**4**	2,637,886	2,266,267	2,382,714
ZOA	**17**	1,802,700	1,613,370	1,672,262
ZOB	**11**	2,389,671	1,955,286	2,008,714
ZSE	**20**	1,246,442	1,128,896	1,137,088
ZSU	**23**	315,178	290,086	290,882
ZTL	**1**	3,092,693	2,878,068	2,908,171
ZUA	**25**	268,149	128,608	183,216

*Ranked by FY2023 operations.

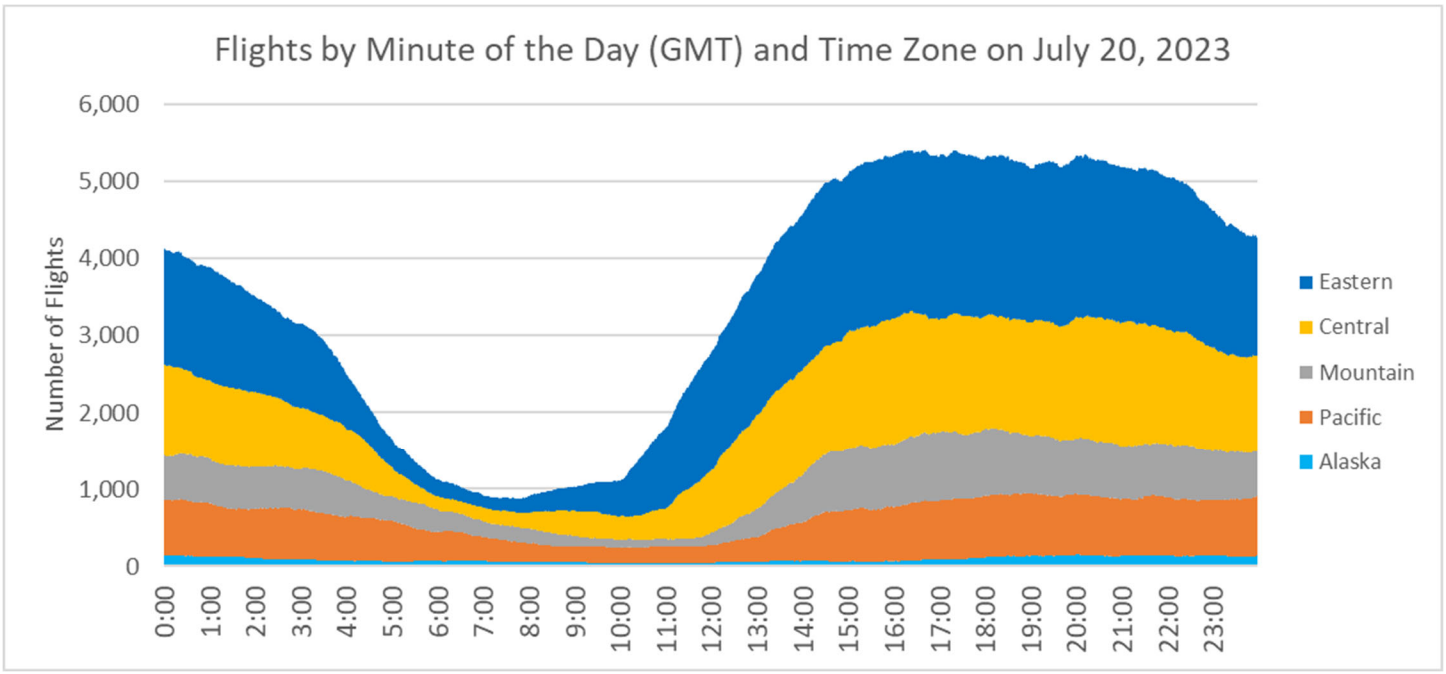
Source: Federal Aviation Administration, Air Traffic Organization, Office of Performance Analysis (AJR-G), Operations Network (OPSNET), November 21, 2023.

Number of IFR Flights at Any Given Minute during Peak Operational Times

5,000 Flights

Traffic flow management system (TFMS) flight data were used to determine the number of flights en route every minute of the day and by U.S. time zone on July 20, 2023. Peak operational times in the NAS range between 1500 GMT and 2200 GMT. During peak operational times in the NAS on that day, there were over **5,400** IFR flights en route in the NAS every minute.

The figure below shows the average number of flights en route per minute and flights under air traffic control by time zone. The Eastern Time zone has the largest share of flights in the NAS on average and, in this analysis, also includes flights under air traffic control from Puerto Rico and Bermuda. The Pacific Time Zone category includes all west coast air traffic as well as oceanic operations controlled by Oakland center (ZOA), including Hawaii and Guam.

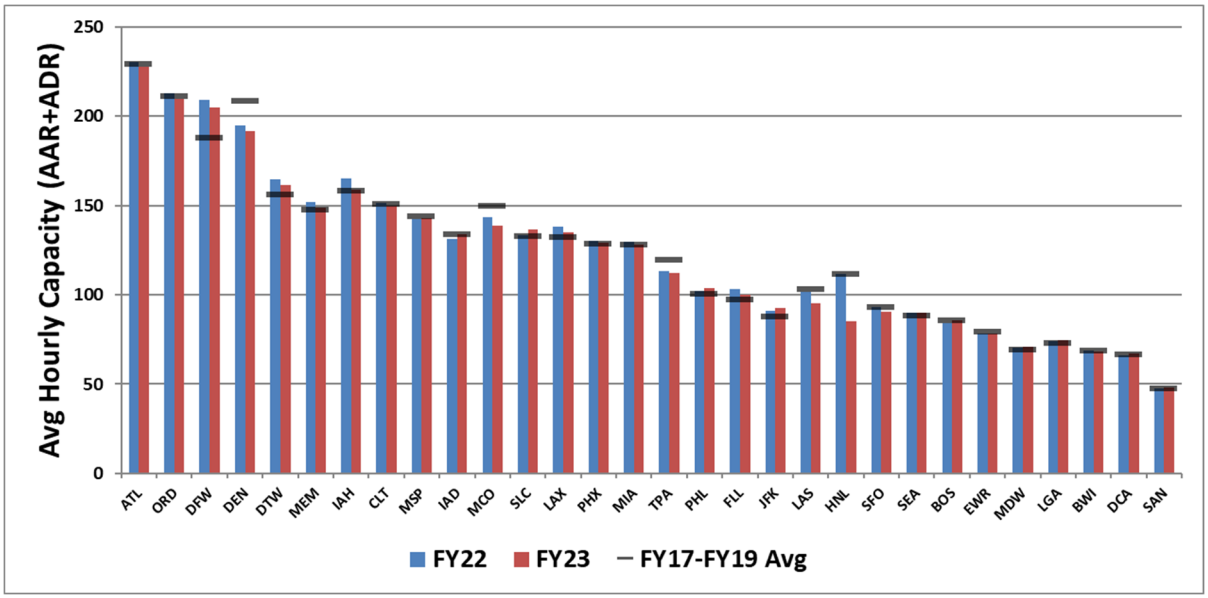


Source: Federal Aviation Administration, Air Traffic Organization, Office of Performance Analysis (AJR-G), April 9, 2024.

Average Hourly Capacity (Called Rate) at Core 30 Airports

In general, airport capacity is determined by its runways and surrounding airspace. For this report, capacity is represented by an airport's called rates for reportable hours. In FY2023, average hourly capacity across all Core 30 airports was 3,612. Note, airport capacity is not determined by circumstances such as the pandemic. Prior to the pandemic capacity averaged 3,643 operations per hour (table below).

In FY2023, the highest average hourly called rates were at Atlanta (ATL) and Chicago O'Hare (ORD). Each had an average called rate of over 200 operations per hour. The largest increases occurred at Salt Lake City (SLC) (up 2.8 percent) and Washington Dulles (IAD) (up 2 percent). The largest decrease occurred at Honolulu (HNL) (down 23.6 percent) due to runway construction. (*See*, Appendix I for explanations of the Core 30 airport codes.)



AHC Across All Core 30 Airports			
FY17-19 Avg	**FY22**	**FY23**	**%Change**
3,691	3,725	3,661	-1.7%

Airport	Rank*	FY17-19 Avg	FY22	FY23
ATL	**1**	229	230	228
BOS	**23**	86	84	86
BWI	**28**	69	69	68
CLT	**7**	151	152	150
DCA	**29**	67	66	67
DEN	**4**	208	195	192
DFW	**3**	188	209	205
DTW	**5**	156	165	161
EWR	**25**	79	79	78
FLL	**18**	97	103	100
HNL	**24**	112	112	85
IAD	**13**	134	131	134
IAH	**6**	158	165	159
JFK	**20**	88	91	93
LAS	**19**	103	102	95

Airport	Rank*	FY17-19 Avg	FY22	FY23
LAX	**12**	132	138	135
LGA	**26**	73	74	75
MCO	**10**	150	143	139
MDW	**27**	69	71	71
MEM	**8**	148	152	149
MIA	**15**	128	130	128
MSP	**9**	144	142	143
ORD	**2**	211	213	210
PHL	**17**	101	102	104
PHX	**14**	129	130	129
SAN	**30**	48	48	48
SEA	**22**	88	90	90
SFO	**21**	93	93	91
SLC	**11**	133	133	137
TPA	**16**	119	113	112

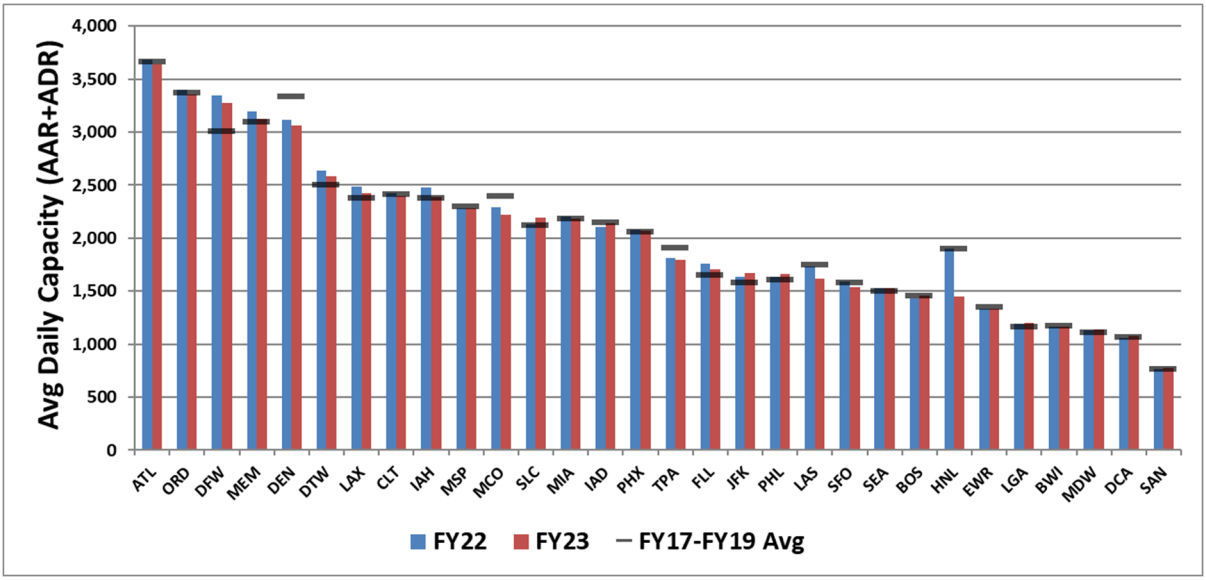
*Ranked by FY2023 call rates.

Source: Federal Aviation Administration, Air Traffic Organization, Office of Performance Analysis (AJR-G), Aviation System Performance Metrics (ASPM), November 22, 2023.

Average Daily Capacity (ADC) - Based on Called Rates at Core 30 Airports

In general, airport capacity is determined by its runways and surrounding airspace. For the purposes of this report, capacity is represented by the airport's called rates for reportable hours. Average daily capacity (ADC) is the ATO's official tracking method for determining an airport's capacity during a day. In FY2023, capacity across all Core 30 airports was 60,431 (table below). Airport capacity is not determined by circumstances such as the pandemic.

In FY2023, data for the Core 30 airports show that the highest ADCs were found at Atlanta (ATL), Chicago (ORD), Dallas-Fort Worth (DFW), Memphis (MEM), and Denver (DEN); each with an average of over 3,000 operations per day. Note, ADC is high for Memphis (MEM) because all 24 hours are reportable there. A large decrease occurred at Honolulu (HNL) (due to runway construction). (*See*, Appendix I for explanations of the Core 30 airport codes.)



ADC Across All Core 30 Airports			
FY17-19 Avg	**FY22**	**FY23**	**%Change**
60,931	61,511	60,431	-1.8%

Airport	Rank*	FY17-19 Avg	FY22	FY23
ATL	**1**	3,664	3,684	3,642
BOS	**23**	1,460	1,434	1,458
BWI	**27**	1,171	1,165	1,161
CLT	**8**	2,414	2,425	2,395
DCA	**29**	1,068	1,058	1,074
DEN	**5**	3,335	3,117	3,065
DFW	**3**	3,009	3,343	3,275
DTW	**6**	2,500	2,635	2,581
EWR	**25**	1,349	1,335	1,333
FLL	**17**	1,655	1,757	1,703
HNL	**24**	1,898	1,900	1,451
IAD	**14**	2,147	2,102	2,144
IAH	**9**	2,375	2,478	2,384
JFK	**18**	1,580	1,635	1,666
LAS	**20**	1,752	1,728	1,616

Airport	Rank*	FY17-19 Avg	FY22	FY23
LAX	**7**	2,379	2,486	2,426
LGA	**26**	1,166	1,187	1,197
MCO	**11**	2,395	2,293	2,218
MDW	**28**	1,111	1,128	1,137
MEM	**4**	3,098	3,194	3,125
MIA	**13**	2,180	2,205	2,180
MSP	**10**	2,302	2,279	2,286
ORD	**2**	3,376	3,403	3,358
PHL	**19**	1,610	1,637	1,662
PHX	**15**	2,057	2,082	2,066
SAN	**30**	762	763	773
SEA	**22**	1,498	1,530	1,529
SFO	**21**	1,585	1,587	1,540
SLC	**12**	2,123	2,130	2,189
TPA	**16**	1,910	1,811	1,797

*Ranked by FY2023 daily capacity.

Source: Federal Aviation Administration, Air Traffic Organization, Office of Performance Analysis (AJR-G), Aviation System Performance Metrics (ASPM), November 22, 2023.

Section 3. NAS Delay, Diversions, Go-Arounds, and Cancellations

Only flights departing from or arriving at their destination at least 15 minutes late are counted as a NAS system delay. The charts that appear below are based on OPSNET numbers, ATO's official source for delay data. Many factors contribute to delay, with weather is the most frequently cited reason. Delay imposes stress on the NAS, air traffic controllers, passengers, and the economy.

Diversions occur when a flight is rerouted to a different airport than its original destination. This usually occurs due to convective weather. Other less frequent reasons for diversions are medical emergencies, security, issues with the aircraft, or issues with passengers or crewmembers.

Go-Arounds occur when an aircraft is on approach to the runway but suddenly aborts the landing. This occurs if there is a sudden shift in the wind, an obstruction on the runway, or possibly, the aircraft inadvertently overshooting the runway. Go-arounds result in the aircraft returning to the landing queue to attempt another landing.

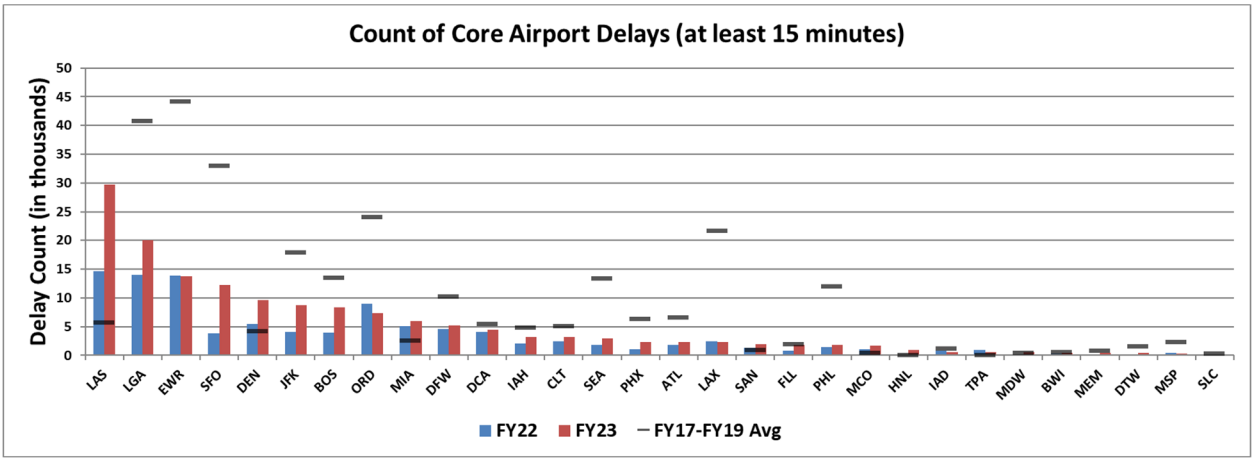
Cancellations can occur for numerous reasons due to weather, extensive delays in the system, air carrier crew or equipment issues, etc. Such reasons may not necessarily be under FAA's control. Air carriers cancel their own flights in response to these issues. Since the three-hour tarmac rule was imposed after 2010, more flights have been cancelled. This increase in cancellations means reductions in the number of recorded delays. During FY2020, the sudden decrease in the demand for air transportation due to the COVID-19 pandemic led to flight cancellations by airlines.

Cancellations can occur for numerous reasons due to weather, extensive delays in the system, equipment issues, etc. Air carriers cancel their own flights in response to these issues. Since the three-hour tarmac rule was imposed after 2010, more flights have been cancelled. This increase in cancellations means reductions in the number of recorded delays. During FY2020, the sudden decrease in the demand for air transportation due to the COVID-19 pandemic led to flight cancellations by airlines.

Counts of NAS Delay at Core 30 Airports

During FY2023, OPSNET data show that the number of Core 30 airport departure delays of at least 15 minutes rose significantly, by 50.6 percent to 153,312 (table below). Since FY2017-FY2019, before the pandemic began, Core 30 airport departure delays fell by 45.6 percent from 281,899.

The graph and table below show, in FY2023, delays were highest at Las Vegas (LAS), LaGuardia (LGA), and Newark (EWR), each with 13,000 or more delays. Together these three airports accounted for about 40 percent of all Core 30 airport delays. All but eight airports show decreases in delays since before the pandemic (LAS, Denver (DEN), Miami (MIA), San Diego (SAN), Orlando (MCO), Honolulu (HNL), Tampa (TPA), and Chicago Midway (MDW)). (*See*, Appendix I for explanations of the Core 30 airport codes.)



Core 30 Total Delay Counts			
FY17-19 Avg	**FY22**	**FY23**	**%Change**
281,899	101,787	153,312	50.6%

Airport	Rank*	FY17-19 Avg	FY22	FY23
ATL	**16**	6,645	1,803	2,286
BOS	**7**	13,473	3,911	8,290
BWI	**26**	585	286	484
CLT	**13**	5,118	2,434	3,156
DCA	**11**	5,422	4,130	4,503
DEN	**5**	4,178	5,391	9,570
DFW	**10**	10,245	4,530	5,204
DTW	**28**	1,539	236	383
EWR	**3**	44,129	13,832	13,729
FLL	**19**	1,943	777	1,849
HNL	**22**	38	6	904
IAD	**23**	1,127	747	600
IAH	**12**	4,774	2,062	3,210
JFK	**6**	17,849	4,133	8,692
LAS	**1**	5,683	14,660	29,763

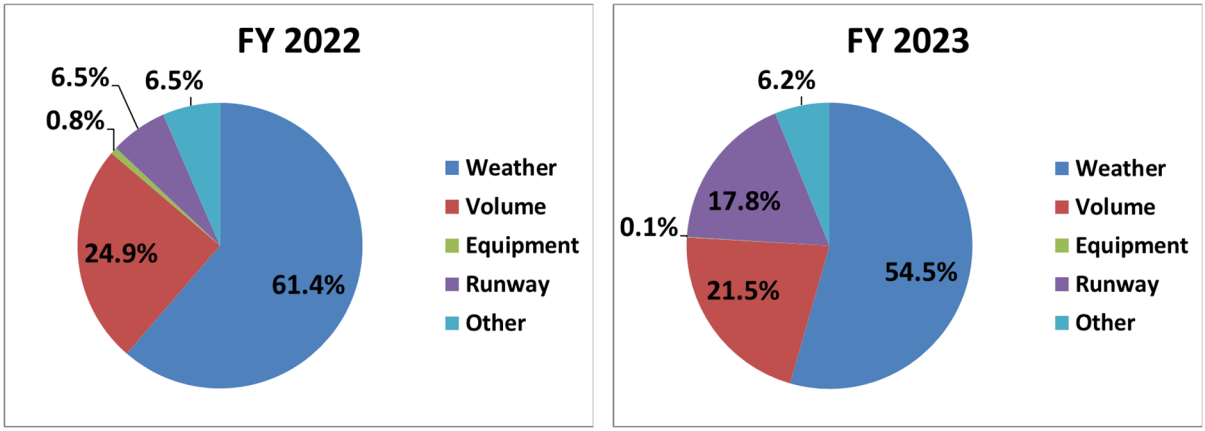
Airport	Rank*	FY17-19 Avg	FY22	FY23
LAX	**17**	21,631	2,412	2,263
LGA	**2**	40,819	14,028	20,019
MCO	**21**	425	998	1,670
MDW	**25**	449	192	542
MEM	**27**	812	237	474
MIA	**9**	2,579	5,058	5,997
MSP	**29**	2,316	409	268
ORD	**8**	24,115	8,918	7,350
PHL	**20**	11,946	1,478	1,815
PHX	**15**	6,387	1,038	2,295
SAN	**18**	934	1,245	1,897
SEA	**14**	13,432	1,844	2,995
SFO	**4**	32,947	3,794	12,303
SLC	**30**	278	231	231
TPA	**24**	80	967	570

*Ranked by number of FY2023 delays.

Source: Federal Aviation Administration, Air Traffic Organization, Office of Performance Analysis (AJR-G), Operations Network (OPSNET), November 24, 2023.

Delays by Category

The two charts below show the sources of delays at Core 30 airports by type of delay.



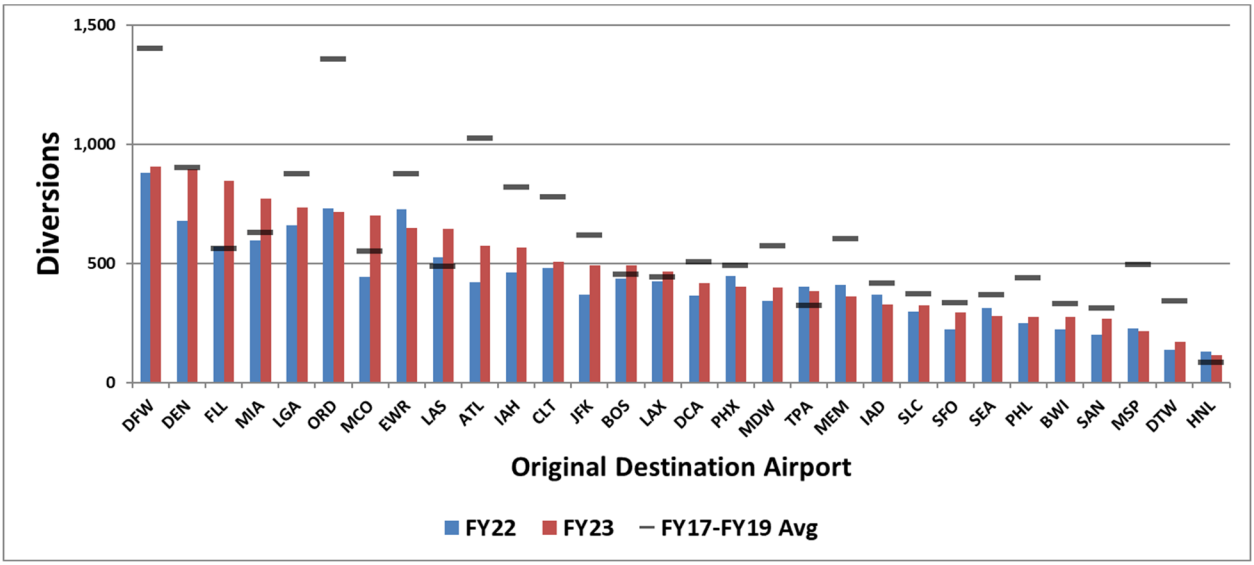
Note: System impact delays are delays assigned to causal facilities in OPSNET and are composed of delays due to TMIs, departure delays, and airborne delays. System impact delays are also the basis for delays by class and delays by cause in OPSNET. (http://aspmhelp.faa.gov/index.php/OPSNET_Reports:_Definitions_of_Variables)

Source: Federal Aviation Administration, Air Traffic Organization, Office of Performance Analysis (AJR-G), Operations Network (OPSNET), December 18, 2023.

Diversions at Core 30 Airports

The airports reported below are the original intended destinations for the diverted aircraft. Increases in the number of diversions can indicate capacity issues at the airport due to weather, construction, or volume. Over all Core 30 airports, the number of diversions rose by 13.5 percent in FY2023; however, since before the start of the pandemic, Core 30 airport diversions fell by 18.7 percent from 17,779 (table below).

Airports with the highest increases in diversions were Orlando (MCO) (with 57.8 percent), Fort Lauderdale (FLL) (48.2 percent), and Atlanta (ATL) (36.5 percent). Airports with the highest decreases were Memphis (MEM) (-12.4 percent), Honolulu (HNL) (-12.2 percent), and Seattle-Tacoma (SEA) (-11.8 percent). (*See*, Appendix I for explanations of the Core 30 airport codes.)



Core 30 Total Diversions			
FY17-19 Avg	FY22	FY23	%Change
17,779	12,737	14,451	13.5%

Airport	Rank*	FY17-19 Avg	FY22	FY23
ATL	10	1,025	419	572
BOS	13	454	437	492
BWI	26	331	222	273
CLT	12	778	481	508
DCA	16	507	365	415
DEN	2	902	679	895
DFW	1	1,404	881	904
DTW	29	344	138	170
EWR	8	874	727	647
FLL	3	562	570	845
HNL	30	85	131	115
IAD	21	415	368	327
IAH	11	819	460	566
JFK	13	618	369	492
LAS	9	488	524	646

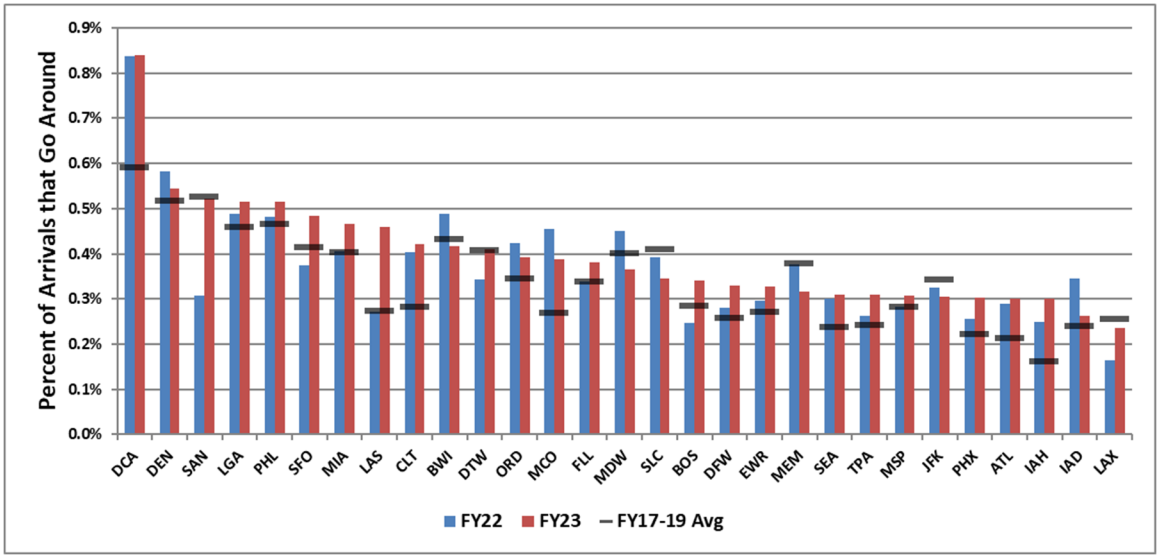
Airport	Rank*	FY17-19 Avg	FY22	FY23
LAX	15	445	426	467
LGA	5	876	661	735
MCO	7	552	443	699
MDW	18	574	343	398
MEM	20	603	410	359
MIA	4	628	595	771
MSP	28	493	228	216
ORD	6	1,359	729	717
PHL	25	439	248	274
PHX	17	492	447	400
SAN	27	311	200	269
SEA	24	369	314	277
SFO	23	336	221	295
SLC	22	374	298	324
TPA	19	325	403	383

*Ranked by number of FY2023 diversions.

Source: Federal Aviation Administration, Air Traffic Organization, Office of Performance Analysis (AJR-G), Aviation System Performance Metrics (ASPM), December 28, 2023.

Go-Arounds at Core 30 Airports

Go-arounds as a percent of arrival operations at each Core 30 airport (except Honolulu) appear below. In FY2023, average go-arounds as a percent of arrivals across all Core 30 airports rose by 7.4 percent to about 0.39 percentage point of arrivals (tables and graph below). This occurred mainly due to a large increase in go-arounds relative to a smaller increase in arrival operations. (The estimates presented here are based on ASPM and CountOps data.) (*See*, Appendix I for explanations of the Core 30 airport codes.)



Core 30 Go Arounds As Percent of Arrivals			
FY17-19 Avg	FY22	FY23	%Change
0.3%	0.36%	0.39%	7.4%

Airport	FY17-19 Avg	FY22	FY23
ATL	0.2%	0.3%	0.3%
BOS	0.3%	0.2%	0.3%
BWI	0.4%	0.5%	0.4%
CLT	0.3%	0.4%	0.4%
DCA	0.6%	0.8%	0.8%
DEN	0.5%	0.6%	0.5%
DFW	0.3%	0.3%	0.3%
DTW	0.4%	0.3%	0.4%
EWR	0.3%	0.3%	0.3%
FLL	0.3%	0.3%	0.4%
IAD	0.2%	0.3%	0.3%
IAH	0.2%	0.2%	0.3%
JFK	0.3%	0.3%	0.3%
LAS	0.3%	0.3%	0.5%
LAX	0.3%	0.2%	0.2%

Airport	FY17-19 Avg	FY22	FY23
LGA	0.5%	0.5%	0.5%
MCO	0.3%	0.5%	0.4%
MDW	0.4%	0.5%	0.4%
MEM	0.4%	0.4%	0.3%
MIA	0.4%	0.4%	0.5%
MSP	0.3%	0.3%	0.3%
ORD	0.3%	0.4%	0.4%
PHL	0.5%	0.5%	0.5%
PHX	0.2%	0.3%	0.3%
SAN	0.5%	0.3%	0.5%
SEA	0.2%	0.3%	0.3%
SFO	0.4%	0.4%	0.5%
SLC	0.4%	0.4%	0.3%
TPA	0.2%	0.3%	0.3%

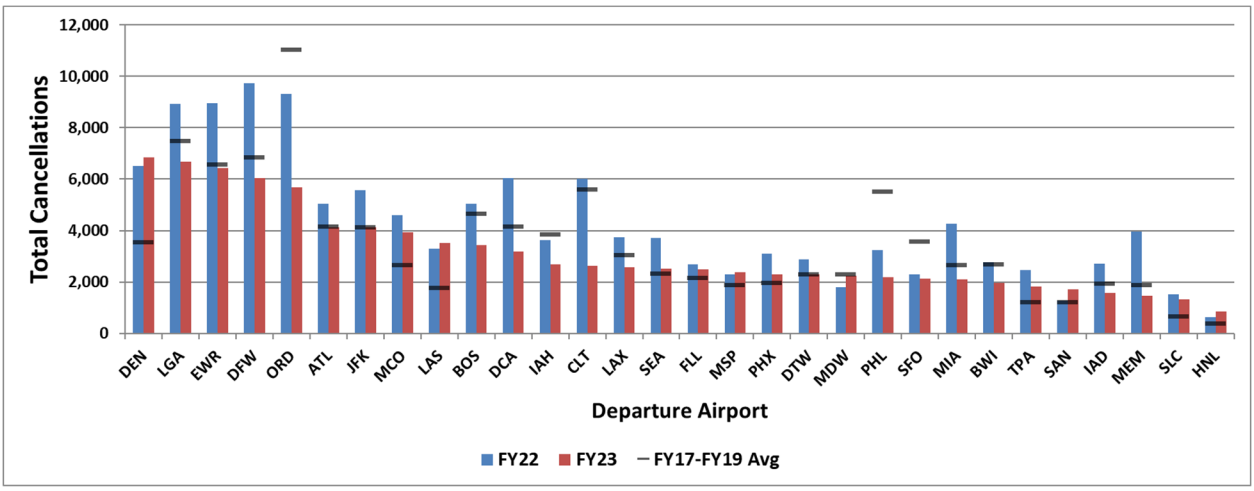
* Excludes Honolulu (HNL).

Sources: Go-arounds: Federal Aviation Administration, Air Traffic Organization, Office of Performance Analysis (AJR-G), Aviation System Performance Metrics (ASPM), December 29, 2023; Arrivals: Federal Aviation Administration, Air Traffic Organization, Office of Performance Analysis (AJR-G), CountOps, December 29, 2023.

Cancellations at Core 30 Airports

During FY2023, flight departure cancellations at Core 30 airports decreased by 27.2 percent, to 93,179 (table below). Cancellations may be due to weather, system delays, equipment issues, or other reasons, such as the COVID pandemic.

The airports with the highest number of cancellations were the hubs of Denver (DEN), Chicago O'Hare (ORD), LaGuardia (LGA), Newark (EWR), and Dallas-Fort Worth (DFW), each with over 6,000 (table and graph below). Together, cancellations at these airports account for over 25 percent of all cancellations. (*See*, Appendix I for explanations of the Core 30 airport codes.)



Core 30 Total Cancellations			
FY17-19 Avg	FY22	FY23	%Change
104,156	127,963	93,179	-27.2%

Airport	Rank*	FY17-19 Avg	FY22	FY23
ATL	6	4,153	5,040	4,138
BOS	10	4,667	5,033	3,440
BWI	24	2,674	2,769	1,962
CLT	13	5,597	6,009	2,616
DCA	11	4,160	6,032	3,180
DEN	1	3,551	6,509	6,837
DFW	4	6,856	9,742	6,043
DTW	19	2,294	2,892	2,290
EWR	3	6,578	8,944	6,440
FLL	16	2,144	2,695	2,492
HNL	30	384	624	865
IAD	27	1,927	2,708	1,562
IAH	12	3,863	3,615	2,689
JFK	7	4,134	5,568	4,125
LAS	9	1,771	3,294	3,515

Airport	Rank*	FY17-19 Avg	FY22	FY23
LAX	14	3,058	3,737	2,567
LGA	2	7,473	8,930	6,672
MCO	8	2,666	4,596	3,932
MDW	20	2,293	1,797	2,246
MEM	28	1,891	3,951	1,476
MIA	23	2,667	4,261	2,090
MSP	17	1,873	2,291	2,371
ORD	5	11,030	9,320	5,669
PHL	21	5,501	3,249	2,180
PHX	18	1,952	3,105	2,300
SAN	26	1,228	1,277	1,711
SEA	15	2,315	3,703	2,513
SFO	22	3,586	2,298	2,122
SLC	29	659	1,517	1,323
TPA	25	1,207	2,457	1,813

Source: Federal Aviation Administration, Air Traffic Organization, Office of Performance Analysis (AJR-G), Aviation System Performance Metrics (ASPM), January 3, 2024.

Section 4. Traffic Management Initiatives

Traffic Management Initiatives (TMIs) are programs and tools that ATC may use to manage air traffic. These initiatives can take a number of forms, depending on the need and situation. Some TMIs are used to manage excess demand or a lowered acceptance rate at a particular airport. Other TMIs are used to manage traffic issues in the en route environment usually caused by convective weather. The TMIs reported in this report include:

Ground Delay Programs (GDP)

Ground stops (GS)

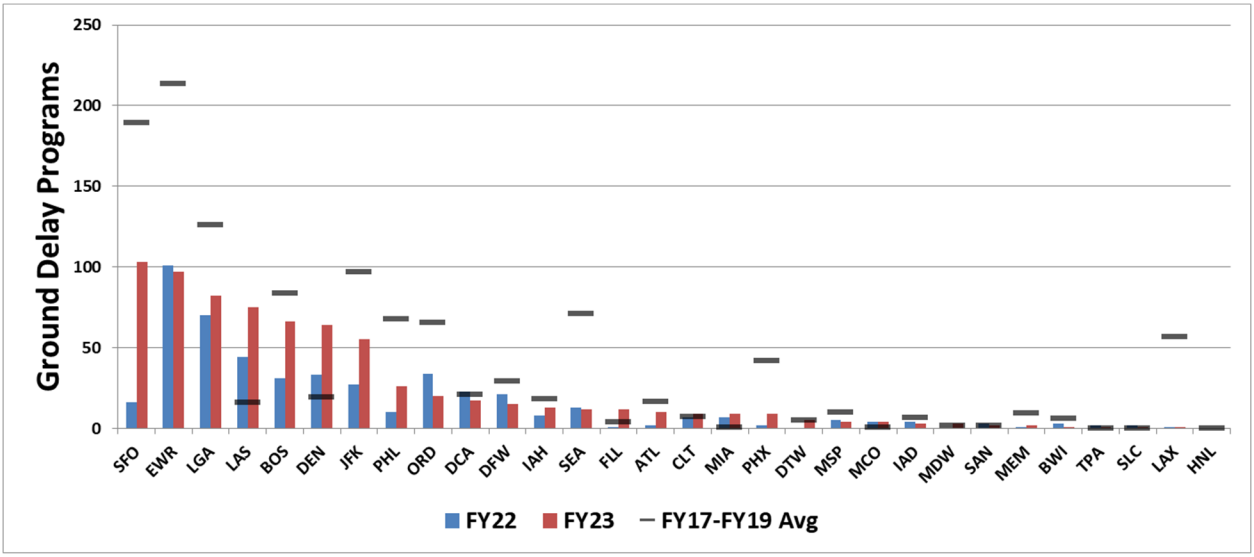
Airspace Flow Programs (AFP)

Holdings

Ground Delay Programs at Core 30 Airports

A ground delay program (GDP) is a TMI where aircraft are delayed at their departure airport to reconcile demand with capacity at their arrival airport. GDPs are airport-specific; therefore, each GDP is reported for a particular airport. During FY2023, GDPs increased by 51.8 percent across all Core 30 airports, from 475 to 721. Before the pandemic (FY2017-2019), the average number of GDPs was 1,190 (table below).

In FY2023, San Francisco (SFO), Newark (EWR), and LaGuardia (LGA) had the highest number of GDPs. Together, these three airports accounted for over 39 percent of all GDPs at Core 30 airports. Since before the pandemic (FY2017-2019), GDPs rose at nine Core 30 airports (LAS, DEN, FLL, CLT, MIA, MCO, MDW, TPA, and SLC (graph and table below)). (*See*, Appendix I for explanations of the Core 30 airport codes.)



Total Core 30 GDPs			
FY17-19 Avg	FY22	FY23	%Change
1,190	475	721	51.8%

Airport	FY17-19 Avg	FY22	FY23
ATL	17	2	10
BOS	84	31	66
BWI	6	3	1
CLT	7	7	9
DCA	21	23	17
DEN	19	33	64
DFW	29	21	15
DTW	5	0	5
EWR	214	101	97
FLL	4	1	12
HNL	0	0	0
IAD	7	4	3
IAH	18	8	13
JFK	97	27	55
LAS	16	44	75

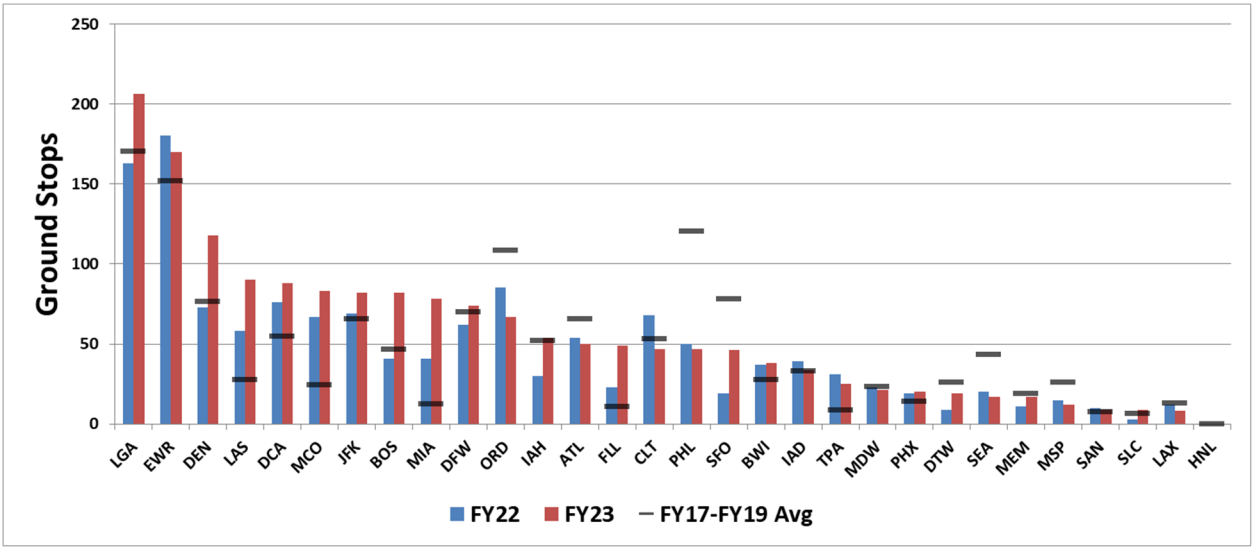
Airport	FY17-19 Avg	FY22	FY23
LAX	57	1	1
LGA	126	70	82
MCO	1	4	4
MDW	2	0	3
MEM	10	1	2
MIA	1	7	9
MSP	10	5	4
ORD	66	34	20
PHL	68	10	26
PHX	42	2	9
SAN	2	3	2
SEA	71	13	12
SFO	190	16	103
SLC	0	2	1
TPA	0	2	1

Source: Federal Aviation Administration, Air Traffic Organization, Office of Performance Analysis (AJR-G), Operations Network (OPSNET), April 1, 2024.

Ground Stops at Core 30 Airports

Ground stops are the most restrictive form of TMI because they hold all aircraft, within the scope of the ground stop, at their departure airports until conditions at the destination airport allow for their arrival. Ground stops only affect arrivals to a specific airport (not departures) and, like GDPs, are airport specific. During FY2023, the number of ground stops increased by 19.6 percent across all Core 30 airports, from 1,388 to 1,660. Before the pandemic (FY2017-2019), the average number of ground stops was 1,716 (table below).

During FY2023, LaGuardia (LGA), Newark (EWR), and Denver (DEN) had the highest number of ground stops (graph and table below). (*See*, Appendix I for explanations of the Core 30 airport codes.) Since before the pandemic (FY2017-2019), ground stops rose at eighteen Core-30 airports.



Total Core 30 Ground Stops			
FY17-19 Avg	FY22	FY23	%Change
1,716	1,388	1,660	19.6%

Airport	FY17-19 Avg	FY22	FY23
ATL	66	54	50
BOS	47	41	82
BWI	28	37	38
CLT	53	68	47
DCA	55	76	88
DEN	76	73	118
DFW	70	62	74
DTW	26	9	19
EWR	152	180	170
FLL	11	23	49
HNL	0	0	0
IAD	33	39	34
IAH	52	30	54
JFK	66	69	82
LAS	28	58	90

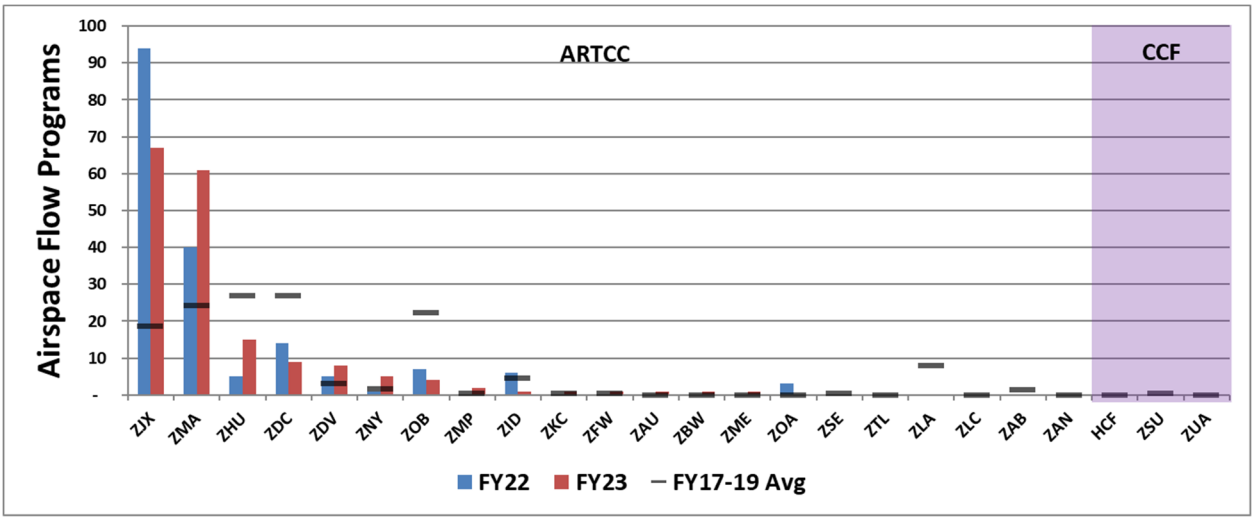
Airport	FY17-19 Avg	FY22	FY23
LAX	13	12	8
LGA	170	163	206
MCO	24	67	83
MDW	24	23	21
MEM	19	11	17
MIA	13	41	78
MSP	26	15	12
ORD	109	85	67
PHL	121	50	47
PHX	14	19	20
SAN	8	10	9
SEA	43	20	17
SFO	78	19	46
SLC	7	3	9
TPA	9	31	25

Source: Federal Aviation Administration, Air Traffic Organization, Office of Performance Analysis (AJR-G), Operations Network (OPSNET), April 1, 2024.

Airspace Flow Programs by Center

Imagine a line drawn in space in association with a constraint, usually convective weather. Under an airspace flow program, any flights filed that crosses the line (usually only in one direction) are assigned an expected departure clearance time (EDCT) by air traffic managers through the flow constrained area, to ensure that it arrives at the line, or "boundary," at a time when it can be accommodated. In FY2023, there were 177 airspace flow programs (AFP) imposed by air traffic managers versus 175 in FY2022, an increase of 1.1 percent. The main reasons for the 177 AFPs in FY2023 were weather conditions and traffic volume. Before the pandemic (FY2017-2019), the average number of AFPs was 140 (table below).

In FY2023, AFPs mainly affected Jacksonville (ZJX) and Miami (ZMA). Together, these centers accounted for 128 of the 177 AFPs. Since before the pandemic (FY2017-2019), the largest increase in AFPs occurred at Jacksonville (ZJX) (graph and table below). (These estimates are based on National Traffic Management Log (NTML) data.) (*See*, Appendix I for explanations of the ARTCC and CCF codes.)



* Data for CCF JCF are not available.

Total Centers Air Flow Programs			
FY17-19 Avg	FY22	FY23	%Change
140	175	177	1.1%

Center	FY17-19 Avg	FY22	FY23
HCF	0	0	0
ZAB	1	0	0
ZAN	0	0	0
ZAU	0	0	1
ZBW	0	0	1
ZDC	27	14	9
ZDV	3	5	8
ZFW	0	0	1
ZHU	27	5	15
ZID	5	6	1
ZJX	19	94	67
ZKC	0	0	1

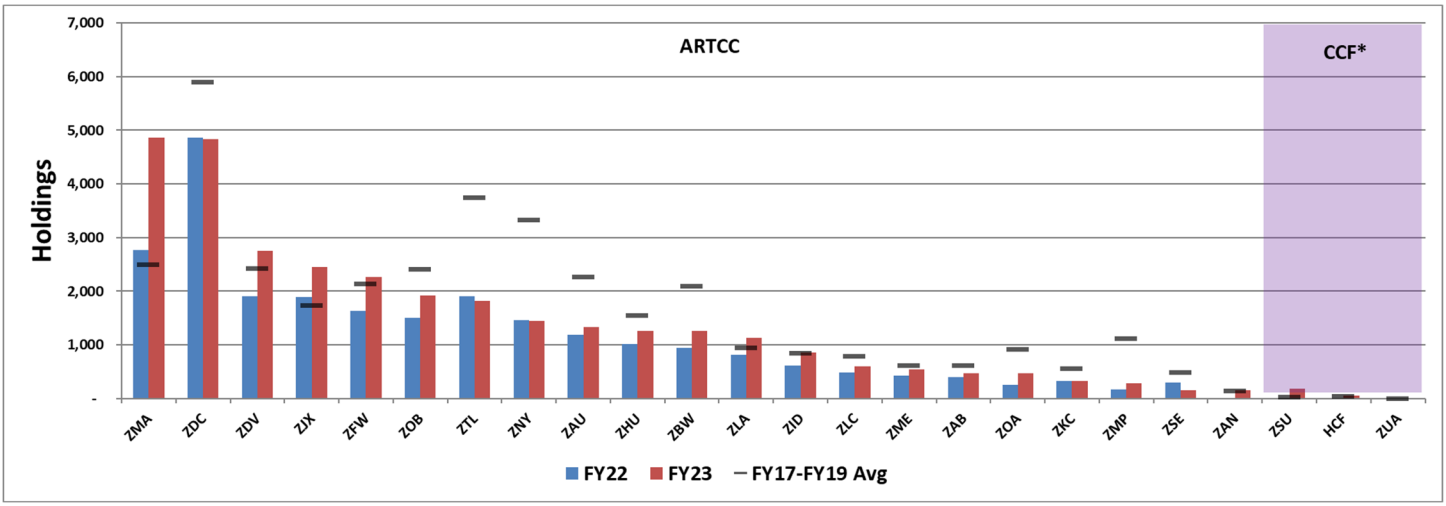
Center	FY17-19 Avg	FY22	FY23
ZLA	8	0	0
ZLC	0	0	0
ZMA	24	40	61
ZME	0	0	1
ZMP	0	0	2
ZNY	2	1	5
ZOA	0	3	0
ZOB	22	7	4
ZSE	0	0	0
ZSU	0	0	0
ZTL	0	0	0
ZUA	0	0	0

Source: Federal Aviation Administration, Air Traffic Organization, Technical Operations (AJW), National Traffic Management Log (NTML), May 13, 2024.

Holdings by Center

A holding occurs when an aircraft is deliberately delayed en route by flying in a repeating rotational pattern. They are typically implemented when there is traffic congestion or convective weather at the destination airport or an adjacent facility. During FY2023, there were 31,429 holdings, rising 26.7 percent from FY2022. Before the pandemic (FY2017-2019), the average number of holdings was far higher at 37,166 (table below).

During FY2023, OPSNET data shows among Air Route Traffic Control Centers (ARTCC), the highest numbers of airborne holdings occurred in Miami (ZMA), DC (ZDC), Denver (ZDV), Jacksonville (ZJX), and Fort Worth (ZFW) (graph and table below). Holdings among these five centers accounted for over one-half of all holdings. (*See*, Appendix I for explanations of the ARTCC and combined control facility (CCF) codes.)



* Data for CCF JCF are not available.

Total Center Flight Holdings			
FY17-19 Avg	FY22	FY23	%Change
37,166	24,813	31,429	26.7%

Center	FY17-19 Avg	FY22	FY23
ZAB	611	404	472
ZAN	146	0	159
ZAU	2,270	1,188	1,332
ZBW	2,093	939	1,256
ZDC	5,894	4,855	4,831
ZDV	2,427	1,899	2,757
ZFW	2,129	1,634	2,266
ZHU	1,552	1,008	1,258
ZID	846	611	863
ZJX	1,738	1,894	2,457
ZKC	553	325	323
ZLA	945	811	1,130

Center	FY17-19 Avg	FY22	FY23
ZLC	789	480	604
ZMA	2,492	2,761	4,858
ZME	619	424	545
ZMP	1,122	173	280
ZNY	3,330	1,453	1,448
ZOA	912	253	469
ZOB	2,409	1,503	1,919
ZSE	482	297	160
ZTL	3,748	1,901	1,813
ZSU	26	0	176
HCF	36	0	53
ZUA	0	0	0

Source: Federal Aviation Administration, Air Traffic Organization, Office of Performance Analysis (AJR-G), Operations Network (OPSNET), January 8, 2024.

Section 5. Safety Metrics

The U.S. national airspace system is the safest air transportation system in the world. This report presents metrics used to measure the safety of the NAS:

Runway Incursions

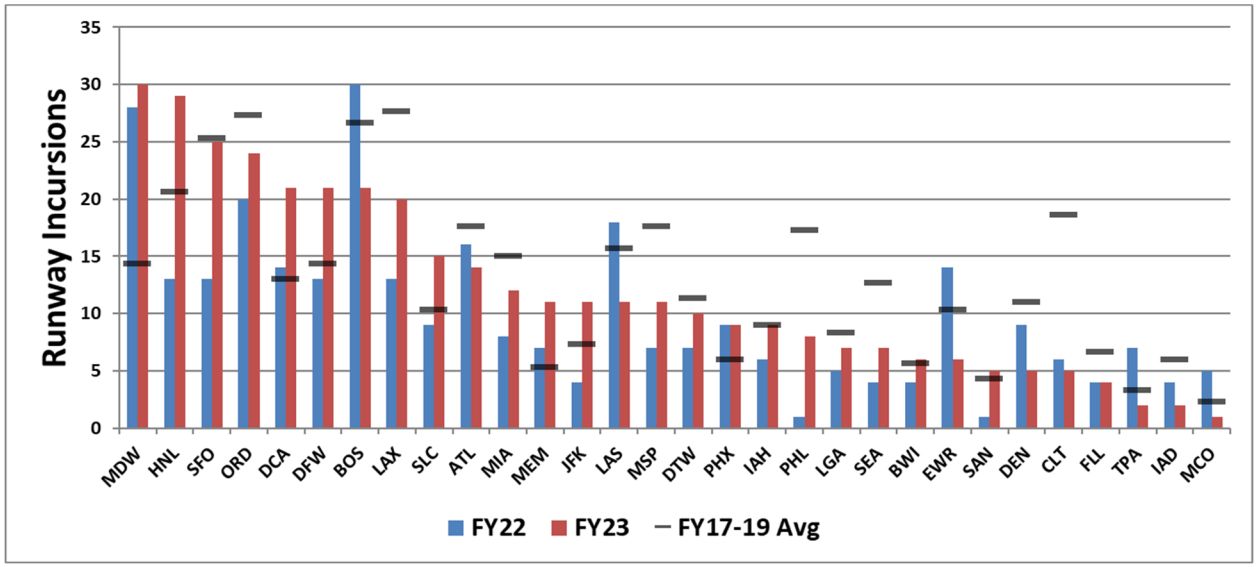
Incursions by Type

Loss of Standard Separation Count

Runway Incursions at Core 30 Airports

A runway incursion is any occurrence involving the incorrect presence of an aircraft, vehicle, or person on the protected area of a surface designated for the landing and takeoff of aircraft. Across all Core 30 airports, the number of runway incursions rose from 299 in FY2022 to 362 in FY2023. Before the pandemic (FY2017-2019), the average annual number of runway incursions was higher, at 391 (table below).

In FY2023, the highest numbers of runway incursions occurred at Chicago Midway (MDW) and Honolulu (HNL). The number of runway incursions exceeded pre-pandemic levels at ten airports, most notably at Chicago Midway (MDW) (graph and table below). Incursions by airport and by type appear on the next page. (*See*, Appendix I for explanations of the Core 30 airport codes.)



Core 30 Total Runway Incursions			
FY17-19 Avg	FY22	FY23	%Change
391	299	362	21.1%

Airport	FY17-19 Avg	FY22	FY23
ATL	18	16	14
BOS	27	30	21
BWI	6	4	6
CLT	19	6	5
DCA	13	14	21
DEN	11	9	5
DFW	14	13	21
DTW	11	7	10
EWR	10	14	6
FLL	7	4	4
HNL	21	13	29
IAD	6	4	2
IAH	9	6	9
JFK	7	4	11
LAS	16	18	11

Airport	FY17-19 Avg	FY22	FY23
LAX	28	13	20
LGA	8	5	7
MCO	2	5	1
MDW	14	28	30
MEM	5	7	11
MIA	15	8	12
MSP	18	7	11
ORD	27	20	24
PHL	17	1	8
PHX	6	9	9
SAN	4	1	5
SEA	13	4	7
SFO	25	13	25
SLC	10	9	15
TPA	3	7	2

*Honolulu is coded as HNL or HCF in the source data.

Source: Federal Aviation Administration, Air Traffic Organization, Safety and Technical Training, Office of Policy and Performance (AJI-3), unpublished Airborne Loss Event data, March 7, 2024.

Incursions by Type at Core 30 Airports, FY2023

Airport	A	B	C	D	E	Totals
ATL	0	0	5	9	0	14
BOS	0	2	11	8	0	21
BWI	0	1	4	1	0	6
CLT	0	0	2	3	0	5
DCA	0	0	9	12	0	21
DEN	0	0	4	1	0	5
DFW	0	0	10	11	0	21
DTW	0	0	3	7	0	10
EWR	0	0	4	2	0	6
FLL	0	0	3	1	0	4
HNL	0	0	23	6	0	29
IAD	0	0	2	0	0	2
IAH	0	0	5	4	0	9
JFK	0	1	4	6	0	11
LAS	0	0	6	5	0	11
LAX	0	0	12	8	0	20
LGA	0	0	6	1	0	7
MCO	0	0	1	0	0	1
MDW	0	0	9	21	0	30
MEM	0	1	1	9	0	11
MIA	0	0	7	5	0	12
MSP	0	0	7	4	0	11
ORD	0	0	6	18	0	24
PHL	0	0	2	6	0	8
PHX	0	0	4	5	0	9
SAN	1	0	3	1	0	5
SEA	0	0	6	1	0	7
SFO	0	3	14	8	0	25
SLC	0	0	10	5	0	15
TPA	0	0	0	2	0	2

Category A - A serious incident in which a collision was narrowly avoided.

Category B - An incident in which separation decreases and there is a significant potential for collision, which may result in a time critical corrective/evasive response to avoid a collision.

Category C - An incident characterized by ample time and/or distance to avoid a collision.

Category D - An incident that meets the definition of a runway incursion such as incorrect presence of a single vehicle/person/aircraft on the protected area of a surface designated for the landing and take-off of aircraft of aircraft but with no immediate safety consequences.

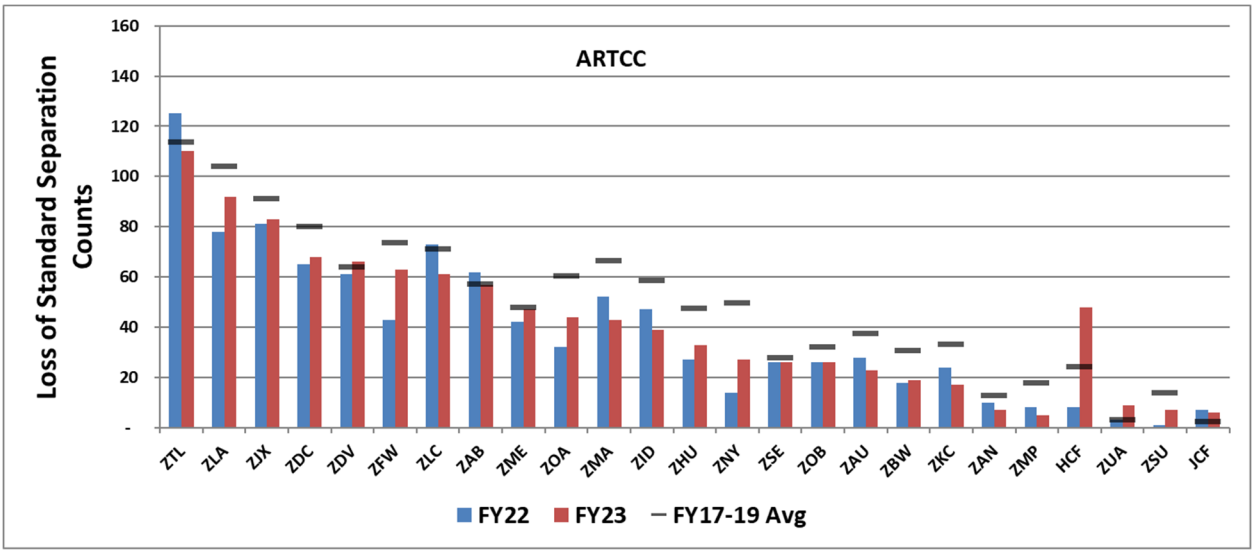
Category E - An incident in which insufficient or conflicting evidence of the event precludes assigning another category.

Source: Federal Aviation Administration, Air Traffic Organization, Safety and Technical Training, Office of Policy and Performance (AJI-3), unpublished Airborne Loss Event data, March 7, 2024.

Loss of Standard Separation Count, by Center

Standard separation is a specified separation minima between airborne aircraft in controlled airspace. Breaches of such minima are based on airborne loss event data. Losses of standard separation are reported by Air Route Traffic Control Center (ARTCC). Across all centers, the number of losses of standard separation rose from 961 in FY2022 to 1,026 in FY2023. Before the pandemic (FY2017-2019), the average annual number of losses of standard separation was higher at 1,221 (table below). This means losses of standard separation remain below pre-pandemic levels.

In FY2023, the centers with the highest losses of standard of separation were Atlanta (ZTL), Los Angeles (ZLA), and Jacksonville (ZJX). The number of losses of standard of separation exceeded pre-pandemic levels at one center (Denver (ZDV)) and three CCF's (Honolulu (HCF)), Guam (ZUA), and San Juan (ZSU) (graph and table below). (*See*, Appendix I for explanations of the ARTCC and combined control facilities (CCF).)



Total Losses of Standard Separation			
FY17-19 Avg	FY22	FY23	%Change
1,221	961	1,026	6.8%

Center	FY17-19 Avg	FY22	FY23
HCF	24	8	48
JCF	2	7	6
ZAB	57	62	57
ZAN	13	10	7
ZAU	37	28	23
ZBW	31	18	19
ZDC	80	65	68
ZDV	64	61	66
ZFW	74	43	63
ZHU	48	27	33
ZID	59	47	39
ZJX	91	81	83
ZKC	33	24	17

Center	FY17-19 Avg	FY22	FY23
ZLA	104	78	92
ZLC	71	73	61
ZMA	66	52	43
ZME	48	42	47
ZMP	18	8	5
ZNY	50	14	27
ZOA	60	32	44
ZOB	32	26	26
ZSE	28	26	26
ZSU	14	1	7
ZTL	114	125	110
ZUA	3	3	9

Source: Federal Aviation Administration, Air Traffic Organization, Safety and Technical Training, Office of Policy and Performance (AJI-3), unpublished Airborne Loss Event data, March 7, 2024.

Section 6. Other ATO Topics

There are a variety of other aspects of the NAS which are of special interest. This report presents the following:

Flight Service Stations

Commercial Space Launch Activity

Flight Service Stations

Flight services are delivered nationwide through certified professional controllers in Alaska and the contiguous United States, Hawaii, and Puerto Rico. Services include preflight weather briefings, flight planning, inflight advisory services, search and rescue (SAR), and processing notices to air missions (NOTAMs). Self-briefing and other automated services are provided through an online web portal. Web services include interactive graphical capabilities to view a wide range of weather and aeronautical information, flight planning, activating and closing flight plans, and more. Pilots may also access automated voice services to receive current and forecast conditions at specific airports, and receive updates for adverse conditions, including TFRs.

Flight Service also delivers the FAA Weather Camera Program. This program features an expanding network of over 400 camera sites in Alaska, Colorado, and Montana (other sites, including Hawaii) and over 200 sites hosted by NAV Canada, Canada's civil air navigation service provider. The weather cameras website provides pilots with additional information for improved situational awareness and decision-making. On the website, pilots can see current images at specific locations, compare the images to clear day views, or playback a loop of past images to establish weather trends. The website also delivers a variety of safety of flight information including adverse conditions, current and forecast conditions, pilot reports, and aeronautical information.

ALASKA FSS	**Barrow FSS (BRW)** **Cold Bay FSS (CDB)** **Deadhorse FSS (SCC)** **Dillingham FSS (DLG)** **Fairbanks FSS (FAI)** **Homer FSS (HOM)** **Iliamna FSS (ILI)** **Juneau FSS (JNU)** **Kenai FSS (ENA)** **Ketchikan FSS (KTN)** **Kotzebue FSS (OTZ)** **McGrath FSS (MCG)** **Nome FSS (OME)** **Northway FSS (ORT)** **Palmer FSS (PAQ)** **Sitka FSS (SIT)** **Talkeetna FSS (TKA)**
FEDERAL CONTRACT FSS	**Leidos FCFSS Washington Hub (DCA)** **Leidos FCFSS Fort Worth Hub (FTW)**

FAA Flight Services

FAA Facilities – Alaska Flight Service							
Year	Pilot Briefs	Flight Plans Filed	Preflight Calls	Aircraft Contacts	Airport Advisories	NOTAMs Issued	Total SAR
FY 2018	89,592	210,626	52,200	521,048	325,140	158,003	4,869
FY 2019	92,070	209,024	52,980	542,550	327,130	166,848	6,924
FY 2020	71,570	141,492	39,031	400,181	243,844	166,954	3,021
FY 2021	67,999	151,946	37,339	445,942	280,499	180,364	3,099
FY 2022	66,580	167,969	36,111	456,727	292,734	166,065	2,736
FY 2023	65,793	162,464	29,569	471,599	298,604	168,694	2,981

Federal Contract Flight Services							
Year	Pilot Briefs	Flight Plans Filed	Preflight Calls	Inflight Contacts	Flight Data Calls	NOTAMs Issued	Total SAR
FY 2018	797,746	462,207	1,255,510	286,392	178,110	216,249	9,337
FY 2019	747,731	387,694	1,158,005	257,701	166,546	200,192	9,728
FY 2020	541,004	195,635	782,145	175,361	121,118	179,612	13,195
FY 2021	483,675	168,094	660,369	186,628	125,186	190,118	33,769
FY 2022	422,210	156,629	564,291	179,414	118,296	184,105	33,313
FY 2023	397,290	128,408	525,776	131,373	115,174	166,416	33,604

Web Services/DUATs		
Year	Pilot Briefs*	Flight Plans Filed
FY 2018	26,349,042	2,229,961
FY 2019	18,946,978	1,690,246
FY 2020	17,290,280	1,272,098
FY 2021	15,550,689	1,328,714
FY 2022	13,639,661	957,148
FY 2023	3,298,272	699,332

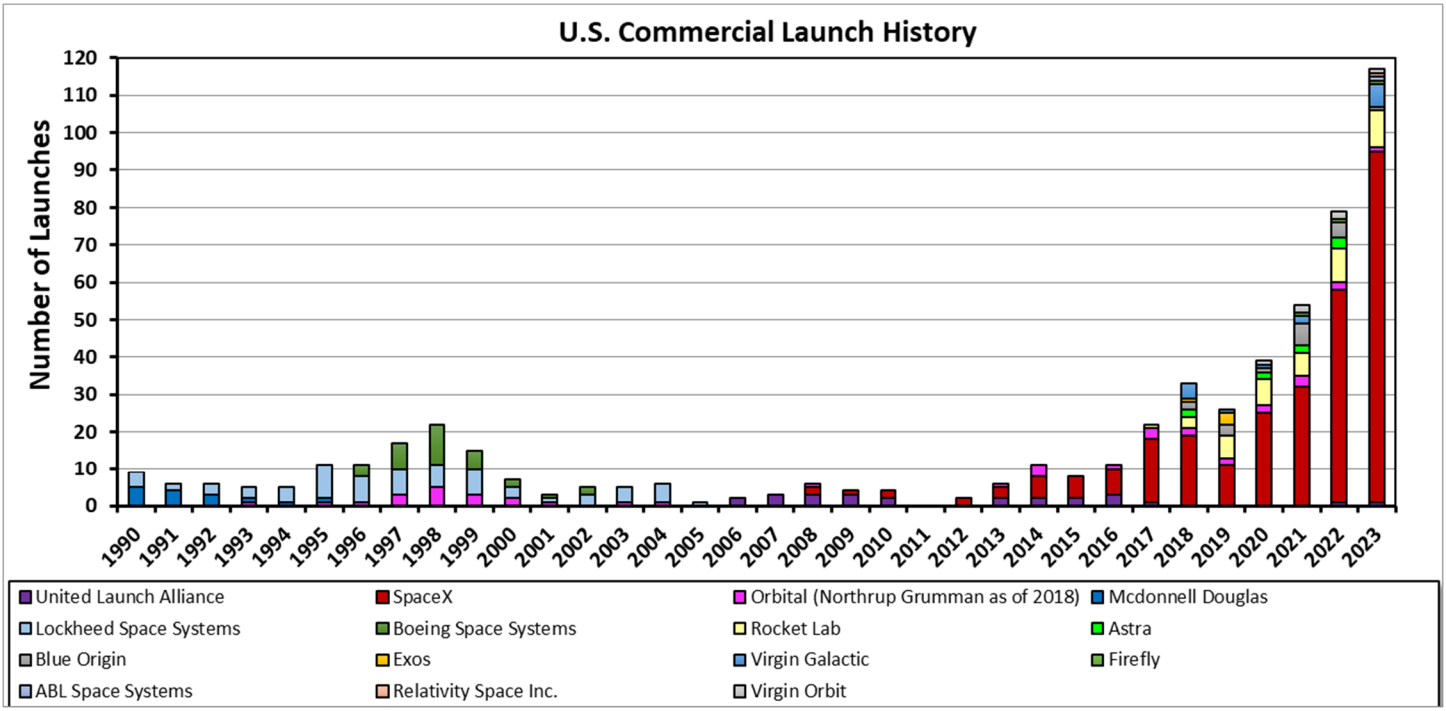
* Represents the number of hits to contract web services including DUATs (DUATs decommissioned May, 2018).

United States NOTAM Office (USNOF)		
Year	Domestic	International
FY 2018	1,569,386	874,091
FY 2019	1,670,499	969,951
FY 2020	1,474,047	873,025
FY 2021	1,620,681	953,125
FY 2022	1,644,074	993,139
FY 2023	1,503,507	896,112

Sources: FAA, Air Traffic Organization, Flight Service (AJR-B), Email communication, March 11, 2024; FAA, Air Traffic Organization, U.S. NOTAM Office (AJV-A370), Calculations based on email communication, February 13, 2024.

Commercial Space Launch Activity

During CY2023, the FAA licensed 117 U.S. orbital commercial space launches. These launches were carried out by the following companies: SpaceX, 94 launches; Rocket Lab, 10 (7 of which from New Zealand); Virgin Galactic, 6; Blue Origin, 1; Orbital, 1 (part of Northrup Grumman Innovation Systems as of 2018); Firefly, 1; United Launch Alliance, 1; ABL Space Systems, 1; Relativity Space Inc., 1; and Virgin Orbit, 1. A graph showing annual numbers of commercial launches, by company, appears below.



Note: A commercial launch is a launch that is internationally competed (i.e., available in principle to international launch providers) or whose primary payload is commercial in nature. FAA-licensed launches carrying captive government (NASA and DOD) or industry payloads are counted here. Data for 2018-2023 include launch failures and successes, and subspace and suborbital launches.

Sources: Federal Aviation Administration, Commercial Space Transportation (AST), The Annual Compendium of Commercial Space Transportation, various years; FAA, Commercial Space Transportation (AST), Launches, as of January 3, 2023. https://www.faa.gov/data_research/commercial_space_data/launches/?type=license; U.S. Dept. of Transportation, Bureau of Transportation Statistics, National Transportation Statistics, Table 1-39, January 17, 2019. https://www.bts.gov/browse-statistical-products-and-data/national-transportation-statistics/national-transportation-8

U.S. Spaceports

U.S. commercial space launches are carried out from FAA-licensed spaceports located throughout the country. As of February 4, 2024, there were 14 active FAA-licensed commercial spaceports. For a map of these locations, and to learn more about U.S. spaceports, please consult the FAA Office of Spaceports web page at: https://www.faa.gov/space/office_spaceports

Appendix I. Facility Codes

Core 30 Airports

(Source: System Data and Infrastructure Group, Office of Performance Analysis, Systems Operations Services, Air Traffic Organization, FAA (AJR-G2).)

Code	Airport	Code	Airport
ATL	Hartsfield-Jackson Atlanta International	LAX	Los Angeles International
BOS	Boston Logan International	LGA	New York LaGuardia
BWI	Baltimore/Washington International	MCO	Orlando International
CLT	Charlotte Douglas International	MDW	Chicago Midway
DCA	Ronald Reagan Washington National	MEM	Memphis International
DEN	Denver International	MIA	Miami International
DFW	Dallas-Fort Worth International	MSP	Minneapolis/St. Paul International
DTW	Detroit Metropolitan Wayne County	ORD	Chicago O`Hare International
EWR	Newark Liberty International	PHL	Philadelphia International
FLL	Fort Lauderdale/Hollywood International	PHX	Phoenix Sky Harbor International
HNL	Honolulu International	SAN	San Diego International
IAD	Washington Dulles International	SEA	Seattle/Tacoma International
IAH	George Bush Houston Intercontinental	SFO	San Francisco International
JFK	New York John F. Kennedy International	SLC	Salt Lake City International
LAS	Las Vegas McCarran International	TPA	Tampa International

Stand-Alone Terminal Radar Control (TRACON) Facilities*

LocID	TRACON	LocID	TRACON
A11	Anchorage TRACON	NCT	Northern California TRACON
A80	Atlanta TRACON	P31	Pensacola TRACON
A90	Boston TRACON	P50	Phoenix TRACON
C90	Chicago TRACON	P80	Portland TRACON
D01	Denver TRACON	PCT	Potomac TRACON
D10	Dallas-Fort Worth TRACON	R90	Omaha TRACON
D21	Detroit TRACON	S46	Seattle TRACON
F11	Central Florida TRACON	S56	Salt Lake City TRACON
I90	Houston TRACON	SCT	Southern California TRACON
L30	Las Vegas TRACON	T75	St Louis TRACON
M03	Memphis TRACON	U90	Tucson TRACON
M98	Minneapolis TRACON	Y90	Yankee TRACON
N90	New York TRACON		

*Cape Cod (K90) merged with Boston TRACON (A90); Meridian (NMM) is now a military, not a civilian TRACON.

Air Route Traffic Control Centers (ARTCC) and Combined Control Facilities (CCF)

LocID	Center	LocID	Center
HCF	Honolulu Control Facility	ZLA	Los Angeles CA ARTCC
JCF	Joshua Tree Control Facility	ZLC	Salt Lake City UT ARTCC
ZAB	Albuquerque NM ARTCC	ZMA	Miami FL ARTCC
ZAN	Anchorage AK ARTCC	ZME	Memphis TN ARTCC
ZAU	Chicago IL ARTCC	ZMP	Minneapolis MN ARTCC
ZBW	Nashua NH ARTCC (Boston)	ZNY	New York NY ARTCC
ZDC	Leesburg VA ARTCC (DC)	ZOA	Oakland CA ARTCC
ZDV	Denver CO ARTCC	ZOB	Cleveland OH ARTCC
ZFW	Fort Worth TX ARTCC	ZSE	Seattle WA ARTCC
ZHU	Houston TX ARTCC	ZSU	San Juan PR Control Facility
ZID	Indianapolis IN ARTCC	ZTL	Atlanta GA ARTCC
ZJX	Jacksonville FL ARTCC	ZUA	Guam Control Facility
ZKC	Kansas City KS ARTCC		

Appendix II. Other FAA Airport Lists

In addition to the Core 30 airports, FAA also uses several other airport lists, including ASPM 77, OEP 35, and OPSNET 45 airports and 34 Select TRACONs.

ASPM 77 Airports

This is an FAA list of 77 airports, including the Core 30, OEP 35, and other airports. The ASPM (Aviation System Performance Metrics) data includes flights to and from the 77 ASPM airports and all flights by ASPM carriers, as well as flights by those carriers to international and domestic non-ASPM airports. (Source: System Data and Infrastructure Group, Office of Performance Analysis, Systems Operations Services, Air Traffic Organization, FAA (AJR-G2).) (*See*, Appendix I for the list of Core 30 airports. For OEP 35 airports, s*ee* the OEP 35 airport list on the next page.)

Code	Airport	Code	Airport
ABQ	Albuquerque International Sunport	MEM	Memphis International
ANC	Ted Stevens Anchorage International	MHT	Manchester
ATL	Hartsfield-Jackson Atlanta International	MIA	Miami International
AUS	Austin-Bergstrom International	MKE	Milwaukee General Mitchell International
BDL	Bradley International	MSP	Minneapolis/St. Paul International
BHM	Birmingham International	MSY	Louis Armstrong New Orleans International
BNA	Nashville International	OAK	Oakland International
BOS	Boston Logan International	OGG	Kahului
BUF	Buffalo Niagara International	OMA	Omaha Eppley Airfield
BUR	Bob Hope (Burbank/Glendale/Pasadena)	ONT	Ontario International
BWI	Baltimore/Washington International	ORD	Chicago O'Hare International
CLE	Cleveland Hopkins International	OXR	Oxnard
CLT	Charlotte Douglas International	PBI	Palm Beach International
CVG	Cincinnati/Northern Kentucky International	PDX	Portland International
DAL	Dallas Love Field	PHL	Philadelphia International
DAY	Dayton International	PHX	Phoenix Sky Harbor International
DCA	Ronald Reagan Washington National	PIT	Pittsburgh International
DEN	Denver International	PSP	Palm Springs International
DFW	Dallas/Fort Worth International	PVD	Providence Francis Green State
DTW	Detroit Metropolitan Wayne County	RDU	Raleigh/Durham International
EWR	Newark Liberty International	RFD	Greater Rockford
FLL	Fort Lauderdale/Hollywood International	RSW	Southwest Florida International
GYY	Gary Chicago International	SAN	San Diego International
HNL	Honolulu International	SAT	San Antonio International
HOU	Houston Hobby	SDF	Louisville International
HPN	Westchester County	SEA	Seattle/Tacoma International
IAD	Washington Dulles International	SFO	San Francisco International
IAH	George Bush Houston Intercontinental	SJC	Norman Mineta San Jose International
IND	Indianapolis International	SJU	San Juan Luis Munoz International
ISP	Long Island Mac Arthur	SLC	Salt Lake City International
JAX	Jacksonville International	SMF	Sacramento International Airport
JFK	New York John F. Kennedy International	SNA	John Wayne Airport-Orange County
LAS	Las Vegas McCarran International	STL	Lambert Saint Louis International
LAX	Los Angeles International	SWF	Stewart International
LGA	New York LaGuardia	TEB	Teterboro
LGB	Long Beach	TPA	Tampa International
MCI	Kansas City International	TUS	Tucson International
MCO	Orlando International	VNY	Van Nuys
MDW	Chicago Midway		

OEP 35 Airports

This is an FAA list of 35 commercial U.S. airports with significant air traffic. These airports serve major metropolitan areas and some also serve as hubs for airline operations. The OEP 35 (Operational Evolution Partnership) is made up of the Core 30, plus five other airports. In 2005, this list was replaced by the Core 30 list. (Source: System Data and Infrastructure Group, Office of Performance Analysis, Systems Operations Services, Air Traffic Organization, FAA (AJR-G2). https://aspm.faa.gov/aspmhelp/index/OEP_35.html.) (*See*, Appendix I for the list of Core 30 airports.)

Code	Airport	Code	Airport
ATL	Hartsfield-Jackson Atlanta International	LGA	New York LaGuardia
BOS	Boston Logan International	MCO	Orlando International
BWI	Baltimore/Washington International	MDW	Chicago Midway
CLE	Cleveland Hopkins International	MEM	Memphis International
CLT	Charlotte Douglas International	MIA	Miami International
CVG	Cincinnati/Northern Kentucky International	MSP	Minneapolis/St Paul International
DCA	Ronald Reagan Washington National	ORD	Chicago O`Hare International
DEN	Denver International	PDX	Portland International
DFW	Dallas/Fort Worth International	PHL	Philadelphia International
DTW	Detroit Metropolitan Wayne County	PHX	Phoenix Sky Harbor International
EWR	Newark Liberty International	PIT	Pittsburgh International
FLL	Fort Lauderdale/Hollywood International	SAN	San Diego International
HNL	Honolulu International	SEA	Seattle/Tacoma International
IAD	Washington Dulles International	SFO	San Francisco International
IAH	George Bush Houston Intercontinental	SLC	Salt Lake City International
JFK	New York John F Kennedy International	STL	Lambert Saint Louis International
LAS	Las Vegas McCarran International	TPA	Tampa International
LAX	Los Angeles International		

OPSNET 45 Airports

The FAA list of OPSNET 45 airports appear below. In the late 1990s, these were airports that contributed to 75 percent of NAS delays and that each had 500 or more operations per day. (Note, by FY2019, the number of OPSNET 45 airports with at least 500 operations per day fell to 36 airports.)

Code	Airport	Code	Airport
ABQ	Albuquerque International Sunport	MCO	Orlando International
ATL	Hartsfield-Jackson Atlanta International	MDW	Chicago Midway
BNA	Nashville International	MEM	Memphis International
BOS	Boston Logan International	MIA	Miami International
BWI	Baltimore/Washington International	MSP	Minneapolis/St Paul International
CLE	Cleveland Hopkins International	MSY	Louis Armstrong New Orleans International
CLT	Charlotte Douglas International	OAK	Oakland International
CVG	Cincinnati/Northern Kentucky International	ORD	Chicago O`Hare International
DCA	Ronald Reagan Washington National	PBI	Palm Beach International
DEN	Denver International	PDX	Portland International
DFW	Dallas/Fort Worth International	PHL	Philadelphia International
DTW	Detroit Metropolitan Wayne County	PHX	Phoenix Sky Harbor International
EWR	Newark Liberty International	PIT	Pittsburgh International
FLL	Fort Lauderdale/Hollywood International	RDU	Raleigh/Durham International
HOU	Houston Hobby	SAN	San Diego International
IAD	Washington Dulles International	SEA	Seattle/Tacoma International
IAH	George Bush Houston Intercontinental	SFO	San Francisco International
IND	Indianapolis International	SJC	Norman Mineta San Jose International
JFK	New York John F Kennedy International	SLC	Salt Lake City International
LAS	Las Vegas McCarran International	STL	Lambert Saint Louis International
LAX	Los Angeles International	TEB	Teterboro
LGA	New York LaGuardia	TPA	Tampa International
MCI	Kansas City International		

34 Select TRACONs

The 34 Select are the TRACONs support the OPSNET 45 airports. (*See*, above for the list of OPSNET 45 airports.) (Source: System Data and Infrastructure Group, Office of Performance Analysis, Systems Operations Services, Air Traffic Organization, FAA (AJR-G2). https://aspm.faa.gov/aspmhelp/index/34_Select.html)

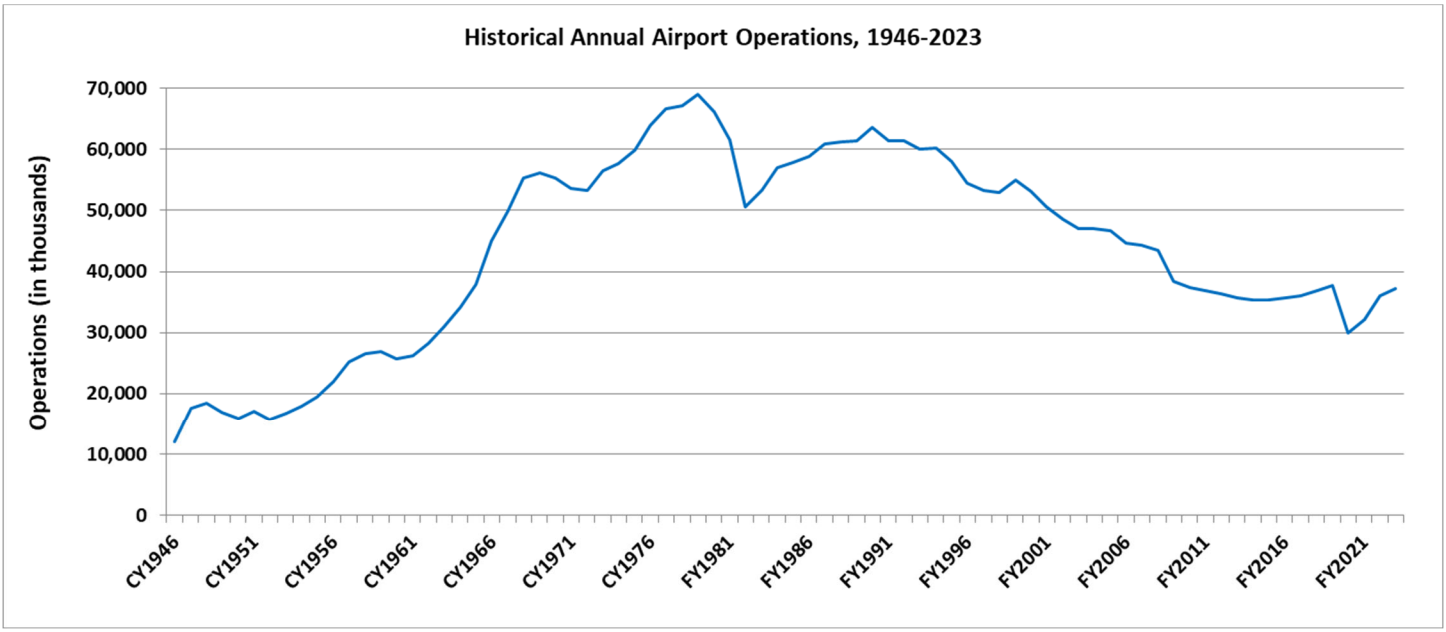
LocID	TRACON	LocID	TRACON
A80	Atlanta TRACON	MEM	Memphis International
A90	Boston TRACON	MIA	Miami International
ABQ	Albuquerque International	MSY	New Orleans International/Moisant
BNA	Nashville International	N90	New York TRACON
C90	Chicago TRACON (Elgin)	NCT	Northern California TRACON
CLE	Cleveland Hopkins International	P50	Phoenix TRACON
CLT	Charlotte/Douglas International	P80	Portland TRACON
CVG	Covington/Cincinnati International	PBI	Palm Beach International
D01	Denver TRACON	PCT	Potomac TRACON
D10	Dallas/Ft Worth TRACON	PHL	Philadelphia International
D21	Detroit TRACON	PIT	Pittsburgh International
I90	Houston TRACON	RDU	Raleigh Durham International
IND	Indianapolis International	S46	Seattle/Tacoma TRACON
L30	Las Vegas TRACON	S56	Salt Lake City TRACON
M98	Minneapolis TRACON	SCT	Southern California TRACON
MCI	Kansas City International	T75	St Louis TRACON
MCO	Orlando International	TPA	Tampa International

Appendix III. Historical Airport and Center Operations

Airport Operations

A graph displaying historical annual airport control tower operations data for 1946-2023 appear below. Included are calendar year data for 1946-1976 and fiscal year data for 1977-2023. Airport towers consist of FAA facilities, not including contract towers, and represent the number of arrivals and departures from the airport at which the airport traffic control tower is located. (Data for 1946-1990 were originally published in the CAA Statistical Handbook of Civil Aviation and the successor publication FAA Statistical Handbook of Aviation. Data for 1991 onward come from the FAA OPSNET database.)

In FY2023, airport operations amounted to 37.3 million, rising by 3.2 percent, from 36.1 million in FY2022 (below). Such operations peaked 43 years earlier, in FY1979, at 69 million. (The decrease since the FY1979 peak was mainly due a decrease in general aviation (GA) operations, which fell from 51.7 million in FY1979 to 15.6 million in FY2023 (not shown below)).



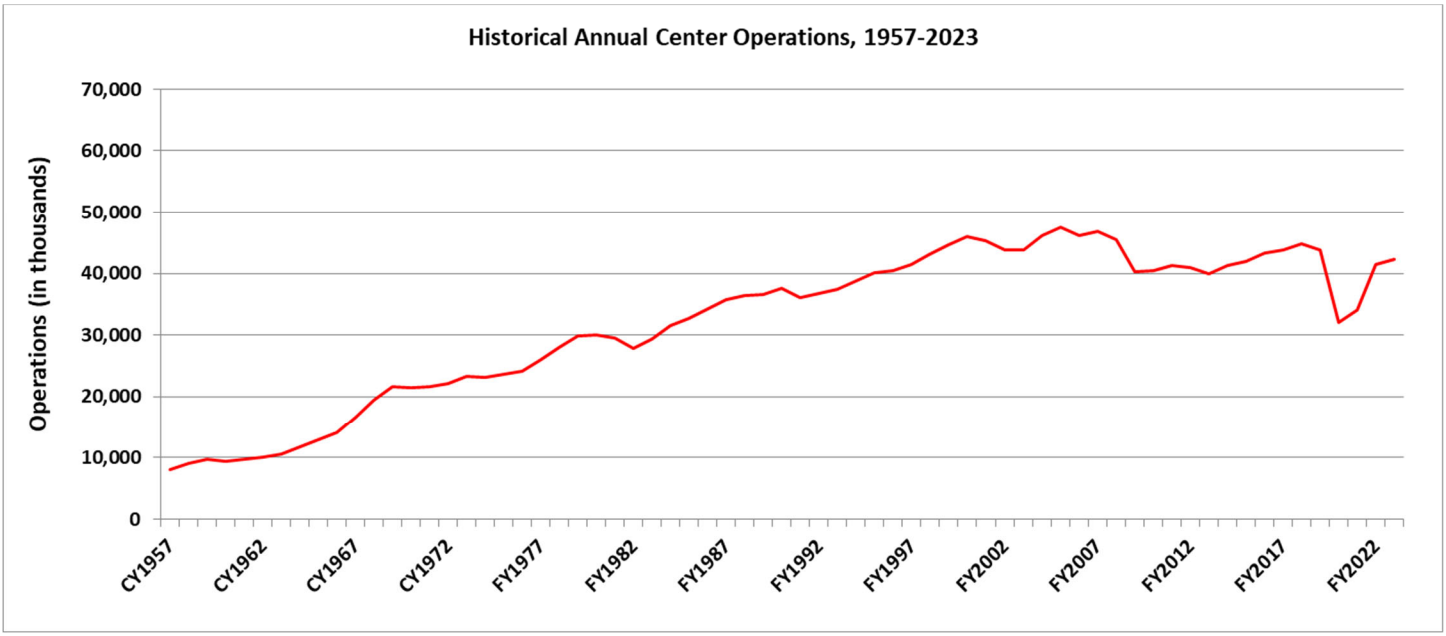
Sources: 1946-1963: Civil Aeronautics Administration, CAA Statistical Handbook of Civil Aviation, various; 1964-1990: Federal Aviation Administration, FAA Statistical Handbook of Aviation, various; 1991-present: Federal Aviation Administration, Air Traffic Organization, Office of Performance Analysis (AJR-G), Operations Network (OPSNET), April 19, 2024.

Center Operations

Historical annual center operations for 1957-2023 are shown below. Included are calendar year data for 1957-1976 and fiscal year data for 1977-2023. In contrast to airport operations, center operations consist of the number of operations passing to and from a TRACON to a center, or from one center to another center, or from a center to a TRACON, and also includes U.S. overflights and oceanic traffic through center air space that do not arrive at or depart from U.S. territory. (Data up to 1990 were originally published in the CAA Statistical Handbook of Civil Aviation and the FAA Statistical Handbook of Aviation. Data for 1991 onward come from the FAA OPSNET database.)

In FY2023, there were 42.3 million center operations, rising by 2.1 percent from 41.4 million in FY2022. The peak occurred in FY2005, at 47.5 million. (The decrease over FY2005 - FY2023 was mainly due to a fall in center air taxi operations, which fell from 10.9 million in FY2005 to 5.6 million in FY2023 (not shown below)).

The histories of airport and center operations also differ because in the past, airport operations largely consisted of GA flights. Such operations were mainly local and did not cross into center airspace; therefore, the large decrease in GA operations did not lead to a large decrease in center operations. In contrast, center GA operations, which numbered 8.8 million in FY1979, fell to about 6.5 million in FY2023 (not shown below). (In addition, note that GA aircraft tend to be smaller and carry fewer passengers over shorter distances and time periods than other user classes such as commercial air carriers.)



Sources: 1957-1963: Civil Aeronautics Administration, CAA Statistical Handbook of Civil Aviation, various; 1964-1990: Federal Aviation Administration, FAA Statistical Handbook of Aviation, various; 1991-present: Federal Aviation Administration, Air Traffic Organization, Office of Performance Analysis (AJR-G), Operations Network (OPSNET), April 19, 2024.

Glossary of Terms

34 Select TRACONs	The 34 Select are the TRACONs support the OPSNET 45 airports. (*See*, Appendix II for the lists of 34 Select TRACONs and OPSNET 45 airports.)
AAR	*See*, Airport Arrival Rate (AAR).
ADC	*See*, Average Daily Capacity (ADC).
ADR	*See*, Airport Departure Rate (ADR).
AFP	*See*, Airspace Flow Programs (AFP).
Airport Arrival Rate (AAR)	The number of arriving aircraft which an airport or airspace can accept from an ARTCC per hour.
Airport Departure Rate (ADR)	The number of aircraft that can depart an airport and the airspace can accept per hour.
Airport Operations	*See*, Operations.
Airspace Flow Programs (AFP)	Airspace flow programs (AFPs) manage demand-capacity imbalances through the issuance of estimated departure clearance times (EDCT) to flights traversing a flow constrained area (FCA). An AFP might be used, for example, to reduce the rate of flights through a center when that center has reduced en route capacity due to severe weather, replacing mile-in-trail (MIT) restrictions for a required reroute, managing airport arrival fix demand or controlling multiple airports within a terminal area.
Air Route Traffic Control Center (ARTCC)	A facility established to provide air traffic control service to aircraft operating on IFR flight plans within controlled airspace and principally during the en route phase of flight. When equipment capabilities and controller workload permit, certain advisory/assistance services may be provided to VFR aircraft. Also known as en route or centers, there are 21 ARTCCs in the continental U.S. A list of the 21 ARTCCs appears in Appendix I.
Air Traffic Control (ATC)	A service operated by appropriate authority to promote the safe, orderly and expeditious flow of air traffic.
Air Traffic Control Tower (ATCT)	A terminal facility that uses air/ground communications, visual signaling, and other devices to provide ATC services to aircraft operating in the vicinity of an airport or on the movement area. Authorizes aircraft to land or takeoff at the airport controlled by the tower or to transit the Class D airspace area regardless of flight plan or weather conditions (IFR or VFR). A tower may also provide approach control services (radar or nonradar).
Army Radar Approach Control (ARAC).	An FAA air traffic control facility using radar and air/ground communications to provide approach control services to aircraft arriving, departing, or transiting the airspace controlled by the facility. Service is provided to both civilian and U.S. Army airports. Currently, the U.S. does not operate any ARACs.
ASM	*See*, Available Seat Miles (ASM).
ASPM	*See*, Aviation System Performance Metrics (ASPM).
ASPM 77 Airports	The ASPM 77 is an FAA list of 77 airports, including the Core 30, OEP 35, and other airports. The ASPM (Aviation System Performance Metrics) data includes flights to and from the 77 ASPM airports and all flights by ASPM carriers, as well as flights by those carriers to international and domestic non-ASPM airports. (*See*, Appendix II for the list of ASPM 77 airports.) (*See*, Appendix I for the list of Core 30 airports and Appendix II for the list of OEP 35 airports.)
ATC	*See*, Air Traffic Control.
ATCT	*See*, Air Traffic Control Tower.
Available Seat Miles (ASM)	The aircraft miles flown in each inter-airport segment, multiplied by the number of seats available for fare paying passenger use on that segment. Available seat miles are computed by summation of the products of the number of miles on each interairport segment, multiplied by the number of available seats on that segment.
Average Daily Capacity (ADC)	Average daily capacity is calculated as the sum of the airport departure rates (ADR) and the capacity airport arrival rates (AAR), divided by the number of days in the period under consideration.

Average Hourly Capacity (Called Rate)	*See*, Called Rate.
Aviation System Performance Metrics (ASPM)	Aviation system performance metrics (ASPM) data includes flights to and from 77 ASPM airports (including the Core 30 and OEP 35 airports) and all flights by ASPM carriers, as well as flights by those carriers to international and domestic non-ASPM airports. All IFR and some VFR flights are included. View this data on the OPSNET website. ASPM flight records fall into two groupings: (1) Efficiency flights are intended to capture all traffic handled by controllers at the ASPM airports and include flights with complete records and flights for which accurate estimates are possible due to only a few pieces of missing data; and, (2) ASPM flights exclude general aviation and military traffic, as well as local (non-itinerant) traffic and records for international flights missing data on the non-U.S. portion of the flight. ASPM contains key event times including actual, scheduled as well as the airline reported gate and runway times. It also synthesizes key times from the traffic flow management system (TFMS) and flight level information from the national traffic management log (NTML).
Called Rate	The hourly throughput that an airport's runways are able to sustain during periods of high demand. Called rates include all arrival and departure traffic that an airport can support. The called rate, or average hourly capacity, is the sum of the average arrival rate (AAR) and the average departure rate (ADR).
Cancellations	The set of cancelled departures as determined by a combination of scheduled flights not flown and TFMS flight plans that were cancelled and not re-filed for ASPM carriers and all other carriers reporting schedule data; and ASQP flight cancellations.
CCF	*See*, Combined Control Facility (CCF).
CAA	*See*, Civil Aeronautics Administration (CAA).
Center	Also known as air route traffic control center (ARTCC) or en Route. *See*, Air Route Traffic Control Center (ARTCC).
Center Operations	*See*, Operations.
CERAP	*See*, Combined En Route Radar Approach Control (CERAP).
Civil Aeronautics Administration (CAA)	According to the FAA: To ensure a federal focus on aviation safety, President Franklin Roosevelt signed the Civil Aeronautics Act in 1938. The legislation established the independent Civil Aeronautics Authority (CAA), with a three-member Air Safety Board that would conduct accident investigations and recommend ways of preventing accidents. . . . In 1940, President Roosevelt split the CAA into two agencies, the Civil Aeronautics Administration, which went back to the Department of Commerce, and the Civil Aeronautics Board (CAB). The offshoot of the original CAA retained responsibility for ATC, airman and aircraft certification, safety enforcement, and airway development. . . . On the eve of America's entry into World War II, for defense purposes, CAA extended its ATC system to include operation of airport towers. In the postwar era, ATC became a permanent federal responsibility at most airports. The CAA became the Federal Aviation Agency in 1958 and the Federal Aviation Administration (FAA) in 1967 (Federal Aviation Administration, A Brief History of the FAA. https://www.faa.gov/about/history/brief_history.
Class B Airspaces	Generally, that airspace from the surface to 10,000 feet MSL surrounding the nation's busiest airports in terms of IFR operations or passenger enplanements. The configuration of each Class B airspace area is individually tailored and consists of a surface area and two or more layers (some Class B airspace areas resemble upside-down wedding cakes), and is designed to contain all published instrument procedures once an aircraft enters the airspace.
Combined ATCT TRACONs	*See*, Terminal Radar Control Facility (TRACON).

Combined Control Facility (CCF)	An air traffic control facility that provides approach control services for one or more airports as well as en route air traffic control (center control) for a large area of airspace. Some may provide tower services along with approach control and en route services. The U.S. has four CCFs. A list of the 4 CCFs appears in Appendix I.
Combined En Route Radar Approach Control (CERAP)	An air traffic control facility that combines the functions of an ARTCC with a TRACON facility.
Coordinated Universal Time (UTC)	A 24-hour time standard that is the basis for world-wide civil time today. This standard is kept using highly precise atomic clocks combined with the Earth's rotation. Until 1972, Greenwich Mean Time (also known as Zulu time) was the same as Universal Time (UT). Since then, GMT was no longer a time standard. FAA uses UTC in all operational activities (FAA Order 7210.3). *See also*, Greenwich Mean Time (GMT), Zulu Time.
Core 30 Airports	The 30 airports with the highest number of operations. A list of the Core 30 Airports appears in Appendix I.
Delays	*See*, OPSNET Delays.
Diversions	Gate return/air return and en route diversion are considered a diversion. However, a planned stop for fuel, known before departure from the gate, where the flight has been dispatched to is not.
Direct User Access Terminal Service (DUATS)	DUATS, or direct user access terminal service is a weather information and flight plan processing service contracted by FAA for use by United States civil pilots and other authorized users. The DUAT Service is a telephone- and Internet-based system which allows the pilot to use a personal computer for access to a Federal Aviation Administration (FAA) database to obtain weather and aeronautical information and to file, amend, and cancel domestic IFR and VFR flight plans.
DUATS	*See*, Direct User Access Terminal Service (DUATS).
EDCT	*See*, Expected Departure Clearance Time (EDCT).
Enhanced Traffic Management System (ETMS)	*See*, Traffic Flow Management System (TFMS).
En Route	Also known as Air Route Traffic Control Center (ARTCC) or, simply, Center. *See*, Air Route Traffic Control Center (ARTCC).
En Route Operations	*See*, Operations.
Expected Departure Clearance Time (EDCT)	The runway release time assigned to an aircraft in a traffic management program. *See also*, Ground Delay Programs (GDP).
FAA	*See*, Federal Aviation Administration (FAA).
FCA	*See*, Flow Constrained Area (FCA).
Federal Aviation Administration (FAA)	The Federal Aviation Act of 1958 created the agency under the name Federal Aviation Agency. The name Federal Aviation Administration was adopted in 1967 when it became a part of the newly created Department of Transportation. The major roles of this agency include: • Regulating civil aviation to promote safety • Encouraging and developing civil aeronautics, including new aviation technology • Developing and operating a system of air traffic control and navigation for both civil and military aircraft • Researching and developing the National Airspace System and civil aeronautics • Developing and carrying out programs to control aircraft noise and other environmental effects of civil aviation • Regulating U.S. commercial space transportation
Federal Aviation Agency	The Federal Aviation Agency replaced the Civil Aeronautics Administration (CAA) under the Federal Aviation Act of 1958. In turn, the Federal Aviation Agency was replaced by the Federal Aviation Administration in 1967, which became a part of the newly created Department of Transportation.
Flight	The period from the start of the takeoff roll to the first landing.

Flight Service Station (FSS)	A flight service station (FSS) is an air traffic facility that provides information and services to aircraft pilots before, during, and after flights, but unlike air traffic control (ATC), is not responsible for giving instructions or clearances or providing separation.
Flow Constrained Area (FCA)	A defined region of airspace, a time interval, or other characteristic used to identify flights subject to a constraint. This constraint may be due to convective weather, military exercises, or other reasons.
FSS	See, Flight Service Station (FSS).
GDP	*See*, Ground Delay Programs (GDP).
GMT	*See*, Greenwich Mean Time (GMT).
Go Around	A go around (sometimes called overshoot) is an aborted landing of an aircraft that is on final approach.
Greenwich Mean Time (GMT)	According to the National Institute of Standards and Technology: Greenwich Mean Time (GMT) originally referred to the mean solar time at the Royal Observatory in Greenwich, England. As an astronomical time scale, it followed the irregular motion of Earth. The modern term for this astronomical time is UT1. The term GMT is now more commonly used to refer to the time zone at the prime meridian (0° longitude), in which case it is being used as a local representation of Coordinated Universal Time (UTC) and not UT1. However, UTC is adjusted with leap seconds to always be within less than one second of UT1, so either use of GMT can be considered equivalent to Coordinated Universal Time (UTC) when fractions of a second are not important (National Institute of Standards and Technology, "NIST Time Frequently Asked Questions (FAQ): What is Greenwich Mean Time (GMT)?," https://www.nist.gov/ pml/time-and-frequency-division/nist-time-frequently-asked-questions-faq#utcnist). FAA uses UTC in all operational activities (FAA Order 7210.3). See also, Coordinated Universal Time (UTC) or Zulu Time.
Ground Delay Programs (GDP)	Ground delay programs are implemented to control air traffic volume to airports where the projected traffic demand is expected to exceed the airport's acceptance rate for a lengthy period of time. Lengthy periods of demand exceeding acceptance rate are normally a result of the airport's acceptance rate being reduced for some reason. The most common reason for a reduction in acceptance rate is adverse weather such as low ceilings and visibility. How it works: Flights that are destined to the affected airport are issued expected departure clearance times (EDCT) at their point of departure. Flights that have been issued EDCTs are not permitted to depart until their expected departure clearance time. These EDCTs are calculated in such a way as to meter the rate that traffic arrives at the affected airport; ensuring that demand is equal to acceptance rate. The length of delays that result from the implementation of a ground delay program depends upon two factors: how much greater than the acceptance rate the original demand was, and for what length of time the original demand was expected to exceed the acceptance rate.
Ground Stops (GS)	Ground stops are implemented for a number of reasons. The most common reasons are: • To control air traffic volume to airports when the projected traffic demand is expected to exceed the airport's acceptance rate for a short period of time. • To temporarily stop traffic allowing for the implementation of a longer-term solution, such as a ground delay program. • The affected airport's acceptance rate has been reduced to zero. How it works: • Flights that are destined to the affected airport are held at their departure point for the duration of the ground stop.
Holdings	Holding (or flying a hold) is a maneuver designed to delay an aircraft already in flight while keeping it within a specified airspace.
IFR Flights	Instrument Flight Rules. A set of rules governing the conduct of flight under instrument meteorological conditions.

Level-Offs	Level-offs are tracked from the top-of-descent (TOD) point or 200 nautical miles (NM) from the airport, whichever is closer. A trajectory segment is considered as a level-off if the change in altitude of position reports is less than or equal to 200 feet and the segment is at least 50 seconds in duration. The metric is calculated as the sum of the count of level-offs for each flight within a scope (i.e. non-military instrument flight rules (IFR) operations arriving into Core 30 airports), divided by the total number of flights within the scope. The metric is derived from flight position reports from the National Offload Program (NOP).
Load Factor	The summation of the number of revenue passenger miles (RPM), divided by the summation of the number of available seat miles (ASM), on revenue paying commercial flights. This quotient is expressed as a percentage. *See also*, available seat miles (ASM) and revenue passenger miles (RPM).
Loss of Separation Events	A defined loss of separation between airborne aircraft occurs whenever specified separation minima in controlled airspace are breached. Minimum separation standards for airspace are specified by air traffic service (ATS) authorities, based on International Civil Aviation Organization (ICAO) standards.
Miles-in-Trail (MIT)	A specified distance between aircraft (in nautical miles), normally, in the same stratum associated with the same destination or route of flight.
National Airspace System (NAS)	The common network of U.S. airspace; air navigation facilities, equipment and services, airports or landing areas; aeronautical charts, information and services; rules, regulations and procedures, technical information, and manpower and material. This includes system components jointly shared with the military.
Notices to Airmen (NOTAM)	*See*, Notices to Air Missions (NOTAM).
Notices to Air Missions (NOTAM)	A NOTAM is a notice containing information essential to personnel concerned with flight operations, but not known far enough in advance to be publicized by other means. It states the abnormal status of a component of the national airspace system (NAS) – not the normal status.
OEP 35 Airports	This is an FAA list of 35 commercial U.S. airports with significant air traffic. These airports serve major metropolitan areas and some also serve as hubs for airline operations. The OEP 35 (Operational Evolution Partnership) is made up of the Core 30, plus five other airports (Cincinnati, Cleveland, Pittsburgh, Portland, and St Louis). In 2005, this list was replaced by the Core 30 list. (Source: System Data and Infrastructure Group, Office of Performance Analysis, Systems Operations Services, Air Traffic Organization, FAA (AJR-G2). https://aspm.faa.gov/aspmhelp/index/OEP_35.html.) (*See*, Appendix I for the list of Core 30 airports and Appendix II for the list of OEP 35 airports.)
Operational Network (OPSNET)	OPSNET is the official source of national airspace system (NAS) air traffic operations and delay data. This data are used to analyze the performance of the FAA's air traffic control facilities. Reportable delay includes information such as the constrained facility, the reason for delay (weather, equipment, runways, volume, etc.), and the traffic management initiative (TMI) employed in delaying the aircraft.
Operations	• Airport operations: The number of arrivals and departures from the airport at which the airport traffic control tower is located. • Tower operations: Airport operations, plus airport tower overflights. • TRACON operations: The number of operations passed to and from area airports or centers, including overflights through TRACON airspace. En route or center operations: The number of operations passing to and from a TRACON to a center, or from one center to another center, or from a center to a TRACON. It includes U.S. overflights and oceanic traffic through center air space that do not arrive at or depart from U.S. territory.
OPSNET 45 Airports	The FAA list of OPSNET 45 airports appear below. In the late 1990s, these were 45 airports that contributed to 75 percent of NAS delays and had 500 or more operations per day. (Note, by FY2019, the number of OPSNET 45 airports with at least 500 operations per day fell to 36 airports.) (*See*, Appendix II for the list of OPSNET 45 airports.)

OPSNET Delays	Delays to instrument flight rules (IFR) traffic of 15 minutes or more, which result from the ATC system detaining an aircraft at the gate, short of the runway, on the runway, on a taxiway, or in a holding configuration anywhere en route, must be reported. The IFR controlling facility must ensure delay reports are received and entered into OPSNET. These OPSNET delays are caused by the application of initiatives by the traffic flow management (TFM) in response to weather conditions, increased traffic volume, runway conditions, equipment outages, and other causes. Below are descriptions of the categories of delay causes resulting in a reportable delay: • Weather: The presence of adverse weather conditions affecting operations. This includes wind, rain, snow/ice, low cloud ceilings, low visibility, and tornado/ hurricane/thunderstorm. • Volume: Delays must only be reported as volume when the airport is in its optimum configuration and no impacting conditions have been reported when the delays were incurred. • Runway/Taxiway: Reductions in facility capacity due to runway/taxiway closure or configuration changes. • Equipment: An equipment failure or outage causing reduced capacity. • Other: All impacting conditions that are not otherwise attributed to weather, equipment, runway/taxiway, or volume, such as airshow, aircraft emergency, bomb threat, external radio frequency interference, military operations, nonradar procedures, etc. Non-reportable delays are delays incurred by IFR traffic, but which should not be reported in OPSNET.
Overflights	• Terminal overflight: A terminal IFR flight that originates outside the TRACON's/RAPCON's/Radar ATCT's area and passes through the area without landing. • En route overflight: An en route IFR flight that originates outside the ARTCC's area and passes through the area without landing.
Radar Approach Control (RAPCON)	An FAA air traffic control facility using radar and air/ground communications to provide approach control services to aircraft arriving, departing, or transiting the airspace controlled by the facility. Service is provided to both civilian and U.S. Air Force airports. Currently, the U.S. does not operate any RAPCONs.
Radar ATC Facility (RATCF)	An FAA air traffic control facility using radar and air/ground communications to provide approach control services to aircraft arriving, departing, or transiting the airspace controlled by the facility. Service is provided to both civilian and U.S. Navy airports. Currently, the U.S. does not operate any RATCFs.
RAPCON	*See*, Radar Approach Control (RAPCON).
RATCF	*See*, Radar ATC Facility (RATCF).
Revenue Passenger Miles (RPM)	One revenue passenger (fare paying passenger) transported one mile. Revenue passenger miles are computed by summation of the products of the revenue aircraft miles on each interairport segment, multiplied by the number of revenue passengers carried on that segment.
Runway Incursions	A runway incursion is any occurrence at an aerodrome involving the incorrect presence of an aircraft, vehicle or person on the protected area of a surface designated for the landing and takeoff of aircraft.
Stand-Alone TRACON	*See*, Terminal Radar Control Facility (TRACON).
Terminal Radar Control Facility (TRACON)	An FAA air traffic control facility using radar and air/ground communications to provide approach control services to aircraft arriving, departing, or transiting the airspace controlled by the facility. A TRACON located in an air traffic control tower is a combined TRACON. A TRACON that does not share a facility is a stand-alone TRACON. The U.S. has 146 civilian TRACONs. There are 121 TRACONs in shared facilities and 25 stand-alone TRACONs. A list of the 25 stand-alone TRACONs appears in Appendix I.
Top-of-Descent (TOD)	Top-of-Descent is the transition from the cruise phase of a flight to the descent phase, the point at which the planned descent to final approach altitude is initiated.
Tower Operations	*See*, Operations.
TRACON	*See*, Terminal Radar Control Facility (TRACON).
TRACON Operations	*See*, Operations.

Traffic Flow Management System (TFMS)	TFMS is a data exchange system for supporting the management and monitoring of national air traffic flow. TFMS processes all available data sources such as flight plan messages, flight plan amendment messages, and departure and arrival messages. TFMS is restricted to the subset of flights that fly under instrument flight rules (IFR) and are captured by the FAA's en-route computers. Formerly known as the enhanced traffic management system (ETMS).
UTC	*See*, Coordinated Universal Time (UTC).
VFR	*See*, Visual Flight Rules (VFR).
VFR flights	Flights operated under visual flight rules.
Visual Flight Rules (VFR)	Visual flight rules are rules that govern the procedures for conducting flights under visual conditions. The term "VFR" is also used in the United States to indicate weather conditions that are equal to or greater than minimum VFR requirements. In addition, it is used by pilots and controllers to indicate a type of flight plan.
Zulu Time	The military name for Coordinated Universal Time (UTC). *See also*, Greenwich Mean Time (GMT), Universal Coordinated Time or Universal Time Coordinated (UTC).

Acknowledgements

The Office of Performance Analysis is very grateful for the helpful contributions, comments, and guidance from:

Jonathan Corning, FAA

Kevin Hanson, FAA

Ed Jennings, FAA

Ashish Khatta, FAA

Josie Lee, FAA

Nadia Mosher, FAA

Julia Schutter, FAA

Kamala Shetty, FAA

Joel Truelove, FAA

Brian Verna, FAA

Gregory Yuhasz, FAA

For more information, please send inquiries to:

Randal Matsunaga

randal.matsunaga@faa.gov
Economist, System Events and Analysis Group (AJR-G3)
Office of Performance Analysis