THE *VOICE* OF **AIRPORTS**®

ACI NORTH AMERICA
AIRPORTS COUNCIL INTERNATIONAL

Taking America Beyond the Horizon

The Economic Impact of U.S. Commercial Airports in 2017

November 2018

About ACI-NA

Airports Council International-North America (ACI-NA) represents local, regional, and state governing bodies that own and operate commercial airports in the United States and Canada. ACI-NA member airports enplane more than 95 percent of the domestic and virtually all the international airline passenger and cargo traffic in North America. Approximately 380 aviation-related businesses are also members of ACI-NA, providing goods and services to airports. Collectively, U.S. airports employ more than 1.3 million people and account for $1.4 trillion in economic activity—or seven percent of the total U.S. workforce and eight percent of GDP. Canadian airports support 405,000 jobs and contribute C$35 billion to Canada's GDP. Learn more at www.airportscouncil.org.

This report was prepared by CDM Smith.
8845 Governor's Hill Drive
Cincinnati, Ohio 45249

Airports Council International – North America
1615 L Street, NW, Suite 300
Washington, DC 20036
202.293.8500
www.airportscouncil.org

America's Airports Remain Economic Engines for Local Communities

Airports are more than runways and terminals. Airports are powerful engines of economic growth and possibility for local communities across the United States. In *Taking America Beyond the Horizon: The Economic Impact of Commercial Service Airports in 2017*, we are pleased to announce the total economic output of U.S. commercial airports now exceeds $1.4 trillion, supporting more than 11.5 million jobs with a payroll of more than $428 billion.

Since 2013, when we last conducted this economic impact study, the overall economic output of America's airports has grown a tremendous 24 percent. That translates into two million more jobs and more opportunities for local and regional economies across the United States.

A large part of this growth stems from dramatic increases in passenger and cargo traffic through our airports. Last year, more than 1.7 billion passengers arrived at and departed from America's airports. Meeting the demands of passenger and cargo growth has never been more important. Our airports must have the ability to modernize as they seek to accommodate rapid growth in passenger and cargo traffic. In the United States alone, airports need nearly $100 billion in infrastructure upgrades and maintenance between 2017 and 2021.

Given the current state of airport infrastructure and the constraints on airports to make necessary investments, our ability to remain powerful engines of economic growth is at risk. After all, our current airport system is only designed to accommodate half of the passenger and cargo volume we see today. Airports remain committed to working with Congress and the Administration to advance airport priorities and ensure a competitive and economically viable 21st century airport system.

Kevin M. Burke
President and CEO
Airports Council International - North America


Arrivals

Taking America Beyond the Horizon

The Economic Impact of U.S. Commercial Airports in 2017

Executive Summary

The U.S. commercial airport network is a valued asset of the U.S. economy. It permits people and goods to move over great distances efficiently. This network ties together markets that stretch between countries and across vast oceans, encouraging economic growth and bettering lives in the U.S. and around the world. On top of these benefits, the U.S. commercial airport system provides significant economic impacts that can be quantified in terms of employment, annual payroll, and annual output.

This economic impact study presents the economic benefits that the 493 commercial airports in the United States make to the national economy. This analysis uses a methodology recognized by the Federal Aviation Administration (FAA) and other government agencies as a proven means of tabulating economic contributions for the 2017 calendar year.

Using data from more than 140 state and individual airport economic impact reports, this analysis found that the 493 commercial airports in the United States:

- Support 11.5 million jobs
- Create an annual payroll of $428 billion
- Produce an annual output of $1.4 trillion

These numbers are a strong indicator of how airports can be powerful economic engines, helping communities grow their economy. This study quantifies how each state benefits from its network of commercial airports.

U.S. Commercial Airports' Economic Impact

Before delving into the details of how this study determined the economic impacts of commercial airports, it is helpful to examine the economic environment in which these airports and the airlines have operated. This section looks back at the last 10 years of the aviation industry and the overall U.S. economy. This information provides context for assessing the economic impacts of commercial airports detailed later in this report.

Following this background introduction, the report highlights the overall impacts from the 493 U.S. commercial airports, along with detailed tables showing economic impacts by state. A section then discusses the degree to which capital investment in commercial airports translates into economic benefits. There is also a brief discussion of how the results of this 2017 study compare to the findings of the 2013 study. Finally, the report concludes by providing an explanation of the methods and assumptions used in developing the estimates of economic impacts.

Economic Environment for Commercial Airports 2007 – 2017

The aviation industry has weathered substantial economic conditions over the past 10 years, starting with the recession of 2008, and followed by the recovery. This section provides a detailed look at economic and operational conditions from 2007 to 2017, with a focus on changes since 2013, when the last study was completed.

Aviation Industry Trends

It is important not only to compare the economic impacts of commercial aviation at the times of the 2013 and 2017 studies, but also to compare the overall commercial aviation environment at these times. This provides context within which to frame the economic impact estimates. Table 1 below compares several airline statistics from 2007 through 2017, as well as to 2013, the base year of the previous study.

Table 1
Aviation Industry Trends 2007-2017

Metric	2007	2013	2017	2007-2013 CAGR[10]	2013-2017 CAGR	2007-2017 CAGR
Enplanements (FAA - P+NP[1])	762,397,236	738,935,380	856,286,541	-0.5%	3.8%	1.2%
Revenue Passenger Miles[2] (millions)	829,441,166	840,432,271	964,348,522	0.2%	3.5%	1.5%
Available Seat Miles[3] (billions)	1,037,691	1,011,167	1,154,871	-0.4%	3.4%	1.1%
Passenger Load Factor[4]	80%	83%	84%	0.6%	0.3%	0.5%
Air Carrier Operations[5]	13,687,788	12,845,544	15,213,265	-1.1%	4.3%	1.1%
Cargo Tonnage (metric tons)	29,296,575	29,203,615	31,740,500	-0.1%	2.1%	0.8%
Revenue Ton Miles[6] (millions)	39,863	34,804	41,108	-2.2%	4.2%	0.3%
Operating Revenue[7] ($ millions)	$138,221	$161,595	$174,934	2.6%	2.0%	2.4%
Net Income[8] ($ millions)	$7,691	$12,711	$16,990	8.7%	7.5%	8.2%
Profit Margin[9]	4.56%	7.54%	8.96%	8.7%	4.4%	7.0%

Notes and Definitions of Terms/Acronyms:
[1]P+NP – Primary + Non-Primary Commercial Service Airports
[2]Revenue Passenger Miles (RPMs) – Number of miles flown multiplied by all paying passengers (measures passenger traffic)
[3]Available Seat Miles (ASMs) – Number of miles flown multiplied by all available seats, whether sold or not (measures capacity)
[4]Passenger Load Factor (PLF) – RPMs divided by ASMs (measures capacity utilization)
[5]From FAA Air Traffic Activity Data System
[6]Revenue Ton Miles (RTMs) – Weight of all paid freight multiplied by number of miles flown
[7]Operating Revenue – Revenues received from total airline operations, most of which is passenger revenue
[8]Net Income – Income minus cost of goods sold, expenses, and taxes for an accounting period
[9]Profit Margin – The amount by which revenue from sales exceeds costs
[10]Compund Annual Growth Rate (CAGR)
Source: Airlines for America, Airports Council International, Bureau of Transportation Statistics, FAA.

Many of the above commercial service industry indicators experienced a decline from 2007 through 2013, during which the world economy went through a significant downturn. The effects of the recovery can be seen in indicators from 2013 through 2017, as the economy experienced growth. For example, national enplanements decreased at a rate of 0.5 percent from 2007 to 2013, but recovered dramatically from 2013 through 2017, growing at a compound annual growth rate (CAGR) of 3.8 percent. Overall, enplanements grew at a CAGR of 1.2 percent from 2007 through 2017.

This pattern is reflected in trends of other commercial service statistics such as revenue passenger miles (RPMs), available seat miles (ASMs), and air carrier operations. RPMs grew only at a rate of 0.2 percent from 2007 through 2013, but from 2013 through 2017 experienced a CAGR of 3.5 percent. Overall, RPMs grew at a CAGR of 1.5 percent from 2007 through 2017. ASMs, meanwhile, experienced a decline from 2007 through 2013, decreasing at an annual rate of 0.4 percent, while similarly recovering at a high rate (3.4 percent) and showing a more moderate 10-year growth rate (1.1 percent). Air carrier operations saw a decrease from 2007 through 2013 at a rate of 1.1 percent annually, but recovered strongly from 2013 to 2017, exhibiting an annual growth rate of 4.3 percent. This, in combination with a steady growth in enplanements, has resulted in constantly growing passenger load factors. Passenger load factor measures capacity utilization (PLF = RPMs/ASMs) and has increased with airlines' efforts to reduce capacity and fly fuller aircraft to increase operating revenue, while holding the line on costs.

Financial factors of the commercial airline industry have seen steady gains over the 10-year period. Operating revenue grew at an average annual rate of 2.6 percent from 2007 to 2013, but eased somewhat in the years immediately following the recession (2.0 percent CAGR). Net income and profit margin trends show similar results, with each growing at a higher rate in the post-recession period (from 2007 to 2013) than over the more recent 2013 to 2017 period. Net income has experienced dramatic growth over the 10-year period with a CAGR of 8.2 percent. Overall, commercial airlines have shown a profit in every year since 2010. However, this recent boon is in contrast to several years prior, as airlines collectively lost money in seven of 10 years from 2000 through 2009. Some of the biggest losses came during the recession, with airlines losing over $23 billion in 2009 alone.

Trends in the air cargo sector of commercial aviation reflect the impacts of the recession and the subsequent recovery. From 2007 through 2013, the years during or immediately after the recession, both cargo tonnage and revenue ton miles experienced declines of 0.1 percent and 2.2 percent annually, respectively. This was due to a number of factors, including the rising cost of fuel, an increase in cargo being shipped in the belly spaces of passenger aircraft, and an increase in other shipping modes such as ship or truck.

However, recent trends have seen surges in air cargo activity. From 2013 to 2017, cargo tonnage increased at a CAGR of 2.1 percent, while revenue ton miles increased at a CAGR of 4.2 percent. The growth in revenue ton miles is very strong, exceeded only by air carrier operations, net income, and profit margin. Cargo metrics showed positive 10-year growth rates despite the dramatic negative growth from 2007 through 2013.

Airline Mergers and Acquisitions

In the last 10 years, the airline industry has experienced several mergers and acquisitions, including the merging of several legacy carriers. In 2008, Northwest Airlines merged into Delta Air Lines, followed by Continental Airlines merging into United Airlines in 2010, US Airways and AMR merging into American Airlines in 2013, and Virgin America merging into Alaska Airlines in 2016. Other low cost and regional airlines have also merged over this period. In 2009, ATA Airlines merged into Southwest Airlines; Republic Airways, Midwest Airlines, and Frontier Airlines merged in 2009; Pinnacle Airlines and Mesaba Airlines merged in 2010; SkyWest, Atlantic Southeast Airlines, and ExpressJet Airlines merged into SkyWest in 2010; and Atlas Air and Southern Air merged to become Atlas Air Worldwide in 2016.

Some negative economic impacts resulting from airline mergers and acquisitions are seen in the form of workforce reductions due to redundancies between the merged airlines. After a merger, it is inevitable that some jobs will be lost at airports where overlapping routes and redundant facilities exist. As experienced by several former large hub airports (notably Pittsburgh International, St. Louis Lambert International, Cincinnati/Northern Kentucky International, Memphis International Airport, and most recently Cleveland Hopkins International), the airline network and hub system is nearly always reconfigured post-merger.

Like the passenger airline industry, several cargo carriers have experienced mergers, acquisitions, or have closed operations altogether. For example, FedEx acquired TNT Express in 2015,

BAX Global shut down its Toledo hub in 2011, DHL pulled out of its Wilmington, Ohio, hub in 2009, and Kitty Hawk Aircargo went out of business in 2008. Like closures and mergers in passenger airlines, these activities in the cargo industry can greatly impact on-airport employment. In contrast to these consolidations is the expansion of Amazon Air, the cargo airline started by Amazon. It began operations in April 2017 at Cincinnati/Northern Kentucky Airport, with plans to expand.

Other Economic Indicators: Unemployment Rate & Gross Domestic Product

Economic factors of the economy as a whole can also help to provide context for the specific economic impacts of commercial aviation. Two important metrics of the economy are the national unemployment rate and gross domestic product (GDP). The unemployment rate is a measure of the percentage of unemployed workers out of the total labor force, while GDP is the market value of all goods and services produced within a country over a given period of time. Table 2 lists these metrics over a 10-year period from 2007 through 2017 and also includes 2013, the base year of the previous study.

A high unemployment rate impacts aviation across the board: businesses cut back on travel and the flying public becomes less willing and/or able to fly due to tightening of budgets. In 2007, prior to the recession, unemployment sat at 4.6 percent. By 2013, with the worst of the recession over, unemployment had fallen from the 2010 high of 9.6 percent to 7.4 percent, still higher than pre-recession levels. However, in 2017, the unemployment rate was only 4.4 percent, lowest of the 10-year period and representing an average annual decline of 0.4 percent since 2007.

Similarly, U.S. GDP grew only moderately from 2007 through 2013 due to the recession but has grown much more rapidly in the years since. From 2013 through 2017, the national GDP grew at a CAGR of 3.8 percent. Overall, from 2007 through 2017, GDP grew at a CAGR of 3.0 percent.

The recession created concerns over the future economic outlook and, subsequently, spending cutbacks occurred across all sectors of the economy. This resulted in fewer purchases of services from the aviation industry, and as a result, industry businesses made corresponding workforce reductions. However, the recent surging economy, reflected in both low unemployment rate and growing GDP, has translated to increased activities in passenger travel and air cargo.

Table 2
Economic Environment 2007-2017

Metric	2007	2013	2017	2007-2013 CAGR	2013-2017 CAGR	2007-2017 CAGR
Unemployment Rate	4.6%	7.4%	4.4%	8.2%	-12.2%	-0.4%
Gross Domestic Product (billions)	14,478	16,692	19,391	2.4%	3.8%	3.0%

Note: Unemployment rate based on average of months in a calendar year.
Source: The Balance, Bureau of Labor Statistics.

Overall Impacts

This study found that the total economic output from U.S. commercial airports in 2017 is estimated at more than $1.4 trillion. Additionally, more than 11.4 million jobs with a total payroll exceeding $428 billion are supported by these 493 airports. The following sections detail these impacts.

Direct Impacts

The direct impacts of the 493 commercial airports are shown in Table 3, broken down into on-airport, capital improvements, and visitor categories.

Table 3
Direct Economic Impacts of Commercial Airports in the U.S.

Impact Category	Employment	Payroll	Output
On-Airport	1,247,000	$77,383,000,000	$276,768,000,000
Capital Improvements	68,000	$2,740,000,000	$16,155,000,000
Visitor	4,392,000	$101,008,000,000	$255,981,000,000
U.S. Total	**5,707,000**	**$181,131,000,000**	**$548,904,000,000**

Source: CDM Smith and IMPLAN. Prepared September 2018.

More than 1.2 million jobs are found at the nation's commercial airports. Visitor spending supports another nearly 4.4 million jobs, while construction work employed 68,000 workers in 2017 at these airports. Economic output from these airports approaches $277 billion annually. Visitors that use these airports spend nearly $256 billion annually, while construction projects add another $16 billion to the national economy.

Multiplier Impacts

Table 4 shows the multiplier impacts resulting from the 493 commercial airports, allocated by impact categories. Multiplier impacts result from the recirculation of direct impacts. For example, as airport employees spend their salary for housing, food, and services, those expenditures circulate through the local economy resulting in increased spending, payroll, and employment throughout the economy. Multiplier impacts re-circulate until they eventually leak beyond the geographic region being studied – in this case, the United States. As can be seen, the multiplier impacts generate billions of dollars of economic output and support millions of jobs.

Table 4
Multiplier Impacts of Commercial Airports in the U.S.

Category of Impact	Employment	Payroll	Output
On-Airport	2,722,000	$122,016,000,000	$437,661,000,000
Capital Improvements	174,000	$4,765,000,000	$28,131,000,000
Visitor	2,847,000	$120,444,000,000	$392,017,000,000
U.S. Total	**5,743,000**	**$247,225,000,000**	**$857,809,000,000**

Source: CDM Smith and IMPLAN. Prepared September 2018.

Total Impacts

Table 5 summarizes the total impacts from commercial airports, showing the combined effects of the direct and multiplier impacts.

Table 5
Total Impacts of Commercial Airports in the U.S.

Category of Impact	Employment	Payroll	Output
On-Airport	3,969,000	$199,399,000,000	$714,429,000,000
Capital Improvements	242,000	$7,505,000,000	$44,286,000,000
Visitor	7,239,000	$221,452,000,000	$647,998,000,000
U.S. Total	**11,450,000**	**$428,356,000,000**	**$1,406,713,000,000**

Source: CDM Smith and IMPLAN. Prepared September 2018.

Table 5 shows that the total output of $1.4 trillion was driven predominately by the on-airport and visitor categories. On-airport output was slightly larger, at $714 billion, than the visitor output of nearly $648 billion. Capital improvements added another $44 billion in output. Visitor spending contributed the largest number of jobs, with 7.2 million employees, while the on-airport category was responsible for nearly 4.0 million jobs.

The impacts of all commercial airports in each state are summed and shown by state in Table 6, in descending order of output. Not surprisingly, the states with the most economic output are those with a significant number of commercial airports, one or more of which are large hub airports.

Table 6
Total Economic Impacts of Commercial Airports in the U.S.

State	Number of Airports	Employment	Payroll	Output
FL	20	1,647,000	$53,312,000,000	$201,248,000,000
CA	26	1,458,000	$53,469,000,000	$171,183,000,000
TX	24	1,105,000	$41,776,000,000	$130,407,000,000
NY	20	877,000	$35,361,000,000	$109,657,000,000
GA	7	679,000	$26,528,000,000	$90,327,000,000
AZ	10	395,000	$17,112,000,000	$54,615,000,000
IL	12	417,000	$16,784,000,000	$53,095,000,000
NJ	4	317,000	$13,955,000,000	$41,067,000,000
VA	9	303,000	$12,918,000,000	$40,879,000,000
CO	13	346,000	$13,728,000,000	$40,782,000,000
NV	5	342,000	$12,612,000,000	$39,354,000,000
WA	13	269,000	$10,030,000,000	$37,186,000,000
PA	13	318,000	$13,143,000,000	$36,094,000,000
NC	11	276,000	$9,671,000,000	$32,153,000,000
MN	8	155,000	$6,507,000,000	$28,456,000,000
HI	9	237,000	$7,802,000,000	$24,599,000,000
OR	7	136,000	$4,347,000,000	$20,613,000,000
MI	19	179,000	$7,515,000,000	$19,866,000,000

State	Number of Airports	Employment	Payroll	Output
MO	8	165,000	$6,001,000,000	$19,151,000,000
TN	5	150,000	$4,803,000,000	$18,726,000,000
MD	3	157,000	$5,555,000,000	$17,323,000,000
UT	7	150,000	$5,427,000,000	$16,829,000,000
OH	8	127,000	$4,606,000,000	$16,496,000,000
MA	7	154,000	$5,170,000,000	$15,391,000,000
KY	5	104,000	$4,696,000,000	$13,281,000,000
SC	6	84,000	$4,465,000,000	$12,921,000,000
OK	3	89,000	$1,598,000,000	$12,309,000,000
AK	87	100,000	$3,445,000,000	$10,774,000,000
LA	7	83,000	$2,770,000,000	$10,281,000,000
WI	8	77,000	$2,877,000,000	$9,216,000,000
IN	4	79,000	$3,086,000,000	$8,652,000,000
KS	7	35,000	$1,987,000,000	$7,938,000,000
CT	2	69,000	$1,989,000,000	$6,210,000,000
NE	6	39,000	$1,193,000,000	$3,799,000,000
NM	6	31,000	$1,211,000,000	$3,597,000,000
AR	7	31,000	$1,249,000,000	$3,597,000,000
AL	5	31,000	$1,201,000,000	$3,416,000,000
MT	12	30,000	$1,111,000,000	$3,283,000,000
RI	3	35,000	$1,148,000,000	$3,252,000,000
ID	6	29,000	$1,036,000,000	$3,146,000,000
MS	6	19,000	$695,000,000	$2,527,000,000
WY	9	23,000	$825,000,000	$2,358,000,000
IA	6	20,000	$726,000,000	$2,176,000,000
ME	6	21,000	$703,000,000	$2,162,000,000
ND	8	18,000	$684,000,000	$2,130,000,000
NH	3	22,000	$728,000,000	$2,076,000,000
SD	4	8,000	$346,000,000	$951,000,000
VT	2	8,000	$264,000,000	$688,000,000
WV	7	6,000	$191,000,000	$476,000,000

Note: Delaware does not have any commercial airports
Source: CDM Smith and IMPLAN. Prepared September 2018.

The total output of commercial airports in the United States of $1.4 trillion is a significant component of the U.S. economy. When compared to the U.S. gross domestic product (GDP) of $19.4 trillion, impacts related to commercial airports contribute 7.2 percent of the total GDP. The 11.4 million workers that depend upon commercial airports and their related activity comprise 7.1 percent of the U.S. work force, which reached 161 million workers at the end of 2017.

Detailed Tables

This section details the economic impacts of commercial airports in each of the 50 U.S. states. Note that there are no impacts for the State of Delaware. The 2017-2021 NPIAS Report listed New Castle Airport (ILG) as a commercial airport in Delaware. However, the carrier providing scheduled airline service at New Castle, Frontier Airlines, ceased service there in 2015, so the airport was excluded from this study. These tables show the three measures of economic impacts (employment, payroll, and output) by type (direct, multiplier, and total), broken out into the categories of on-airport, capital improvements, and visitor impacts. A detailed explanation of the methodology used to estimate these impacts follows these tables.

Table 8
Direct Employment of Commercial Airports in the U.S.

State	On-Airport	CIP	Visitor	State Total
AK	16,000	1,160	27,000	44,000
AL	3,500	220	11,000	15,000
AR	4,800	600	8,000	13,000
AZ	58,400	2,410	122,000	183,000
CA	133,100	9,340	608,000	750,000
CO	38,400	1,740	132,000	172,000
CT	9,300	70	24,000	33,000
DE	0	0	0	0
FL	94,300	10,610	794,000	899,000
GA	72,400	2,560	266,000	341,000
HI	23,900	1,700	94,000	120,000
IA	3,800	220	4,000	8,000
ID	4,400	200	8,000	13,000
IL	62,600	4,920	122,000	190,000
IN	10,900	190	27,000	38,000
KS	8,300	460	5,000	14,000
KY	22,600	270	19,000	42,000
LA	5,300	2,450	35,000	43,000
MA	11,900	1,220	68,000	81,000
MD	13,900	690	67,000	82,000
ME	2,900	20	7,000	10,000
MI	23,500	700	62,000	86,000
MN	23,600	1,380	45,000	70,000
MO	17,500	370	65,000	83,000
MS	2,600	390	6,000	9,000
MT	4,600	130	9,000	14,000
NC	42,200	1,170	84,000	127,000
ND	2,600	460	5,000	8,000
NE	5,400	290	13,000	19,000
NH	2,600	250	8,000	11,000
NJ	39,400	680	115,000	155,000

State	On-Airport	CIP	Visitor	State Total
NM	4,000	190	11,000	15,000
NV	30,800	660	147,000	178,000
NY	109,800	4,110	311,000	425,000
OH	17,600	1,090	41,000	60,000
OK	18,300	490	18,000	37,000
OR	13,300	790	55,000	69,000
PA	44,300	1,610	104,000	150,000
RI	2,100	200	17,000	19,000
SC	11,300	430	28,000	40,000
SD	1,500	90	2,000	4,000
TN	20,300	1,090	49,000	70,000
TX	112,400	5,200	442,000	560,000
UT	13,100	1,330	63,000	77,000
VA	44,900	850	95,000	141,000
VT	800	50	3,000	4,000
WA	24,000	3,060	110,000	137,000
WI	11,700	120	24,000	36,000
WV	1,200	70	1,000	2,000
WY	1,300	170	11,000	12,000
Total	**1,247,000**	**68,000**	**4,392,000**	**5,707,000**

Note: Totals may not add up due to rounding.
Source: CDM Smith and IMPLAN. Prepared September 2018.

Table 9
Multiplier Employment of Commercial Airports in the U.S.

State	On-Airport	CIP	Visitor	State Total
AK	34,800	2,940	18,000	56,000
AL	7,500	570	8,000	16,000
AR	10,300	1,530	6,000	18,000
AZ	127,300	6,110	79,000	212,000
CA	290,400	23,650	394,000	708,000
CO	83,900	4,400	86,000	174,000
CT	20,400	170	15,000	36,000
DE	0	0	0	0
FL	205,800	26,870	515,000	748,000
GA	158,100	6,480	173,000	338,000
HI	52,200	4,290	61,000	117,000
IA	8,200	560	3,000	12,000
ID	9,700	490	6,000	16,000
IL	136,800	12,460	78,000	227,000
IN	23,900	470	17,000	41,000

State	On-Airport	CIP	Visitor	State Total
KS	18,200	1,180	2,000	21,000
KY	49,300	700	12,000	62,000
LA	11,700	6,210	22,000	40,000
MA	26,100	3,080	44,000	73,000
MD	30,300	1,750	43,000	75,000
ME	6,400	40	5,000	11,000
MI	51,200	1,790	40,000	93,000
MN	51,400	3,500	30,000	85,000
MO	38,100	920	43,000	82,000
MS	5,800	980	3,000	10,000
MT	10,100	340	6,000	16,000
NC	92,000	2,950	54,000	149,000
ND	5,700	1,160	3,000	10,000
NE	11,800	730	8,000	20,000
NH	5,700	620	5,000	11,000
NJ	86,000	1,720	74,000	162,000
NM	8,800	470	7,000	16,000
NV	67,100	1,670	95,000	164,000
NY	239,500	10,420	202,000	452,000
OH	38,300	2,750	26,000	67,000
OK	39,800	1,260	11,000	52,000
OR	28,900	2,000	36,000	67,000
PA	96,700	4,090	67,000	168,000
RI	4,500	510	11,000	16,000
SC	24,600	1,100	19,000	44,000
SD	3,200	240	1,000	4,000
TN	44,400	2,750	32,000	80,000
TX	245,300	13,150	287,000	545,000
UT	28,600	3,380	41,000	73,000
VA	98,000	2,170	62,000	162,000
VT	1,700	140	2,000	4,000
WA	52,500	7,740	72,000	132,000
WI	25,500	290	15,000	41,000
WV	2,700	190	1,000	4,000
WY	2,700	420	7,000	11,000
Total	**2,722,000**	**174,000**	**2,847,000**	**5,743,000**

Note: Totals may not add up due to rounding.
Source: CDM Smith and IMPLAN. Prepared September 2018.

Table 10
Total Employment of Commercial Airports in the U.S.

State	On-Airport	CIP	Visitor	State Total
AK	50,800	4,100	45,000	100,000
AL	11,000	790	19,000	31,000
AR	15,100	2,130	14,000	31,000
AZ	185,700	8,520	201,000	395,000
CA	423,500	32,990	1,002,000	1,458,000
CO	122,300	6,140	218,000	346,000
CT	29,700	240	39,000	69,000
DE	0	0	0	0
FL	300,100	37,480	1,309,000	1,647,000
GA	230,500	9,040	439,000	679,000
HI	76,100	5,990	155,000	237,000
IA	12,000	780	7,000	20,000
ID	14,100	690	14,000	29,000
IL	199,400	17,380	200,000	417,000
IN	34,800	660	44,000	79,000
KS	26,500	1,640	7,000	35,000
KY	71,900	970	31,000	104,000
LA	17,000	8,660	57,000	83,000
MA	38,000	4,300	112,000	154,000
MD	44,200	2,440	110,000	157,000
ME	9,300	60	12,000	21,000
MI	74,700	2,490	102,000	179,000
MN	75,000	4,880	75,000	155,000
MO	55,600	1,290	108,000	165,000
MS	8,400	1,370	9,000	19,000
MT	14,700	470	15,000	30,000
NC	134,200	4,120	138,000	276,000
ND	8,300	1,620	8,000	18,000
NE	17,200	1,020	21,000	39,000
NH	8,300	870	13,000	22,000
NJ	125,400	2,400	189,000	317,000
NM	12,800	660	18,000	31,000
NV	97,900	2,330	242,000	342,000
NY	349,300	14,530	513,000	877,000
OH	55,900	3,840	67,000	127,000
OK	58,100	1,750	29,000	89,000
OR	42,200	2,790	91,000	136,000
PA	141,000	5,700	171,000	318,000
RI	6,600	710	28,000	35,000
SC	35,900	1,530	47,000	84,000
SD	4,700	330	3,000	8,000

State	On-Airport	CIP	Visitor	State Total
TN	64,700	3,840	81,000	150,000
TX	357,700	18,350	729,000	1,105,000
UT	41,700	4,710	104,000	150,000
VA	142,900	3,020	157,000	303,000
VT	2,500	190	5,000	8,000
WA	76,500	10,800	182,000	269,000
WI	37,200	410	39,000	77,000
WV	3,900	260	2,000	6,000
WY	4,000	590	18,000	23,000
Total	**3,969,000**	**242,000**	**7,239,000**	**11,450,000**

Table 11
Direct Payroll of Commercial Airports in the U.S.

State	On-Airport	CIP	Visitor	State Total
AK	$752,000,000	$46,000,000	$630,000,000	$1,428,000,000
AL	$235,000,000	$9,000,000	$261,000,000	$505,000,000
AR	$294,000,000	$24,000,000	$194,000,000	$512,000,000
AZ	$4,149,000,000	$96,000,000	$2,808,000,000	$7,053,000,000
CA	$8,463,000,000	$374,000,000	$13,974,000,000	$22,811,000,000
CO	$2,665,000,000	$70,000,000	$3,043,000,000	$5,778,000,000
CT	$307,000,000	$3,000,000	$543,000,000	$853,000,000
DE	$0	$0	$0	$0
FL	$4,700,000,000	$424,000,000	$18,262,000,000	$23,386,000,000
GA	$4,975,000,000	$102,000,000	$6,125,000,000	$11,202,000,000
HI	$1,120,000,000	$68,000,000	$2,157,000,000	$3,345,000,000
IA	$195,000,000	$9,000,000	$92,000,000	$296,000,000
ID	$232,000,000	$8,000,000	$190,000,000	$430,000,000
IL	$3,926,000,000	$197,000,000	$2,796,000,000	$6,919,000,000
IN	$664,000,000	$7,000,000	$617,000,000	$1,288,000,000
KS	$663,000,000	$19,000,000	$104,000,000	$786,000,000
KY	$1,438,000,000	$11,000,000	$439,000,000	$1,888,000,000
LA	$292,000,000	$98,000,000	$797,000,000	$1,187,000,000
MA	$621,000,000	$49,000,000	$1,567,000,000	$2,237,000,000
MD	$821,000,000	$28,000,000	$1,534,000,000	$2,383,000,000
ME	$131,000,000	$1,000,000	$166,000,000	$298,000,000
MI	$1,680,000,000	$28,000,000	$1,418,000,000	$3,126,000,000
MN	$1,579,000,000	$55,000,000	$1,042,000,000	$2,676,000,000
MO	$1,037,000,000	$15,000,000	$1,500,000,000	$2,552,000,000
MS	$142,000,000	$15,000,000	$130,000,000	$287,000,000
MT	$249,000,000	$5,000,000	$208,000,000	$462,000,000
NC	$2,060,000,000	$47,000,000	$1,932,000,000	$4,039,000,000

State	On-Airport	CIP	Visitor	State Total
ND	$153,000,000	$18,000,000	$109,000,000	$280,000,000
NE	$197,000,000	$12,000,000	$298,000,000	$507,000,000
NH	$121,000,000	$10,000,000	$178,000,000	$309,000,000
NJ	$3,142,000,000	$27,000,000	$2,638,000,000	$5,807,000,000
NM	$253,000,000	$7,000,000	$246,000,000	$506,000,000
NV	$1,996,000,000	$26,000,000	$3,374,000,000	$5,396,000,000
NY	$7,455,000,000	$165,000,000	$7,161,000,000	$14,781,000,000
OH	$943,000,000	$43,000,000	$938,000,000	$1,924,000,000
OK	$251,000,000	$20,000,000	$409,000,000	$680,000,000
OR	$568,000,000	$32,000,000	$1,275,000,000	$1,875,000,000
PA	$3,002,000,000	$65,000,000	$2,386,000,000	$5,453,000,000
RI	$107,000,000	$8,000,000	$388,000,000	$503,000,000
SC	$1,158,000,000	$17,000,000	$654,000,000	$1,829,000,000
SD	$94,000,000	$4,000,000	$42,000,000	$140,000,000
TN	$851,000,000	$44,000,000	$1,136,000,000	$2,031,000,000
TX	$7,335,000,000	$208,000,000	$10,174,000,000	$17,717,000,000
UT	$811,000,000	$53,000,000	$1,455,000,000	$2,319,000,000
VA	$3,111,000,000	$34,000,000	$2,193,000,000	$5,338,000,000
VT	$41,000,000	$2,000,000	$70,000,000	$113,000,000
WA	$1,602,000,000	$122,000,000	$2,540,000,000	$4,264,000,000
WI	$648,000,000	$5,000,000	$545,000,000	$1,198,000,000
WV	$50,000,000	$3,000,000	$25,000,000	$78,000,000
WY	$104,000,000	$7,000,000	$245,000,000	$356,000,000
Total	**$77,383,000,000**	**$2,740,000,000**	**$101,008,000,000**	**$181,131,000,000**

Source: CDM Smith and IMPLAN. Prepared September 2018.

Table 12
Multiplier Payroll of Commercial Airports in the U.S.

State	On-Airport	CIP	Visitor	State Total
AK	$1,186,000,000	$81,000,000	$750,000,000	$2,017,000,000
AL	$370,000,000	$15,000,000	$311,000,000	$696,000,000
AR	$463,000,000	$42,000,000	$232,000,000	$737,000,000
AZ	$6,543,000,000	$168,000,000	$3,348,000,000	$10,059,000,000
CA	$13,346,000,000	$650,000,000	$16,662,000,000	$30,658,000,000
CO	$4,201,000,000	$121,000,000	$3,628,000,000	$7,950,000,000
CT	$484,000,000	$4,000,000	$648,000,000	$1,136,000,000
DE	$0	$0	$0	$0
FL	$7,411,000,000	$739,000,000	$21,776,000,000	$29,926,000,000
GA	$7,844,000,000	$179,000,000	$7,303,000,000	$15,326,000,000
HI	$1,767,000,000	$118,000,000	$2,572,000,000	$4,457,000,000

State	On-Airport	CIP	Visitor	State Total
IA	$306,000,000	$15,000,000	$109,000,000	$430,000,000
ID	$365,000,000	$13,000,000	$228,000,000	$606,000,000
IL	$6,190,000,000	$342,000,000	$3,333,000,000	$9,865,000,000
IN	$1,047,000,000	$14,000,000	$737,000,000	$1,798,000,000
KS	$1,045,000,000	$32,000,000	$124,000,000	$1,201,000,000
KY	$2,267,000,000	$19,000,000	$522,000,000	$2,808,000,000
LA	$462,000,000	$171,000,000	$950,000,000	$1,583,000,000
MA	$979,000,000	$85,000,000	$1,869,000,000	$2,933,000,000
MD	$1,295,000,000	$48,000,000	$1,829,000,000	$3,172,000,000
ME	$206,000,000	$1,000,000	$198,000,000	$405,000,000
MI	$2,649,000,000	$49,000,000	$1,691,000,000	$4,389,000,000
MN	$2,491,000,000	$97,000,000	$1,243,000,000	$3,831,000,000
MO	$1,634,000,000	$25,000,000	$1,790,000,000	$3,449,000,000
MS	$225,000,000	$27,000,000	$156,000,000	$408,000,000
MT	$392,000,000	$10,000,000	$247,000,000	$649,000,000
NC	$3,248,000,000	$81,000,000	$2,303,000,000	$5,632,000,000
ND	$241,000,000	$32,000,000	$131,000,000	$404,000,000
NE	$311,000,000	$20,000,000	$355,000,000	$686,000,000
NH	$190,000,000	$17,000,000	$212,000,000	$419,000,000
NJ	$4,955,000,000	$47,000,000	$3,146,000,000	$8,148,000,000
NM	$399,000,000	$13,000,000	$293,000,000	$705,000,000
NV	$3,147,000,000	$46,000,000	$4,023,000,000	$7,216,000,000
NY	$11,755,000,000	$286,000,000	$8,539,000,000	$20,580,000,000
OH	$1,488,000,000	$76,000,000	$1,118,000,000	$2,682,000,000
OK	$396,000,000	$34,000,000	$488,000,000	$918,000,000
OR	$896,000,000	$55,000,000	$1,521,000,000	$2,472,000,000
PA	$4,732,000,000	$112,000,000	$2,846,000,000	$7,690,000,000
RI	$168,000,000	$14,000,000	$463,000,000	$645,000,000
SC	$1,826,000,000	$30,000,000	$780,000,000	$2,636,000,000
SD	$149,000,000	$6,000,000	$51,000,000	$206,000,000
TN	$1,342,000,000	$75,000,000	$1,355,000,000	$2,772,000,000
TX	$11,566,000,000	$362,000,000	$12,131,000,000	$24,059,000,000
UT	$1,279,000,000	$93,000,000	$1,736,000,000	$3,108,000,000
VA	$4,906,000,000	$60,000,000	$2,614,000,000	$7,580,000,000
VT	$64,000,000	$4,000,000	$83,000,000	$151,000,000
WA	$2,525,000,000	$213,000,000	$3,028,000,000	$5,766,000,000
WI	$1,021,000,000	$8,000,000	$650,000,000	$1,679,000,000
WV	$79,000,000	$5,000,000	$29,000,000	$113,000,000
WY	$165,000,000	$11,000,000	$293,000,000	$469,000,000
Total	**$122,016,000,000**	**$4,765,000,000**	**$120,444,000,000**	**$247,225,000,000**

Source: CDM Smith and IMPLAN. Prepared September 2018.

Table 13
Total Payroll of Commercial Airports in the U.S.

State	On-Airport	CIP	Visitor	State Total
AK	$1,938,000,000	$127,000,000	$1,380,000,000	$3,445,000,000
AL	$605,000,000	$24,000,000	$572,000,000	$1,201,000,000
AR	$757,000,000	$66,000,000	$426,000,000	$1,249,000,000
AZ	$10,692,000,000	$264,000,000	$6,156,000,000	$17,112,000,000
CA	$21,809,000,000	$1,024,000,000	$30,636,000,000	$53,469,000,000
CO	$6,866,000,000	$191,000,000	$6,671,000,000	$13,728,000,000
CT	$791,000,000	$7,000,000	$1,191,000,000	$1,989,000,000
DE	$0	$0	$0	$0
FL	$12,111,000,000	$1,163,000,000	$40,038,000,000	$53,312,000,000
GA	$12,819,000,000	$281,000,000	$13,428,000,000	$26,528,000,000
HI	$2,887,000,000	$186,000,000	$4,729,000,000	$7,802,000,000
IA	$501,000,000	$24,000,000	$201,000,000	$726,000,000
ID	$597,000,000	$21,000,000	$418,000,000	$1,036,000,000
IL	$10,116,000,000	$539,000,000	$6,129,000,000	$16,784,000,000
IN	$1,711,000,000	$21,000,000	$1,354,000,000	$3,086,000,000
KS	$1,708,000,000	$51,000,000	$228,000,000	$1,987,000,000
KY	$3,705,000,000	$30,000,000	$961,000,000	$4,696,000,000
LA	$754,000,000	$269,000,000	$1,747,000,000	$2,770,000,000
MA	$1,600,000,000	$134,000,000	$3,436,000,000	$5,170,000,000
MD	$2,116,000,000	$76,000,000	$3,363,000,000	$5,555,000,000
ME	$337,000,000	$2,000,000	$364,000,000	$703,000,000
MI	$4,329,000,000	$77,000,000	$3,109,000,000	$7,515,000,000
MN	$4,070,000,000	$152,000,000	$2,285,000,000	$6,507,000,000
MO	$2,671,000,000	$40,000,000	$3,290,000,000	$6,001,000,000
MS	$367,000,000	$42,000,000	$286,000,000	$695,000,000
MT	$641,000,000	$15,000,000	$455,000,000	$1,111,000,000
NC	$5,308,000,000	$128,000,000	$4,235,000,000	$9,671,000,000
ND	$394,000,000	$50,000,000	$240,000,000	$684,000,000
NE	$508,000,000	$32,000,000	$653,000,000	$1,193,000,000
NH	$311,000,000	$27,000,000	$390,000,000	$728,000,000
NJ	$8,097,000,000	$74,000,000	$5,784,000,000	$13,955,000,000
NM	$652,000,000	$20,000,000	$539,000,000	$1,211,000,000
NV	$5,143,000,000	$72,000,000	$7,397,000,000	$12,612,000,000
NY	$19,210,000,000	$451,000,000	$15,700,000,000	$35,361,000,000
OH	$2,431,000,000	$119,000,000	$2,056,000,000	$4,606,000,000
OK	$647,000,000	$54,000,000	$897,000,000	$1,598,000,000
OR	$1,464,000,000	$87,000,000	$2,796,000,000	$4,347,000,000
PA	$7,734,000,000	$177,000,000	$5,232,000,000	$13,143,000,000
RI	$275,000,000	$22,000,000	$851,000,000	$1,148,000,000
SC	$2,984,000,000	$47,000,000	$1,434,000,000	$4,465,000,000
SD	$243,000,000	$10,000,000	$93,000,000	$346,000,000

State	On-Airport	CIP	Visitor	State Total
TN	$2,193,000,000	$119,000,000	$2,491,000,000	$4,803,000,000
TX	$18,901,000,000	$570,000,000	$22,305,000,000	$41,776,000,000
UT	$2,090,000,000	$146,000,000	$3,191,000,000	$5,427,000,000
VA	$8,017,000,000	$94,000,000	$4,807,000,000	$12,918,000,000
VT	$105,000,000	$6,000,000	$153,000,000	$264,000,000
WA	$4,127,000,000	$335,000,000	$5,568,000,000	$10,030,000,000
WI	$1,669,000,000	$13,000,000	$1,195,000,000	$2,877,000,000
WV	$129,000,000	$8,000,000	$54,000,000	$191,000,000
WY	$269,000,000	$18,000,000	$538,000,000	$825,000,000
Total	**$199,399,000,000**	**$7,505,000,000**	**$221,452,000,000**	**$428,356,000,000**

Source: CDM Smith and IMPLAN. Prepared September 2018.

Table 14
Direct Output of Commercial Airports in the U.S.

State	On-Airport	CIP	Visitor	State Total
AK	$2,318,000,000	$274,000,000	$1,595,000,000	$4,187,000,000
AL	$619,000,000	$53,000,000	$661,000,000	$1,333,000,000
AR	$760,000,000	$142,000,000	$492,000,000	$1,394,000,000
AZ	$13,576,000,000	$569,000,000	$7,115,000,000	$21,260,000,000
CA	$29,246,000,000	$2,204,000,000	$35,413,000,000	$66,863,000,000
CO	$7,801,000,000	$410,000,000	$7,712,000,000	$15,923,000,000
CT	$1,038,000,000	$16,000,000	$1,377,000,000	$2,431,000,000
DE	$0	$0	$0	$0
FL	$29,917,000,000	$2,504,000,000	$46,281,000,000	$78,702,000,000
GA	$19,129,000,000	$604,000,000	$15,522,000,000	$35,255,000,000
HI	$3,743,000,000	$400,000,000	$5,467,000,000	$9,610,000,000
IA	$559,000,000	$52,000,000	$233,000,000	$844,000,000
ID	$696,000,000	$46,000,000	$483,000,000	$1,225,000,000
IL	$12,388,000,000	$1,161,000,000	$7,085,000,000	$20,634,000,000
IN	$1,771,000,000	$44,000,000	$1,565,000,000	$3,380,000,000
KS	$2,701,000,000	$109,000,000	$263,000,000	$3,073,000,000
KY	$3,987,000,000	$65,000,000	$1,111,000,000	$5,163,000,000
LA	$1,389,000,000	$578,000,000	$2,019,000,000	$3,986,000,000
MA	$1,762,000,000	$287,000,000	$3,972,000,000	$6,021,000,000
MD	$2,727,000,000	$163,000,000	$3,887,000,000	$6,777,000,000
ME	$420,000,000	$4,000,000	$421,000,000	$845,000,000
MI	$3,995,000,000	$166,000,000	$3,594,000,000	$7,755,000,000
MN	$8,087,000,000	$326,000,000	$2,642,000,000	$11,055,000,000
MO	$3,598,000,000	$86,000,000	$3,803,000,000	$7,487,000,000
MS	$558,000,000	$91,000,000	$331,000,000	$980,000,000

State	On-Airport	CIP	Visitor	State Total
MT	$723,000,000	$31,000,000	$526,000,000	$1,280,000,000
NC	$7,363,000,000	$275,000,000	$4,895,000,000	$12,533,000,000
ND	$439,000,000	$108,000,000	$277,000,000	$824,000,000
NE	$659,000,000	$68,000,000	$755,000,000	$1,482,000,000
NH	$301,000,000	$58,000,000	$450,000,000	$809,000,000
NJ	$9,182,000,000	$160,000,000	$6,686,000,000	$16,028,000,000
NM	$736,000,000	$44,000,000	$623,000,000	$1,403,000,000
NV	$6,696,000,000	$156,000,000	$8,550,000,000	$15,402,000,000
NY	$23,653,000,000	$971,000,000	$18,148,000,000	$42,772,000,000
OH	$3,788,000,000	$256,000,000	$2,377,000,000	$6,421,000,000
OK	$3,628,000,000	$117,000,000	$1,037,000,000	$4,782,000,000
OR	$4,619,000,000	$186,000,000	$3,232,000,000	$8,037,000,000
PA	$7,647,000,000	$381,000,000	$6,048,000,000	$14,076,000,000
RI	$245,000,000	$48,000,000	$983,000,000	$1,276,000,000
SC	$3,272,000,000	$102,000,000	$1,657,000,000	$5,031,000,000
SD	$240,000,000	$22,000,000	$107,000,000	$369,000,000
TN	$4,158,000,000	$257,000,000	$2,879,000,000	$7,294,000,000
TX	$23,933,000,000	$1,226,000,000	$25,783,000,000	$50,942,000,000
UT	$2,568,000,000	$315,000,000	$3,688,000,000	$6,571,000,000
VA	$10,173,000,000	$201,000,000	$5,557,000,000	$15,931,000,000
VT	$79,000,000	$13,000,000	$177,000,000	$269,000,000
WA	$7,327,000,000	$722,000,000	$6,437,000,000	$14,486,000,000
WI	$2,187,000,000	$27,000,000	$1,381,000,000	$3,595,000,000
WV	$105,000,000	$18,000,000	$62,000,000	$185,000,000
WY	$262,000,000	$39,000,000	$622,000,000	$923,000,000
Total	**$276,768,000,000**	**$16,155,000,000**	**$255,981,000,000**	**$548,904,000,000**

Source: CDM Smith and IMPLAN. Prepared September 2018.

Table 15
Multiplier Output of Commercial Airports in the U.S.

State	On-Airport	CIP	Visitor	State Total
AK	$3,665,000,000	$478,000,000	$2,444,000,000	$6,587,000,000
AL	$979,000,000	$91,000,000	$1,013,000,000	$2,083,000,000
AR	$1,203,000,000	$247,000,000	$753,000,000	$2,203,000,000
AZ	$21,467,000,000	$991,000,000	$10,897,000,000	$33,355,000,000
CA	$46,249,000,000	$3,838,000,000	$54,233,000,000	$104,320,000,000
CO	$12,336,000,000	$714,000,000	$11,809,000,000	$24,859,000,000
CT	$1,643,000,000	$27,000,000	$2,109,000,000	$3,779,000,000
DE	$0	$0	$0	$0
FL	$47,310,000,000	$4,359,000,000	$70,877,000,000	$122,546,000,000

State	On-Airport	CIP	Visitor	State Total
GA	$30,249,000,000	$1,052,000,000	$23,771,000,000	$55,072,000,000
HI	$5,920,000,000	$697,000,000	$8,372,000,000	$14,989,000,000
IA	$885,000,000	$91,000,000	$356,000,000	$1,332,000,000
ID	$1,102,000,000	$80,000,000	$739,000,000	$1,921,000,000
IL	$19,590,000,000	$2,021,000,000	$10,850,000,000	$32,461,000,000
IN	$2,799,000,000	$77,000,000	$2,396,000,000	$5,272,000,000
KS	$4,270,000,000	$191,000,000	$404,000,000	$4,865,000,000
KY	$6,304,000,000	$112,000,000	$1,702,000,000	$8,118,000,000
LA	$2,196,000,000	$1,007,000,000	$3,092,000,000	$6,295,000,000
MA	$2,787,000,000	$501,000,000	$6,082,000,000	$9,370,000,000
MD	$4,311,000,000	$283,000,000	$5,952,000,000	$10,546,000,000
ME	$665,000,000	$8,000,000	$644,000,000	$1,317,000,000
MI	$6,317,000,000	$290,000,000	$5,504,000,000	$12,111,000,000
MN	$12,788,000,000	$568,000,000	$4,045,000,000	$17,401,000,000
MO	$5,690,000,000	$151,000,000	$5,823,000,000	$11,664,000,000
MS	$882,000,000	$159,000,000	$506,000,000	$1,547,000,000
MT	$1,142,000,000	$55,000,000	$806,000,000	$2,003,000,000
NC	$11,644,000,000	$479,000,000	$7,497,000,000	$19,620,000,000
ND	$694,000,000	$188,000,000	$424,000,000	$1,306,000,000
NE	$1,042,000,000	$119,000,000	$1,156,000,000	$2,317,000,000
NH	$475,000,000	$102,000,000	$690,000,000	$1,267,000,000
NJ	$14,520,000,000	$279,000,000	$10,240,000,000	$25,039,000,000
NM	$1,163,000,000	$76,000,000	$955,000,000	$2,194,000,000
NV	$10,588,000,000	$270,000,000	$13,094,000,000	$23,952,000,000
NY	$37,403,000,000	$1,690,000,000	$27,792,000,000	$66,885,000,000
OH	$5,989,000,000	$447,000,000	$3,639,000,000	$10,075,000,000
OK	$5,736,000,000	$203,000,000	$1,588,000,000	$7,527,000,000
OR	$7,304,000,000	$324,000,000	$4,948,000,000	$12,576,000,000
PA	$12,093,000,000	$663,000,000	$9,262,000,000	$22,018,000,000
RI	$388,000,000	$82,000,000	$1,506,000,000	$1,976,000,000
SC	$5,175,000,000	$177,000,000	$2,538,000,000	$7,890,000,000
SD	$380,000,000	$38,000,000	$164,000,000	$582,000,000
TN	$6,575,000,000	$447,000,000	$4,410,000,000	$11,432,000,000
TX	$37,845,000,000	$2,135,000,000	$39,485,000,000	$79,465,000,000
UT	$4,061,000,000	$548,000,000	$5,649,000,000	$10,258,000,000
VA	$16,087,000,000	$351,000,000	$8,510,000,000	$24,948,000,000
VT	$125,000,000	$22,000,000	$272,000,000	$419,000,000
WA	$11,587,000,000	$1,256,000,000	$9,857,000,000	$22,700,000,000
WI	$3,458,000,000	$48,000,000	$2,115,000,000	$5,621,000,000
WV	$166,000,000	$30,000,000	$95,000,000	$291,000,000
WY	$414,000,000	$69,000,000	$952,000,000	$1,435,000,000
Total	**$437,661,000,000**	**$28,131,000,000**	**$392,017,000,000**	**$857,809,000,000**

Source: CDM Smith and IMPLAN. Prepared September 2018.

Table 16
Total Output of Commercial Airports in the U.S.

State	On-Airport	CIP	Visitor	State Total
AK	$5,983,000,000	$752,000,000	$4,039,000,000	$10,774,000,000
AL	$1,598,000,000	$144,000,000	$1,674,000,000	$3,416,000,000
AR	$1,963,000,000	$389,000,000	$1,245,000,000	$3,597,000,000
AZ	$35,043,000,000	$1,560,000,000	$18,012,000,000	$54,615,000,000
CA	$75,495,000,000	$6,042,000,000	$89,646,000,000	$171,183,000,000
CO	$20,137,000,000	$1,124,000,000	$19,521,000,000	$40,782,000,000
CT	$2,681,000,000	$43,000,000	$3,486,000,000	$6,210,000,000
DE	$0	$0	$0	$0
FL	$77,227,000,000	$6,863,000,000	$117,158,000,000	$201,248,000,000
GA	$49,378,000,000	$1,656,000,000	$39,293,000,000	$90,327,000,000
HI	$9,663,000,000	$1,097,000,000	$13,839,000,000	$24,599,000,000
IA	$1,444,000,000	$143,000,000	$589,000,000	$2,176,000,000
ID	$1,798,000,000	$126,000,000	$1,222,000,000	$3,146,000,000
IL	$31,978,000,000	$3,182,000,000	$17,935,000,000	$53,095,000,000
IN	$4,570,000,000	$121,000,000	$3,961,000,000	$8,652,000,000
KS	$6,971,000,000	$300,000,000	$667,000,000	$7,938,000,000
KY	$10,291,000,000	$177,000,000	$2,813,000,000	$13,281,000,000
LA	$3,585,000,000	$1,585,000,000	$5,111,000,000	$10,281,000,000
MA	$4,549,000,000	$788,000,000	$10,054,000,000	$15,391,000,000
MD	$7,038,000,000	$446,000,000	$9,839,000,000	$17,323,000,000
ME	$1,085,000,000	$12,000,000	$1,065,000,000	$2,162,000,000
MI	$10,312,000,000	$456,000,000	$9,098,000,000	$19,866,000,000
MN	$20,875,000,000	$894,000,000	$6,687,000,000	$28,456,000,000
MO	$9,288,000,000	$237,000,000	$9,626,000,000	$19,151,000,000
MS	$1,440,000,000	$250,000,000	$837,000,000	$2,527,000,000
MT	$1,865,000,000	$86,000,000	$1,332,000,000	$3,283,000,000
NC	$19,007,000,000	$754,000,000	$12,392,000,000	$32,153,000,000
ND	$1,133,000,000	$296,000,000	$701,000,000	$2,130,000,000
NE	$1,701,000,000	$187,000,000	$1,911,000,000	$3,799,000,000
NH	$776,000,000	$160,000,000	$1,140,000,000	$2,076,000,000
NJ	$23,702,000,000	$439,000,000	$16,926,000,000	$41,067,000,000
NM	$1,899,000,000	$120,000,000	$1,578,000,000	$3,597,000,000
NV	$17,284,000,000	$426,000,000	$21,644,000,000	$39,354,000,000
NY	$61,056,000,000	$2,661,000,000	$45,940,000,000	$109,657,000,000
OH	$9,777,000,000	$703,000,000	$6,016,000,000	$16,496,000,000
OK	$9,364,000,000	$320,000,000	$2,625,000,000	$12,309,000,000
OR	$11,923,000,000	$510,000,000	$8,180,000,000	$20,613,000,000
PA	$19,740,000,000	$1,044,000,000	$15,310,000,000	$36,094,000,000
RI	$633,000,000	$130,000,000	$2,489,000,000	$3,252,000,000

State	On-Airport	CIP	Visitor	State Total
SC	$8,447,000,000	$279,000,000	$4,195,000,000	$12,921,000,000
SD	$620,000,000	$60,000,000	$271,000,000	$951,000,000
TN	$10,733,000,000	$704,000,000	$7,289,000,000	$18,726,000,000
TX	$61,778,000,000	$3,361,000,000	$65,268,000,000	$130,407,000,000
UT	$6,629,000,000	$863,000,000	$9,337,000,000	$16,829,000,000
VA	$26,260,000,000	$552,000,000	$14,067,000,000	$40,879,000,000
VT	$204,000,000	$35,000,000	$449,000,000	$688,000,000
WA	$18,914,000,000	$1,978,000,000	$16,294,000,000	$37,186,000,000
WI	$5,645,000,000	$75,000,000	$3,496,000,000	$9,216,000,000
WV	$271,000,000	$48,000,000	$157,000,000	$476,000,000
WY	$676,000,000	$108,000,000	$1,574,000,000	$2,358,000,000
Total	**$714,429,000,000**	**$44,286,000,000**	**$647,998,000,000**	**$1,406,713,000,000**

Source: CDM Smith and IMPLAN. Prepared September 2018.

Table 17
Total Economic Impacts of Commercial Airports in the U.S.

State	Employment	Payroll	Output
AK	100,000	$3,445,000,000	$10,774,000,000
AL	31,000	$1,201,000,000	$3,416,000,000
AR	31,000	$1,249,000,000	$3,597,000,000
AZ	395,000	$17,112,000,000	$54,615,000,000
CA	1,458,000	$53,469,000,000	$171,183,000,000
CO	346,000	$13,728,000,000	$40,782,000,000
CT	69,000	$1,989,000,000	$6,210,000,000
DE	0	$0	$0
FL	1,647,000	$53,312,000,000	$201,248,000,000
GA	679,000	$26,528,000,000	$90,327,000,000
HI	237,000	$7,802,000,000	$24,599,000,000
IA	20,000	$726,000,000	$2,176,000,000
ID	29,000	$1,036,000,000	$3,146,000,000
IL	417,000	$16,784,000,000	$53,095,000,000
IN	79,000	$3,086,000,000	$8,652,000,000
KS	35,000	$1,987,000,000	$7,938,000,000
KY	104,000	$4,696,000,000	$13,281,000,000
LA	83,000	$2,770,000,000	$10,281,000,000
MA	154,000	$5,170,000,000	$15,391,000,000
MD	157,000	$5,555,000,000	$17,323,000,000
ME	21,000	$703,000,000	$2,162,000,000
MI	179,000	$7,515,000,000	$19,866,000,000
MN	155,000	$6,507,000,000	$28,456,000,000

State	Employment	Payroll	Output
MO	165,000	$6,001,000,000	$19,151,000,000
MS	19,000	$695,000,000	$2,527,000,000
MT	30,000	$1,111,000,000	$3,283,000,000
NC	276,000	$9,671,000,000	$32,153,000,000
ND	18,000	$684,000,000	$2,130,000,000
NE	39,000	$1,193,000,000	$3,799,000,000
NH	22,000	$728,000,000	$2,076,000,000
NJ	317,000	$13,955,000,000	$41,067,000,000
NM	31,000	$1,211,000,000	$3,597,000,000
NV	342,000	$12,612,000,000	$39,354,000,000
NY	877,000	$35,361,000,000	$109,657,000,000
OH	127,000	$4,606,000,000	$16,496,000,000
OK	89,000	$1,598,000,000	$12,309,000,000
OR	136,000	$4,347,000,000	$20,613,000,000
PA	318,000	$13,143,000,000	$36,094,000,000
RI	35,000	$1,148,000,000	$3,252,000,000
SC	84,000	$4,465,000,000	$12,921,000,000
SD	8,000	$346,000,000	$951,000,000
TN	150,000	$4,803,000,000	$18,726,000,000
TX	1,105,000	$41,776,000,000	$130,407,000,000
UT	150,000	$5,427,000,000	$16,829,000,000
VA	303,000	$12,918,000,000	$40,879,000,000
VT	8,000	$264,000,000	$688,000,000
WA	269,000	$10,030,000,000	$37,186,000,000
WI	77,000	$2,877,000,000	$9,216,000,000
WV	6,000	$191,000,000	$476,000,000
WY	23,000	$825,000,000	$2,358,000,000
Total	**11,450,000**	**$428,356,000,000**	**$1,406,713,000,000**

Source: CDM Smith and IMPLAN. Prepared September 2018.

Comparison between 2013 and 2017 Studies

One of the goals of this study was to follow the methodology and assumptions used in the 2013 study so that the results of the two studies could be compared. Through careful analysis and quality control, this was accomplished. Table 18 compares the direct impacts between the 2013 and 2017 studies, and illustrates the growth in economic activity that has occurred at commercial airports over that timeframe.

Table 18
2013 to 2017 Comparison of Direct Impacts

Impact Measure	2013	2017	Percent Change
Employment	5,305,000	5,707,000	8%
Payroll	$167,578,000,000	$181,131,000,000	8%
Output	$496,812,000,000	$548,904,000,000	10%

Source: CDM Smith and IMPLAN. Prepared September 2018.

The tables show direct employment and payroll are up 8 percent over the 2013 study, while output has increased by 10 percent.

The growth from 2013 to 2017 stems from several factors. Not surprisingly, growth in passenger traffic and aircraft operations generally helped drive up impacts. Additionally, states that updated their economic impact studies often identified new or expanded economic activities.

For example, South Carolina's economic impact study for 2017 reflected the thousands of jobs and billions of dollars that Boeing's aircraft manufacturing facility brought to Charleston International Airport, which was not part of the data for the 2013 study. Likewise, Oklahoma, which didn't have a recent economic impact study for its airports in 2013, conducted a detailed analysis in 2017. That study identified significant amounts of aerospace parts manufacturing and aircraft maintenance work at Oklahoma's commercial airports, activity that was not specifically included in the 2013 study's regression analysis. As a result, Oklahoma's impacts increased significantly. This illustrates the value in having a recent airport economic impact study.

The growth in total impacts are presented Table 19. It can be seen that total employment increased 19 percent and total output grew by 24 percent. These growth rates are higher than the growth in direct impacts and is explained in the "IMPLAN Economic Model" section of this report.

Table 19
2013 to 2017 Comparison of Total Impacts

Impact Measure	2013	2017	Percent Change
Employment	9,596,000	11,450,000	19%
Payroll	$357,860,000,000	$428,356,000,000	20%
Output	$1,135,179,000,000	$1,406,713,000,000	24%

Source: CDM Smith and IMPLAN. Prepared September 2018

Table 20 compares the total output of commercial airports by state and shows the percentage change from 2013 to 2017.

Table 20
2013 to 2017 Comparison of Total Output by State

State	2013 Total Output	2017 Total Output	Percent Change
AK	$9,400,000,000	$10,774,000,000	15%
AL	$3,133,000,000	$3,416,000,000	9%
AR	$2,893,000,000	$3,597,000,000	24%
AZ	$43,378,000,000	$54,615,000,000	26%
CA	$131,159,000,000	$171,183,000,000	31%
CO	$33,748,000,000	$40,782,000,000	21%
CT	$5,263,000,000	$6,210,000,000	18%
DE	$0	$0	Not Applicable
FL	$143,476,000,000	$201,248,000,000	40%
GA	$76,325,000,000	$90,327,000,000	18%
HI	$21,632,000,000	$24,599,000,000	14%
IA	$1,783,000,000	$2,176,000,000	22%
ID	$2,677,000,000	$3,146,000,000	18%
IL	$45,105,000,000	$53,095,000,000	18%
IN	$7,070,000,000	$8,652,000,000	22%
KS	$8,909,000,000	$7,938,000,000	-11%
KY	$10,729,000,000	$13,281,000,000	24%
LA	$8,087,000,000	$10,281,000,000	27%
MA	$12,428,000,000	$15,391,000,000	24%
MD	$13,226,000,000	$17,323,000,000	31%
ME	$1,865,000,000	$2,162,000,000	16%
MI	$15,724,000,000	$19,866,000,000	26%
MN	$20,311,000,000	$28,456,000,000	40%
MO	$15,728,000,000	$19,151,000,000	22%
MS	$2,483,000,000	$2,527,000,000	2%
MT	$2,288,000,000	$3,283,000,000	43%
NC	$27,526,000,000	$32,153,000,000	17%
ND	$1,373,000,000	$2,130,000,000	55%
NE	$3,269,000,000	$3,799,000,000	16%
NH	$2,422,000,000	$2,076,000,000	-14%
NJ	$29,296,000,000	$41,067,000,000	40%
NM	$3,558,000,000	$3,597,000,000	1%
NV	$29,551,000,000	$39,354,000,000	33%
NY	$122,450,000,000	$109,657,000,000	-10%
OH	$13,342,000,000	$16,496,000,000	24%
OK	$4,390,000,000	$12,309,000,000	180%
OR	$16,504,000,000	$20,613,000,000	25%

State	2013 Total Output	2017 Total Output	Percent Change
PA	$28,582,000,000	$36,094,000,000	26%
RI	$2,573,000,000	$3,252,000,000	26%
SC	$4,495,000,000	$12,921,000,000	187%
SD	$806,000,000	$951,000,000	18%
TN	$14,604,000,000	$18,726,000,000	28%
TX	$106,744,000,000	$130,407,000,000	22%
UT	$13,249,000,000	$16,829,000,000	27%
VA	$34,418,000,000	$40,879,000,000	19%
VT	$840,000,000	$688,000,000	-18%
WA	$25,971,000,000	$37,186,000,000	43%
WI	$7,697,000,000	$9,216,000,000	20%
WV	$749,000,000	$476,000,000	-36%
WY	$1,950,000,000	$2,358,000,000	21%
Total	**$1,135,179,000,000**	**$1,406,713,000,000**	**24%**

Source: CDM Smith and IMPLAN. Prepared September 2018.

Study Approach and Methods Used

This study built upon the previous two efforts conducted by CDM Smith on the economic impacts of U.S. commercial airports. As with those previous studies, which analyzed economic impacts in 2010 and 2013, this study began by defining the group of commercial airports included in the analysis. Following the criteria in the previous studies, U.S. commercial airports were defined as those designated by the FAA as commercial service airports in the 2017-2021 National Plan of Integrated Airport Systems (NPIAS) . The NPIAS identifies airports with at least 2,500 annual passenger enplanements on scheduled airlines as commercial service airports. There are 512 commercial service airports listed in the current NPIAS (including three proposed commercial airports), of which 494 are in the United States. The other 15 are in American Samoa, Guam, the Northern Marianas, Puerto Rico, and the U.S. Virgin Islands and were not part of this analysis. Even though it was listed in the 2017-2021 NPIAS, Delaware's only commercial airport, New Castle Airport (ILG), was dropped from the analysis since scheduled airline service ceased in 2015.

This study gathered the available data on the 493 commercial airports from the 2013 study. This data was supplemented with economic impact studies performed by CDM Smith since the 2013 study, along with any additional third-party economic impact studies found through research. This study included new economic impact studies for 177 airports. Combined with the 211 airports that had prior studies, a total of 388 airports had data from an economic impact study. That left only 105 airports that needed to use an alternative methodology for assessing their economic impacts.

Extensive efforts were put into quality checking the data from each economic study to ensure accuracy and consistency of measurements. For example, direct military impacts were removed from existing studies when it was possible to do so. However, not all studies provided the same level of detail, so it is impossible to determine that all of the data has the same underlying assumptions and basis for every individual airport. These uncertainties, however, tend to be smoothed out when the individual airport results are aggregated at the state level. Accuracy and consistency of this data was also important because this data served as the basis for estimating the direct impacts of the 105 airports that did not have a recent economic impact study.

The following sections explain in more detail the framework, methodology, and assumptions used in the development of these estimates of economic impact.

Measures of Economic Impact

There are a number of ways to quantify the many economic contributions of commercial airports in the U.S. economy. This study uses the following three measures to evaluate the economic impacts of commercial airports.

Employment – This is a measure of the number of employees with jobs associated with activity at commercial airports, either directly or indirectly. It is expressed in full-time equivalents, where two part-time jobs are assumed to equal one full-time job.

Payroll – This accounts for the annual wages, salaries, and benefits associated with the jobs that are tied to commercial airports, measured in dollars.

Economic Output – This is the economic activity generated by the operation of commercial airports and all their related activity, measured in dollars. Economic output is defined as the annual revenues generated by a company, or, in the case of organizations that do not generate revenues (e.g., air traffic control), their annual operating expenses, plus annual average capital improvement project expenditures for that business or organization.

In general, economic impacts at commercial airports are generated by airport management, businesses and organizations engaged in airport activities at commercial airports, and by visitors traveling via commercial airlines to and from commercial airports that spend money off airport during their visit.

This study estimates the impacts stemming from the economic activities described above for each of the 493 commercial airports.

Types of Economic Impact

The economic activity generated by the groups discussed above results in three types of economic impacts that are estimated with the use of an economic input-output model. These three types of economic impact are common to most economic studies and are described below:

Direct Impacts – Direct impacts account for the initial point where commercial airport-related money first starts circulating in the economy. This includes activity such as the purchase of aviation goods and services on the airport, on-airport construction, and the off-airport spending by airline passengers visiting the region. On-airport impacts include the employment, payroll, and spending of businesses such as airlines, ground handling services, retail and food vendors, airport management, operations staff, government organizations, and other on-airport organizations that provide aviation services. Capital expenditures of these businesses and government organizations are also included in direct impacts. Visitors contribute to direct impacts through their off-airport spending (any on-airport spending by visitors is included in the on-airport impacts), that supports employment at restaurants, hotels, and other venues where they make purchases.

Multiplier Impacts – Multiplier impacts result from the re-circulation and re-spending of direct impacts within the economy. This re-spending of money can occur multiple times and takes two forms - indirect and induced. Indirect impacts occur when businesses spend their revenue on business expenses. Induced impacts occur when employees spend their earnings on goods and services. For example, as airport employees spend their salary for housing, food, and services, those expenditures circulate through the local economy resulting in increased spending, payroll, and employment throughout the economy. Multiplier impacts re-circulate until they eventually leak beyond the geographic region being studied – in this case, the United States.

Total Impacts – Total impacts are the sum of all direct and multiplier economic impacts attributable to an airport or the system of airports.

Categories of Economic Impact

The approach for this study involved obtaining direct impacts from either previous studies or by estimating them using regression analysis. These direct impacts were then entered into a linear economic model to estimate multiplier impacts. For each of the 493 airports, this study developed direct impacts for the following categories:

On-Airport Activity – This category includes airport tenants that are businesses with employees, such as airlines, rental car agencies, FBOs, flight schools, concessionaires, and

governmental agencies. Governmental agencies include public airport sponsors, air traffic controllers, other FAA units, as well as various other state and federal agencies. Direct impacts for employment, payroll and output were obtained from existing studies, or estimated as described in more detail later.

Capital Improvements – Each year airports undertake capital improvements projects (CIP), such as runway rehabilitation or terminal improvements. In addition, businesses and other agencies invest in CIP. These projects employ people in jobs such as construction, architecture, engineering, and consulting. For this analysis, direct CIP output was obtained from existing studies, or estimated through regression analysis. The direct employment and payroll associated with the CIP expenditures were derived from ratios developed in the economic model. All airports that did not have existing studies used the same ratios.

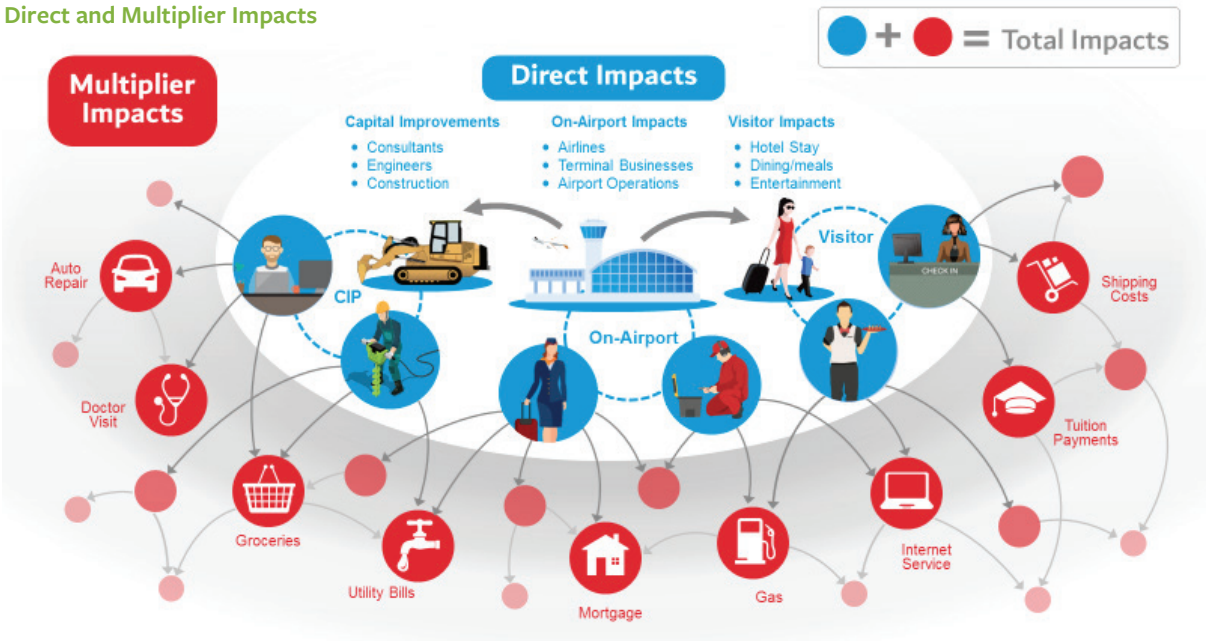
Commercial Service Visitors – This category includes the estimated impacts resulting from non-local passengers (visitors) arriving via commercial airlines. The direct output of this group was assumed equal to their spending on hotel, food and beverage, transportation (but not including airfare or rental car, which were captured in the on-airport impacts), retail and entertainment expenses during their visit to the region. This spending supports jobs primarily in the hospitality industry. For this analysis, direct visitor output was obtained from existing studies, or estimated through regression analysis. The direct employment and payroll associated with visitor expenditures were derived from ratios developed in the economic model. All airports that did not have existing studies used the same ratios.

Figure 2 presents a graphic depiction of what the economic impact model captures to better illustrate the concepts previously described. The direct impacts, shown in blue, occur predominately on the airport, except for the direct impacts from visitor spending, and some direct impacts from capital expenditures. The multiplier impacts, illustrated in red, take place off the airport.

As can be seen, there can be more than one round of multiplier interactions. The combination of direct and multiplier impacts yields the total impact.

For the majority of airports (nearly 80 percent), the direct impacts associated with the categories listed above were obtained from existing economic impact studies. However, some of the airports, especially ones without significant amounts of commercial airline service, did not have any economic studies from which to draw the direct impact data. For these airports, direct impacts were estimated using regression analysis, which is detailed in the following section.

Figure 2
Direct and Multiplier Impacts



Regression Analysis

Using the data found in more than 140 reports, summaries, and fact sheets, CDM Smith compiled a database of direct economic impacts for the majority of the U.S. commercial airports. In addition to these sources, CDM Smith drew upon the information found in the significant number of economic models developed for individual airports and statewide airport economic impact studies conducted since 2013.

From all these data sources, direct impact data were found for 388 out of the 493 commercial airports. This data was reviewed and any results that were not suitable because the underlying assumptions were incompatible with this study, or because it was determined that the impacts measured did not align with this study's measurements, were discarded. Payroll and output results from studies dated prior to 2017 were adjusted to 2017 dollars using standard Consumer Price Index inflation rates from the Bureau of Labor Statistics. This data served as the basis for a regression analysis estimate of direct impacts for the approximately 20 percent of airports that did not have an adequate economic impact study.

Regression analysis is a method of estimating a dependent variable from an independent variable when there is a high degree of correlation between the two. The degree of correlation is expressed with a correlation coefficient, where a coefficient of zero indicates no relationship between the variables and a coefficient of one indicates a perfect relationship between the two variables.

For this analysis, the missing direct economic data (dependent variables) were estimated using correlations that were found with data sets for each airport (independent variable). In an effort to ensure that results were comparable with the 2013 study, the same sets of dependent and independent variables were used. In certain cases, the source of the independent variable was changed to obtain a complete data set for the study airports and eliminate the need to use more than one independent variable. For example, the source for operations for the independent variable used to estimate on-airport employment was switched to data from the FAA's 5010 Form since this data source included every airport in this study, whereas the 2013 study used a source that did not include a number of the smaller commercial airports.

Table 21 shows each dependent variable, its corresponding independent variable, and the correlation coefficient between the two. As the table shows, with the exception of the independent variable for CIP expenditures, all of the correlation coefficients were 0.90 or higher, indicating a very high degree of correlation between the variable sets.

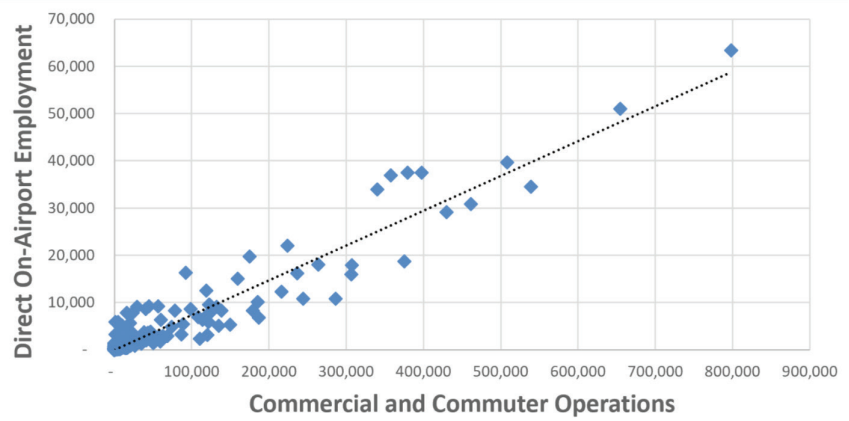
Table 21
Correlation Analysis

Dependent Variable	Independent Variable	Correlation Coefficient
On-Airport Employment	Commercial and Commuter Operations[1]	0.96
On-Airport Payroll	Enplanements[2]	0.93
On-Airport Output	Payroll	0.97
CIP Expenditures	Air Carrier Operations[3]	0.88
Visitor Expenditures	Enplanements[2]	0.95

[1] *From FAA 5010 Form data for 2017*
[2] *From FAA Air Carrier data for 2017*
[3] *From FAA Air Traffic Activity Data System for 2017*
Source: CDM Smith. Prepared September 2018.

After confirming that each independent variable had a suitably high correlation with each dependent variable, scatter plots were made for each dependent variable. An example of a scatter plot is shown in Figure 3, which demonstrates the correlation between direct on-airport employment and the number of commercial and commuter operations. A trend line is plotted showing the best fitting linear relationship between the two data sets.

Figure 3
Scatter Plot of Direct On-Airport Employment Against Commercial and Commuter Operations



Source: CDM Smith and FAA 5010 Form 2017 data. Prepared September 2018.

Each scatter plot was analyzed for outlier data, which was removed to strengthen the correlation. The equation for the best fitting linear relationship was determined and this equation was used to estimate values for dependent variables of airports missing this direct impact data.

Once direct impact data was available for all five dependent variables, the data was entered into an economic model to estimate multiplier impacts.

IMPLAN Economic Model

For this study, it was necessary to use an economic model to estimate the multiplier impacts. The economic studies that were reviewed for this study used multipliers that reflected the induced and indirect impacts within a local geographic region or within a state. This study measured the impacts of commercial airports within the nation as a whole, which is why the multiplier impacts from other studies could not be used. When measured at the national level, the multiplier impact is higher than state or local multipliers impacts, since the larger geographic area captures more recirculation of the initial economic input before it leaks beyond the country's borders.

The Impact Analysis for Planning (IMPLAN) input/output model was used to quantify multiplier impacts in this study. IMPLAN is a linear model that estimates purchases and sales between hundreds of sectors of the economy. The U.S. Forest Service, in cooperation with several other government agencies, initially developed the IMPLAN system to generate regional non-survey input-output models for regions as small as a single county. This modeling process is considered one of the leading methods currently available for estimating the total economic impact of an industry and has been used to estimate economic impacts for individual airports and systems of airports throughout the country.

The IMPLAN model and its underlying assumptions have been used by CDM Smith to estimate the economic impacts of numerous other airports in various state and individual airport economic impact studies. It is a well-accepted methodology of estimating economic impacts attributed to airports.

The IMPLAN model contains a large economic database used to generate input-output tables. It includes data from sources such as Dun and Bradstreet, the U.S. Department of Commerce, and the U.S. Census Bureau. IMPLAN multipliers and data tables specific to the aviation industry and its related business segments were obtained and used in this analysis just as they were in the previous study.

Multipliers change every year due to changes in overall economic conditions and the reactions that businesses and consumers have to those conditions. In general, multipliers change when the expenditure patterns of businesses change – affecting indirect impacts – or when the expenditure patterns of households change – affecting induced impacts.

Table 22 presents the overall multipliers resulting from the economic impact models used in 2013 and 2017. In other words, the ratio of total employment to direct employment in 2017 for all 493 airports is 2.01.

Table 22
Comparison of Overall Multipliers from 2013 to 2017

Multiplier Measure	2013	2017	Percent Change
Employment	1.81	2.01	11%
Payroll	2.14	2.37	11%
Output	2.28	2.56	12%

Source: IMPLAN and CDM Smith. Prepared September 2018.

The information in the table shows that multipliers increased slightly more than 10 percent across all measures. Higher multipliers are a contributing factor to the increase in multiplier impacts, albeit a modest one. Identifying the specific reasons for increases in airport-related multipliers is difficult. Possible explanations range from the overall improvement in the U.S. economy resulting in less leakage of economic benefits, to government actions that encourage "Buy American" policies, to less overseas outsourcing of aviation goods and services.

Summary

This study gathered, assessed, and analyzed more than 140 state and individual airport economic impact studies, summaries, and fact sheets to obtain direct economic impact data for 388 out of the 493 commercial airports analyzed. After screening this data, a detailed, highly correlated regression analysis was developed that estimated direct impact data for the other airports that were missing direct impacts. These direct impact results were used as input for an IMPLAN economic impact model that produced the multiplier impacts found within the United States.

The results of this study showed that the airport sector has continued its recovery from the recession of 2008. Enplanements and airline operations have increased since 2013, helping to grow direct jobs and payroll by 8 percent. Direct output attributed to commercial airports in 2017 increased by 10 percent over 2013 results. When the multiplier impacts attributed to commercial airports are included, the 493 U.S. commercial airports:

- Support 11.5 million jobs
- Create an annual payroll of $428 billion
- Produce an annual output of $1.4 trillion

To put these economic benefits in perspective, they comprise 7.1 percent of the U.S. work force and 7.2 percent of the U.S. GDP. This is clear proof that U.S. commercial airports make a strong contribution to the economy of the United States, in addition to providing key transportation links that allow people and goods to move rapidly and cost effectively around the country and world.

ACI NORTH AMERICA

AIRPORTS COUNCIL INTERNATIONAL