

Appendix D

ECONOMIC BENEFIT ANALYSIS

This section presents an analysis of economic benefits created by Falcon Field Airport (Airport). The Airport initially came into existence as a primary training field for allied pilots during World War II. Between 1941 and 1945, several thousand British Royal Air Force and U.S. Army Air Corps pilots earned their wings at the facility in the Arizona desert. The Airport was sold by the federal government to the City of Mesa for one dollar in 1948.



While World War II pilot training was underway, Falcon Field was a bustling center of activity, with a staff of over 100, including a large overnight maintenance crew, composed of up to 60 percent women who carried out specialized technical tasks for checking, testing, and repair.

Today, the tradition of flight training continues, Falcon Field has evolved into a key economic asset for the City of Mesa, and over 700 aircraft are based on the Airport. Moreover, measured by operations, Falcon Field is among the top five most active general aviation airports in the nation.



General aviation aircraft owners based at the Airport enjoy the benefits of on-demand flight schedules to destinations within the state or any of the nearly 5,000 general aviation airports that provide access to large and small communities across the country. Corporate flyers journey to Falcon Field to conduct business, meet with clients and suppliers, and place orders for goods and services produced in the region. Many general aviation visitors come for

personal reasons, to visit friends and relatives, attend sporting events, or to simply vacation near world-class scenery and recreation opportunities.

Falcon Field creates significant benefits that extend beyond the aviation community to impact economic growth and development as well as the quality of life of residents of Mesa, Maricopa County, and the entire state. The availability of an airport with sufficient infrastructure to support corporate jets 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, aerial mapping, and air cargo shipments are all essential functions provided at Falcon Field Airport every day of the year.

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, analysts have emphasized economic benefits that can be quantified:

- **Employment** is the number of jobs supported by economic activity created by the presence of Falcon Field 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, D.C., 1992, and has been closely followed in recent years by public and private sector aviation analysts. Consistent with the FAA methodology, this study views Falcon Field Airport as a source of measurable benefits that impact the Falcon Field community and the residents of Mesa and Maricopa County. 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 a 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 by 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, 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 secondary transactions known as multiplier or “ripple effects,” 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 further detail below.

- **Total economic benefits** are the combined sum of direct and secondary benefits created both on and off the airport.
- **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. 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 the number of visitors and their outlays for goods and services. These initial direct benefit figures are the “inputs” to an input-output model to estimate secondary benefits.
- **Secondary benefits** 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.

There are two types of 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 inter-industry or “supply chain” relationships within the 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 input-output model used for this study was the IMPLAN model, based on data and coefficients for the Maricopa 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 2018 and figures are expressed in 2018 dollars.

SUMMARY OF FINDINGS

The direct benefits of on-airport and air visitor activity related to Falcon Field Airport consisted of economic output of \$449.9 million, employment of 1,619 workers, and payroll of \$108.3 million in 2018. The total economic benefits of Falcon Field Airport, incorporating direct benefits and all multiplier or secondary benefits, included 4,009 jobs with payroll of \$237.7 million and output of \$811.7 million. The direct, secondary, and total economic benefits created by on-airport, commercial service and general aviation activity are set out in **Table D1**.

Table D1 Summary of Economic Benefits Falcon Field Airport			
SOURCE	EMPLOYMENT	PAYROLL	OUTPUT
Direct Economic Benefits			
On-Airport Benefits: Activity by Aviation & Non-Aviation Private Firms, Government Agencies, Capital Improvement Projects	1,486	\$104,367,000	\$434,335,000
Air Visitor Benefits: Activity by General Aviation Travelers	133	\$3,984,000	\$15,544,000
<i>Direct Benefits</i>	1,619	\$108,351,000	\$449,879,000
Secondary Economic Benefits			
Indirect Benefits: Activity by Suppliers & Vendors	822	\$52,216,000	\$145,497,000
Induced Benefits: Activity by Employees as Consumers	1,568	\$77,107,000	\$216,301,000
<i>Secondary Benefits</i>	2,390	\$129,323,000	\$361,798,000
Total Economic Benefits			
Total Benefits	4,009	\$237,674,000	\$811,677,000

Source: On-airport employment was obtained through on-site interviews and records maintained by Falcon Field administrative staff. Payroll figures based on Maricopa County wage data from U.S. Bureau of Labor Statistics Quarterly Census of Employment and Wages. Output estimates were computed from the IMPLAN input-output model, with coefficients for Maricopa County. Air visitor spending estimates were provided by Mesa Convention and Visitors Bureau and Longwoods International. Secondary benefits (indirect and induced) were computed from the IMPLAN model. All Values are in 2018 dollars.

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 2018.

There were 110 on-airport employers, with 1,486 workers in combined private aviation, non-aviation, construction firms, and government units. Payroll for on-airport workers was \$104.4 million. The direct output created by on-airport tenants, public agencies, and capital improvement project spending was \$434.3 million.

SUMMARY: AIR VISITOR DIRECT BENEFITS

An estimated 19,226 transient general aviation aircraft arrived at Falcon Field Airport in 2018. Of these, 4,672 remained overnight and the remaining 14,554 stayed for one day or a portion of a day. The direct spending on lodging, food and drink, retail, and recreation and entertainment off the Airport by general aviation visitors was \$15.5 million in the regional hospitality industry, creating 133 private sector jobs with payroll to workers of \$4.0 million.

SUMMARY: SECONDARY BENEFITS

The production of goods and services on the airport and for air visitors requires intermediate inputs from suppliers across the supply chain, creating secondary benefits in the form of additional output, employment, and payroll in the regional economy. As the initial direct benefits of Falcon Field Airport recirculated, secondary benefits as estimated by the IMPLAN model added output of \$361.8 million and 2,390 additional jobs with payroll of \$129.3 million. Each 100 direct jobs supported 148 additional secondary jobs in other sectors, and each \$1 million dollars of direct output created an additional \$805,000 of secondary spending in the general economy.

Of the 2,390 secondary jobs due to the presence of the Airport, 822 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 systems, and communication. Indirect benefits included output in the regional economy of \$145.5 million and payroll to workers of \$52.2 million.

In addition, on-airport and visitor industry direct employees and the secondary employees of suppliers created induced benefits as they spent their payroll in their home communities. There were 1,568 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 \$216.3 million of output to the area economy.

SUMMARY: TOTAL ECONOMIC BENEFITS

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



Figure B. Falcon Field Airport Total Economic Benefits

The average salary for all jobs in the area supported by activity at Falcon Field Airport can be calculated as \$59,266. The average annual pay for all workers in the Maricopa County economy as of mid-year 2018, according to the U.S. Bureau of Labor Statistics, was \$52,832. Salaries associated with the presence of Falcon Field were some 12 percent higher. Moreover, average salaries for on-airport jobs at Falcon Field were significantly greater than the Maricopa County average, at \$70,233.

A DAY AT FALCON FIELD AIRPORT

Airports are available to serve the flying public and support the economy every day of the year. The Falcon Field Airport is a “24/7” source of revenues, employment and income for the regional economy. During an average day in 2018, Falcon Field Airport generated \$2.2 million of total economic benefits (including direct plus secondary benefits) and supported 4,009 area workers bringing home daily income of \$651,000 for spending in their home communities (**Table D2**).

Table D2 Economic Benefits for an Average Day Falcon Field Airport	
Activity	Average Day
All Aircraft Operations	767 Daily Aircraft Operations
On-Airport Employment	1,486 Workers on the Airport
On-Airport Payrolls	\$286,000 Paid to Airport Workers
General Aviation Air Visitors	215 Air Visitors in the Area Daily*
Air Visitor Spending	\$43,000 Daily Visitor Spending
Total Employment	4,009 Total Area Jobs Supported
Total Payrolls	\$651,000 Paid to Area Workers
Total Economic Benefits	\$2,224,000 Daily Economic Benefits

*Includes overnight visitors as well as those who remain for only part of a day

On an average day at the Airport, there were 767 operations by aircraft involved in local or itinerant activity including touch-and-go operations, pilot training flights, corporate travel on business jets, or general aviation flights bringing passengers visiting the area for personal travel or on business. On an average day, 215 air visitors were in the area spending for lodging, food and drink, retail goods and services, recreation and ground transportation. Visitor spending injected \$43,000 per day into the regional economy.

ON-AIRPORT ECONOMIC BENEFITS

Economic benefits on the Airport flow from the employment, payroll, and output created by the 110 private firms and public agencies located on the Airport, as well as capital improvement projects undertaken by private contractors that come onto the Airport.

Information about employers on the Airport was obtained through surveys and interviews with managers conducted at mid-year 2018. Final follow-up tallies were completed over the following weeks. Figures for employment, payroll, and output reported in this study were current as of November 2018. Survey participants were informed that the individual employer results were confidential and only aggregate totals would appear in the written report.



The Falcon Field Airport administration provided substantial data and collaboration in support of this study. Airport staff shared tenant records, facilitated on-site interviews with business owners and managers, and provided specialized knowledge regarding airport operations.

As of November 2018, the 110 employers on the Airport reported 1,473 employees (**Table D3**). This tally includes five government agencies with 169 employees and 105 private firms with 1,304 employees. Government units include Falcon Field Airport staff, City of Mesa fire and police units, FAA Air Traffic Control Tower, and the U.S. Postal Service. Ninety-five percent of on-airport employers and 88 percent of on-airport jobs are in the private sector.

Table D3 On-Airport Economic Benefits Falcon Field Airport			
SOURCE	EMPLOYMENT	PAYROLL	OUTPUT
Direct Economic Benefits			
Private Aviation Employers (60 Firms)	832	\$66,564,000	\$354,970,000
Government Aviation Employers (4 Public Sector Agencies)	86	\$8,466,000	\$14,467,000
Non-Aviation Employers (45 Firms + U.S. Postal Service)	555	\$28,712,000	\$62,962,000
Capital Improvement Projects (Five Year Average Value)	13	\$625,000	\$1,936,000
<i>Direct Benefits</i>	1,486	\$104,367,000	\$434,335,000
Secondary Economic Benefits			
Indirect Benefits: <i>Activity by Suppliers & Vendors</i>	789	\$50,484,000	\$140,243,000
Induced Benefits: <i>Activity by Workers as Consumers</i>	1,499	\$73,594,000	\$207,008,000
<i>Secondary Benefits</i>	2,288	\$124,078,000	\$347,251,000
Total Economic Benefits			
Total Benefits	3,774	\$228,445,000	\$781,585,000

Source: On-airport employment was obtained through on-site interviews and records maintained by Falcon Field administrative staff. Payroll figures based on Maricopa County wage data from U.S. Bureau of Labor Statistics Quarterly Census of Employment and Wages. Output estimates were computed from the IMPLAN input-output model, with coefficients for Maricopa County. Values are in 2018 dollars.

There were 64 tenants on the Airport involved in the supply or support of aviation activity, as shown in **Figure C**. Of these, 60 were private firms and four were public sector agencies. Falcon Field has a diverse economic base of aviation firms, ranging from full FBO services to specialized maintenance, manufacturing, historical aircraft, and more. The private sector aviation firms reported employment of 832 workers with compensation of \$66.6 million and output (revenues) of \$355.0 million.

There were 46 non-aviation employers on the Airport, including business and financial services, manufacturing, and health care. The non-aviation tenants created direct employment of 555 workers with compensation of \$28.7 million and output of \$63.0 million.

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 were obtained from Falcon Field Airport records and averaged over the five-year period from 2013 through 2018. The average annual outlay was \$1.9 million (**Table D4**). This value was used to obtain the employment estimate of 13 workers and payroll of \$625,000 as representative annual figures for capital improvement activity at the Airport.

FALCON FIELD EMPLOYERS

Aviation Employers (64 Firms & Agencies)

- FBO Services & Fueling
- Flight Training
- Avionics & ADS-B Systems
- Maintenance & Inspections
- Aircraft Painting
- Helicopter Service
- Repair & Upgrades
- Aircraft Manufacturing
- Sales & Rental
- Aircraft Parts
- Photography
- Charter Flights & Tours
- Hangar Rental
- Pilot Supplies
- Historical Aircraft
- FAA Tower
- Mesa Police & Fire
- Airport Administration

Non-Aviation Employers (46 Firms & Agencies)

- Business Services
- Real Estate Sales
- Financial Services
- Insurance
- Health Care
- Construction
- Manufacturing
- Food Service
- U.S. Postal Service

Figure C. Airport Employers

Table D4 Capital Improvement Projects: Five Year Summary (\$ Thousands) Falcon Field Airport							
Source	FY 2013	FY 2014	FY 2015	FY 2016	FY 2017	Total	Average
Federal	\$575.5	\$349.4	\$1,538.2	\$1,984.9	\$1,827.5	\$6,275.6	\$1,255.1
State	\$647.3	\$2,006.9	\$155.8	\$498.6	\$97.4	\$3,406.2	\$681.2
Total	\$1,222.9	\$2,356.3	\$1,694.1	\$2,483.6	\$1,925.0	\$9,681.7	\$1,936.3

Source: Falcon Field Airport records of Federal and State grant awards, various years.

DIRECT, SECONDARY, AND TOTAL ON-AIRPORT BENEFITS

The capital improvement projects undertaken on the Airport by private contract firms were incorporated into the computation of direct benefits of on-airport activity to provide a final sum of 1,486 jobs on the Airport, with payroll of \$104.4 million and output of \$434.3 million.

Secondary benefits as estimated by the IMPLAN model added employment of 2,288 more jobs and additional output of \$347.2 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 across the area economy.

Of the 2,288 secondary jobs created by airport operations, 789 were indirect jobs adding to the number of workers in supplier industries to on-airport activity, such as finance and insurance, business services, providers of parts, supplies and materials, transportation and warehousing, information and communication systems. There were 1,499 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 3,774 jobs supported, with payroll of \$228.4 million, and output of \$781.6 million contributed to the area economy.

Comparison of total on-airport benefit figures with the initial direct benefits gives insight into the multiplier values for each component. For example, the 1,486 direct on-airport jobs support total employment of 3,774, a multiple of 2.54. The economic interpretation is that, on average, every 100 on-airport jobs support an additional 154 jobs in the general economy.

The output multiplier is the ratio of total output (\$781.6 million) to direct output (\$434.3 million), or 1.80. Every million dollars of direct output on the Airport results in \$625,000 more of additional output as the initial direct spending recirculates in the regional economy.

ECONOMIC BENEFITS OF FLIGHT TRAINING ACTIVITY

The tradition of flight training continues at Falcon Field Airport with pilot instruction in helicopters and fixed wing aircraft. From its earliest days of existence, the Airport has been recognized as an ideal location for flight instruction, with minimal weather restrictions on training activity. From the initial emphasis on military aircraft, the Airport now offers opportunities for those interested in civilian flying to have individual instruction or participate in a more formal training environment. Fuel, maintenance, parts, and general administrative outlays in support of flight training all contribute importantly to the economic footprint of the Airport.

Moreover, there are economic benefits associated with expenditures by Academy flight students not shown in these tables, but nonetheless significant. Most students who have come to Mesa for their training are from other nations and other states. Students were not surveyed for this study, but a very conservative calculation of combined rental costs and living expenses yields an estimate of student expenditures easily exceeding \$10 million per year injected into the local economy.

GENERAL AVIATION VISITOR ECONOMIC BENEFITS

Visitors travel on general aviation aircraft to Falcon Field Airport for business, as vacationers, to reunite with friends and relatives, to attend sporting or cultural events in the Phoenix/Mesa metropolitan area, or for various personal or professional reasons. 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 Falcon Field 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, aviation flyers face fewer restrictions on transportability of baggage, more efficient security checks, and flexibility of arrival and departure schedules.

Extrapolating flight data from the FAA Air Traffic Activity System (ATADS), an estimate was developed of 26,337 itinerant general aviation (GA) arrivals at Falcon Field Airport in 2018 (**Table D5**). An itinerant arrival is defined as a flight that has originated at an airport other than Falcon Field. This definition includes returning based aircraft as well as arriving non-based (transient) aircraft. To determine the number of transient arrivals, the FlightAware Flight Tracker database for Falcon Field was used. This source includes arrival and departure times for aircraft identified by N numbers, on a 24-hour basis. Based aircraft arrivals were identified by matching arriving N numbers with known N numbers of Falcon Field based aircraft, including CAE Oxford Aviation Academy training flights. Through this process, 19,226 non-based itinerant arrivals were estimated for 2018, defined in this study as “true transients.”

Table D5 General Aviation Itinerant Aircraft Falcon Field Airport	
Category	Value
Itinerant GA Arrivals	26,337
Itinerant Based Aircraft	7,111
Transient Aircraft	19,226
Overnight Stay Aircraft	4,672
One Day Stay Aircraft	14,554
Aircraft with < 3 Hour Stay	5,843
Aircraft with > 3 Hour Stay	8,711

Source: Derived from FAA Air Traffic Activity System (ATADS) and FAA 24-hour daily arrival and departure N number records for Falcon Field Airport as compiled by the FlightAware Flight Tracker system, 2018

Of these, an estimated 4,672 remained overnight while the GA travel party conducted business or visited in the area for personal reasons. The remaining 14,554 aircraft stayed for a portion of one day but not overnight. To compute a conservative estimate of economic benefits of GA visitors, one-day aircraft were further partitioned into those staying less than 3 hours (5,843) and 3 hours or more (8,711), based on arrival and departure times.

GENERAL AVIATION VISITOR SPENDING

Visitor spending estimates were computed for overnight visitors and those staying 3 hours or longer, with the assumption that those staying longer than 3 hours had sufficient opportunity to attend off airport business meetings, travel to sporting events, or leave the Airport for other business or personal activity that might include expenditures, such as shopping.

Overall visitor spending depends on the number of visitors, their length of stay, and the types of expenditures made. The number of visitors for an arriving aircraft was based on studies by the National Business Aviation Association and Harris Interactive that found average count across general aviation aircraft flights of 3.0 persons. In this study, it was also assumed that 25 percent of transient general aviation aircraft included, in addition, two crewmembers.

From analysis of the arrival and departure database, it was determined that the average length of stay of overnight general aviation aircraft was 2.8 days. Multiplying length of stay by numbers of passengers and crew, the result is 45,786 visitor days by general aviation visitors that remained overnight. The number of visitor days by those who only stayed in the area one day or a portion of one day was 32,672 visitor days. The sum of general aviation visitor days for 2018 was 78,458.

Note that dividing this figure by 365 gives 215, an estimate of how many general aviation visitors are in the area during a typical day.

Estimates for visitor spending per person per day are set out in **Table D6**. Data on spending by category were obtained from the Mesa Convention and Visitors Bureau, as developed by Longwoods International.

Table D6 General Aviation Visitor Spending per Person per Day Falcon Field Airport		
Category	Overnight GA Visitors	One Day GA Visitors
Lodging	\$128	
Food & Drink	\$58	\$39
Retail Goods & Services	\$39	\$26
Entertainment	\$21	\$14
Ground Transportation	\$25	\$17
<i>Spending per Day</i>	<i>\$271</i>	<i>\$96</i>
Visitor Days*	45,786	32,672
<i>Direct Visitor Spending</i>	<i>\$12,408,000</i>	<i>\$3,136,000</i>
Direct Visitor Benefits		\$15,544,000

***Visitor day sum includes 2 crew for 25% of transient GA aircraft**

Source: Spending based on surveys from Mesa Convention and Visitors Bureau and Longwoods International, adjusted to 2018 values by Consumer Price Index, U.S. Bureau of Labor statistics. Day visitor spending for each category is 66% of one full day spending. Some figures are rounded and may not compute exactly.

Visitor spending per person per day for overnight visitors was \$271. The largest component was lodging at \$128, which accounted for 47 percent of the total. The next largest category for overnight visitors was food and drink, at \$58 per person per day and 21 percent of the total. Visitors who were only in the area for a day had no expenses for lodging and therefore total spending per person was lower than for overnight visitors, at \$96. Since one-day visitors were often in the area for only a portion of a full day,

each spending category was further reduced by a factor of one third to adjust day visitor per person spending downward. Multiplication of spending per person per day by the total number of visitor days results in estimates of annual overnight visitor spending of \$12.4 million and annual one-day visitor spending of \$3.1 million, for a direct economic benefit of \$15.5 million in 2018.

DIRECT, SECONDARY, AND TOTAL AIR VISITOR BENEFITS

Annual direct, secondary, and total air visitor benefits are shown in **Table D7**. Output (visitor expenditures) benefits are shown for overnight, one day, and combined general aviation visitors. The largest spending category by aviation visitors was overnight expenditures for hotel or other accommodation, with outlays of \$5.9 million. The level of lodging employment associated with this spending level was 65 jobs and payroll of \$2.1 million. The second greatest spending category was food and drink, with combined outlays of \$3.9 million, creating 34 jobs with payroll of \$725,000. Direct visitor benefits include spending of \$15.5 million, 133 jobs supported, and payroll of \$4.0 million.

TABLE D7 Economic Benefits from Air Visitors Falcon Field Airport					
Category	Overnight GA Visitors	One Day GA Visitor	Output (All Expendi- tures)	Worker Payroll	Employment
Direct Economic Benefits					
Lodging	\$5,861,000		\$5,861,000	\$2,148,000	65
Food/Drink	\$2,656,000	\$1,272,000	\$3,928,000	\$725,000	34
Retail Sales	\$1,786,000	\$855,000	\$2,641,000	\$365,000	13
Entertainment	\$960,000	\$461,000	\$1,421,000	\$486,000	16
Ground Transport	\$1,145,000	\$548,000	\$1,693,000	\$260,000	5
<i>Direct Benefits</i>	<i>\$12,408,000</i>	<i>\$3,136,000</i>	<i>\$15,544,000</i>	<i>\$3,984,000</i>	<i>133</i>
Secondary Economic Benefits					
Indirect Benefits	\$4,276,000	\$978,000	\$5,254,000	\$1,732,000	33
Induced Benefits	\$7,641,000	\$1,651,000	\$9,293,000	\$3,513,000	69
<i>Secondary Benefits</i>	<i>\$11,917,000</i>	<i>\$2,629,000</i>	<i>\$14,546,000</i>	<i>\$5,245,000</i>	<i>102</i>
Total Economic Benefits					
Total Benefits	\$24,325,000	\$5,766,000	\$30,091,000	\$9,172,000	235

Source: Spending estimates based on figures from Mesa Convention and Visitors Bureau and Longwoods International. Employment and payroll estimated by the IMPLAN input-output model.

Each one million dollars of direct spending by air visitors created 8.6 jobs in the hospitality industry. This figure is obtained from 133 jobs/\$15.5 million. By visitor spending category, the employment benefits from spending on lodging are greatest, with 11.1 jobs created per one million dollars of outlays. Benefits from retail spending are smaller (4.9 jobs per million dollars) and recreation spending creates the fewest jobs (2.9 per million dollars of spending).

The indirect benefits created by purchase of intermediate goods and services from suppliers to the hospitality industry were output of \$5.2 million and 33 additional jobs across the regional economy. The

induced spending by workers as consumers created benefits of \$9.3 million revenues and 69 jobs. Both the indirect and induced spending recirculated within the area 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 \$14.5 million of revenues, 102 jobs, and \$5.2 million of payroll.

The total economic benefits from air visitor spending were \$30.1 million in output and 235 jobs supported throughout the economy, with payroll income to workers of \$9.2 million. The output multiplier for GA visitor spending was $\$30.1/\$15.5 = 1.94$, indicating that each one million dollars of direct air visitor spending recycled in the economy to create total final output of \$1.94 million (or \$940,000 of secondary spending benefits per million dollars of direct spending).

The employment multiplier (comparing total employment of 235 with direct employment of 133) was 1.77. Each 100 direct jobs related to air visitor spending created an additional 77 jobs in the overall economy.

THE BOEING COMPANY ECONOMIC BENEFITS

The world's largest aerospace firm, the Boeing Company, has been in Arizona for more than three decades. The site at 5000 E. McDowell Road is directly north of Falcon Field and has runway access for operations on the Airport. The Mesa facility produces military rotorcraft, most notably the AH-64E Apache helicopter, with a fleet of more than 1,000 in use by customers worldwide. The Boeing Company in Mesa has a significant economic presence, supported by some 350 Arizona suppliers and annual purchases exceeding \$1 billion. As of mid-year 2018, the Boeing Company reported 4,281 employees at the Mesa site.

Although the Boeing Company is not located within Falcon Field property boundaries, economic benefit studies often include the employment, payroll, and output of those firms with runway access in calculation of the economic benefits of the Airport. (An example is Scottsdale Municipal Airport, where many employers are located in the private Airpark adjacent to the Airport with "through the fence" authorization for runway access. Employment and output at these firms is directly related to the Airport and included in analysis of economic benefits.)

In **Table D8**, the Boeing Company has been added to the economic benefit calculations for Falcon Field. These figures illustrate the importance to Mesa and the entire Phoenix/Mesa metropolitan area of the Airport and the Boeing Company as a contiguous employer. Employment figures were provided by the Boeing Company. The Boeing Company output and payroll were estimated from the IMPLAN model, based on internal coefficients from the U.S. Bureau of Economic Analysis and U.S. Bureau of Labor Statistics for Maricopa County. The output for the Boeing Company Mesa facility estimated by the model was \$3.6 billion. At an estimated wage rate of \$125,600, payroll was calculated to be \$537.8 million.

With the Boeing Company included, the direct impact of Falcon Field rises to 5,900 employees, payroll of \$646.2 million and output of \$4.1 billion. Incorporating secondary benefits as calculated through the IMPLAN model, the total economic benefits across the regional economy rise to employment of 23,184, payroll of \$1.6 billion, and total output of \$6.8 billion.

Table D8 Economic Benefits Including the Boeing Company Falcon Field Airport			
Source	Employment	Payroll	Output
On-Airport	1,486	\$104,367,000	\$434,335,000
General Aviation Visitors	133	\$3,984,000	\$15,544,000
The Boeing Company	4,281	\$537,828,000	\$3,624,059,000
<i>Direct Benefits</i>	5,900	\$646,179,000	\$4,073,938,000
<i>Secondary Benefits</i>	17,284	\$984,563,000	\$2,759,654,000
Total Economic Benefits			
Total Benefits	23,184	\$1,630,742,000	\$6,833,592,000

Source: On-airport data from employer interviews and Falcon Field Airport staff records; air visitor calculations from FAA arrival and departure flight records and FlightAware Flight Tracker system; visitor spending from Mesa Convention and Visitors Bureau; the Boeing Company employment from the Boeing Company; the Boeing Company payroll and output calculated from the IMPLAN input-output model.

FUTURE ECONOMIC BENEFITS

Maricopa County and Falcon Field service area economic indicators such as population, employment, and income have consistently grown more rapidly than the nation as a whole. That trend is expected to continue into the future, although at a somewhat slower pace. For example, population in the Airport service area is projected to grow at an annual rate of 1.7% until 2022, and by 1.2% between 2022 and 2027. However, the national rate of population growth is expected to be well below 1% over the entire period. By 2027, the Falcon Field service area is expected to add 205,500 new residents and create an additional 124,500 jobs (*Falcon Field Airport Master Plan*, Tables 2C and 2D). As the regional economy grows, the demand and supply of aviation services will rise, increasing future economic benefits.

Table D9 shows a baseline summary of current economic benefits associated with the presence of Falcon Field Airport. **Tables D10 through D12** illustrate the future benefits of the Airport based on projections for the short, intermediate, and long-term growth periods, represented respectively by annual values for 2022, 2027, and 2037. The methodology for estimating future economic benefits is a linear extrapolation of current baseline values of the direct on-airport and visitor benefits applying growth rates for aviation activity represented by operations, adjusted for tower closure hours, as developed in Chapter 2 of the *Falcon Field Airport Master Plan*. All figures are expressed in 2018 dollars.

On-airport revenues, employment, and payrolls increase by the forecast growth rate of combined annual operations: 5.3 percent by 2022, 10.1 percent between 2022 and 2027, and 14.8 percent from 2027 to 2037. Non-aviation employment, payroll, and output are all assumed to maintain current ratios to aviation activity and therefore increase at the pace of operations. General aviation visitor spending, payroll, and employment likewise increase at the same pace as operations and on-airport activity. The Boeing Company is not included in the projection calculations. 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 D9 Baseline Economic Benefits: 2018 Falcon Field Airport			
Source	Employment	Payroll	Output
On-Airport	1,486	\$104,367,000	\$434,335,000
Air Visitors	133	\$3,984,000	\$15,544,000
<i>Direct Benefits</i>	1,619	\$108,351,000	\$449,879,000
<i>Secondary Benefits</i>	2,390	\$129,323,000	\$361,798,000
Total Benefits	4,009	\$237,674,000	\$811,677,000

Source: Estimates calculated from 2017 operations of 300,200 and adjusted for growth to 2018 values

Airport activity in future years will be demand driven but is represented here by forecast activity levels five, ten, and twenty years from the base year. Falcon Field Airport operations are forecast to rise from 300,200 in 2017 to 320,400 by 2022. Between 2022 and 2027, operations increase by 32,400, rising to 352,800 in 2027. There are 404,900 annual operations forecast in 2037, an increase of 34.9% from 2017.

Airport direct benefits from on-airport activity are projected to rise from \$434.3 million output and 1,496 on-site jobs in 2018 to \$457.6 million output and 1,566 jobs in 2022 (**Table D10**). The rise in operations to 320,400 in 2022 increases air visitor spending to \$16.4 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 2022, total benefits include employment of 4,224 with payroll of \$250.4 million and output of \$855.2 million.

Table D10 Projected Economic Benefits: 2022 Falcon Field Airport			
Source	Employment	Payroll	Output
On-Airport	1,566	\$109,960,000	\$457,612,000
Air Visitors	140	\$4,197,000	\$16,377,000
<i>Direct Benefits</i>	1,706	\$114,157,000	\$473,989,000
<i>Secondary Benefits</i>	2,518	\$136,254,000	\$381,187,000
Total Benefits	4,224	\$250,411,000	\$855,176,000

Source: Based on 320,400 annual operations; all figures are in \$2018

For the year 2027, on-airport output is projected to be \$503.9 million, with 1,724 on-site jobs. Output from air visitor spending is projected to rise to \$18 million, creating 154 hospitality sector jobs. By 2027, total benefits increase to 4,651 jobs in the region with payroll of \$275.7 million and output of \$941.6 million (**Table D11**).

Table D11 Projected Economic Benefits: 2027 Falcon Field Airport			
Source	Employment	Payroll	Output
On-Airport	1,724	\$121,080,000	\$503,887,000
Air Visitors	154	\$4,622,000	\$18,033,000
<i>Direct Benefits</i>	1,878	\$125,702,000	\$521,920,000
<i>Secondary Benefits</i>	2,773	\$150,032,000	\$419,733,000
Total Benefits	4,651	\$275,734,000	\$941,653,000

Source: Based on 352,800 annual operations; all figures in \$2018

By 2037, aviation demand levels rise to 404,900 operations. Based aircraft at Falcon Field Airport are projected to number 1,040, including 30 jet aircraft and 75 helicopters. At this level of activity, on-airport employment increases to 1,979 workers, with payroll of \$139.0 million and output of \$578.3 million (**Table D12**). Visitor spending is projected to rise to \$20.7 million, creating 177 jobs.

In the year 2037, Falcon Field Airport becomes a billion-dollar economic asset. Total output, including all secondary benefits, is forecast to be \$1.1 billion, an increase of one third over baseline total output of \$811.7 million. For 2037, total regional employment due to the presence of the Airport increases to 5,338 workers with payroll of \$316.4 million.

Table D12 Projected Economic Benefits: 2037 Falcon Field Airport			
Source	Employment	Payroll	Output
On-Airport	1,979	\$138,960,000	\$578,299,000
Air Visitors	177	\$5,304,000	\$20,696,000
<i>Direct Benefits</i>	2,156	\$144,264,000	\$598,995,000
<i>Secondary Benefits</i>	3,182	\$172,189,000	\$481,718,000
Total Benefits	5,338	\$316,453,000	\$1,080,713,000

Source: Based on 404,900 annual operations; all figures in \$2018

GOVERNMENT REVENUE BENEFITS

Because of the output, jobs, and income created by the presence of Falcon Field 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 D13**. The table shows the revenues for each tax category derived from the IMPLAN model. The model uses current average tax rates for Maricopa 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 D13** shows tax revenues associated with the 2018 baseline level of total output of \$811.7 million. The total economic benefits include direct and secondary benefits from on-airport activity and air visitor spending. The 4,009 total workers supported by airport activity receive payrolls of \$237.7 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 \$27.1 million in 2018. The second largest federal tax category is the personal income tax paid by workers and proprietors of \$16.4 million. The federal corporate profits tax is \$8.2 million. Overall, federal tax revenues estimated due to economic activity associated with Falcon Field Airport are calculated to be \$54.0 million for 2018.

State and local tax revenues, shown in the lower portion of the table, sum to \$22.3 million for 2018. The largest state and local component is sales taxes of \$10.7 million. Property taxes for homeowners and businesses are estimated to be \$5.7 million. Combined federal, state, and local government tax revenues

created by the presence of Falcon Field Airport are \$76.3 million at the 2018 level of airport activity and visitor spending.

Table D13 Government Revenue Benefits Falcon Field Airport				
Source	2018	2022	2027	2037
Federal Taxes				
Corporate Profits Tax	\$8,171,000	\$8,609,000	\$9,479,000	\$10,879,000
Personal Income Tax	\$16,419,000	\$17,299,000	\$19,049,000	\$21,862,000
Social Security Tax	\$27,150,000	\$28,605,000	\$31,497,000	\$36,149,000
All Other Federal Taxes	\$2,255,000	\$2,375,000	\$2,616,000	\$3,002,000
Total Federal Taxes	\$53,995,000	\$56,888,000	\$62,641,000	\$71,892,000
State and Local Taxes				
Corporate Profits Tax	\$858,000	\$904,000	\$995,000	\$1,142,000
Property Tax	\$5,717,000	\$6,024,000	\$6,633,000	\$7,613,000
Sales Tax	\$10,670,000	\$11,242,000	\$12,379,000	\$14,207,000
Personal Income Tax	\$2,804,000	\$2,954,000	\$3,253,000	\$3,733,000
All Other State & Local	\$2,213,000	\$2,209,000	\$2,432,000	\$2,791,735
Total State & Local Taxes	\$22,262,000	\$23,333,000	\$25,692,000	\$29,486,000
Total Federal, State and Local Taxes				
Total Taxes	\$76,257,000	\$80,221,000	\$88,333,000	\$101,378,000

Source: Calculations from the IMPLAN input-output model based on tax rates for Maricopa County and Arizona and current federal rates. All figures are in 2018 dollars.

Projected tax revenues rise as future airport activity increases. In the year 2022, total economic benefits created by the presence of Falcon Field Airport are projected to be \$855.2 million, with 4,224 jobs supported in the region and worker compensation of \$250.4 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 \$28.6 million. Federal personal income taxes will rise to \$17.3 million. All figures assume constant 2018 tax rates. In 2022, state and local government revenues will be \$23.3 million, and combined total annual state and federal tax collections will be \$80.2 million.

Total economic benefits due to the presence of the Airport are projected to increase to \$941.6 million for the year 2027. Jobs supported will rise to 4,651 and worker and proprietor income will be \$275.7 million. Total state and federal tax collections will be \$88.3 million.

Within the long-term (2037) horizon, total economic benefits from activity at Falcon Field Airport are projected to exceed one billion dollars (\$1.1 billion), with 5,338 jobs supported and payroll of \$316.4 million. Annual federal tax collections in 2037 are estimated to be \$71.9 million, with social security contributions of \$36.1 million and personal income taxes paid of \$21.9 million (assuming rates under current law). At the state and local levels, annual sales tax collections increase to \$14.2 million and property tax collections rise to \$7.6 million. Combined state and federal tax collections will be \$101.4 million, an increase of 33 percent over the 2018 base year revenues.