Federal Aviation Administration

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

2020 State Supplement

Introduction

"Furthering economic growth and development, civil aviation provides the means of transporting millions of passengers and tons of freight to all corners of the globe every day. Consumers rely on this physical connectivity to improve their quality of life and businesses depend on it to facilitate transactions, both of which are key to increasing a nation's economic productivity and prosperity."

— The Economic Impact of U.S. Civil Aviation: 2020, August 2022

This report supplements Federal Aviation Administration's (FAA) publication The Economic Impact of U.S. Civil Aviation: 2020, released in August 2022. The Economic Impact Report, or The National Report, presents economic statistics on the impact of the industry on the U.S. economy at the national level for the year 2020. This supplement, also known as The State Report, examines the impact of the industry at the state level, a comparison of impacts across states, the state-level enabling impacts, and FAA spending impacts for 2020.[1] The COVID-19 public health emergency impacted civil aviation. The sections below will highlight the role civil aviation sectors has for each state, while detailing the impact COVID-19 had on those civil aviation sectors for each state.

As presented in The Economic Impact of U.S. Civil Aviation: 2020, issued in 2022,- all civil aviation activity, across both the direct and catalytic sectors, amounts to 2.3 percent of U.S. Gross Domestic Product (GDP), and generated $0.9 trillion in total economic activity and supported 4.9 million jobs with $259.1 billion in earnings.[2] Considering only the direct sectors, the impact is 1.3 percent of GDP, $535 billion in economic activity, and over 2.6 million jobs. At the state level, the intensity of the impact varies by population, number of airports, civil aviation manufacturing, tourism, and other civil aviation related business activities.

The National Report incorporated the 2018-2020 years' data from the U.S. Department of Commerce, Department of Transportation, Department of Labor, and the National Science Foundation. The U.S. Department of Commerce completed its 2017 Economic Census data collection and reporting. These data were incorporated into the estimates for manufacturing, air couriers, and travel arrangements. Due to using this updated data source, FAA did not produce national estimates for Civilian Avionics Manufacturing. Therefore, this report will not cover Civilian Avionics Manufacturing.

More recent Regional Input-Output Modeling System (RIMS II) multipliers from the Bureau of Economic Analysis (BEA) reflecting the 2012 input-output benchmark tables (I-O tables) and the 2020 regional economic

accounts are also incorporated in this report. The incorporation of the new regional accounts (replacing the previous data from 2018) into the calculation of the new multipliers captures changes to the structure of the U.S. and regional economies that occurred during the year.

The State Report provides snapshots of aviation-related economic activity for all 50 states and the District of Columbia during calendar year 2020. The report is organized as follows: The first section covers the economic performance of state economies. The second section briefly examines state-level economic impacts of the civil aviation industry by the type of expenditure categories included in The National Report. These expenditure categories are: airline operations, airport operations, general aviation, aircraft manufacturing, research and development, air couriers, visitor expenditures, and travel arrangements. State-level estimates of enabling effects, or economic activities which depend on air transportation, appear in the third section. Estimates of the impact of FAA spending in each state are presented in the fourth section. Fact sheets on each of the 50 states and the District of Columbia are available at www.faa.gov/economic-impact

What's New?

This report incorporates the 2020 year's data from the U.S. Department of Commerce, Department of Transportation, Department of Labor, and the National Science Foundation. The U.S. Department of Commerce completed its 2017 Economic Census data collection and reporting. These data were incorporated into the estimates for manufacturing, air couriers, and travel arrangements.

Additionally, Civilian Avionics Manufacturing expenditure categories was dropped from this report. This was due to incorporating the 2017 Economic Census data and The National Report was unable to produce estimates for this category.

More recent RIMS II multipliers from the BEA reflecting the 2012 input-output benchmark tables (I-O tables) and the 2020 annual regional economic accounts are also incorporated in this report. The incorporation of the new regional accounts (replacing the previous data from 2018) into the calculation of the new multipliers captures changes to the structure of the U.S. and regional economies that occurred during the year. The new multipliers mainly show changes to impacts on employment across the relevant industries and states with most of them lower than the previous version of multipliers.

State Economic Impact

In addition to providing connectivity and increased accessibility, aviation is important to a state's economic performance because it supports economic output, attracts business and tourism, supports local economic development, and retains jobs that might otherwise be relocated elsewhere.

The state-level estimates that appear in this report are based on the same methodology as the estimates that appear in The National Report and represent direct and catalytic expenditures on aviation-related economic activities. Civil aviation-related economic activities cover eight different expenditure categories. Direct expenditures account for the following six activities: airline operations, airport operations, general aviation, aircraft-related manufacturing, research and development, and air couriers. Catalytic expenditures cover two activities: visitor expenditures, and travel arrangements. Together, these direct and catalytic expenditures use the RIMS II multipliers for each state to produce estimates of the additional secondary impacts of aviation expenditures.[3]

The sum of the primary and secondary impacts is the total impact of civil aviation on a state's economy. When summed, the primary impacts for state-level estimates equal the national-level estimates. However, because of differences in multipliers, the summed state-level impacts will not equal the national-level estimates for total economic impacts. Examples of those differences include multipliers that are state and industry specific and multipliers that do not incorporate the interaction between states.

Based on multipliers provided by the RIMS II model, an estimate of value-added activities within the civil aviation sector is used to identify the contribution of civil aviation-related economic activity. This measure is reported as a percentage of state GDP, representing aviation's contribution to the state's economy.[4]

Total economic impact on output by state (including the District of Columbia) appears in Table 1 (column 2). Data on earnings, value added, and jobs generated by the aviation industry also appear in the table (columns 3, 4, and 5). Other information in Table 1 includes contributions of aviation to state GDP and aviation-related jobs as a percent of total jobs (columns 6 and 7). Information on output (economic activity), earnings, jobs, and contribution to state GDP can also be found in the state fact sheets www.faa.gov/economic-impact.

Nationally, the direct impact is 1.3 percent of GDP and including catalytic impacts the contribution of civil aviation is 2.3 percent of GDP in 2020.[5] Table 1 shows at the state level, the value of the contribution to a state's GDP of direct and catalytic (visitor spending and travel arrangements) impacts range from 8.5 percent (Hawaii) to a low of 0.2 percent (Delaware).

At the state level, aviation-related output is associated with population and overall economic activity. The three largest states in terms of populations are California, Texas, and Florida, which are also the top three states in terms of overall aviation economic activity.

Table 1 – Total Economic Impacts of Civil Aviation by State, Calendar Year 2020

State	Output ($Millions)	Earnings ($Millions)	Value Added ($Millions)	Jobs	Value Added Share ofState GDP	Jobs Share of State Total [9]
Alabama	4,828	1,266	2,492	29,144	1.1%	1.1%
Alaska	4,619	1,314	2,438	30,262	4.8%	7.0%
Arizona	22,864	6,182 1	2,403	130,480	3.2%	3.3%
Arkansas	3,451	829	1,725	18,452	1.3%	1.1%
California	95,186	27,038	51,420	498,053	1.7%	2.2%
Colorado	19,288	5,592	10,605 1	10,835	2.7%	2.9%
Connecticut	12,032	2,815	6,203	45,916 2	.2%	2.1%
Delaware	283	63	152	1,375	0.2%	0.2%
District of Columbia	3,198	269	1,763	5,304	1.2%	0.6%
Florida	69,357	20,385	39,369	472,909	3.5%	3.7%
Georgia	23,919	6,462	12,907	144,060	2.1%	2.3%
Hawaii	12,620	3,669	7,042	77,623	8.5%	9.5%
Idaho	2,279	622	1,232 1	6,718	1.4%	1.6%
Illinois	25,506	7,163	13,836	138,819	1.6%	1.8%
Indiana	9,272	2,461	4,837	60,128	1.3%	1.6%
Iowa	2,255	585	1,202	15,051	0.6%	0.7%
Kansas	5,738	1,295	2,892	25,225	1.6%	1.3%
Kentucky	12,460	3,203	6,485 7	8,632	3.0%	3.2%
Louisiana	5,760	1,564	3,048 3	7,228	1.3%	1.4%
Maine	1,616	432	864	9,404	1.2%	1.2%
Maryland	6,909	1,816	3,870	35,884	0.9%	1.0%
Massachusetts	10,888	2,969	6,053	57,101	1.0%	1.2%
Michigan	11,441	3,234	6,250	71,079	1.2%	1.3%
Minnesota	9,562	2,612	5,110	62,331	1.4%	1.7%
Mississippi	1,598	400	803	8,854	0.7%	0.6%
Missouri	14,398	3,622	7,674	77,279	2.3%	2.1%
Montana	2,408	665	1,258	16,808	2.4%	2.5%
Nebraska	2,549	692	1,395	18,752	1.0%	1.4%

State	Output ($Millions)	Earnings ($Millions)	Value Added ($Millions)	Jobs	Value Added Share ofState GDP	Jobs Share of State Total [9]
Nevada	12,657	3,587	7,208	78,171	4.2%	4.4%
New Hampshire	1,098	280	582	6,171	0.7%	0.7%
New Jersey	15,338	4,144	8,420	79,401	1.4%	1.5%
New Mexico	2,070	567	1,094	15,191	1.1%	1.4%
New York	34,094	9,122	19,450	182,337	1.1%	1.5%
North Carolina	13,058	3,634	7,145	84,564	1.2%	1.4%
North Dakota	1,805	452	945	11,169	1.7%	2.0%
Ohio	13,576	3,569	7,073	79,463	1.0%	1.2%
Oklahoma	3,963	1,073	2,073	25,780	1.1%	1.1%
Oregon	8,075	2,164	4,431	53,005	1.8%	2.1%
Pennsylvania	16,172	4,369	8,761	98,883	1.1%	1.3%
Rhode Island	1,122	289	633	6,723	1.0%	1.1%
South Carolina	5,539	1,462	2,941	32,440	1.2%	1.1%
South Dakota	1,146	316	619	8,405	1.1%	1.4%
Tennessee	21,211	5,817	11,450	131,818	3.0%	3.2%
Texas	68,682	18,948	36,811	411,966	2.1%	2.3%
Utah	12,401	3,675	6,608	78,714	3.3%	3.7%
Vermont	602	144	297	3,193	0.9%	0.8%
Virginia	9,091	2,424	4,979	53,740	0.9%	1.0%
Washington	28,283	7,793	14,936	140,839	2.4%	3.2%
West Virginia	1,022	204	437	4,607	0.6%	0.5%
Wisconsin	5,006	1,362	2,702	34,879	0.8%	1.0%
Wyoming	917	247	474	5,780	1.3%	1.4%

Contribution to State Gross Domestic Product, Top Ten States

Table 2
2020 Total Economic Impact of Civil Aviation

2020 Total Economic Impact of Civil Aviation (Top 10 States, Percent)	
State	**Contribution to State GDP**
Hawaii	8.5%
Alaska	4.8%
Nevada	4.2%
Florida	73.5%
Utah	3.3%
Arizona	3.2%
Tennessee	3.0%
Kentucky	3.0%
Colorado	2.7%
Washington	2.4%

Table 3
2020 Direct Economic Impact of Civil Aviation

2020 Direct Economic Impact of Civil Aviation (Top 10 States, Percent)	
State	**Contribution to State GDP**
Alaska	3.5%
Hawaii	3.0%
Tennessee	2.3%
Kentucky	2.3%
Utah	2.3%
Arizona	2.0%
Connecticut	1.9%
Washington	1.7%
Montana	1.7%
Missouri	1.5%

Table 3 shows the ranking of top ten states with the highest percent contribution to state GDP based on the different types of economic impact (total, direct, and catalytic).

Table 4
2020 Total Catalytic Impact of Civil Aviation

2020 Catalytic Economic Impact of Civil Aviation (Top 10 States, Percent)	
State	**Contribution to State GDP**
Hawaii	5.6%
Nevada	2.8%
Florida	2.2%
Alaska	1.3%
Arizona	1.2%
Colorado	1.2%
Utah	1.0%
Illinois	0.9%
Texas	0.8%
Georgia	0.8%

Due to COVID-19, the ranking of top ten states for total economic impact differs compared to historical reports. A decline in tourism decreased the role of catalytic impact and increased the role of direct impact. This resulted in Alaska reaching number two in ranking moving past five other states. Table 4 presents the top ten states for contribution to state GDP based on catalytic economic impact.

Table 3 also shows the top ten states for contribution of GDP based on direct economic impact. For 2020, Alaska ranked first for direct economic impact while Washington dropped to 8th as COVID-19 and issues related to the 737 Max impacted aircraft manufacturing. Also noteworthy, FedEx maintains its headquarters in Tennessee (ranked 3rd) and air courier expenditures accounted for almost 55 percent of Tennessee's total aviation-related economic activity.

Catalytic Impacts

Table 5 – Catalytic Economic Impacts of Civil Aviation by State, Calendar Year 2020

State	Output ($Millions)	Earnings ($Millions)	Value Added ($Millions)	Jobs	Value Added Share ofState GDP	Jobs Share of State Total [6]
Alabama	1,407	410	822	12,954	0.4%	0.5%
Alaska	1,114	329	661	10,116	1.3%	2.3%
Arizona	7,877	2,348	4,701	59,154	1.2%	1.5%
Arkansas	803	232	466	7,108	0.3%	0.4%
California	39,059	11,687	23,003	238,064	0.8%	1.0%
Colorado	8,088	2,444	4,802	55,060	1.2%	1.4%
Connecticut	1,751	487	1,033	9,891	0.4%	0.4%
Delaware	142	35	83	941	0.1%	0.2%
District of Columbia	1,805	173	1,089	3,914	0.8%	0.5%
Florida	41,567	12,547	24,876	309,929	2.2%	2.4%
Georgia	8,531	2,524	5,049	68,877	0.8%	1.1%
Hawaii	7,732	2,304	4,607	51,532	5.6%	6.3%
Idaho	891	260	524	8,243	0.6%	0.8%
Illinois	12,741	3,685	7,413	79,232	0.9%	1.1%
Indiana	2,622	748	1,514	21,510	0.4%	0.6%
Iowa	923	261	538	8,057	0.3%	0.4%
Kansas	638	173	372	5,208	0.2%	0.3%
Kentucky	2,653	725	1,524	20,408	0.7%	0.8%
Louisiana	2,614	762	1,525	21,599	0.7%	0.8%
Maine	499	149	297	3,538	0.4%	0.4%
Maryland	3,440	927	2,054	20,026	0.5%	0.6%
Massachusetts	6,008	1,714	3,587	34,689	0.6%	0.8%
Michigan	5,899	1,761	3,456	41,244	0.7%	0.8%
Minnesota	4,836	1,413	2,807	39,555	0.7%	1.1%
Mississippi	425	121	247	3,658	0.2%	0.2%
Missouri	4,505	1,240	2,631	33,499	0.8%	0.9%
Montana	644	190	381	6,116	0.7%	0.9%
Nebraska	1,096	320	646	9,634	0.5%	0.7%
Nevada	8,162	2,399	4,909	54,804	2.8%	3.1%

State	Output ($Millions)	Earnings ($Millions)	Value Added ($Millions)	Jobs	Value Added Share ofState GDP	Jobs Share of State Total [9]
New Hampshire	403	112	240	2,523	0.3%	0.3%
New Jersey	7,130	1,979	4,222	43,022	0.7%	0.8%
New Mexico	704	206	415	6,644	0.4%	0.6%
New York	22,562	6,154	13,504	131,957	0.8%	1.1%
North Carolina	5,765	1,695	3,401	45,759	0.6%	0.8%
North Dakota	508	138	299	4,343	0.5%	0.8%
Ohio	4,622	1,340	2,671	39,287	0.4%	0.6%
Oklahoma	1,378	410	806	12,541	0.4%	0.6%
Oregon	3,226	928	1,913	26,748	0.8%	1.1%
Pennsylvania	7,055	2,009	4,125	52,267	0.5%	0.7%
Rhode Island	628	167	375	3,749	0.6%	0.6%
South Carolina	1,779	512	1,046	12,929	0.4%	0.5%
South Dakota	384	112	226	3,270	0.4%	0.5%
Tennessee	4,555	1,312	2,662	29,682	0.7%	0.7%
Texas	25,232	7,474	14,768	196,491	0.8%	1.1%
Utah	3,467	1,026	2,037	28,998	1.0%	1.4%
Vermont	238	67	141	1,747	0.4%	0.4%
Virginia	3,826	1,084	2,271	28,541	0.4%	0.5%
Washington	7,233	2,093	4,235	48,199	0.7%	1.1%
West Virginia	187	50	110	1,510	0.1%	0.2%
Wisconsin	2,372	693	1,378	20,319	0.4%	0.6%
Wyoming	194	54	115	1,556	0.3%	0.4%

Table 5 presents the economic impact for all 50 states and the District of Columbia of visitor expenditures and travel arrangements (the catalytic impact), on output and contribution to state GDP.

Direct Impacts

Table 6 – Direct Economic Impacts of Civil Aviation by State, Calendar Year 2020

State	Output ($Millions)	Earnings ($Millions)	Value Added ($Millions)	Jobs	Value Added Share ofState GDP	Jobs Share ofState Total [9]
Alabama	5,660	1,377	2,752	27,557	1.2%	1.0%
Alaska	4,130	1,087	2,041	22,935	3.8%	5.0%
Arizona	26,119	6,331	13,270	117,226	3.8%	3.0%
Arkansas	4,197	908	1,971	18,204	1.5%	1.1%
California	93,842	24,247	46,735	412,595	1.6%	1.7%
Colorado	16,153	4,158	8,208	79,204	2.2%	2.1%
Connecticut	18,713	4,070	9,317	61,655	3.3%	2.7%
Delaware	270	52	131	878	0.2%	0.1%
District of Columbia	3,034	171	1,433	2,685	1.0%	0.3%
Florida	41,743	10,787	21,367	223,967	2.0%	1.8%
Georgia	23,496	5,749	11,884	112,647	2.0%	1.8%
Hawaii	10,372	2,642	5,014	51,856	5.4%	5.6%
Idaho	1,853	445	921	10,429	1.2%	1.0%
Illinois	23,340	5,840 1	1,499	105,837	1.3%	1.3%
Indiana	9,322	2,272	4,561	49,238	1.2%	1.2%
Iowa	2,208	498	1,078	11,033	0.6%	0.5%
Kansas	13,938	2,912	6,801	52,031	4.0%	2.7%
Kentucky	10,019	2,385	4,950	55,985	2.4%	2.2%
Louisiana	5,978	1,506	2,876	28,772	1.1%	1.1%
Maine	2,166	516	1,078	0,595	1.7%	1.3%
Maryland	6,476	1,561	3,339	27,427	0.8%	0.7%
Massachusetts	9,084	2,072	4,451	38,021	0.8%	0.8%
Michigan	10,490	2,609	5,201	51,710	1.0%	0.9%
Minnesota	9,903	2,398	4,772	46,390	1.3%	1.2%
Mississippi	1,550	346	725	7,327	0.6%	0.5%
Missouri	10,018	2,339	5,071	45,775	.6%	1.2%
Montana	2,224	565	1,086	13,548	2.1%	2.0%
Nebraska	2,133	523	1,078	12,473	0.9%	0.9%
Nevada	8,092	1,990	4,075	40,646	2.4%	2.2%

State	Output ($Millions)	Earnings ($Millions)	Value Added ($Millions)	Jobs	Value Added Share ofState GDP	Jobs Share ofState Total [9]
New Hampshire	403	112	240	2,523	0.3%	0.3%
New Jersey	7,130	1,979	4,222	43,022	0.7%	0.8%
New Mexico	704	206	415	6,644	0.4%	0.6%
New York	22,562	6,154	13,504	131,957	0.8%	1.1%
North Carolina	5,765	1,695	3,401	45,759	0.6%	0.8%
North Dakota	1,758	387	824	8,359	1.5%	1.4%
Ohio	4,622	1,340	2,671	39,287	0.4%	0.6%
Oklahoma	1,378	410	806	12,541	0.4%	0.6%
Oregon	3,226	928	1,913	26,748	0.8%	1.1%
Pennsylvania	7,055	2,009	4,125	52,267	0.5%	0.7%
Rhode Island	628	167	375	3,749	0.6%	0.6%
South Carolina	1,779	512	1,046	12,929	0.4%	0.5%
South Dakota	384	112	226	3,270	0.4%	0.5%
Tennessee	4,555	1,312	2,662	29,682	0.7%	0.7%
Texas	25,232	7,474	14,768	196,491	0.8%	1.1%
Utah	3,467	1,026	2,037	28,998	1.0%	1.4%
Vermont	238	67	141	1,747	0.4%	0.4%
Virginia	3,826	1,084	2,271	28,541	0.4%	0.5%
Washington	7,233	2,093	4,235	48,199	0.7%	1.1%
West Virginia	187	50	110	1,510	0.1%	0.2%
Wisconsin	2,372	693	1,378	20,319	0.4%	0.6%
Wyoming	194	54	115	1,556	0.3%	0.4%

Economic Impact by Expenditure Category - Direct

Table 6 highlights the total direct economic impact that civil aviation has on the U.S. economy. Below are the six direct expenditure categories and the top five states in output level for each category. The national total direct output values cited below come from The National Report. As previously described these national values do not equal the summed state-level values.

Airline Operations

Table 7 – Total Economic Output for Airlines, Top Five States

2020 Economic Impact of Civil Aviation (Top Five States, Billions of Dollars)	
State	**Airlines Operations**
California	14.4
Texas	11.5
Florida	11.4
New York	4.4
Illinois	4.1

Of all the expenditure categories for both direct and catalytic, airline operations accounted for the second-largest share of the economic impact, after visitor expenditures. Airline operations expenditures include spending on air transportation of passengers and freight on commercial passenger airlines. In 2020, the national total output by airlines was $140.0 billion. Table 7 presents the top five states by total airline output. Together, these top five states contributed almost one-third of the national total output by airlines in 2020.

Airport Operations

Table 8 – Total Economic Output for Airports, Top Five States

2020 Economic Impact of Civil Aviation (Top Five States, Billions of Dollars)	
State	**Airport Operations**
California	12.2
Florida	7.8
Texas	6.1
Illinois	4.7
Utah	4.4

Airports contributed $107.3 billion in total output to the U.S. economy in 2020. California, Florida, Texas, Illinois, and Utah were the top five states in the total economic impact of airport operations (Table 8). Airports in these top five states handle seven of the top fifteen airports based on total itinerant operations.

General Aviation

Table 9 – Total Economic Output for General Aviation, Top Five States

2020 Economic Impact of Civil Aviation (Top Five States, Billions of Dollars)	
State	**General Aviation Operations**
California	4.3
Florida	3.1
Texas	3.0
Arizona	1.3
Ohio	1.3

General aviation operations contributed $47.4 billion to total national civil aviation-related economic output in 2020. California ranked first in total economic output for general aviation at $4.3 billion in 2020 (Table 9). The warm weather states of Florida, Texas, and Arizona followed behind with $3.1 billion, $ 3.0 billion, and $1.3 billion respectively.

Aircraft Manufacturing

Table 10 – Total Economic Output for Aircraft, Aircraft Engine, and Parts Manufacturing, Top Five States

2020 Economic Impact of Civil Aviation (Top Five States, Billions of Dollars)	
State	**Aircraft Manufacturing**
Texas	15.8
California	15.1
Connecticut	8.8
Washington	8.2
Arizona	7.6

COVID-19 and issues related to the 737 Max impacted aircraft manufacturing throughout the United States in 2020.[7] Washington's economy was relatively more affected and experienced a decline of over $35 billion in total output from 2018 to 2020, falling from first place to fourth place in 2020 (Table 10). The top five states together accounted for almost 43 percent of national aviation-related manufacturing in the United States.

Research and Development

Table 11 – Total Economic Output for R&D, Top Five States

2020 Economic Impact of Civil Aviation (Top Five States, Billions of Dollars)	
State	**R & D**
Washington	3.2
California	3.0
Texas	2.1
Missouri Ohio	1.6
Ohio	0.9

In 2020, the total economic output of aviation R&D amounted to $22.2 billion. The top-five states with R&D were Washington, California, Texas, Missouri, and Ohio (Table 11). These are the same five states as in 2018, with Washington and California switching places and Missouri and Ohio switching places. In all, these five states accounted for more than 48 percent of the national total.

Air Couriers

Table 12 – Total Economic Output for Air Couriers, Top Five States

2020 Economic Impact of Civil Aviation (Top Five States, Billions of Dollars)	
State	**Air Couriers**
Tennessee	11.6
Kentucky	7.1
California	7.1
Texas	4.9
Florida	2.9

Express air cargo has become an integral part of everyday life for businesses and consumers across the globe. Air couriers are engaged in air delivery of individually addressed letters, parcels, and packages (generally under 100 lbs.). Retail outlets of the largest air couriers, FedEx and UPS, are located in almost every nook and cranny of the United States. Air transportation's infrastructure, aircraft and technological advances have enabled air couriers to provide their customers with quick and reliable services.

The total economic output of air couriers grew 16.4 percent in real terms between 2018 and 2020, even as COVID-19 negatively impacted other civil aviation sectors. Tennessee, Kentucky, Texas, California, and Florida were the top five states in total economic output for air couriers. Tennessee and Kentucky are home to FedEx and UPS international air hubs, providing considerable economic development and growth potential for local residents (Table 12).

Economic Impact by Expenditure Category - Catalytic

The prior section focused on the direct expenditure categories. This section covers the two remaining expenditure categories. To find the total impact that these catalytic expenditure categories have on the U.S. economy see Table 5. The tables below cover the individual impact these categories have on the U.S. economy. The national total catalytic output values cited below come from The National Report. As previously described these national values do not equal the summed state-level values. Additionally, visitor expenditures is split into two subgroupings: airlines and general aviation.

Visitor Expenditures

Table 13 – Total Economic Output for Visitor Expenditures: Airlines, Top Five States

2020 Economic Impact of Civil Aviation (Top Five States, Billions of Dollars)	
State	**Visitor Expenditures- Airlines**
Florida	38.9
California	36.0
Texas	23.9
New York	21.3
Illinois	11.7

Visitor expenditures by travelers using air transportation contributed the largest single portion of the total economic impact of civil aviation in 2020. At the national level, commercial airline visitor expenditures contributed $349.9 billion to the U.S. economy and supported over 2.2 million jobs. In 2020, Florida, California, Texas, New York, and Illinois were the top five states for commercial airline visitor expenditures (Table 13). These five states are popular tourist and business destinations, and are home to some of the busiest airports in the nation. In terms of enplanements, nine out of the 20 busiest airports in the nation are located within these states.

Visitor Expenditures

Table 14 – Total Economic Output for Visitor Expenditures: General Aviation, Top Five States

2020 Economic Impact of Civil Aviation (Top Five States, Billions of Dollars)	
State	**Visitor Expenditures- GA**
California	1.2
Florida	0.9
Texas	0.8
Alabama	0.3
Arizona	0.3

The top five states for general aviation visitor expenditures were California, Florida, Texas, Alabama, and Arizona (Table 14). All five states experience mild weather conditions that are conducive to general aviation operations. Nationally, general aviation visitor expenditures amounted to $12.9 billion in total output and supported 74 thousand jobs.

Travel Arrangements

Table 15 – Total Economic Output for Travel Arrangements, Top Five States

2018 Economic Impact of Civil Aviation (Top Five States, Billions of Dollars)	
State	**Avionics Manufacturing**
California	1.9
Florida	1.7
New York	1.1
Illinois	0.8
Washington	0.7

In 2020, the top five states for travel arrangement and reservation services output were California, Florida, New York, Illinois, and Washington (Table 15). In all, these five states accounted for almost 44 percent of the national total.

More information about the economic impact of civil aviation for each state is available at www.faa.gov/economic-impact, which contains civil aviation-related data on all 50 states and the District of Columbia. These fact sheets report data on aviation-related economic activity, including jobs, earnings, and other economic statistics.

The next section covers the enabling impacts of civil aviation, followed by FAA spending by state.

Enabling Impact by State

First introduced in The National Report (2011), the enabling impact of air transportation describes transportation services in terms of certain characteristics: speed, flexibility, reliability, cost, and safety.[8]

Safety is always the most important characteristic for civil aviation, but speed, flexibility, and reliability are also important for passengers facing travel time constraints. Speed and reliability are highly important for high-value cargo. The value of air transportation is partly determined by passenger spending at their destinations and the value of goods transported by air. Destination spending (or visitor expenditures) was covered earlier in this report. This section presents air freight findings for 2020 by state.

Value of Air Freight Flows by Commodity

Table 16 – Top Ten Value of Commodities Transported by Air, 2020

Commodity	Domestic and Export Flows ($Billions)
Electronics	151.7
Machinery	88.7
Precision instruments	87.0
Misc. manufactured products	70.4
Transport equipment	65.0
Pharmaceuticals	55.5
Chemical products	18.4
Motorized vehicles	12.4
Mixed freight	11.4
Articles-base metal	10.6
All other commodities	49.5
All Commodities	620.7

Source: U.S. Department of Transportation, Federal Highway Administration and Bureau of Transportation Statistics, *Freight Analysis Framework*, Version 4.5.1

Across all commodities, $620.7 billion in goods was transported by air in 2020 (Table 16). Data for this section came from the Freight Analysis Framework published by the U.S. Department of Transportation.[9]

Among the commodities normally transported by air are manufactured and technology-oriented goods. Total values of the flows for the top ten commodities transported by air in 2020 appear in Table 16.[10] Electronics ($151.7 billion), machinery ($88.7 billion), and precision instruments ($87.0 billion) were the commodities with the three highest total values transported by air. Electronics accounted for over 24 percent of the value of all commodities, while machinery and precision instruments accounted for 14.3 percent and 14.0 percent, respectively. Together, the top three commodities accounted for almost 53 percent of the total shipment value and the top five accounted for over 74 percent.

Domestically across all categories, the majority of the value of goods transported is carried by truck and only about 1 percent is transported by air. Even so, it may seem impractical to move items under most of these headings by air, but the categories are quite broad and encompass a range of individual products. For example, Transport Equipment includes locomotives and other railway equipment, but it also includes high-value items such as spacecraft and spacecraft parts. In terms of dollars per ton of goods shipped, those moved by air are valued at about $71,600/ton while for all modes combined the value is under $900/ton. In fact, the mode with the second highest value per ton is multi-modal including mail which averages just over $4,600/ton. All other modes individually carried goods valued under $1,000/ton on average.

Value of Air Freight Flows by State

Table 17 – Top Five States, Value of Goods Transported by Air, 2020

State	Domestic and Export Flows ($Billions)
California	104.4
Texas	72.5
New York	41.4
Washington	30.9
Florida	27.7
All other states	343.8
All States	**620.7**

Source: U.S. Department of Transportation, Federal Highway Administration and Bureau of Transportation Statistics, *Freight Analysis Framework*, Version 4.5.1

Among the individual states, the value of freight transported by air includes goods transported within the state, to other states, and to other countries (exports). In 2020, California was ranked highest with $104.4 billion worth of goods transported by air. Texas was second at $72.5 billion. The next three states were New York ($41.4 billion), Florida ($30.9 billion), and Washington ($27.7 billion) (Table 17). California, New York, Texas and Florida are the top four states in terms of both population and economic size, while Washington is ranked 10th for gross domestic product and 13th by population.[11] By value, goods shipped from California accounted for 16.8 percent of the value of goods shipped from all states and the District of Columbia; goods shipped from the top three states accounted for just over 35 percent; and goods shipped from the top five states accounted for over 44 percent. All five states in Table 17 are the same states that appeared on the previous State Report list, with Washington moving from 4th to 5th.

The latest estimates from the Freight Analysis Framework show that aviation continues to play an important role in transporting higher-value and perishable goods. The commodity categories that appear at the top of the list in Table 16 are mainly the same categories that lead the lists for the top states in Table 17. For example, four of the top five categories of goods listed for the nation as a whole also appear in the top five list of goods transported from California. These categories are electronics, precision instruments, machinery, and miscellaneous manufactured products.

Enabled flow estimates for each state and the District of Columbia are available at www.faa.gov/economic-impact.

The next section covers the economic impact of FAA spending, providing the latest updated data from fiscal year 2020.

FAA Spending

The FAA's spending in states represents the agency's contribution to the U.S. economy. This section presents the economic impact of those expenditures on each of the 50 states and the District of Columbia for fiscal year (FY) 2020. Apart from Washington, D.C. where the headquarters results in outlays, the largest driver of FAA spending is the presence of FAA facilities and airports which are spread throughout all 50 states. FAA spending includes payroll, non-payroll expenses (including facilities and equipment, operations, research, etc.), and grants issued through the Airport Improvement Program (AIP). The FAA's abilities to maintain safe skies, finance infrastructure projects, and support job creation are valuable to state and local officials. These expenditures assist local economies in important ways by:

- Keeping the civil aviation industry operating safely and efficiently,
- Providing federal, state, and local job opportunities,
- Facilitating opportunities for private businesses,
- Distributing aid for infrastructure building by local airports, and
- Modernizing the air traffic system with NextGen investment.

Total spending by the FAA at the state level was $18.7 billion in FY 2020 (Table 18), an increase to that spent in FY2018. FAA expenditures were highest in the District of Columbia, Texas, California, Florida, and Virginia. expenditures in these five states comprised of about 40 percent for all of FAA spending in FY 2020.

FAA spending not only supports direct federal employment, earnings, and jobs, but also induces other economic activities within state economies. Estimates of the total impact of FAA spending are derived through the use of the RIMS II model. The total impact of FAA spending, or the sum of primary FAA expenditures plus secondary impacts, was $32.4 billion (Table 19). The total impact of FAA spending supported more than 189,000 jobs with earnings totaling $10.1 billion. Texas, Virginia, and Florida were the top three state beneficiaries of FAA spending in terms of this total impact.

Table 18 – FAA Spending by State, FY 2020

State	FAA Spending ($Millions)	Percent of FAA Spending
Alabama	128.4	0.7
Alaska	401.0	2.1
Arizona	226.1	1.2
Arkansas	83.3	0.4
California	1,113.8	6.0
Colorado	444.3	2.4
Connecticut	53.9	0.3
Delaware	13.0	0.1
District of Columbia	2,766.1	14.8
Florida	1,104.6	5.9
Georgia	548.9	2.9
Hawaii	155.9	0.8
Idaho	67.8	0.4
Illinois	890.1	4.8
Indiana	250.1	1.3
Iowa	97.6	0.5
Kansas	179.9	1.0
Kentucky	144.2	0.8
Louisiana	132.1	0.7
Maine	57.1	0.3
Maryland	666.4	3.6
Massachusetts	357.0	1.9
Michigan	294.0	1.6
Minnesota	221.5	1.2
Mississippi	74.9	0.4
Missouri	324.0	1.7
Montana	110.1	0.6
Nebraska	77.1	0.4
Nevada	193.7	1.0
New Hampshire	163.1	0.9
New Jersey	396.2	2.1
New Mexico	127.4	0.7
New York	793.2	4.3
North Carolina	280.3	1.5
North Dakota	279.5	1.5
Ohio	311.9	1.7
Oklahoma	916.5	4.9
Oregon	197.3	1.1
Pennsylvania	278.4	1.5
Rhode Island	11.8	0.1
South Carolina	142.5	0.8
South Dakota	46.6	0.2
Tennessee	256.0	1.4
Texas	1,322.5	7.1
Utah	180.5	1.0
Vermont	23.3	0.1
Virginia	1,087.3	5.8
Washington	443.8	2.4
West Virginia	57.5	0.3
Wisconsin	111.6	0.6
Wyoming	49.9	0.3
State Total	18,654.3	100.0

Table 19 – Total Impact of FAA Spending by State, FY 2020

	Total: Primary + Secondary Impacts		
State	Output ($Millions)	Earnings ($Millions)	Jobs
Alabama	254.9	87.2	1,789
Alaska	602.0	213.3	3,686
Arizona	427.4	149.4	2,874
Arkansas	88.9	29.7	674
California	1,911.6	649.2	10,986
Colorado	866.5	300.2	5,386
Connecticut	87.4	29.2	488
Delaware	21.1	6.2	109
District of Columbia	2,989.9	288.2	4,862
Florida	2,075.8	732.3	15,517
Georgia	979.6	319.8	7,031
Hawaii	262.6	93.3	1,670
Idaho	121.6	43.1	899
Illinois	1,916.2	622.9	10,561
Indiana	454.2	145.7	2,863
Iowa	174.7	59.1	1,169
Kansas	284.9	85.1	1,755
Kentucky	274.5	86.9	1,743
Louisiana	243.3	82.9	1,643
Maine	97.5	34.9	714
Maryland	1,297.6	419.5	7,488
Massachusetts	634.9	209.7	3,579
Michigan	563.4	194.9	3,755
Minnesota	367.4	119.2	2,244
Mississippi	140.0	46.6	961
Missouri	648.6	203.2	4,088

	Total: Primary + Secondary Impacts		
State	Output ($Millions)	Earnings ($Millions)	Jobs
Montana	196.2	71.2	1,455
Nebraska	138.5	48.0	975
Nevada	337.9	120.0	2,219
New Hampshire	167.9	50.1	1,222
New Jersey	698.6	212.4	3,633
New Mexico	182.7	61.9	1,310
New York	1,189.6	386.1	6,776
North Carolina	573.6	194.9	3,864
North Dakota	517.8	163.8	2,808
Ohio	581.0	186.9	3,679
Oklahoma	1,669.8	570.0	11,789
Oregon	378.5	125.4	2,182
Pennsylvania	551.9	179.9	3,148
Rhode Island	15.7	4.7	93
South Carolina	292.8	97.6	2,036
South Dakota	81.0	28.8	569
Tennessee	497.8	157.1	2,943
Texas	2,881.1	948.0	18,428
Utah	344.8	115.4	2,321
Vermont	38.8	13.6	271
Virginia	2,109.0	685.3	12,081
Washington	691.1	228.3	4,008
West Virginia	92.4	29.2	582
Wisconsin	216.0	74.8	1,389
Wyoming	84.6	29.2	581
State Total	32,436.6	10,076.6	189,338

Conclusion

The State Report supplement updates and highlights the economic impact of civil aviation on all fifty state economies and the District of Columbia for 2020. The strength and importance of the civil aviation industry at the state level provides a platform for decision makers at the national and state levels to better formulate policies that support economic development and job creation. At the national level in 2020, direct civil aviation impacts were $535 billion in economic activity, and over 2.5 million jobs. When visitor spending and travel arrangements are included, the total supports $0.9 trillion in economic activity and 4.9 million jobs with $259.1 billion in earnings. Direct and catalytic impacts accounted for 2.3 percent of U.S. GDP.

As a result of COVID-19, civil aviation's contribution to Gross State Product decreased compared to 2018. Hawaii, Nevada, and Washington experienced the largest decreases ranging from a decrease of almost twelve percentage points to five percentage points. When looking at the direct impact of civil aviation on Gross State Product in percentage term Alaska (3.5 percent), Hawaii (3.0 percent), and Tennessee (2.3 percent) were now the new top three states. For catalytic impact of civil aviation on Gross State Product in percentage term Hawaii (5.6 percent), Nevada (2.8 percent), and Florida (2.2 percent) maintained their top three status in spite of the impact of COVID-19. Additionally, this report draws attention to the eight aviation-related economic categories that make up overall aviation economic activity for the states.

Due to the evolving nature of civil aviation, additional category estimates will be added to the report over time. For example, Commercial Space launches and unmanned aircraft systems are rapidly expanding industries but source data are sparse. As soon as reliable data are available, the inclusion of these categories will provide an even more robust picture of the importance of civil aviation to the U.S. Economy at both the national and state levels.

Notes

1. Previous versions of The State Report were published in 2009, 2011, 2015, 2017, and 2020. The 2020 version contained statistics for the year 2016. The National Report was published by the FAA in 2007, 2009, 2011, 2014, 2016, 2020, and 2021.

2. U.S. Department of Transportation, Federal Aviation Administration. 2022. The Economic Impact of U.S. Civil Aviation: 2020. August 2022. https://www.faa.gov/sites/faa.gov/files/2022-08/2022-APL-038%202022_economic%20impact_report.pdf

3. The RIMS II model was developed by the U.S. Department of Commerce, Bureau of Economic Analysis. Regional Input-Output Modeling System. http://www.bea.gov/regional/rims/index.cfm

4. State GDP is the sum of the value added of all economic activities in the state. GDP can also be measured as total economic activities less intermediate purchases.

5. U.S. Department of Transportation, Federal Aviation Administration. 2021. Op. cit.

6. Calculated using Bureau of Economic Analysis total employment data from the SAINC4 Personal Income and Employment by Major Component table.

7. U.S. Department of Transportation, Federal Aviation Administration. 2021. Op. cit.

8. Mariya A. Ishutkina and R. John Hansman. 2009. "Analysis of the Interaction Between Air Transportation and Economic Activity: A Worldwide Perspective," MIT International Center for Air Transportation.

9. U.S. Department of Transportation, Federal Highway Administration and Bureau of Transportation Statistics. 2019. Freight Analysis Framework. Versions 4.5.1.

10. For a list of the detailed commodities that make up the categories that appear on Table 15, see, U.S. Bureau of the Census, SCTG Commodity Codes, 2012 Commodity Flow Survey. November 2011. https://www2.census.gov/programs-surveys/cfs/technical-documentation/code-list/2012-manual.pdf

11. Based on 2018 population estimates from the U.S. Census Bureau, the five most populous states were ranked in the following order: California (39.5 million persons), Texas (28.6 million), Florida (21.2 million), New York (19.5 million), and Pennsylvania (12.8 million) (U.S. Department of Commerce, Bureau of the Census, Annual Estimates of the Resident Population: April 1, 2010 to July 1, 2019. 2019 Population Estimates. https://www.census.gov/programs-surveys/popest/data/tables.html. The size of each state's economy is measured in terms of state-level GDP. In 2018, the top five states by state GDP were California ($2,975.1 billion), Texas ($1,795.6 billion), New York ($1,705.0 billion), Florida ($1,050.3 billion), and Illinois ($863.0 billion) (U.S. Department of Commerce, Bureau of Economic Analysis, Regional Economic Accounts. http://www.bea.gov/regional/index.htm).

Appendix A Notes

1. U.S. Department of Transportation, Federal Aviation Administration. National Plan of Integrated Airport Systems (NPIAS). http://www.faa.gov/airports/planning_capacity/npias/

2. U.S. Department of Commerce, Bureau of the Census, Annual Estimates of the Resident Population: April 1, 2010 to July 1, 2019. 2019 Population Estimates. https://www.census.gov/programs-surveys/popest/data/tables.html.

3. U.S. Department of Commerce, Bureau of Economic Analysis. Regional Economic Accounts. https://www.bea.gov/data/economic-accounts/regional

4. U.S. Department of Commerce, International Trade Administration. Office of Travel and Tourism Industries. https://travel.trade.gov/

5. U.S. Department of Transportation, Federal Aviation Administration. Terminal Area Forecast (TAF). https://taf.faa.gov/

6. U.S. Department of Transportation, Bureau of Transportation Statistics. T-100 Segment Database.

7. Total economic impact is the sum of primary plus secondary impacts.

8. U.S. Department of Transportation, Federal Highway Administration and Bureau of Transportation Statistics. 2019. Freight Analysis Framework. Versions 4.5.1. https://www.bts.gov/faf/faf4

Glossary of Economic Terms

Catalytic Sector

This is a term used to categorize the various sectors within the civil aviation industry. In this report, these sectors provide goods and services that are related to, and partially dependent upon, civil aviation, but their main function is not to support aviation. The sectors categorized as catalytic are visitor expenditures and travel arrangers[1]

Direct Sector

This is a term used to categorize the various sectors within the civil aviation industry. In this report, these sectors provide goods and services that are fundamental to, and inseparable from, civil aviation. Airline operations, aircraft manufacturing, air couriers and others all are grouped in this category.

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 Bureau of Labor Statistics (BLS) publishes earnings data.

Employment (Jobs)

The BLS is responsible for collecting and publishing data on the number of persons employed within the United States. 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[2]

Enabling Impact

Enabling impact is the economic impact on employment and income generated by economic activities that are dependent on the availability of air transportation services.[3]

FAA Spending

FAA spending includes FAA expenditures on payroll, non-payroll (including facilities and equipment, operations, research), and grants issued through the Airport Improvement Program (AIP).

Gross Domestic Product

Gross domestic product (GDP) is a measure of overall economic production during a period of time. It represents 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 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[4]. 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, and thus exceeds GDP. The BEA publishes annual national and industry-level estimates of gross output.

Input

The total monetary value of goods and services consumed or used to produce a final good or service including capital, labor, energy, materials, and services.

Multipliers

Multipliers measure the impact of a particular category of spending on the rest of the economy, specifically 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

This is a term used to categorize the dollar amounts that flow through the civil aviation industry. Primary impact refers to the first round of expenditures within each sector that are collected from government and private sources. These amounts are applied against the RIMS II multipliers to derive secondary impacts.

Secondary Impact

This is a term used to categorize the dollar amounts that flow through the civil aviation industry. Secondary impacts result from follow-on spending down the supply chain after the initial round or primary impact.

This includes payments- to suppliers, and suppliers of suppliers, as well as spending by employees of those businesses. Secondary impacts therefore capture both interindustry and household spending that derive from activity in the respective sectors.

Total Economic Activity

Total economic activity is a term used interchangeably with gross output.

Total Impact

Total impact is the sum of primary and secondary 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.) Measures of value added consist 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.

Glossary Notes

1 ACI Europe, "The Social and Economic Impact of Airports in Europe," 2004, p. 5.

2 Bureau of Labor Statistics, U.S. Department of Labor, Chapter 2. Employment, Hours, and Earnings from the Establishment Survey. In Handbook of Methods, (accessed October 1, 2020) https://www.bls.gov/opub/hom/pdf/ces-20110307.pdf

3 Mariya A. Ishutkina and R. John Hansman. 2009. "Analysis of the Interaction Between Air Transportation and Economic Activity: A Worldwide Perspective," MIT International Center for Air Transportation.

4 Organization for Economic Co-operation and Development. 2002. "Glossary of Statistical Terms."

Acknowledgements

The Forecast and Performance Analysis Division is very grateful for the helpful contribution, comments and guidance from:

Chris Atkin, FAA

Edward Burns, FAA Contractor

Murali Darivemula, FAA Contractor

Lourdes Duca, FAA

Jon Henning, FAA

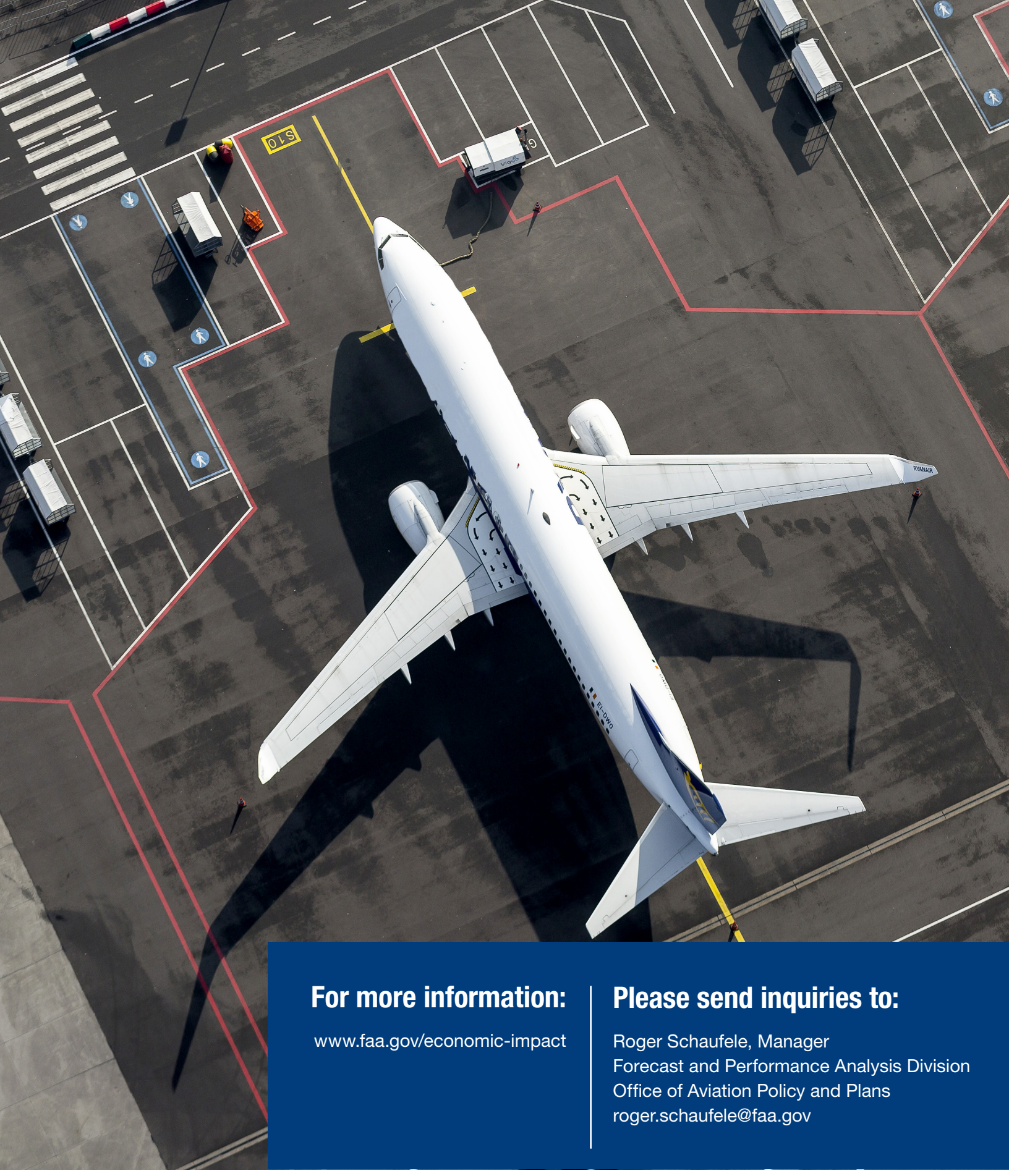
Ramesh Iyer, FAA Contractor

Sherri Jensen, FAA

Kathy Kowsky, FAA

Allison Ritman, FAA

Jonathan Stanewick, FAA



For more information:

www.faa.gov/economic-impact

Please send inquiries to:

Roger Schaufele, Manager
Forecast and Performance Analysis Division
Office of Aviation Policy and Plans
roger.schaufele@faa.gov