

# The Economic Impact of Commercial Airports in 2013

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## Executive Summary

U.S. commercial airports are valued components of this country's – and the world's – transportation network. They enable the efficient movement of people and goods across vast distances, strengthening ties between communities, regions, and countries and encouraging economic growth. These infrastructure assets are such an integral part of life that it is easy to overlook their immense value.

This economic impact study summarizes the economic benefits that the 485 commercial airports in the U.S. make to the national economy. This analysis uses methodology recognized by the Federal Aviation Administration (FAA) and other government agencies as a proven means of tabulating economic contributions in terms of employment, annual payroll, and annual output for the 2013 calendar year.

Using data from more than 90 state and individual airport economic impact studies, this analysis found that the 485 commercial airports in the U.S.:

- Support 9.6 million jobs
- Create an annual payroll of \$358 billion
- Produce an annual output of \$1.1 trillion

These are significant contributions to the national economy. Commercial airports are often economic engines that drive the local, state, and national economies. Airports are valuable assets that contribute to the growth of jobs and economic output across the country.

## Commercial Airports' Economic Impact

Commercial airports have a vast economic impact in the U.S. The airports in this analysis help to accommodate the travel needs of business and leisure visitors in the U.S. and beyond. They play an integral role in shipping time-critical and high-value cargo. The airports themselves are also significant generators of economic activity. Airports help to support employment, payroll, and output for the nation's economy. This section looks at the recent history of the aviation industry and discusses the combined economic impacts associated with employment, annual payroll, and total annual economic output for all 485 commercial airports in this study. The follow on section contains detailed tables showing the combined impacts of all commercial airports in each of the 50 U.S. states.

## Economic Environment for Commercial Airports 2010 – 2013

### *Airline Statistics*

To put into context any potential changes that may be observed in economic impacts between the 2010 and 2013 studies, it is important to look at the economic environment in each of these years.

**Table 1** below compiles several airline statistics between study years to indicate national industry trends. To provide a longer-term perspective on industry trends, 2003 metrics are included to illustrate trends over the past decade. Metrics from 2008 are included to indicate effects of the recession on the aviation industry.

Table 1  
Aviation Industry Trends 2003-2013

Metric	2003	2008	2003-2008 AAGR	2010	2008-2010 AAGR	2013	2010-2013 AAGR	2003-2013 AAGR
Enplanements (FAA - P+NP <sup>1</sup> )	650,808,785	735,296,677	2.5%	712,632,371	-0.1%	738,616,420	1.2%	1.3%
Revenue Passenger Miles <sup>2</sup> (millions)	657,323	812,377	4.3%	798,043	0.7%	840,423	1.7%	2.5%
Available Seat Miles <sup>3</sup> (millions)	894,602	1,021,330	2.7%	972,601	-0.2%	1,011,152	1.3%	1.2%
Passenger Load Factor <sup>4</sup>	73%	80%	1.6%	82%	0.9%	83%	0.4%	1.2%
Aircraft Operations (FAA ATADS <sup>5</sup> )	62,598,686	57,257,475	-1.8%	51,278,629	-2.7%	50,015,358	-0.8%	-2.2%
Cargo Tonnage (ACI -NA short tons)	31,251,674	30,221,803	-0.7%	29,596,841	-0.7%	29,203,615	-0.4%	-0.7%
Revenue Ton Miles <sup>6</sup> (millions)	26,736	28,119	1.0%	27,885	-1.2%	26,441	-1.8%	-0.1%
Operating Revenue <sup>7</sup> (millions)	\$117,768	\$186,087	9.6%	\$174,677	1.5%	\$200,245	4.7%	5.5%
Net Income <sup>8</sup> (millions)	-\$1,715	-\$23,750	-40.9%	\$3,666	13.2%	\$12,771	51.6%	22.2%
Profit Margin <sup>9</sup>	-1.50%	-12.80%	-34.9%	2.10%	14.9%	6.40%	45.0%	15.6%

Notes and Definitions of Terms/Acronyms:

<sup>1</sup>P+NP – Primary + Non-Primary Commercial Service Airports

<sup>2</sup>Revenue Passenger Miles (RPMs) – Number of miles flown multiplied by all paying passengers (measures passenger traffic)

<sup>3</sup>Available Seat Miles (ASMs) – Number of miles flown multiplied by all available seats, whether sold or not (measures capacity)

<sup>4</sup>Passenger Load Factor (PLF) – RPMs divided by ASMs (measures capacity utilization)

<sup>5</sup>ATADS – Air Traffic Activity Data System

<sup>6</sup>Revenue Ton Miles (RTMs) – Weight of all paid freight multiplied by number of miles flown

<sup>7</sup>Operating Revenue – Revenues received from total airline operations, most of which is passenger revenue

<sup>8</sup>Net Income – Income minus cost of goods sold, expenses, and taxes for an accounting period (AKA the “bottom line”)

<sup>9</sup>Profit Margin – The amount by which revenue from sales exceeds costs

Source: Airlines for America, FAA, ACI-NA

Enplanements grew at a slower AAGR over the past three years than over the last decade, which includes a period where enplanements declined at 0.1 percent AAGR from 2008 to 2010.

Enplanements have grown at an AAGR of 1.2 percent since the last study.



Revenue Passenger Miles (RPMs) and Available Seat Miles (ASMs) similarly saw strong growth from 2003 to 2008, then slow or negative growth from 2008 through 2010, and modest growth from 2010 to 2013. The improvement seen in Passenger Load Factor, which measures capacity utilization ( $PLF = RPMs / ASMs$ ), for each year from 2003 to 2013 is a result of airlines' efforts to reduce capacity in order to fly fuller aircraft, thereby increasing operating revenue. This, as well as other factors, is reflected in Operating Revenue. Other factors include cutting less profitable routes and increasing ancillary revenue such as baggage fees, premium seating, priority boarding, higher change/cancellation fees, pay-per-view entertainment, and à la carte food pricing. The significant loss in Net Income experienced from 2003 to 2008 is the product of high fuel costs and a drop in enplanements due to the recession. The rebound from 2010 to 2013 can be attributed to the recovering economy, as well as capacity reductions and ancillary revenue enhancements. Lastly, the significant drop in Profit Margin from 2003 to 2008 is a reflection of the emphasis that airlines placed on increasing market share and the resulting investment in additional capacity. These increased costs, coupled with higher fuel costs, had a negative impact on Profit Margin. Following the recession, airline focus shifted to cost cutting and the Profit Margins of airlines have recovered greatly since 2010.

The air cargo sector of commercial aviation has similarly struggled through most of the first decade of the 21<sup>st</sup> century. However, in recent years, air cargo airlines have not rebounded as well as passenger airlines. As exhibited by the overall decline in both Total Air Cargo Tonnage and Revenue Ton Miles (RTMs) over the last 10 years, it is evident that U.S. air cargo carriers have struggled to overcome their changing economic landscape. The rising cost of fuel has spurred a modal shift where cargo is increasingly transported via more economical means such as trucks and ships in lieu of faster delivery via aircraft. The industry is taking better advantage of passenger aircraft belly space to transport freight, which takes cargo away from dedicated freighter aircraft. In recent years, a number of air cargo carriers have either significantly reduced operations or folded altogether.<sup>1</sup> It is for these reasons, compounded with stagnant demand for air cargo services due to market maturity that air cargo airlines most likely would not contribute to any growth in economic impact seen between studies.

### **Airline Mergers**

Since 2008, four major U.S. airline mergers have occurred. Six legacy carriers<sup>2</sup> have merged into three (American, United, and Delta), and two low-cost carriers have consolidated into one (Southwest). These four airlines now control 80 percent of the U.S. market as measured by seat capacity in 2013<sup>3</sup>. Consideration of these four mergers are included in this section as they help provide a framework of market conditions and could account for changes in economic impacts since the last study.

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<sup>1</sup> For example, BAX Global shut down its Toledo hub in 2011, DHL pulled out of its Wilmington, Ohio hub in 2009, and Kitty Hawk Air cargo went out of business in 2008.

<sup>2</sup> Those airlines that had established interstate routes prior to the Airline Deregulation Act of 1978

<sup>3</sup> Diio schedules - all passenger flights on marketing carriers originating from the U.S. for year-end 2013 (one direction).

U.S. airlines made a profit in 2000, and then lost money in seven of the next nine years.<sup>4</sup> According to the Bureau of Transportation Statistics, U.S. airlines lost \$23.7 billion in 2008 and appeared likely to continue down that path. However U.S. carriers have made money each year since 2010, including \$98 million in 2012, and \$12.7 billion in 2013,<sup>5</sup> and are projected to score record profits in 2014. The airline mergers have increased both economies of scale and market share of the airlines to achieve gains in added revenue and savings in operating costs.

Where economic impacts can be seen as a result of the airline mergers is in workforce reductions where redundancies between the merged airlines now exist where they previously did not. 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, Lambert-St. Louis 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.

Another sector of the aviation industry that has been similarly hard-hit by the recession and fuel volatility is the air cargo industry. Similar to passenger airlines, air cargo carriers employ significant numbers of people at airports to handle and sort freight transitioning from aircraft-to-aircraft and aircraft-to-truck. Air cargo is carried on dedicated freighter aircraft as well as in the bellies of passenger aircraft. In the latter, air cargo companies typically have the airlines' ground handlers on/off load parcels. In the former, the air cargo companies have their own dedicated aircraft and ground handlers.

Due to a mature air cargo market and shifting economics, over the last decade the industry has experienced declines in both total tonnage and revenue ton miles (shown in Table 1), as more freight is transported on cheaper modes of transportation such as trucks and ships. Several air cargo operators have folded or reduced operations and several hubs have closed, all of which has had a negative impact on airport jobs.

#### **Other Economic Indicators: Unemployment Rate & Gross Domestic Product (GDP)**

Other important considerations when contextualizing the aviation industry's economic environment during the years in which the studies were conducted are the metrics of 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 both of these metrics for the two study years of 2010 and 2013, as well as 2003 and 2008 to illustrate 10-year trends.

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<sup>4</sup> <http://www.forbes.com/sites/tedreed/2013/02/25/airlines-not-yet-where-they-want-to-be-make-21-cents-per-passenger/>

<sup>5</sup> <http://www.latimes.com/business/la-fi-mo-airline-profits-skyrocket-20140505-story.html>

Table 2  
Economic Environment 2003-2013

Metric	2003	2008	2003-2008 AAGR	2010	2008-2010 AAGR	2013	2010-2013 AAGR	2003-2013 AAGR
Unemployment Rate	6.1%	5.8%	-0.5%	9.6%	5.2%	7.4%	-8.3%	2.0%
Gross Domestic Product (billions)	\$11,512	\$14,720	2.5%	\$14,958	0.2%	\$16,803	4.0%	3.9%

Source: BLS, BEA

As supported by Table 2, the recession caused a major increase in the unemployment rate, which reached a 10-year peak of 9.6 percent in 2010. Since then, the unemployment rate has declined to 7.4 percent in 2013, but it is still not down to the 6.1 percent level of 2003 (2007 was the 10-year low at 4.6 percent). A high unemployment rate impacts aviation across the board: businesses cut back on business travel, and the flying public becomes less likely to fly due to lack of work or simply tightening of their personal/family/leisure budgets. The recession created concerns over the 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 make corresponding workforce reductions.

Overall, U.S. Gross Domestic Product, or GDP, has grown by an AAGR of 3.9 percent from 2003 to 2013. As shown in Table 2, growth drastically slowed to an AAGR of 0.2 percent between 2008 and 2010 due to the recession. Not shown in Table 2 is the decline in GDP from 2007 to 2009, which contracted 0.4 percent. However, U.S. GDP has recovered to grow by a respectable 4.0 percent from 2010 to 2013.

## Overall Impacts

The total economic impact from commercial airports in the U.S. in 2013 is estimated at more than \$1.1 trillion in output. Those 485 airports supported 9.6 million jobs with a total payroll of \$358 billion. The following sections detail these impacts.

### Direct Impacts

**Table 3** shows the direct impacts of the 485 commercial airports, broken down into on-airport, capital improvement projects (CIP), and visitor categories.

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

Impact Measure	On-Airport	CIP	Visitor	U.S. Total
Employment	1,179,170	50,750	4,075,430	5,305,350
Payroll	\$72,266,526,000	\$1,943,378,000	\$93,367,844,000	\$167,577,748,000
Output	\$256,596,856,000	\$12,164,945,000	\$228,050,182,000	\$496,811,983,000

Source: CDM Smith and IMPLAN. Prepared July 2014.

Almost 1.2 million jobs are found at the nation's commercial airports. Visitor spending supports another 4 million jobs, while construction work employed more than 50,000 workers in 2013 at these

airports. Economic output from these airports exceeds \$256 billion annually. Visitors that use these airports spend more than \$228 billion annually, while construction projects add another \$12 billion to the national economy.

### Multiplier Impacts

**Table 4** shows the multiplier impacts of the 485 commercial airports, broken down into on-airport, CIP and visitor categories. Multiplier impacts result from the recirculation of money from direct impacts. 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.

Impact Measure	On-Airport	CIP	Visitor	U.S. Total
Employment	2,311,470	125,410	1,854,110	4,290,990
Payroll	\$104,752,799,000	\$3,171,109,000	\$82,358,626,000	\$190,282,534,000
Output	\$361,032,827,000	\$19,435,304,000	\$257,898,716,000	\$638,366,847,000

Source: CDM Smith and IMPLAN. Prepared July 2014.

### 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.

Impact Measure	On-Airport	CIP	Visitor	U.S. Total
Employment	3,490,640	176,160	5,929,540	9,596,340
Payroll	\$177,019,325,000	\$5,114,487,000	\$175,726,470,000	\$357,860,282,000
Output	\$617,629,683,000	\$31,600,249,000	\$485,948,898,000	\$1,135,178,830,000

Source: CDM Smith and IMPLAN. Prepared July 2014.

The total economic output of over \$1.1 trillion was split closely between on-airport output and visitor spending, each supporting approximately \$618 billion and \$486 billion in output, respectively. Construction activity contributed nearly \$32 billion to the output. Visitor spending resulted in nearly 6 million jobs, while on-airport activities accounted for nearly 3.5 million jobs.

The impacts of all 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.  
(in descending order of Output)

State	Number of Airports	Employment	Payroll	Output
FL	19	1,183,520	\$37,775,353,000	\$143,476,302,000
CA	29	1,220,530	\$42,557,945,000	\$131,159,185,000
NY	17	820,580	\$41,091,810,000	\$122,450,144,000
TX	26	968,060	\$36,133,874,000	\$106,743,865,000
GA	8	606,470	\$24,793,763,000	\$76,324,610,000
IL	10	373,720	\$14,692,174,000	\$45,104,782,000
AZ	11	324,010	\$14,137,437,000	\$43,377,927,000
VA	9	279,850	\$10,961,510,000	\$34,417,517,000
CO	14	310,990	\$11,782,587,000	\$33,747,926,000
NV	5	261,720	\$9,814,349,000	\$29,550,877,000
NJ	2	214,720	\$8,509,691,000	\$29,296,134,000
PA	13	298,060	\$10,081,527,000	\$28,582,032,000
NC	9	206,080	\$8,583,943,000	\$27,526,060,000
WA	12	209,900	\$8,202,102,000	\$25,970,681,000
HI	7	221,890	\$7,165,938,000	\$21,632,192,000
MN	7	122,900	\$5,005,265,000	\$20,311,421,000
OR	9	110,130	\$3,438,542,000	\$16,503,632,000
MO	7	140,970	\$5,070,687,000	\$15,728,233,000
MI	17	160,880	\$5,073,414,000	\$15,724,218,000
TN	6	123,230	\$3,774,443,000	\$14,603,857,000
OH	6	110,670	\$3,856,252,000	\$13,342,188,000
UT	5	123,760	\$4,396,506,000	\$13,249,424,000
MD	3	132,250	\$4,369,107,000	\$13,225,568,000
MA	6	135,140	\$4,400,550,000	\$12,428,493,000
KY	5	99,140	\$3,473,327,000	\$10,728,933,000
AK	91	89,040	\$2,977,513,000	\$9,400,304,000
KS	8	37,430	\$2,013,196,000	\$8,908,519,000
WI	8	69,800	\$2,378,800,000	\$7,697,124,000
LA	7	70,280	\$2,292,360,000	\$8,087,314,000
IN	4	67,430	\$2,584,260,000	\$7,069,891,000
CT	2	62,440	\$1,741,974,000	\$5,262,520,000
SC	6	51,990	\$1,622,691,000	\$4,494,709,000
OK	3	45,320	\$1,442,925,000	\$4,390,002,000
NM	5	31,060	\$1,125,079,000	\$3,558,479,000
AL	6	31,740	\$1,105,165,000	\$3,132,947,000
NE	6	33,670	\$1,067,803,000	\$3,268,887,000
AR	4	28,250	\$1,077,873,000	\$2,893,211,000

Table 6: Total Economic Impacts of Commercial Airports in the U.S.  
(in descending order of Output)

State	Number of Airports	Employment	Payroll	Output
ID	6	25,650	\$910,483,000	\$2,677,092,000
RI	3	30,520	\$971,444,000	\$2,572,810,000
MS	8	19,550	\$695,086,000	\$2,482,717,000
NH	2	28,480	\$836,958,000	\$2,422,279,000
MT	9	22,730	\$798,111,000	\$2,287,561,000
WY	10	19,610	\$617,635,000	\$1,949,781,000
ME	6	19,360	\$620,646,000	\$1,864,818,000
IA	8	15,240	\$540,276,000	\$1,783,170,000
ND	8	10,980	\$466,301,000	\$1,372,748,000
VT	2	9,710	\$277,602,000	\$840,345,000
SD	5	7,240	\$305,237,000	\$806,297,000
WV	6	9,650	\$248,768,000	\$749,104,000
DE	-	-	\$0	\$0
Total	485	9,596,340	\$357,860,282,000	\$1,135,178,830,000

Note: Delaware does not have any commercial airports<sup>6</sup>

Source: CDM Smith and IMPLAN. Prepared July 2014.

The total economic output tied to commercial airports in the U.S. of \$1.1 trillion is a significant amount. When compared to the U.S. gross domestic product (GDP) of \$16.8 trillion, impacts related to commercial airports contribute nearly 7 percent of the total GDP. The 9.6 million workers that depend upon commercial airports and their related activity comprise more than 6 percent of the U.S. work force, which stood at 156 million at the end of 2013.

## 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. At the time of its publication, the 2013-2017 National Plan of Integrated Airport Systems (NPIAS) Report listed no commercial airports in Delaware.<sup>7</sup> 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, CIP, and visitor impacts. A detailed explanation of the methodology used to estimate these impacts follows these tables.

<sup>6</sup> Despite accommodating commercial passenger service starting in 2013, New Castle Airport (ILG) in Wilmington, Delaware, is classified as a General Aviation Reliever by the 2013-2017 NPIAS Report and is thereby excluded from this report.



Table 7: Direct Employment of Commercial Airports in the U.S.

State	On-Airport	CIP	Visitor	State Total
AK	15,950	970	26,420	43,340
AL	4,800	260	11,440	16,500
AR	4,710	290	9,130	14,130
AZ	57,020	2,820	99,950	159,790
CA	125,010	8,100	565,210	698,320
CO	38,630	1,600	131,330	171,560
CT	9,420	130	23,450	33,000
DE	-	-	-	-
FL	90,270	4,050	620,110	714,430
GA	67,270	1,350	276,750	345,370
HI	32,710	500	84,770	117,980
IA	3,700	130	2,630	6,460
ID	4,440	170	8,200	12,810
IL	62,580	4,140	119,650	186,370
IN	10,930	430	23,100	34,460
KS	10,200	450	3,920	14,570
KY	21,520	970	22,040	44,530
LA	5,340	1,320	34,290	40,950
MA	11,850	670	67,180	79,700
MD	13,390	720	61,950	76,060
ME	2,930	80	7,150	10,160
MI	22,970	890	61,710	85,570
MN	23,300	440	36,000	59,740
MO	17,310	430	60,630	78,370
MS	3,020	380	6,380	9,780
MT	4,040	650	5,870	10,560
NC	29,930	1,330	77,560	108,820
ND	2,450	230	2,000	4,680
NE	5,370	170	11,810	17,350
NH	2,400	30	14,620	17,050
NJ	30,660	2,610	78,980	112,250
NM	3,590	150	13,690	17,430
NV	30,860	410	116,130	147,400
NY	107,670	1,630	341,020	450,320
OH	16,280	860	40,880	58,020
OK	6,740	210	16,940	23,890
OR	14,010	410	46,210	60,630
PA	40,240	2,010	118,190	160,440
RI	2,060	30	16,700	18,790

Table 7: Direct Employment of Commercial Airports  
in the U.S.

State	On-Airport	CIP	Visitor	State Total
SC	4,640	340	25,490	30,470
SD	1,500	30	1,860	3,390
TN	21,440	530	39,820	61,790
TX	115,960	5,120	417,200	538,280
UT	15,920	240	52,090	68,250
VA	29,320	1,320	129,530	160,170
VT	1,640	30	3,280	4,950
WA	19,150	680	103,680	123,510
WI	10,640	210	25,810	36,660
WV	2,100	110	2,100	4,310
WY	1,290	120	10,580	11,990
Total	1,179,170	50,750	4,075,430	5,305,350

Source: CDM Smith and IMPLAN. Prepared July 2014.



Table 8: Multiplier Employment of Commercial Airports in the U.S.

State	On-Airport	CIP	Visitor	State Total
AK	31,270	2,410	12,020	45,700
AL	9,400	640	5,200	15,240
AR	9,240	730	4,150	14,120
AZ	111,790	6,960	45,470	164,220
CA	245,060	20,000	257,150	522,210
CO	75,720	3,960	59,750	139,430
CT	18,460	320	10,660	29,440
DE	-	-	-	-
FL	176,950	10,020	282,120	469,090
GA	131,870	3,320	125,910	261,100
HI	64,110	1,240	38,560	103,910
IA	7,250	340	1,190	8,780
ID	8,690	420	3,730	12,840
IL	122,690	10,220	54,440	187,350
IN	21,410	1,050	10,510	32,970
KS	19,990	1,090	1,780	22,860
KY	42,180	2,410	10,020	54,610
LA	10,470	3,260	15,600	29,330
MA	23,220	1,660	30,560	55,440
MD	26,250	1,760	28,180	56,190
ME	5,750	200	3,250	9,200
MI	45,020	2,210	28,080	75,310
MN	45,680	1,100	16,380	63,160
MO	33,930	1,080	27,590	62,600
MS	5,910	950	2,910	9,770
MT	7,910	1,590	2,670	12,170
NC	58,680	3,290	35,290	97,260
ND	4,810	570	920	6,300
NE	10,520	420	5,380	16,320
NH	4,700	80	6,650	11,430
NJ	60,090	6,450	35,930	102,470
NM	7,030	370	6,230	13,630
NV	60,480	1,010	52,830	114,320
NY	211,080	4,040	155,140	370,260
OH	31,920	2,130	18,600	52,650
OK	13,210	510	7,710	21,430
OR	27,460	1,010	21,030	49,500
PA	78,890	4,960	53,770	137,620
RI	4,050	80	7,600	11,730

Table 8: Multiplier Employment of Commercial Airports in the U.S.

State	On-Airport	CIP	Visitor	State Total
SC	9,090	840	11,590	21,520
SD	2,930	80	840	3,850
TN	42,030	1,300	18,110	61,440
TX	227,330	12,640	189,810	429,780
UT	31,220	590	23,700	55,510
VA	57,490	3,260	58,930	119,680
VT	3,210	60	1,490	4,760
WA	37,550	1,670	47,170	86,390
WI	20,860	530	11,750	33,140
WV	4,110	280	950	5,340
WY	2,510	300	4,810	7,620
Total	2,311,470	125,410	1,854,110	4,290,990

Source: CDM Smith and IMPLAN. Prepared July 2014.

Table 9: Total Employment of Commercial Airports in the U.S.

State	On-Airport	CIP	Visitor	State Total
AK	47,220	3,380	38,440	89,040
AL	14,200	900	16,640	31,740
AR	13,950	1,020	13,280	28,250
AZ	168,810	9,780	145,420	324,010
CA	370,070	28,100	822,360	1,220,530
CO	114,350	5,560	191,080	310,990
CT	27,880	450	34,110	62,440
DE	-	-	-	-
FL	267,220	14,070	902,230	1,183,520
GA	199,140	4,670	402,660	606,470
HI	96,820	1,740	123,330	221,890
IA	10,950	470	3,820	15,240
ID	13,130	590	11,930	25,650
IL	185,270	14,360	174,090	373,720
IN	32,340	1,480	33,610	67,430
KS	30,190	1,540	5,700	37,430
KY	63,700	3,380	32,060	99,140
LA	15,810	4,580	49,890	70,280
MA	35,070	2,330	97,740	135,140
MD	39,640	2,480	90,130	132,250
ME	8,680	280	10,400	19,360
MI	67,990	3,100	89,790	160,880
MN	68,980	1,540	52,380	122,900
MO	51,240	1,510	88,220	140,970
MS	8,930	1,330	9,290	19,550
MT	11,950	2,240	8,540	22,730
NC	88,610	4,620	112,850	206,080
ND	7,260	800	2,920	10,980
NE	15,890	590	17,190	33,670
NH	7,100	110	21,270	28,480
NJ	90,750	9,060	114,910	214,720
NM	10,620	520	19,920	31,060
NV	91,340	1,420	168,960	261,720
NY	318,750	5,670	496,160	820,580
OH	48,200	2,990	59,480	110,670
OK	19,950	720	24,650	45,320
OR	41,470	1,420	67,240	110,130
PA	119,130	6,970	171,960	298,060
RI	6,110	110	24,300	30,520
SC	13,730	1,180	37,080	51,990

Table 9: Total Employment of Commercial Airports in the U.S.

State	On-Airport	CIP	Visitor	State Total
SD	4,430	110	2,700	7,240
TN	63,470	1,830	57,930	123,230
TX	343,290	17,760	607,010	968,060
UT	47,140	830	75,790	123,760
VA	86,810	4,580	188,460	279,850
VT	4,850	90	4,770	9,710
WA	56,700	2,350	150,850	209,900
WI	31,500	740	37,560	69,800
WV	6,210	390	3,050	9,650
WY	3,800	420	15,390	19,610
Total	3,490,640	176,160	5,929,540	9,596,340

Source: CDM Smith and IMPLAN. Prepared July 2014.

Table 10: Direct Payroll of Commercial Airports in the U.S.

State	On-Airport	CIP	Visitor	State Total
AK	\$710,498,000	\$37,227,000	\$605,259,000	\$1,352,984,000
AL	\$239,188,000	\$9,873,000	\$262,094,000	\$511,155,000
AR	\$267,285,000	\$11,280,000	\$209,057,000	\$487,622,000
AZ	\$3,896,218,000	\$107,905,000	\$2,289,765,000	\$6,293,888,000
CA	\$7,091,576,000	\$309,946,000	\$12,949,018,000	\$20,350,540,000
CO	\$2,432,532,000	\$61,316,000	\$3,008,706,000	\$5,502,554,000
CT	\$293,034,000	\$5,001,000	\$537,177,000	\$835,212,000
DE	\$0	\$0	\$0	\$0
FL	\$4,339,109,000	\$155,142,000	\$14,206,703,000	\$18,700,954,000
GA	\$5,194,926,000	\$51,535,000	\$6,340,292,000	\$11,586,753,000
HI	\$1,412,638,000	\$19,235,000	\$1,941,998,000	\$3,373,871,000
IA	\$168,822,000	\$5,148,000	\$60,142,000	\$234,112,000
ID	\$220,354,000	\$6,551,000	\$187,811,000	\$414,716,000
IL	\$3,721,549,000	\$158,376,000	\$2,741,268,000	\$6,621,193,000
IN	\$630,867,000	\$16,322,000	\$529,186,000	\$1,176,375,000
KS	\$734,554,000	\$17,037,000	\$89,817,000	\$841,408,000
KY	\$989,981,000	\$37,271,000	\$504,890,000	\$1,532,142,000
LA	\$277,935,000	\$50,564,000	\$785,552,000	\$1,114,051,000
MA	\$586,297,000	\$25,718,000	\$1,539,096,000	\$2,151,111,000
MD	\$663,782,000	\$27,385,000	\$1,419,210,000	\$2,110,377,000
ME	\$124,176,000	\$3,134,000	\$163,768,000	\$291,078,000
MI	\$948,119,000	\$34,239,000	\$1,413,779,000	\$2,396,137,000
MN	\$1,391,383,000	\$16,999,000	\$824,769,000	\$2,233,151,000
MO	\$984,902,000	\$16,637,000	\$1,389,070,000	\$2,390,609,000
MS	\$155,630,000	\$14,670,000	\$146,251,000	\$316,551,000
MT	\$195,952,000	\$24,750,000	\$134,417,000	\$355,119,000
NC	\$2,084,247,000	\$51,009,000	\$1,776,892,000	\$3,912,148,000
ND	\$145,637,000	\$8,799,000	\$45,907,000	\$200,343,000
NE	\$220,997,000	\$6,501,000	\$270,633,000	\$498,131,000
NH	\$83,005,000	\$1,230,000	\$334,945,000	\$419,180,000
NJ	\$1,976,347,000	\$99,956,000	\$1,809,428,000	\$3,885,731,000
NM	\$212,092,000	\$5,734,000	\$313,726,000	\$531,552,000
NV	\$1,945,581,000	\$15,653,000	\$2,660,550,000	\$4,621,784,000
NY	\$10,705,318,000	\$62,545,000	\$7,812,689,000	\$18,580,552,000
OH	\$819,210,000	\$33,013,000	\$936,560,000	\$1,788,783,000
OK	\$282,262,000	\$7,939,000	\$388,197,000	\$678,398,000
OR	\$573,470,000	\$15,644,000	\$1,058,737,000	\$1,647,851,000
PA	\$1,952,653,000	\$76,891,000	\$2,707,674,000	\$4,737,218,000
RI	\$101,248,000	\$1,250,000	\$382,631,000	\$485,129,000
SC	\$199,832,000	\$12,995,000	\$583,924,000	\$796,751,000

Table 10: Direct Payroll of Commercial Airports in the U.S.

State	On-Airport	CIP	Visitor	State Total
SD	\$90,566,000	\$1,237,000	\$42,579,000	\$134,382,000
TN	\$818,283,000	\$20,223,000	\$912,183,000	\$1,750,689,000
TX	\$7,196,930,000	\$195,856,000	\$9,558,165,000	\$16,950,951,000
UT	\$868,076,000	\$9,104,000	\$1,193,443,000	\$2,070,623,000
VA	\$2,140,590,000	\$50,509,000	\$2,967,520,000	\$5,158,619,000
VT	\$54,521,000	\$1,009,000	\$75,128,000	\$130,658,000
WA	\$1,495,438,000	\$25,969,000	\$2,375,357,000	\$3,896,764,000
WI	\$507,995,000	\$8,130,000	\$591,392,000	\$1,107,517,000
WV	\$59,941,000	\$4,336,000	\$48,100,000	\$112,377,000
WY	\$60,980,000	\$4,585,000	\$242,389,000	\$307,954,000
Total	\$72,266,526,000	\$1,943,378,000	\$93,367,844,000	\$167,577,748,000

Source: CDM Smith and IMPLAN. Prepared July 2014.

Table 11: Multiplier Payroll of Commercial Airports in the U.S.

State	On-Airport	CIP	Visitor	State Total
AK	\$1,029,891,000	\$60,746,000	\$533,892,000	\$1,624,529,000
AL	\$346,711,000	\$16,109,000	\$231,190,000	\$594,010,000
AR	\$387,439,000	\$18,405,000	\$184,407,000	\$590,251,000
AZ	\$5,647,701,000	\$176,074,000	\$2,019,774,000	\$7,843,549,000
CA	\$10,279,482,000	\$505,755,000	\$11,422,168,000	\$22,207,405,000
CO	\$3,526,038,000	\$100,052,000	\$2,653,943,000	\$6,280,033,000
CT	\$424,763,000	\$8,161,000	\$473,838,000	\$906,762,000
DE	\$0	\$0	\$0	\$0
FL	\$6,289,687,000	\$253,155,000	\$12,531,557,000	\$19,074,399,000
GA	\$7,530,223,000	\$84,093,000	\$5,592,694,000	\$13,207,010,000
HI	\$2,047,667,000	\$31,387,000	\$1,713,013,000	\$3,792,067,000
IA	\$244,713,000	\$8,401,000	\$53,050,000	\$306,164,000
ID	\$319,411,000	\$10,690,000	\$165,666,000	\$495,767,000
IL	\$5,394,512,000	\$258,430,000	\$2,418,039,000	\$8,070,981,000
IN	\$914,463,000	\$26,633,000	\$466,789,000	\$1,407,885,000
KS	\$1,064,761,000	\$27,800,000	\$79,227,000	\$1,171,788,000
KY	\$1,435,011,000	\$60,816,000	\$445,358,000	\$1,941,185,000
LA	\$402,876,000	\$82,507,000	\$692,926,000	\$1,178,309,000
MA	\$849,858,000	\$41,964,000	\$1,357,617,000	\$2,249,439,000
MD	\$962,175,000	\$44,687,000	\$1,251,868,000	\$2,258,730,000
ME	\$179,997,000	\$5,114,000	\$144,457,000	\$329,568,000
MI	\$1,374,331,000	\$55,869,000	\$1,247,077,000	\$2,677,277,000
MN	\$2,016,857,000	\$27,738,000	\$727,519,000	\$2,772,114,000
MO	\$1,427,649,000	\$27,147,000	\$1,225,282,000	\$2,680,078,000
MS	\$225,591,000	\$23,938,000	\$129,006,000	\$378,535,000
MT	\$284,039,000	\$40,385,000	\$118,568,000	\$442,992,000
NC	\$3,021,187,000	\$83,234,000	\$1,567,374,000	\$4,671,795,000
ND	\$211,106,000	\$14,358,000	\$40,494,000	\$265,958,000
NE	\$320,343,000	\$10,608,000	\$238,721,000	\$569,672,000
NH	\$120,319,000	\$2,008,000	\$295,451,000	\$417,778,000
NJ	\$2,864,783,000	\$163,103,000	\$1,596,074,000	\$4,623,960,000
NM	\$307,435,000	\$9,358,000	\$276,734,000	\$593,527,000
NV	\$2,820,186,000	\$25,541,000	\$2,346,838,000	\$5,192,565,000
NY	\$15,517,724,000	\$102,057,000	\$6,891,477,000	\$22,511,258,000
OH	\$1,187,473,000	\$53,868,000	\$826,128,000	\$2,067,469,000
OK	\$409,148,000	\$12,955,000	\$342,424,000	\$764,527,000
OR	\$831,264,000	\$25,528,000	\$933,899,000	\$1,790,691,000
PA	\$2,830,437,000	\$125,466,000	\$2,388,406,000	\$5,344,309,000
RI	\$146,762,000	\$2,040,000	\$337,513,000	\$486,315,000
SC	\$289,663,000	\$21,205,000	\$515,072,000	\$825,940,000

Table 11: Multiplier Payroll of Commercial Airports in the U.S.

State	On-Airport	CIP	Visitor	State Total
SD	\$131,279,000	\$2,018,000	\$37,558,000	\$170,855,000
TN	\$1,186,129,000	\$32,999,000	\$804,626,000	\$2,023,754,000
TX	\$10,432,196,000	\$319,589,000	\$8,431,138,000	\$19,182,923,000
UT	\$1,258,306,000	\$14,855,000	\$1,052,722,000	\$2,325,883,000
VA	\$3,102,858,000	\$82,419,000	\$2,617,614,000	\$5,802,891,000
VT	\$79,030,000	\$1,645,000	\$66,269,000	\$146,944,000
WA	\$2,167,689,000	\$42,376,000	\$2,095,273,000	\$4,305,338,000
WI	\$736,356,000	\$13,267,000	\$521,660,000	\$1,271,283,000
WV	\$86,887,000	\$7,075,000	\$42,429,000	\$136,391,000
WY	\$88,393,000	\$7,481,000	\$213,807,000	\$309,681,000
Total	\$104,752,799,000	\$3,171,109,000	\$82,358,626,000	\$190,282,534,000

Source: CDM Smith and IMPLAN. Prepared July 2014.



Table 12: Total Payroll of Commercial Airports in the U.S.

State	On-Airport	CIP	Visitor	State Total
AK	\$1,740,389,000	\$97,973,000	\$1,139,151,000	\$2,977,513,000
AL	\$585,899,000	\$25,982,000	\$493,284,000	\$1,105,165,000
AR	\$654,724,000	\$29,685,000	\$393,464,000	\$1,077,873,000
AZ	\$9,543,919,000	\$283,979,000	\$4,309,539,000	\$14,137,437,000
CA	\$17,371,058,000	\$815,701,000	\$24,371,186,000	\$42,557,945,000
CO	\$5,958,570,000	\$161,368,000	\$5,662,649,000	\$11,782,587,000
CT	\$717,797,000	\$13,162,000	\$1,011,015,000	\$1,741,974,000
DE	\$0	\$0	\$0	\$0
FL	\$10,628,796,000	\$408,297,000	\$26,738,260,000	\$37,775,353,000
GA	\$12,725,149,000	\$135,628,000	\$11,932,986,000	\$24,793,763,000
HI	\$3,460,305,000	\$50,622,000	\$3,655,011,000	\$7,165,938,000
IA	\$413,535,000	\$13,549,000	\$113,192,000	\$540,276,000
ID	\$539,765,000	\$17,241,000	\$353,477,000	\$910,483,000
IL	\$9,116,061,000	\$416,806,000	\$5,159,307,000	\$14,692,174,000
IN	\$1,545,330,000	\$42,955,000	\$995,975,000	\$2,584,260,000
KS	\$1,799,315,000	\$44,837,000	\$169,044,000	\$2,013,196,000
KY	\$2,424,992,000	\$98,087,000	\$950,248,000	\$3,473,327,000
LA	\$680,811,000	\$133,071,000	\$1,478,478,000	\$2,292,360,000
MA	\$1,436,155,000	\$67,682,000	\$2,896,713,000	\$4,400,550,000
MD	\$1,625,957,000	\$72,072,000	\$2,671,078,000	\$4,369,107,000
ME	\$304,173,000	\$8,248,000	\$308,225,000	\$620,646,000
MI	\$2,322,450,000	\$90,108,000	\$2,660,856,000	\$5,073,414,000
MN	\$3,408,240,000	\$44,737,000	\$1,552,288,000	\$5,005,265,000
MO	\$2,412,551,000	\$43,784,000	\$2,614,352,000	\$5,070,687,000
MS	\$381,221,000	\$38,608,000	\$275,257,000	\$695,086,000
MT	\$479,991,000	\$65,135,000	\$252,985,000	\$798,111,000
NC	\$5,105,434,000	\$134,243,000	\$3,344,266,000	\$8,583,943,000
ND	\$356,743,000	\$23,157,000	\$86,401,000	\$466,301,000
NE	\$541,340,000	\$17,109,000	\$509,354,000	\$1,067,803,000
NH	\$203,324,000	\$3,238,000	\$630,396,000	\$836,958,000
NJ	\$4,841,130,000	\$263,059,000	\$3,405,502,000	\$8,509,691,000
NM	\$519,527,000	\$15,092,000	\$590,460,000	\$1,125,079,000
NV	\$4,765,767,000	\$41,194,000	\$5,007,388,000	\$9,814,349,000
NY	\$26,223,042,000	\$164,602,000	\$14,704,166,000	\$41,091,810,000
OH	\$2,006,683,000	\$86,881,000	\$1,762,688,000	\$3,856,252,000
OK	\$691,410,000	\$20,894,000	\$730,621,000	\$1,442,925,000
OR	\$1,404,734,000	\$41,172,000	\$1,992,636,000	\$3,438,542,000
PA	\$4,783,090,000	\$202,357,000	\$5,096,080,000	\$10,081,527,000
RI	\$248,010,000	\$3,290,000	\$720,144,000	\$971,444,000
SC	\$489,495,000	\$34,200,000	\$1,098,996,000	\$1,622,691,000

Table 12: Total Payroll of Commercial Airports in the U.S.

State	On-Airport	CIP	Visitor	State Total
SD	\$221,845,000	\$3,255,000	\$80,137,000	\$305,237,000
TN	\$2,004,412,000	\$53,222,000	\$1,716,809,000	\$3,774,443,000
TX	\$17,629,126,000	\$515,445,000	\$17,989,303,000	\$36,133,874,000
UT	\$2,126,382,000	\$23,959,000	\$2,246,165,000	\$4,396,506,000
VA	\$5,243,448,000	\$132,928,000	\$5,585,134,000	\$10,961,510,000
VT	\$133,551,000	\$2,654,000	\$141,397,000	\$277,602,000
WA	\$3,663,127,000	\$68,345,000	\$4,470,630,000	\$8,202,102,000
WI	\$1,244,351,000	\$21,397,000	\$1,113,052,000	\$2,378,800,000
WV	\$146,828,000	\$11,411,000	\$90,529,000	\$248,768,000
WY	\$149,373,000	\$12,066,000	\$456,196,000	\$617,635,000
Total	\$177,019,325,000	\$5,114,487,000	\$175,726,470,000	\$357,860,282,000

Source: CDM Smith and IMPLAN. Prepared July 2014.

Table 13: Direct Output of Commercial Airports in the U.S.

State	On-Airport	CIP	Visitor	State Total
AK	\$2,345,154,000	\$233,031,000	\$1,478,341,000	\$4,056,526,000
AL	\$668,175,000	\$61,800,000	\$640,162,000	\$1,370,137,000
AR	\$673,753,000	\$70,607,000	\$510,620,000	\$1,254,980,000
AZ	\$12,341,428,000	\$675,451,000	\$5,592,733,000	\$18,609,612,000
CA	\$24,397,109,000	\$1,940,166,000	\$31,627,868,000	\$57,965,143,000
CO	\$7,100,766,000	\$383,819,000	\$7,348,740,000	\$14,833,325,000
CT	\$991,012,000	\$31,305,000	\$1,312,051,000	\$2,334,368,000
DE	\$0	\$0	\$0	\$0
FL	\$27,840,584,000	\$971,144,000	\$34,699,753,000	\$63,511,481,000
GA	\$17,651,606,000	\$322,595,000	\$15,486,111,000	\$33,460,312,000
HI	\$4,658,055,000	\$120,406,000	\$4,743,315,000	\$9,521,776,000
IA	\$576,001,000	\$32,227,000	\$146,896,000	\$755,124,000
ID	\$661,849,000	\$41,008,000	\$458,727,000	\$1,161,584,000
IL	\$11,741,616,000	\$991,383,000	\$6,695,525,000	\$19,428,524,000
IN	\$1,682,693,000	\$102,170,000	\$1,292,533,000	\$3,077,396,000
KS	\$3,391,776,000	\$106,647,000	\$219,378,000	\$3,717,801,000
KY	\$3,113,874,000	\$233,303,000	\$1,233,190,000	\$4,580,367,000
LA	\$1,319,726,000	\$316,512,000	\$1,918,705,000	\$3,554,943,000
MA	\$1,661,744,000	\$160,984,000	\$3,759,229,000	\$5,581,957,000
MD	\$2,240,855,000	\$171,424,000	\$3,466,409,000	\$5,878,688,000
ME	\$399,459,000	\$19,619,000	\$400,001,000	\$819,079,000
MI	\$3,244,375,000	\$214,325,000	\$3,453,143,000	\$6,911,843,000
MN	\$6,540,228,000	\$106,409,000	\$2,014,492,000	\$8,661,129,000
MO	\$3,418,382,000	\$104,141,000	\$3,392,792,000	\$6,915,315,000
MS	\$616,114,000	\$91,829,000	\$357,217,000	\$1,065,160,000
MT	\$492,530,000	\$154,925,000	\$328,313,000	\$975,768,000
NC	\$7,249,051,000	\$319,300,000	\$4,340,043,000	\$11,908,394,000
ND	\$411,607,000	\$55,080,000	\$112,127,000	\$578,814,000
NE	\$728,965,000	\$40,695,000	\$661,018,000	\$1,430,678,000
NH	\$273,783,000	\$7,701,000	\$818,100,000	\$1,099,584,000
NJ	\$7,583,421,000	\$625,693,000	\$4,419,513,000	\$12,628,627,000
NM	\$761,276,000	\$35,896,000	\$766,273,000	\$1,563,445,000
NV	\$6,418,382,000	\$97,980,000	\$6,498,371,000	\$13,014,733,000
NY	\$33,556,513,000	\$391,510,000	\$19,082,428,000	\$53,030,451,000
OH	\$3,294,926,000	\$206,649,000	\$2,287,540,000	\$5,789,115,000
OK	\$930,813,000	\$49,696,000	\$948,168,000	\$1,928,677,000
OR	\$4,461,509,000	\$97,929,000	\$2,585,956,000	\$7,145,394,000
PA	\$5,500,283,000	\$481,311,000	\$6,613,471,000	\$12,595,065,000
RI	\$233,076,000	\$7,826,000	\$934,572,000	\$1,175,474,000
SC	\$516,938,000	\$81,345,000	\$1,426,229,000	\$2,024,512,000

Table 13: Direct Output of Commercial Airports in the U.S.

State	On-Airport	CIP	Visitor	State Total
SD	\$234,555,000	\$7,743,000	\$103,998,000	\$346,296,000
TN	\$3,958,200,000	\$126,591,000	\$2,228,000,000	\$6,312,791,000
TX	\$22,356,443,000	\$1,225,999,000	\$23,345,737,000	\$46,928,179,000
UT	\$2,862,442,000	\$56,988,000	\$2,914,975,000	\$5,834,405,000
VA	\$7,541,011,000	\$316,173,000	\$7,248,144,000	\$15,105,328,000
VT	\$179,863,000	\$6,313,000	\$183,499,000	\$369,675,000
WA	\$5,477,953,000	\$162,561,000	\$5,801,789,000	\$11,442,303,000
WI	\$1,864,108,000	\$50,894,000	\$1,444,471,000	\$3,359,473,000
WV	\$177,920,000	\$27,142,000	\$117,484,000	\$322,546,000
WY	\$254,954,000	\$28,700,000	\$592,032,000	\$875,686,000
Total	\$256,596,856,000	\$12,164,945,000	\$228,050,182,000	\$496,811,983,000

Source: CDM Smith and IMPLAN. Prepared July 2014.

Table 14: Multiplier Output of Commercial Airports in the U.S.

State	On-Airport	CIP	Visitor	State Total
AK	\$3,299,641,000	\$372,302,000	\$1,671,835,000	\$5,343,778,000
AL	\$940,125,000	\$98,735,000	\$723,950,000	\$1,762,810,000
AR	\$947,973,000	\$112,805,000	\$577,453,000	\$1,638,231,000
AZ	\$17,364,440,000	\$1,079,133,000	\$6,324,742,000	\$24,768,315,000
CA	\$34,326,832,000	\$3,099,703,000	\$35,767,507,000	\$73,194,042,000
CO	\$9,990,807,000	\$613,208,000	\$8,310,586,000	\$18,914,601,000
CT	\$1,394,358,000	\$50,014,000	\$1,483,780,000	\$2,928,152,000
DE	\$0	\$0	\$0	\$0
FL	\$39,171,816,000	\$1,551,547,000	\$39,241,458,000	\$79,964,821,000
GA	\$24,835,882,000	\$515,393,000	\$17,513,023,000	\$42,864,298,000
HI	\$6,553,902,000	\$192,366,000	\$5,364,148,000	\$12,110,416,000
IA	\$810,436,000	\$51,487,000	\$166,123,000	\$1,028,046,000
ID	\$931,224,000	\$65,516,000	\$518,768,000	\$1,515,508,000
IL	\$16,520,502,000	\$1,583,882,000	\$7,571,874,000	\$25,676,258,000
IN	\$2,367,556,000	\$163,232,000	\$1,461,707,000	\$3,992,495,000
KS	\$4,772,243,000	\$170,384,000	\$248,091,000	\$5,190,718,000
KY	\$4,381,233,000	\$372,736,000	\$1,394,597,000	\$6,148,566,000
LA	\$1,856,860,000	\$505,675,000	\$2,169,836,000	\$4,532,371,000
MA	\$2,338,081,000	\$257,196,000	\$4,251,259,000	\$6,846,536,000
MD	\$3,152,892,000	\$273,875,000	\$3,920,113,000	\$7,346,880,000
ME	\$562,040,000	\$31,344,000	\$452,355,000	\$1,045,739,000
MI	\$4,564,849,000	\$342,416,000	\$3,905,110,000	\$8,812,375,000
MN	\$9,202,128,000	\$170,004,000	\$2,278,160,000	\$11,650,292,000
MO	\$4,809,677,000	\$166,381,000	\$3,836,860,000	\$8,812,918,000
MS	\$866,875,000	\$146,710,000	\$403,972,000	\$1,417,557,000
MT	\$692,992,000	\$247,516,000	\$371,285,000	\$1,311,793,000
NC	\$10,199,444,000	\$510,129,000	\$4,908,093,000	\$15,617,666,000
ND	\$579,133,000	\$87,998,000	\$126,803,000	\$793,934,000
NE	\$1,025,657,000	\$65,016,000	\$747,536,000	\$1,838,209,000
NH	\$385,214,000	\$12,303,000	\$925,178,000	\$1,322,695,000
NJ	\$10,669,904,000	\$999,638,000	\$4,997,965,000	\$16,667,507,000
NM	\$1,071,118,000	\$57,349,000	\$866,567,000	\$1,995,034,000
NV	\$9,030,690,000	\$156,538,000	\$7,348,916,000	\$16,536,144,000
NY	\$47,214,151,000	\$625,495,000	\$21,580,047,000	\$69,419,693,000
OH	\$4,635,974,000	\$330,152,000	\$2,586,947,000	\$7,553,073,000
OK	\$1,309,658,000	\$79,397,000	\$1,072,270,000	\$2,461,325,000
OR	\$6,277,361,000	\$156,456,000	\$2,924,421,000	\$9,358,238,000
PA	\$7,738,921,000	\$768,966,000	\$7,479,080,000	\$15,986,967,000
RI	\$327,939,000	\$12,503,000	\$1,056,894,000	\$1,397,336,000
SD	\$330,020,000	\$12,371,000	\$117,610,000	\$460,001,000

Table 14: Multiplier Output of Commercial Airports in the U.S.

State	On-Airport	CIP	Visitor	State Total
TN	\$5,569,204,000	\$202,248,000	\$2,519,614,000	\$8,291,066,000
TX	\$31,455,607,000	\$1,958,716,000	\$26,401,363,000	\$59,815,686,000
UT	\$4,027,468,000	\$91,047,000	\$3,296,504,000	\$7,415,019,000
VA	\$10,610,233,000	\$505,133,000	\$8,196,823,000	\$19,312,189,000
VT	\$253,068,000	\$10,086,000	\$207,516,000	\$470,670,000
WA	\$7,707,502,000	\$259,715,000	\$6,561,161,000	\$14,528,378,000
WI	\$2,622,808,000	\$81,311,000	\$1,633,532,000	\$4,337,651,000
WV	\$250,334,000	\$43,363,000	\$132,861,000	\$426,558,000
WY	\$358,721,000	\$45,853,000	\$669,521,000	\$1,074,095,000
Total	\$361,032,827,000	\$19,435,304,000	\$257,898,716,000	\$638,366,847,000

Source: CDM Smith and IMPLAN. Prepared July 2014.

Table 15: Total Output of Commercial Airports in the U.S.

State	On-Airport	CIP	Visitor	State Total
AK	\$5,644,795,000	\$605,333,000	\$3,150,176,000	\$9,400,304,000
AL	\$1,608,300,000	\$160,535,000	\$1,364,112,000	\$3,132,947,000
AR	\$1,621,726,000	\$183,412,000	\$1,088,073,000	\$2,893,211,000
AZ	\$29,705,868,000	\$1,754,584,000	\$11,917,475,000	\$43,377,927,000
CA	\$58,723,941,000	\$5,039,869,000	\$67,395,375,000	\$131,159,185,000
CO	\$17,091,573,000	\$997,027,000	\$15,659,326,000	\$33,747,926,000
CT	\$2,385,370,000	\$81,319,000	\$2,795,831,000	\$5,262,520,000
DE	\$0	\$0	\$0	\$0
FL	\$67,012,400,000	\$2,522,691,000	\$73,941,211,000	\$143,476,302,000
GA	\$42,487,488,000	\$837,988,000	\$32,999,134,000	\$76,324,610,000
HI	\$11,211,957,000	\$312,772,000	\$10,107,463,000	\$21,632,192,000
IA	\$1,386,437,000	\$83,714,000	\$313,019,000	\$1,783,170,000
ID	\$1,593,073,000	\$106,524,000	\$977,495,000	\$2,677,092,000
IL	\$28,262,118,000	\$2,575,265,000	\$14,267,399,000	\$45,104,782,000
IN	\$4,050,249,000	\$265,402,000	\$2,754,240,000	\$7,069,891,000
KS	\$8,164,019,000	\$277,031,000	\$467,469,000	\$8,908,519,000
KY	\$7,495,107,000	\$606,039,000	\$2,627,787,000	\$10,728,933,000
LA	\$3,176,586,000	\$822,187,000	\$4,088,541,000	\$8,087,314,000
MA	\$3,999,825,000	\$418,180,000	\$8,010,488,000	\$12,428,493,000
MD	\$5,393,747,000	\$445,299,000	\$7,386,522,000	\$13,225,568,000
ME	\$961,499,000	\$50,963,000	\$852,356,000	\$1,864,818,000
MI	\$7,809,224,000	\$556,741,000	\$7,358,253,000	\$15,724,218,000
MN	\$15,742,356,000	\$276,413,000	\$4,292,652,000	\$20,311,421,000
MO	\$8,228,059,000	\$270,522,000	\$7,229,652,000	\$15,728,233,000
MS	\$1,482,989,000	\$238,539,000	\$761,189,000	\$2,482,717,000
MT	\$1,185,522,000	\$402,441,000	\$699,598,000	\$2,287,561,000
NC	\$17,448,495,000	\$829,429,000	\$9,248,136,000	\$27,526,060,000
ND	\$990,740,000	\$143,078,000	\$238,930,000	\$1,372,748,000
NE	\$1,754,622,000	\$105,711,000	\$1,408,554,000	\$3,268,887,000
NH	\$658,997,000	\$20,004,000	\$1,743,278,000	\$2,422,279,000
NJ	\$18,253,325,000	\$1,625,331,000	\$9,417,478,000	\$29,296,134,000
NM	\$1,832,394,000	\$93,245,000	\$1,632,840,000	\$3,558,479,000
NV	\$15,449,072,000	\$254,518,000	\$13,847,287,000	\$29,550,877,000
NY	\$80,770,664,000	\$1,017,005,000	\$40,662,475,000	\$122,450,144,000
OH	\$7,930,900,000	\$536,801,000	\$4,874,487,000	\$13,342,188,000
OK	\$2,240,471,000	\$129,093,000	\$2,020,438,000	\$4,390,002,000
OR	\$10,738,870,000	\$254,385,000	\$5,510,377,000	\$16,503,632,000
PA	\$13,239,204,000	\$1,250,277,000	\$14,092,551,000	\$28,582,032,000
RI	\$561,015,000	\$20,329,000	\$1,991,466,000	\$2,572,810,000



Table 15: Total Output of Commercial Airports in the U.S.

State	On-Airport	CIP	Visitor	State Total
SC	\$1,244,272,000	\$211,306,000	\$3,039,131,000	\$4,494,709,000
SD	\$564,575,000	\$20,114,000	\$221,608,000	\$806,297,000
TN	\$9,527,404,000	\$328,839,000	\$4,747,614,000	\$14,603,857,000
TX	\$53,812,050,000	\$3,184,715,000	\$49,747,100,000	\$106,743,865,000
UT	\$6,889,910,000	\$148,035,000	\$6,211,479,000	\$13,249,424,000
VA	\$18,151,244,000	\$821,306,000	\$15,444,967,000	\$34,417,517,000
VT	\$432,931,000	\$16,399,000	\$391,015,000	\$840,345,000
WA	\$13,185,455,000	\$422,276,000	\$12,362,950,000	\$25,970,681,000
WI	\$4,486,916,000	\$132,205,000	\$3,078,003,000	\$7,697,124,000
WV	\$428,254,000	\$70,505,000	\$250,345,000	\$749,104,000
WY	\$613,675,000	\$74,553,000	\$1,261,553,000	\$1,949,781,000
Total	\$617,629,683,000	\$31,600,249,000	\$485,948,898,000	\$1,135,178,830,000

Source: CDM Smith and IMPLAN. Prepared July 2014.



Table 16: Total Economic Impacts of Commercial Airports in the U.S.

State	Employment	Payroll	Output
AK	89,040	\$2,977,513,000	\$9,400,304,000
AL	31,740	\$1,105,165,000	\$3,132,947,000
AR	28,250	\$1,077,873,000	\$2,893,211,000
AZ	324,010	\$14,137,437,000	\$43,377,927,000
CA	1,220,530	\$42,557,945,000	\$131,159,185,000
CO	310,990	\$11,782,587,000	\$33,747,926,000
CT	62,440	\$1,741,974,000	\$5,262,520,000
DE	-	\$0	\$0
FL	1,183,520	\$37,775,353,000	\$143,476,302,000
GA	606,470	\$24,793,763,000	\$76,324,610,000
HI	221,890	\$7,165,938,000	\$21,632,192,000
IA	15,240	\$540,276,000	\$1,783,170,000
ID	25,650	\$910,483,000	\$2,677,092,000
IL	373,720	\$14,692,174,000	\$45,104,782,000
IN	67,430	\$2,584,260,000	\$7,069,891,000
KS	37,430	\$2,013,196,000	\$8,908,519,000
KY	99,140	\$3,473,327,000	\$10,728,933,000
LA	70,280	\$2,292,360,000	\$8,087,314,000
MA	135,140	\$4,400,550,000	\$12,428,493,000
MD	132,250	\$4,369,107,000	\$13,225,568,000
ME	19,360	\$620,646,000	\$1,864,818,000
MI	160,880	\$5,073,414,000	\$15,724,218,000
MN	122,900	\$5,005,265,000	\$20,311,421,000
MO	140,970	\$5,070,687,000	\$15,728,233,000
MS	19,550	\$695,086,000	\$2,482,717,000
MT	22,730	\$798,111,000	\$2,287,561,000
NC	206,080	\$8,583,943,000	\$27,526,060,000
ND	10,980	\$466,301,000	\$1,372,748,000
NE	33,670	\$1,067,803,000	\$3,268,887,000
NH	28,480	\$836,958,000	\$2,422,279,000
NJ	214,720	\$8,509,691,000	\$29,296,134,000
NM	31,060	\$1,125,079,000	\$3,558,479,000
NV	261,720	\$9,814,349,000	\$29,550,877,000
NY	820,580	\$41,091,810,000	\$122,450,144,000
OH	110,670	\$3,856,252,000	\$13,342,188,000
OK	45,320	\$1,442,925,000	\$4,390,002,000
OR	110,130	\$3,438,542,000	\$16,503,632,000
PA	298,060	\$10,081,527,000	\$28,582,032,000
RI	30,520	\$971,444,000	\$2,572,810,000
SC	51,990	\$1,622,691,000	\$4,494,709,000

Table 16: Total Economic Impacts of Commercial Airports in the U.S.

State	Employment	Payroll	Output
SD	7,240	\$305,237,000	\$806,297,000
TN	123,230	\$3,774,443,000	\$14,603,857,000
TX	968,060	\$36,133,874,000	\$106,743,865,000
UT	123,760	\$4,396,506,000	\$13,249,424,000
VA	279,850	\$10,961,510,000	\$34,417,517,000
VT	9,710	\$277,602,000	\$840,345,000
WA	209,900	\$8,202,102,000	\$25,970,681,000
WI	69,800	\$2,378,800,000	\$7,697,124,000
WV	9,650	\$248,768,000	\$749,104,000
WY	19,610	\$617,635,000	\$1,949,781,000
Total	9,596,340	\$357,860,282,000	\$1,135,178,830,000

Source: CDM Smith and IMPLAN. Prepared July 2014.

### Comparison between 2010 and 2013 Studies

By comparing the 2013 results with the results from the 2010 study, any growth in the economic impact of commercial airports can be benchmarked. When compared side-by-side, it is observed that direct impacts have increased. From 2010 to 2013 direct jobs, direct payroll, and direct output increased by 9 percent, 19 percent, and 8 percent, respectively. This growth is impressive in light of the challenges presented to the industry, such as airline consolidation, rising fuel prices, and a global economy still recovering from recessionary forces. The growth in direct impacts are presented in **Table 17**, while **Table 18** presents the change in direct output by state

Table 17: 2010 to 2013 Comparison of Direct Impacts

Study Year	Employment	Payroll	Output
2010	4,871,270	\$140,302,173,000	\$460,183,445,000
2013	5,305,350	\$167,577,748,000	\$496,811,983,000
Percent Change	9%	19%	8%

Source: CDM Smith and IMPLAN. Prepared July 2014.

Table 18: 2010 to 2013 Comparison of Direct Output by State

State	2010 Direct Output by State	2013 Direct Output by State	Percent Change
AK	\$4,655,882,000	\$4,056,526,000	-13%
AL	\$1,303,908,000	\$1,370,137,000	5%
AR	\$1,174,688,000	\$1,254,980,000	7%
AZ	\$17,211,258,000	\$18,609,612,000	8%
CA	\$61,715,960,000	\$57,965,143,000	-6%
CO	\$13,564,956,000	\$14,833,325,000	9%
CT	\$2,175,966,000	\$2,334,368,000	7%
DE	\$0	\$0	N/A
FL	\$49,321,407,000	\$63,511,481,000	29%
GA	\$31,459,517,000	\$33,460,312,000	6%
HI	\$9,546,100,000	\$9,521,776,000	0%
IA	\$706,832,000	\$755,124,000	7%
ID	\$1,087,313,000	\$1,161,584,000	7%
IL	\$19,685,082,000	\$19,428,524,000	-1%
IN	\$3,454,960,000	\$3,077,396,000	-11%
KS	\$3,416,975,000	\$3,717,801,000	9%
KY	\$5,438,676,000	\$4,580,367,000	-16%
LA	\$2,442,456,000	\$3,554,943,000	46%
MA	\$5,366,026,000	\$5,581,957,000	4%
MD	\$3,296,474,000	\$5,878,688,000	78%
ME	\$853,204,000	\$819,079,000	-4%
MI	\$7,235,729,000	\$6,911,843,000	-4%
MN	\$9,653,239,000	\$8,661,129,000	-10%
MO	\$7,303,361,000	\$6,915,315,000	-5%
MS	\$660,453,000	\$1,065,160,000	61%
MT	\$908,103,000	\$975,768,000	7%
NC	\$9,151,918,000	\$11,908,394,000	30%
ND	\$541,787,000	\$578,814,000	7%
NE	\$1,238,585,000	\$1,430,678,000	16%
NH	\$1,439,029,000	\$1,099,584,000	-24%
NJ	\$12,002,776,000	\$12,628,627,000	5%
NM	\$1,908,336,000	\$1,563,445,000	-18%
NV	\$15,757,286,000	\$13,014,733,000	-17%
NY	\$33,608,869,000	\$53,030,451,000	58%
OH	\$5,296,129,000	\$5,789,115,000	9%
OK	\$2,344,894,000	\$1,928,677,000	-18%
OR	\$4,190,014,000	\$7,145,394,000	71%
PA	\$11,826,521,000	\$12,595,065,000	6%
RI	\$1,202,800,000	\$1,175,474,000	-2%

Table 18: 2010 to 2013 Comparison of Direct Output by State

State	2010 Direct Output by State	2013 Direct Output by State	Percent Change
SC	\$1,556,648,000	\$2,024,512,000	30%
SD	\$335,732,000	\$346,296,000	3%
TN	\$7,074,618,000	\$6,312,791,000	-11%
TX	\$45,574,731,000	\$46,928,179,000	3%
UT	\$3,711,680,000	\$5,834,405,000	57%
VA	\$19,452,070,000	\$15,105,328,000	-22%
VT	\$439,513,000	\$369,675,000	-16%
WA	\$12,838,756,000	\$11,442,303,000	-11%
WI	\$3,994,780,000	\$3,359,473,000	-16%
WV	\$215,283,000	\$322,546,000	50%
WY	\$842,165,000	\$875,686,000	4%
Total	\$460,183,445,000	\$496,811,983,000	8%

Source: CDM Smith and IMPLAN. Prepared July 2014.

When comparing total output between the 2010 and 2013 studies, the results are less vibrant in terms of growth but still very impressive in scale nonetheless. The total output of commercial airports in the U.S. went from \$1.18 trillion in 2010 to \$1.13 trillion in 2013, a decrease of about 4 percent. Since direct output increased over the same period, this drop in total output can be attributed to the decrease in multipliers from 2010 to 2013. The decrease in multipliers is likely due to reduced industry expenditures and leakage outside the study area. More explanation on this is provided on page 40 in the “IMPLAN Economic Model” subsection of the “Study Approach” section of this document. The total output of each state’s airports is summed and shown in **Table 19**.

Table 19: 2010 to 2013 Comparison of Total Output by State

State	2010 Total Output by State	2013 Total Output by State	Percent Change
AK	\$11,990,487,000	\$9,400,304,000	-22%
AL	\$3,341,001,000	\$3,132,947,000	-6%
AR	\$3,017,744,000	\$2,893,211,000	-4%
AZ	\$44,070,762,000	\$43,377,927,000	-2%
CA	\$157,996,816,000	\$131,159,185,000	-17%
CO	\$34,646,508,000	\$33,747,926,000	-3%
CT	\$5,556,297,000	\$5,262,520,000	-5%
DE	\$0	\$0	N/A
FL	\$125,850,286,000	\$143,476,302,000	14%
GA	\$80,534,186,000	\$76,324,610,000	-5%
HI	\$24,423,369,000	\$21,632,192,000	-11%
IA	\$1,824,820,000	\$1,783,170,000	-2%
ID	\$2,791,507,000	\$2,677,092,000	-4%
IL	\$50,673,207,000	\$45,104,782,000	-11%

Table 19: 2010 to 2013 Comparison of Total Output by State

State	2010 Total Output by State	2013 Total Output by State	Percent Change
IN	\$8,858,534,000	\$7,069,891,000	-20%
KS	\$8,846,916,000	\$8,908,519,000	1%
KY	\$14,038,514,000	\$10,728,933,000	-24%
LA	\$6,312,449,000	\$8,087,314,000	28%
MA	\$13,678,043,000	\$12,428,493,000	-9%
MD	\$8,466,261,000	\$13,225,568,000	56%
ME	\$2,187,894,000	\$1,864,818,000	-15%
MI	\$18,608,708,000	\$15,724,218,000	-16%
MN	\$24,913,504,000	\$20,311,421,000	-18%
MO	\$18,685,053,000	\$15,728,233,000	-16%
MS	\$1,688,756,000	\$2,482,717,000	47%
MT	\$2,348,021,000	\$2,287,561,000	-3%
NC	\$23,591,262,000	\$27,526,060,000	17%
ND	\$1,402,058,000	\$1,372,748,000	-2%
NE	\$3,175,647,000	\$3,268,887,000	3%
NH	\$3,676,395,000	\$2,422,279,000	-34%
NJ	\$30,870,992,000	\$29,296,134,000	-5%
NM	\$4,863,841,000	\$3,558,479,000	-27%
NV	\$40,533,175,000	\$29,550,877,000	-27%
NY	\$85,968,063,000	\$122,450,144,000	42%
OH	\$13,608,778,000	\$13,342,188,000	-2%
OK	\$6,010,181,000	\$4,390,002,000	-27%
OR	\$10,772,625,000	\$16,503,632,000	53%
PA	\$30,267,593,000	\$28,582,032,000	-6%
RI	\$3,068,923,000	\$2,572,810,000	-16%
SC	\$3,953,528,000	\$4,494,709,000	14%
SD	\$865,123,000	\$806,297,000	-7%
TN	\$18,198,854,000	\$14,603,857,000	-20%
TX	\$116,622,794,000	\$106,743,865,000	-8%
UT	\$9,495,047,000	\$13,249,424,000	40%
VA	\$49,628,495,000	\$34,417,517,000	-31%
VT	\$1,126,966,000	\$840,345,000	-25%
WA	\$32,977,801,000	\$25,970,681,000	-21%
WI	\$10,215,395,000	\$7,697,124,000	-25%
WV	\$552,291,000	\$749,104,000	36%
WY	\$2,151,146,000	\$1,949,781,000	-9%
Total	\$1,178,946,616,000	\$1,135,178,830,000	-4%

Source: CDM Smith and IMPLAN. Prepared July 2014.

## Study Approach and Methods Used

Like any economic impact study, this analysis relied on specific methodologies, definitions, and assumptions to arrive at the impact estimates previously presented. This study began by defining the scope of analysis to include all of the economic impacts associated with commercial airports in the U.S. Commercial airports were defined as any airport listed in the National Plan of Integrated Airport Systems (NPIAS)<sup>7</sup> designated by the FAA as a commercial service airport, which meant any airport with at least 2,500 annual passenger enplanements on scheduled airlines. The NPIAS identifies 499 commercial service airports, of which 485 are in the U.S. The other 13 are in American Samoa, Guam, the Northern Marianas, Puerto Rico, and the U.S. Virgin Islands and were not part of this analysis.

The analysis of 485 commercial airports involved gathering data from existing studies, estimating data for any airports that did not have existing studies, and entering that data into an economic model to develop economic impact estimates for each airport. The results of that analysis were aggregated and reported by state in this report. With one exception, every state in the U.S. is served by multiple commercial airports. Delaware does not have any commercial airports according to the NPIAS (2013-2017) report.<sup>8</sup>

It should be kept in mind that these impact estimates are only as accurate as the data that was available. Every effort was made to collect similar data for each airport to ensure data consistency within the study. For example, direct military impacts were deleted 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.

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

Commercial airports contribute to the U.S. economy by supporting businesses at the airport, providing transportation for visitors and residents, moving air cargo, and by supporting extensive infrastructure improvement and expansion projects. The total economic impact of the airports in this analysis is measured in terms of employment, payroll, and output, as defined below:

- **Employment** – the number of employees that have jobs that can be tied to commercial airports. These are expressed in full-time equivalents, where two part-time jobs are assumed to equal one full-time job.
- **Payroll** – the annual wages, salaries, and benefits associated with the jobs that are tied to commercial airports.

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<sup>7</sup> NPIAS airports are considered significant components of the national aviation system and are therefore eligible for federal funding.

<sup>8</sup> Frontier Airlines commenced service at New Castle Airport (ILG) in Wilmington, Delaware, in July 2013.



- **Economic Output** – the economic activity generated by commercial airports and associated activity. Economic output is defined as the annual average capital improvement project expenditures plus 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.

In general, economic impacts at commercial airports are generated by 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 during their visit.

This study estimates the impacts stemming from the economic activities described above for each of the 485 commercial airports.

## Types of Economic Impact

The economic activity generated by the groups discussed above, results in three types of economic impact. These three types of economic impact are common to most economic studies and are described below:

- **Direct Impacts** – Direct impacts are those that are tied to the initial point of economic activity generated by commercial airports – the purchase of aviation goods and services on the airport, on-airport construction, and the spending by airline passengers passing through the region. On-airport activity includes the benefits associated with businesses and government organizations located at the airport, which are directly related to the provision of aviation services. 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, and government organizations. 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), such as might take place at restaurants or hotels. Direct impacts account for the initial point where money first starts circulating in the economy.
- **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 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 U.S.
- **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 485 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 later.
- **Capital Improvement Programs (CIP)** – Each year, airports undertake capital improvements, such as runway rehabilitation or terminal improvements. In addition, businesses and other agencies undertake capital improvement projects. 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 used the same ratios.
- **Commercial Service Visitors** – This category includes estimated 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 trip. 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 used the same ratios.

For the majority of airports, the direct impacts associated with the categories listed above were obtained from previous 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.

## Regression Analysis

Data for the direct economic impacts were collected from over 90 available studies for as many airports as possible. A large portion of these studies were produced in-house by CDM Smith, while the remainder were produced by various industry consulting firms and obtained either by web search or through ACI-NA's website. The recent studies conducted by CDM Smith in 22 states include direct impact data for 168 commercial airports. From all of these data sources, direct impact data were found for 361 out of the 485 commercial airports. This data was reviewed and any results that were not suitable because the underlying assumptions were incompatible with this study were discarded. Any studies 10 years old or more were deemed unreliable and were also discarded. Payroll and output results from studies dated prior to 2013 were adjusted for inflation using standard Consumer Price Index inflation rates from the Bureau of Labor Statistics. Direct impact data for the other airports and for any discarded data was estimated using regression analysis.

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,  $R$ , 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). A number of independent variables were obtained for each airport and included passenger enplanements, various types of aircraft operations, and the population, employment, and total income tied to each airport's associated city.

The correlations between these dependent and independent variables were evaluated to obtain the highest correlation value for each dependent variable. **Table 20** shows each dependent variable, its corresponding independent variable, and the correlation coefficient between the two. On-Airport Employment and On-Airport Output show two independent variables because data for each of the first two listed independent variables was not available for all 485 airports in the study, so the second independent variable was used in a limited number of cases. As the table shows, with the exception of the independent variable for CIP expenditures and the “backup” independent variable for on-airport employment, all of the correlation coefficients were 0.90 or higher, indicating a very high degree of correlation between the variable sets.

Table 20: Correlation Analysis

Dependent Variable	Independent Variable	Correlation Coefficient
On-Airport Employment	Air Carrier and Air Taxi Operations <sup>1</sup>	0.95
	Associated City Employment	0.49
On-Airport Payroll	Total Passengers*	0.96
On-Airport Output	Payroll	0.99
CIP Expenditures	Air Carrier Operations	0.73
Visitor Expenditures	Total Passengers*	0.95

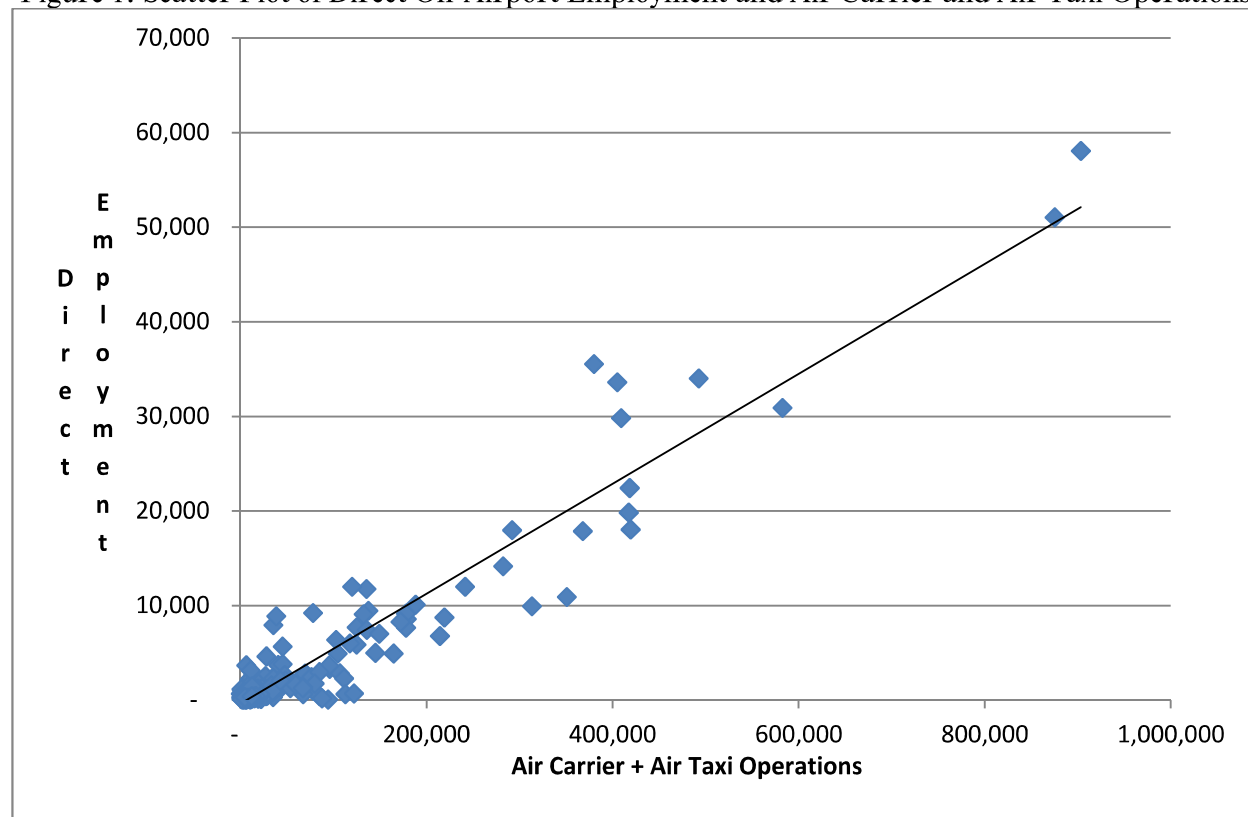
<sup>1</sup> From FAA ATADS data for 2013

\* From 2013 FAA Air Carrier Data

Source: CDM Smith. Prepared July 2014.

Once it was determined which independent variable had the highest correlation with each dependent variable, scatter plots were made for each dependent variable. An example of a scatter plot is shown in **Figure 1**, which demonstrates the correlation between direct on-airport employment and the number of air carrier and air taxi operations. A trend line is plotted showing the best fitting linear relationship between the two data sets.

Figure 1: Scatter Plot of Direct On-Airport Employment and Air Carrier and Air Taxi Operations



Source: CDM Smith and FAA ATADS 2013 data. Prepared July 2014.

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 dependent variables where needed.

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.

The obvious question that this analysis raises is why are total impacts for commercial airports less in 2013 than they were in 2010 if direct impacts in 2013 are more than they were in 2010.

As mentioned in the discussion leading into Table 19 (“2010 to 2013 Comparison of Total Output by State”), the answer rests with how the IMPLAN multipliers changed from 2010 to 2013. Table 21 shows the multipliers for each measure of economic impact in the three categories of impact for 2010 and 2013. It can be seen that the largest drops in multipliers occurred in the on-airport and visitor categories – both of which make significant contributions to the economic impacts of airports.

Table 21: Comparison of Multipliers from 2010 to 2013

Multiplier Category	2010	2013	Percent Change
On-Airport			
Employment	3.40	2.96	-13%
Payroll	2.95	2.45	-17%
Output	2.59	2.41	-7%
Construction			
Employment	3.59	3.47	-3%
Payroll	2.61	2.63	1%
Output	2.71	2.60	-4%
Visitor			
Employment	1.69	1.45	-14%
Payroll	2.35	1.88	-20%
Output	2.52	2.13	-15%

Source: IMPLAN and CDM Smith. Prepared July 2014.

Multipliers change every year due to changes in overall economic conditions as well as changes to specific industries. 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.

According to IMPLAN, there are three factors to consider when analyzing changes in economic multipliers. They are:

- A change in the geographic size of the study area
- A change in household spending in the U.S.
- A change in industry expenditures

These changes can influence particular industries or the entire economy. For instance, a reduction in household spending will negatively impact all industry multipliers, while a shortage of nurses would disproportionately drive up medical labor costs and drive down the multiplier for the hospital industry. Each of these three factors will be analyzed as they pertain to this study in more detail.

### ***Change in Geographic Size of the Study Area***

The geographic size of the study region plays a role in determining how quickly expenditures leak out of the area of interest. A larger study area contains more businesses that can capture expenditures, resulting in larger economic multipliers. If the study area changes size for any reason, that influences the multipliers for industries in that region. This study examined the economic impacts of commercial airports within the U.S. and compared the results to a similar analysis from 2010. Since there were no changes in to U.S. borders since 2010, this issue is not a factor.

### ***Change in Household Spending in the U.S.***

Spending by U.S. households drives induced impacts. If U.S. households spend proportionally more of their income, that puts more money into circulation and is reflected in the form of a higher multiplier. Conversely, if U.S. households reduce the share of their income they expend, by delaying purchases or increasing the portion of their paycheck that they save, there is less money circulating in the economy and a smaller multiplier results. While this may be a factor behind the smaller multipliers in this study, no evidence was found directly supporting this assumption.

### ***Change in Industry Expenditures***

An industry sector's multiplier is an indicator of its inter-connectedness to the local economy. From the business point of view, the multiplier is largely dependent upon two factors – the proportion of resources purchased from within the study area (i.e., expenditures made outside the study area leak out before they have the opportunity to recirculate within the study area and add to the multiplier impacts), and how its expenditures are split between labor and resources relative to its output. An example of the second factor is a business that doubles its output while tripling its labor costs will put proportionally less into resources, which reduces its indirect impacts and is reflected in a lower multiplier.

This economic model takes into account the changes in industry expenditures over the vast number of industries and government organizations necessary to run a commercial service airport. It uses multipliers to model the complex relationships and interactions that occur among the airport-related businesses and all the off-airport industries they support. With so many industries included in the economic model, a multitude of reasons are behind the changes in multipliers. This discussion will focus on the reasons common to all industries.

With recovery from the Great Recession still in progress for many industries, businesses have been reluctant to hire and spend money. When businesses spend less of their revenues, multiplier impacts are reduced as reflected in smaller multipliers.

The global economy may also be contributing to a reduction in multipliers. For example, as airlines conduct more heavy maintenance outside the U.S. in an effort to control costs, those expenditures leak outside the study area and reduce the multiplier. Other industries that pursue similar cost-cutting measures overseas could contribute to reduced multipliers.

## Summary

This study examined more than 90 state and individual airport economic impact studies to obtain direct economic impact data for 361 out of the 485 commercial airports analyzed. A detailed, highly correlated regression analysis was developed that estimated direct impact data for the other airports as needed. These direct impact results were used as input for an IMPLAN economic impact model that produced the multiplier impacts found within the U.S.

In the face of rising fuel prices, airline consolidation, and ongoing recovery from the economic recession, the increase in direct economic impacts of commercial airports is significant. From 2010 to 2013, direct jobs, direct payroll, and direct output increased by 9 percent, 19 percent, and 8 percent, respectively. These gains are indicative of a resilient airline industry, as well as a strong network of commercial airports that facilitate both aviation and the U.S. economy.

In total, this analysis found that the 485 commercial airports in the U.S.:

- Support 9.6 million jobs
- Create an annual payroll of \$358 billion
- Produce an annual output of \$1.1 trillion

These economic impacts are a considerable contribution to the national economy. Not only do these airports provide vital transportation links that permit the rapid, efficient, and cost-effective movement of people, goods and services, they account for nearly 7 percent of the national GDP and support more than 6 percent of the country's work force.