TERMINAL AREA FORECAST EXECUTIVE SUMMARY

Fiscal Years 2021-2045

Federal Aviation Administration

Preface

This publication provides aviation data users with summary historical and forecast statistics on passenger demand and aviation activity at U.S. airports. The summary level forecasts are based on individual airport projections.

The Terminal Area Forecast (TAF) includes forecasts for active airports in the National Plan of Integrated Airport Systems (NPIAS). The Federal Aviation Administration's (FAA) Forecast and Performance Analysis Division, Office of Aviation Policy and Plans, develops the TAF. The TAF is available on the Internet. The TAF database can be accessed at:

https://taf.faa.gov

The TAF contains a query data application that allows the public to access and print historical (1990 to 2020) and forecast (2021 to 2045) aviation activity data by individual airport, state, or FAA region.

The FAA welcomes public comment on the forecasts, as well as suggestions for improving the usefulness of the TAF.

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Summary Historical and Forecast Highlights

- Total passenger enplanements at U.S. airports are estimated to be 554.1 million enplanements in 2021, an estimated annual increase of 7.8 percent. Total enplanements are forecast to recover in aggregate to their 2019 pre-COVID-19 pandemic level by 2024.
- In 2021, FAA tower airports and FAA contract tower airports are estimated to account for 549.9 million enplanements or 99.2 percent of total enplanements at U.S. airports.
- The top 100 airports are estimated to account for 518.7 million enplanements in 2021, or 93.6 percent of total U.S. enplanements.
- FAA tower airports and FAA contract tower airports handled 47.7 million operations in 2021. This figure is a 7.1 percent increase from 2020. Total operations at these airports are forecast to recover in aggregate to their 2019 level by 2023.
- In 2021 there were 33.5 million total TRACON operations. These operations were a 7.2 percent increase from the 31.3 million operations in 2020. Total TRACON operations are forecast to recover in aggregate to their 2019 level by 2023.
- The 29 large hub airports[1] enplaned an estimated 379.1 million passengers in 2021. These airports are projected to enplane 1.1 billion passengers in 2045, a 189.9 percent increase over the 24-year period (or 4.5 percent annually).
- The 33 medium hub airports[2] enplaned an estimated 100.7 million enplanements in 2021. These airports are projected to enplane 281.9 million passengers in 2045, a 180.0 percent increase over the 24-year period (or 4.4 percent annually).
- Atlanta (30.6 million enplanements), Dallas/Ft. Worth (27.6 million), Denver (25.6 million), Chicago O'Hare (22.2 million), and Los Angeles (19.5 million) led U.S. commercial airports in estimated passenger enplanements in 2021, accounting for 22.6 percent of enplanements at U.S. airports.
- Atlanta is projected to remain the country's busiest airport, as measured by passenger enplanements, through the forecast period with a projected 88.6

[1] Airports enplaning one percent or more of total enplanements.
[2] Airports enplaning 0.25 to 0.99 percent of total enplanements.

million enplaned passengers in 2045. Los Angeles is projected to enplane the second most passengers (69.9 million) in 2045, followed by Chicago O'Hare with 65.7 million enplanements.

- Enplanements at San Francisco, John F. Kennedy, and Boston airports are projected to grow fastest among the large hub airports. The annual growth rates at these airports are forecast to increase by 7.5, 6.8, and 6.4 percent per year, respectively, over the forecast period.
- In terms of total operations, Atlanta was the busiest U.S. airport in 2021 with 673,000 aircraft operations. Chicago O'Hare and Dallas/Ft. Worth were the second and third busiest airports with 622,000 and 621,000 operations, respectively.
- In 2045, Atlanta is expected to be the busiest airport in the nation, as measured by total operations, with a projected 1.46 million operations. Chicago O'Hare (1.38 million operations) is projected to be in second place and Los Angeles and Dallas/Ft. Worth are projected to be in third and fourth place (each with 1.12 million operations).
- The FAA's Southern region airports are estimated to enplane more passengers at tower airports than any other region with an estimated 150.2 million passengers in 2021. The Western Pacific region was second with 100.9 million enplanements.
- The Southern region is expected to lead in passenger enplanements at tower airports in 2045, reaching 379.0 million. The Western Pacific region is projected to stay in second place with 333.2 million enplanements.
- The Southern region led all FAA regions in the number of airport operations at tower airports with 11.6 million in 2021. The Southern region is expected to remain first in 2045 with 17.4 million operations. The Western Pacific and Southwest regions ran second and third in airport operations in 2021 with 10.5 and 6.2 million, respectively. In 2045, the Western Pacific region is projected to remain in second place with 15.6 million operations and the Southwest region is projected to remain in third place with 8.7 million operations.

Forecast Process

Introduction

The Terminal Area Forecast (TAF) contains historical and forecast data for enplanements, airport operations, TRACON operations, and based aircraft. The data cover 264 FAA tower airports, 258 FAA contract tower airports, 153 terminal radar approach control facilities, and 2,770 non FAA airports. Data in the TAF are presented on a U.S. Government fiscal year basis (October through September).

The TAF is available on the Internet. The TAF data and TAF query data application can be accessed at:

https://taf.faa.gov

The TAF query data application allows public access to historical and forecast aviation activity data by individual airport, state, or FAA region.

The TAF is prepared to assist the FAA in meeting its planning, budgeting, and staffing requirements. In addition, state aviation authorities and other aviation planners use the TAF as a basis for planning airport improvements.

The airport activity data contained in the TAF consist of the following:

- **enplanements** (sum of originating and connecting passengers) for air carriers and regionals;
- **itinerant operations** for air carriers, commuters and air taxis, general aviation (GA), and military aircraft;
- **local operations** for civil and military aircraft; and
- **TRACON operations** for aircraft operations under radar control.

Impact of COVID-19 Pandemic on TAF Forecasts

In the 2021 TAF the forecasts account for the downturn and recovery from the COVID-19 pandemic to varying degrees based on airport type. The types are:

. ***FAA and FAA contract tower airports*** – Forecasts account for impact on passenger enplanements, commercial operations, and general aviation operations. In 2019 these airports accounted for 99.4 percent of total US passenger enplanements and 89.4 percent of total US commercial operations.

. ***Non-FAA airports with greater than 100,000 passenger enplanements in 2019*** – Forecasts account for impact on passenger enplanements and commercial operations.

In 2019 these airports accounted for 0.2 percent of total US passenger enplanements and 0.3 percent of total US commercial operations.

. ***Non-FAA airports with fewer than 100,000 passenger enplanements in 2019*** – Forecasts do not account for impact on passenger enplanements, commercial operations, and general aviation operations. In 2019 these airports accounted for 0.4 percent of total US passenger enplanements and 10.3 percent of total US commercial operations.

Data on operations presented in the TAF show historical information from 1990 through 2020 and forecasts for 2021 to 2045.[3] The historical enplanement information in the TAF is from 1976 through 2020. The enplanement forecasts are from 2021 to 2045. Appendix A provides a detailed description of the activity data elements in the TAF. Appendix B provides a list of FAA tower airports and FAA contract tower airports by hub size for the large, medium, and small hubs.

Forecast Method

The TAF assumes a demand driven forecast for aviation services based upon local and national economic conditions as well as conditions within the aviation industry. In other words, an airport's forecast is developed independent of the ability of the airport and the air traffic control system to furnish the capacity required to meet demand. However, if the airport historically functions under constrained conditions, the FAA forecast may reflect those constraints since they are embedded in historical data. In statistical terms, the relationships between economic growth data and data representing growth in aviation activity reflect those constraints.

In 2020 there was a major decrease in passenger enplanements and commercial operations as a result of the COVID-19 pandemic. In 2021 there was modest recovery with these parameters increasing at above historical average growth rates. There is uncertainty associated with the forecasts because of the uncertainty regarding the path of the pandemic and its economic impacts. Particular attention was spent on forecasting the near term recovery back to 2019 activity.

The forecasts of passenger enplanements and commercial operations at airports with more than 100,000 enplanements in 2019 are based on a bottoms-up approach. The domestic enplanements are forecast by generating origin and destination (O&D) market demand forecasts using the DB1B (quarterly 10% sample) data to model passenger flow on a quarterly basis. The O&D passenger demand forecasts are based on regression analysis using fares, regional demographics, and regional economic factors as the independent variables. The O&D forecasts are then combined with DOT T-100

[3] Operations data for FAA towers and FAA contract towers for 2021 are actual.

segment data to generate passenger forecasts by airport pair and segment pair. The segment pair passenger forecasts are assigned to aircraft equipment in order to produce segment pair operation forecasts. The quarterly segment pair forecasts are aggregated to produce annual airport forecasts.

Separate models are used to forecast international passenger enplanements and operations and cargo operations. The international passenger enplanements are forecast on a quarterly basis using time series analysis and T-100 segment data. The segment pair passenger enplanement forecasts are used to generate segment pair operation forecasts. The cargo operation forecasts are also generated on a quarterly basis using time series analysis and T-100 segment data. The segment pair forecasts for international passenger enplanements and operations and cargo operations are aggregated to the market pair and airport level on an annual basis.

The near term recovery forecasts to 2019 activity were based on an analysis of the recovery from previous external shocks and real personal income projections. The previous external shocks include the September 11, 2001 Terrorist Attack and the 2008 Financial Crisis. The real personal income projections incorporate the risks associated with the pandemic and its impact on the economy.

The long term forecast rates of passenger enplanements and commercial operations at FAA facilities with fewer than 100,000 enplanements in 2019 are based on the long term forecast rates in the 2020 TAF. These long term rates in the 2020 TAF were based primarily on analysis of historic trends. The near term recovery forecasts of passenger enplanements and commercial operations to 2019 activity at these airports were based on the forecasts of non-hub airports with more than 100,000 enplanements in 2019.

The long term forecast rates of itinerant general aviation operations and local civil operations at FAA facilities are based on the long term forecast rates in the 2020 TAF. These long term rates in the 2020 TAF were based primarily on time series analysis. The near term recovery forecasts were based on recent trends. On average the 2020 decrease in these operations was significantly less than the decrease in passenger enplanements and commercial operations. Because military operations forecasts have national security implications, the Department of Defense (DOD) provides only limited information on future aviation activity. Hence, the TAF projects military activity at its present level except when FAA has specific knowledge of a change. For instance, DOD may announce a base closing or may shift an Air Force wing from one base to another.

For non-FAA facilities, historic operations in the TAF are from the Form 5010 data. These operations levels are held constant for the forecast unless otherwise specified by a local or regional FAA official.

Data Sources

The development of the TAF begins with an update of the latest historical enplanement, operation, and based aircraft statistics, using information derived from several sources. FAA's National Flight Data Center provides general airport information such as the airport name, location, and location identifier. Airport operations and TRACON (radar assisted) operations data for airports with FAA and FAA contract air traffic control services are reported by FAA air traffic and FAA contract tower staff. Operations at non FAA airports are taken from FAA Form 5010 reports on aviation activity at the airport as estimated by FAA inspectors or information provided by airport managers, state aviation activity surveys, and other sources.

U.S. domestic and international (U.S. and foreign flag carriers) enplanements are derived from the Department of Transportation's (DOT's) T-100 database. Regional carrier enplanements are derived from DOT T-100 and 298-C data.[4]

The origin and destination (O&D) data are based on the Airline Origin and Destination Survey (DB1B). This is a 10 percent sample of airline tickets from carriers reporting to the Office of Airline Information at the Bureau of Transportation Statistics.

Based aircraft data are collected by FAA inspectors, airport managers, and state aviation officials and reported on FAA Form 5010. These data show numbers of aircraft, mostly general aviation aircraft, permanently based at an airport.

[4] In October 2002, DOT began collecting data for all airlines using the T-100 format. This change provides more detail on regional airlines, who previously reported on Form 298-C.

Forecast Trends

Near-Term and Long-Term Forecasts

In 2021 total estimated enplanements at FAA and FAA contract towers increased 7.7 percent. Total operations at these airports increased 7.1 percent, commercial operations increased 4.9 percent, and non-commercial operations increased 8.5 percent. The increases in aviation activity in 2021 were attributable to improvements in the COVID-19 pandemic and the economy.

Total enplanements at tower airports are forecast to increase at an average annual rate of 4.4 percent from 2021 to 2045. Enplanements at these airports are forecast to recover in aggregate to their 2019 level by 2024. The projected average annual rate of increase for enplanements during the 2021 to 2024 recovery period is 20.9 percent and during the 2024 to 2045 post recovery period is 2.3 percent.

Total operations at tower airports are forecast to increase at an average annual rate of 1.6 percent from 2021 to 2045. The growth rates for this period by user group are as follows: air carrier, 3.6 percent; air taxi/commuter, 0.8 percent; itinerant general aviation, 0.7 percent; and local civil, 0.7 percent. Total operations at the towers are forecast to recover in aggregate to their 2019 level by 2023. The projected average annual rate of increase for total operations during the 2021 to 2023 recovery period is 7.6 percent and during the 2023 to 2045 post recovery period is 1.1 percent.

Trends by Region

Table S-1 shows enplanements and airport operations at the tower airports by FAA region. The Southern region led FAA regions in estimated passenger enplanements at tower airports with 150.2 million in 2021, followed by the Western Pacific region with 100.9 million enplanements, and the Southwest region with 74.5 million enplanements. Enplanements in the New England region are projected to increase the fastest with an average annual rate of 5.7 percent from 2021 to 2045. The next two regions with the fastest projected increases in enplanements are Eastern and Western Pacific with average annual forecast rates of 5.2 percent and 5.1 percent, respectively.

In 2021 the Southern (11.6 million operations), Western Pacific (10.5 million operations), and Southwest (8.7 million operations) regions ranked as the top three FAA regions in tower airport operations. The Eastern (2.1 percent), Southern (1.7 percent), New England (1.7 percent), and Western Pacific (1.7 percent) regions are projected to be the fastest growing FAA regions from 2021 to 2045 in terms of tower airport operations.

Tower Airports by Hub Size

Table S-2 presents passenger enplanements and airport operations at FAA and FAA contract towers by hub size. An airport qualifies as a large hub with one percent or more of total U.S. passenger enplanements. A medium hub airport enplanes from 0.25 to 0.99 percent of total U.S. passenger enplanements while small and non-hub airports enplane from 0.05 to 0.249 percent and less than 0.05 percent, respectively. Appendix B contains a list of hub tower airports classified by size for the large, medium, and small hubs.

The 29 large hub airports enplaned 379.1 million passengers in 2021 while the 33 medium hub airports enplaned 100.7 million, and the 76 small hub airports enplaned 54.0 million. The 384 non-hub airports enplaned 16.1 million passengers. Enplanements at large hubs are expected to increase at an annual rate of 4.5 percent over the 2021 to 2045 forecast period. Medium hub airports are forecast to increase 4.4 percent and small hub airports are forecast to increase 3.8 percent per year.

Operations at large hub airports totaled 9.3 million in 2021 compared to 4.6 million at medium hub airports and 6.4 million at small hub airports. Operations at large hub airports are forecast to increase at an annual rate of 3.2 percent from 2021 to 2045. Operations at the medium hubs are forecast to rise at an annual rate of 2.5 percent from 2021 to 2045; operations at small hub airports are forecast to grow 1.4 percent per year.

In 2021 non-hub airports accounted for 27.4 million operations or 57.4 percent of total operations at FAA and FAA contract towers. General aviation aircraft operations accounted for the majority of operations at the non-hub airports.

Large Hub Airports

Table S-3 presents enplanement forecast summaries for the large hub airports. Atlanta was the busiest airport in 2021 (30.6 million estimated enplanements), followed by Dallas/Ft. Worth (27.6 million), Denver (25.6 million), Chicago O'Hare (22.2 million), and Los Angeles (19.5 million). The ranking of the top five airports in terms of projected enplanements in 2045 is Atlanta (88.6 million), Los Angeles (69.9 million), Chicago O'Hare (65.7 million), Dallas/Ft. Worth (59.1 million), and Denver (58.9 million). The three airports with the fastest projected increases in enplanements from 2021 to 2045 are San Francisco (7.5 percent), John F. Kennedy (6.8 percent), and Boston (6.4 percent).

Table S-4 presents operations forecast summaries for the large hub airports. In 2021, FAA controllers at Atlanta handled 673,000 landings and takeoffs, followed by Chicago O'Hare (622,000 operations), Dallas/Ft. Worth (621,000 operations), and Denver (556,000 operations). The ranking of the top four airports in terms of projected

operations in 2045 is Atlanta (1.5 million), Chicago O'Hare (1.4 million), Los Angeles (1.1 million), and Dallas/Ft. Worth (1.1 million). The three airports with the fastest projected increases in operations from 2021 to 2045 are San Francisco (5.1 percent), John F. Kennedy (4.9 percent), and Boston (4.8 percent).

TAF Forecast Tables

Table S-1 Enplanements and Airport Operations at FAA Towers and FAA Contract Towers by FAA Region

Enplanements at Tower Airports (000's)

Region	Name	Airports in 2021	2019	2020	2021e	Rate 2020 - 2021e	2045	Annual rate 2021e - 2045
ASO	Southern	112	217,017.8	126,980.5	150,168.6	18.3%	378,990.0	3.9%
AWP	Western - Pacific	81	190,459.9	102,572.2	100,923.7	-1.6%	333,163.7	5.1%
ASW	Southwest	77	106,595.1	63,121.6	74,506.4	18.0%	178,939.7	3.7%
AEA	Eastern	61	143,857.5	73,322.6	67,596.6	-7.8%	227,523.8	5.2%
AGL	Great Lakes	80	115,650.6	63,201.4	65,757.4	4.0%	183,015.3	4.4%
ANM	Northwest Mountain	51	91,848.5	53,493.0	63,166.8	18.1%	161,580.1	4.0%
ANE	New England	25	29,183.4	14,503.6	13,003.3	-10.3%	49,652.2	5.7%
ACE	Central	27	20,183.1	11,262.2	12,037.5	6.9%	31,383.3	4.1%
AAL	Alaskan	8	3,966.7	2,170.6	2,733.9	25.9%	6,215.6	3.5%
TOTAL		522	918,762.6	510,627.9	549,894.3	7.7%	1,550,463.6	4.4%

Operations at Tower Airports (000's)

Region	Name	Airports in 2021	2019	2020	2021	Rate 2020 - 2021	2045	Annual rate 2021 - 2045
ASO	Southern	112	12,969.7	10,973.2	11,576.8	5.5%	17,376.6	1.7%
AWP	Western - Pacific	81	11,938.6	10,040.0	10,473.4	4.3%	15,606.6	1.7%
ASW	Southwest	77	6,759.0	5,841.4	6,200.5	6.1%	8,720.0	1.4%
AGL	Great Lakes	80	6,368.1	5,185.8	5,862.5	13.1%	8,421.3	1.5%
ANM	Northwest Mountain	51	5,291.5	4,611.5	5,170.1	12.1%	7,150.4	1.4%
AEA	Eastern	61	6,045.4	4,469.2	4,621.8	3.4%	7,563.5	2.1%
ANE	New England	25	1,781.9	1,450.5	1,594.6	9.9%	2,383.1	1.7%
ACE	Central	27	1,436.6	1,239.2	1,362.5	10.0%	1,864.7	1.3%
AAL	Alaskan	8	840.5	691.5	797.2	15.3%	1,159.6	1.6%
TOTAL		522	53,431.0	44,502.2	47,659.4	7.1%	70,245.9	1.6%

Table S-2 Enplanements and Airport Operations at FAA Towers and FAA Contract Towers by Hub Size

Enplanements at Tower Airports (000's)

	Airports in 2021	2019	2020	2021e	Rate 2020 - 2021e	Aggregate Recovery to 2019	2045	Annual rate 2021e - 2045
Large Hubs	29	645,837.5	355,462.5	379,119.0	6.7%	2024	1,098,951.5	4.5%
Medium Hubs	33	167,915.2	93,620.2	100,672.3	7.5%	2024	281,914.6	4.4%
Small Hubs	76	80,566.1	46,929.7	54,019.3	15.1%	2023	133,251.6	3.8%
Non Hubs	384	24,443.8	14,615.5	16,083.8	10.0%	2024	36,345.9	3.5%
Total	522	918,762.6	510,627.9	549,894.3	7.7%	2024	1,550,463.6	4.4%

Operations at Tower Airports (000's)

	Airports in 2021	2019	2020	2021	Rate 2020 - 2021	Aggregate Recovery to 2019	2045	Annual rate 2021 - 2045
Large Hubs	29	12,922.6	9,078.2	9,284.3	2.3%	2024	19,813.1	3.2%
Medium Hubs	33	5,670.4	4,372.6	4,591.1	5.0%	2023	8,351.7	2.5%
Small Hubs	76	6,993.1	5,924.4	6,424.8	8.4%	2023	8,985.2	1.4%
Non Hubs	384	27,844.9	25,127.1	27,359.2	8.9%	2022	33,095.9	0.8%
Total	522	53,431.0	44,502.2	47,659.4	7.1%	2023	70,245.9	1.6%

Table S-3 Enplanements at Large Hub Airports
(in thousands)

Loc Id	Region	Airport Name	2019	2020	2021e	Rate 2020 - 2021e	Recovery to 2019	2045	Annual rate 2021e - 2045
ATL	ASO	HARTSFIELD - JACKSON ATLANTA INTL	53,247.2	28,673.7	30,566.0	6.6%	2024	88,593.8	4.5%
DFW	ASW	DALLAS - FORT WORTH INTL	34,862.3	22,468.1	27,575.2	22.7%	2023	59,078.0	3.2%
DEN	ANM	DENVER INTL	33,124.9	20,077.9	25,615.1	27.6%	2023	58,932.7	3.5%
ORD	AGL	CHICAGO O'HARE INTL	40,625.8	21,448.4	22,152.6	3.3%	2024	65,673.3	4.6%
LAX	AWP	LOS ANGELES INTL	42,843.2	21,532.8	19,481.7	-9.5%	2025	69,879.8	5.5%
CLT	ASO	CHARLOTTE/DOUGLAS INTL	23,637.0	15,614.0	19,147.0	22.6%	2023	41,654.8	3.3%
MCO	ASO	ORLANDO INTL	24,087.9	13,985.7	17,061.4	22.0%	2023	45,066.4	4.1%
PHX	AWP	PHOENIX SKY HARBOR INTL	22,191.1	13,565.7	16,566.3	22.1%	2023	41,180.7	3.9%
LAS	AWP	MC CARRAN INTL	24,219.5	14,188.6	16,182.2	14.1%	2023	42,653.7	4.1%
MIA	ASO	MIAMI INTL	21,279.0	12,044.8	14,382.0	19.4%	2023	35,215.3	3.8%
SEA	ANM	SEATTLE - TACOMA INTL	24,606.7	13,410.4	14,318.6	6.8%	2025	41,488.0	4.5%
IAH	ASW	GEORGE BUSH INTERCONTINENTAL/HOUSTON	21,698.4	11,912.3	14,145.1	18.7%	2024	37,980.9	4.2%
FLL	ASO	FORT LAUDERDALE/HOLLYWOOD INTL	17,705.5	10,266.8	12,488.0	21.6%	2023	33,155.3	4.2%
EWR	AEA	NEWARK LIBERTY INTL	23,019.5	11,955.0	11,576.7	-3.2%	2025	37,558.1	5.0%
JFK	AEA	JOHN F KENNEDY INTL	31,098.3	14,327.3	11,378.7	-20.6%	2025	54,865.2	6.8%
MSP	AGL	MINNEAPOLIS - ST PAUL INTL/WOLD - CHAMBERLAIN	18,906.4	10,168.0	9,952.2	-2.1%	2024	30,064.6	4.7%
DTW	AGL	DETROIT METROPOLITAN WAYNE COUNTY	17,910.0	9,753.1	9,532.5	-2.3%	2024	27,203.8	4.5%
SLC	ANM	SALT LAKE CITY INTL	12,685.9	7,578.6	9,209.1	21.5%	2024	21,362.2	3.6%
SFO	AWP	SAN FRANCISCO INTL	27,653.9	13,099.6	9,188.7	-29.9%	2024	52,397.8	7.5%
PHL	AEA	PHILADELPHIA INTL	15,797.2	8,412.6	8,401.5	-0.1%	2024	24,165.0	4.5%
BOS	ANE	GENERAL EDWARD LAWRENCE LOGAN INTL	20,563.6	10,024.3	8,391.8	-16.3%	2024	36,907.3	6.4%
BWI	AEA	BALTIMORE/WASHINGTON INTL THURGOOD MARSHALL	13,135.6	7,542.0	8,064.3	6.9%	2023	21,387.2	4.1%
TPA	ASO	TAMPA INTL	10,787.3	6,468.4	7,753.1	19.9%	2023	19,436.4	3.9%
MDW	AGL	CHICAGO MIDWAY INTL	10,183.8	5,709.3	6,742.7	18.1%	2024	15,744.2	3.6%
BNA	ASO	NASHVILLE INTERNATIONAL	8,686.7	5,276.4	6,549.6	24.1%	2023	17,037.4	4.1%
SAN	AWP	SAN DIEGO INTL	12,545.6	6,770.7	6,504.3	-3.9%	2024	23,671.4	5.5%
IAD	AEA	WASHINGTON DULLES INTL	11,868.3	5,918.4	5,824.1	-1.6%	2024	20,072.5	5.3%
LGA	AEA	LAGUARDIA	15,360.5	7,326.0	5,482.9	-25.2%	2024	19,769.8	5.5%
DCA	AEA	RONALD REAGAN WASHINGTON NATIONAL	11,506.5	5,943.8	4,885.4	-17.8%	2024	16,756.1	5.3%
TOTAL			645,837.5	355,462.5	379,119.0	6.7%	2024	1,098,951.5	4.5%

Table S-4 Operations at Large Hub Airports

(in thousands)

Loc Id	Region	Airport Name	2019	2020	2021	Rate 2020 - 2021	Recovery to 2019	2045	Annual rate 2021 - 2045
ATL	ASO	HARTSFIELD - JACKSON ATLANTA INTL	903.1	621.0	672.5	8.3%	2023	1,455.7	3.3%
ORD	AGL	CHICAGO O'HARE INTL	914.6	643.8	622.4	-3.3%	2024	1,376.3	3.4%
DFW	ASW	DALLAS - FORT WORTH INTL	703.2	559.3	620.8	11.0%	2023	1,119.0	2.5%
DEN	ANM	DENVER INTL	629.3	483.3	555.6	15.0%	2023	987.4	2.4%
CLT	ASO	CHARLOTTE/DOUGLAS INTL	570.8	443.9	483.8	9.0%	2023	896.2	2.6%
LAX	AWP	LOS ANGELES INTL	695.0	457.4	456.0	-0.3%	2024	1,121.0	3.8%
LAS	AWP	MC CARRAN INTL	549.1	377.9	431.8	14.2%	2023	793.8	2.6%
PHX	AWP	PHOENIX SKY HARBOR INTL	435.6	343.1	378.7	10.4%	2023	760.1	2.9%
SEA	ANM	SEATTLE - TACOMA INTL	445.3	329.8	358.3	8.7%	2024	732.4	3.0%
IAH	ASW	GEORGE BUSH INTERCONTINENTAL/HOUSTON	474.2	320.9	354.0	10.3%	2024	705.5	2.9%
MIA	ASO	MIAMI INTL	417.7	290.5	338.9	16.7%	2023	675.7	2.9%
SLC	ANM	SALT LAKE CITY INTL	342.7	285.9	333.2	16.5%	2023	513.5	1.8%
MSP	AGL	MINNEAPOLIS - ST PAUL INTL/WOLD - CHAMBERLAIN	404.6	279.8	289.0	3.3%	2024	591.6	3.0%
MCO	ASO	ORLANDO INTL	363.7	261.7	287.0	9.7%	2023	645.2	3.4%
DTW	AGL	DETROIT METROPOLITAN WAYNE COUNTY	394.9	275.4	272.6	-1.0%	2024	531.9	2.8%
FLL	ASO	FORT LAUDERDALE/HOLLYWOOD INTL	331.2	225.5	256.2	13.6%	2023	571.5	3.4%
JFK	AEA	JOHN F KENNEDY INTL	465.0	273.2	253.5	-7.2%	2025	790.3	4.9%
EWR	AEA	NEWARK LIBERTY INTL	448.6	278.4	244.4	-12.2%	2028	642.5	4.1%
PHL	AEA	PHILADELPHIA INTL	388.6	268.2	243.8	-9.1%	2032	466.5	2.7%
SFO	AWP	SAN FRANCISCO INTL	460.7	292.4	236.6	-19.1%	2024	778.9	5.1%
BOS	ANE	GENERAL EDWARD LAWRENCE LOGAN INTL	432.7	273.6	227.6	-16.8%	2024	698.8	4.8%
IAD	AEA	WASHINGTON DULLES INTL	309.1	209.6	215.4	2.7%	2024	414.1	2.8%
BNA	ASO	NASHVILLE INTERNATIONAL	231.2	181.3	199.0	9.7%	2023	396.1	2.9%
BWI	AEA	BALTIMORE/WASHINGTON INTL THURGOOD MARSHALL	261.3	203.3	189.2	-6.9%	2024	376.2	2.9%
TPA	ASO	TAMPA INTL	214.2	166.6	181.4	8.9%	2023	354.9	2.8%
MDW	AGL	CHICAGO MIDWAY INTL	233.9	172.4	172.7	0.2%	2024	327.0	2.7%
SAN	AWP	SAN DIEGO INTL	230.0	160.3	147.6	-7.9%	2024	388.4	4.1%
LGA	AEA	LAGUARDIA	374.4	210.9	133.5	-36.7%	2027	394.8	4.6%
DCA	AEA	RONALD REAGAN WASHINGTON NATIONAL	297.8	188.8	128.5	-31.9%	2024	307.7	3.7%
Total			12,922.6	9,078.2	9,284.3	2.3%	2024	19,813.1	3.2%

Appendix A: Description of Activity Measures

Air Carrier Enplanements

These data summarize domestic enplaned passengers (originations and connections) of U.S. commercial air carriers and international enplanements for both U.S. and foreign flag carriers submitted to the U.S. Department of Transportation (DOT), Bureau of Transportation Statistics (BTS) on T-100 reports. Estimates include both scheduled and non-scheduled enplaned passengers.

Regional Enplanements

Starting in FY 2003, FAA includes in the regional category enplanements for those airlines whose primary function is to provide passenger feed to mainline carriers, regardless of aircraft size. As of October 2002, all scheduled and non-scheduled operations using aircraft with 10 or more seats to transport regional passengers must report on T-100.

Historic enplanement data includes originating passengers on scheduled commuter or regional carriers as reported on DOT Form 41 and 298-C; where possible, adjustments were made to include connecting passengers. Historically, Form 298-C included carriers operating at least five scheduled round trips per week whose entire fleet consists of aircraft having 60 seats or less.

Aircraft Operations

FAA air traffic controllers count landings and takeoffs at FAA towered airports. Controllers employed by an FAA contractor count operations at FAA contract towers. At non-FAA facilities, operations counts represent an estimate.

Air carrier operations represent either takeoffs or landings of commercial aircraft with seating capacity of more than 60 seats.

Commuter/air taxi operations are one category. Commuter operations include takeoffs and landings by aircraft with 60 or fewer seats that transport regional passengers on scheduled commercial flights. Air taxi operations include takeoffs and landings by aircraft with 60 or fewer seats conducted on non-scheduled or for-hire flights.

Itinerant general aviation and local civil operations represent all civil aviation aircraft takeoffs and landings not classified as commercial. Military operations represent takeoffs and landings by military aircraft. Operations are either itinerant or local flights.

Local Operations

Aircraft operating in the traffic pattern or within sight of the tower, or aircraft known to be departing or arriving from flight in local practice areas, or aircraft executing practice instrument approaches at the airport.

Itinerant Operations

FAA reports all aircraft operations other than local operations as itinerant. Essentially, these data represent takeoffs and landings of aircraft going from one airport to another.

Tracon Operations

These data include arrivals, departures, and overflights conducted by an FAA radar approach control facility for aircraft under Instrument Flight Rule (IFR) or Visual Flight Rule (VFR) plans.

Overflights

These data include operations of aircraft in transit through the approach control facility airspace.

Appendix B: List of Large, Medium, and Small Hub Tower Airports

Table B-1 List of Large Hub Towers

Location Identifier	Region	Airport Name	City, State
ATL	ASO	HARTSFIELD-JACKSON ATLANTA INT`L	ATLANTA, GA
BNA	ASO	NASHVILLE INTERNATIONAL	NASHVILLE, TN
BOS	ANE	BOSTON/LOGAN INTERNATIONAL	BOSTON, MA
BWI	AEA	BALTIMORE-WASHINGTON INT`L	BALTIMORE, MD
CLT	ASO	CHARLOTTE/DOUGLAS INT`L	CHARLOTTE, NC
DCA	AEA	WASHINGTON NATIONAL	WASHINGTON , DC
DEN	ANM	DENVER INTERNATIONAL	DENVER, CO
DFW	ASW	DALLAS/FT WORTH INT`L	DALLAS-FORT WORTH, TX
DTW	AGL	DETROIT METRO WAYNE CO	DETROIT, MI
EWR	AEA	NEWARK TOWER	NEWARK, NJ
FLL	ASO	FT LAUDERDALE/HOLLYWOOD	FORT LAUDERDALE, FL
IAD	AEA	WASHINGTON DULLES INT`L	WASHINGTON , DC
IAH	ASW	HOUSTON/G BUSH INTERCONT`L	HOUSTON, TX
JFK	AEA	KENNEDY TOWER	NEW YORK, NY
LAS	AWP	LAS VEGAS/MC CARRAN INT`L	LAS VEGAS, NV
LAX	AWP	LOS ANGELES INTERNATIONAL	LOS ANGELES, CA
LGA	AEA	LA GUARDIA	NEW YORK, NY
MCO	ASO	ORLANDO INTERNATIONAL	ORLANDO, FL
MDW	AGL	CHICAGO MIDWAY	CHICAGO, IL
MIA	ASO	MIAMI INTERNATIONAL	MIAMI, FL
MSP	AGL	MINNEAPOLIS-ST PAUL INT`L	MINNEAPOLIS, MN
ORD	AGL	CHICAGO/O`HARE INT`L	CHICAGO, IL
PHL	AEA	PHILADELPHIA INTERNATIONAL	PHILADELPHIA, PA
PHX	AWP	PHOENIX SKY HARBOR INTL	PHOENIX, AZ
SAN	AWP	SAN DIEGO INT`L/LINDBERGH	SAN DIEGO, CA
SEA	ANM	SEATTLE TACOMA INT`L	SEATTLE, WA
SFO	AWP	SAN FRANCISCO INT`L	SAN FRANCISCO, CA
SLC	ANM	SALT LAKE CITY INT`L	SALT LAKE CITY, UT
TPA	ASO	TAMPA INTERNATIONAL	TAMPA, FL

Listed 29 Airports

Table B-2 List of Medium Hub Towers

Location Identifier	Region	Airport Name	City, State
ABQ	ASW	ALBUQUERQUE INTERNATIONAL	ALBUQUERQUE, NM
ANC	AAL	ANCHORAGE INTERNATIONAL	ANCHORAGE, AK
AUS	ASW	AUSTIN TOWER	AUSTIN, TX
BDL	ANE	WINDSOR LOCKS/BRADLEY INTL	WINDSOR LOCKS, CT
BUR	AWP	BURBANK-GLENDALE-PASADENA	BURBANK, CA
CHS	ASO	CHARLESTON AFB/INT`L	CHARLESTON, SC
CLE	AGL	CLEVELAND HOPKINS INT`L	CLEVELAND, OH
CMH	AGL	PORT COLUMBUS INT`L	COLUMBUS, OH
CVG	ASO	COVINGTON/CINCINNATI INT`L	COVINGTON, KY
DAL	ASW	DALLAS LOVE FIELD	DALLAS, TX
HNL	AWP	HONOLULU INTERNATIONAL	HONOLULU, HI
HOU	ASW	HOUSTON HOBBY	HOUSTON, TX
IND	AGL	INDIANAPOLIS INTERNATIONAL	INDIANAPOLIS, IN
JAX	ASO	JACKSONVILLE INT`L	JACKSONVILLE, FL
MCI	ACE	KANSAS CITY INTERNATIONAL	KANSAS CITY, MO
MEM	ASO	MEMPHIS TOWER	MEMPHIS, TN
MKE	AGL	MILWAUKEE/GEN MITCHELL INT	MILWAUKEE, WI
MSY	ASW	NEW ORLEANS INT`L/MOISANT	NEW ORLEANS, LA
OAK	AWP	OAKLAND TOWER	OAKLAND, CA
OGG	AWP	MAUI/KAHULUI	KAHULUI, HI
OMA	ACE	OMAHA	OMAHA, NE
ONT	AWP	ONTARIO INTERNATIONAL	ONTARIO, CA
PBI	ASO	PALM BEACH INTERNATIONAL	WEST PALM BEACH, FL
PDX	ANM	PORTLAND INTERNATIONAL	PORTLAND, OR
PIT	AEA	PITTSBURGH INTERNATIONAL	PITTSBURGH, PA
RDU	ASO	RALEIGH-DURHAM INT`L	RALEIGH/DURHAM, NC
RSW	ASO	FT MYERS/SW FL INT`L	FORT MYERS, FL
SAT	ASW	SAN ANTONIO INTERNATIONAL	SAN ANTONIO, TX
SJC	AWP	SAN JOSE TOWER	SAN JOSE, CA
SJU	ASO	SAN JUAN INTERNATIONAL	SAN JUAN, PR
SMF	AWP	SACRAMENTO INTERNATIONAL	SACRAMENTO, CA
SNA	AWP	SANTA ANA/JOHN WAYNE	SANTA ANA, CA
STL	ACE	LAMBERT-ST LOUIS INT`L	ST LOUIS, MO

Listed 33 Airports

Table B-3 List of Small Hub Towers

Location Identifier	Region	Airport Name	City, State
ACY	AEA	ATLANTIC CITY INT`L	ATLANTIC CITY, NJ
ALB	AEA	ALBANY COUNTY	ALBANY, NY
AVL	ASO	ASHEVILLE REGIONAL	ASHEVILLE, NC
BHM	ASO	BIRMINGHAM	BIRMINGHAM, AL
BIL	ANM	BILLINGS LOGAN INT`L	BILLINGS, MT
BOI	ANM	BOISE AIR TERMINAL	BOISE, ID
BTV	ANE	BURLINGTON TOWER	BURLINGTON, VT
BUF	AEA	GREATER BUFFALO INT`L	BUFFALO, NY
BZN	ANM	BOZEMAN/GALLATIN FIELD	BOZEMAN, MT
CAE	ASO	COLUMBIA METROPOLITAN	COLUMBIA, SC
CHA	ASO	CHATTANOOGA/LOVELL FIELD	CHATTANOOGA, TN
CID	ACE	CEDAR RAPIDS	CEDAR RAPIDS, IA
COS	ANM	COLORADO SPRINGS MUNICIPAL	COLORADO SPRINGS, CO
DAY	AGL	DAYTON INTERNATIONAL	DAYTON, OH
DSM	ACE	DES MOINES INTERNATIONAL	DES MOINES, IA
ECP	ASO	NORTHWEST FLORIDA BEACHES INTL	PANAMA CITY, FL
ELP	ASW	EL PASO INTERNATIONAL	EL PASO, TX
EUG	ANM	EUGENE/M SWEET FIELD	EUGENE, OR
EYW	ASO	KEY WEST INTERNATIONAL	KEY WEST, FL
FAI	AAL	FAIRBANKS TOWER	FAIRBANKS, AK
FAR	AGL	FARGO/HECTOR INTERNATIONAL	FARGO, ND
FAT	AWP	FRESNO YOSEMITE INT`L	FRESNO, CA
FSD	AGL	SIOUX FALLS/FOSS FIELD	SIOUX FALLS, SD
FWA	AGL	FORT WAYNE INTERNATIONAL	FORT WAYNE, IN
GEG	ANM	SPOKANE INTERNATIONAL	SPOKANE, WA
GRR	AGL	GRAND RAPIDS/KENT CO INT`L	GRAND RAPIDS, MI
GSO	ASO	GREENSBORO/PIEDMONT TRIAD	GREENSBORO, NC
GSP	ASO	GREENVILLE-SPARTANBURG	GREER, SC
GUM	AWP	AGANA/GUAM INTERNATIONAL	GUAM, GU
HPN	AEA	WHITE PLAINS/WESTCHESTER	WHITE PLAINS, NY
HSV	ASO	HUNTSVILLE TOWER	HUNTSVILLE, AL
ICT	ACE	WICHITA MID CONTINENT	WICHITA, KS
ILM	ASO	WILMINGTON/NEW HANOVER INT	WILMINGTON, NC
ISP	AEA	ISLIP/LONG ISL. MACARTHUR	NEW YORK, NY
ITO	AWP	HILO INTERNATIONAL	HILO, HI
IWA	AWP	PHOENIX/WILLIAMS GATEWAY	PHOENIX, AZ
JAC	ANM	JACKSON/J HOLE	JACKSON, WY
JAN	ASO	JACKSON INTERNATIONAL	JACKSON, MS
KOA	AWP	KAILUA/KONA INTERNATIONAL	KAILUA/KONA, HI
LBB	ASW	LUBBOCK INTERNATIONAL	LUBBOCK, TX
LEX	ASO	LEXINGTON/BLUE GRASS	LEXINGTON, KY
LGB	AWP	LONG BEACH/DAUGHTERY FIELD	LONG BEACH, CA
LIH	AWP	LIHUE	LIHUE, HI
LIT	ASW	LITTLE ROCK ADAMS FIELD	LITTLE ROCK, AR
MAF	ASW	MIDLAND INTERNATIONAL	MIDLAND, TX
MDT	AEA	HARRISBURG INTERNATIONAL	HARRISBURG, PA
MFR	ANM	MEDFORD/ROGUE VALLEY INT'L	MEDFORD, OR
MHT	ANE	MANCHESTER	MANCHESTER, NH
MSN	AGL	MADISON/DANE CNTY REGIONAL	MADISON, WI
MSO	ANM	MISSOULA INTERNATIONAL	MISSOULA, MT
MYR	ASO	MYRTLE BEACH INTERNATIONAL	MYRTLE BEACH, SC
OKC	ASW	OKLAHOMA CITY/WILL ROGERS	OKLAHOMA CITY, OK
ORF	AEA	NORFOLK INTERNATIONAL	NORFOLK, VA
PGD	ASO	PUNTA GORDA	PUNTA GORDA, FL
PIE	ASO	ST PETERSBURG CLEARWATER	ST PETERSBURG-CLEARWATER , FL
PNS	ASO	PENSACOLA REGIONAL	PENSACOLA, FL
PSP	AWP	PALM SPRINGS REGIONAL	PALM SPRINGS, CA
PVD	ANE	PROVIDENCE	PROVIDENCE, RI
PWM	ANE	PORTLAND INT`L JETPORT	PORTLAND, ME
RDM	ANM	REDMOND/ROBERTS FIELD	REDMOND, OR

Table B-3 List of Small Hub Towers

Location Identifier	Region	Airport Name	City, State
RIC	AEA	RICHMOND INTERNATIONAL	RICHMOND, VA
RNO	AWP	RENO/TAHOE INTERNATIONAL	RENO, NV
ROC	AEA	GREATER ROCHESTER INT`L	ROCHESTER, NY
SAV	ASO	SAVANNAH INTERNATIONAL	SAVANNAH, GA
SBA	AWP	SANTA BARBARA MUNICIPAL	SANTA BARBARA, CA
SBN	AGL	SOUTH BEND/MI RGNL TRANS	SOUTH BEND, IN
SDF	ASO	LOUISVILLE INTL/STANDIFORD	LOUISVILLE, KY
SFB	ASO	ORLANDO/SANFORD	ORLANDO, FL
SGF	ACE	SPRINGFIELD-BRANSON RGNL	SPRINGFIELD, MO
SRQ	ASO	SARASOTA BRADENTON	SARASOTA/BRADENTON, FL
STT	ASO	CYRIL E KING	CHARLOTTE AMALIE, VI
SYR	AEA	SYRACUSE HANCOCK INT`L	SYRACUSE, NY
TUL	ASW	TULSA INTERNATIONAL	TULSA, OK
TUS	AWP	TUCSON INTERNATIONAL	TUCSON, AZ
TYS	ASO	KNOXVILLE/MCGHEE TYSON	KNOXVILLE, TN
XNA	ASW	NORTHWEST ARKANSAS TOWER	FAYETTEVILLE/SPRINGDALE/ROGERS , AR

Listed 76 Airports