



U.S. Department  
of Transportation  
Federal Aviation  
Administration

# The Economic Impact of Civil Aviation on the U.S. Economy

June 2014



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# Foreword

Flying is an inspiring part of American life. It's a symbol of our freedom, pioneering spirit, and economic success. As the nation continues to revitalize itself following the most recent recession, civil aviation has outpaced the national economy. In 2012, aviation accounted for 5.4% of our gross domestic product (GDP), contributed \$1.5 trillion in total economic activity, and supported 11.8 million jobs. Aviation manufacturing also continues to be the nation's top net export.

The nation's economic success depends on having a vibrant civil aviation industry. To support this effort, the FAA remains committed to ensuring the safest, most efficient aerospace system in the world. We're focused on the following four strategic priorities: making aviation safer and smarter, delivering benefits through technology and infrastructure, enhancing global leadership, and empowering the FAA's workforce so we can innovate. We're in the process of transforming the airspace system by deploying the Next Generation Air Transportation System (NextGen). NextGen will make aviation more fuel and cost efficient, and more environmentally friendly.

This concise report, ideal for policymakers and industry officials, offers the latest data on the economic impact of civil aviation. It discusses the economic benefits of passenger and cargo transportation, from activities by commercial airlines, air couriers, airports, tourism, and manufacturing. This version also estimates the economic impact of general aviation, a uniquely American achievement. In addition to 2012, this report also includes revised economic impact estimates for the years 2000 to 2009 and newly estimated economic impacts for 2010 and 2011.

Flying remains an economic frontier for America. We see unmanned aircraft and commercial space launches on the horizon. Through these innovations, civil aviation will continue to inspire the next generation, and bring economic prosperity to our lives.

**Teri L. Bristol**



Chief Operating Officer  
Air Traffic Organization  
Federal Aviation Administration

# Overview



## Providing Vital Connectivity to the World...

Civil aviation connects passengers and freight almost anywhere in the world. Civil aviation connectivity is a key facilitator of economic growth. U.S. businesses and consumers continue to depend on the vibrant and unwavering services of the civil air transportation industry while the U.S. economy continues down the path of revitalization. Some highlights of civil aviation in 2012 include:

- Air carriers operating in U.S. airspace transported 837.2 million passengers with over 1,146.0 billion revenue passenger miles (RPM).
- More than 61.2 billion revenue ton-miles (RTM) of freight passed through U.S. airports.
- Commercial airline operations enabled \$262.8 billion of visitor expenditures on goods and services.
- Civil aircraft manufacturing continues to be the top net exporter in the U.S. with a positive trade balance of \$54.3 billion.

## Invigorating the U.S. Economy...

The vitality and resourcefulness of the U.S. air transportation network continues to energize the U.S. economy. Since the end of the recession in June 2009, real U.S. economic growth averaged 2.4 percent per year between 2009 and 2012 (2009 dollars), accounted for a total of 7.3 percent over the three-year period. During the same time, real primary output of civilian aviation outpaced the U.S. economy, by growing at 11.8 percent between 2009 and 2012 while averaging 3.9 percent per year.

The 2012 civil aviation economic impact estimates in this report reveal that the real growth in civilian commercial aircraft manufacturing output between 2009 and 2012 averaged 9.2 percent per year, outpacing overall U.S. economic growth with sales of new aircraft in both the domestic and overseas markets. Civil aircraft manufacturing fuels the U.S. economy by being the top U.S. net export. According to data from the Bureau of Economic Analysis (BEA) and the U.S. Census Bureau, civil aircraft manufacturing contributed \$54.3 billion to the U.S. trade balance (exports less imports) in 2012.<sup>1</sup>

The U.S. airline industry is both dynamic and innovative. Faced with persistently high jet fuel costs, the industry continues to restructure and streamline operations in order to maximize fuel efficiency and manage operating costs. The growth of airline operations output (in real terms) was not far behind aircraft manufacturing at just over 20 percent between 2009 and 2012. Also noteworthy, airline operating revenue and profits data from the Bureau of Transportation Statistics reported that major U.S. airlines<sup>2</sup> had an overall net profit margin of 4.0 percent in 2012 versus a 1.0 percent net profit margin in 2009.<sup>3</sup> In addition to managing costs, U.S. airlines appear to have adjusted their business models to a pseudo just-in-time delivery system, not unlike the U.S. manufacturing sector. Also noteworthy, IATA reported that the near term outlook for U.S. airlines is projected to surpass 2012.

*“Airlines in North America, where consolidation has progressed the furthest, are expected to generate the largest profits and best margins in both 2013 and 2014.”*

-IATA December 12, 2013

<sup>1</sup> Bureau of Economic Analysis and Census Bureau. <http://www.bea.gov/international/detailedtradedata.htm> For 2009, the BEA and Census Bureau reported the civil aviation trade balance was \$44.1 billion. This number is different than the trade balance statistics published by the US International Trade Commission (USITC), as the USITC estimates did not subtract imports from exports.

<sup>2</sup> The major air carriers defined by BTS include: AirTran, Alaska, American, American Eagle, Atlas Air, Delta/Northwest, Federal Express, Frontier, Hawaiian, JetBlue, SkyWest, Southwest, United/Continental, UPS and US Airways

<sup>3</sup> <http://transtats.bts.gov/>

<sup>4</sup> World Bank, Databank, December 2013. <http://data.worldbank.org/>

<sup>5</sup> Bureau of Economic Analysis, National Income and Product Account Tables, December 2013. <http://www.bea.gov/iTable/indexnipa.cfm>

<sup>6</sup> U.S. Department of Labor, Bureau of Labor Statistics, Labor Force Statistics from the Current Population Survey. December 2013. <http://www.bls.gov/data/>

## Sustaining Economic Development and Growth...

From traveling home for the holidays, overnight delivery of time sensitive goods, to local air traffic news reports - civil aviation is an integral part of everyday life and commerce in the U.S. Air transportation provides an essential foundation for businesses and families to connect and re-connect while ensuring economic growth and vitality.

Since the last economic impact report, annual global real gross domestic product (GDP) grew 3.0 percent per year between 2009 and 2012.<sup>4</sup> During the same time, U.S. real GDP grew 2.4 percent per year.<sup>5</sup> However, despite a slower recovery from the global recession than the rest of the world, the U.S. economy generated \$16.2 trillion in value-added economic activity and supported 143.3 million jobs in 2012.<sup>6</sup> At the same time, the civil aviation industry

- Supported 11.8 million jobs,
- Accounted for \$1.5 trillion in total economic activity, and
- Contributed 5.4 percent to U.S. GDP.

# Introduction



## What's New?

Due to budget constraints, the Federal Aviation Administration (FAA) will only publish an abbreviated version of The Economic Impact of Civil Aviation on the U.S. Economy this year. This report incorporates the latest economic data available through the end of 2013 and includes the most important data tables from previously published reports.

The report incorporates the most recent year (2012) data from the U.S. Department of Transportation (DOT), U.S. Department of Commerce (DOC), and U.S. Department of Labor (DOL). Along with the economic impact estimate for 2012, the report includes revised economic impact estimates for the years 2000 through 2009 and newly estimated economic impacts for 2010 and 2011.

While this report incorporates most of the required source data, some sources were not available in time for this publication. For the primary estimates of manufacturing output in 2012, the FAA used monthly manufacturing reports from the DOC<sup>7</sup> as extrapolators. Part 135 Activity Survey (GA Survey)

was not available for 2011 and 2012. General aviation (GA) output estimates in this report were extrapolated using data from the previously published GA Surveys.

With the most recent release of U.S. GDP data, the Bureau of Economic Analysis has made several changes to the definition of GDP.<sup>8</sup> Since this report calculates aviation's contribution to GDP, the FAA has made adjustments accordingly to ensure consistency across annual estimates - See section on "Aviation's Contribution to GDP" for further details.

Due to resource constraints, the detailed reporting of the impact of federal spending and enabling impacts will not be published in this report. Those impact estimates will be updated in forthcoming publications.

The next section describes the methodology used to estimate the economic impact of civil aviation on the U.S. economy.

<sup>7</sup> 2012 Annual Survey of Manufacturers data from the Department of Commerce (DOC) are extrapolated using the monthly Manufacturers' Shipments, Inventories, and Orders (M3) DOC survey.

<sup>8</sup> <http://www.bea.gov/national/ani.htm#2013comprehensive>

# National Impact of U.S. Civil Aviation



## The Economic Contribution

The report estimates the economic contribution of the civil aviation industry to the U.S. economy. Civil aviation has far-reaching economic impacts. While some of these impacts cannot be measured quantitatively, this report captures economic activity generated by direct and indirect air transport of passengers and cargo using the best data available from government and private sources.

## Methodology

The total economic impact of an industry is a summation of primary impacts and induced impacts of spending on that particular industry. This definition is standard for economic-impact studies and is used to estimate aviation's unique economic contribution to the national economy. The data used to measure the primary economic impacts of civil aviation were collected from reliable government and private sources. This study estimated those impacts by looking at industry output, earnings, and jobs. These data were entered into the RIMS II Input-Output Model, a model developed by the U.S. Department of Commerce's Bureau of Economic Analysis, to derive the secondary economic impacts of spending. Primary and secondary impacts were then summed to produce a measure of civil aviation's total impact on the U.S. economy.



## Types of Economic Impacts

**Primary Impacts:** The primary impacts of aviation are a summation of direct and indirect impacts of civil aviation on the U.S. economy and include:

- Air transportation and supporting services
- Aircraft, aircraft engines, and parts manufacturing
- Travel and other trip-related expenditures by travelers using air transportation

**Induced or Secondary Impacts:** Induced impacts result from expenditures made by industries identified in the measurement of primary impacts to supporting businesses and entities, as well as the spending of direct and indirect employees. Induced impacts capture the secondary impacts to the economy as direct/indirect sales, and payroll impacts are circulated to supporting industries through multiplier effects.

## Measures of Economic Impacts

Primary expenditure estimates are input into the RIMS II model to estimate the secondary effects of those expenditures on the U.S. economy. The output of the RIMS II model includes the secondary effects on economic output, earnings and jobs.

**Output:** The total economic value of goods and services produced.<sup>9</sup>

**Earnings:** Wages and salaries, other labor income, benefits, and proprietors' income paid to all employee persons who deliver final demand output and services.

**Jobs:** The number of people employed in the industry that provide civil-aviation services, manufacture aircraft and aircraft engines, or work in other industries that are indirectly affected by activity in the civil air transportation sector.

<sup>9</sup> "Output" includes the sum of all of intermediate goods and services used in production, plus value added by the industry itself. This distinguishes output from gross domestic product, which only counts value added.

## Results

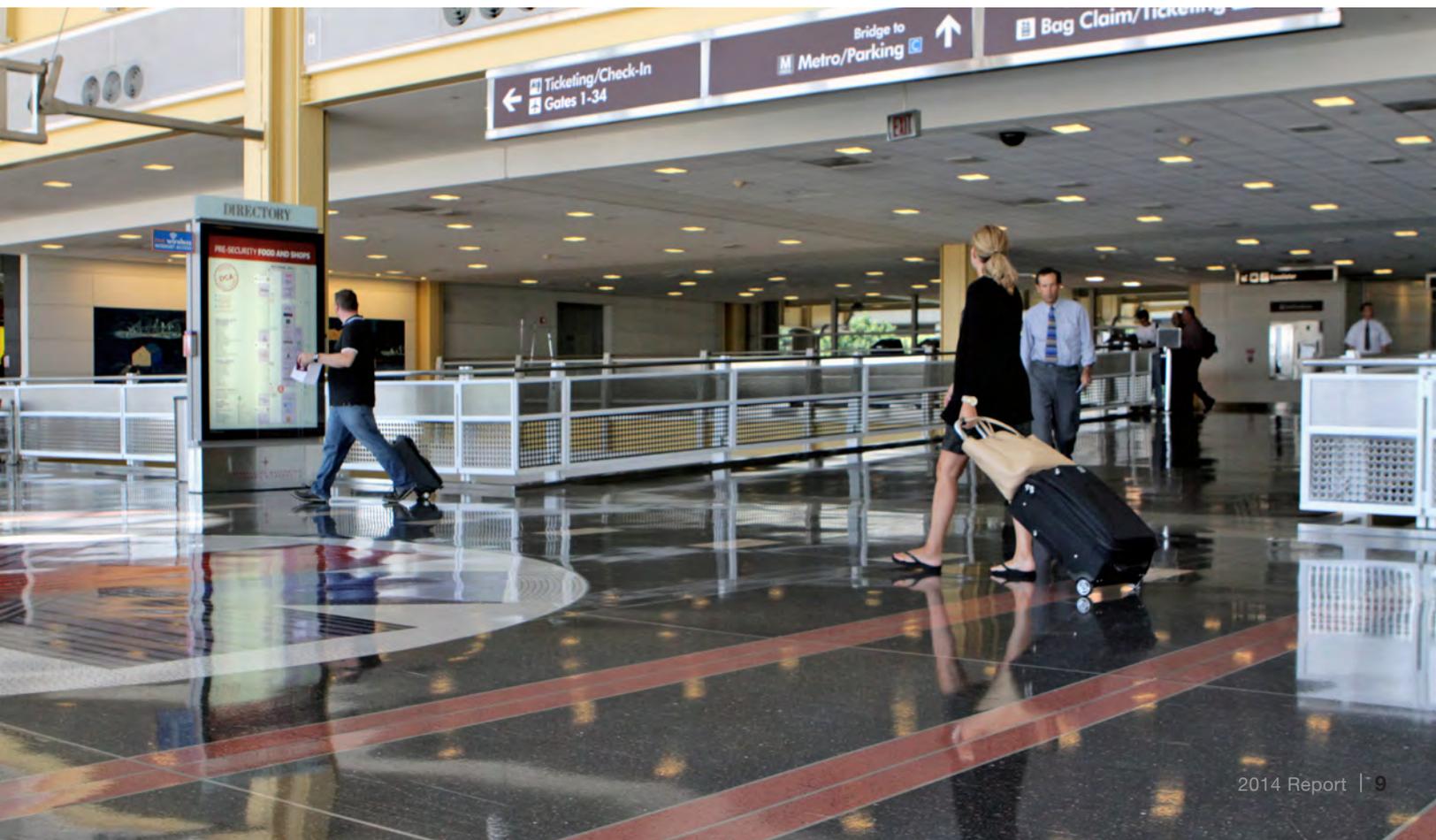
**Table 1** summarizes the total impact of U.S. civil aviation on output, earnings, and jobs. In 2012, economic activity attributed to civil aviation-related goods and services totaled \$1.5 trillion, generating 11.8 million jobs with \$459.4 billion in earnings. Aviation contributed 5.4 percent to GDP, the value-added measure of overall U.S. economic activity.

Civil aviation's recovery from the last recession accelerated in 2011 with an increase in its contribution to GDP from 5.2 to 5.3 percent by the end of 2011, followed by 5.4 percent in 2012 (**Table 1**).

**Table 1** Summary - Civil Aviation Economic Impact on U.S. Economy 2000-2012 (Current Dollars)

Year	Output (\$Billions)	Earnings (\$Billions)	Jobs (Thousands)	Percent of GDP*
2012	1,533.8	459.4	11,790	5.4
2011	1,455.0	437.2	11,238	5.3
2010	1,354.8	407.8	10,496	5.2
2009	1,309.4	393.2	10,118	5.2
2008	1,453.5	436.9	11,237	5.6
2007	1,421.6	426.7	10,960	5.6
2006	1,315.2	395.4	10,185	5.4
2005	1,204.6	362.9	9,405	5.2
2004	1,107.6	334.0	8,653	5.1
2003	1,013.9	305.4	7,881	5.0
2002	1,002.1	300.8	7,735	4.6
2001	1,077.8	323.6	9,383	4.7
2000	1,131.0	339.5	9,891	5.1

\*Note: GDP is gross domestic product excluding research and development (R&D).



**Table 2** reports revisions from previously published FAA economic impact estimates for civil aviation. Most of the revisions between 2006 and 2009 output estimates were due to revised data for commercial aircraft manufacturing from the Department of Commerce.

In 2009, the negative revision from previously published estimates was due to a revision to commercial visitor expenditures.

**Table 2** Revisions to Previously Published Estimates (Current Dollars)

OUTPUT			
Year	Previous (\$Billions)	Current (\$Billions)	Percent Difference
2009	1,311.2	1,309.4	-0.1
2008	1,437.1	1,453.5	1.1
2007	1,409.7	1,421.6	0.8
2006	1,307.8	1,315.2	0.6
2005	1,206.3	1,204.6	-0.1
2004	1,106.2	1,107.6	0.1
2003	1,012.9	1,013.9	0.1
2002	1,003.1	1,002.1	-0.1
2001	1,077.8	1,077.8	0.0
2000	1,131.0	1,131.0	0.0

EARNINGS			
Year	Previous (\$Billions)	Current (\$Billions)	Percent Difference
2009	394.4	393.2	-0.3
2008	432.6	436.9	1.0
2007	423.7	426.7	0.7
2006	393.5	395.4	0.5
2005	363.4	362.9	-0.1
2004	333.4	334.0	0.2
2003	305.1	305.4	0.1
2002	301.1	300.8	-0.1
2001	323.6	323.6	0.0
2000	339.5	339.5	0.0

JOBS			
Year	Previous (Thousands)	Current (Thousands)	Percent Difference
2009	10,186	10,118	-0.7
2008	11,138	11,237	0.9
2007	10,901	10,960	0.5
2006	10,149	10,185	0.4
2005	9,413	9,405	-0.1
2004	8,641	8,653	0.1
2003	7,876	7,881	0.1
2002	7,740	7,735	-0.1
2001	9,383	9,383	0.0
2000	9,891	9,891	0.0

PERCENTAGE OF GDP			
Year	Previous	Current	Percentage Difference
2009	5.2	5.2	0.0
2008	5.5	5.6	0.1
2007	5.6	5.6	0.0
2006	5.4	5.4	0.0
2005	5.3	5.2	-0.1
2004	5.2	5.1	-0.1
2003	5.0	5.0	0.0
2002	4.7	4.6	-0.1
2001	4.8	4.7	-0.1
2000	5.2	5.1	-0.1



**Table 3** reports real primary output in 2009 dollars and is the basis for calculating the total economic impact of civil aviation for 2009 and 2012. In order to isolate real changes in civil aviation spending from inflationary effects, the real primary output measures are transformed into 2009 constant-dollar measures.

Between 2009 and 2012, real primary output increased by 11.8 percent. Commercial aviation, the bulk of primary output, increased 12.3 percent between 2009 and 2012, while primary output for total GA economic activity increased 2.3 percent. Commercial aircraft manufacturing, airline operations, air couriers, and visitor expenditures were the drivers of most of the growth in commercial aviation between 2009 and 2012.

Primary output is used to estimate the secondary effects of spending in the economy. Primary output estimates are input into the RIMS II model to calculate the secondary or induced impacts.

Total output, or the sum of primary and secondary impacts, is reported in **Table 4**, which shows the following:

- In 2012, commercial aviation accounts for the bulk of civil aviation's economic contribution, with operations generating \$373.9 billion in total output
- As airline passengers reach their destinations, their total expenditures on hotels, rental cars, and entertainment contributed \$671 billion in total output, nearly double the output supported by airlines operations
- Total GA accounted for nearly \$79 billion of total output in 2012. While the impact is less than commercial aviation, the GA contribution continues to reflect the industry's unique role in the nation's transportation system. GA operations contributed \$39.3 billion to total output.

**Table 3** Real Primary Output (2009 Dollars)

Description	2009 (2009 \$Billions)	2012 (2009 \$Billions)	Percent Change
Airline Operations	99.4	119.3	20.1
Airport Operations	25.1	22.6	-10.2
Civilian Aircraft Manufacturing	34.1	44.4	30.4
Civilian Aircraft Engine and Engine Parts Manufacturing	7.2	6.9	-3.9
Civilian Other Aircraft Parts and Equipment Manufacturing	23.4	24.7	5.4
Air Couriers	26.7	30.4	13.8
Visitor Expenditures	228.0	250.2	9.7
Travel Arrangements	4.7	5.5	15.9
<b>Subtotal - Commercial</b>	<b>448.6</b>	<b>504.0</b>	<b>12.3</b>
General Aviation Operations	13.0	13.1	1.0
GA Aircraft Manufacturing	9.1	9.5	4.4
GA Visitor Expenditures	4.6	4.7	1.6
<b>Subtotal - General Aviation</b>	<b>26.7</b>	<b>27.3</b>	<b>2.3</b>
<b>Total Primary Output</b>	<b>475.3</b>	<b>531.3</b>	<b>11.8</b>

**Table 4** Total Output, Earnings and Jobs Estimates, 2012 (Current Dollars)

Description	Output (\$Billions)	Earnings (\$Billions)	Jobs (Thousands)
Airline Operations	373.9	115.9	2,530
Airport Operations	73.4	25.5	571
Civilian Aircraft Manufacturing	132.4	33.7	657
Civilian Aircraft Engine and Engine Parts Manufacturing	21.1	5.6	113
Civilian Other Aircraft Parts and Equipment Manufacturing	81.7	24.3	513
Air Couriers	86.1	25.7	761
Visitor Expenditures	670.8	200.9	5,988
Travel Arrangements	16.1	5.1	148
<b>Subtotal - Commercial</b>	<b>1,455.3</b>	<b>436.7</b>	<b>11,282</b>
General Aviation Operations	39.3	12.2	266
GA Aircraft Manufacturing	27.0	6.9	134
GA Visitor Expenditures	12.1	3.6	108
<b>Subtotal - General Aviation</b>	<b>78.5</b>	<b>22.7</b>	<b>508</b>
<b>Total Impact</b>	<b>1,533.8</b>	<b>459.4</b>	<b>11,790</b>

## Aviation's Contribution to Gross Domestic Product

In August 2013, the Bureau of Economic Analysis released its comprehensive revision estimates of U.S. GDP data with several notable changes. One notable change that affected the definition of GDP is the new inclusion of research and development (R&D) expenditures as investment — now part of GDP, rather than as intermediate inputs — previously not counted in GDP. This new treatment increased the level of GDP.

In order to maintain consistency and comparability with its previously published estimates, the FAA has decided, for this year's report, to not include R&D in the calculation of aviation's contribution to GDP until implications on aviation impact estimates are further explored. Therefore, it should be noted that all contribution (percent) to GDP estimates referenced in this report exclude R&D.

Excluding R&D, U.S. GDP was \$15,826.8 billion in 2012.<sup>10</sup> GDP represents the sum of all value-added activities in an economy, so intermediate goods and services used in the production of goods and services are not included. In the previous section, total output calculation included intermediate goods and services that were purchased as part of the production process. In order to compare aviation's contribution to GDP, these intermediate goods and services must be subtracted from the total output.

Each sector within the civil aviation industry has a different impact on the economy. To estimate civil aviation's overall contribution to GDP, each impact type is calculated separately using the RIMS II value-added coefficients and aggregated.

The result is shown in **Table 5**. In 2012, aviation-related value-added economic activities totaled \$847.1 billion, or 5.4 percent of U.S. GDP.

In 2012, commercial aviation contributed \$807.1 billion or 5.1 percent to GDP. Within commercial aviation, the largest component is commercial visitor expenditures totaling \$403.7 billion, or approximately 2.6 percent of GDP (**Table 5**) followed by airline operations at \$189.7 billion or 1.2 percent of GDP. General aviation, while quite small in comparison to commercial aviation, still contributed 0.3 percent to GDP, or nearly \$39.9 billion.

See Appendix for civil aviation's contribution to GDP for the years 2000 through 2012.

**Table 5** Civil Aviation's Contribution to GDP, 2012 (Current Dollars)

Description	Value Added (\$Billions)	Percent of GDP*
Airline Operations	189.7	1.2
Airport Operations	41.5	0.3
Civilian Aircraft Manufacturing	62.2	0.4
Civilian Aircraft Engine and Engine Parts Manufacturing	10.2	0.1
Civilian Other Aircraft Parts and Equipment Manufacturing	41.8	0.3
Air Couriers	48.7	0.3
Visitor Expenditures	403.7	2.6
Travel Arrangements	9.3	0.1
<b>Subtotal - Commercial</b>	<b>807.1</b>	<b>5.1</b>
General Aviation Operations	20.0	0.1
GA Aircraft Manufacturing	12.7	0.1
GA Visitor Expenditures	7.3	0.0
<b>Subtotal - General Aviation</b>	<b>39.9</b>	<b>0.3</b>
<b>Total Impact</b>	<b>847.1</b>	<b>5.4</b>

\*Note: GDP is gross domestic product excluding research and development (R&D).

<sup>10</sup> U.S. Department of Commerce, Bureau of Economic Analysis. August 2013.

## Real Change from Previous Years

Three measures highlight the economic contribution of the civil aviation sector: the value of total output, earnings paid to employees, and the number of jobs supported by civil aviation. These measures are shown in Table 6. The dollar values are presented in 2009 dollars to remove changes due to inflation. Real output of civil aviation increased 11.8 percent between 2009 and 2012 (**Table 6**), much faster than the 7.3 percent increase in real GDP as reported by the BEA.<sup>11</sup>

The total output of commercial aviation increased 12.4 percent between 2009 and 2012; almost double the growth rate of the U.S. economy. Commercial airline manufacturing, airline operations, and air couriers were the top contributors to the impressive growth rate at 30.4 percent, 20.1 percent and 13.8 percent respectively. Expenditures on travel arrangements and visitor expenditures increased 15.9 percent and 9.7 percent respectively.

Job growth in commercial aircraft manufacturing and airlines also registered growth rates of 36.9 percent and 26.1 percent respectively. Aircraft manufacturing is buoyed by the increase in demand for new airplanes, and airlines are seeing a return of air travelers after the painful financial fallout from the last recession.

According to FAA data, GA operations (number of flights) dropped 4.4 percent between 2009 and 2012 while the cost of operating GA has risen. Despite the decrease in reported GA operations, the economic impact of GA continued its long term trend of growth in output and employment. The overall increase in real GA output between 2009 and 2012 was 2.3 percent while employment growth was 2.4 percent (**Table 6**).

**Table 6** U.S. Civil Aviation: Growth of Total Output, Earnings and Jobs (Real)

Description	Output			Earnings			Jobs		
	(2009 \$Billions)		Percent Change	(2009 \$Billions)		Percent Change	(Thousands)		Percent Change
	2009	2012		2009	2012		2009	2012	
Airline Operations	296.5	356.1	20.1	91.9	110.3	20.1	2,006	2,530	26.1
Airport Operations	77.8	69.9	-10.2	27.1	24.3	-10.2	605	571	-5.7
Civilian Aircraft Manufacturing	96.7	126.1	30.4	24.6	32.1	30.4	480	657	36.9
Civilian Aircraft Engine and Engine Parts Manufacturing	20.9	20.1	-3.9	5.6	5.4	-3.9	112	113	0.9
Civilian Other Aircraft Parts and Equipment Manufacturing	73.8	77.8	5.4	22.0	23.2	5.4	464	513	10.7
Air Couriers	72.0	82.0	13.8	21.5	24.5	13.8	637	761	19.5
Visitor Expenditures	582.1	638.8	9.7	174.3	191.3	9.7	5,196	5,988	15.2
Travel Arrangements	13.2	15.3	15.9	4.2	4.8	15.9	122	148	21.7
<b>Subtotal – Commercial</b>	<b>1,233.0</b>	<b>1,385.9</b>	<b>12.4</b>	<b>371.1</b>	<b>415.9</b>	<b>12.1</b>	<b>9,622</b>	<b>11,282</b>	<b>17.2</b>
General Aviation Operations	38.8	39.2	1.0	12.0	12.1	1.0	262	266	1.4
GA Aircraft Manufacturing	25.8	26.9	4.4	6.6	6.9	4.4	128	134	4.8
GA Visitor Expenditures	11.9	12.1	1.6	3.6	3.6	1.6	106	108	2.0
<b>Subtotal – General Aviation</b>	<b>76.4</b>	<b>78.2</b>	<b>2.3</b>	<b>22.1</b>	<b>22.6</b>	<b>2.1</b>	<b>496</b>	<b>508</b>	<b>2.4</b>
<b>Total Impact</b>	<b>1,309.4</b>	<b>1,464.1</b>	<b>11.8</b>	<b>393.2</b>	<b>438.5</b>	<b>11.5</b>	<b>10,118</b>	<b>11,790</b>	<b>16.5</b>

<sup>11</sup> Bureau of Economic Analysis, August 2013

# Conclusion



Civil aviation connects the entire globe, providing much needed economic benefits both seen and unseen for U.S. consumers and businesses. Civil aviation has been a major force behind decreasing barriers to trade, and U.S. civil aviation industry truly remains a unique engine for innovation and technological progress.

The network connectivity of civil air transportation provides a dynamic and real-time infrastructure that keeps our nation competitive on the global stage. Specific areas of civil aviation such as air cargo, have contributed to more effective networking and collaboration between companies near and far.

This report found that when all impacts are included, civil aviation contributed 5.4 percent to the U.S. economy in 2012. The total output of civil aviation-related goods and services amounted to \$1.5 trillion in 2012 and generated nearly 12 million jobs, with earnings of \$459 billion.

The economic impacts of civil aviation summarized in this report, represent the quantifiable benefits made possible by civil aviation. Other benefits are only just beginning to be captured by researchers, and there is hope that new indexes such as the World Bank Air Connectivity Index will provide even more insight into civil aviation's influence on economic growth and development. The industry contributes positively to the U.S. trade balance, creates high-paying jobs, helps keep just-in-time business models viable, and connects us to friends, family, and market opportunities. Air transportation will continue to move the U.S. and global economy towards a bright and healthy future.



Los Angeles  
San Francisco  
Kahului, Maui  
Honolulu



## Baggage Claim A



# Appendix – Supplemental Tables

**Table 7** U.S. Civil Aviation Economic Impact, Total Output: Primary plus Secondary Impacts (Current Dollars)

Description	Output (\$Billions)												
	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
Airline Operations	274.5	236.8	232.3	251.5	275.3	300.3	326.7	345.0	360.6	296.5	338.9	371.4	373.9
Airport Operations	44.9	52.2	60.5	58.3	59.9	61.9	65.6	74.2	75.1	77.8	76.1	72.6	73.4
Civilian Aircraft Manufacturing	98.7	111.1	77.2	60.7	56.6	60.7	80.8	94.8	80.3	96.7	90.4	102.7	132.4
Civilian Aircraft Engine and Engine Parts Manufacturing	18.4	18.6	17.0	16.9	16.7	18.4	19.8	28.4	28.2	20.9	18.2	18.8	21.1
Civilian Other Aircraft Parts and Equipment Manufacturing	55.1	57.7	48.4	48.4	52.2	53.5	63.9	70.8	75.9	73.8	66.1	75.3	81.7
Air Couriers	57.4	56.4	54.0	58.3	63.5	65.2	73.6	79.8	81.1	72.0	73.8	80.9	86.1
Visitor Expenditures	494.2	461.7	435.5	446.4	503.1	554.1	583.3	621.6	640.2	582.1	601.0	639.4	670.8
Travel Arrangements	18.7	17.8	16.1	15.9	15.6	15.3	15.0	14.5	14.8	13.2	14.4	15.3	16.1
<b>Subtotal – Commercial</b>	<b>1,061.8</b>	<b>1,012.3</b>	<b>941.2</b>	<b>956.3</b>	<b>1,042.7</b>	<b>1,129.4</b>	<b>1,228.7</b>	<b>1,329.2</b>	<b>1,356.3</b>	<b>1,233.0</b>	<b>1,279.0</b>	<b>1,376.6</b>	<b>1,455.3</b>
General Aviation Operations	27.2	25.6	26.9	27.3	33.3	38.4	44.6	45.7	46.6	38.8	41.8	41.2	39.3
GA Aircraft Manufacturing	27.8	28.1	21.9	18.3	19.4	24.6	29.4	33.9	37.9	25.8	22.4	25.4	27.0
GA Visitor Expenditures	14.2	11.8	12.0	12.0	12.2	12.2	12.4	12.7	12.7	11.9	11.7	11.8	12.1
<b>Subtotal – General Aviation</b>	<b>69.2</b>	<b>65.5</b>	<b>60.8</b>	<b>57.6</b>	<b>64.9</b>	<b>75.2</b>	<b>86.5</b>	<b>92.4</b>	<b>97.2</b>	<b>76.4</b>	<b>75.8</b>	<b>78.5</b>	<b>78.5</b>
<b>Total Impact</b>	<b>1,131.0</b>	<b>1,077.8</b>	<b>1,002.1</b>	<b>1,013.9</b>	<b>1,107.6</b>	<b>1,204.6</b>	<b>1,315.2</b>	<b>1,421.6</b>	<b>1,453.5</b>	<b>1,309.4</b>	<b>1,354.8</b>	<b>1,455.0</b>	<b>1,533.8</b>

**Table 8** U.S. Civil Aviation Economic Impact, Total Earnings: Primary plus Secondary Impacts (Current Dollars)

Description	Earnings (\$Billions)												
	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
Airline Operations	78.9	68.1	72.0	77.9	85.3	93.0	101.2	106.9	111.7	91.9	105.0	115.1	115.9
Airport Operations	16.9	19.6	21.1	20.3	20.8	21.5	22.8	25.8	26.1	27.1	26.5	25.3	25.5
Civilian Aircraft Manufacturing	25.5	28.7	19.7	15.4	14.4	15.4	20.6	24.1	20.4	24.6	23.0	26.1	33.7
Civilian Aircraft Engine and Engine Parts Manufacturing	4.6	4.7	4.5	4.5	4.5	4.9	5.3	7.6	7.5	5.6	4.9	5.0	5.6
Civilian Other Aircraft Parts and Equipment Manufacturing	16.0	16.7	14.4	14.4	15.5	15.9	19.0	21.1	22.6	22.0	19.7	22.4	24.3
Air Couriers	18.0	17.7	16.1	17.4	19.0	19.5	22.0	23.8	24.2	21.5	22.0	24.2	25.7
Visitor Expenditures	154.3	144.2	130.4	133.7	150.7	165.9	174.7	186.2	191.7	174.3	180.0	191.5	200.9
Travel Arrangements	6.0	5.7	5.1	5.0	4.9	4.8	4.7	4.6	4.7	4.2	4.5	4.8	5.1
<b>Subtotal – Commercial</b>	<b>320.1</b>	<b>305.3</b>	<b>283.3</b>	<b>288.7</b>	<b>315.1</b>	<b>341.1</b>	<b>370.3</b>	<b>400.1</b>	<b>409.1</b>	<b>371.1</b>	<b>385.6</b>	<b>414.4</b>	<b>436.7</b>
General Aviation Operations	7.8	7.4	8.3	8.5	10.3	11.9	13.8	14.2	14.4	12.0	12.9	12.8	12.2
GA Aircraft Manufacturing	7.2	7.3	5.6	4.6	4.9	6.3	7.5	8.6	9.6	6.6	5.7	6.5	6.9
GA Visitor Expenditures	4.4	3.7	3.6	3.6	3.7	3.7	3.7	3.8	3.8	3.6	3.5	3.5	3.6
<b>Subtotal – General Aviation</b>	<b>19.4</b>	<b>18.3</b>	<b>17.5</b>	<b>16.7</b>	<b>18.9</b>	<b>21.8</b>	<b>25.0</b>	<b>26.6</b>	<b>27.9</b>	<b>22.1</b>	<b>22.1</b>	<b>22.8</b>	<b>22.7</b>
<b>Total Impact</b>	<b>339.5</b>	<b>323.6</b>	<b>300.8</b>	<b>305.4</b>	<b>334.0</b>	<b>362.9</b>	<b>395.4</b>	<b>426.7</b>	<b>436.9</b>	<b>393.2</b>	<b>407.8</b>	<b>437.2</b>	<b>459.4</b>

**Table 9** U.S. Civil Aviation Economic Impact, Total Jobs: Primary plus Secondary Impacts

Description	Jobs (Thousands)												
	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
Airline Operations	1,965	1,695	1,572	1,702	1,863	2,032	2,210	2,334	2,440	2,006	2,293	2,513	2,530
Airport Operations	437	508	471	453	466	482	511	578	584	605	592	565	571
Civilian Aircraft Manufacturing	548	617	383	301	281	301	401	470	398	480	448	509	657
Civilian Aircraft Engine and Engine Parts Manufacturing	100	101	92	91	90	99	107	153	152	112	98	101	113
Civilian Other Aircraft Parts and Equipment Manufacturing	359	376	304	304	328	336	401	445	477	464	415	474	513
Air Couriers	566	557	478	515	562	577	651	706	717	637	653	716	761
Visitor Expenditures	5,241	4,897	3,888	3,985	4,491	4,946	5,207	5,549	5,715	5,196	5,365	5,708	5,988
Travel Arrangements	176	168	149	147	144	142	138	133	137	122	133	141	148
<b>Subtotal – Commercial</b>	<b>9,392</b>	<b>8,918</b>	<b>7,337</b>	<b>7,498</b>	<b>8,223</b>	<b>8,914</b>	<b>9,626</b>	<b>10,369</b>	<b>10,621</b>	<b>9,622</b>	<b>9,998</b>	<b>10,727</b>	<b>11,282</b>
General Aviation Operations	195	183	182	185	225	260	302	310	316	262	283	279	266
GA Aircraft Manufacturing	155	156	109	91	96	122	146	168	188	128	111	126	134
GA Visitor Expenditures	150	125	107	107	109	109	111	114	113	106	104	106	108
<b>Subtotal – General Aviation</b>	<b>499</b>	<b>464</b>	<b>398</b>	<b>382</b>	<b>431</b>	<b>491</b>	<b>559</b>	<b>591</b>	<b>617</b>	<b>496</b>	<b>498</b>	<b>511</b>	<b>508</b>
<b>Total Impact</b>	<b>9,891</b>	<b>9,383</b>	<b>7,735</b>	<b>7,881</b>	<b>8,653</b>	<b>9,405</b>	<b>10,185</b>	<b>10,960</b>	<b>11,237</b>	<b>10,118</b>	<b>10,496</b>	<b>11,238</b>	<b>11,790</b>

**Table 10** U.S. Civil Aviation Economic Impact, Value Added (Current Dollars)

Description	Value Added (\$Billions)												
	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
Airline Operations	100.6	86.8	101.8	127.6	139.6	152.3	165.7	175.0	182.9	150.4	171.9	188.4	189.7
Airport Operations	21.9	25.5	32.9	33.0	33.9	35.0	37.1	42.0	42.5	44.0	43.1	41.1	41.5
Civilian Aircraft Manufacturing	34.3	38.6	28.9	28.5	26.6	28.5	38.0	44.5	37.7	45.4	42.5	48.2	62.2
Civilian Aircraft Engine and Engine Parts Manufacturing	6.4	6.5	6.4	8.2	8.1	9.0	9.6	13.8	13.7	10.2	8.9	9.1	10.2
Civilian Other Aircraft Parts and Equipment Manufacturing	19.2	20.1	18.1	24.8	26.7	27.4	32.7	36.2	38.8	37.7	33.8	38.5	41.8
Air Couriers	37.8	37.2	31.3	33.0	36.0	36.9	41.7	45.2	45.9	40.8	41.8	45.8	48.7
Visitor Expenditures	257.7	240.8	241.0	268.7	302.8	333.4	351.0	374.1	385.3	350.3	361.7	384.8	403.7
Travel Arrangements	10.0	9.6	9.6	9.2	9.1	8.9	8.7	8.4	8.6	7.7	8.4	8.9	9.3
<b>Subtotal – Commercial</b>	<b>488.0</b>	<b>465.0</b>	<b>470.0</b>	<b>532.9</b>	<b>582.7</b>	<b>631.5</b>	<b>684.5</b>	<b>739.3</b>	<b>755.5</b>	<b>686.5</b>	<b>712.0</b>	<b>765.0</b>	<b>807.1</b>
General Aviation Operations	10.0	9.4	11.8	13.9	16.9	19.5	22.6	23.2	23.7	19.7	21.2	20.9	20.0
GA Aircraft Manufacturing	9.7	9.8	8.2	8.6	9.1	11.6	13.8	15.9	17.8	12.1	10.5	11.9	12.7
GA Visitor Expenditures	7.4	6.1	6.6	7.2	7.4	7.4	7.5	7.7	7.6	7.1	7.0	7.1	7.3
<b>Subtotal – General Aviation</b>	<b>27.0</b>	<b>25.3</b>	<b>26.6</b>	<b>29.6</b>	<b>33.3</b>	<b>38.4</b>	<b>43.9</b>	<b>46.8</b>	<b>49.1</b>	<b>38.9</b>	<b>38.7</b>	<b>40.0</b>	<b>39.9</b>
<b>Total Impact</b>	<b>515.0</b>	<b>490.3</b>	<b>496.6</b>	<b>562.5</b>	<b>616.0</b>	<b>669.8</b>	<b>728.5</b>	<b>786.1</b>	<b>804.6</b>	<b>725.4</b>	<b>750.7</b>	<b>804.9</b>	<b>847.1</b>

**Table 11** U.S. Civil Aviation Economic Impact, Percent Contribution to GDP

Description	Value Added - Percent of GDP*												
	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
Airline Operations	1.0	0.8	1.0	1.1	1.2	1.2	1.2	1.2	1.3	1.1	1.2	1.2	1.2
Airport Operations	0.2	0.2	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3
Civilian Aircraft Manufacturing	0.3	0.4	0.3	0.3	0.2	0.2	0.3	0.3	0.3	0.3	0.3	0.3	0.4
Civilian Aircraft Engine and Engine Parts Manufacturing	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Civilian Other Aircraft Parts and Equipment Manufacturing	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.2	0.3	0.3
Air Couriers	0.4	0.4	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3
Visitor Expenditures	2.6	2.3	2.2	2.4	2.5	2.6	2.6	2.6	2.7	2.5	2.5	2.5	2.6
Travel Arrangements	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
<b>Subtotal – Commercial</b>	<b>4.9</b>	<b>4.5</b>	<b>4.4</b>	<b>4.7</b>	<b>4.9</b>	<b>4.9</b>	<b>5.1</b>	<b>5.2</b>	<b>5.3</b>	<b>4.9</b>	<b>4.9</b>	<b>5.1</b>	<b>5.1</b>
General Aviation Operations	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.2	0.1	0.1	0.1	0.1
GA Aircraft Manufacturing	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
GA Visitor Expenditures	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0
<b>Subtotal – General Aviation</b>	<b>0.3</b>	<b>0.2</b>	<b>0.2</b>	<b>0.3</b>									
<b>Total Impact</b>	<b>5.1</b>	<b>4.7</b>	<b>4.6</b>	<b>5.0</b>	<b>5.1</b>	<b>5.2</b>	<b>5.4</b>	<b>5.6</b>	<b>5.6</b>	<b>5.2</b>	<b>5.2</b>	<b>5.3</b>	<b>5.4</b>

\*Note: GDP is gross domestic product excluding research and development (R&D).



# Glossary of Economic Terms

## Annual Rates

Published time series data often represent flows which take place over a month, quarter, or year. One example is revenue passenger miles, which is often reported at rates of RPM per month, per quarter, or per year. Therefore, these data are at different rates, meaning RPM per year are far higher than RPM per month and RPM per quarter, making it difficult to compare the data. To annualize or present the monthly or quarterly data at annual rates, multiply the data by 12 and 4, respectively.

## Earnings

Earnings are wages and salaries and other labor income, such as overtime, benefits and proprietors' income, paid to all employed persons by employers for a given unit of work or time. The BLS publishes earnings data.

## Employment (Jobs)

Employment is the implicit or explicit contractual relationship which exists between an employer and employee, whereby the employee voluntarily agrees to provide work effort to the employer in exchange for cash or in-kind remuneration.<sup>1</sup> The Bureau of Labor Statistics (BLS) is responsible for collecting and publishing data on the number employed within the U.S. According to BLS:

Employment data refer to persons on establishment payrolls who received pay for any part of the pay period that includes the 12th day of the month. Data exclude proprietors, the unincorporated self-employed, unpaid volunteer or family workers, farm workers, and domestic workers. Salaried officers of corporations are included. Government employment covers only civilian employees; military personnel are excluded. Employees of the Central Intelligence Agency, the National Security Agency, the National Imagery and Mapping Agency and the Defense Intelligence Agency also are excluded.<sup>2</sup>

## Gross Domestic Product

Gross domestic product (GDP) is the dollar measure of overall economic production during a period of time. It is the current dollar value of all final goods and services produced within a country during a specified time period, such as a year or quarter. These goods and services include consumption, investment, government expenditures and net exports. GDP also can be viewed in value added terms as the sum or aggregate of value added over each stage of production over the entire economy. The Bureau of Economic Analysis (BEA) publishes annual and quarterly measures of GDP.

## Gross Output

For an industry, gross output is the dollar value of goods or services produced by the industry and made available for use outside that industry during a specified time period.<sup>3</sup> It is measured as total sales or receipts, plus other operating income, commodity taxes (sales and excise taxes) and changes in inventories; or, equivalently, as value added, plus goods and services purchased for use in production. For an entire nation, total gross output is equal to total intermediate inputs plus GDP. Therefore, total gross output exceeds GDP. The BEA publishes annual national- and industry-level estimates of gross output.

## Induced Impact

Induced impacts result from expenditures identified in the measurement of primary impacts, as well as spending by employees.

## Input

Input is the total monetary value of goods and services consumed or used to produce a final good or service. These inputs include capital, labor, energy, materials and services.

<sup>1</sup> United Nations. 2008. System of National Accounts, 2008, p. 136.

<sup>2</sup> U.S. Department of Labor, Bureau of Labor Statistics. 2011. Handbook of Labor Statistics. March 2011.

<sup>3</sup> Organisation for Economic Co-operation and Development. 2002. "Glossary of Statistical Terms."

## **Multipliers**

Multipliers measure the impact of particular spending on the rest of the economy. In particular, these coefficients gauge the effects of spending on output, earnings and employment. The BEA publishes industry-level multiplier estimates.

## **Output**

Output is the current dollar production of goods or services by a production unit and is measured by total sales or receipts of that unit, plus other operating income, commodity taxes (sales and excise taxes) and changes in inventories.

## **Primary Impact**

Primary impact refers to expenditures on air transportation and support services; aircraft, aircraft engines and parts manufacturing; and travel and other trip-related expenditures by travelers using air transportation.

## **Recession**

A recession is the period between an economic peak and an economic trough and is characterized by a significant decline in economic activity across the economy, lasting from a few months to more than a year. The timing of economic peaks and troughs are based on measures of economic activity such as real GDP, employment, retail sales and industrial production.<sup>4</sup> Recessions are declared by the Business Cycle Dating Committee of the National Bureau of Economic Research (NBER). The most recent U.S. business-cycle contraction or recession officially began in December 2007 and ended in June 2009. It was labeled the Great Recession by the press, due to the length and severity of the recession. An official definition for the term does not exist.<sup>5</sup>

## **Seasonally Adjusted, at Annual Rates**

This term refers to time series data which have been both seasonally adjusted and annualized. See, Annual Rates and Seasonal Adjustment.

## **Seasonal Adjustment**

Many aviation-related time series data display seasonal patterns or seasonality. For example, travel tends to pick up during the summer and the end-of-year holiday season and slow down in the spring. Seasonal adjustment is a statistical process which removes such patterns to reveal underlying trends. In other words, seasonal adjustment removes the effects of recurring seasonal influences from time series. This process “quantifies seasonal patterns and then factors them out of the series to permit analysis of non-seasonal”<sup>6</sup> trends in the data.

## **Secondary Impact**

Secondary impact is used interchangeably with Induced Impact.

## **Total Economic Activity**

Total economic activity is a term used interchangeably with Gross Output.

## **Total Impact**

Total impact is the sum of primary and induced impacts.

## **Value Added**

Value added refers to the current dollar contribution to production by an individual producer, industry or sector during a specified time period. It is measured as the difference between gross output and goods and services purchased for use in production. (These purchased goods and services are also called input purchases or intermediate inputs.) Equivalently, value added consists of employee compensation, production-related taxes, imports less subsidies and gross operating surplus. Value added can be summed or aggregated across individual producers over an entire sector, industry or nation; at the national level, total value added equals GDP. The BEA publishes national- and selected sector-level annual and quarterly measures of value added, as well as selected annual industry measures.

<sup>4</sup> National Bureau of Economic Research. “Statement of the NBER Business Cycle Dating Committee on the Determination of the Dates of Turning Points in the U.S. Economy.”

<sup>5</sup> Catherine Rampell. 2009. “‘Great Recession’: A Brief Etymology.” New York Times. March 11, 2009; Courtney Schlisserman. 2010.

“‘Great Recession’ Gets Recognition as Entry in AP Stylebook.” Bloomberg. February 23, 2010; Neil Irwin. 2010. “It’s Official: The Great Recession Ended Last Summer.” Washington Post. September 20, 2010.

<sup>6</sup> Bureau of Labor Statistics. 2010. “Fact Sheet on Seasonal Adjustment in the CPI.” February 23, 2010.

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