

Appendix C

ECONOMIC BENEFIT ANALYSIS

This section presents an analysis of economic benefits created by Flagstaff Airport (FLG). The airport is the primary aviation gateway for the Northern Arizona region, welcoming commerce and visitors while providing residents with access for outward travel to national and intercontinental destinations. The airport creates significant benefits that extend beyond the aviation community to impact economic growth and development as well as the quality of life of Northern Arizona residents. The availability of air transport is invariably listed by business executives as a key criterion for business location and expansion. Public safety and national security objectives are supported by aviation operations of police officers and government agencies. Medical transport, search and rescue, aerial mapping, air cargo and express delivery services are all essential functions provided at Flagstaff Airport every day of the year.

Airline travelers come to Flagstaff to conduct business, meet with clients and suppliers and place orders for goods and services produced in the region. Even greater numbers come for personal reasons, to visit friends and relatives, or to hike, fish, hunt or simply vacation in the midst of world class scenery and recreation opportunities. General aviation flyers based at FLG enjoy the benefits of on-demand flight schedules to destinations within the state or any of the nearly 3,000 general aviation airports that provide access to large and small communities across the country.

DEFINITIONS AND METHODOLOGY

Although qualitative advantages created by an airport are important, they are also challenging to measure. In studying the economic benefits of airports and aviation, aviation analysts have emphasized economic benefits that can be quantified:

- **Employment** is the number of jobs supported by economic activity created by the presence of Flagstaff Airport.
- **Payroll** includes income to workers as employee compensation (the dollar value of payments received by workers as wages and benefits) and proprietor's income to business owners.
- **Output** is the value of the production of private firms and public agencies. For a private firm, output is equal to the annual value of revenue or gross sales at producer prices (before addition of further margins or transportation costs), including sales or excise taxes. Output, revenue, and sales are interchangeable synonymous terms used throughout this study and in turn, these are equal to spending or expenditures from the perspective of the buyer. For government units, the agency budget is used as the measure of output.

Economic benefit studies differ from cost-benefit analyses, which are often used to support a “go-no-go” decision to undertake a proposed project. Analysis of economic benefits is related to measurement of the economic contribution of an industry or a particular component of the economy. This methodology was standardized in the publication by the Federal Aviation Administration, *Estimating the Regional Economic Significance of Airports*, Washington DC, 1992, and has been closely followed in recent years by public and private sector aviation analysts. Consistent with the FAA methodology, this study views Flagstaff Airport as a source of measurable benefits that impact Flagstaff and the residents of Northern Arizona. Aviation activity creates revenues for firms and employment and income for workers on and off the airport.

On-airport activity by private aviation related firms and government agencies located on the airport is one source of output, jobs, and worker payrolls. Business spending on the airport injects revenues into the community when firms and public sector agencies buy products from local and regional suppliers and again when employees of the airport spend for goods and services in their communities. Included in on-airport economic benefits are capital improvement projects that provide for growth and enhance air safety.

Off-airport spending by visitors that arrive via airliner or general aviation aircraft is a second source of economic benefits. Air visitor spending creates jobs, income, and revenues in the region's lodging, food service, ground transportation, retail, and recreation industries.

DIRECT, SECONDARY AND TOTAL ECONOMIC BENEFITS

Economic activity (such as purchase of fuel by an aircraft pilot) creates an initial economic impact or benefit when the purchase is made. The spending by the pilot provides revenue to the fixed base operator (FBO), a portion of which is retained as margin, and the remainder is used for payments to suppliers or to pay salaries to workers (who then spend their wages in their home communities). As payments are received by suppliers or spent by workers, the initial direct spending from the fuel purchase recirculates in the economy in a series of successive transactions known as multiplier or secondary benefits, illustrated in **Figure A**. These combined direct and secondary benefits summed together provide a measure of total economic benefits.



Figure A. Direct, Secondary, and Total Economic Benefits

The terminology is explained in greater detail below.

- **Direct benefits** measure the initial output, employment, and payroll when businesses and agencies on the airport generate sales and revenues, hire workers, and make payments to employees. Off-airport direct benefits result when visitors that arrive by air spend for goods and services including lodging, restaurants, auto rental, retail items, or recreational activity.
- **Secondary benefits** (often known as “ripple effects”) are created when the initial spending on system airports or by visitors circulates and recycles through the economy. The secondary benefits measure the magnitude of successive rounds of re-spending in the broader regional economy.
- **Total economic benefits** are the combined sum of direct and secondary benefits created both on and off the airport. The on-airport direct benefits are tabulated by obtaining data on revenues received by airport employers, the number of workers, and compensation paid. Air visitor direct spending benefits are based on surveys of passengers. These initial direct benefit figures are the “inputs” to the input-output model to estimate secondary benefits. The sum of the direct plus secondary benefits provides a measure of total economic benefits.

In turn, two components make up secondary benefits.

- **Indirect benefits** include activity by suppliers and vendors who sell to airport or hospitality businesses, along with the jobs created and incomes paid to workers by these suppliers. For example, businesses and agencies on the airport purchase services such as insurance and hard goods such as tools or office furniture from off-airport providers. The revenues to suppliers and jobs supported as well as wages paid are indirect benefits.
- **Induced benefits** measure the consumer spending of workers who produced both the direct or indirect goods and services. For example, when an aircraft technician’s salary is spent for consumer goods such as groceries or medical services, this contributes to additional employment and income in the general economy for providers of these goods and services.

Economic benefit studies rely on multiplier factors from input-output models to estimate how direct spending on the goods and services of a particular industry or set of industries creates secondary indirect and induced benefits or multiplier effects. An input-output model incorporates interindustry relationships within a state or region that account for changes in employment, payroll, and output in related industries set off by a change in demand in an initial industry.

The indirect and induced spending coefficients used for this study were from the IMPLAN input-output model based on data on the Flagstaff/Coconino County economy from the U. S. Bureau of Economic Analysis. This model is frequently used for studying the economic benefits of airports and aviation across the nation, as well as economic impacts associated with changes in regional economies, such as closing of a military base or construction of a major sports venue. Because the airport is an existing facility, the current IMPLAN application is a contribution study, analyzing the benefits the airport creates annually for the local economy. The time period studied is calendar year 2016 and figures are expressed in 2016 dollars.

SUMMARY OF FINDINGS

The direct benefits of on-airport and air visitor activity related to Flagstaff Airport consisted of economic output of \$137.0 million, employment of 783 workers, and payroll of \$40.0 million in 2016. The total economic benefits of Flagstaff Airport included 1,365 jobs with payroll of \$61.6 million and output of \$200.3 million, incorporating all multiplier or secondary benefits. The direct, secondary, and total economic benefits created by on-airport, commercial service and general aviation activity are set out in **Table C1**.

SUMMARY: ON-AIRPORT DIRECT BENEFITS

On-airport direct benefits include employment, payroll, and output created by private firms and government agencies on the airport. Capital improvement projects are also included in on-airport benefits since these outlays generate employment and payroll when private contractors earn revenues from their on-airport activity. Including non-aviation firms, private employment accounted for nine out of every ten jobs on the airport in 2016.

There were 27 on-airport tenants employing 498 workers in combined private aviation, non-aviation, construction firms, and government units. Payroll for on-airport workers was \$32.7 million. The direct output created by on-airport tenants, public agencies, and capital improvement project spending was \$112.8 million.

SUMMARY: AIR VISITOR DIRECT BENEFITS

Air visitors arrive at Flagstaff Airport by commercial service carrier or by general aviation (GA) aircraft. According to the Origin and Destination (O&D) database of the U. S. Department of Transportation, 35,454 commercial service visitors enplaned at the airport in 2016. In addition, 10,532 itinerant general aviation aircraft arrived at the airport during the year. Of these, 2,422 remained overnight and the remaining 8,110 stayed for one day or less. The direct spending on lodging, food and drink, retail, and

recreation and entertainment off the airport by combined commercial service and general aviation visitors was \$24.2 million in the Northern Arizona hospitality industry, creating 285 private sector jobs with payroll to workers of \$7.3 million.

Table C1
Summary of Economic Benefits
Flagstaff Airport

SOURCE	EMPLOYMENT	PAYROLL	OUTPUT
Direct Economic Benefits			
On-Airport Benefits: Aviation & Non-Aviation Private Firms, Government Agencies & Capital Improvement Projects	498	\$32,661,000	\$112,802,000
Air Visitor Benefits: Commercial Service & General Aviation Travelers	285	\$7,320,000	\$24,165,000
<i>Direct Benefits</i>	783	\$39,981,000	\$136,967,000
Secondary Economic Benefits			
Indirect Benefits: Activity by Suppliers & Vendors	198	\$6,582,000	\$23,070,000
Induced Benefits: Activity by Workers as Consumers	384	\$15,085,000	\$40,292,000
<i>Secondary Benefits</i>	582	\$21,667,000	\$63,362,000
Total Economic Benefits			
Total Benefits	1,365	\$61,648,000	\$200,329,000

Note: On-airport spending for auto rental is included as on-airport benefits and not included as air visitor spending off-airport. Secondary benefits were computed from the IMPLAN input-output model. Values are in 2016 dollars.

SUMMARY: SECONDARY BENEFITS

The production of goods and services on the airport and for air visitors requires intermediate inputs from suppliers and vendors, creating secondary benefits in the form of additional output, employment, and payroll in the regional economy. As the initial direct benefits of Flagstaff Airport recirculated, secondary benefits as estimated by the IMPLAN model added output of \$63.4 million and 582 additional jobs with payroll of \$21.7 million. Each 100 direct jobs supported 74 secondary jobs in other sectors of the economy, and each one million dollars of direct output created an additional \$453,000 of secondary spending in the general economy.

Of the 582 secondary jobs due to the presence of the airport, 198 were indirect jobs in supplier industries for airport employers or visitor service firms. These suppliers included firms in the general economy such as finance and insurance, business services, transportation and warehousing, information and communication. Indirect benefits included output in the regional economy of \$23.1 million and payroll to workers of \$6.6 million.

In addition, on-airport and tourism industry direct employees and the secondary employees of suppliers created induced benefits as they spent their payroll in their home communities. There were 384 additional jobs induced by employee household spending across a broad spectrum of consumer industries including health care, food service, retail trade, and personal services. These induced benefits added \$40.3 million of output to the Northern Arizona economy.

SUMMARY: TOTAL ECONOMIC BENEFITS

The total benefits are the sum of the direct and secondary benefits. Including benefits from on-airport economic activity, air visitor spending, and all multiplier effects, Flagstaff Airport contributed total economic benefits as shown in **Figure B**.



Figure B. Flagstaff Airport Total Economic Benefits

A DAY AT FLAGSTAFF AIRPORT

Airports are available to serve the flying public and support the economy every day of the year. The Flagstaff Airport is a “24/7” source of revenues, employment and income for the service area economy. During an average day, the Flagstaff Airport generated \$549,000 of total economic benefits (including direct plus secondary benefits) and supported 1,365 workers bringing home daily income of \$169,000 for spending in their home communities (**Table C2**).

On an average day at the airport, there were 127 operations by aircraft involved in local or itinerant activity including touch and go operations, corporate travel on business jets, or commercial flights bringing passengers visiting the area for personal travel or on business. The average number of enplanements daily was 177 passengers, and 97 of these were visitors. On an average day, 440 air visitors were in the

area spending for lodging, food and drink, retail goods and services, recreation and ground transportation. Visitor spending injected \$77,000 per day into the regional economy.

Table C2
Economic Benefits for an Average Day
Flagstaff Airport

Activity	Average Day
All Aircraft Operations	127 Daily Aircraft Operations
On-Airport Employment	498 Workers on the Airport
Commercial Service Passengers	177 Daily Enplanements
Air Visitors (Commercial Service + GA)	440 Air Visitors in the Area Daily
Air Visitor Spending	\$77,000 Daily Visitor Spending*
Total Employment	1,365 Total Jobs Supported
Total Payrolls	\$169,000 Daily Pay for Workers
Total Economic Benefits	\$549,000 Daily Economic Benefits

*Includes spending at on-airport auto rental agencies

Sources: Flagstaff Airport; FAA Air Carrier Activity Information System (ACAIS) 2016; Flagstaff Airport Visitor Survey; IMPLAN Input-Output model.

ON-AIRPORT ECONOMIC BENEFITS

The on-airport sources of economic benefits include employment, payroll, and output for private firms and public agencies located on the airport, as well as capital improvement projects undertaken by private contractors (Table C3).

Airport staff provided considerable data and collaboration in support of this study. Airport staff facilitated on-site interviews with airport tenants who provided information on their operations, including average employment levels during the prior 12 months. Telephone follow-up contact was made as necessary. Respondents were informed that the individual employer results were confidential and only aggregate totals would appear in the written report.

There were eleven private aviation tenants on the airport, including commercial air service; a full service FBO providing aircraft fueling, maintenance and repair; and medical transport and specialized aviation services. Within the terminal are passenger services including ticketing and auto rental. Concession outlets available to airport passengers feature general merchandise and food services. The private sector aviation firms reported employment of 136 workers with compensation of \$9.6 million and output (revenues) of \$19.0 million.

There were nine non-aviation private employers on the airport, including manufacturing, biotech and medical research, express parcel services, management consulting, and various business and technical services. The non-aviation firms created direct employment of 286 workers with compensation of \$19.3 million and output of \$85.2 million.

There were seven governmental units on-site including the City of Flagstaff airport staff; state and local police personnel; a seasonal fire response unit; the Federal Aviation Administration Air Traffic Control Tower; U.S. Department of Homeland Security employees from the Transportation Security Administration (TSA); and the Federal Bureau of Investigation. These government agencies reported combined budgets of \$5.2 million, with 52 employees and payrolls of \$2.9 million.

Table C3
On-Airport Economic Benefits
Flagstaff Airport

SOURCE	EMPLOYMENT	PAYROLL	OUTPUT
Direct Economic Benefits			
Private Aviation Employers (11) <i>Commercial Service</i> <i>Auto Rental</i> <i>Airport Concessions</i> <i>FBO Services</i> <i>Medical Air Transport</i>	136	\$9,582,000	\$19,004,000
Non-Aviation Employers (9) <i>Manufacturing</i> <i>Biomedical Firms</i> <i>Express Delivery Services</i> <i>Energy & Utility Services</i>	286	\$19,286,000	\$85,231,000
Capital Improvement Projects (10 Year Average Value) <i>Construction, Upgrades,</i> <i>Equipment Acquisitions</i>	24	\$916,000	\$3,317,000
Government Agencies (7) <i>Airport Administration</i> <i>FAA Control Tower</i> <i>Dept. Homeland Security</i> <i>Fire Control (seasonal)</i> <i>FBI Unit</i>	52	\$2,877,000	\$5,250,000
<i>Direct Benefits</i>	498	\$32,661,000	\$112,802,000
Secondary Economic Benefits			
Indirect Benefits: <i>Activity by Suppliers & Vendors</i>	155	\$5,360,000	\$18,487,000
Induced Benefits: <i>Activity by Workers as Consumers</i>	299	\$11,608,000	\$31,684,000
<i>Secondary Benefits</i>	454	\$16,968,000	\$50,171,000
Total Economic Benefits			
Total Benefits	952	\$49,629,000	\$162,973,000

Note: On-airport spending for auto rental is included as on-airport benefits and not included as air visitor spending off-airport. Secondary benefits were computed from the IMPLAN input-output model. Values are in 2016 dollars.

CAPITAL IMPROVEMENT PROJECTS

Capital improvement projects are also included as a source of airport economic benefits, since construction activity generates spending and employment both on and off the airport. Runway improvements, fencing, drainage projects, and building construction are all examples of capital improvements that enhance safety and provide for growth.

Major capital improvement projects that begin at a particular point in time can extend over more than one year and reported outlays can vary sharply from year to year when larger projects are underway. In order to smooth out the annual variation in capital improvement spending, economic benefit studies average outlays over a multi-year period.

For this study, figures on capital improvements and equipment acquisitions were obtained from Airport records and averaged over the ten-year period from 2007 through 2016. The ten-year average annual outlay was \$3.3 million. This value was used to obtain the employment estimate of 24 workers and payroll of \$916,000 as representative annual figures for airport capital improvement activity.

DIRECT, SECONDARY AND TOTAL ON-AIRPORT BENEFITS

The combined direct benefits of on-airport private firms, government agencies, and capital improvement projects were 498 direct jobs with payroll of \$32.7 million and \$112.8 million output. The ratio of private sector on-airport jobs to all direct on-airport jobs was $452/498 = 90$ percent private sector jobs.

Secondary benefits as estimated by the IMPLAN model added employment of 454 jobs and output of \$50.2 million as the initial direct spending recirculated within the regional economy. As noted earlier, secondary effects come from two sources. On-airport private firms and public agencies make purchases from suppliers and vendors, who in turn purchase inputs and hire employees to support production of goods and services for airport customers. This effect is known as the indirect benefit. Simultaneously, employees of airport firms and agencies and employees of their suppliers are also consumers who spend incomes in their home communities. This spending stimulates additional jobs and output in the sectors serving consumers, creating induced benefits.

Of the 454 secondary jobs created by airport operations, 155 were indirect jobs adding to the number of workers in supplier industries to on-airport activity, such as finance and insurance, business services, transportation and warehousing, information and communication, and government agencies. There were 299 additional jobs induced by airport and supplier employee household spending across a broad spectrum of consumer industries including health care, food service, retail trade, and personal services.

The total benefits of on-airport operations are the sum of the combined direct and secondary benefits. The total benefits were 952 jobs supported, with payroll of \$49.6 million, and output of \$163.0 million added to the economy.

Comparison of total benefit figures with the initial direct benefits gives insight into the multiplier values for each component. For example, the 498 direct on-airport jobs support total employment of 952, a multiple of 1.91. The economic interpretation is that, on average, each 100 on-airport jobs support an additional 91 jobs in the general economy.

The output multiplier is the ratio of total output (\$163.0 million) to direct output (\$112.8 million), or 1.44. Every million dollars of direct output on the airport results in \$440,000 of additional output as the initial direct spending recirculates in the regional economy.

COMMERCIAL SERVICE VISITOR ECONOMIC BENEFITS

Visitors travel to the Northern Arizona area for diverse purposes, including business and personal reasons. Some come to camp, hike, or vacation. Others come to meet business clients or as customers of Flagstaff firms and suppliers. Many others come to visit friends and relatives, renewing and strengthening relationships by personal contact.

Table C4
Commercial Service Visitors
Flagstaff Airport

Category	Value*
Enplanements	64,578
Percent Visitors	54.9%
Number of Visitors	35,454
Spending Per Trip	\$612
Visitor Spending**	\$21,698,000

* Some figures are rounded

**Includes on-airport auto rental spending

Source: FAA Air Carrier Activity System; U.S. Department of Transportation; Flagstaff Airport Visitor Survey, 2016

One common characteristic among travelers to the region is that, while away from home, they make expenditures on a daily basis, creating employment, incomes, and revenues for workers, businesses, and governments. A recent study by Northern Arizona University for the Flagstaff Convention & Visitors Bureau reported the total economic contribution of visitor spending was \$575 million in 2014, supporting some 7,311 jobs in the Flagstaff area.

Flagstaff Airport contributes to the visitor industry of Northern Arizona by providing commercial service links for air travelers coming from within the state and across the country. According to the FAA Air Carrier Activity Information System (ACAIS), there were 64,578 airline enplanements at Flagstaff Airport in 2106 (**Table C4**).

Analysis of passenger origination data from the U. S. Department of Transportation revealed that 54.9 percent or 35,454 enplaning airport passengers were visitors to the area during calendar year 2016. The greatest number of visitors came from Los Angeles, followed by New York, San Francisco, Seattle, Denver, Dallas/Ft. Worth, San Diego, Phoenix, Portland (Oregon), and Santa Ana, rounding out the top 10 originating airports.

Average spending per visitor per trip was \$612. Multiplied over all visitors, the annual commercial service direct visitor spending benefit was calculated as \$21,698,000 for 2016.

COMMERCIAL SERVICE VISITOR SURVEY

Visitor spending per trip is a function of length of stay and the distribution of spending over lodging, food, auto rental, other transport, retail, and entertainment/recreation. Business travelers tend to have shorter stays but spend more on lodging and auto rental compared to those traveling to visit relatives, for example, who may stay longer and have no lodging expenses but spend more on retail or entertainment.

To obtain information on spending patterns by airport commercial service travelers, surveys were administered to a sample of more than 500 enplaning visitors in the terminal during 2016. Surveys were distributed at various hours of the day and during each day of the week, including weekends, to passengers who identified themselves as visitors to Northern Arizona.

One individual for each travel party completed the survey for the visitors in the party. Travel party information on air visitor spending for lodging, food, retail goods and services, recreation and ground transportation was provided by responding visitors, as well as party size, length of stay in the Flagstaff area, and purpose of the trip.

COMMERCIAL SERVICE VISITOR SPENDING

Table C5 presents summary information from the commercial service visitor survey. Travelers responding to the surveys identified the main purpose of their travel as either business, personal, or tourist/vacation. Surveys were analyzed within these three categories, along with a separate grouping of travelers who were part of larger, organized travel parties (10 or more persons).

The greatest number of estimated visitors (20,526) in 2016 were tourists, accounting for 58 percent of total air visitors. The remaining air visitors were distributed over the business, personal and large group categories, each accounting for 14 percent of the total.

Those traveling for personal reasons, typically visiting friends or relatives, had the longest stay (4.5 days). Those traveling as part of a large group had the shortest stay (2.4 days), most likely because their ultimate destination was a major attraction beyond the Flagstaff area, such as the Grand Canyon. Business and tourist travel parties each reported an average stay of 3.5 days.

Applying the survey results to the total population of air visitors, there were 123,440 visitor days for the 2016 calendar year. On an average day, there were 338 commercial service passengers visiting in Northern Arizona and spending for lodging, auto rental and various other goods and services.

Visitors who identified as tourists reported the highest spending per person per trip (\$743). Ninety-two percent of travel parties in this category reported lodging expenses of \$100 or more on their trip. In comparison, only 40 percent of those traveling to visit friends or family spent this amount during their trip. Business travelers reported the second highest spending per person per trip (\$564), followed by those traveling for personal reasons (\$510). The least spending per person per trip was reported for the large group category (\$229). Those traveling in a large group had the shortest stay and likely had the least opportunity for independent entertain activities and retail shopping. While those in the tourist category accounted for 58 percent of visitor days, spending by tourists of \$15.3 million made up 70 percent of total air visitor spending in the region (\$21.7 million).

Table C5
Commercial Service Visitor Characteristics and Spending
Flagstaff Airport

	BUSINESS	PERSONAL	TOURIST	LARGE GROUP	OVERALL
Commercial Service Visitor Characteristics					
Number of Visitors	4,838	4,986	20,526	5,114	35,454
<i>Percent by Purpose of Travel</i>	14%	14%	58%	14%	100%
Length of Stay (Days)	3.5	4.5	3.5	2.4	3.7
Number of Visitor Days	16,993	22,392	71,841	12,274	123,440
<i>Percent of Visitor Days</i>	14%	18%	58%	10%	100%
Commercial Service Visitor Spending by Purpose of Travel					
Accommodations	\$294	\$154	\$304	\$73	\$248
Food & Drink	\$109	\$143	\$129	\$57	\$118
Retail Goods & Services	\$56	\$77	\$66	\$61	\$65
Recreation & Entertainment	\$28	\$89	\$148	\$8	\$104
Ground Transportation	\$77	\$47	\$97	\$30	\$77
Spending per Person per Trip	\$564	\$510	\$743	\$229	\$612
Visitor Direct Spending	\$2,728,000	\$2,537,000	\$15,261,000	\$1,172,000	\$21,698,000
<i>Percent of Visitor Spending</i>	13%	12%	70%	5%	100%

Source: Compiled from Flagstaff Airport Visitor Survey, 2016

GENERAL AVIATION VISITOR ECONOMIC BENEFITS

Visitors travel on general aviation aircraft to Flagstaff Airport for the same purposes as those arriving by commercial service flights - as vacationers, to visit friends and relatives, and for business. Although general aviation travel is sometimes viewed as a luxury mode of transport, the efficiencies and flexibility of general aviation are highly desirable, especially to corporate travelers. Studies of companies that use business aviation find that these firms outperform other firms on key financial measures such as earnings and share price growth.

General aviation flights to Flagstaff Airport can originate at any of some 5,000 public use airport facilities across the nation, while commercial service travelers are limited to flights originating at approximately 500 commercial service airports. Moreover, users of general aviation face fewer restrictions on transportability of baggage, more efficient security checks, and flexibility of arrival and departure schedules.

According to the FAA Air Traffic Activity System (ATADS), there were 10,532 itinerant general aviation (GA) arrivals at the airport in 2016 (**Table C6**). Of these, an estimated 2,422 remained overnight while

the GA travel party conducted business or visited in the area. The remaining 8,110 stayed one day or less.

To compute a conservative estimate of economic benefits of GA visitors, one-day aircraft were further partitioned into those staying less than 4 hours and 4 hours or more, based on arrival and departure time as reported in the FAA flight plan data.

Visitor spending estimates were computed only for those aircraft staying 4 hours or longer at the airport, reflecting the fact that many aircraft stop only for fuel and travelers do not spend for food, retail shopping, or ground transportation off the airport. There were 1,896 general aviation aircraft that stayed on the ground 4 hours or more during the year and 6,214 that stayed fewer than 4 hours.

GENERAL AVIATION VISITOR SPENDING

From analysis of the FAA flight plan data base, it was determined that the average length of stay of overnight general aviation aircraft was 3.2 days. The length of stay for those day visitor aircraft that were on the airport for more than four hours was 5.3 hours and for those that stayed less than four hours the time of stay was 58 minutes. The average number of passengers per aircraft was based on 4,857 jet arrivals, 4,959 turboprop, and 716 piston aircraft arrivals. Average passenger counts were set at five for the jet category (including crew), three for turboprop, and two for piston aircraft. The weighted average over all aircraft type was 3.8 persons per arriving aircraft.

A specific survey for general aviation visitors was not used. Visitors arriving on general aviation aircraft were assumed to spend the same average per person amounts for accommodations, restaurants, auto rental, and other outlays as reported by commercial service travelers. The expenditures per person from the commercial service passenger survey are reported in Table C6 in the “Overall” summary column.

Applying these average values for lodging and other expenditures, spending per aircraft was based on average number of passengers for each type of aircraft and length of stay. Spending estimates per aircraft by aircraft type (jet, turboprop and piston) were then combined to derive an overall figure for general aviation spending per aircraft, using percentage of each aircraft type as the weighting factor.

Passengers on overnight GA aircraft spent an average of \$2,170 per aircraft on their 3.2 day visit and one day GA visitors staying four or more hours spent \$406 per aircraft (**Table C7**).

Lodging accounted for 40 percent of overnight GA visitor spending, averaging \$876 per aircraft travel party. The second largest spending category for overnight travelers was food and drink, at \$419 per party. Food and drink also was the largest spending category for one day visitors (\$131 per party).

Multiplication of 2,422 overnight GA aircraft by spending per trip of \$2,160 yields total expenditures of \$5.3 million for those with an overnight stay in the Flagstaff area. Similarly, the 1,892 one-day aircraft

**Table C6
General Aviation Itinerant Aircraft
Flagstaff Airport**

Category	Value
Itinerant GA Arrivals	10,532
Overnight Aircraft	2,422
Aircraft with > 4 Hour Stay	1,896
Aircraft with < 4 Hour Stay	6,214

Source: Derived from FAA flight plan arrival and departure records as compiled by the Airport IQ Data Center, 2016

parties spent a total of \$768,000. The sum of direct general aviation visitor spending benefits was \$6.0 million.

Table C7
Spending Per General Aviation Aircraft Per Trip
Flagstaff Airport

Category	Overnight GA Aircraft	Day Visit GA Aircraft
Accommodations	\$876	
Food & Drink	\$419	\$131
Retail Goods & Services	\$234	\$74
Recreation & Entertainment	\$370	\$116
Ground Transportation	\$271	\$85
<i>Spending per Trip Per AC</i>	<i>\$2,170</i>	<i>\$406</i>
Number of Aircraft	2,422	1,892
<i>Direct GA Spending</i>	<i>\$5,258,000*</i>	<i>\$768,000*</i>

*Source: Derived from FAA operations data and Flagstaff Airport visitor survey. *Spending figures by category are rounded and may not compute exactly.*

COMBINED COMMERCIAL SERVICE AND GA VISITOR BENEFITS

Commercial service and general aviation visitors combined to spend \$24.2 million off the airport in the Northern Arizona region during 2016, creating 285 direct jobs off the airport with earnings to workers of \$7.3 million (see **Table C8**).

There were 160,624 visitor days attributable to combined commercial and general aviation travelers during the year. Seventy-seven percent of visitor days (123,440) were due to commercial air travelers and twenty-three percent of days (37,184) were contributed by general aviation visitors. On an average day, there were 440 air visitors in the service area. Average daily off-airport spending by all air travelers was \$66,200 (the on-airport portion of auto rental expenditures is excluded from these figures and Table C9).

The largest spending category by aviation visitors was expenditures for hotel or other accommodation, with outlays of \$10.9 million. The level of lodging employment associated with this spending level was 113 jobs and payroll of \$3.1 million. The second greatest spending category was food and drink, with outlays of \$5.4 million, creating 91 jobs with payroll of \$2.1 million.

The total economic benefits from air visitor spending were \$37.4 million in output (revenues) and 413 jobs supported throughout the economy, with payroll income to workers of \$12.0 million. The indirect benefits created by purchase of intermediate goods and services from suppliers to the hospitality industry were output of \$4.6 million and 43 additional jobs across the regional economy.

Table C8
Combined Economic Benefits: Commercial Service and GA Visitors
Flagstaff Airport

Category	Employment	Payroll	Output
Direct Economic Benefits			
Accommodations	113	\$3,083,000	\$10,925,000
Food & Drink	91	2,090,000	5,449,000
Retail Goods & Services	14	334,000	3,029,000
Recreation & Entertainment	67	1,813,000	4,762,000
<i>Direct Benefits</i>	285	7,320,000	24,165,000
Secondary Economic Benefits			
Indirect Activity by Suppliers & Vendors	43	1,222,000	4,583,000
Induced Spending by Workers & Proprietors of Businesses	85	3,477,000	8,608,000
<i>Secondary Benefits</i>	128	4,699,000	13,191,000
Total Economic Benefits			
Total Benefits	413	\$12,019,000	\$37,356,000

Source: FAA passenger statistics; Flagstaff Airport passenger survey; FAA flight plan data base; employment estimates from IMPLAN input-output model based on coefficients from U. S. Bureau of Economic Analysis; on-airport auto rental is included in on-airport economic benefit tables. Figures are rounded.

The induced spending by workers as consumers created benefits of \$8.6 million revenues and 85 jobs. Both the indirect and induced spending recirculated within the Northern Arizona economy to increase revenues to business, create jobs for workers, and provide payroll for further expenditures. The secondary benefits due to multiplier effects summed to \$13.2 million of revenues, 128 jobs, and \$4.7 million of payroll.

The overall output multiplier for combined commercial service and GA visitor spending was \$37.4/\$24.2 = 1.54, indicating that each one million dollars of direct air visitor spending recycled in the economy to create total final output of \$1.54 million (or \$540,000 of secondary spending benefits per million dollars of direct spending). The employment multiplier (comparing total employment of 413 with direct employment of 285) was 1.45. Each 100 direct jobs related to air visitor spending created an additional 45 jobs in the overall economy. Moreover, each one million dollars of direct spending by air visitors created 11.8 jobs in the hospitality industry. This figure is obtained from 285 jobs/\$24.2 million. By visitor spending category, the employment benefits from spending on food and drink are greatest, with 16.8 jobs created per one million dollars of outlays. For lodging, the figure is 10.8 jobs per million. Benefits from retail spending are smaller (4.6 jobs per million) and recreation spending creates the fewest jobs (3.3 per million dollars of spending).

BENEFITS OF A DEPARTING COMMERCIAL AIRCRAFT

The figures for spending per person per trip can be applied to illustrate the economic value of visitor expenditures from a typical commercial service aircraft operation at Flagstaff Airport (**Table C9**).

Airport flight records show there were 1,759 commercial service departures during the 2016 calendar year. There were an average of 37 passenger enplanements per departure during the period. Drawing from the U. S. Department of Transportation Origin and Destination data base, the average proportion of visitors among enplaning passengers was 54.9 percent at Flagstaff Airport.

The computed average number of visitors on a typical departing commercial service flight were estimated as 20 (54.9 percent of 37, rounded). These 20 visitors per aircraft will have spent on average \$612 per person during their trip, based on figures from the airport passenger survey. A direct economic benefit of \$12,240 was injected into the local economy for each of 1,759 departing commercial aircraft on average, during 2016.

Table C9
Benefits of a Commercial Departure
Flagstaff Airport

Activity	Value
Commercial Service Departures	1,759
Enplaning Passengers	64,461
Enplanements per Departure	37
Percent Visitors	54.9%
Average Visitors/Aircraft	20
Trip Expenditures/Person	\$612
Departing Aircraft Benefit	\$12,240

Source: Airport IQ Data Center and FLG Visitor Survey. Some figures are rounded.

FUTURE ECONOMIC BENEFITS

Coconino County and Flagstaff area socioeconomic indicators including population, employment, and income, have consistently grown more rapidly than the nation as a whole. For example, the compound annual population growth rate of 2.2 percent for the City of Flagstaff between 1970 and 2015 was twice the U.S. pace of 1.1 percent over the same period. By 2035, Coconino County is projected to add an additional 42,000 jobs over the 2015 base of 83,350, an increase of 50 percent (*Flagstaff Airport Master*

Plan, Table 2C). As the regional economy grows, the demand and supply of aviation services will rise, bringing an increase in future economic benefits.

Table C10 shows a baseline summary of current economic benefits associated with the presence of Flagstaff Airport. **Tables C11 through C13** illustrate the future benefits of the airport based on projections for the short, intermediate, and long-term growth periods. The methodology for estimating future economic benefits is a linear extrapolation of current baseline values of the direct on-airport and visitor benefits in **Table C10** using growth rates for aviation activity developed in Chapter 2 of the *Flagstaff Airport Master Plan*. All figures are expressed in 2016 dollars. On-airport aviation revenues, employment, and income increase by the forecast growth rate of combined annual operations: 4.2 percent by 2020, 6.7 percent between 2020 and 2025, and 13.7 percent from 2025 to 2035. Non-aviation employment, payroll, and output are outside the model and assumed to remain constant in 2016 dollars.

Air visitor spending, employment, and income increase by the forecast growth rate of passenger enplanements: 19.0 percent by 2020, 18.7 percent from 2020 to 2025, and 31.6 percent from 2025 to 2035. These extrapolations are based on the standard assumption of “ceteris paribus” or no change in economic relationships (including the multiplier value of IMPLAN coefficients for secondary benefits) in the years ahead.

Table C10
Baseline Economic Benefits
Flagstaff Airport

Source	Employment	Payroll	Output
On-Airport	498	\$32,661,000	\$112,802,000
Air Visitors	285	\$7,320,000	\$24,165,000
<i>Direct Benefits</i>	783	\$39,981,000	\$136,967,000
<i>Secondary Benefits</i>	582	\$21,667,000	\$63,362,000
Total Benefits	1,365	\$61,648,000	\$200,329,000

Source: On-airport employer interviews, passenger surveys, and IMPLAN input-output model based on coefficients from the U. S. Bureau of Economic Analysis. Figures shown are in 2016 dollars and some are rounded.

The time periods (short, intermediate, and long term) are demand driven but generally correspond to forecast activity levels five, ten and twenty years from the base year. The short term is associated with enplanements of 80,000 and total annual operations of approximately 48,000, expected by 2020. The intermediate term is associated with 95,000 enplanements and 51,200 operations by 2025. There are 125,000 annual enplanements forecast in the long term, along with 58,200 operations projected by 2035.

Airport direct benefits from on-airport activity are projected to rise from \$112.8 million output and 498 on-site jobs in 2016 to \$113.7 million output and 505 jobs in the short term (**Table C11**). The increase is due to aviation-related growth, as non-aviation employment and output remain fixed. The rise in enplanements to 80,000 increases air visitor spending to \$27.8 million. Assuming no changes in the inter-industry relationships of the IMPLAN model, the ratios of indirect and induced benefits to initial direct

benefits remain stable while the economy and airport related activity grow. By 2020, total benefits include employment of 1,451 with payroll of \$64.1 million and output in the region of \$206.2 million.

Table C11
Projected Economic Benefits: Short Term
Flagstaff Airport

Source	Employment	Payroll	Output
On-Airport	505	\$33,111,000	\$113,729,000
Air Visitors	327	\$8,412,000	\$27,768,000
<i>Direct Benefits</i>	832	\$41,523,000	\$141,497,000
<i>Secondary Benefits</i>	618	\$22,595,000	\$64,700,000
Total Benefits	1,451	\$64,118,000	\$206,197,000

Source: Based on 48,000 annual operations and passenger enplanements of 80,000.

At the intermediate milestone (approximately 2025), on-airport output is projected to be \$115.6 million, with 520 on-site jobs. Output from air visitor spending is projected to rise to \$33 million, creating 389 hospitality sector jobs. By 2020, total benefits increase to 1,583 jobs in the region with payroll of \$68 million and output of \$216.5 million (**Table C12**).

Table C12
Projected Economic Benefits: Intermediate Term
Flagstaff Airport

Source	Employment	Payroll	Output
On-Airport	520	\$34,033,000	\$115,629,000
Air Visitors	389	\$9,989,000	\$32,975,000
<i>Direct Benefits</i>	909	\$44,022,000	\$148,604,000
<i>Secondary Benefits</i>	675	\$23,955,000	\$67,949,000
Total Benefits	1,583	\$67,977,000	\$216,553,000

Source: Based on 51,200 annual operations and passenger enplanements of 95,000.

In the long term, aviation demand levels rise to 58,200 operations and 125,000 annual enplanements. At this level of activity, on-airport employment increases to 552 workers, with payroll of \$36 million and output of \$120 million (**Table C13**). Visitor spending is projected to rise to \$43.4 million, creating 512 jobs. Total output is forecast to be \$237.8 million, an increase of \$37.4 million over baseline total output of \$200.3 million. In the long term, total regional employment due to the presence of the airport increases to 1,853 workers with payroll of \$76 million.

Table C13
Projected Economic Benefits: Long Term
Flagstaff Airport

Source	Employment	Payroll	Output
On-Airport	552	\$36,049,000	\$119,785,000
Air Visitors	512	\$13,143,000	\$43,388,000
<i>Direct Benefits</i>	1,063	\$49,192,000	\$163,173,000
<i>Secondary Benefits</i>	790	\$26,768,000	\$74,611,000
Total Benefits	1,853	\$75,960,000	\$237,784,000

Source: Based on 58,200 annual operations and passenger enplanements of 125,000.

GOVERNMENT REVENUE BENEFITS

Because of the output, jobs, and income created by the presence of Flagstaff Airport, the facility is an important source of public revenues. As airport activity expands, tax revenues will continue to grow. Estimated tax revenue potential is set out in **Table C14**. The table shows the revenues for each tax category derived from the IMPLAN model. The model uses current average tax rates for Coconino County and Arizona for profits, personal income, property, and sales taxes and applies these rates to direct and secondary economic activity. Federal taxes are applied using current federal rates for Social Security taxes, income, profits, and federal excise taxes and fees.

The first column of Table C15 shows tax revenues associated with the 2016 baseline level of total output of \$200.3 million (as seen in Table C11). The total economic benefits include direct and secondary benefits from on-airport activity and air visitor spending. The 1,365 total workers supported by airport activity receive payrolls of \$61.6 million. Employers and workers are subject to various federal, state, and local taxes. The largest federal component is the social security tax, with contributions from employers and workers of \$6.4 million in 2016. The second largest federal tax category is the personal income tax paid by workers and proprietors of \$4.1 million. The federal corporate profits tax is \$2.2 million. Overall, federal tax revenues estimated due to economic activity associated with Flagstaff Airport are calculated to be \$13.6 million for 2016.

State and local tax revenues, shown in the lower portion of the table, sum to \$8.4 million for 2016. The largest state and local component is sales taxes of \$4.0 million. Property taxes for homeowners and businesses are estimated to be \$2.4 million. Combined federal, state, and local government tax revenues created by the presence of Flagstaff Airport are \$22.0 million at the 2016 level of airport activity and visitor spending.

Table C14
Government Revenue Benefits
Flagstaff Airport

Source	2016	Short Term	Intermediate Term	Long Term
Federal Taxes				
Corporate Profits Tax	\$2,201,000	\$2,266,000	\$2,380,000	\$2,613,000
Personal Income Tax	\$4,117,000	\$4,237,000	\$4,450,000	\$4,887,000
Social Security Tax	\$6,381,000	\$6,568,000	\$6,898,000	\$7,574,000
All Other Federal Taxes	\$910,000	\$937,000	\$984,000	\$1,081,000
Total Federal Taxes	\$13,609,000	\$14,008,000	\$14,712,000	\$16,155,000
State and Local Taxes				
Corporate Profits Tax	\$249,000	\$256,000	\$269,000	\$295,000
Property Tax	\$2,403,000	\$2,473,000	\$2,598,000	\$2,852,000
Sales Tax	\$4,029,000	\$4,147,000	\$4,356,000	\$4,783,000
Personal Income Tax	\$699,000	\$720,000	\$756,000	\$830,000
All Other State & Local	\$1,034,000	\$1,064,000	\$1,118,000	\$1,227,000
Total State & Local Taxes	\$8,414,000	\$8,660,000	\$9,097,000	\$9,988,000
Total Federal, State and Local Taxes				
Total Taxes	\$22,023,000	\$22,668,000	\$23,809,000	\$26,143,000

Source: Calculations from the IMPLAN input-output model based on tax rates for Coconino County and Arizona and current federal rates. All figures are in 2016 dollars.

Projected tax revenues rise as future airport activity increases. In the short term, total economic benefits created by the presence of Flagstaff Airport are projected to be \$206.2 million, with 1,451 jobs supported in the region and worker compensation of \$64.1 million. At the federal level, the rise in employment and income will be accompanied by an increase of business and employee social security contributions paid to \$6.6 million. Federal personal income taxes will rise to \$4.2 million. All figures assume constant 2016 tax rates. Short term state and local government revenues will be \$8.7 million, and combined total annual state and federal tax collections will be \$22.7 million in the short term.

Total economic benefits due to the presence of the airport are projected to increase to \$216.5 million in the intermediate term. Jobs supported will rise to 1,583 and worker and proprietor income will be \$68.0 million. Total state and federal tax collections will be \$23.8 million in the intermediate term.

Within the long term time horizon (to 2035), total economic benefits from activity at Flagstaff Airport are projected to increase to output of \$237.8 million, with 1,853 jobs supported and payroll of \$76.0 million. Annual federal tax collections in the long term are estimated to be \$16.1 million, with social security contributions of \$7.6 million and personal income taxes paid of \$4.9 million (assuming rates under current law). At the state and local level, annual sales tax collections increase to \$4.8 million and property tax collections rise to \$2.8 million. Combined state and federal tax collections will be \$26.1 million, an increase of 18 percent over the 2016 base year revenues.

BASED AIRCRAFT BENEFITS

A survey of owners of aircraft based at Flagstaff Airport was conducted to compile information on private aircraft usage patterns, including number of hours flown per year, purpose of travel, and hours flown per trip. Contact information for aircraft owners was obtained through the assistance of Flagstaff Airport staff and public records.

There were 139 aircraft based at Flagstaff Airport in 2016 (**Table C15**). Of these, 113 or 81 percent were single engine, 15 were multi-engine, four were turboprop, four were helicopters, and three were gliders or experimental aircraft.

The average reported value for an aircraft was \$143,000 and annual outlays were \$12,700 for maintenance, storage, and other expenses such as insurance.

Those responding to the survey reported 150 average (non-training) hours flown per year, or, 20,850 hours of flight travel by Flagstaff Airport based aircraft. Based aircraft were used for business for 10,286 hours, or 37.5 percent of the total hours flown.

Table C15
Based Aircraft Usage and Business Activity
Flagstaff Airport

Category	Based AC
Average Aircraft Market Value	\$143,000
Average Maintenance Expenses per Year	\$12,700
Total Hours Flown per Year	20,850
Total Business Hours Flown per Year	10,286
Business Hours as Percent of All Hours	37.5%
Total Personal Hours Flown per Year	10,564
Employment at Firms with Based Aircraft	726
Annual Sales at Firms with Based Aircraft	\$72,000,000

Source: Aircraft Owner Survey, Flagstaff Airport

Business aircraft are viewed by business firms as investments that provide returns through enhanced revenues and time savings when compared to scheduled airline travel. Local firms with based aircraft at Flagstaff Airport accounted for 726 employees in the Northern Arizona region, with sales of \$72 million.

Business travel on private aircraft reduces costs and increases effectiveness in individual firms. Annual studies by the National Business Aviation Association show that those firms with business aircraft outperform those without aircraft with earnings 230 percent higher and average revenue growth 22 percent greater.

Among Business Week's "50 Most Innovative Companies," 95 percent of the S&P 500 companies listed were users of business aircraft (*National Business Aviation Association Fact Book, 2014*).

The importance of the airport and general aviation for economic vitality of the region can be seen from these written notes from aircraft owner surveys:

- Large employer: "The airport is very important to enable us to connect with our businesses without going through Phoenix."
- Self-employed analyst: "Our airport is exceptional for a city our size, and is one reason we moved here. Without it, we would need to leave."
- Medical doctor: "The airport is critical for referral of patients to Flagstaff for surgery."