



OHIO

**AIRPORTS ECONOMIC
IMPACT STUDY**



**Technical
Report
2014**



OHIO AIRPORTS ECONOMIC IMPACT STUDY

October 2014

Prepared for:

**OHIO DEPT. OF TRANSPORTATION
OFFICE OF AVIATION**

2829 West Dublin-Granville Road
Columbus, OH 43235
614-793-5040



Prepared by:

CDM SMITH

8805 Governor's Hill Drive, Suite 305
Cincinnati, OH 45249
513-583-9800



With:

RS&H

Engage Public Affairs

CAD Concepts, Inc.

Table of Contents

Chapter 1: Executive Summary

Introduction.....	1-1
Study Background	1-2
Study Findings	1-6
Summary	1-10

Chapter 2: Socioeconomic Overview of Ohio

Introduction.....	2-1
Population	2-1
Employment	2-5
Per Capita Personal Income	2-6
Summary	2-6

Chapter 3: Study Approach

Introduction.....	3-1
The Economic Modeling Process.....	3-1
Data Requirements for the Economic Modeling Process.....	3-3
Surveys, Data Collection Methods, and Model Assumptions.....	3-4
On-Airport Activity	3-4
Construction Impacts.....	3-5
Commercial Service Visitors	3-6
General Aviation Visitors.....	3-8
Multiplier Impacts.....	3-9
Total Impacts.....	3-10
Summary	3-11

Chapter 4: Employment, Payroll, and Output Impacts for Study Airports

Introduction.....	4-1
Employment Impacts	4-2
Employment from On-Airport Activity.....	4-2
Employment from Capital Improvement Project (CIP) Expenditures	4-2
Employment from Commercial Service Visitor Spending	4-3
Employment from General Aviation Visitor Spending.....	4-3
Total Employment.....	4-4
Payroll Impacts.....	4-4
Payroll from On-Airport Activity	4-4
Payroll from CIP Expenditures	4-5
Payroll from Commercial Service Visitor Spending	4-5

Payroll from General Aviation Visitor Spending.....	4-5
Total Annual Payroll.....	4-6
Output Impacts.....	4-6
Output from On-Airport Activity.....	4-7
Output from CIP Expenditures.....	4-7
Output from Commercial Service Visitor Spending	4-7
Output from General Aviation Visitor Spending.....	4-8
Total Annual Output.....	4-8
Employment, Payroll, and Output Impacts Summary	4-8
Aviation Maintenance	4-9
Location and Type of Maintenance Activity	4-9
Economic Impact of Aviation Maintenance Activity	4-12
Summary	4-12

Chapter 5: Additional Benefits

Introduction.....	5-1
Qualitative Airport Benefits	5-1
Ability to Support a Variety of Aviation Activities	5-1
Community Relationships and Outreach	5-8
Value to Airport Users	5-8
Value Added Benefits from Aviation Dependent Businesses.....	5-10
Dependence on Commercial Service Aviation.....	5-11
Dependence on General Aviation.....	5-11
Dependence on Air Cargo.....	5-11
Overall Dependence on Airports.....	5-11
Business Location.....	5-11
Summary	5-12

Chapter 6: Unique Aspects of Aviation in Ohio / Four Case Studies

Introduction.....	6-1
Shale Oil & Gas Industry	6-1
Ohio Shale Production Overview	6-1
Impact on Commercial Service Airports in Ohio	6-3
Impact on General Aviation Airports in Ohio.....	6-4
Inventory Findings.....	6-5
Shale Industry Summary	6-9
Island Airports.....	6-9
Island Airport Descriptions.....	6-12
Economic Impacts	6-14
Island Airports Summary	6-14
Aviation Education.....	6-15
Professional and University Aviation Education.....	6-15
Other Aviation Training and Education	6-20

Aviation Education Summary	6-21
Fractional Ownership	6-23
The Fractional Model and Its Benefits	6-23
Fractional Ownership in Ohio	6-24
Fractional Ownership Summary	6-25
Summary	6-25

Chapter 7: Tax Impacts of the Ohio Airport System

Introduction.....	7-1
Aviation Fuel Tax Impacts	7-1
Aviation Services and Sales Tax Impacts	7-3
Tax Impacts Summary	7-5

Chapter 8: General Aviation Airport Valuation

Introduction.....	8-1
Methodology	8-1
Infrastructure Facility Analysis	8-2
Airport Valuation Results.....	8-4
Valuation Summary	8-7

Tables

Chapter 1: Executive Summary

Table 1-1: Total Economic Impacts for Ohio Airports	1-6
Table 1-2: Total Economic Impacts of Ohio Airports by System Plan Classification.....	1-10

Chapter 2: Socioeconomic Overview of Ohio

Table 2-1: Ohio Employment by Industry In 2011.....	2-5
---	-----

Chapter 3: Study Approach

Table 3-1: Enplanements & Percent Visitors at Ohio Commercial Service Airports - 2012.....	3-7
Table 3-2: Ohio IMPLAN Multipliers by Economy Sector	3-10

Chapter 4: Employment, Payroll, and Output Impacts for Study Airports

Table 4-1: Ohio On-Airport Employment.....	4-2
Table 4-2: Ohio Employment from CIP Expenditures	4-3
Table 4-3: Ohio Employment from Commercial Service Visitor Spending.....	4-3
Table 4-4: Ohio Employment from General Aviation Visitor Spending.....	4-3
Table 4-5: Ohio Airports Total Employment.....	4-4
Table 4-6: Ohio On-Airport Payroll.....	4-4
Table 4-7: Ohio Annual Payroll from CIP Expenditures	4-5
Table 4-8: Ohio Annual Payroll from Commercial Service Visitor Spending.....	4-5
Table 4-9: Ohio Annual Payroll from General Aviation Visitor Spending	4-6
Table 4-10: Ohio Airports Total Annual Payroll	4-6
Table 4-11: Ohio On-Airport Output	4-7
Table 4-12: Ohio Output from CIP Expenditures	4-7
Table 4-13: Ohio Output from Commercial Service Visitor Spending.....	4-8
Table 4-14: Ohio Output from General Aviation Visitor Spending	4-8
Table 4-15: Ohio Airports Total Annual Output	4-8
Table 4-16: Economic Impact Summary for Ohio Airports.....	4-9
Table 4-17: Direct Economic Impacts of Aviation Maintenance at Ohio Airports.....	4-12
Table 4-18: 2012 Economic Impacts of Ohio Airports.....	4-13
Table 4-19: 2012 Total Economic Impacts of Ohio Airports by System Plan Classification .	4-13

Chapter 5: Additional Benefits

Table 5-1: Frequency of Aviation Activities at Ohio System Airports	5-3
Table 5-2: Comments from Transient Pilot Surveys.....	5-9

Chapter 6: Unique Aspects of Aviation in Ohio / Four Case Studies

Table 6-1: Projected Increase in Enplanements and Commercial Visitor Spending Based on Marcellus/Utica Shale Activity..... 6-4

Table 6-2: Select Airports Facilities in the Marcellus/Utica Shale Areas 6-6

Table 6-3: Ohio’s Airports with Increased Oil-Related Traffic and On-Airport Drilling 6-7

Table 6-4: Ohio’s Lake Erie Island Airports..... 6-10

Table 6-5: Economic Impact Summary of Ohio’s Island Airports 6-14

Chapter 7: Tax Impacts of the Ohio Airport System

Table 7-1: Estimate of Sales and Use Tax Revenue from Aviation Fuel Sales in Ohio 7-3

Table 7-2: Estimate of Sales and Use Tax Revenue from General Aviation Related Sales in Ohio 7-4

Table 7-3: Summary of Sales and Use Tax Revenue from General Aviation Activity in Ohio .. 7-5

Chapter 8: General Aviation Airport Valuation

Table 8-1: Valuation of Ohio General Aviation Airports..... 8-2

Table 8-2: Cost Per Facility Item 8-3

Table 8-3: Airport Reference Code Adjustments..... 8-4

Table 8-4: Valuation of Ohio General Aviation Airports..... 8-5

Table 8-5: Valuation Summary of Ohio General Aviation Airports..... 8-8

Exhibits

Chapter 1: Executive Summary

Exhibit 1-1: Ohio Airports Included in the Economic Impact Study 1-3

Chapter 2: Socioeconomic Overview of Ohio

Exhibit 2-1: Historic Population by County..... 2-2

Exhibit 2-2: Ohio Socioeconomic Trends 1990-2040..... 2-3

Exhibit 2-3: Ohio Population Growth Forecast 2010-2040 2-4

Chapter 4: Employment, Payroll, and Output Impacts for Study Airports

Exhibit 4-1: Types of Ohio Airport Businesses Providing Aviation Maintenance 4-10

Exhibit 4-2: Ohio Airports with Aviation Maintenance Activity 4-11

Chapter 5: Additional Benefits

Exhibit 5-1: Economic Sectors of Responding Businesses 5-10

Chapter 6: Unique Aspects of Aviation in Ohio / Four Case Studies

Exhibit 6-1: Areas of Potential Shale Exploration in Ohio 6-2

Exhibit 6-2: Areas of Potential Shale Exploration and Ohio System Airports..... 6-8

Exhibit 6-3: Map of Ohio’s Lake Erie Islands..... 6-11

Exhibit 6-4: Types of Ohio Airport Tenants Reporting Aviation Education Activity..... 6-21

Exhibit 6-5: Location of Aviation Education in Ohio..... 6-22

Appendix A

Table A-1: Estimates of General Aviation Itinerant Arrivals to Ohio Airports.....	A-1
Table A-2: Estimates of General Aviation Visitors to Ohio Airports.....	A-3
Table A-3: Estimates of General Aviation Visitor Expenditures at Ohio Airports	A-5
Table A-4: Estimates of Commercial Service Visitors to Ohio Airports	A-7
Table A-5: Estimates of Commercial Service Visitor Expenditures at Ohio Airports.....	A-7
Table A-6: On-Airport Employment from Ohio Airports	A-8
Table A-7: CIP Employment from Ohio Airports	A-10
Table A-8: General Aviation Visitor Employment from Ohio Airports.....	A-12
Table A-9: Commercial Service Visitor Employment from Ohio Airports	A-14
Table A-10: Total Employment from Ohio Airports.....	A-14
Table A-11: On-Airport Payroll from Ohio Airports	A-16
Table A-12: CIP Payroll from Ohio Airports	A-18
Table A-13: General Aviation Visitor Payroll from Ohio Airports.....	A-20
Table A-14: Commercial Service Visitor Payroll from Ohio Airports	A-22
Table A-15: Total Payroll from Ohio Airports	A-23
Table A-16: On-Airport Output from Ohio Airports.....	A-25
Table A-17: CIP Output from Ohio Airports	A-27
Table A-18: General Aviation Visitor Output from Ohio Airports	A-29
Table A-19: Commercial Service Visitor Output from Ohio Airports.....	A-31
Table A-20: Total Output from Ohio Airports.....	A-31
Table A-21: Total Economic Impacts from Ohio Airports	A-33

Executive Summary

Introduction

Air transportation is a positive contributor to Ohio's economy. Airports and the linkages they provide help to both support and stimulate economic activity throughout the state. The Ohio Department of Transportation's (ODOT) Office of Aviation completed the *Ohio Airports Economic Impact Study* in 2014 to measure the value provided by airports and aviation-related activities. The statewide economic impact study shows how aviation helps Ohio's economy. The study also documents many other benefits provided by the state's system of airports.

Airports benefit Ohio in a variety of ways. Specifically, airports contribute to the economic development of many communities in that air transportation has helped to attract and retain businesses. In today's time-sensitive business environment, air transportation improves efficiency by enabling businesses to expedite customer service and the delivery of their products to market. In effect, airports in Ohio are the gateway to both the nation's air transportation system and the world's economy.



Additionally, airports in Ohio promote the state's tourism industry. Air transportation brings tourists to Ohio, enabling them to enjoy the state's bustling cities, picturesque small towns, variety of cultural and recreational activities, and numerous historic sites. During these trips, visitors spend money locally on food, lodging, events, and other items. Conversely, residents of Ohio use airports for their own leisure travel to connect with family and friends and vacation destinations throughout the world.

Beyond business and tourism, airports also bring other benefits to Ohio's residents. Airports facilitate the movement of patients to and from medical centers. Aircraft use Ohio airports to apply pesticides to crops. Military units use Ohio's airports to conduct training flights. Search and rescue operations are flown from the state's airports as well. Airports help to support services which are vital to all citizens in Ohio. Citizens benefit from an improved quality of life that air transportation helps to support, even if they never use an airport directly. Aviation in Ohio helps promote safer, healthier, and more productive lives through simple things such as package delivery and the ability to visit family and friends.

This study identifies the economic benefits, quantified in terms of employment, payroll, and total economic activity (output), associated with the seven commercial service and 97 general aviation airports that serve communities throughout Ohio. This study found that in 2013, these 104 airports:

- Supported nearly 123,500 jobs
- Generated nearly \$4.2 billion in annual payroll
- Produced more than \$13.3 billion in annual economic output

Study Background

Ohio is served by a diverse system of 104 publicly-owned, public-use airports ranging in size from small general aviation airports to busy corporate general aviation reliever airports, to Cleveland-Hopkins International, the busiest commercial service airport in the state and the 40th busiest in the U.S in 2012.¹ The ODOT Office of Aviation supports the operation and development of the Ohio system of airports through grants administration, airport pavement and safety inspections, airspace protection, aircraft registration, aviation education, and enforcement of Ohio aviation laws. The *Ohio Airports Focus Study*, ODOT Office of Aviation's 2014 statewide system plan, classified airports according to the role they play within Ohio's system. This system is outlined below:

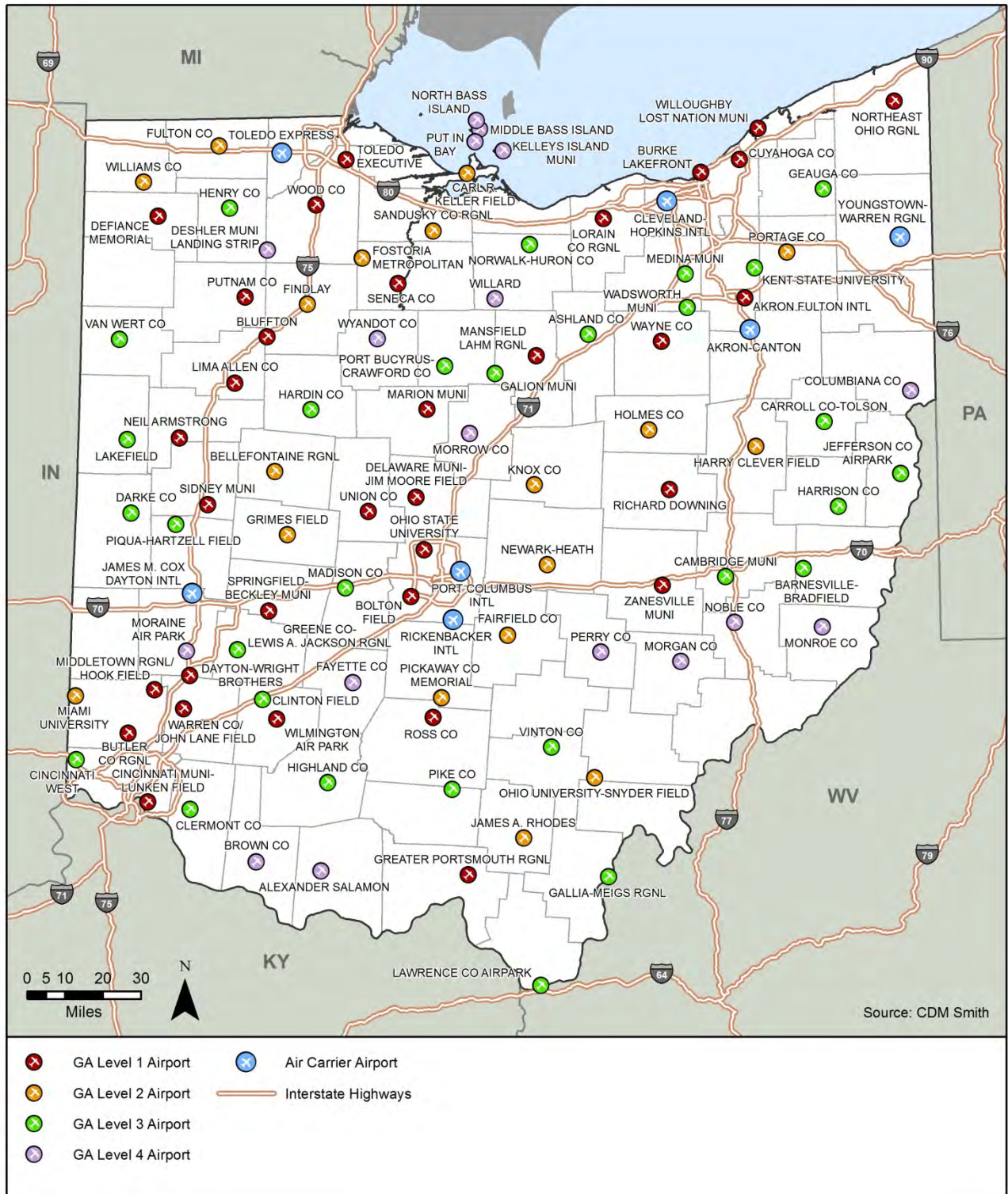
- **Air Carrier:** Air carrier airports are intended to support commercial airline activities. Where capacity constraints do not impose limits, this airport classification can also support all types of general aviation activities.
- **General Aviation Level 1 Airport:** These airports are intended to meet nearly all of the needs of general aviation turbine powered aircraft, including corporate jet aircraft, and their users. This facility classification can also support recreational general aviation activities and flight training.
- **General Aviation Level 2 Airport:** These airports are intended to support smaller corporate aircraft, such as small jets and turboprop aircraft, and meet many, but not necessarily all, of their needs. This airport classification is intended to support a variety of uses (business, pleasure, and training).
- **General Aviation Level 3 Airport:** This classification of airports serves light, twin-engine, and single-engine aircraft flying for business, pleasure, and training. Its purpose is to fulfill nearly all of the needs of piston-powered aircraft. Turbine-powered aircraft may use these airports, but the primary focus is on meeting the facilities and services that support piston-powered aircraft.
- **General Aviation Level 4 Airport:** These airports include facilities that are needed for the flight operations of small general aviation aircraft but do not necessarily provide all of the support services, such as maintenance. Single-engine aircraft represent the primary aircraft type; however, many light twin-engine aircraft may also be accommodated. This airport classification supports private pilots that may be flying for business or pleasure and require minimal support facilities and services.



Exhibit 1-1 depicts the location and classification of the system airports.

¹http://www.faa.gov/airports/planning_capacity/passenger_allcargo_stats/passenger/media/CY12CommercialServiceEnplanements.pdf

Exhibit 1-1 Ohio Airports Included in the Economic Impact Study



This economic impact analysis highlights the important contributions Ohio realizes from its airports by quantifying employment, payroll, and economic output. The analysis presented in this study considers the annual economic impacts associated with on-airport businesses and government agencies, on-airport construction, visitors who arrive via commercial airlines, and visitors who arrive on privately-owned general aviation aircraft. These impacts are reported for each individual airport. It is important to note that an economic impact study provides a "snapshot in time" with respect to airport operations and economic conditions. The data collection processes, economic modeling, and the state of the economy for this study are all specifically related to 2012.

In addition, this study summarizes other benefits attributed to airports in Ohio. These additional areas of analysis are not typically captured by a traditional economic impact study and include the following:

- **Aviation Maintenance Analysis:** Aviation maintenance takes place at many of the airports in this study and generates employment, payroll, and output impacts for Ohio's economy. Aviation maintenance includes airframe and powerplant maintenance on all types of aircraft, avionics installation and repair, and aircraft remanufacturing, refurbishment, and customization. Many of these activities take place at businesses dedicated to aircraft maintenance, but a number of other on-airport businesses, most notably fixed base operators (FBOs), also attribute some of their economic impact to maintenance activities. This analysis provides an estimate of the economic impacts generated in Ohio by these businesses.
- **Qualitative Benefits:** Airports provide contributions in forms other than jobs, payroll, and output. This analysis highlights some of the airport benefits, such as medical transport, aerial application, and police/fire support, which are not easily quantified.
- **Benefits to Non-Aviation Businesses:** There are businesses throughout the state that benefit from airports, beyond direct airport jobs and revenue, even though they are not located on the airport. This analysis examines how these businesses benefit and to what degree they value Ohio's airports, based on a survey of 2,700 off-airport Ohio businesses.
- **Case Studies:** This report provides case studies of unique segments of aviation in Ohio. Similar to the discussion on qualitative benefits, these more detailed analyses provide examples of how Ohio's airports improve the quality of life for the state's residents, above the jobs, payroll, and economic activity that they generate. The areas that were analyzed included the following:
 - **Shale Oil & Gas Industry:** Shale oil and gas production is a growing industry in Ohio that is expected to have a significant impact on the state for several years to come. Airports – both commercial service and general aviation – are crucial gateways enabling industry personnel to efficiently access areas of interest throughout the state. This case study describes the impacts of Ohio's emerging shale boom on the state's airports in terms of activity levels, economic benefits, and facility requirements.
 - **Island Airports:** The Lake Erie Islands are a unique area of Ohio that draws a significant number of seasonal tourists each year, but also serves as home to several hundred year-round residents. There are four general aviation airports in Ohio that serve this region. This case study describes the Lake Erie Islands region and its transportation network and documents the importance of the airports to the local economy.



- **Aviation Education:** Aviation education, including flight training, is an important element of the aviation industry in Ohio and the nation. Schools in Ohio train students to become pilots, air traffic controllers, airplane mechanics, flight attendants, airport managers, and many other professions within the industry. These aviation-related curricula range from major university programs to small training classes at general aviation airports. While most of these schools are located on-airport, many of the higher education programs offer coursework both on and off airports. This case study provides an overview of aviation education in Ohio, profiles several of the major programs and institutions, and offers a brief summary of other on-airport training activity.
- **Fractional Ownership:** In 1986, NetJets formed the fractional ownership model, in which a company or person owns a share of an aircraft, lowering the cost to the owner while increasing the utility of the aircraft. Ohio can be considered one of the epicenters of fractional ownership activity in the nation, as it is home to three companies offering this service: NetJets, Flight Options, and MaxFlight. A description of the fractional ownership model and its benefits, as well as details on the three companies offering this service in Ohio, is provided in this case study.
- **Tax Impacts:** In 2012, general aviation activity at Ohio's airports produced tax revenue for the state's General Revenue Fund through a 5.5 percent sales tax on both aviation fuel and aviation goods and services.² This analysis provides an estimate of the tax revenue produced in Ohio by these two categories of tax impacts. Only the taxes generated by general aviation for Ohio's General Revenue Fund are evaluated in the analysis.
- **General Aviation Airports Valuation Analysis:** Ohio's general aviation airports are important transportation assets that have been constructed and maintained through capital investment from federal, state, local, and private sources. This analysis provides an estimate of the cost of building Ohio's paved, publicly-owned general aviation airports in order to establish their value as a strategic infrastructure asset. Developing an estimate of each airport's value provides the public, airport stakeholders, and public policy decision makers with an understandable value of their airport, as well as the value of the state's current system of general aviation airports.



² Ohio raised its Sales and Use Tax to 5.75 percent in 2013.

Study Findings

This study found that the system of 104 publicly-owned, public-use airports in Ohio provides a positive economic impact on the state. In brief, the 104 airports in 2012:

- Supported nearly 123,500 jobs
- Generated nearly \$4.2 billion in annual payroll
- Produced more than \$13.3 billion in annual economic output

These figures include expenditures by hundreds of on-airport businesses and government agencies and several million visitors, as well as multiplier impacts associated with this spending.

Table 1-1 lists the total employment, payroll, and output for the 104 system airports. These economic benefits include direct impacts from on-airport businesses and government agencies, capital improvement projects, spending by visitors using commercial airlines and general aviation, and the multiplier impacts resulting from the recirculation of money spent by all of the aforementioned activities. A more detailed breakout of this information can be found in **Appendix A**.

Table 1-1
Total Economic Impacts for Ohio Airports

Associated City	Airport Name	System Plan Level	Total Employment	Total Payroll	Total Output
<i>Commercial Service Airports</i>					
Akron	Akron-Canton	Air Carrier	7,688	\$242,191,000	\$690,205,000
Cleveland	Cleveland-Hopkins International	Air Carrier	40,186	\$1,303,089,000	\$4,561,290,000
Columbus	Port Columbus International	Air Carrier	33,464	\$1,061,252,000	\$3,718,693,000
Columbus	Rickenbacker International	Air Carrier	4,806	\$267,282,000	\$903,975,000
Dayton	James M. Cox Dayton International	Air Carrier	11,111	\$351,576,000	\$1,046,730,000
Toledo	Toledo Express	Air Carrier	3,973	\$178,866,000	\$387,283,000
Youngstown/Warren	Youngstown-Warren Regional	Air Carrier	4,731	\$101,876,000	\$178,697,000
Commercial Service Airports Total			105,959	\$3,506,132,000	\$11,486,873,000
<i>General Aviation Airports</i>					
Akron	Akron Fulton International	1	117	\$3,653,000	\$11,923,000
Ashland	Ashland County	3	141	\$5,623,000	\$18,387,000
Ashtabula	Northeast Ohio Regional	1	45	\$1,856,000	\$5,497,000
Athens/Albany	Ohio University-Snyder Field	2	184	\$7,832,000	\$16,648,000
Barnesville	Barnesville-Bradfield	3	8	\$224,000	\$807,000
Batavia	Clermont County	3	263	\$7,418,000	\$27,453,000
Bellefontaine	Bellefontaine Regional	2	27	\$614,000	\$2,144,000
Bluffton	Bluffton	1	124	\$5,006,000	\$14,954,000
Bowling Green	Wood County	1	63	\$1,632,000	\$2,125,000
Bryan	Williams County	2	18	\$493,000	\$1,497,000
Bucyrus	Port Bucyrus-Crawford County	3	15	\$388,000	\$1,500,000
Cadiz	Harrison County	3	29	\$845,000	\$3,330,000
Caldwell	Noble County	4	3	\$73,000	\$219,000
Cambridge	Cambridge Municipal	3	19	\$346,000	\$963,000

Table 1-1
Total Economic Impacts for Ohio Airports

Associated City	Airport Name	System Plan Level	Total Employment	Total Payroll	Total Output
<i>General Aviation Airports</i>					
Carrollton	Carroll County-Tolson	3	37	\$796,000	\$2,966,000
Celina	Lakefield	3	5	\$102,000	\$439,000
Chesapeake/Huntington, WV	Lawrence County Airpark	3	29	\$852,000	\$3,051,000
Chillicothe	Ross County	1	73	\$1,974,000	\$6,756,000
Cincinnati	Cincinnati Municipal-Lunken Field	1	2,155	\$96,023,000	\$292,896,000
Circleville	Pickaway County Memorial	2	38	\$1,192,000	\$3,343,000
Cleveland	Burke Lakefront	1	953	\$34,483,000	\$106,916,000
Cleveland	Cuyahoga County	1	1,262	\$61,593,000	\$185,237,000
Columbus	Bolton Field	1	104	\$2,503,000	\$11,162,000
Columbus	Ohio State University	1	813	\$35,347,000	\$157,753,000
Coshocton	Richard Downing	1	146	\$4,716,000	\$15,699,000
Dayton	Dayton-Wright Brothers	1	323	\$10,774,000	\$35,874,000
Dayton	Greene County-Lewis A. Jackson Regional	3	135	\$3,813,000	\$7,764,000
Dayton	Moraine Air Park	4	56	\$1,702,000	\$6,776,000
Defiance	Defiance Memorial	1	113	\$3,878,000	\$11,329,000
Delaware	Delaware Municipal-Jim Moore Field	1	96	\$3,323,000	\$10,874,000
Deshler	Deshler Municipal Landing Strip	4	1	\$15,000	\$31,000
East Liverpool	Columbiana County	4	47	\$1,755,000	\$6,489,000
Findlay	Findlay	2	91	\$6,202,000	\$19,861,000
Fostoria	Fostoria Metropolitan	2	46	\$1,532,000	\$4,917,000
Fremont	Sandusky County Regional	2	34	\$1,174,000	\$3,968,000
Galion	Galion Municipal	3	49	\$2,534,000	\$12,424,000
Gallipolis	Gallia-Meigs Regional	3	15	\$454,000	\$1,629,000
Georgetown	Brown County	4	5	\$142,000	\$416,000
Hamilton	Butler County Regional	1	334	\$12,510,000	\$40,591,000
Harrison	Cincinnati West	3	52	\$1,382,000	\$3,186,000
Hillsboro	Highland County	3	57	\$1,738,000	\$7,476,000
Jackson	James A. Rhodes	2	12	\$299,000	\$919,000
Kelleys Island	Kelleys Island Land Field	4	15	\$368,000	\$1,017,000
Kent	Kent State University	3	102	\$3,012,000	\$4,787,000
Kenton	Hardin County	3	14	\$416,000	\$1,660,000
Lancaster	Fairfield County	2	121	\$3,081,000	\$9,083,000
Lebanon	Warren County/John Lane Field	1	116	\$2,782,000	\$13,784,000
Lima	Lima Allen County	1	79	\$2,842,000	\$8,926,000
London	Madison County	3	34	\$721,000	\$3,255,000
Lorain/Elyria	Lorain County Regional	1	213	\$7,978,000	\$33,395,000
Mansfield	Mansfield Lahm Regional	1	2,202	\$89,606,000	\$156,488,000
Marion	Marion Municipal	1	99	\$3,146,000	\$9,279,000

Table 1-1
Total Economic Impacts for Ohio Airports

Associated City	Airport Name	System Plan Level	Total Employment	Total Payroll	Total Output
<i>General Aviation Airports</i>					
Marysville	Union County	1	54	\$1,484,000	\$4,863,000
McArthur	Vinton County	3	8	\$140,000	\$462,000
McConnelsville	Morgan County	4	57	\$1,687,000	\$4,159,000
Medina	Medina Municipal	3	62	\$2,131,000	\$7,614,000
Middle Bass	Middle Bass Island	4	4	\$111,000	\$705,000
Middlefield	Geauga County	3	72	\$2,919,000	\$10,884,000
Middletown	Middletown Regional/Hook Field	1	269	\$6,829,000	\$22,251,000
Millersburg	Holmes County	2	45	\$1,567,000	\$4,980,000
Mount Gilead	Morrow County	4	39	\$1,147,000	\$6,873,000
Mount Vernon	Knox County	2	39	\$1,257,000	\$3,623,000
Napoleon	Henry County	3	19	\$471,000	\$1,839,000
New Lexington	Perry County	4	12	\$362,000	\$1,105,000
New Philadelphia	Harry Clever Field	2	96	\$2,971,000	\$7,732,000
Newark	Newark-Heath	2	70	\$2,925,000	\$9,450,000
North Bass Island	North Bass Island	4	2	\$59,000	\$559,000
Norwalk	Norwalk-Huron County	3	11	\$258,000	\$1,106,000
Ottawa	Putnam County	1	9	\$233,000	\$857,000
Oxford	Miami University	2	8	\$302,000	\$913,000
Piqua	Piqua-Hartzell Field	3	18	\$894,000	\$2,861,000
Port Clinton	Carl R. Keller Field	2	198	\$6,310,000	\$18,665,000
Portsmouth	Greater Portsmouth Regional	1	48	\$1,330,000	\$4,538,000
Put In Bay	Put In Bay	4	52	\$1,585,000	\$4,907,000
Ravenna	Portage County	2	59	\$1,797,000	\$6,742,000
Sidney	Sidney Municipal	1	41	\$1,137,000	\$4,024,000
Springfield	Springfield-Beckley Municipal	1	1,452	\$78,585,000	\$117,191,000
Steubenville	Jefferson County Airpark	3	66	\$2,344,000	\$8,110,000
Tiffin	Seneca County	1	131	\$4,015,000	\$14,360,000
Toledo	Toledo Executive	1	84	\$2,390,000	\$8,051,000
Upper Sandusky	Wyandot County	4	2	\$26,000	\$58,000
Urbana	Grimes Field	2	99	\$2,018,000	\$9,059,000
Van Wert	Van Wert County	3	11	\$243,000	\$598,000
Versailles	Darke County	3	20	\$1,138,000	\$2,640,000
Wadsworth	Wadsworth Municipal	3	45	\$1,120,000	\$3,909,000
Wapakoneta	Neil Armstrong	1	108	\$4,459,000	\$11,085,000
Washington Court House	Fayette County	4	8	\$183,000	\$541,000
Wauseon	Fulton County	2	78	\$2,195,000	\$8,988,000
Waverly	Pike County	3	6	\$210,000	\$697,000
West Union	Alexander Salamon	4	4	\$121,000	\$395,000
Willard	Willard	4	2	\$28,000	\$165,000

Table 1-1
Total Economic Impacts for Ohio Airports

Associated City	Airport Name	System Plan Level	Total Employment	Total Payroll	Total Output
<i>General Aviation Airports</i>					
Willoughby	Willoughby Lost Nation Municipal	1	117	\$2,799,000	\$9,428,000
Wilmington	Clinton Field	3	53	\$1,615,000	\$5,770,000
Wilmington	Wilmington Air Park	1	2,567	\$93,776,000	\$174,347,000
Woodsfield	Monroe County	4	14	\$617,000	\$1,908,000
Wooster	Wayne County	1	148	\$5,818,000	\$21,826,000
Zanesville	Zanesville Municipal	1	58	\$1,815,000	\$6,415,000
General Aviation Airports Total			17,497	\$688,184,000	\$1,847,116,000
All Airports Total			123,456	\$4,194,316,000	\$13,333,989,000

*Includes multiplier impacts

Source: CDM Smith, IMPLAN, *Columbus Regional Airport Authority Economic Impact Study Update* (2012), and *The Ohio State University Airport Economic Impact Study Update* (2012)

As shown in Table 1-1, Ohio's airports help the state's growing economy. Other findings included the following:

- Total economic impacts (including multiplier impacts) tied to visitors arriving at Ohio's airports via commercial airlines are estimated at nearly 56,200 jobs, nearly \$1.5 billion in annual payroll, and nearly \$4.1 billion in annual output.
- Total economic impacts (including multiplier impacts) tied to visitors arriving at Ohio's airports via general aviation aircraft are estimated at nearly 2,100 jobs, nearly \$52.9 million in annual payroll, and more than \$142.8 million in annual output.
- More than 123,000 residents of Ohio are employed, either directly or indirectly, as a result of Ohio's airports. These employees represent nearly 2.0 percent of all the employees in the state.
- Of the direct statewide economic impacts, on-airport aviation maintenance activities account for more than 600 jobs, more than \$34.8 million in annual payroll, and nearly \$128.5 million in output.
- Ohio's airports support critical services to which it is difficult to assign a dollar value, such as medical transport, law enforcement, military operations, utility inspection and control, and agricultural spraying.
- The utilization of air travel and aviation services helps businesses in Ohio to increase their productivity, expand their operations, and achieve their goals. Off-airport businesses in Ohio that were surveyed for this study reported that 22 percent of their total business activity is dependent on commercial aviation, while 5 percent is dependent on general aviation. Approximately 25 percent of the employment at these businesses is dependent upon aviation.
- Airports in Ohio play an important role when it comes to supporting the state's emerging shale oil and gas boom. Ohio's commercial service and general aviation airports provide shale extraction companies with access to the state, including remote areas where drilling sites are more prevalent. An increasing number of system airports within close proximity to the state's underlying shale formations are equipped to accommodate business aircraft typically utilized by oil and gas industry firms. Also, several Ohio airports have lease agreements for drilling on airport property, which provides the airports with an additional revenue stream for airport development.
- Total economic impacts tied to the airports serving the Lake Erie Islands region of Ohio include more than 70 jobs, more than \$2.1 million in annual payroll, and nearly \$7.2 million in output.

These airports are essential elements of the Lake Erie Islands region's transportation network and will continue to be key factors in the long-term success of this unique area of Ohio.

- Aviation education is an important and extensive activity in Ohio that will help to ensure the continued viability of aviation in the state by training the pilots, air traffic controllers, aircraft mechanics, airport managers, and other aviation professionals of tomorrow. A total of 73 system airports reported having some form of based aviation education in 2012.
- Ohio continues to be the center of the fractional ownership industry due to the presence of NetJets, Flight Options, and MaxFlight, which have a total of approximately 1,400 direct full-time equivalent employees in the state.³ These operators provide a wide range of fractional ownership options and services that allow companies to conduct business more efficiently.
- Total taxes collected from general aviation fuel, goods, and services in 2012 in Ohio is estimated at \$29.6 million, which represents additional economic benefits beyond the total jobs, payroll, and output estimated for the study airports.
- The total value of Ohio's publicly-owned, public-use general aviation airports, in terms of property, facilities, and infrastructure, is estimated at \$5.2 billion.

Summary

The *Ohio Airports Economic Impact Study* determined that the 104 airports in the Ohio system are significant contributors to the continued growth of the state's economy. Specifically, this study found that in 2012, the airports supported nearly 123,500 total jobs with a total annual payroll of nearly \$4.2 billion. The airports also produced more than \$13.3 billion in total annual economic output.

Table 1-2 presents the 2012 total economic impacts (including multiplier impacts) of the state's airports by classification in the *Ohio Airports Focus Study*. As shown, the air carrier airports generate the largest share of the airport system's economic impacts. These airports generate nearly 106,000 total jobs, more than \$3.5 billion in total annual payroll, and nearly \$11.5 billion in total output.

Table 1-2
2012 Total Economic Impacts of Ohio Airports
by System Plan Classification

System Plan Classification	Number of Airports	Total Employment*	Total Payroll*	Total Output*
Air Carrier	7	105,959	\$3,506,132,000	\$11,486,873,000
General Aviation Level 1	33	14,516	\$590,295,000	\$1,530,694,000
General Aviation Level 2	18	1,263	\$43,761,000	\$132,532,000
General Aviation Level 3	29	1,395	\$44,147,000	\$147,567,000
General Aviation Level 4	17	323	\$9,981,000	\$36,323,000
Total	104	123,456	\$4,194,316,000	\$13,333,989,000

*Includes multiplier impacts

Source: CDM Smith and IMPLAN

This study also found that airports and aviation-related activities in Ohio support additional benefits beyond the economic impacts presented in Tables 1-1 and 1-2. For example, many businesses in Ohio rely on the commercial airline, general aviation, and air cargo services provided at the state's airports for their day-to-day operations. These businesses significantly increase their productivity and efficiency, whether it is through the transport of employees, clients, suppliers, or goods. Airports in Ohio also support the state's emerging shale gas boom by providing access to

³ Two part-time positions are the equivalent of one full-time position.

rural areas for personnel of shale gas extraction companies. When these additional benefits are considered along with the economic impacts summarized in Tables 1-1 and 1-2, it is clear that airports and aviation-related activities in Ohio have a significant positive impact on the state's economy.

Socioeconomic Overview of Ohio

Introduction

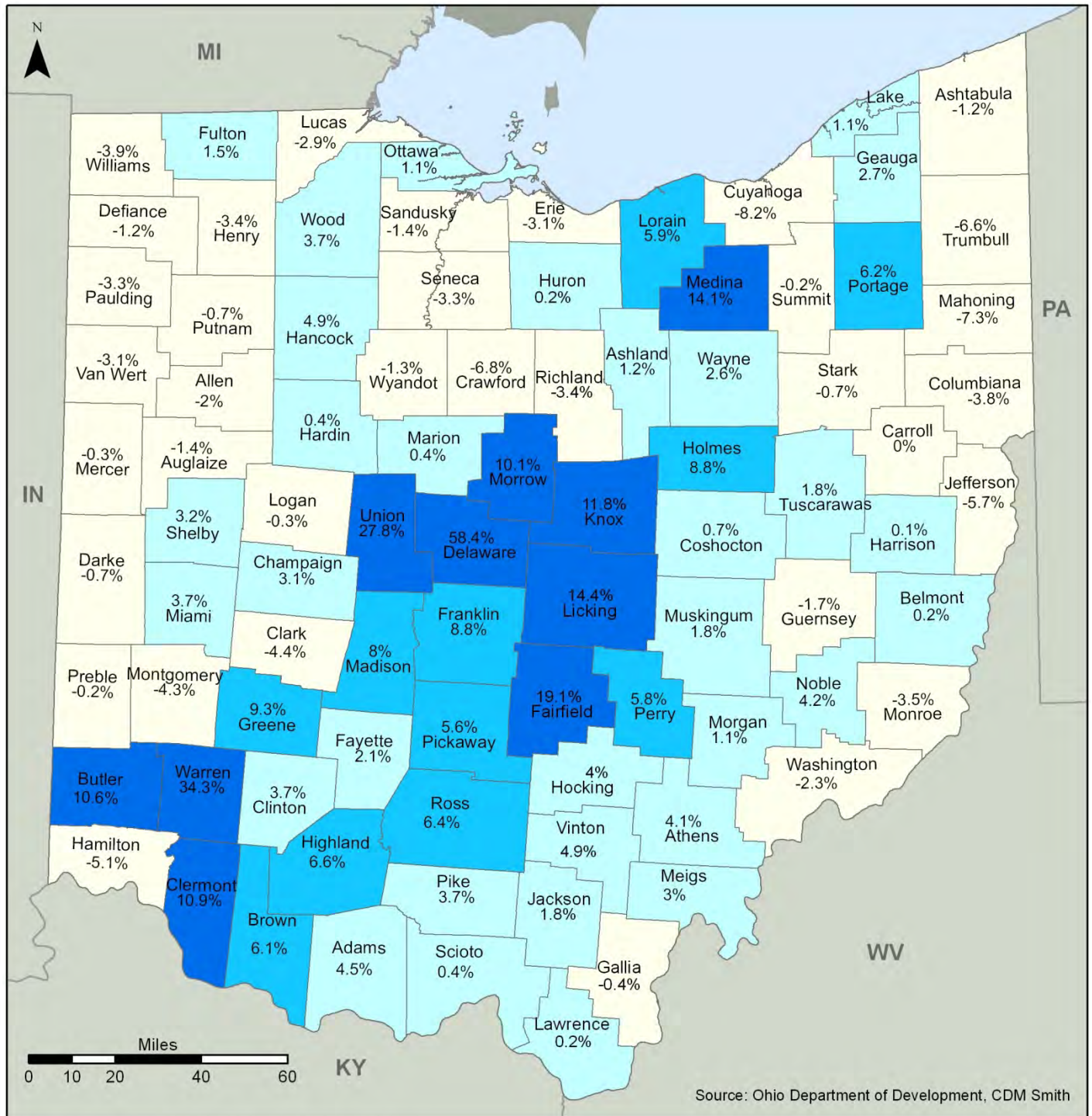
The magnitude of the economic impact of Ohio's airports is linked to the demand that is generated within the state for aviation goods and services. As population, employment, and personal income levels rise in the state, so too does demand for air travel, air cargo shipments, recreational flying, and other aviation-related activities by Ohio residents, businesses, and visitors. This chapter reviews Ohio's general socioeconomic characteristics of population, employment, and personal income and analyzes trends between 1990 and 2012 and forecasts through 2040.

Population

In the 1990 Census, Ohio's population was more than 10.8 million. By the 2010 Census, the population had grown to more than 11.5 million, making Ohio the seventh most populous state in the country. Ohio's growth during this period occurred at a compounded annual growth rate (CAGR) of 0.3 percent. In comparison, the population of the U.S. grew at a CAGR of 1.1 percent during the same time period. Ohio's growth occurred at a significantly slower pace than that of the U.S.

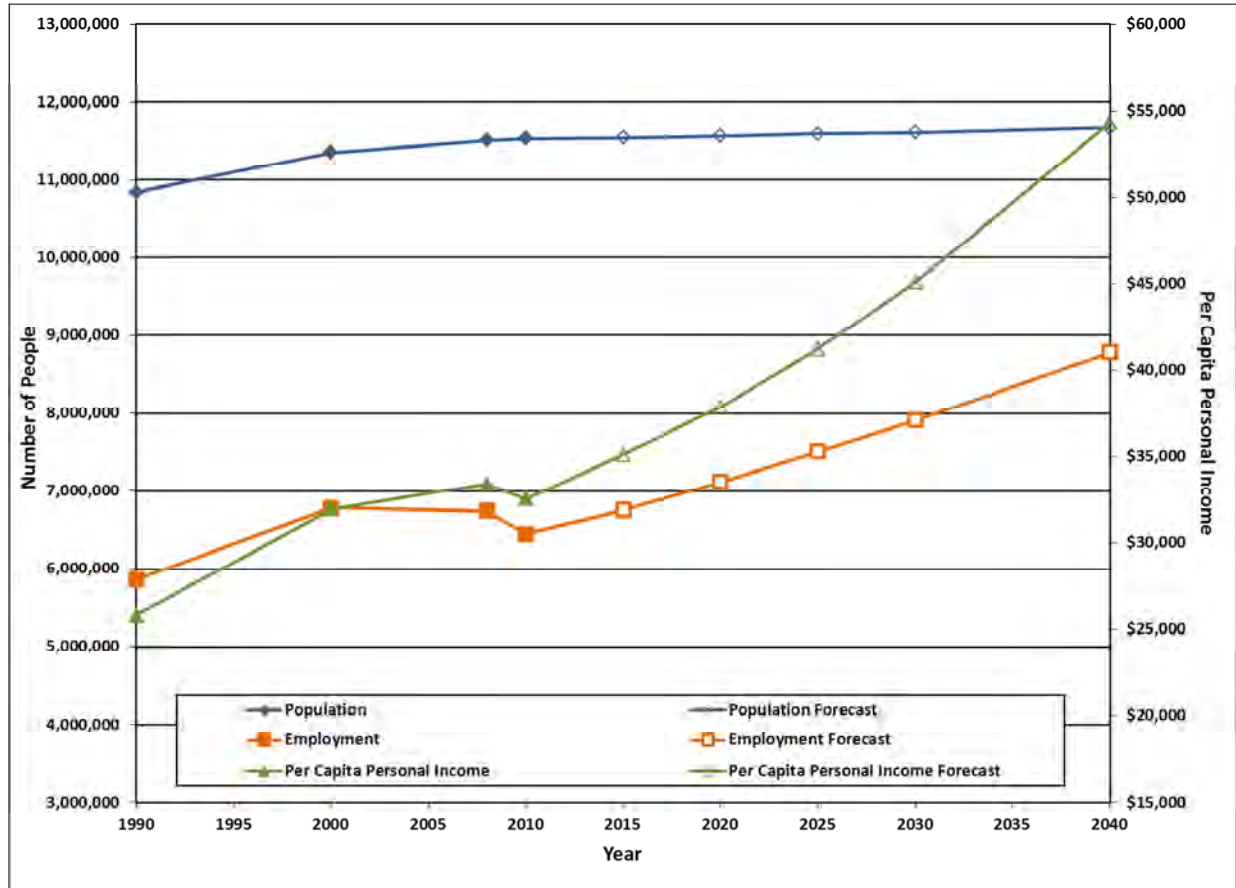
As shown in **Exhibit 2-1**, most of Ohio's counties increased in population between the 2000 Census and the 2010 Census. Of the 88 Ohio counties, 53, or 60 percent, experienced positive growth in population. The counties experiencing the most significant growth were suburban counties adjacent to the state's largest cities, such as Delaware County (58.4 percent increase) near Columbus, Medina County (14.1 percent increase) near Cleveland, and Warren County (34.3 percent increase) near Cincinnati. Aside from Franklin County, the state's urban counties (Cuyahoga, Montgomery, Hamilton, Lucas, Summit, and Mahoning) all lost population.

Exhibit 2-1
Historic Population by County



Ohio's population is projected to experience slow growth through 2040, increasing to nearly 11.6 million by 2020 and nearly 11.7 million by 2040. This represents a CAGR of less than 0.1 percent between 2010 and 2040, less than the growth seen from 1990 to 2010 and significantly less than the national forecast CAGR of 0.7 percent. **Exhibit 2-2** shows the trend of Ohio population growth from 1990 to 2040.

Exhibit 2-2
Ohio Socioeconomic Trends 1990-2040

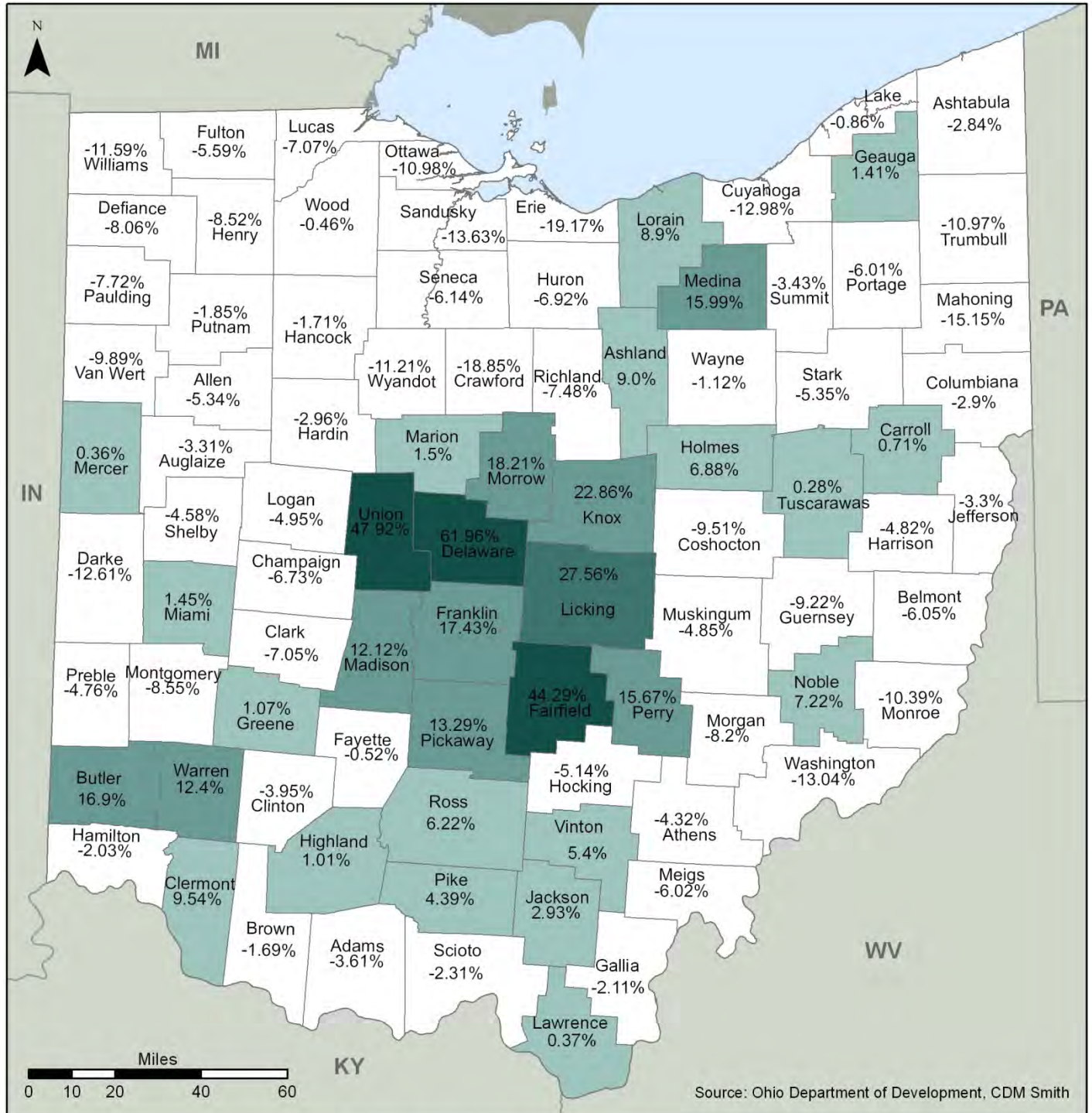


Note: Per capita personal income figures are presented in constant dollars to show the “real” change in earnings and income when inflation is taken into account.

Sources: U.S. Census Bureau, Ohio Development Services Agency, and Woods & Poole Economics, Inc., 2013 CEDDS

Additionally, fewer counties are anticipating population growth from 2010 to 2040 than occurred from 2000 to 2010, as shown in **Exhibit 2-3**. According to the Ohio Development Services Agency, only 35 percent, or 31 of Ohio's 88 counties, are expected to increase population by 2040. For those counties where population is forecast to increase, the trend of growth occurring in suburban counties neighboring Cleveland, Columbus, and Cincinnati is expected to continue. Counties near Columbus such as Delaware (62 percent increase), Union (48 percent increase), and Fairfield (44 percent increase) are projected to be the fastest growing areas.

Exhibit 2-3 Ohio Population Growth Forecast 2010-2040



Employment

In 1990, the Ohio workforce totaled nearly 5.9 million workers and grew to more than 6.5 million workers by 2011.¹ This growth represents a CAGR of 0.5 percent. From 2000 to 2011, however, the number of employees in the state decreased at a CAGR of 0.4 percent. This negative employment growth rate, as compared to the growth seen in population during the same period, was largely due to conditions brought on by the economic recession beginning in December 2007. Ohio suffered its greatest loss of employment in 2009. Losses continued into 2010 with growth returning in 2011. Nationally, job losses were significant between 2008 and 2010 due to the recession, but job growth was positive overall during the 2000 to 2011 period, increasing at a CAGR of 0.6 percent.

The forecasts of Ohio employment through 2040 show employment exceeding the pre-recession level by 2020 and reaching nearly 8.8 million jobs by 2040 (see Exhibit 2-2). This growth during the 2011 to 2040 period represents a CAGR of 1.0 percent, which is less than the national forecasts CAGR of 1.3 percent.

Table 2-1 shows the breakdown of Ohio jobs in 2011 by industry. Health care and government jobs comprise the largest segments of the workforce, each with nearly 13 percent of the total. Retail trade makes up the next largest sector. While the rest of the U.S. was shifting to a more service-focused economy, Ohio retained part of its manufacturing base, which employs more than 10 percent of the state's workforce.

Table 2-1
Ohio Employment by Industry In 2011

Industry	Employment	Percent
Health Care and Social Assistance	842,674	12.9%
Government	817,458	12.5%
Retail Trade	669,877	10.3%
Manufacturing	662,849	10.2%
Accommodation and Food Services	451,148	6.9%
Administrative and Waste Management Services	403,064	6.2%
Professional, Scientific, and Technical Services	376,777	5.8%
Other Services	339,697	5.2%
Finance and Insurance	327,128	5.0%
Construction	298,618	4.6%
Real Estate, Rental, and Leasing	247,376	3.8%
Wholesale Trade	238,395	3.7%
Transportation and Warehousing	220,593	3.4%
Educational Services	151,052	2.3%
Arts, Entertainment, and Recreation	121,805	1.9%
Management of Companies and Enterprises	117,556	1.8%
Information	91,693	1.4%
Agriculture, Forestry, Fishing, & Hunting	89,803	1.4%
Mining	33,488	0.5%
Utilities	20,206	0.3%
Total	6,521,257	100%

Source: U.S. Bureau of Economic Analysis

¹ The latest year of employment data available from the U.S. Bureau of Economic Analysis is 2011.

Per Capita Personal Income

Personal income can be used as an indication of how much money people will spend on the consumption of goods and services, including aviation, since the greater the income, the greater the purchasing power one has. Per capita personal income for the state of Ohio was \$25,800 in 1990 and grew to \$33,500 by 2011.² The change in this figure represents a CAGR of 1.2 percent. By comparison, per capita personal income for the U.S. grew from \$26,800 to \$36,700 during the same period, for a 1.5 percent CAGR.

The effects of the most recent economic recession were reflected in Ohio's per capita income, with it dropping 2.4 percent from 2008 (\$33,400) to 2010 (\$32,600). Per capita income increased in 2011, by 2.8 percent to \$33,500, indicating a recovery from the recession.

Projections of future per capita income show positive growth continuing through 2040, with an average annual increase in per capita income of 1.7 percent expected, rising from \$33,500 per capita in 2011 to \$54,300 per capita in 2040 (see Exhibit 2-2). This is slightly above the forecast national CAGR of 1.5 percent for the same period.

Summary

The socioeconomic statistics reported in this chapter show Ohio was affected by the economic recession. However, there are indications the state is poised for economic growth. Although population growth has been slow since 1990 and is forecast to remain slow through 2040, employment opportunities in Ohio are rising as the state recovers from the national recession. With 27 Fortune 500 companies headquartered in Ohio, including Cardinal Health, Kroger, and Procter & Gamble,³ employment prospects look promising and are projected to grow at a CAGR of 1.0 percent during the 2011 to 2040 period. Per capita personal income is also projected to grow at a CAGR of 1.7 percent during the same period, which is higher than the forecasted national CAGR.

² The latest year of per capita personal income data available from the U.S. Bureau of Economic Analysis is 2011. All figures in this section are presented in constant dollars to show the "real" change in earnings and income when inflation is taken into account.

³ "Fortune 500 List Features 27 Ohio Companies," *Dayton Business Journal*, May 7, 2013.

Study Approach

Introduction

This study follows a proven Federal Aviation Administration (FAA) approved methodology of survey data and modeling estimates accounting for impacts from on-airport business and government agency activities, airport capital improvements, visitor spending, and associated multiplier impacts. The total economic impact of each of the 104 public-use airports is quantified in terms of employment, payroll, and output. Output represents total spending or economic activity and accounts for the total value of aviation-related activities supported by the airports included in this analysis. This chapter details the methodology used to estimate the economic impact of the airports in terms of the following three aviation-dependent groups:

- Businesses and government agencies engaged in on-airport activities, including on-airport construction projects;
- Visitors traveling to Ohio via commercial airlines; and
- Visitors traveling to and within Ohio via general aviation aircraft.

As explained in Chapter 1, this study also summarizes many of the other benefits attributed to airports in Ohio. These additional areas that were analyzed include benefits to non-aviation businesses, aviation maintenance, general aviation airports valuation, and tax impacts. This study also provides four specific case studies of unique segments of aviation in Ohio, including aviation education, shale oil and gas production, fractional ownership, and the Lake Erie Islands airports. These additional areas of analysis and case studies are presented in subsequent chapters of this report.



The Economic Modeling Process

All economic impacts from the 104 airports considered in this analysis were calculated using an input-output modeling process, where the model accounts for the relationship of production inputs among various industry segments when modeling the outputs of those industries.¹ The input-output model considers economic impacts associated with on-airport activities, commercial service visitors, and general aviation visitors arriving at the airports. Impacts that are discussed include the following:

- **Direct Impacts:** Direct impacts account for the initial point where money from on-airport activity and visitor spending first starts circulating in the economy. On-airport activity includes the benefits associated with businesses and government agencies located at the airport, which

¹ The Columbus Regional Airport Authority (CRAA) and The Ohio State University Airport conducted their own economic impact studies for their respective airports in 2012 and employed an input-output modeling process identical to the one used in this analysis; therefore the results for these four airports (Port Columbus International Airport, Rickenbacker International Airport, Bolton Field Airport, and The Ohio State University Airport) were used in the statewide analysis.

are directly related to the provision of aviation services. On-airport impacts include the employment, payroll, and spending of businesses such as fixed base operators (FBOs), flight schools, aircraft repair facilities, and airport management and operations staff. Capital expenditures of these businesses and government agencies are also included in direct impacts. Visitors contribute to direct impacts through their off-airport spending, such as might take place at restaurants or hotels. Any on-airport spending by visitors is included in the impacts of the on-airport businesses.

- **Multiplier Impacts:** Multiplier impacts result from the recirculation and re-spending of direct impacts within the economy. This re-spending of money can occur multiple times and takes two forms – indirect and induced impacts. Indirect impacts occur when businesses spend their revenue on business expenses, whereas induced impacts occur when employees spend their earnings on goods and services. For example, as airport employees spend their salary for housing, food, and services, those expenditures circulate through the economy resulting in increased spending, payroll, and employment throughout Ohio. As this money is spent over and over again, some of it leaks beyond the boundaries of Ohio, and thus no longer benefits the state's citizens. The economic model uses parameters specific to Ohio to estimate the leakage effect associated with these multiplier impacts.
- **Total Impacts:** Total impacts are the sum of all direct and multiplier economic impacts attributable to an airport or system of airports.

Direct impacts are measured through surveys of businesses, government agencies, and visitors. Because multiplier impacts are not as easy to measure as direct impacts, it is important to employ a reliable method of estimating multiplier impacts. A leading method used to estimate multiplier impacts is the input-output model.

The Impact Analysis for Planning (IMPLAN) input-output model was used to quantify multiplier impacts in this study. IMPLAN is a linear model that estimates purchases and sales between hundreds of sectors of the economy. The U.S. Forest Service, in cooperation with several other government agencies, initially developed the IMPLAN system to generate regional non-survey input-output models for regions as small as a single county. This modeling process is considered one of the leading methods currently available for estimating the total economic impact of an industry and has been used to estimate economic impacts for individual airports and systems of airports throughout the country.

The IMPLAN model contains a substantial economic database used to generate input-output tables that contain data relating different sectors of the economy to each other. It includes data from sources such as Dun and Bradstreet, the U.S. Department of Commerce, and the U.S. Census Bureau. IMPLAN multipliers and data tables specific to Ohio's industrial sectors were obtained from IMPLAN Group LLC, the company responsible for providing the data and software to run an IMPLAN model, and used in this analysis. The IMPLAN model used for this analysis requires direct impact estimates for the following three separate components of Ohio's economy:

- **Employment:** Employment is based on the total of full-time jobs plus part-time jobs. In this analysis, two part-time positions are the equivalent of a single full-time position.
- **Payroll:** Payroll represents the annual salary, wages, and benefits paid to all employees.
- **Economic Output (Spending):** Output for on-airport activities is typically assumed to be the sum



of annual gross sales and average annual capital expenditures. While this assumption works well for profit-oriented tenants, it must be modified for organizations that do not generate sales, such as government tenants or corporate flight departments. In order to estimate the impact of these important tenant-related activities, output is assumed to be the sum of payroll, operating expenditures, and average annual capital improvement outlays. While airlines do generate sales, ticket revenue is usually transferred outside the area being modeled. This makes it difficult to assign that revenue to a specific airport, so airlines are treated in a manner similar to organizations that do not generate sales. For visitors using an airport, output is assumed to equal total visitor spending.

It is important to note payroll and output cannot be combined because elements of economic benefit related to payroll are also contained, to some extent, in the output estimate. Each of the three impact components (employment, payroll, and output) stands alone as a measure of an airport's or the airport system's total economic impact.

Data Requirements for the Economic Modeling Process

A number of data collection efforts were undertaken to gather information related to economic activity occurring at Ohio's public-use airports. These data were inputs to the modeling process to identify total economic impacts. The following groups were part of the data gathering effort to estimate direct impacts:

- On-Airport Activity:** This group includes airport tenants with employees, such as FBOs, airlines, corporate flight departments, flight schools, aircraft maintenance providers, concessionaires, and governmental agencies. Governmental agencies include public airport sponsors, FAA, Transportation Security Administration (TSA), as well as various other state and federal agencies.
- Construction Impacts:** Each year, airports undertake capital improvement projects (CIPs), such as pavement maintenance or terminal improvements. In addition, on-airport businesses and other government agencies undertake CIPs. These projects employ people in jobs such as construction, architecture, engineering, and consulting. For this analysis, construction impacts are included in the direct impact category.
- Commercial Service Visitors:** This group includes estimated non-local passengers (visitors) arriving via commercial airlines. Average visitor spending for this group was derived from passenger surveys conducted for JobsOhio's *Ohio Commercial Service Airports Economic Impact Study* prepared by CDM Smith in 2012.
- General Aviation Visitors:** Impacts from general aviation visitors are produced by non-local passengers arriving via private or business aircraft. General aviation visitors make up a portion of each airport's general aviation operations that leave the airport's local airspace, termed itinerant operations. Some itinerant operations at an airport are conducted by residents of the airport's market area who fly their planes to distant locations and subsequently return to their home airport. The remaining itinerant operations are attributed to visitors. Itinerant operations performed by visitors are called true transient



operations in this study. Impacts for this group were estimated using survey data from pilots and passengers visiting public-use airports across Ohio.

Direct economic impacts presented in this report were estimated primarily through surveys undertaken specifically to support this study. IMPLAN multipliers specific to Ohio were then applied to direct impacts to estimate subsequent multiplier economic impacts.

Surveys, Data Collection Methods, and Model Assumptions

The economic model requires an extensive data gathering effort in order to estimate direct impacts. The methods used to collect information from each group considered in the direct impacts are discussed in the following sections, along with the assumptions needed to arrive at these direct impacts.

On-Airport Activity

Airport sponsors and managers provided contact information for each airport tenant. All airport tenants having aviation-related employees on Ohio airports during 2012 were contacted to collect information regarding their economic activity. Since the purpose of this study was to measure the economic impacts of each Ohio airport, a distinction was made between those on-airport tenants dependent on the airport and those who were not. For example, an aviation insurance business located on an airport would not be designated as aviation-related since an insurance business does not need an airport to operate, unless it has an employee whose job requires aviation-related activities, such as a pilot or dispatcher.

A survey was provided to each aviation-related tenant and follow-ups were made to obtain responses and to verify information on returned surveys. Airport tenants at each airport were grouped into the following 26 categories to aid in analysis:



- Aerial applicators
- Air ambulance services
- Air cargo
- Aircraft maintenance – piston
- Aircraft maintenance – turbine
- Airlines – passenger only
- Airport management with two or more full-time employees
- Airport management with less than two full-time employees
- Air traffic control – contract
- Air traffic control – FAA
- Charter, including fractional
- Concessions – commercial service airports
- Concessions – general aviation airports
- Corporate flight departments
- FBOs with five or more full-time employees
- FBOs with less than five full-time employees
- Federal government, not including air traffic control or TSA
- Flight instruction – independent flight schools
- Flight instruction – colleges or universities
- Hangar rental and development
- Military
- Nonprofit
- Parking
- Rental car
- State and local government
- TSA

The survey sent to each airport tenant, including airport sponsors and managers, requested the following information:

- Type of aviation activity conducted by the tenant
- Number of full-time and part-time employees
- Estimated total operating expenses in 2012
- Estimated total annual wages and benefits paid to employees in 2012
- Estimated total capital improvement expenditures for each year, 2009 through 2012
- Estimated total gross sales (where applicable) by the business on the airport in 2012

A high response rate was desired for the airport management and tenant surveys and approximately 37 percent responded to survey efforts. Several rounds of follow-up calls were made to non-responding entities and to airport managers to obtain the greatest response rate possible for on-airport employment. For airport tenants who did not supply complete information on payroll, expenses, output, and CIP, estimates were developed using ratios of payroll, expenses, output, and CIP per employee. These ratios were developed from survey data obtained from similar tenant and business categories who did respond to the survey. For those categories of tenants that did not have sufficient Ohio data to provide reliable averages, additional data was used from economic studies conducted by CDM Smith around the country.

For purposes of estimating multiplier impacts, airport tenants were classified into one of three categories - aviation, concession, and government - based upon the nature of their business. This was done to facilitate subsequent IMPLAN modeling. Aviation multipliers were used for airlines, aircraft maintenance, FBOs, air cargo, flight schools, and corporate flight departments. Retail, food and beverage, car rental, and parking tenants had a set of concession multipliers applied to estimate multiplier impacts. Government-related entities, including military units, received their own set of multipliers. Impacts stemming from construction projects were broken out from each tenant. Different multipliers were used for each of these categories because each of these categories interacts with the Ohio economy in different ways. Further discussion of study multipliers are presented in a subsequent section.

Construction Impacts

As explained above, CIPs employ people in jobs such as construction, architecture, engineering, and consulting. For this analysis, data was gathered on CIP expenditures and combined with IMPLAN data to estimate direct construction impacts. The following steps were used to estimate construction impacts:

- CIP data for 2009-2012 was gathered from airport managers as well as aviation-related businesses and government agencies located on each airport.
- CIP expenditures for the period were averaged to avoid showing peaks or troughs in construction activity. This average CIP expenditure was used as the CIP direct output for the airport.
- The IMPLAN model indicates every \$1.0 million spent annually on construction activity supports approximately 9.4 construction-related jobs in Ohio. These jobs include construction workers, equipment operators, foremen, engineers, architects, consultants, and managers.



- Data from the U.S. Bureau of Labor Statistics was used to determine average pay for Ohio employees involved in construction activity. This average payroll was applied to each CIP-related employee to determine direct payroll associated with CIP activity.
- CIP multipliers from the IMPLAN model were applied to these direct impact numbers to estimate multiplier impacts.

Commercial Service Visitors

Airline flights to and from Ohio's commercial service airports provide access for several million business and leisure visitors each year. Visitors using commercial service airports as a gateway to the state contribute to the economy through their expenditures for food, lodging, entertainment, transportation, retail sales, and other goods and services. Numerous service industries also benefit from the multiplier effects stemming from visitor spending.

As stated earlier, the spending patterns of commercial service visitors to Ohio were estimated based on the results of departing passenger surveys conducted for JobsOhio's *Ohio Commercial Service Airports Economic Impact Study* prepared by CDM Smith in 2012. Survey teams visited five commercial service airports to interview departing passengers.² Departing passengers were first asked to indicate whether they were a resident of the airport area or a visitor. Those passengers who indicated that they were visitors were asked several questions to determine the following:



- The purpose of their trip
- Duration of their stay
- Total expenditures during their stay in each of the following categories: lodging, food and beverage, rental car, taxi/shuttle, entertainment/recreation, retail, and other
- The total number of people that accounted for the expenditure estimates they identified

This data was used to estimate the economic impacts related to commercial service visitors for each commercial service airport, using the following methodology.

Enplanement data for 2012 was obtained for each commercial service airport from airport websites or FAA records. The percentage of visiting passengers for each airport was taken from JobsOhio's 2012 *Ohio Commercial Service Airports Economic Impact Study*. This data for each airport is shown in **Table 3-1**. Visiting passengers ranged from 5 percent at Youngstown-Warren Regional and Rickenbacker International Airports to 45 percent at Toledo Express Airport.

² The five airports included in this analysis were: Akron-Canton Airport, Cleveland Hopkins International Airport, James M. Cox Dayton International Airport, Port Columbus International Airport, and Toledo Express Airport. Commercial service visitor spending patterns at Youngstown-Warren Regional Airport for this study were estimated based on data for Rickenbacker International Airport in the 2012 *Columbus Regional Airport Authority Economic Impact Study Update*, since passengers at those airports are primarily residents of the respective airport market area who fly to resort destinations.

Table 3-1
Enplanements & Percent Visitors at Ohio Commercial Service Airports - 2012

Associated City	Airport Name	Enplanements (2012)*	Percent Visitors	Visitors
Akron	Akron-Canton	921,767	38%	350,271
Cleveland	Cleveland-Hopkins International	4,346,941	33%	1,434,491
Columbus	Port Columbus International	3,190,068	41%	1,307,928
Columbus	Rickenbacker International	7,541	5%	377
Dayton	James M. Cox Dayton International	1,304,313	39%	508,682
Toledo	Toledo Express	78,757	45%	35,441
Youngstown/Warren	Youngstown-Warren Regional	40,102	5%	2,005
Commercial Service Airports Total		9,889,489	37%	3,639,195

*Enplanements for Port Columbus International and Rickenbacker International Airports are for 2011.

Sources: FAA records, airport websites, *Columbus Regional Airport Authority Economic Impact Study Update* (2012) by CDM Smith, and *Ohio Commercial Service Airports Economic Impact Study* (2012) by CDM Smith

The average expenditure per visitor at each airport determined from the JobsOhio study was applied to the number of annual visitors for each airport to determine total economic output generated by commercial airline visitors on an annual basis.

The following example using Cleveland-Hopkins International Airport demonstrates the calculations used to estimate commercial service visitor impacts.³

Cleveland-Hopkins International Airport reported 4,346,941 enplanements during 2012. According to JobsOhio's 2012 *Ohio Commercial Service Airports Economic Impact Study*, 33 percent of these enplanements were visitors to the area. Applying this percentage to the airport's 2012 enplanements yields 1,434,491 visitors who traveled through Cleveland-Hopkins International Airport in 2012.

$$4,346,941 \text{ enplanements} \times 33 \text{ percent visitors} = 1,434,491 \text{ visitors}$$

The JobsOhio study provided estimates of average spending per visit of \$674. This average expenditure was used to calculate visitor's annual spending (or output) of more than \$966.8 million.

$$1,434,491 \text{ visitors} \times \$674 \text{ per trip} = \$966.8 \text{ million}$$

In order to estimate employment associated with commercial service visitor expenditures, Ohio-specific employment ratios per \$1 million of visitor output were developed using the IMPLAN model. It was estimated that approximately 14.8 persons are employed in Ohio as a result of every \$1 million in commercial service visitor output. That equates to an estimated 14,325 visitor-related jobs associated with visitors arriving via Cleveland-Hopkins International on commercial airlines.

$$\$966.8 \text{ million} \times 14.8 \div \$1,000,000 \text{ per job} = 14,325 \text{ jobs}$$

In order to estimate payroll impacts associated with employment supported by commercial service visitors, average state wages for appropriate industry sectors were applied to the estimated number of employees supported by commercial airline visitor spending. Most visitor expenditures

³ Rounded numbers are used in this example, and any variation in calculations is the result of rounding.

take place in the hospitality sector, which includes hotel, motel, food, beverage, entertainment, retail, and transportation. Based on data obtained from the U.S. Bureau of Labor Statistics, an average payroll of \$22,110 per employee in Ohio was assumed for these job categories.

$$14,325 \text{ jobs} \times \$22,110 = \$316.7 \text{ million annual payroll}$$

The same calculation was used for each commercial service airport, using the average expenditure per trip appropriate for each airport, and the same employment multiplier and average payroll for all airports. Detailed tables showing the commercial service visitor impacts at each commercial service airport can be found in **Appendix A** at the end of this report.

General Aviation Visitors

General aviation refers to all segments of aircraft activity that are not related to the commercial airlines or the military. Visitors to Ohio use general aviation aircraft to conduct business and to enjoy the leisure opportunities available statewide. For example, The Ohio State University Airport and Cuyahoga County Airport are frequently used by corporate aircraft of companies conducting business in the Central Ohio and Northeast Ohio regions, respectively. Kelleys Island Municipal Airport and Put-In-Bay Airport are popular with tourists visiting the Lake Erie Islands region of Ohio.

The economic activity produced by general aviation visitors in Ohio was determined by surveying visiting pilots and passengers. Surveys were delivered to FBO managers throughout the state's system of airports. The survey requested the following information:

- The airport where the survey was received
- Where the aircraft is based
- The number of travelers in the aircraft
- The type of aircraft
- The purpose of the trip
- The length of stay in the airport area
- The estimated expenditures during the trip
- The number of people responsible for the expenditures
- Further comments regarding the value of the Ohio aviation system to the pilot and his or her business

This survey data was used to develop an estimate of visitor expenditures. These estimates included the average number of visitors per aircraft and the average expenditure per visitor per trip. Recognizing these averages vary at different types of airports, Ohio's airports were grouped into one of four categories based on the airport's classification in the *Ohio Airports Focus Study* with modifications made for the Lake Erie Islands airports due to their unique aspects. Survey data within each group of airports was used to estimate the average number of visitors per arriving aircraft and how much each spent during their stay.



Itinerant operations data from the *Ohio Airports Focus Study* were used. Since many of these operations are aircraft returning to their home base and do not carry visitors, an estimate of true transient aircraft – defined as those carrying visitors to the area – was needed. It was assumed between 33 percent and 50 percent of itinerant aircraft operations were true transients, based on which of the four groups the airport was classified as. Together, all of these estimates were used to assess the level of general aviation visitor spending at each airport as illustrated in the following example.⁴

Wadsworth Municipal Airport was estimated to have 12,025 itinerant operations in 2012, or 6,012 itinerant arrivals, since all arrivals have a corresponding departure. Furthermore, it was assumed true transient arrivals were 33 percent of these itinerant arrivals, or:

$$6,012 \text{ itinerant arrivals} \times 33 \text{ percent} = 1,984 \text{ true transient arrivals.}$$

Transient pilot survey data for the group of airports in which Wadsworth Municipal Airport was categorized provided estimates of 2.2 visitors as the average number of visitors per aircraft, including the pilot, and \$70 as the average expenditure per visitor per trip. These averages were used to calculate 4,365 visitors as the total annual visitors, and approximately \$306,000 per year as the impacts of those visitors spending in the region around Wadsworth Municipal.

$$1,984 \text{ transient arrivals} \times 2.2 \text{ visitors per arrival} = 4,365 \text{ annual visitors}$$

$$4,365 \text{ visitors} \times \$70 \text{ per visitor per trip} = \$306,000 \text{ annual spending by visitors}$$

Direct payroll and employment impacts resulting from this visitor spending (or output) were determined based on the IMPLAN ratio of \$1 million of visitor-spending output per approximately 17.0 full-time positions in other industries. Most of these jobs are in the service and retail sectors. Visitors using general aviation at Wadsworth Municipal support approximately five full-time positions.

$$\$306,000 \times 17.0 \text{ jobs} \div \$1,000,000 \text{ per job} = 5 \text{ jobs}$$

The average annual statewide salary for the hospitality sector (\$22,110) was then applied to the estimate of employment to calculate the payroll impacts associated with general aviation visitors. In this example, visitor-related payroll created by the approximately five full-time positions is estimated to total approximately \$111,000.

$$5 \text{ jobs} \times \$22,110 = \$111,000 \text{ annual payroll}$$

The operational and visitor impact data for each study airport can be found in Appendix A.

Multiplier Impacts

Employment, payroll, and output impacts derived from airport businesses, government agencies, on-airport construction activities, and visitors comprise each airport's direct economic impacts. Once these impacts enter the economy, they circulate among other sectors, creating rounds of additional spending beyond the initial inputs. This re-spending of the initial inputs continues until the money leaks beyond the defined boundaries of the study. This phenomenon is referred to as the multiplier effect.

⁴ Rounded numbers are used in this example, and any variation in calculations is the result of rounding.

Multipliers for estimating impacts beyond the direct impacts were derived from the IMPLAN model. The multipliers used in this analysis were developed specifically to measure the economic impacts that occur within different sectors of the Ohio economy. **Table 3-2** summarizes the multipliers used for modeling the multiplier impacts of on-airport activities and visitor spending.

Table 3-2
Ohio IMPLAN Multipliers by Economy Sector

Economy Sector	Employment Multiplier	Payroll Multiplier	Output Multiplier
Aviation (Note 1)	2.79	1.97	1.68
Concessions (Note 2)	1.39	1.73	1.80
Government (Note 3)	2.11	1.84	1.87
Construction C.I.P. (Note 4)	1.80	1.65	1.96
Commercial Service Visitor Expenditures (Note 5)	1.58	1.83	1.81
General Aviation Visitor Expenditures (Note 5)	1.49	1.71	1.77

Sources: CDM Smith and IMPLAN multipliers

Notes

1. Aviation multipliers are the weighted average of the Aircraft Manufacturing, Aircraft Engine and Engine Parts Manufacturing, Other Aircraft Parts and Auxiliary Equipment Manufacturing, and Transport by Air multipliers.
2. Concessions multipliers are the weighted average of the Retail Stores - Miscellaneous, Business Support Services, Hotels and Motels, and Food Services and Drinking Places multipliers.
3. Government multipliers are the weighted average of the Other Federal Government Enterprises and Other State and Local Government Enterprises multipliers.
4. Construction multipliers are the weighted average of the Construction of Other New Nonresidential Structures, Maintenance and Repair of Nonresidential Structures, and Architectural, Engineering, and Related Services multipliers.
5. Visitor expenditures multipliers are the weighted average of the Retail Stores - Miscellaneous, Automotive Equipment Rental and Leasing, Hotels and Motels, and Food Services and Drinking Places multipliers. Weightings were different for commercial airline service and general aviation visitor multipliers to reflect the difference in their spending habits.

Multiplier effects arise from various interdependencies within an economic system. For example, the operation of an airport requires inputs in the form of supplies, equipment, and maintenance. These inputs generate a boost in sales for those businesses providing these services and products. Moreover, the goods and services themselves require inputs for their production. The process continues as a large number of impacts re-circulate through the economy. The total requirement for goods and services is the multiple of the initial needs of the airports considered in this analysis; hence it is referred to using the term “multiplier.”

The multipliers presented in Table 3-2 were used to estimate multiplier impacts in this analysis. For example, \$100 in direct expenditures (output) in the aviation sector supports a total output of \$168. That total output breaks down into \$100 of direct output and \$68 of multiplier impact.

Total Impacts

Total impacts consist of the combination of direct and multiplier impacts. When referring to each Ohio airport's (or the airport system's) economic impacts, this generally means the total employment, total payroll, and total output of the airport (or the airport system).

Summary

This chapter presented the methodology used to estimate the economic impacts of Ohio's airports. The total economic impact of each airport is quantified in terms of employment, payroll, and output for three aviation-dependent groups: businesses and government agencies engaged in on-airport activities, including on-airport construction projects; visitors traveling to Ohio via commercial airlines; and visitors traveling to and within Ohio via general aviation aircraft. The impacts for each of these groups are discussed as direct impacts (on-airport and visitor-related), multiplier impacts, and total impacts. By following this methodology, estimates of total employment, total annual payroll, and total annual output/spending associated with each airport were developed.

Employment, Payroll, and Output Impacts for Study Airports

Introduction

Ohio's airports help to sustain business and leisure visitors in Ohio. The airports themselves are also significant generators of economic activity. Airports support jobs, payroll, and economic output for Ohio's economy.

A wide variety of businesses and employers are found at Ohio's airports, ranging from individual flight instructors to major airlines, such as United Airlines, which operates a hub at Cleveland-Hopkins International Airport, and corporate flight departments for Fortune 500 companies, such as Procter & Gamble at Cincinnati Municipal Airport – Lunken Field. NetJets, the world leader in fractional ownership and rental of private business jets, has over 1,000 employees at its world headquarters at Port Columbus International Airport. PSA Airlines, a regional airline for US Airways, is headquartered in Vandalia, Ohio and has more than 400 employees at James M. Cox Dayton International Airport.



Military aviation units have a significant presence at several Ohio airports. The largest among these is found at Youngstown-Warren Regional Airport, a joint-use airport with the Youngstown Air Reserve Station and home to the nearly 2,000 personnel of the United States Air Force Reserve Command's 910th Airlift Wing. Other airports hosting military aviation units include Rickenbacker International Airport, Mansfield Lahm Regional Airport, Akron-Canton Airport, Toledo Express Airport, and Springfield-Beckley Municipal Airport.

Numerous aviation maintenance businesses are located at airports throughout Ohio and generate substantial economic impacts for the state's economy. These businesses perform airframe and powerplant maintenance, avionics installation and repair, as well as aircraft remanufacturing, refurbishment, and customization. Notable examples of aircraft maintenance activity are found at Port Columbus International Airport. NetJets' world headquarters includes a 200,000-square-foot, state-of-the-art FAA Certified Repair Station. American Eagle Airlines and Republic Airways Holdings both operate aircraft maintenance and repair facilities at Port Columbus International. Lane Aviation, one of the airport's fixed base operators (FBOs), has been providing aircraft maintenance services for more than 75 years. Lane Aviation is an FAA Certified Repair Station as well as a Cessna Authorized Service Center.

This chapter identifies the economic impacts associated with employment, annual payroll, and total economic activity (output) for the study airports. The combined impact of all of Ohio's 104 public-use airports is shown in each section. Detailed tables showing the impacts of each individual airport can be found in **Appendix A**. Due to the prevalence of aviation maintenance businesses at Ohio's airports, this chapter also provides an overview of this activity and identifies the associated economic impacts.

Employment Impacts

The findings of this analysis indicate that airports in Ohio are an important source of jobs. Employment, as defined in this analysis, is based on estimates where two part-time jobs are the equivalent of a single full-time job. Employment impacts were calculated for on-airport activity and visitors. On-airport activity includes aviation-related businesses and government organizations, including military aviation units. Spending for capital improvement projects (CIP) and other improvement and construction projects also contributes to on-airport employment.

Employment from On-Airport Activity

Table 4-1 identifies the total number of jobs supported by the day-to-day activities of on-airport aviation-related businesses and government agencies at the 104 Ohio airports. These jobs comprise those people who are engaged in the provision of aviation-related services on the airport, such as aircraft fuel sales, aircraft maintenance, flight training, airport management, and charter services.

Table 4-1
Ohio On-Airport Employment

Airports	Direct On-Airport Employment	Multiplier Employment	Total On-Airport Employment
Commercial Service Airports	21,609	23,656	45,265
General Aviation Airports	5,720	8,590	14,310
Total On-Airport Employment	27,329	32,246	59,575

Source: CDM Smith and IMPLAN

In total, there are more than 27,300 direct jobs supported by the on-airport activities at Ohio's airports. It is important to note that this employment estimate does not include jobs associated with non-aviation businesses which, for various reasons, are located on an airport. For instance, some airports have industrial or business parks that include companies that are not related to the airport or aviation in any way. Employment related to these businesses is not included in the employment estimate shown in Table 4-1.

Multiplier impacts are those jobs that are created by ripple effects stemming from direct jobs associated with businesses and government agencies at Ohio's airports. For example, an employee of a fuel distributor may owe a portion of his job to an airport since the distributor sells fuel to the airport's fixed base operator. As a result of on-airport business and government agency activity, additional multiplier employment is created. Multiplier impacts associated with the day-to-day operation of Ohio's airports add more than 32,200 positions to the economy. When direct and multiplier employment is considered, Ohio's airport businesses and government agencies contributed nearly 59,600 jobs to Ohio's employment base. Of this total, approximately 45,300 jobs are associated with commercial service airports and approximately 14,300 jobs are associated with general aviation airports.



Employment from Capital Improvement Project (CIP) Expenditures

Construction projects on airports generate jobs for architects, engineers, consultants, and laborers. **Table 4-2** identifies the number of employees in Ohio whose jobs are supported by an average year of airport-related construction. Construction at Ohio airports supports more than 3,000 direct jobs. Multiplier impacts add nearly 2,600 jobs, resulting in more than 5,600 jobs that depend on airport

CIP work. Of these total jobs, nearly 4,100 jobs are associated with commercial service airports and nearly 1,600 jobs are associated with general aviation airports.

Table 4-2
Ohio Employment from CIP Expenditures

Airports	Direct CIP Employment	Multiplier Employment	Total CIP Employment
Commercial Service Airports	2,187	1,889	4,076
General Aviation Airports	861	689	1,550
Total CIP Employment	3,048	2,578	5,626

Source: CDM Smith and IMPLAN

Employment from Commercial Service Visitor Spending

Visitors arriving via commercial airlines spend money, which supports jobs beyond those found at the airport. These jobs are primarily found in the hospitality industry. **Table 4-3** identifies the number of employees in Ohio whose jobs are supported by the spending of visitors arriving on commercial airlines via the state's seven airports with commercial service.

Table 4-3
Ohio Employment from Commercial Service Visitor Spending

	Direct Commercial Service Visitor Employment	Multiplier Employment	Total Commercial Service Visitor Employment
Total Commercial Service Visitor Employment	35,044	21,152	56,196

Source: CDM Smith and IMPLAN

There are approximately 35,000 direct jobs supported by commercial service visitor spending. Multiplier impacts include those jobs that exist due to ripple effects. Multiplier impacts result in nearly 21,200 additional positions supported by the spending of commercial service visitors. When direct and multiplier visitor-related employment impacts are combined, an estimated 56,200 jobs are supported by spending from visitors to Ohio who arrive via commercial airlines.

Employment from General Aviation Visitor Spending

Similar to visitors using commercial airline service, intra-state and inter-state visitors using general aviation aircraft typically spend money while visiting, thereby helping to support additional employment. **Table 4-4** identifies the number of jobs supported by spending from visitors using general aviation aircraft to travel to and within Ohio.

Table 4-4
Ohio Employment from General Aviation Visitor Spending

	Direct GA Visitor Employment	Multiplier Employment	Total GA Visitor Employment
Commercial Service Airports	280	142	422
General Aviation Airports	1,088	549	1,637
Total General Aviation Visitor Employment	1,368	691	2,059

Source: CDM Smith and IMPLAN

Direct jobs associated with general aviation visitor spending are usually found off-airport, primarily in the hospitality industry. In Ohio, general aviation visitor expenditures support nearly 1,400 direct jobs.

Additionally, multiplier employment includes those jobs that exist due to continued circulation of general aviation visitor expenditures, resulting in nearly 700 additional jobs supported by Ohio general aviation visitors. When these direct and multiplier employment impacts are combined, a total of nearly 2,100 jobs are supported by the spending of visitors using general aviation aircraft in Ohio. Not surprisingly, the majority of these jobs (more than 1,600) are associated with the general aviation airports.

Total Employment

Table 4-5 identifies the total number of jobs supported by all activities at Ohio's 104 airports. As a result of on-airport activities, CIP expenditures, and spending by visitors using the study airports, there are more than 66,700 direct jobs. The multiplier effect adds more than 56,600 additional jobs. In total, nearly 123,400 jobs are supported in Ohio by aviation-related businesses, government agencies, construction activities, and visitors to the study airports.

Table 4-5
Ohio Airports Total Employment

	Direct Employment	Multiplier Employment	Total Employment
Commercial Service Airports	59,120	46,839	105,959
General Aviation Airports	7,669	9,828	17,497
Total Employment	66,789	56,667	123,456

Source: CDM Smith and IMPLAN

Payroll Impacts

The salaries, wages, and benefits paid to the employees described above result in a significant annual payroll benefit to the Ohio economy. Estimates of the payroll impacts related to the previously identified employment impacts associated with on-airport businesses and government agencies, CIP expenditures, commercial service visitors, and general aviation visitors are detailed below.

Payroll from On-Airport Activity

Table 4-6 shows the annual payroll impacts associated with on-airport activity at all of the study airports.



Table 4-6
Ohio On-Airport Payroll

	Direct On-Airport Payroll	Multiplier Payroll	Total On-Airport Payroll
Commercial Service Airports	\$1,069,047,000	\$816,019,000	\$1,885,066,000
General Aviation Airports	\$307,970,000	\$280,633,000	\$588,603,000
Total On-Airport Payroll	\$1,377,017,000	\$1,096,652,000	\$2,473,669,000

Source: CDM Smith and IMPLAN

This study found that direct on-airport annual payroll impacts are nearly \$1.4 billion. This payroll impact ripples throughout the Ohio economy, creating multiplier payroll impacts that are estimated through the IMPLAN model. The multiplier annual payroll impact related to on-airport businesses and government agencies at the study airports is nearly \$1.1 billion. Total payroll impacts produced by airports, which include direct and multiplier payroll, approach \$2.5 billion annually.

Payroll from CIP Expenditures

CIP and related construction work provide another source of airport-related payroll. Estimates of annual payroll tied to CIP are shown in **Table 4-7**.

Table 4-7
Ohio Annual Payroll from CIP Expenditures

	Direct CIP Payroll	Multiplier Payroll	Total CIP Payroll
Commercial Service Airports	\$88,336,000	\$67,401,000	\$155,737,000
General Aviation Airports	\$34,607,000	\$23,029,000	\$57,636,000
Total CIP Payroll	\$122,943,000	\$90,430,000	\$213,373,000

Source: CDM Smith and IMPLAN

Direct CIP-related payroll totaled nearly \$123.0 million in 2012. Multiplier impacts added more than \$90.4 million in payroll, giving a total annual payroll impact attributed to CIP of nearly \$213.4 million.

Payroll from Commercial Service Visitor Spending

Table 4-8 identifies the annual payroll impact attributed to employees whose jobs are supported by the spending of commercial service visitors using the study airports.

Table 4-8
Ohio Annual Payroll from Commercial Service Visitor Spending

	Direct Commercial Service Visitor Payroll	Multiplier Payroll	Total Commercial Service Visitor Payroll
Total Commercial Service Visitor Payroll	\$774,095,000	\$680,304,000	\$1,454,399,000

Source: CDM Smith and IMPLAN

Direct payroll consists of salary, wages, and benefits paid to employees working at restaurants, hotels, motels, retail businesses, and other hospitality industries that are used by commercial service visitors. Direct annual payroll attributable to spending by commercial service visitors is estimated at nearly \$774.1 million.

As employees in the hospitality industries spend their payroll, the money continues to circulate in Ohio, generating additional employment and subsequent payroll. Annual multiplier payroll impacts associated with commercial service



visitor-supported employment are estimated at more than \$680.3 million. When direct and multiplier payroll impacts stemming from commercial service visitor spending in Ohio are combined, a total annual payroll impact of nearly \$1.5 billion is produced.

Payroll from General Aviation Visitor Spending

Table 4-9 identifies the payroll impacts attributed to spending by visitors using general aviation to travel to various parts of Ohio.

Table 4-9
Ohio Annual Payroll from General Aviation Visitor Spending

	Direct GA Visitor Payroll	Multiplier Payroll	Total GA Visitor Payroll
Commercial Service Airports	\$6,226,000	\$4,704,000	\$10,930,000
General Aviation Airports	\$24,215,000	\$17,730,000	\$41,945,000
Total GA Visitor Payroll	\$30,441,000	\$22,434,000	\$52,875,000

Source: CDM Smith and IMPLAN

Visitor-related payroll includes salaries paid to employees working in hospitality industries that are utilized by general aviation visitors, such as hotels, motels, and restaurants. Direct annual payroll attributable to spending by general aviation visitors is estimated at more than \$30.4 million. Approximately \$24.2 million of that payroll is attributed to Ohio's general aviation airports.

As employees in the visitor-related industries spend their payroll, this spending continues to circulate, generating additional employment and subsequent payroll. The multiplier payroll impact associated with general aviation visitor spending is estimated at more than \$22.4 million. When direct and multiplier payroll impacts stemming from general aviation visitor spending are combined, a total payroll impact of nearly \$52.9 million is produced annually.



Total Annual Payroll

The combined impacts of on-airport businesses and government agencies, construction projects, and visitor-related payroll in Ohio are identified in **Table 4-10**. The collective direct annual payroll impact supported by the study airports is more than \$2.3 billion. Nearly \$4.2 billion in total annual payroll is realized in Ohio as a result of on-airport activity and visitor spending associated with the study airports, with approximately \$1.9 billion in multiplier payroll benefits.

Table 4-10
Ohio Airports Total Annual Payroll

	Direct Payroll	Multiplier Payroll	Total Payroll
Commercial Service Airports	\$1,937,704,000	\$1,568,428,000	\$3,506,132,000
General Aviation Airports	\$366,792,000	\$321,392,000	\$688,184,000
Total Payroll	\$2,304,496,000	\$1,889,820,000	\$4,194,316,000

Source: CDM Smith and IMPLAN

Output Impacts

Economic output is the result of money spent, invested, and generated by businesses and visitors. For this study, on-airport output is defined as annual gross sales for on-airport businesses and activities. The exceptions are organizations such as corporate flight departments and government agencies that do not generate revenue. Airlines are also exceptions since it is difficult to attribute revenues to specific airports. Output for these types of organizations is defined as the sum of payroll and operating expenses. Output for CIP is simply the expenditures related to those projects.

Output related to commercial service and general aviation visitors is defined as spending by those people during their visits at locations that are not already captured by on-airport output, typically off-airport establishments. Annual economic output benefiting Ohio's economy is discussed in this section.

Output from On-Airport Activity

Table 4-11 identifies annual output for all on-airport activities. In total, Ohio's airports generate more than \$4.7 billion in direct economic output.

Table 4-11
Ohio On-Airport Output

	Direct On-Airport Output	Multiplier Output	Total On-Airport Output
Commercial Service Airports	\$3,833,795,000	\$3,090,874,000	\$6,924,669,000
General Aviation Airports	\$900,644,000	\$652,956,000	\$1,553,600,000
Total On-Airport Output	\$4,734,439,000	\$3,743,830,000	\$8,478,269,000

Source: CDM Smith and IMPLAN

As aviation-related businesses and government entities located on each study airport spend money, these expenditures ripple through Ohio's economy, leading to additional output impacts. Multiplier output impacts are estimated using IMPLAN multipliers, with an estimate of more than \$3.7 billion in multiplier output from on-airport activity. When direct and multiplier impacts are combined, the total annual output for the study airports from on-airport activity approaches \$8.5 billion.

Output from CIP Expenditures

Spending on CIP adds nearly \$336.4 million in direct output to the Ohio economy, as shown in **Table 4-12**. Multiplier impacts add more than \$320.7 million in impacts, resulting in total CIP impacts of nearly \$657.1 million.

Table 4-12
Ohio Output from CIP Expenditures

	Direct CIP Output	Multiplier Output	Total CIP Output
Commercial Service Airports	\$244,604,000	\$232,600,000	\$477,204,000
General Aviation Airports	\$91,753,000	\$88,121,000	\$179,874,000
Total CIP Output	\$336,357,000	\$320,721,000	\$657,078,000

Source: CDM Smith and IMPLAN

Output from Commercial Service Visitor Spending

Table 4-13 identifies the output attributed to commercial visitor spending. Direct output is comparable to total annual visitor expenditures. Direct output from commercial service visitor spending is estimated at approximately \$2.2 billion. As the hospitality industries re-spend this output, multiplier impacts result. Annual multiplier impacts related to commercial service visitor output are estimated at more than \$1.8 billion. In total, the combined annual output from commercial service visitor spending approaches \$4.1 billion.

Table 4-13
Ohio Output from Commercial Service Visitor Spending

	Direct Commercial Service Visitor Output	Multiplier Output	Total Commercial Service Visitor Output
Total Commercial Service Visitor Output	\$2,238,439,000	\$1,817,371,000	\$4,055,810,000

Source: CDM Smith and IMPLAN

Output from General Aviation Visitor Spending

Table 4-14 identifies the output attributed to general aviation visitors using airports in Ohio. Direct annual output is comparable to all general aviation visitor expenditures at these airports and is estimated at more than \$80.5 million. The majority of this output is found at the general aviation airports.

Table 4-14
Ohio Output from General Aviation Visitor Spending

	Direct GA Visitor Output	Multiplier Output	Total GA Visitor Output
Commercial Service Airports	\$16,413,000	\$12,777,000	\$29,190,000
General Aviation Airports	\$64,094,000	\$49,548,000	\$113,642,000
Total GA Visitor Output	\$80,507,000	\$62,325,000	\$142,832,000

Source: CDM Smith and IMPLAN

As the hospitality industries re-spend direct output, money continues to circulate, resulting in multiplier impacts. The multiplier impacts related to general aviation visitor output are estimated at more than \$62.3 million. The total annual output from spending by visitors arriving via general aviation aircraft at Ohio's airports is more than \$142.8 million.

Total Annual Output

The total combined annual output related to on-airport activities, CIP expenditures, and commercial service and general aviation visitor spending is presented in **Table 4-15**. Direct annual output is estimated at nearly \$7.4 billion. Multiplier output impacts are estimated at more than \$5.9 billion annually. Combined direct and multiplier output from on-airport activities, construction projects, visitors, and ripple effects produce a total annual output estimate of more than \$13.3 billion for Ohio's economy.

Table 4-15
Ohio Airports Total Annual Output

	Direct Output	Multiplier Output	Total Output
Commercial Service Airports	\$6,333,251,000	\$5,153,622,000	\$11,486,873,000
General Aviation Airports	\$1,056,491,000	\$790,625,000	\$1,847,116,000
Total Output	\$7,389,742,000	\$5,944,247,000	\$13,333,989,000

Source: CDM Smith and IMPLAN

Employment, Payroll, and Output Impacts Summary

Table 4-16 provides a summary of each category of economic impacts for all Ohio airports discussed in the sections above. As shown, the study airports generated more than \$13.3 billion in

economic output in 2012. These expenditures help to support a total of nearly 123,500 jobs that have an annual payroll of approximately \$4.2 billion.

Table 4-16
Economic Impact Summary for Ohio Airports

Airports	Direct On-Airport Impacts	Direct CIP Impacts	Direct Visitor-Related Impacts	Multiplier Impacts	Total Impacts
<i>Employment</i>					
Commercial Service Airports	21,609	2,187	35,324	46,839	105,959
General Aviation Airports	5,720	861	1,088	9,828	17,497
Total Employment	27,329	3,048	36,412	56,667	123,456
<i>Payroll</i>					
Commercial Service Airports	\$1,069,047,000	\$88,336,000	\$780,321,000	\$1,568,428,000	\$3,506,132,000
General Aviation Airports	\$307,970,000	\$34,607,000	\$24,215,000	\$321,392,000	\$688,184,000
Total Payroll	\$1,377,017,000	\$122,943,000	\$804,536,000	\$1,889,820,000	\$4,194,316,000
<i>Output</i>					
Commercial Service Airports	\$3,833,795,000	\$244,604,000	\$2,254,852,000	\$5,153,622,000	\$11,486,873,000
General Aviation Airports	\$900,644,000	\$91,753,000	\$64,094,000	\$790,625,000	\$1,847,116,000
Total Output	\$4,734,439,000	\$336,357,000	\$2,318,946,000	\$5,944,247,000	\$13,333,989,000

Source: CDM Smith and IMPLAN

Aviation Maintenance

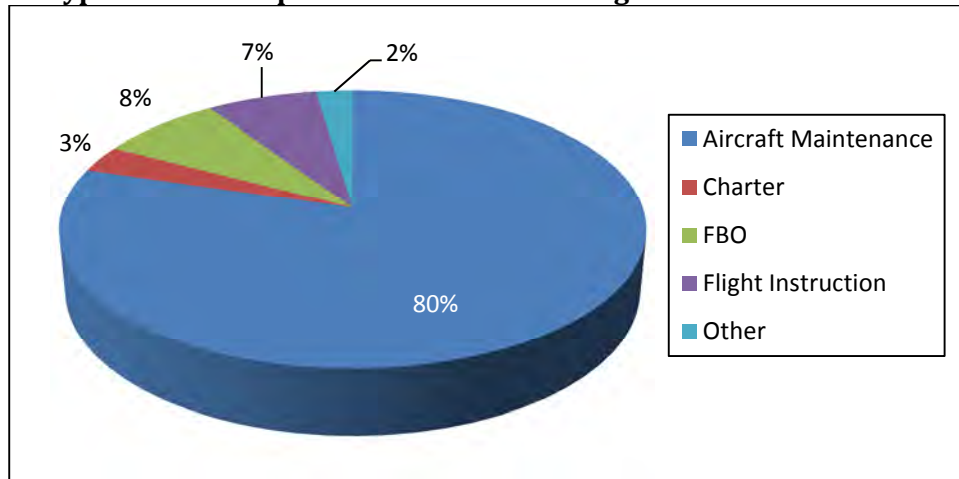
As discussed earlier, a common activity at Ohio's airports is aviation maintenance, which includes airframe and powerplant maintenance on all types of aircraft, avionics installation and repair, and aircraft remanufacturing, refurbishment, and customization. Much of this maintenance activity takes place at businesses dedicated to aviation maintenance, but other businesses such as FBOs and flight schools offer maintenance services as well. The following sections provide an overview of aviation maintenance activities at the 104 airports included in this study, the types of businesses that offer these services, and the portion of the direct on-airport impacts presented in Table 4-16 that this activity represents.



Location and Type of Maintenance Activity

Aircraft maintenance is performed by a variety of businesses at Ohio's airports. During the on-airport activity survey effort, airport sponsors and managers reported on-airport businesses that primarily offer aircraft maintenance services. In addition, the survey effort revealed a number of businesses that, while not defining themselves exclusively as maintenance providers, also offer these services. In total, it was found that 129 Ohio on-airport businesses offer aircraft maintenance. **Exhibit 4-1** details the types of businesses provide these services. Eighty percent of these businesses were reported as maintenance companies, while the other 20 percent were split between FBOs, flight instruction, charter, and other types of aviation businesses.

Exhibit 4-1
Types of Ohio Airport Businesses Providing Aviation Maintenance

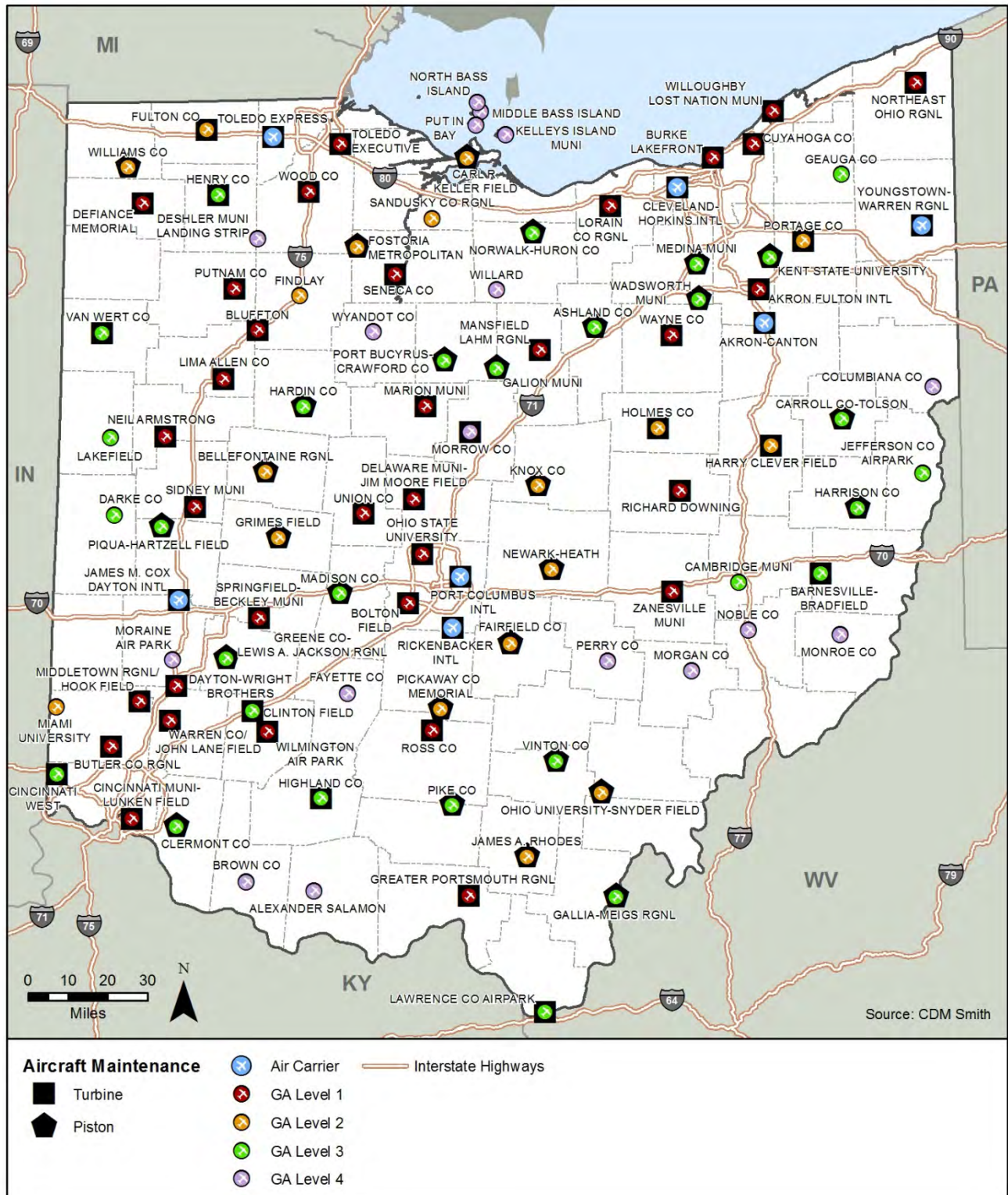


Source: CDM Smith

Exhibit 4-2 identifies the locations of these services throughout the Ohio airport system, revealing which airports offer piston and turbine aircraft maintenance. In total, 80 of the 104 Ohio system airports provide aircraft maintenance services. Of these, 28 offer only piston aircraft maintenance, while 52 offer turbine services.



Exhibit 4-2
Ohio Airports with Aviation Maintenance Activity



Economic Impact of Aviation Maintenance Activity

Aviation maintenance activity at Ohio's airports was found to account for notable employment, payroll, and output impacts throughout the state. These economic impacts were estimated using the same methodology applied to individual airport and statewide impacts. However, to separate these impacts from the individual airport and statewide impacts, it was first necessary to determine the percentage of each business' economic activity that applies to aviation maintenance. During the on-airport activity survey effort, companies were asked to report the percentage of their business that is aircraft maintenance-related. If this data was provided, this reported percentage was applied to the business' economic impact. For all other companies reporting as primarily an aviation maintenance business, it was assumed that 100 percent of their activity is attributable to maintenance. For other business categories such as charter and FBO, an average percentage was calculated based on the available survey data and applied to the few companies that did not report the percentage of their total business related to aviation maintenance.

Based on these percentages, it was then possible to estimate the direct economic impacts for the maintenance activities at these 129 businesses. **Table 4-17** reveals the direct employment, payroll, and output that can be attributed to aviation maintenance activities at Ohio system airports. In total, aviation maintenance at Ohio's airports accounts for more than 600 direct jobs, more than \$34.8 million in direct annual payroll, and nearly \$128.5 million in direct output. These impacts do not include multiplier impacts.

Table 4-17
Direct Economic Impacts of
Aviation Maintenance
at Ohio Airports

Direct Economic Impacts*	
Employment	613
Payroll	\$34,820,000
Output	\$128,453,000

*Multiplier impacts are not included

Source: CDM Smith

Summary

Ohio's 104 public-use airports generate significant economic impacts and are critical components of the state's economy. This study examined their economic contributions in terms of jobs, payroll and output from on-airport operations, CIP expenditures, visitor expenditures, and the multiplier impacts resulting from the re-circulation of these initial impacts.

Table 4-18 summarizes the 2012 economic impacts for Ohio's airports. As shown in Table 4-18, total employment supported by all airports is estimated at nearly 123,500 jobs; total annual payroll associated with these jobs is estimated at nearly \$4.2 billion. Total annual output from all commercial service and general aviation airports in this study is estimated at more than \$13.3 billion.

Table 4-18
2012 Economic Impacts of Ohio Airports

	Direct Impacts	Multiplier Impacts	Total Impacts
<i>Employment</i>			
Commercial Service Airports	59,120	46,839	105,959
General Aviation Airports	7,669	9,828	17,497
Total	66,789	56,667	123,456
<i>Payroll</i>			
Commercial Service Airports	\$1,937,704,000	\$1,568,428,000	\$3,506,132,000
General Aviation Airports	\$366,792,000	\$321,392,000	\$688,184,000
Total	\$2,304,496,000	\$1,889,820,000	\$4,194,316,000
<i>Output</i>			
Commercial Service Airports	\$6,333,251,000	\$5,153,622,000	\$11,486,873,000
General Aviation Airports	\$1,056,491,000	\$790,625,000	\$1,847,116,000
Total	\$7,389,742,000	\$5,944,247,000	\$13,333,989,000

Source: CDM Smith and IMPLAN

Table 4-19 provides a breakout of the 2012 total economic impacts (including multiplier impacts) by classification in the *Ohio Airports Focus Study*. Not surprisingly, the air carrier airports generate the majority of the airport system's economic impacts, producing nearly \$11.5 billion in total output. These expenditures generate nearly 106,000 total jobs earning approximately \$3.5 billion in total annual payroll. Of the state's general aviation airports, the General Aviation Level 1 airports produce the largest share of economic impacts. These airports generate approximately 14,500 total jobs, nearly \$590.3 million in total annual payroll, and more than \$1.5 billion in total output.

Table 4-19
2012 Total Economic Impacts of Ohio Airports
by System Plan Classification

System Plan Classification	Number of Airports	Total Employment*	Total Payroll*	Total Output*
Air Carrier	7	105,959	\$3,506,132,000	\$11,486,873,000
General Aviation Level 1	33	14,516	\$590,295,000	\$1,530,694,000
General Aviation Level 2	18	1,263	\$43,761,000	\$132,532,000
General Aviation Level 3	29	1,395	\$44,147,000	\$147,567,000
General Aviation Level 4	17	323	\$9,981,000	\$36,323,000
Total	104	123,456	\$4,194,316,000	\$13,333,989,000

*Includes multiplier impacts

Source: CDM Smith and IMPLAN

Additional Benefits

Introduction

Airports in Ohio provide additional benefits beyond the economic impacts detailed in Chapter 4. These additional benefits are not as easily quantified as the economic impacts described in the previous chapter. Identifying these qualitative benefits is important because the value of an airport system is comprised of more than just economic numbers. For instance, airports in a system also provide real value to those people who rely on them not just for their livelihoods, but also their safety and quality of life. In addition, the existence of both commercial and general aviation airports is often of crucial importance to area businesses, which rely on airports for the transportation of employees, clients, suppliers, and cargo. This chapter provides an overview of these additional benefits:

- Qualitative benefits that airports provide for their communities and regions
- Benefits to the business community, including a summary of the business survey effort

Qualitative Airport Benefits

Beyond the quantitative aspects of aviation benefits that have been discussed previously, there are also a wide variety of qualitative benefits that deserve consideration when the total value of an airport system is considered. Qualitative benefits are those activities which take place at an airport on a regular basis that add to the quality of life of local and regional residents and visitors, but are difficult to assign a dollar value. Qualitative benefits typically enhance the health, welfare, or safety of individuals in the airport's market area. This may be through providing emergency access to communities, helping to transport locals to distant hospitals for treatment, providing bases of operations for emergency services, and providing educational outlets for youth groups, among many others. It is obviously difficult to put a dollar figure on these types of benefits, because it is nearly impossible to determine a value for such a subjective concept as a person's quality of life. As such, these values can only be described through anecdotal evidence provided by those who have benefited directly and indirectly from the existence of Ohio's airports.

The following sections provide an overview of these qualitative benefits by detailing the wide variety of aviation activities supported by Ohio's 104 system airports, describing the types of relationships these airports maintain with their communities, and providing specific examples of how Ohio airports provide value to their users.

Ability to Support a Variety of Aviation Activities

The ability of an airport system to support a wide variety and full range of aviation activities is immeasurably valuable to the residents and economies of communities, regions, and the state as a whole. Activities contributing to these qualitative benefits vary throughout the Ohio system, but each airport contributes in some way to the quality of life of Ohio residents. During the airport inventory effort, airport managers and sponsors were asked to report the existence and frequency of many types of aviation activities at their airports. Activities such as recreational flying, corporate activity, and air cargo are commonplace, but many other types of aviation activities often go unnoticed by the general public. Examples of these activities and benefits include the following:

- **Medical operations:** Airports routinely serve as bases of operations for medical transport aircraft, allowing patients and doctors to be moved quickly and efficiently through smaller, less active airports. In Ohio, this service is particularly important to remote locations such as rural areas or islands that do not have convenient or direct ground access to medical facilities. Survey

results reveal that 88 percent of Ohio system airports support emergency medical operations, while 76 percent have specifically experienced Angel Flight activity.

- **Law enforcement operations:** Airports are often utilized by local and state police as bases of operations for helicopter units, as staging areas for emergency evacuation plans, and for prisoner transport. Survey results reveal that 92 percent of Ohio system airports experience law enforcement operations.
- **Military and government operations:** The number of airports and diversity of their locations are primary considerations for supporting governmental organizations such as the military when timing and efficiency are of the utmost importance. Six Ohio system airport sponsors reported that military operations are a daily occurrence at their airports, while 86 percent of the system reported experiencing military operations at least seasonally.
- **Utility inspection and control:** Airports in Ohio are commonly utilized for the inspection of utilities such as powerlines and pipelines. Airports serve as the base of operations for the aircraft that perform this surveying, photography, and data collection. Airport management and sponsor survey results reveal that 82 percent of Ohio system airports experience utility inspection activity.
- **Agricultural spraying:** Aerial application of fertilizers and pesticides often occurs in a heavily agricultural state such as Ohio. While this is typically only a seasonal activity, it is nonetheless an important activity for airports to support. Airport sponsors reported that 73 percent of the Ohio system experiences agricultural aerial application activities.

Table 5-1 details all activities reported by airport managers and sponsors. These activities were reported as occurring daily (D), weekly (W), monthly (M), or seasonally (S) at each airport. Ohio system airports reported additional activities beyond those listed in this table. Such reported activities included blimp and balloon flights, Civil Air Patrol operations, aerobatic flights, and aerial sightseeing, among others.

Table 5-1
Frequency of Aviation Activities at Ohio System Airports

Associated City	Airport Name	Air Carrier	Scheduled Charter	Aircraft Charter	Air Cargo	Corporate/Business	Emergency Medical	Angel Flight	Agricultural	Law Enforcement	Power Line/Pipeline Control	Skydiving	Flight Training	Military	Recreational
<i>Air Carrier</i>															
Akron	Akron-Canton	D		M	D	D	M	M		M	S		D	W	D
Cleveland	Cleveland-Hopkins International	D	D	D	D	D	M	M					S	S	M
Columbus	Port Columbus International	D		S	D	D	W	M		W			D	M	D
Columbus	Rickenbacker International	W	W	W	D	D	M	M		M			M	D	W
Dayton	James M. Cox Dayton International	D	S	D	D	D	W	W		M	W		D	W	D
Toledo	Toledo Express	D	W	D	D	D	D	M	S	W	S		D	D	D
Youngstown/Warren	Youngstown-Warren Regional	D	D	W	M	D	S	S	S	S	S		D	D	D
<i>GA Level 1</i>															
Akron	Akron Fulton International			D	S	D	D	M	S	D	W		D	M	D
Ashtabula	Northeast Ohio Regional			M	M	W	M	S	S	M	S		W	M	D
Bluffton	Bluffton		W	W	M	D	D	W	S	W	W		D	M	D
Bowling Green	Wood County			M		W	S	S	S	M	S		D		D
Chillicothe	Ross County		W	W	D	D	D	S	S	D	W		S	D	D
Cincinnati	Cincinnati Municipal-Lunken Field		D	D	D	D	D	D		S			D	W	D
Cleveland	Burke Lakefront		W	D	D	D	D	M		W	S		D	M	D
Cleveland	Cuyahoga County		W	W		D	W	M	S	S	S		D	M	D
Columbus	Bolton Field			M		D	M	M		W			D	M	D
Columbus	Ohio State University			D	D	D	D	S		D	S		D	M	D
Coshocton	Richard Downing			M	S	M	D	S	S	W	M		M	W	D
Dayton	Dayton-Wright Brothers			W	S	D	S	S		S	S		D	S	D
Defiance	Defiance Memorial			D	M	D	D	M	S	M	W		D	M	D
Delaware	Delaware Municipal-Jim Moore Field			M	M	D	M	S	S	S	M		D	S	D
Hamilton	Butler County Regional			D	D	D	W	M	S	M	M		D	S	D
Lebanon	Warren County/John Lane Field			M		W	D	M		W	M		D		D

Table 5-1
Frequency of Aviation Activities at Ohio System Airports

Associated City	Airport Name	Air Carrier	Scheduled Charter	Aircraft Charter	Air Cargo	Corporate/Business	Emergency Medical	Angel Flight	Agricultural	Law Enforcement	Power Line/Pipeline Control	Skydiving	Flight Training	Military	Recreational
Lima	Lima Allen County			D	D	D	W	W	S	D	D	S	D	W	D
Lorain/Elyria	Lorain County Regional			D	D	D	D	M	S	S	D		D	W	D
Mansfield	Mansfield Lahm Regional		M	W	W	D	D	M	S	D	D	S	D	D	D
Marion	Marion Municipal			W	W	D	M	M	S	M	S		M	M	W
Marysville	Union County			W	M	D	D	M	S	W	W		D	W	D
Middletown	Middletown Regional/Hook Field			M	D	D	M	M	S	D	S	D	D	S	D
Ottawa	Putnam County			D		W	M	S	D				D	S	D
Portsmouth	Greater Portsmouth Regional		M	W	S	D	D	S	S	M	S	S	D	M	D
Sidney	Sidney Municipal			M	S	D		M	S	S	M		D	M	D
Springfield	Springfield-Beckley Municipal		S	W		W	M		S	M	M		D	W	D
Tiffin	Seneca County			D	M	D	D	M	S	M	W		D	M	D
Toledo	Toledo Executive			D		D	D	M	S	S	S		D	M	D
Wapakoneta	Neil Armstrong			W	D	D	M	S	S	S	M		D	S	D
Willoughby	Willoughby Lost Nation Municipal			S		D							D		D
Wilmington	Wilmington Air Park			M	M	W	S	S	S				S	S	S
Wooster	Wayne County			W		D	D	M	S	S	M		D	W	D
Zanesville	Zanesville Municipal			D	S	W	W	S	S	W	S		S	S	M
GA Level 2															
Athens/Albany	Ohio University-Snyder Field			W	S	D	M		S	S	M		D	M	D
Bellefontaine	Bellefontaine Regional			W	M	D	M	S	S	M	M		D		W
Bryan	Williams County			M	S	D	M	S	S	M	M		W	S	D
Circleville	Pickaway County Memorial				S	S			S	M	S			W	D
Findlay	Findlay			D	W	D	M	M	S	W	W		W	M	D
Fostoria	Fostoria Metropolitan			W		W	S	S	S	S	W		W	S	D
Fremont	Sandusky County Regional			W		W	D	S	S	D	M		D	M	D

Table 5-1
Frequency of Aviation Activities at Ohio System Airports

Associated City	Airport Name	Air Carrier	Scheduled Charter	Aircraft Charter	Air Cargo	Corporate/Business	Emergency Medical	Angel Flight	Agricultural	Law Enforcement	Power Line/Pipeline Control	Skydiving	Flight Training	Military	Recreational
Jackson	James A. Rhodes			W	M	W	M	M	S	M			D	M	S
Lancaster	Fairfield County			S		D	D		S	S	W	M		M	D
Millersburg	Holmes County			D	M	W	M		S	S	M		D	D	D
Mount Vernon	Knox County			M	S	D	M	M	S	M	M		D	M	D
New Philadelphia	Harry Clever Field			W	W	W	D	M	S	S	S		D	M	D
Newark	Newark-Heath				M	W	S		S	S	M		D	S	D
Oxford	Miami University			M		D	M	S	S	M	M		D	M	D
Port Clinton	Carl R. Keller Field		M	D	S	D	W	S	S	M	M		D	W	D
Ravenna	Portage County			S		M	D		S	S	S		D	W	D
Urbana	Grimes Field			M	M	W	D	S	S	S	W	S	D	M	D
Wauseon	Fulton County			S	S	W	D	S	S	S	S		D	S	D
GA Level 3															
Ashland	Ashland County			W		W	M	M	S	S	D		D	W	D
Barnesville	Barnesville-Bradfield			S		W	W	S			S		S	S	W
Batavia	Clermont County			W	W	W	W	W	S	W	W		D	W	D
Bucyrus	Port Bucyrus-Crawford County			M	M	D	S	S	S	S	S		D	S	D
Cadiz	Harrison County			M		M	S			S	W		W	M	W
Cambridge	Cambridge Municipal			D		D	M	M	S	W	W		W	M	D
Carrollton	Carroll County-Tolson			W	S	W	M	S	S	W	S		M	W	D
Celina	Lakefield			W	S	D	M	S	S	M	M		W	M	D
Chesapeake/Huntington, WV	Lawrence County Airpark		W	S		D	S	M		M	S		D	S	D
Dayton	Greene County-Lewis A. Jackson Regional			M		W		S		S	S		D		D
Galion	Galion Municipal			S		M	D	M	S	S	S		W	S	D
Gallipolis	Gallia-Meigs Regional					M	M		S	S	S		M	M	D
Harrison	Cincinnati West			M		D	S	M		M	D	S	D	M	D

Table 5-1
Frequency of Aviation Activities at Ohio System Airports

Associated City	Airport Name	Air Carrier	Scheduled Charter	Aircraft Charter	Air Cargo	Corporate/Business	Emergency Medical	Angel Flight	Agricultural	Law Enforcement	Power Line/Pipeline Control	Skydiving	Flight Training	Military	Recreational
Hillsboro	Highland County			M	S	W	M	S	S	W	S		W	W	D
Kent	Kent State University			S		W	S	S		S	M		D	W	D
Kenton	Hardin County			M	S	W	M	S	S	S	S		S	S	D
London	Madison County			M	S	W	S	S	S	M	S		W	W	W
McArthur	Vinton County			D	M	M	M	S	S	M	S	W	D	W	D
Medina	Medina Municipal			W		D	D	M	S	W	W		D	W	D
Middlefield	Geauga County			M	M	M	D		S	S		S	W		S
Napoleon	Henry County			M		W	M	M	S	S	S		W	S	D
Norwalk	Norwalk-Huron County			M	S	M	M	S	S	M	M		S	S	D
Piqua	Piqua-Hartzell Field			M		D			S	M	S		D		D
Steubenville	Jefferson County Airpark			S		W	D			S	W		W	M	D
Van Wert	Van Wert County			S	W	W	M	M	S	S	S	S	D	W	W
Versailles	Darke County		M	M	S	D	W	S	S	S	S		W	M	D
Wadsworth	Wadsworth Municipal			S		M		S	S			S	D	M	D
Waverly	Pike County					M	W		S	S	S			W	D
Wilmington	Clinton Field					M			S	S			D	S	D
GA Level 4															
Caldwell	Noble County									S	S		W	W	D
Dayton	Moraine Air Park					W	D			S			D		D
Deshler	Deshler Municipal Landing Strip			S		S			S				M		W
East Liverpool	Columbiana County			M	S	D	D	M	S	M	W		D	W	D
Georgetown	Brown County			M		D	M	M	S	M	M		D	M	D
Kelleys Island	Kelleys Island Municipal			D		S	S	S		S					D
McConnelsville	Morgan County			S		M	D			S	S		D	M	D
Middle Bass	Middle Bass Island			D		S	S			S					D

Table 5-1
Frequency of Aviation Activities at Ohio System Airports

Associated City	Airport Name	Air Carrier	Scheduled Charter	Aircraft Charter	Air Cargo	Corporate/Business	Emergency Medical	Angel Flight	Agricultural	Law Enforcement	Power Line/Pipeline Control	Skydiving	Flight Training	Military	Recreational
Mount Gilead	Morrow County		M	M	M	M			S	M	S		S	S	D
New Lexington	Perry County			S	S	S	S			M	S		M	W	S
North Bass Island	North Bass Island			W						S					S
Put-In-Bay	Put In Bay			D	S		W							S	S
Upper Sandusky	Wyandot County					M			S	M					M
Washington Court House	Fayette County		M	S	S	M	S	M	S	S	S		D	W	D
West Union	Alexander Salamon			M		W	M	S	S	S	M		W	W	D
Willard	Willard			M		S	S	S	S	S	S				W
Woodsfield	Monroe County			M	M	W	W	M		M	M		W	W	D

Source: Airport Inventory and Data Survey

Community Relationships and Outreach

Another area in which airports provide qualitative benefits is through their relationships with surrounding communities and regions. During the airport inventory effort, airport managers and sponsors were asked to answer questions regarding community involvement and outreach programs. Like the benefits of activities listed above, it is not possible to assign an economic value to these benefits, but they nonetheless provide great value to Ohio residents and businesses. These community relationships come in many forms, including involvement in the planning and economic development processes of a region and activities such as youth outreach and community events. The following are examples of these relationships and outreach efforts:

- **Government and stakeholder partnerships:** Airport groups that are heavily involved in the regional planning and economic development processes of their communities and regions are in a better position to ensure that their airport is part of a region's plans moving forward. Many airports maintain membership in appropriate chambers of commerce or coordinate with local planning and economic development agencies. Ohio survey results reveal that 61 percent of the state's system airports are members of their local chambers of commerce, while 88 percent coordinate with local economic development agencies.
- **Serving as a staging area for community events:** As part of a community at-large, airports are frequently used as venues for a variety of community events. Whether due to the availability of open space and facilities that airports can offer for community gatherings, or for gatherings related to airport operations themselves, airports are a multifaceted resource for host communities. In Ohio, these events range from pilot group gatherings, air shows, and aviation festivals to community group meetings and athletic events, among others.
- **Providing youth outreach activities:** Airports have always been a draw for young people mesmerized by the allure of flying. Through various youth groups, airports routinely serve as an educational resource and inspiration for those that could choose to pursue a career in aviation. Ohio system airports regularly host youth groups such as school field trips, providing tours and creating awareness about the importance of aviation. In addition, many airports host local Boy Scout groups looking to earn aviation badges.

Whether it is a community event, youth program, or some other form of outreach, 85 percent of Ohio system airports reported having some type of ongoing community outreach program.

Value to Airport Users

As part of the *Ohio Airports Economic Impact Study*, a transient pilot survey effort was conducted. This effort was primarily undertaken to help estimate the additional economic impact created by general aviation visitors to the state, but survey results also helped to further illustrate the qualitative benefits of the Ohio airport system. Approximately 200 responses provided comments on the value of Ohio airports, providing a special insight into how airport users view the Ohio airport system.

Common themes in these comments include the quality and availability of airside services, the importance of Ohio airports to business operations, quality of airport restaurants, the convenience of airport locations, and the overall appreciation of Ohio's extensive airport system. Several examples of comments illustrating the qualitative benefits of Ohio aviation are shown in **Table 5-2**.

Table 5-2
Comments from Transient Pilot Surveys

Comment Category	Airport User Quote
Business	"Airports with 24 hour fuel service have become so important. Our business requires early or late departure where often times FBOs are closed. Ohio airports large numbers makes flying in this state great."
	"Local airports are crucial for our business. We purchase roughly 450 gallons of Jet A every two days. We must have local airports to operate."
	"The Ohio airport system allows us to service our customers more effectively. Ready access through the smaller airports eliminates multi-day trips for 3 hour meetings. We generate more business because of this convenient access to our customer locations."
	"Ohio airports are crucial to my business, giving me the ability to market myself and my business in a way that would be impossible otherwise."
	"Absolutely essential to our business. We use small airports around the state of Ohio and the eastern and central U.S. to conduct our manufacturing and distribution business. Based in Ohio, our airports make it possible to effectively service our extensive customer base."
	"Small airports make it easy for people to conduct business and go where they need to go when they need to go without relying on airlines."
Education	"Flight training school based [at the airport]. Probably would not have become a pilot if not for the closeness of the school and availability of rental aircraft."
	"As airport students and future certified flight instructors, we love having the availability of flying either solo or with fellow students to friendly Ohio airports for flight experience or just for fun."
	"As a flight instructor, Ohio airports are invaluable. Flight instructors are the basis for all pilots in Ohio, and knowing that, I make it a point to understand the importance of smaller GA airports on the commerce within Ohio. GA airports are a vital part of Ohio's and surrounding states' economics."
Regional and Economic Development	"Ohio's airports are crucial for the state and its commerce. In addition, the revenue that is received by the state and local businesses keeps our local counties and state financially healthy."
	"Great for tourism and economic development."
	"Invaluable to area development."
	"The airports in Ohio are vital to the economic success of each community and the state as a whole."
Other/General	"Ohio's airports are one of its great assets."
	"Ohio has many small, well maintained airports with very good facilities. I have flown to many of them to fly dogs rescued from shelters."
	"Very well run restaurant, good food & service, aeronautical museum on site, and a great place to bring friends and visiting business associates."

Source: CDM Smith Transient Pilot Surveys

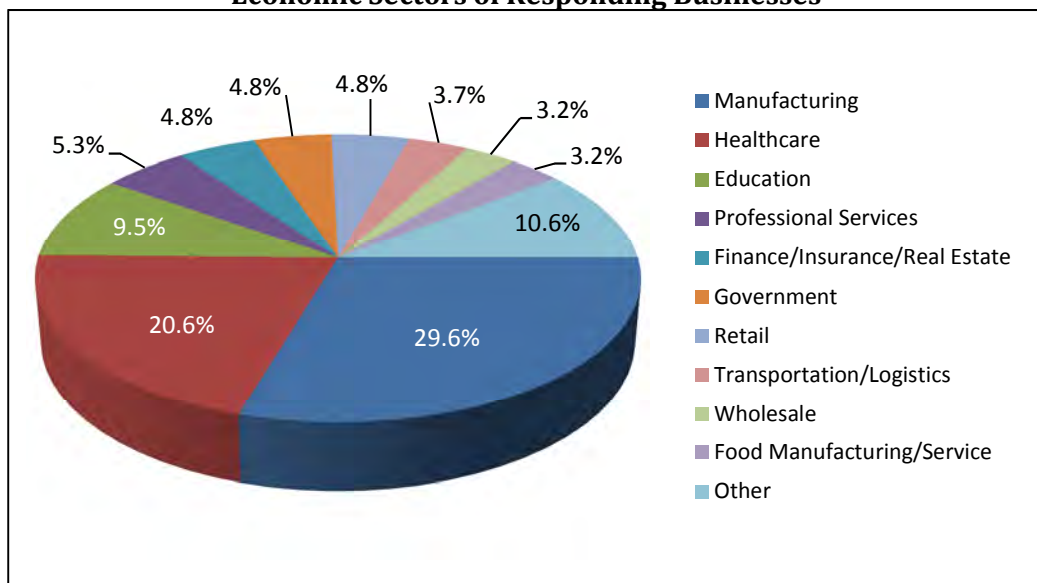
As explained above, these comments are only examples of the feedback provided by airport users. Many more comments illustrated the importance of Ohio airports to business operations, a benefit which the following sections will expand upon. It is also important to recognize that no matter how large or small their contributions, all airports in Ohio contribute in some way to the quality of life and economic vitality of Ohio.

Value Added Benefits from Aviation Dependent Businesses

The utilization of air travel and aviation services helps businesses throughout the United States to increase their productivity, expand their operations, and achieve their goals, and Ohio is no different. Many off-airport businesses in Ohio greatly benefit from the presence of the state's system of 104 public airports, and it was therefore necessary to estimate this additional benefit that aviation provides.

Approximately 2,700 Ohio businesses were surveyed in an effort to measure their dependence upon aviation. Industries with a known propensity to utilize airports were targeted, including manufacturing, construction, healthcare, financial services, among others. While it is not possible to make exact measurements of the additional economic impact that this business use of aviation provides, it is possible to make broader assumptions about the benefits that aviation provides Ohio's non-aviation businesses. **Exhibit 5-1** summarizes the specific industry sectors reporting by responding businesses. Together, manufacturing and healthcare made up approximately half of the nearly 200 responses, with education following at nearly 10 percent of the total. The average size of respondent businesses was 482 full-time equivalent employees.

Exhibit 5-1
Economic Sectors of Responding Businesses



Source: Business Use Survey

Businesses were asked to answer a number of questions related to their use of aviation. These questions were aimed at assessing the following:

- Dependence on commercial airline and general aviation service
- Tendency of clients and suppliers to use aviation to visit business sites
- Dependence upon and use of air cargo
- The level to which airports affect the decision of business location

The results of the survey effort confirmed that Ohio businesses rely on the statewide airport system for the transportation of employees, clients, suppliers, and varying types of cargo. The following sections summarize how these businesses utilize aviation and the ways in which they are dependent on Ohio's 104 public airports.

Dependence on Commercial Service Aviation

While the number of trips varies greatly by business, 71 percent of respondent businesses reported using commercial aviation at some point during 2012. These companies took an average of 323 trips, or approximately 0.6 trips per employee. On average, respondent businesses spent \$670 per trip.

In addition, 64 percent of respondent businesses reported that clients and suppliers use commercial aviation to reach their place of business. These businesses reported an average of 128 client trips per year.

Dependence on General Aviation

Survey results revealed that fewer Ohio businesses utilize general aviation for their day-to-day operations than they do commercial aviation. In total, 22 percent of respondent businesses reported using general aviation in 2012. Many of these businesses utilize one or more forms of general aviation, with 11 percent owning their own corporate aircraft, 2 percent having fractional ownership in an aircraft, 4 percent leasing or renting a general aviation aircraft, and 10 percent using general aviation charter or taxi flights.

As with commercial aviation, businesses often use general aviation to bring clients and suppliers to their place of business. Twenty-eight percent of respondent businesses reported this activity, with an average of 25 client trips per year.

Dependence on Air Cargo

Because the shipment of goods is a necessary function of aviation in the business world, surveyed companies were also asked to report their reliance upon air cargo services. In total, 64 percent of surveyed companies reported utilizing air cargo for business needs in 2012. Detailed results reveal that 40 percent shipped documents less than two pounds, 49 percent shipped parcels between two and 70 pounds, and 33 percent of respondent businesses shipped freight over 70 pounds in weight.

Overall Dependence on Airports

Surveyed businesses were also asked to estimate their total Ohio business activity that is dependent on airports in Ohio, in the form of a percentage. Businesses reported that 22 percent of their total business activity is dependent on commercial aviation, while five percent is dependent on general aviation. When applied to the reported population totals, it was found that approximately 25 percent of the employment at these businesses is dependent upon aviation.

According to the U.S. Bureau of Labor Statistics, there were approximately 5.2 million employees in Ohio in 2012. Industries targeted as part of this survey effort account for over 2.6 million of these employees, or just over half. Based on the survey results, it can be assumed that 25 percent of this employment is dependent upon aviation. In all, it is conservatively estimated that approximately 665,000 Ohio jobs, or 13 percent of the statewide total, are in some way dependent upon the state's airport system.

Business Location

The final section of the business use survey asked businesses to rate the importance of several factors and amenities considered when locating, relocating, or expanding a business. Businesses gave each of the thirteen factors a score from 1 (least important) to 5 (most important). These factors, listed by the importance given to them by Ohio businesses, are as follows:

1. Convenient highway access
2. Available trained workforce
3. Quality of life
4. Tax incentives
- 5. Commercial service airport**
6. Proximity of suppliers
7. Universities or R&D centers
8. Natural resources
9. Urban business district
10. Historic location of business
- 11. General aviation airport**
12. Rail transportation facilities
13. Water transportation facilities

Of the businesses responding to the survey, 62 percent noted that the existence of a commercial service airport is of moderate to extreme importance (score of 3 or above), while 40 percent noted the same for the availability of a general aviation airport.

Summary

This chapter illustrated the additional qualitative benefits of Ohio's system of public airports that cannot be easily assigned a dollar amount. Such benefits include supporting a wide range of aviation activities that can enhance the public health, safety, and welfare. Ohio airports also maintain strong relationship within their communities and regions through partnerships, a variety of events, and youth outreach programs. Through additional survey efforts to transient pilots at Ohio airports and off-airport Ohio businesses, it was possible to illustrate the great importance that the state's airports provide to their users, particularly in the business community.

Unique Aspects of Aviation in Ohio/ Four Case Studies

Introduction

As the birthplace of aviation, Ohio has a long history with aircraft and airports. As a result, there are a number of unique aspects to Ohio's aviation economy. In case-study format, this chapter will examine four unique facets of Ohio's aviation system that are considered important. These aspects include Ohio's unique airports, unique uses of Ohio airports, and unique industries that are supported by Ohio's airports. The four aspects are as follows:

- Shale Oil & Gas Industry
- Island Airports
- Aviation Education
- Fractional Ownership

Shale Oil & Gas Industry

As discussed at length in Chapter 4 of the *Ohio Airports Focus Study*, a unique aspect of aviation in Ohio is related to the development of shale gas. Shale gas production is a growing industry in Ohio that is expected to have a significant impact on the state for several years to come. Airports – both commercial service and general aviation – are crucial gateways enabling industry personnel to efficiently access areas of interest throughout the state. Since exploration of shale plays generally occurs in rural areas, general aviation airports are of particular importance to shale gas extraction companies.

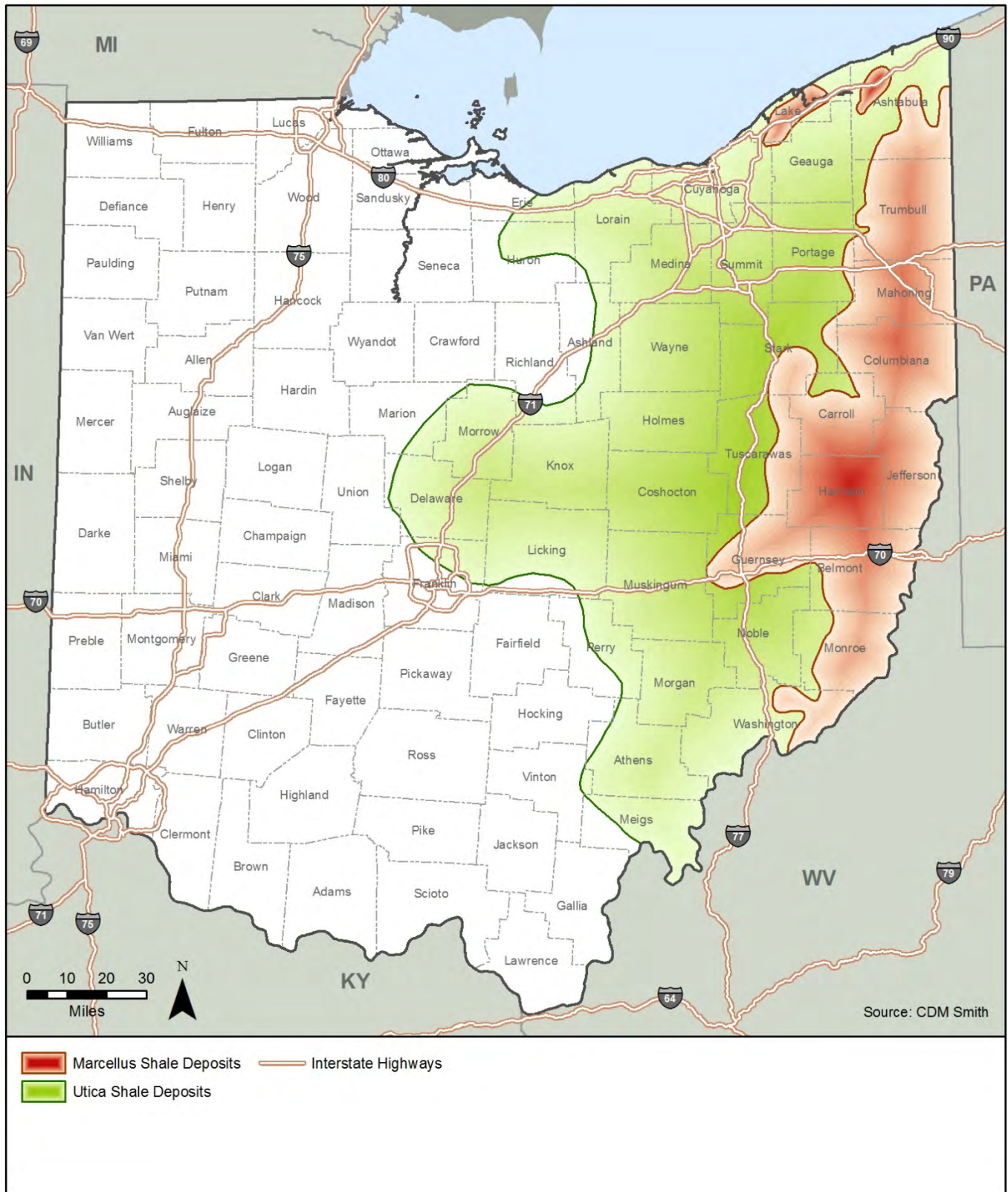
Ohio Shale Production Overview

Ohio is favorable to drilling activities due to a variety of factors – both regulatory and geologic in nature. These factors include a conducive and strong regulatory environment, availability of state lands for drilling, and moratoriums in other nearby states/provinces (i.e. New York, Quebec). Ohio's shale formations are generally at shallower depths than other shale plays (roughly 3,500 to 10,000 feet for Utica); interlayered carbonate and shale in Ohio lends to “fracability” of the rock; and maturation levels indicate a large “sweet spot” in Ohio.

The Marcellus Shale Formation is present under a small area in eastern Ohio, primarily along the Ohio River and Pennsylvania border. The Utica Formation sits below a much larger portion of the state, stretching as far west as Delaware and Franklin Counties in central Ohio (shown in **Exhibit 6-1**). According to the Ohio Department of Natural Resources (ODNR), the area for the greatest Utica drilling potential encompasses approximately 45 Ohio counties. In 2012 the Utica-Marcellus region was the third largest producer of natural gas in North America, behind only Texas and western Canada.¹

¹ <http://www.ohio.com/news/local/utica-marcellus-shales-are-ripe-with-natural-gas-to-benefit-ohio-pennsylvania-1.429684>

Exhibit 6-1
Areas of Potential Shale Exploration in Ohio



A study conducted by IHS Inc. and the U.S. Chamber of Commerce's Institute for the 21st Century Energy indicates that in 2012 Ohio's Utica shale development supported 38,380 jobs in the state, added \$4.1 billion to the state's economy, and produced \$911 million in state and local tax revenues. By 2020, these totals are expected to grow to 143,000 jobs, \$18 billion, and \$4.6 billion, respectively. Ohio is currently ranked as the 9th largest shale producing state based on number of workers.² A report issued by the Ohio Department of Job and Family Services stated that jobs in the oil and gas fields are up 17 percent from 2011 to 2012. The average salary across all the shale-related industries in Ohio is \$73,934 per year. Those with jobs extracting oil in Ohio's shale are making over \$100,000 per year.³

The exploration and extraction of shale gas has provided a substantial economic boom to other states, which, to a certain degree has already been felt in Ohio. One example is in Carroll County, where local businesses such as hotels, gas stations, and restaurants have seen their sales skyrocket and have added employees. Carrollton, a town that previously had one hotel, will soon have a total of three hotels as a direct result of the drilling boom.⁴ New hotels intended to cater to the oil and gas industry are emerging all over eastern Ohio; a total of six new hotels have opened or are in the process of opening in Salem, St. Clairsville, and Canton. According to Hotelmanagement.net, hotel operations in areas where oil and gas companies drill have expanded breakfast hours, and increased staff on late night/early morning shifts.⁵

This economic activity has included a significant increase in aviation activity at certain facilities. Ohio's shale-related activity is projected to create increased passenger activity at commercial service airports in the state. The state's shale activity is expected to boost activity at general aviation airports, driving demand at these airports for facilities and services to support business jet aircraft.

Carroll County is the reigning Utica shale capital of Ohio, representing 38 percent of all wells approved in Ohio since 2010. However, drillers are increasingly shifting southward into Harrison, Belmont, Monroe, Guernsey, Noble, and Washington Counties.⁶ Exhibit 6-1 displays the areas of Ohio that overlay the Marcellus and Utica shale formations, which are largely in eastern Ohio. Airports within these areas are considered to have the greatest potential to experience increased use by business aircraft at general aviation airports.

Impact on Commercial Service Airports in Ohio

Based on previous studies in North Dakota and Pennsylvania, it has been determined that greater activity in the oil and gas industry provides an increase in passenger traffic at a region's commercial airports. The exploration and extraction of the Marcellus/Utica shale in Ohio is expected to positively impact the commercial airline industry in two facets: commercial enplanements and average visitor spending per trip. For the purpose of this study, only activity at Akron-Canton Airport, Cleveland-Hopkins International Airport, and Port Columbus International Airport has been projected. Although Youngstown-Warren Regional Airport is situated well within areas

² <http://www.ohio.com/blogs/drilling/ohio-utica-shale-1.291290/utica-shale-to-generate-143-000-ohio-jobs-18-billion-to-economy-by-2020-1.359095>

³ <http://marcellusdrilling.com/2013/02/oh-report-details-shale-drillings-huge-impact-on-jobs-economy/>

⁴ <http://www.athensnews.com/ohio/article-39980-ou-conference-looks-at-upside-downside-of-shale-drilling-boom.html>

⁵ <http://www.tribune-chronicle.com/page/content.detail/id/592361/Fri---7-23am--New-hotel-will-serve-oil--gas-industry.html?nav=5192>

⁶ <http://www.ohio.com/news/top-stories/drillers-in-ohio-increasingly-shifting-to-southern-counties-1.425984>

overlying shale deposits, it is excluded from this analysis of commercial service visitor impacts due to the nature of its commercial flights. Youngstown-Warren Regional's only airline is Allegiant Air, which is considered a "vacation airline" that serves relatively few business travelers.

Impact on Commercial Enplanements

In Pennsylvania, commercial airports typically estimated that the Marcellus Shale industry has significantly boosted activity at smaller commercial service airports. However, due to the diverse economies and high enplanement numbers already supported by Akron, Cleveland, and Columbus, it is expected that oil and gas activity will increase enplanement levels by less than one percent. Still, these additional enplanements will bring a variety of economic benefits to the state. **Table 6-1** reveals expected increases in enplanements at these three airports.

Table 6-1
Projected Increase in Enplanements and Commercial Visitor Spending
Based on Marcellus/Utica Shale Activity

Associated City	Airport Name	2012 Enplanements	Projected Increase in Annual Enplanements	2012 Visitor Spending	Projected Increase in Annual Visitor Spending
Akron	Akron-Canton	910,313	3,600	\$207,551,000	\$830,000
Cleveland	Cleveland-Hopkins International	4,325,353	4,800	\$962,045,000	\$962,000
Columbus	Port Columbus International	3,095,360	1,500	\$788,548,000	\$513,000
TOTAL		8,331,026	9,900	\$1,958,144,000	\$2,305,000

Source: CDM Smith⁷

Impact on Visitor Spending

Studies in Pennsylvania and North Dakota also reveal that a boom in the energy industry increases the average spending per trip of commercial airline travelers, both by staying in the region longer and spending more in the local economy. In North Dakota, spending per trip at airports in areas of Bakken Shale extraction was more than double that at other commercial airports. In Pennsylvania, it was found that spending per trip was more than 50 percent higher than at airports not experiencing Marcellus Shale activity, which is a more reasonable comparison. However, because these airports have historically experienced minimal enplanements (less than 50,000 annually), and serve a highly specialized economy that is dependent on the energy industry, these average increases are considered much higher than what will be the average increase at Ohio's more robust facilities.

Based on Ohio airports' proximity to Marcellus/Utica Shale extraction, commercial service visitor spending per trip is projected to increase by less than one percent at Akron, Cleveland, and Columbus. When applied to a full year, this amounts to the projected increase in visitor spending also shown in Table 6-1.

Impact on General Aviation Airports in Ohio

The Ohio State Airport System consists of 104 public-use airports throughout the state, including 97 general aviation facilities. The areas that overlay shale deposits are home to 33 of these general aviation system airports, which, for the purpose of this analysis, includes one commercial service

⁷ The methodology used to project increases in enplanements and visitor spending due to shale activity was taken from the JobsOhio-sponsored *Ohio Commercial Service Airports Economic Impact Study* conducted by CDM Smith.

airport – Youngstown-Warren Regional. According to the state aviation system plan’s airport-stratification model, the 33 airports include 11 Level 1 airports, six Level 2 airports, 10 Level 3 airports, and six Level 4 airports.

Table 6-2 lists basic facilities that are offered at each airport. While runways with a length of at least 4,000 feet are deemed adequate to serve many business aircraft, a length of at least 5,000 feet is preferable to serve larger jet aircraft.

Inventory Findings

The inventory effort of the *Ohio Airports Focus Study* revealed that 20 airports reported experiencing an increase in traffic related to the oil industry, while 14 airports reported that they have an existing drilling lease on airport property. On-airport drilling leases are important to consider as any revenues generated from this activity is required by FAA grant assurances to be used towards airport development and cannot be diverted elsewhere. These revenues can be major sources of income for an airport, as demonstrated by Carroll County-Tolson, Jefferson County Airpark, and Portage County, which have drilling leases with values estimated at \$230,000, \$56,000, and \$85,000, respectively. Of the airports that reported increases in activity related to shale development, seven are Level 1 airports, five are Level 2 airports, six are Level 3 airports, and two are Level 4 airports. System airports with on-airport drilling include three Level 1, two Level 2, one Level 3, and one Level 4 airport. These airports are listed in **Table 6-3** and the location of these airports is illustrated in **Exhibit 6-2**. Exhibit 6-3 shows that the state system airports with an existing drilling lease, as well as the majority of airports reporting increases in oil-related traffic, are located in the eastern half of the state. This is consistent with the areas of potential and existing shale exploration.

Table 6-2
Select Airport Facilities in the Marcellus/Utica Shale Areas

System Role	Associated City	Airport Name	4,000' Runway		Jet Fuel	Instrument Approach	Ground Transportation (rental/ courtesy/ both)	Terminal Facilities
			≥4,000'	≥5,000'				
Level 1	Akron	Akron Fulton International	✓	✓	✓	✓	Both	✓
	Ashtabula	Northeast Ohio Regional	✓	✓	✓	✓	Both	✓
	Cleveland	Burke Lakefront	✓	✓	✓	✓	Both	✓
	Cleveland	Cuyahoga County	✓	✓	✓	✓	Courtesy	✓
	Coshocton	Richard Downing	✓	✓	✓	✓	Courtesy	✓
	Delaware	Delaware Municipal-Jim Moore Field	✓	✓	✓	✓		✓
	Lorain/Elyria	Lorain County Regional	✓	✓	✓	✓	Both	✓
	Willoughby	Willoughby Lost Nation Municipal	✓	✓	✓	✓	Courtesy	✓
	Wooster	Wayne County	✓	✓	✓	✓	Both	✓
	Youngstown/ Warren	Youngstown-Warren Regional*	✓	✓	✓	✓	Both	✓
	Zanesville	Zanesville Municipal	✓	✓	✓	✓	Courtesy	✓
Level 2	Athens/Albany	Ohio University-Snyder Field	✓	✓	✓	✓	Courtesy	✓
	Millersburg	Holmes County			✓	✓	Courtesy	✓
	Mount Vernon	Knox County	✓	✓	✓	✓	Courtesy	✓
	New Philadelphia	Harry Clever Field			✓	✓		✓
	Newark	Newark-Heath	✓		✓	✓	Both	✓
	Ravenna	Portage County			✓	✓	Courtesy	✓
Level 3	Barnesville	Barnesville-Bradfield	✓			✓		✓
	Cadiz	Harrison County				✓	Courtesy	✓
	Cambridge	Cambridge Municipal	✓		✓	✓	Courtesy	✓
	Carrollton	Carroll County-Tolson	✓		✓	✓		
	Kent	Kent State University	✓		✓	✓	Courtesy	✓
	Medina	Medina Municipal			✓	✓	Rental	✓
	Middlefield	Geauga County					Courtesy	
	Norwalk	Norwalk-Huron County	✓		✓	✓		✓
	Steubenville	Jefferson County Airpark	✓	✓	✓	✓		✓
	Wadsworth	Wadsworth Municipal			✓	✓	Courtesy	✓
Level 4	Caldwell	Noble County				✓		✓
	East Liverpool	Columbiana County				✓		✓
	McConnelsville	Morgan County						✓
	Mount Gilead	Morrow County						✓
	New Lexington	Perry County				✓	Courtesy	✓
	Woodsfield	Monroe County				✓		✓

Source: CDM Smith

*Youngstown-Warren Regional Airport is classified as an Air Carrier Airport despite inclusion in Level 1 category

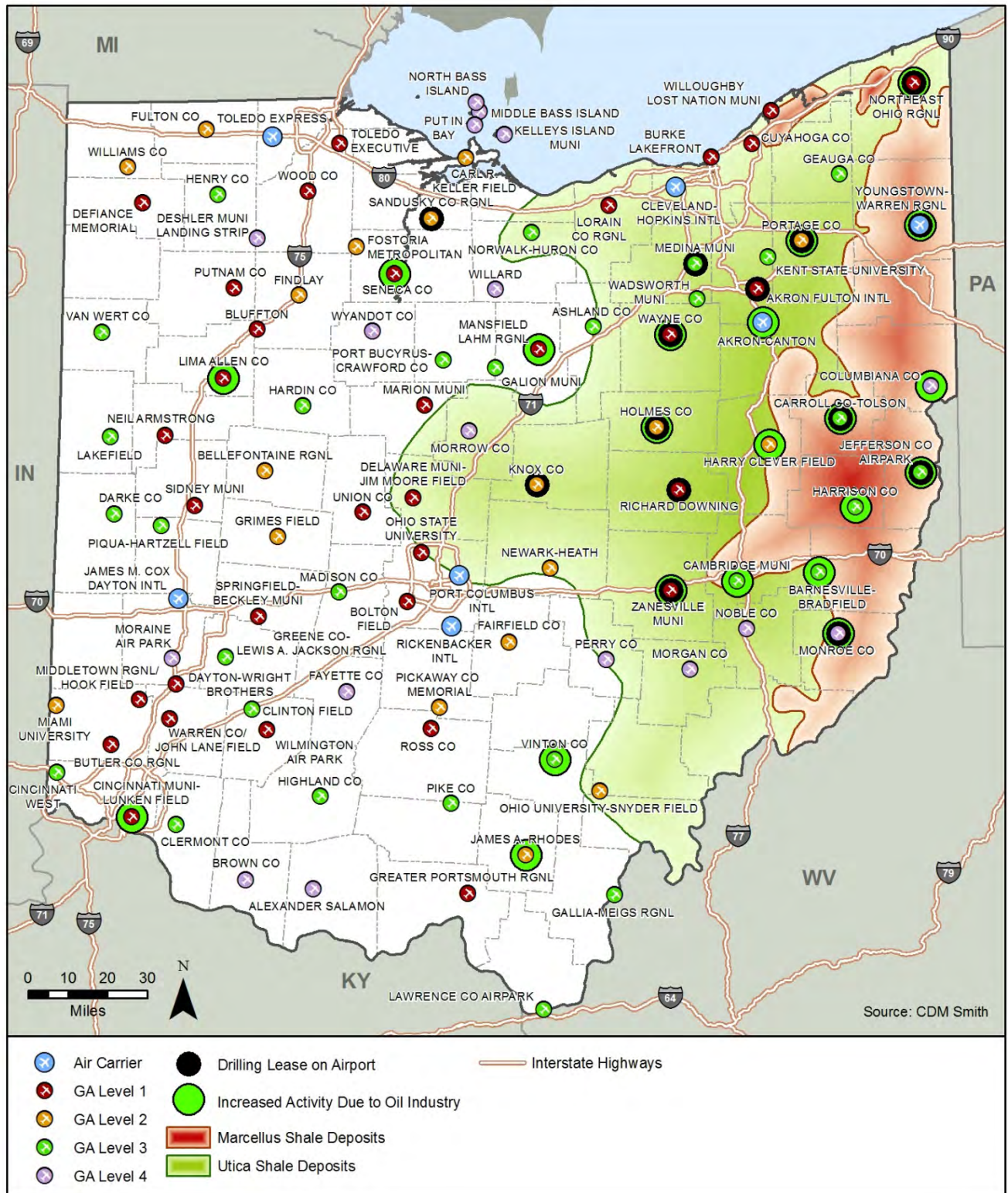
Table 6-3
Ohio's Airports with Increased Oil-Related Traffic and On-Airport Drilling

System Role	City	Airport	On-Airport Drilling Lease	Oil Business Traffic Increase
Level 1	Akron	Akron-Canton	No	Yes
	Cincinnati	Cincinnati Municipal-Lunken Field	No	Yes
	Lima	Lima Allen County	No	Yes
	Mansfield	Mansfield Lahm Regional	No	Yes
	Tiffin	Seneca County	No	Yes
	Wooster	Wayne County	Yes	Yes
	Zanesville	Zanesville Municipal	Yes	Yes
	Youngstown/Warren	Youngstown-Warren Regional*	Yes	Yes
Level 2	Ashtabula	Northeast Ohio Regional	Yes	Yes
	Jackson	James A. Rhodes	No	Yes
	Millersburg	Holmes County	Yes	Yes
	New Philadelphia	Harry Clever Field	No	Yes
	Ravenna	Portage County	Yes	Yes
Level 3	Barnesville	Barnesville-Bradfield	No	Yes
	Cadiz	Harrison County	No	Yes
	Cambridge	Cambridge Municipal	No	Yes
	Carrollton	Carroll County-Tolson	Yes	Yes
	McArthur	Vinton County	No	Yes
	Steubenville	Jefferson County Airpark	Yes	Yes
Level 4	East Liverpool	Columbiana County	No	Yes
	Woodsfield	Monroe County	Yes	Yes

Source: CDM Smith

*Youngstown-Warren Regional Airport is classified as an Air Carrier Airport despite inclusion in Level 1 category

Exhibit 6-2
Areas of Potential Shale Exploration and Ohio System Airports



In addition, airports outside of the exhibited shale areas also see increased activity related to the oil and gas industry. In many cases this is due to the airport's proximity to areas of interest as well as availability of airport facilities and services. Examples of such airports that have reported increased activity due to oil and gas include Mansfield Lahm Regional, James A. Rhodes, and Vinton County. Extraction companies use these airports to prospect nearby land for potential wells, negotiate with landowners, and to fly in VIPs. However, several airports that are further outside of the state's shale areas also report increased shale-related activity. These airports include Cincinnati Municipal-Lunken Field, Lima Allen County, and Seneca County.

In the case of Lima Allen County, the airport is near the Husky Oil Refinery, which recently expanded local operations and is developing three major natural gas fields in the region, resulting in increased traffic at the airport. Cincinnati Municipal-Lunken Field has seen increased oil and gas industry traffic as well, likely related to the development of the Bluegrass Pipeline, which will move natural gas liquids from the Marcellus and Utica shale areas of Ohio, West Virginia, and Pennsylvania to processing and storage facilities in Louisiana. While the exact route through Ohio is still to be determined, a preliminary map shows pipelines would extend west toward the Cincinnati area before pushing south.⁸ In addition, Ashland Inc., a Fortune 500 petrochemical company, is located 10 miles from Cincinnati Municipal-Lunken Field in Covington, Kentucky.

Shale Industry Summary

As demonstrated in this economic impact study, airports and aviation are critical factors in facilitating the economy, both locally and globally. Airports play an equally important role when it comes to supporting Ohio's emerging shale boom. Ohio's commercial service airports provide shale extraction companies with access to the state and region, while Ohio's general aviation airports provide access to the more remote areas of the state where drilling sites are more prevalent. Numerous Level 1, Level 2, and Level 3 general aviation airports have already seen increased activity related to shale development, while greater numbers of system airports within close proximity to the state's shale area are equipped to accommodate business aircraft typically utilized by oil and gas industry firms. In several cases, airports have lease agreements for drilling directly on-airport property, which provides the airport with supplemental revenue required to be used for airport development. In either case (increased activity or on-airport drilling), Ohio's airports directly benefit from the state's emerging shale boom.

Island Airports

Another unique aspect of aviation in Ohio is the state's four Island Airports. The Island Airports are situated on four separate islands that are part an archipelago known as The Lake Erie Islands. The chain consists of several islands – large and small, as well as commercially developed and undeveloped – in the western half of Lake Erie. Ohio's four primary islands are situated in a cluster north of the Marblehead Peninsula (located north of Sandusky, Ohio) and consist of Kelleys Island, North Bass Island, Middle Bass Island, and South Bass Island. These are Ohio's largest islands and are each home to one state system



⁸ <http://www.bizjournals.com/columbus/news/2013/07/08/pipeline-through-ohio-given-go-ahead.html?page=all>

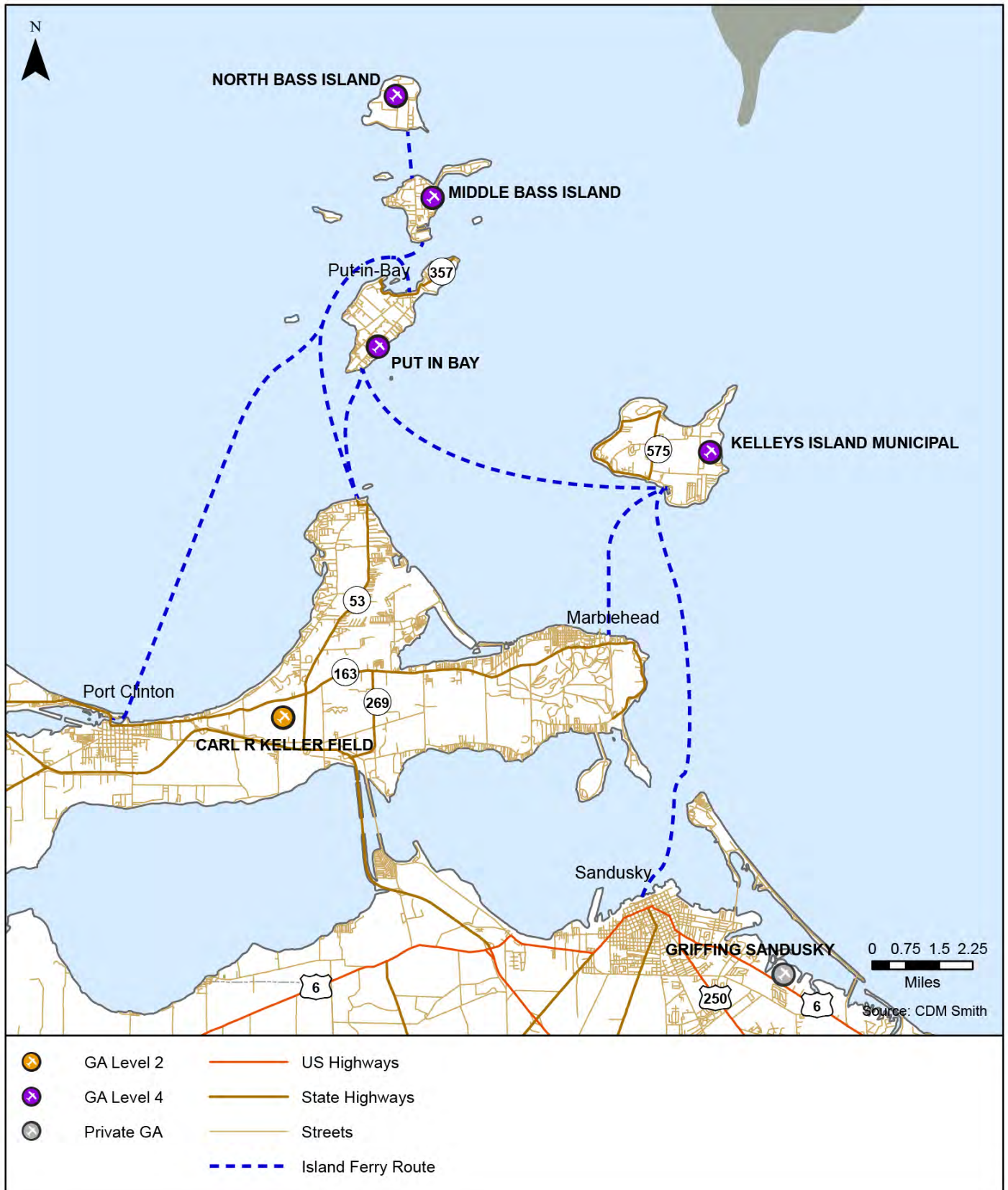
airport that serves the unique needs of each island and its communities. The airports are vital links between the mainland and the islands as the only other mode of access is by boat. In addition, Middle Bass Island and Rattlesnake Island (a smaller island located to the west of Middle Bass Island) are each home to privately-owned air strips; however, only the private air strip on Middle Bass is available for public use.

The four island airports and their characteristics such as runway length, based aircraft, and annual operations are listed in **Table 6-4** below. **Exhibit 6-3** illustrates the location of Ohio's Lake Erie Islands, their airports, and associated ferry routes.

Table 6-4
Ohio's Lake Erie Island Airports

System Role	Associated City	Airport Name	ID	Runway Length	Based Aircraft	Annual Operations
Level 4	Middle Bass	Middle Bass Island	3T7	1,852	1	6,500
	Put In Bay	Put In Bay	3W2	2,870	3	12,075
	North Bass Island	North Bass Island	3X5	1,804	-	1,000
	Kelleys Island	Kelleys Island Municipal	89D	2,203	5	25,495

Exhibit 6-3
Map of Ohio's Lake Erie Islands



Island Airport Descriptions

Kelleys Island Municipal Airport

With a total area of just under 4.5 square miles, Kelleys Island is the largest of Ohio's islands and is located southeast of the three Bass Islands, approximately four miles north of Marblehead. As part of Erie County, Kelleys Island is a popular tourist destination during the summer months but maintains a population of approximately 100 residents year-round. Among the numerous attractions is the 677-acre Kelleys Island State Park, located on the northern shores of the island. Ferry service is provided by two privately-owned operators; Kelleys Island Ferry and Jet Express. Kelleys Island Ferry Boat Line offers the only daily automobile and passenger ferry service to Kelleys Island on a 20-minute journey from Marblehead, Ohio. At its summertime peak, the service runs between Kelleys Island and the mainland every half hour throughout the majority of the day; however, the service stops in early December and does not resume until April the following year. Jet Express is a high-speed passenger-only ferry that connects Kelleys Island with Sandusky and Put-in-Bay on South Bass Island. From late May through mid-September Jet Express operates between five and 13 round trips, depending on the day of the week. Kelleys Island Ferry arrives at the Seaway Marina, two blocks east of downtown Kelleys Island, while Jet Express arrives at the Casino Dock downtown.

Kelleys Island Municipal is owned and operated by the Village of Kelleys Island. The airport consists of a 2,203 foot long runway, a small terminal building, and seven tie downs for transient aircraft. Although there are no on-airport services available, the airport serves as a critical link for the residents of the island, especially during the winter months when the ferries do not operate (roughly November through May). In the summer months the airport is used by the island's tourism industry through recreational users and unscheduled charters such as Griffing Flying Service, which currently operates out of Griffing Sandusky Airport and Carl R. Keller Field in Port Clinton. Griffing Sandusky Airport is a privately owned public-use airport that is scheduled to close in the near future, at which time Griffing Flying Service will move all operations to Carl R. Keller Field. In the winter months, however, Kelleys Island Municipal becomes the primary lifeline for the island since the ferries suspend service for the duration of the season. The airport provides the island with daily postal service, emergency medical services, grocery delivery, prescription medication delivery, and other essential services. The island has its own junior/senior high school but each year there are several students who commute to the mainland for schooling, which also requires the use of the airport by aircraft charter services during winter months. The airport is unique in that it has through-the-fence (TTF) access by private residential properties with aircraft hangars. An FAA sponsor study is underway to examine the situation; however, expansion solutions are not readily evident as Lake Erie and Kelleys Island State Park are physical constraints to airport expansion.

Put-in-Bay Airport

Northwest of Kelleys Island lies South Bass Island, which, as the name implies, is the southernmost of the Bass Islands and is also the third largest island in Lake Erie at about 2.5 square miles in total area. The island is situated approximately three miles north of the mainland (Scott Point in Catawba Island Township) and is part of Put-in-Bay Township, which also includes North and Middle Bass Islands. South Bass Island is a very popular tourist destination in the summer due to its numerous tourist attractions and activities. The island's only incorporated village, Put-in-Bay, plays host to a lively nightlife with numerous bars and nightclubs and is commonly referred to as "the Key West of the North." The island boasts approximately 140 full-time residents, most of whom remain on the island throughout winter. Seasonal ferry service is provided by Miller Boat Line and Jet Express. Miller Boat Line operates an automobile/passenger ferry between Catawba

Island and the southernmost point of South Bass Island adjacent to the airport. This service runs every half-hour from mid-May through early-September, and on a nearly hourly basis in October and late March through mid-May. The Jet Express ferry connects downtown Put-in-Bay with Port Clinton and Kelleys Island on a high frequency schedule from May through October. Sandusky can also be reached from Put-in-Bay on the Jet Express after its Kelleys Island stop.

Although the majority of transportation to and from South Bass Island occurs via ferry or private boat, access to the island by aircraft is also common and becomes a necessity during winter months. Situated on the southeastern tip of South Bass Island, Put-in-Bay Airport consists of a 2,870 foot runway. Owned and operated by Put-in-Bay Township Port Authority, the airport accommodates a variety of recreational flights in the summer months such as helicopter rides, biplane rides, and general use by private pilots. During the winter months when the ferries stop running the airport is used by aircraft transporting mail, groceries, drugs, and general supplies. Life Flight helicopters use the airport to make emergency medical evacuations as needed. School children from Middle Bass Island and North Bass Island are flown in to attend school since it is the only school on the three Bass Islands. Employees of the island's lone bank are also flown in to work one day per week during winter. Griffing Flying Service is the primary charter company for these activities. No fuel or other aircraft services are offered on-airport other than aircraft tie-downs and a pilot lounge; however, golf cart rentals are available on the airport for moving about the island. Several homes surrounding the airport have deeded residential TTF access. Physical constraints such as Lake Erie, roadways, and surrounding residential homes limit the expansion of the airport.

Middle Bass Island Airport

Separated by about one-half mile of water, north of South Bass Island lies Middle Bass Island, which is Lake Erie's fourth largest island and is also part of Put-in-Bay Township. In contrast to neighboring South Bass Island, Middle Bass Island is considered a quieter vacation destination as it is far less crowded and overtly "touristy." The island has many outdoor recreational opportunities as well as several dining and lodging options; however, it is generally regarded as a destination for rest and relaxation. The island is home to about 50 year-round residents and a few thousand summer vacationers. Getting to the island can be accomplished by either boat or aircraft. Seasonal automobile ferry service from Catawba Island Township is provided by Miller Boat Line, while the Middle Bass Ferry provides scheduled passenger service between Middle Bass Island and Put-in-Bay – also on a seasonal basis.

Middle Bass Island Airport is owned and operated by the Put-in-Bay Township Port Authority and features a 1,852 foot runway. The airport also has a substantial apron (14,000 square yards) with 38 tie-downs for aircraft parking as well as a 700-square foot terminal building, which is used as shelter while waiting for mail delivery and charters. During the summer months the airport supports the tourism industry through activity by unscheduled charters and recreational pilots. During winter months the airport becomes the only transportation link to and from the island that all residents rely upon. From October through May all food, medical supplies, and mail arrive via the airport. The transport of school children to and from the island also occurs via the airport during this time. Griffing Flying Service is the primary provider of this charter service.

North Bass Island Airport

One mile north of Middle Bass Island lies the 688-acre North Bass Island, also known as Isle St. George. It is the northernmost island in Ottawa County and is located 18 miles from the Ohio mainland and less than two miles from the Canadian border. North Bass Island State Park makes up 593 acres, or 87 percent, of land on the island, which helps preserve Lake Erie's largest undeveloped island. The remainder of the island consists of 12 privately owned residences. The

park is only open for low-impact outdoor pursuits such as hiking, picnicking, biking, wildlife watching, fishing, and primitive camping with a special permit. ODNR continues to lease 38 acres to Sandusky's Firelands Vineyard to preserve North Bass Island's cultural fabric and history of vineyards and winemaking. A small population of about two dozen permanent residents resides on the island. There is no ferry service to the island; it can be reached only by aircraft or personal watercraft.

The airport, which is owned and operated by the Put-in-Bay Township Port Authority, consists of a 1,804 foot runway with a turnaround and a 2,000-square yard apron. The airport is used primarily to serve the island's remaining population with the delivery of mail, food, and general supplies as well as through law enforcement and medical evacuation flights. During the winter months, the airport is the only mode of access to and from the island. Griffing Flying Service is the primary provider of charter services.

Griffing Flying Service is the primary charter service for each of the island airports; however, other charter companies such as BD Aero Works, Buckeye, and Baystormer also fly to Ohio's island airports. Typical one way fares to and from Ohio's islands (Kelleys and Bass Islands) using Griffing Flying Service are \$45 for adults, \$22.50 for children ages 3-9, \$15 for large dogs, and \$50 for extra-large dogs. Babies and cats are complimentary; however, any freight, packages, or luggage are charged \$5 plus \$0.15 per pound. In 2012, the three Bass Islands combined for more than 11,000 passenger enplanements on all carriers, which represented a three-year peak. Kelleys Island recorded nearly 1,500 passenger enplanements in 2011 from Griffing Flying Service alone.

Economic Impacts

Ohio's island airports are responsible for a total of 45 direct jobs, \$1.2 million in payroll, and more than \$3.8 million in economic output, the majority of which can be attributed to Put-in-Bay Airport. When multiplier impacts are considered, the total economic impacts for the island airports are estimated at 73 jobs and more than \$2.1 million in payroll and \$7.1 million in output. A summary of these impacts is listed in **Table 6-5**.

Table 6-5
Economic Impact Summary of Ohio's Island Airports

Associated City	Airport Name	Direct Impacts			Total Impacts (Direct + Multiplier)		
		Jobs	Payroll	Output	Jobs	Payroll	Output
Middle Bass	Middle Bass Island	2	\$65,000	\$378,000	4	\$111,000	\$705,000
Put In Bay	Put In Bay	32	\$933,000	\$2,655,000	52	\$1,585,000	\$4,907,000
North Bass Island	North Bass Island	1	\$34,000	\$297,000	2	\$59,000	\$559,000
Kelleys Island	Kelleys Island Municipal	10	\$216,000	\$564,000	15	\$368,000	\$1,017,000
TOTAL		45	\$1,248,000	\$3,894,000	73	\$2,123,000	\$7,188,000

Source: CDM Smith and IMPLAN

Island Airports Summary

Aviation is one of the critical factors that enable people to live and thrive on Ohio's Lake Erie Islands. An essential element of the islands' transportation network, aviation fulfills significant roles for Ohio's Lake Erie Shore & Islands region through general aviation air services. In addition to these very important services, the island airports are significant contributors to the local economy and represent extensive value to their host communities. From the transportation and recreational benefits that it affords the area through its services, to the value with which it directly

impacts the economy, aviation has been and will continue to be a key factor in the long term success of Ohio's Lake Erie Shore and Islands region.

Aviation Education

Aviation education, including flight training, is an important element of the aviation industry in Ohio and the nation. Schools in Ohio train students to become pilots, air traffic controllers, airplane mechanics, flight attendants, airport managers and many other professions within the industry. These aviation-related curriculums range from major university programs to small training classes at general aviation airports. While most of these schools are located on-airport, many of the higher education programs offer coursework both on and off airports. The following sections provide an overview of aviation education in Ohio, including profiling several of the major programs and institutions, and a brief summary of other on-airport training activity.

Professional and University Aviation Education

Many flight schools and higher education institutions go beyond merely providing certification and flight hours to trainees. Several universities and community colleges in Ohio offer a wide array of degree programs in the aviation industry, varying from training in aviation administration to becoming a commercial pilot. Many of these schools emphasize a hands-on learning experience at their associated or university-owned airports, and help to ensure the continuation of the industry through cooperative learning programs and partnerships with airlines and other aviation companies. The following profiles several of the largest and most advanced aviation education institutions in Ohio, and details degree and certificate programs at these schools.

The Ohio State University

The Center for Aviation Studies at The Ohio State University (OSU) provides students with the opportunity to gain an education in aviation by pursuing a number of degree programs through several of the university's colleges. Through the Center for Aviation Studies, the College of Arts and Sciences offers a Bachelor of Arts degree in Air Transportation, based on a foundation of liberal



arts. The Fisher College of Business offers a Bachelor of Science in Business Administration degree with a specialization in Aviation Management. This degree is designed to prepare students for administrative duties in the aviation industry. The College of Engineering offers a Bachelor of Science degree in Aviation with two possible specializations: Aviation Management and Professional Pilot. A Professional Pilot specialization involves students gaining private and commercial pilot's certificate, an instrument rating, and either a multi-engine rating or flight instructor's certificate.

The Center for Aviation Studies offers additional coursework and programs for those who are not majoring in one of the above degree programs. The aviation minor is available to students at OSU, and is often sought by students majoring in aeronautical or astronautical engineering in the College of Engineering. The Center for Aviation Studies also offers three non-degree programs, including the Flight Training Clinic, which allows students not enrolled in aviation classes to earn their pilot certificate. The second of the non-degree programs is the Computer Assisted Testing Service (CATS), which offers a comprehensive selection of certification tests and exams, including many

required for FAA certification. Finally, OSU serves as the only Cirrus Standardized Training Center in central Ohio, serving students and the public in various Cirrus Aircraft training needs. Cirrus Aircraft are notable as they incorporate the latest state-of-the-art technologies such as fiberglass and carbon fiber construction, glass cockpit display, satellite weather and radio system, advanced engine and fuel monitoring, built-in seat belt airbags, as well as Cirrus' well known emergency parachute system.

Much of the aviation-related coursework at OSU, such as flight laboratory, is held at The Ohio State University Airport, while other classes are held on the university's main campus. The OSU Airport provides a real-world learning laboratory for aviation students in and out of the classroom. The airport provides flexible, priority access to space and facilities which are close to the Columbus campus; the elements are essential to full-time students. Summer internships and year-round work experiences as flight instructors, flight line operations, and airport management prepare students for life after graduation. The College of Engineering also conducts extensive aviation-related research at OSU and its airport. Research areas include avionics, evaluation of flight system displays, pilot risk assessment, aviation psychology, and human factors.

The Center for Aviation Studies at OSU employs more than 20 faculty, university staff, and airport staff, in addition to student employees.

Ohio University

The Russ College of Engineering and Technology at Ohio University (OU) is home to the Department of Aviation and Avionics Engineering Center. The combination of these aviation schools employs more than 30 faculty and staff at OU, in addition to many student interns.

The Department of Aviation aims to prepare students for all aspects of the aviation industry, while keeping up-to-date on technology and the constant growing demands of the industry and national airport system. The department also emphasizes providing students with a hands-on learning experience and small class sizes. Within the Russ College of Engineering and Technology, students have the option of taking part in the cooperative education program. Specific to aviation students at



OU, the university has entered into a partnership with Dayton-based PSA Airlines, a subsidiary of US Airways. The program allows OU aviation students to apply for an internship with PSA, a job that would guarantee them an interview following graduation.

The Department of Aviation offers a Bachelor of Science degree in Aviation with the option to major in flight education or aviation management. The flight education major includes FAA Part 141 flight training at Ohio University Airport-Snyder Field, located 15 minutes southwest of the university campus. These students learn to fly in

the university's fleet of Piper Warrior aircraft. The aviation management major is a non-flight program offered in cooperation with the OU College of Business. A two-year associate degree is available in aviation technology, in which students can earn their private and commercial pilot certificates, instrument rating, and multi-engine rating.

The Avionics Engineering Center at OU is a unique and advanced research and education facility. The center is focused on the research, development, advancement and evaluation of electronic navigation, communication, and surveillance systems. The center offers undergraduate programs in Electronic Navigation Systems and Communications/Control/Electromagnetics. The Avionics Engineering Center also offers masters and PhD programs in Electronic Navigation Systems. Center students take part in course and lab work at the OU main campus, the Ohio University Airport, and at Tamiami-Kendall Executive Airport in Florida.

Kent State University

The College of Applied Engineering, Sustainability and Technology (CAEST) at Kent State University is home to the institution's Aeronautics Program.



The program prepares students to be professionals in an ever-changing aviation industry, both now and into the future. Students in the Aeronautics Program choose from one of five major concentrations: Aeronautical Studies, Aeronautical Systems Engineering Technology, Air Traffic Control, Aviation Management, and Flight Technology.

The Aeronautical Studies concentration is intended for students with a strong interest in aviation but want to pursue a more flexible

education curriculum. Students taking on the Aeronautical Systems Engineering Technology concentration gain an aviation education based on scientific and engineering principles, while learning practical technical skills and experiences. The Air Traffic Control concentration works under the banner of the FAA Air Traffic Collegiate Training Initiative to help train tomorrow's air traffic control specialists. Students with an Aviation Management concentration gain an education of modern business management theory and aviation knowledge, preparing them for administrative duties in all areas of the aviation industry. Finally, the Flight Technology concentration is for students aiming to be professional pilots. These students log flight hours at Kent State University Airport. The University has more than 20 on-airport employees in addition to campus-based Aeronautics Program faculty.

In addition, CAEST offers a Master of Technology degree program. Students in this program can choose a more flexible curriculum or focus on a concentration such as aeronautics.



Bowling Green State University

The Aviation Studies program at Bowling Green State University (BGSU) is an FAA Part 141 approved flight education and training program. The program employs more than 20 professors, staff, flight instructors, mechanics, and dispatchers. Majors in the program choose from one of three areas of specialization: Aviation Engineering Technology, Aviation Management and Operations, and Flight Technology and Operations. Students specializing in Aviation Engineering Technology will focus on manufacturing, consulting, engineering, and other technical areas of expertise as they relate to

aviation. The Aviation Management and Operations specialty prepares students for careers in such fields as aviation law, air traffic control, planning, construction, and economics. The Flight Technology and Operations specialty aims to train professional pilots.

The BGSU Aviation Studies program emphasizes a combination of theory and hands-on practice and training, including a cooperative education program. BGSU offers much of this education at Wood County Regional Airport, which is directly adjacent to the university's campus and accessible by foot to students. The school has a fleet of nine aircraft and one simulator for educational use. The BGSU Aviation Studies program also offers flight certificate training to the general public. Available certifications include private pilot, instrument rating, commercial pilot, multi-engine rating, and certified flight instructor. This training also takes place at Wood County Regional.



University of Cincinnati

The Clermont College branch of the University of Cincinnati (UC) offers the Aviation Technology program. The program enables students to seek a two-year Associate Degree in Aviation Technology, preparing them for a variety of careers in the aviation industry, including commercial, corporate, or airline pilot, the military and law enforcement, aviation management, flight instruction, airport management, and aircraft dispatch. After

completing their two-year program, students have the option of beginning their career or transitioning to the UC main campus to continue with a bachelor program. A common choice is to pair Aviation Technology course work with a bachelor's program from UC's Carl H. Lindner College of Business Administration.

Students enrolled in flight training through the Aviation Technology program receive training from the aviation staff at Sporty's Academy at Clermont County Airport, directly west of the Clermont College campus. Students train in a fleet of 15 aircraft, including a Cessna 172, Beechcraft Bonanza, Piper Aztec, and Diamond motor glider, and often gain employment working at Sporty's Academy as flight instructors, logging flight time while continuing their aviation education. Sporty's Academy offers many types of flight training courses in addition to its association with the Aviation Technology program.

Embry-Riddle Aeronautical University

Embry-Riddle Aeronautical University is a world-renowned, worldwide university for aviation and aerospace education. Embry-Riddle curriculum prepares students for careers in many industries, covering the operation, engineering, research, manufacturing, marketing, and management of modern aircraft and aviation systems. Embry-Riddle has deep roots in Ohio, being founded at Cincinnati Municipal Airport-Lunken Field in 1925.

Today, Embry-Riddle has two non-residential campuses located in Ohio under the Embry-Riddle Worldwide umbrella. The Cincinnati and Dayton locations offer a wide range of associates, bachelor's, and master's programs in a variety of fields. The four associate, seven bachelor's, and 10 master's programs offered at these branches prepare students for careers in the fields of aerospace, aviation, and unmanned aerial systems, fire science, healthcare, the military, professional development, and transportation, logistics, and supply chains. Both locations also offer an Aviation

Maintenance Technology Part 65 certificate program and Information Assurance certificate program. Students enrolled in Embry-Riddle Worldwide have the option of designing their curriculum in classrooms, online, and through a combination of both to fit their lifestyles.



Sinclair Community College

The School of Aviation Technology at Sinclair Community College offers one of the most comprehensive aviation technology programs in Ohio, educating students looking to become professional pilots, flight dispatchers, air traffic controllers, flight attendants, aircraft mechanics, and other aviation-related professionals. The School of Aviation Technology offers three Associate of Applied Science degree programs: Aviation Maintenance Technology, Aviation Technology, and Aviation

Technology/Professional Pilot and Airway Science.

The School of Aviation Technology offers a wide variety of certificate programs for students. A one-year technical certificate for Airframe Aviation Maintenance provides the skills required by an FAA Part 147 Aviation Maintenance Technician School. The school also offers short-term technical certificates for Aircraft Dispatcher, Airline Flight Attendant, General Aviation Maintenance, Powerplant Aviation Maintenance, and Unmanned Aerial Systems.

Aviation Sales Inc., in partnership with the School of Aviation Technology, operates the ASI Flight Academy at Dayton-Wright Brothers Airport. The academy specializes in private and commercial flight training, offers an instrument rating program, and trains students in ground instruction. The academy also offers time building programs for pilots needing to increase their logged flight hours to meet hiring requirements. ASI maintains a fleet of aircraft specifically for training and rental.

Cincinnati State Technical and Community College

The Center for Innovative Technologies at Cincinnati State Technical and Community College offers three programs for students interested in careers in aviation. The Aviation Maintenance Technology Degree, the only degree program at Cincinnati State that is focused on aviation,



educates students in the inspection, overhaul, repair, and service of aircraft and their components. Such businesses as Comair, General Electric, and Kroger Aviation have hired students as part of the college's cooperative education program. Cincinnati State also offers two aviation certificate programs: the Aviation Mechanics Airframe Certificate and Aviation Mechanics Powerplant Certificate. These programs are based at Cincinnati West Airport, which is owned by

Cincinnati State, and employ six on-airport faculty.

Columbus State Community College

The Aviation Maintenance program at Columbus State Community College offers FAA-authorized aviation maintenance training to students. Students enroll in the school with the goal of earning

Airframe and Powerplant (A&P) certification. In addition, students at Columbus State can earn an Associate of Applied Science degree with a focus in aviation maintenance. This degree can be earned in conjunction with A&P certification. Columbus State students receive their hands-on training at nearby Bolton Field Airport from 10 faculty and staff members who have more than 100 combined years of aviation experience.

Flight Safety International

Flight Safety International is one of the world leaders in aviation training and education, delivering over one million hours of professional training worldwide each year. Flight Safety provides training that covers the full spectrum of the aviation industry, offering comprehensive education in business and corporate aviation, commercial aviation, military and defense aviation, aircraft dispatch, and maintenance training. Students can earn a pilot's certificate, gain certification in maintenance, or become a flight attendant, among many other possible career paths.

Flight Safety aims to keep their training courses as current and up-to-date as possible. Flight Safety manufactures their own flight simulators, and keeps their training centers equipped with simulators for nearly every type of aircraft still in production. In addition, the company maintains a working relationship with all leading aircraft manufacturers to ensure that maintenance training programs remain current and vital.

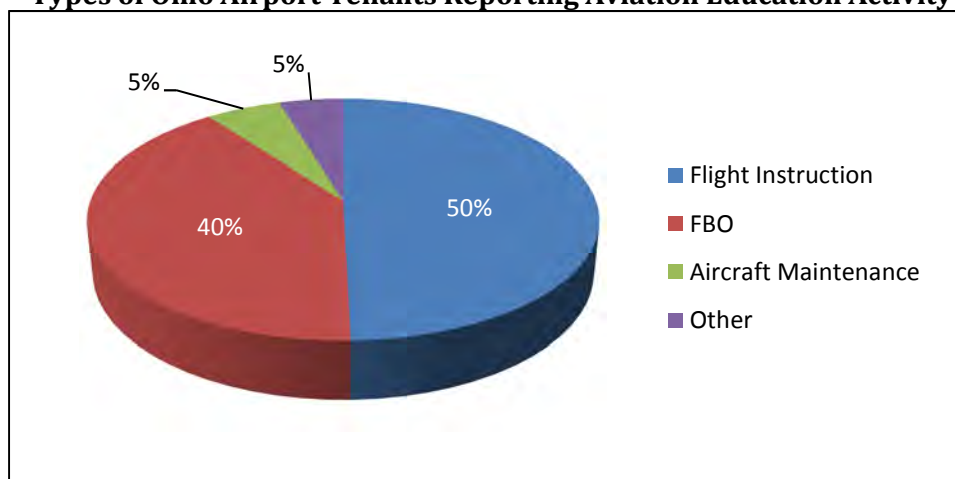
The Flight Safety Columbus Learning Center is located at Port Columbus International Airport. The facility is equipped with nine different flight simulators and training devices. With more than 120 people employed as instructors and staff, the Columbus Learning Center is one of the top providers of aviation education in Ohio.

Other Aviation Training and Education

In addition to university and professional aviation education in Ohio, numerous other on-airport companies provide training to aspiring students. These educators typically focus on flight training, including the logging of required hours, and training students in aircraft maintenance. This training takes place at dedicated flight schools as well as various other on-airport tenant businesses, including FBOs, charter companies, and maintenance providers.

During the economic impact data collection effort of the *Ohio Airports Economic Impact Study*, airport tenant businesses were surveyed and asked to report their business activity at Ohio airports. Of the nearly 700 airport tenants located at Ohio's 104 public airports, more than 120 reported providing some kind of based aviation education activity. **Exhibit 6-4** summarizes the types of airport tenants reporting that some portion of their business is attributable to aviation education. Ninety percent of these businesses reported as being primarily a flight instruction business or airport FBO, while the final 10 percent is made up of tenants focused on aircraft maintenance and various other activities. In total, 73 Ohio system airports reported having some form of based aviation education.

Exhibit 6-4
Types of Ohio Airport Tenants Reporting Aviation Education Activity



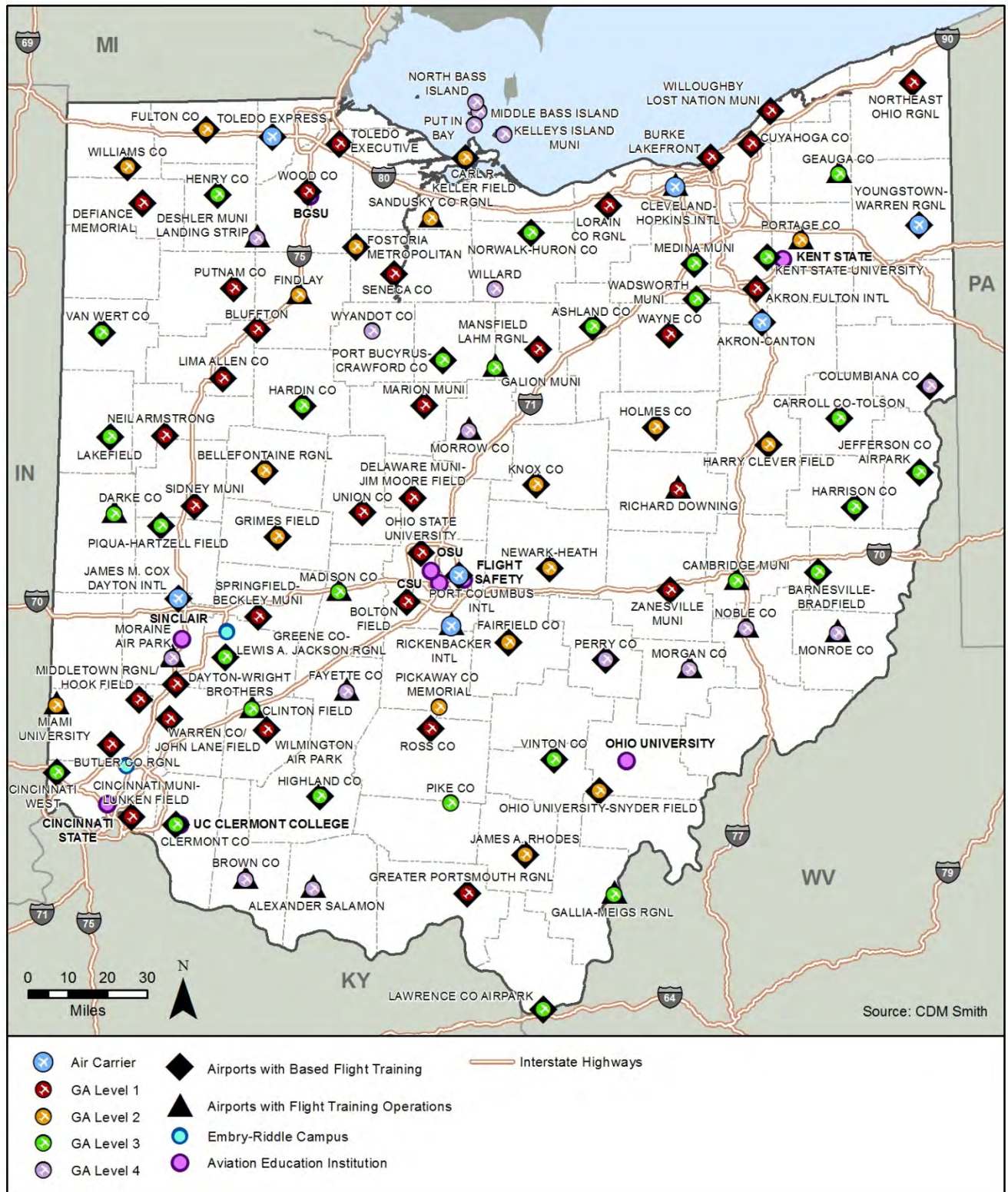
Source: *Ohio Airports Economic Impact Study* tenant surveys

During the airport inventory effort of the *Ohio Airports Focus Study*, airport managers and sponsors were asked to report flight training exercises occurring at their facilities. These activities were not necessarily the result of tenants offering based education, but simply activities and operations happening at their facility. These include such activities as touch-and-go operations and itinerant flights from airports with based flight training. Of the 31 system airports that do not have any form of based education activity, 23 reported having experienced these non-based training operations.

Aviation Education Summary

Exhibit 6-5 illustrates how far reaching aviation education is within the state, showing the locations of airports with based education, training activities, and higher education institutions that have aviation programs. The combination of universities offering aviation education, numerous airport tenants providing training, and various other training activities taking place at system airports means that Ohio has a vast network of aviation education. These schools will help to ensure the continued viability of aviation in the state, while training the aviation professionals and pilots of tomorrow.

Exhibit 6-5
Location of Aviation Education in Ohio



Fractional Ownership

In today's competitive business environment, companies and individuals often choose to utilize general aviation over commercial airline service to take advantage of time savings, security, and point-to-point service to thousands of large and small airports. However, these benefits are often outweighed by the substantial costs of purchasing, storing, and maintaining private aircraft. This imbalance is often exacerbated when the aircraft is used rarely, spending most of its time sitting dormant in a hangar. In 1986, NetJets formed the fractional ownership model, in which a company or person owns a share of an aircraft, lowering the cost to the owner while increasing the utility of the aircraft.

In Ohio, fractional ownership is an important part of the total general aviation industry. Three companies offer fractional ownership in the state: NetJets, Flight Options, and MaxFlight. The following sections describe the model of fractional ownership, benefits to shared ownership over commercial air travel and full ownership, and offer details of the three companies offering fractional ownership in the state.

The Fractional Model and Its Benefits

At its most basic concept, the fractional model applies the timeshare model to aircraft ownership. Customers purchase or lease a share of an aircraft, gaining all the benefits of full ownership in addition to professional management, storage, maintenance, and overall lower costs. Fractional owners pay for their percentage share in the aircraft along with regular maintenance and operating fees, which is an optimal situation for many businesses and persons not in need of a full-time aircraft. Companies operating under the fractional model guarantee that customers will always have access to an aircraft, even if their specific plane is not currently available. This is achieved through larger fleet sizes of similar aircraft that can be switched in and out when needed. Customers often also have the option of upgrading to larger aircraft in the fleet when needed.

The fractional model provides numerous benefits to customers. All forms of private jet aviation – charter, full ownership, and fractional ownership – share many benefits over commercial air travel. These benefits include access to a substantially larger number of airports, business class amenities, in-flight comfort, professional pilots and flight crews, greater flexibility in scheduling, and avoiding crowded commercial terminals, among others. Fractional ownership provides a mid-point between



full ownership and charter by offering the full flexibility of the former with the professional management of the latter. While the costs of fractional ownership are substantially lower than full ownership, they are still significant. However, in some cases – such as with one leg trips – fractional ownership may save money that charter operations cannot. The availability of flexible fleets means that fractional ownership customers may not always have to pay for a return trip as a charter customer would.

Due to its numerous advantages over full ownership and charter flights, fractional ownership has experienced a dramatic increase in activity since its inception in the 1980s. Rapid growth during the 1990s increased concerns within the aviation community and FAA about appropriate regulation and responsibility. A specific debate arose as to whether fractional ownership should be regulated similarly to FAR Part 91 corporate flight departments or FAR Part 135 charter operators. In 1999,

the FAA formed the 27 member Fractional Ownership Aviation Rulemaking Committee (FOARC) to guide the decision making process regarding the regulation of fractional ownership. In 2000, FOARC concluded that fractional ownership should continue to be regulated under Part 91, largely due to the excellent safety record of fractional ownership, but under a new subpart K. Part 91 subpart K was based on accepted industry practices served as the foundation for the regulation. Subpart K stated five requirements for a fractional ownership program:

- A designated program manager
- One or more owners per fractional ownership program aircraft, with at least one aircraft having multiple owners
- A minimum fractional ownership interest of at least 1/16 for subsonic, fixed-wing, or powered-lift aircraft and 1/32 for a rotorcraft
- A dry lease exchange agreement among all owners
- Multi-year program agreements

Subpart K also clearly defines operational control responsibilities, including reinforcing that the responsibility for the airworthiness, safe operation, and maintenance of fractionally owned aircraft primarily falls to the fractional ownership program managers. It requires that fractional ownership program managers are issued management specifications detailing proper practices and procedures, and requires these program managers to develop and maintain a program operating manual. The regulation also sets various standards related to operational safety, including but not limited to rules for the inspection and testing of program aircraft, the makeup and experience of a flight crew, and training programs.

Fractional Ownership in Ohio

Ohio could be considered one of the epicenters of fractional ownership activity in the nation. The state considers the fractional model such an integral and crucial aspect of its aviation economy that it has set an \$800 dollar tax cap on qualified fractionally owned aircraft, to be divided among owners, in order to stimulate the further growth of this subsector of the aviation industry. As stated above, three companies offer fractional aircraft ownership in Ohio. The following briefly details each of these companies, their unique contributions to the fractional model, and their Ohio employment that can be attributed to fractional ownership activity.

NetJets

As the creator of the fractional model, NetJets remains at the forefront of the private aviation industry. NetJets provides their customers access to their entire fleet, upgrading or downgrading aircraft size based on the needs of their particular trip. The current worldwide fleet totals more than 700 aircraft of 13 different jet models from Cessna, Hawker, Embraer, Gulfstream, Dassault, and Bombardier. NetJets also surpasses industry averages in terms of aircraft age and the experience of their pilots, whom average more than 7,500 flight hours each. NetJets manages more than 300,000 flights to destinations that exceed 170 countries annually.

NetJets offers customers three options for use of their fleet: the NetJets Share, NetJets Lease, and Marquis Jet Card. The NetJets Share starts at 50 annual flight hours, increasing in increments of 25 hours. The share is true fractional ownership and the most economical choice for any person or business needing to fly at least 50 hours a year. Purchasers of shares must make a minimal time commitment, after which they are able to sell back their share at a fair market price. The lease program is similarly beneficial to individuals or businesses flying more than 50 hours per year, with lease times set up in increments of 12 months up to 60 months. Finally, the Marquis Jet Card allows NetJets customers to pre-purchase flight time in a specific aircraft at increments of 25 hours.

Port Columbus International Airport is the home of the NetJets Aviation corporate headquarters. Netjets Aviation is the operator of all NetJets aircraft in the United States. The Columbus location has nearly 1,200 full-time equivalent employees, including the domestic NetJets Owner Services Team.

Flight Options

Located at Cuyahoga County Airport near Cleveland, Flight Options was originally founded in 1998 as the first company to offer pre-owned fractional ownership. Flight Options primarily serves the contiguous United States, much of northern Mexico, major cities in southern Canada, and the Bahamas. The rest of Mexico and most of the Caribbean is included in the company's extended service area. Flight Options maintains a fleet exceeding 100 private aircraft of five different aircraft models: the Hawker 400XP, Nextant 400 XT, Phenom 300, Citation X, and Legacy 600.

Flight Options offers customers three options for private aviation: true fractional ownership, the Jet Membership Club, and the Jetpass Jet Card. Like NetJets, true fractional ownership offers the lowest cost per flight hour, and is the best choice for a person or company that flies more than 50 and up to 800 hours per year. The Jet Membership Club is ideal for customers flying between 25 and 150 hours per year and prefer to sign a 36-month agreement instead of taking on an ownership share. Users of the JetPASS pre-purchase flight time at 25 hour increments.

Flight Options employs more than 200 full-time equivalent employees at their Cuyahoga County headquarters.

MaxFlight

Located at Dayton-Wright Brothers Airport, MaxFlight offers a wide range of private aviation services, such as charter, aircraft management, sales, maintenance, and fractional ownership. MaxFlight offers fractional ownership through its Aircraft Membership program, and tailors enrollment to meet the customer's needs. Like other fractional ownership programs, Membership provides customers access to MaxFlight's fleet, and availability within a 24-hour notice. MaxFlight also offers cost cutting to customers who choose to pay for enrollment up front instead of through monthly payments. Another way MaxFlight saves fractional owners money is through the Round Robin Benefit program. Any trip that returns to its point of origin within 12 hours saves customers between 50 and 70 percent compared to many other private aircraft programs.

MaxFlight employs 15.5 full-time equivalent employees at their Dayton-Wright Brothers Airport headquarters.

Fractional Ownership Summary

Due to the Columbus headquarters of NetJets, Ohio has been and remains at the center of the fractional ownership industry. The three companies that offer fractional ownership in the state provide a wide range of fractional ownership options and services. Fractional aircraft ownership accounts for approximately 1,400 direct full-time equivalent employees in the state. Furthermore, the availability of such services in Ohio greatly enhances the ability of companies to do business on a tighter schedule with higher mobility and for a lower cost.

Summary

Ohio has a diverse aviation system, with a wide variety of airport types and many distinct aviation users. In addition to the measureable economic impacts identified in Chapter 4, Ohio is home to several unique aspects of aviation that provide Ohio with both quantitative and qualitative benefits. Ohio's airports support a major economic contributor in the Shale Industry boom; numerous

aviation education programs call Ohio airports home, as do two of the country's largest fractional ownership companies; and Ohio's Island Airports serve as a vital link to both the tourism industry and the resident population of Ohio's Lake Erie Shores and Islands region. It is important to note that, although difficult to quantify, these unique aspects are nonetheless extremely important components of the state – and national – aviation system.

Tax Impacts of the Ohio Airport System

Introduction

In addition to economic impact, the Ohio airport system produces significant tax revenue for the state's General Revenue Fund. Aviation contributes tax revenues through the state's 5.5 percent sales tax on aviation fuel, and the state's 5.5 percent sales tax on aviation goods and services. Since this study is focused on general aviation, only the tax contribution related to general aviation is evaluated in this section. Sales and other taxes tied to commercial aviation, such as taxes paid by rental car companies or concessions at commercial service airports, have been excluded. However, general aviation businesses at commercial service airports are included to the extent that their operations support general aviation.

In an effort to avoid inflating the tax impacts from general aviation, the only taxes calculated are sales taxes for aviation fuel and other on-airport goods and services. This study does not attempt to calculate secondary tax revenues such as those generated by the spending of general aviation visitors. It also does not include any taxes related to aviation businesses that are not located on a system airport. For example, it does not include taxes generated by any flight schools located on privately owned airfields, or avionics manufacturers located off airport.

The following sections explain the methodologies used to calculate sales tax revenue generated by the Ohio airport system. In general, two methodologies were used – one for aviation fuel tax impacts and one for the revenues generated by other on-airport goods and services.

Aviation activities also produce tax revenues for local municipalities and counties, but this study is solely concerned with taxes generated for Ohio's General Revenue Fund. Also, 2012 data was used to calculate the taxable sales numbers. Therefore, only the 2012 Ohio Sales and Use Tax rate of 5.5 percent is used.¹

Aviation Fuel Tax Impacts

The first portion of general aviation's impact on tax revenue in Ohio is related to the sale of aviation fuels. Because the Ohio Department of Taxation does not maintain specific records on the taxation of aviation fuels, and because not all aviation fuel sales are subject to sales tax, it was necessary to estimate this impact.

The following data were required to calculate this estimate:

- Volume of aviation fuel sold in Ohio in 2012, provided by the U.S. Energy Information Administration (US EIA)
- The percentage of this fuel that is taxable, an estimate calculated using data collected from airports as part of the inventory portion of the *Ohio Airports Focus Study*
- An average cost of both aviation gasoline (avgas) and jet fuel (Jet A), from the Airnav.com fuel price report
- The Ohio Sales and Use Tax rate

¹ Ohio raised its Sales and Use Tax to 5.75 percent in 2013.

With this data, the following formula was used to estimate the tax revenue gained from aviation fuel sales in Ohio:

$$\text{Taxable sales volume} * \text{cost per gallon} * \text{sales and use tax rate} = \text{tax revenue from aviation fuels}$$

The US EIA maintains a record of all motor fuels sold in the nation, including breakdowns by type of fuel and state. According to their records, in 2012, over 3.9 million gallons of avgas were sold in Ohio, along with over 492 million gallons of Jet A fuel.

However, because the sale of fuel to air carrier operators (both passenger and cargo) is not taxable, it is estimated that much of that Jet A volume is not taxed. To determine a reasonable estimate for the taxable volume of Jet A sales, three methodologies were employed:

- **Jet A Volume Reported by Airports:** During the airport inventory survey effort, airport managers and sponsors reported their volume of fuel sales. From this it was possible to calculate the volume of Jet A that is attributable to general aviation activity at Ohio airports, and therefore taxable. Comparing this data to volumes reported by the US EIA revealed that approximately 10 percent of the Jet A sales volume in Ohio is taxable.
- **Ohio Jet A Consumption Estimate:** The second methodology used registered turbine aircraft in Ohio as a basis for estimating the percentage of Jet A sales that is taxable. This includes all registered turboprop, turbojet/fan, and turboshaft aircraft in the state. A total volume of fuel consumed was estimated using the number of aircraft,² the average hours flown per year,³ and the hourly fuel burn for these aircraft.⁴ The result of this calculation also revealed that approximately 10 percent of the Jet A sales in Ohio is related to general aviation.
- **National Trends:** To validate the above methodologies, national trends were examined. In 2012, airlines consumed 85.9 percent of US jet fuel. Over the past 10 years, the percent of jet fuel consumed by airlines has varied from a low of 84.3 percent to a high of 94.1 percent. However, the average has been 89.8 percent annually, justifying the assumption that 10 percent of all jet fuel is consumed by general aviation.⁵

As a result of these estimates, it is assumed that 10 percent of Jet A reported by the US EIA is taxable. Despite some smaller commercial operators, such as aerial applicator businesses, also being tax exempt, for the purpose of this study it is assumed that all avgas sales reported by the US EIA are taxable. Therefore, the taxable amount of avgas is 3,979,000 gallons, while the taxable volume of Jet A is 49,293,000 gallons.

To determine an applicable cost of both avgas and Jet A, tables maintained by Airnav.com were referenced. Airnav maintains a database of fuel prices from more than 3,600 FBOs nationwide, and organizes the data into regions. Ohio is located in the Great Lakes region, which has average prices of \$6.02 per gallon for avgas, and \$5.37 per gallon for Jet A. These prices were applied to the volume calculated above to estimate total taxable avgas sales of \$24.1 million, and \$264.7 million in Jet A sales.

The final step in estimating tax revenues related to aviation fuel sales in Ohio was to apply the sales tax rate applicable to aviation fuels. According to the Ohio Department of Taxation, both avgas and Jet A are subject to the state's 5.5 percent Sales and Use Tax. While counties in Ohio apply

² FAA Aircraft Database

³ FAA 2010 GA and Part 135 Activity Survey

⁴ FAA 2010 GA and Part 135 Activity Survey

⁵ Research and Innovative Technology Administration, Bureau of Transportation Statistics

additional sales taxes to aviation fuels, this study is only concerned with tax revenue that the state receives, and as a result only applies the 5.5 percent rate.

It is estimated that avgas sales in Ohio result in over \$1.3 million in tax revenue to the state, while Jet A sales provide over \$14.6 million in revenue, for a total of approximately \$15.9 million in 2012. The details of this estimate are shown below in **Table 7-1**.

Table 7-1
Estimate of Sales and Use Tax Revenue
from Aviation Fuel Sales in Ohio

Fuel Type	Taxable Volume (Gallons)	Taxable Sales	Tax Revenue
Avgas	4,000,000	\$24,100,000	\$1,300,000
Jet A	49,300,000	\$264,700,000	\$14,600,000
Total	53,300,000	\$288,800,000	\$15,900,000

Source: Airnav.com, *Ohio Airports Focus Study* airport inventory surveys Ohio Department of Taxation, US EIA

As of September 1, 2013, the statewide Sales and Use Tax rate in Ohio was increased to 5.75 percent. If sales of aviation fuels remain steady in 2013, this would mean an increase of total tax revenue to approximately \$16.6 million.

Aviation Services and Sales Tax Impacts

The other major component of the Ohio airport system's contribution to the state's tax revenue base is related to other services and sales that take place at airports. These include sales taxes paid on goods and services provided by businesses such as flight schools, charter companies, and car rental companies, among others. Like tax revenues related to aviation fuel sales, the Ohio Department of Taxation does not maintain detailed records of these revenues. In addition, not all of the goods and services available at airports are subject to the Sales and Use Tax. Because of these reasons, it was necessary to estimate this tax revenue.

The following data were required to calculate this estimate:

- Total gross sales of on-airport tenants, reported during the airport inventory and tenant survey efforts for the *Ohio Airports Economic Impact Study*
- The portion of these sales that is directly related to general aviation activity
- The amount of these sales that are taxable
- The Ohio Sales and Use Tax rate

With this data, the following formula was used to estimate the tax revenue gained from these aviation related sales in Ohio:

$$\text{Taxable sales volume} * \text{sales and use tax rate} = \text{tax revenue from aviation activities}$$

The airport and tenant inventory effort for the *Ohio Airports Economic Impact Study* collected significant economic data about airport management and on-airport tenant businesses. This data was used in part to calculate the economic impacts of the airport system. Each business' gross sales, collected during this effort, was used as the most basic data for calculating applicable sales tax revenues generated by general aviation activities in the state.

Because the *Ohio Airports Focus Study* is primarily concerned with general aviation activity in the state, a necessary step towards estimating tax revenues is to omit activities that can be directly attributed to commercial service activities. For the purpose of this study, it was assumed that the following activities at air carrier airports are completely attributable to commercial activity, and therefore are omitted from the tax estimate:

- Passenger airlines
- Scheduled cargo operators
- Terminal concessionaires
- Rental car agencies
- Parking companies
- Ground transportation

All other activity at air carrier airports was assumed to be related to general aviation.

Other measures were taken to generate a more accurate estimation of tax revenue. First, to avoid double counting, any gross sales data assumed to be attributed to the sale of aviation fuels was removed from the total. Second, the State of Ohio Executive Budget lists four aviation-related activities that are exempt or capped under the Sales and Use Tax.⁶ These items are:

- An \$800 tax cap per aircraft on qualified fractionally-owned aircraft
- Sales of property and services for the maintenance and repair of qualified fractionally-owned aircraft
- Sales and materials for maintenance and repair of aircraft
- Sales and repair of flight simulators

Two major fractional ownership charter companies operate in Ohio: NetJets and Flight Options. To account for this tax cap, the taxing of their sales was limited to \$800 per aircraft in Ohio. To account for other exemptions from the Sales and Use Tax, any companies that were assumed to offer only aircraft maintenance or the sales and repair of flight simulators were omitted from the calculation.

After removing commercial activity and sales that are exempt from the tax, it was estimated that general aviation activities at Ohio system airports generated over \$247 million in taxable revenue in 2012. When the 5.5 percent Sales and Use tax is applied to this number, it is estimated that general aviation activities at Ohio system airports generated approximately \$13.7 million in sales tax revenue. **Table 7-2** breaks these numbers out by category, revealing that charter companies account for a large portion of this revenue.

Table 7-2
Estimate of Sales and Use Tax Revenue
from General Aviation Related Sales in Ohio

Business Type	Taxable Sales	Sales Tax Revenue
Charter	\$139,300,000	\$7,700,000
Flight Training	\$52,000,000	\$2,900,000
All Other Categories	\$56,300,000	\$3,100,000
Total	\$247,600,000	\$13,700,000

Source: *Ohio Airports Focus Study* airport and tenant inventory surveys,
Ohio Department of Taxation

⁶ State of Ohio Executive Budget Fiscal Years 2012 and 2013: The Tax Expenditure Report

As of September 1, 2013, the statewide Sales and Use Tax rate in Ohio was increased to 5.75 percent. If sales of general aviation services and products remain steady in 2013, this would mean an increase of total tax revenue to approximately \$14.2 million.

Tax Impacts Summary

The taxation of general aviation fuel, goods, and services creates significant tax revenue for the Ohio General Revenue Fund. The combination of these tax revenues was estimated to be \$29.6 million in 2012 (see **Table 7-3**), a number that is expected to increase with the Sales and Use Tax increase to 5.75 percent in 2013.

Table 7-3
Summary of Sales and Use Tax Revenue
from General Aviation Activity in Ohio

Tax Source	Taxable Sales	Sales Tax Revenue
General Aviation Fuel	\$288,800,000	\$15,900,000
Other General Aviation Goods and Services	\$247,600,000	\$13,700,000
Total	\$536,400,000	\$29,600,000

Source: CDM Smith

In 2005, in an update of estimates previously made by the Ohio Department of Transportation, the State of Ohio Legislative Service Commission estimated that these same general aviation activities generated \$40.5 million in tax revenue for the state. However, this estimate was calculated before the exemption for aviation maintenance was put into effect. That same study estimated that maintenance accounted for slightly less than \$11 million in tax revenue. When accounting for the difference that maintenance activity represents, it can be concluded that tax revenue streams from aviation activities in Ohio have remained steady over the past years.

General Aviation Airport Valuation

Introduction

In addition to the economic impacts and tax revenue generated by airports in Ohio, it is important to obtain a comprehensive understanding of the value airports represent in Ohio. Airport valuation attempts to apply current construction and property costs as well as current building, design, and environmental standards to estimate the replacement cost of an airport. By evaluating the current cost of replacing the facilities, an estimate can be established for the aviation assets in the state. Developing an estimate of each general aviation airport's replacement cost provides the public, airport stakeholders, as well as policy decision makers an understandable value range for each airport, airport role, and combined value of Ohio's system of general aviation airports. Airport values presented are in 2013 dollar values and are based on Ohio's average construction costs.



Methodology

A two-step process was used to complete the airport valuation task. The first step developed average cost estimates or “drivers” for typical airport facilities. These cost estimates used common and recent project cost data to build asset estimates for each airport. The second step applies these values to each existing on-airport facility assessed in the valuation. Assets and average construction costs are presented in the following categories:

- **Land:** Per acre land values based on Jobs Ohio Region (Northeast, Northwest, Appalachian, Central, West Central and Southwest) then classified by use (Urban, Suburban, Mixed, Rural, Industrial). This value includes earthwork necessary to prepare land for airport development.
- **Runway, Taxiway, Apron:** Per square foot value assigned to airfield pavement areas. The thickness and strength of airfield pavement influences its cost. Consideration of the types of aircraft using each airport and associated pavement strength was included in the development of pavement costs.
- **Hangars, Buildings, Auto Parking:** Per square foot or unit values for landside structures and auto parking pavement. This includes the cost for T-hangars, box hangars, corporate hangars, and community hangars as well as all other buildings on the airport such as terminal buildings, maintenance facilities, storage buildings and other airport-owned buildings.
- **Nav aids, Lights and Fuel:** Units costs for on-airport navigation systems, approach and runway lighting systems and fueling systems.
- **Engineering, Planning, Permitting, Environmental Contingency:** A 15 percent adjustment applied to construction costs to account for engineering, planning, permitting and environmental mitigation. This includes the cost of planning, designing, engineering and permitting the airport as well as studying and mitigating any environmental impacts.
- **Airport Reference Code (ARC) Adjustment:** Larger and busier airports typically have higher facility costs that were not included in this analysis. Not every level of infrastructure detail such

as utilities, fencing, drainage, access roads, and runway safety area grading and development could be analyzed. To adjust for facility values of less identifiable infrastructure assets, a simple calculation was developed based on each airport's ARC, a coding system that relates airport design criteria to the operational and physical characteristics of the airplanes that are intended to operate at an airport.

Infrastructure Facility Analysis

To account for variations in the cost of land across the state, **Table 8-1** presents the per acre land values based on project survey data as well as published Ohio real estate market data. Land values are broken down by Jobs Ohio Region (Northeast, Northwest, Appalachian, Central, West Central and Southwest) then classified by use (Urban, Suburban, Mixed, Rural/Agricultural, Industrial).

Table 8-1
Valuation of Ohio General Aviation Airports

Land Costs (Fee Simple)	Northeast	Northwest	Appalachian	Central	West Central	Southwest
Urban	\$43,551.14	\$65,923.30	\$32,215.91	\$95,156.25	\$23,565.34	\$80,241.48
Suburban	\$37,744.32	\$57,133.52	\$27,920.45	\$82,468.75	\$20,423.30	\$69,542.61
Mixed Land Use	\$20,323.86	\$30,764.20	\$15,034.09	\$44,406.25	\$10,997.16	\$37,446.02
Rural/Agricultural	\$9,042.05	\$13,686.93	\$6,688.64	\$19,756.25	\$4,892.61	\$16,659.66
Industrial	\$70,511.36	\$106,732.95	\$52,159.09	\$154,062.50	\$38,153.41	\$129,914.77

Source: CDM Smith, project survey, real estate market data

Table 8-2 identifies average infrastructure unit cost estimates for each facility type needed to develop a construction cost estimate for each airport.

Table 8-2
Cost Per Facility Item

Cost Criteria	Estimated Cost	Unit
Runway Pavement - ARC - Aircraft Category A	\$17.50	SF
Runway Pavement - ARC - Aircraft Category B	\$19.50	SF
Runway Pavement - ARC - Aircraft Category C+	\$21.50	SF
Runway/Taxiway Turf Surface	\$5.90	SF
Taxiway Pavement- ARC - Aircraft Category A & B	\$17.50	SF
Taxiway Pavement - ARC - Aircraft Category C+	\$20.50	SF
Land Clearing, Grubbing and Leveling (Appalachian)	\$22,500.00	AC
Land Clearing, Grubbing and Leveling (all other regions)	\$15,750.00	AC
MIRL/HIRL (Runway Lighting)	\$80.00	LF
Aircraft Apron Pavement	\$17.00	SF
T-Hangar Units	\$42,000.00	EA
Conventional Hangar	\$87.00	SF
Tower-ATCT	\$5,500,000.00	EA
ASOS/AWOS	\$185,000.00	EA
GA Terminal Building	\$150.00	SF
Auto Parking	\$9.50	SF
Fuel Farm	\$20.00	GAL
Nav aids ILS	\$1,600,000.00	EA
Nav aids VOR, NDB, DME, or GPS	\$225,000.00	EA
MALSR, MALSF, MALS	\$850,000.00	EA
VGSIs	\$80,000.00	EA
REILs	\$35,000.00	EA
Wind Indicator (lighted)	\$20,000.00	EA
Rotating Beacon	\$50,000.00	EA
ARFF Building	\$160.00	SF
Snow Removal Building	\$120.00	SF
Maintenance Building	\$120.00	SF

Source: CDM Smith

Specific criteria for estimating the value of some of the airport facilities are presented as follows:

- **Runways:** Runway construction costs were based on per square foot costs of construction. This value represents the cost of building a runway on terrain assumed to be fairly level. In addition, costs varied depending on runway surface type as well as pavement strength and thickness associated with the appropriate ARC
- **Taxiways:** Taxiway construction costs were based on per square foot costs of construction. Aerial photos were used to confirm the taxiway system dimensions for each airport.
- **Clearing, Grubbing and Leveling:** In order to account for unique terrain issues in the Appalachian region, a higher rate was used for earthwork in this region. Construction costs for earthwork are based on overall airport acreage.
- **Aircraft Apron:** Aircraft apron construction costs were based on a construction per square foot value. This value represents the cost of building an apron on terrain assumed to be fairly level. Aerial photos were used to confirm the apron area for each airport provided in the survey stage of this project.
- **T-hangar:** T-hangar construction costs are based on average construction costs of a 10-bay T-hangar unit. Aerial photos were used to ascertain the number of T-hangars located on each airport and compared to survey data collected.
- **Conventional Hangars:** Conventional hangar construction costs are based on average per square foot construction costs of a 60-foot by 60-foot conventional hangar. Aerial photos and

interviews/surveys with airport managers were used to ascertain the square footage of hangars located at each airport.

- **Air Traffic Control Tower (ATCT):** A pre-fabricated unit cost of \$5.5 million per tower was used based on current ATCT development projects.
- **ASOS/AWOS Weather Reporting Equipment:** Automated weather equipment range in cost between \$170,000 and \$200,000. An average of \$185,000 was used.
- **General Aviation (GA) Terminal Building:** Prices for this facility can vary greatly, depending on the size and level of amenities. A per square foot cost of \$150 was used in this analysis. GA terminal buildings usually accommodate the traveling public using general aviation as well as FBO businesses and airport administration functions.
- **Fuel Farm:** Since the size of fuel farms can vary greatly between types or categories of airports, a unit cost of \$20 per gallon was used to estimate fuel farm costs.
- **NAVAIDS:** An airport with an instrument landing system (ILS) and associated approach lighting system is currently estimated to be almost \$2.45 million. Equipment associated with non-precision approaches cost approximately \$225,000.

As discussed earlier, to adjust for facility values of less identifiable infrastructure assets, a simple calculation was developed based on each airport's ARC and applied to the cost of construction (not including the engineering, planning, permitting, and environmental contingency). **Table 8-3** identifies the ARC adjustment increase given to each airport.

Table 8-3
Airport Reference Code Adjustments

ARC – Aircraft Category	Adjustment
Aircraft Category A	0%
Aircraft Category B	5%
Aircraft Category C	10%
Aircraft Category D	15%

Source: CDM Smith

Airport Valuation Results

The second step applied the values discussed above to each existing on-airport facility included in the valuation. Tools utilized to quantify facilities for this step included:

- Aerial photos of airports
- Airport master plans and layout plans
- Airport Capital Improvement Program (CIP) data
- Ohio airport directory and aviation aeronautical charts
- Airport-related construction cost estimates from other states (for comparison)
- FAA 5010 forms and FAA Airport Facility Directory (AFD)
- Surveys and interviews with airport managers

Table 8-4 presents the estimated valuation of each general aviation airport in Ohio.

Table 8-4
Valuation of Ohio General Aviation Airports

City	Airport Name	Land and Land Development	Runway, Taxiway, Apron	Hangars, Buildings, Auto Parking	NAVAIDS, Lights, Fuel	Engineering, Planning, Permitting, Environment	ARC Adjustment	Total
Akron	Akron Fulton International	\$31,963,000	\$91,623,000	\$11,909,000	\$1,770,000	\$20,590,000	\$13,726,000	\$171,581,000
Ashland	Ashland County	\$2,479,000	\$10,034,000	\$4,665,000	\$1,425,000	\$2,791,000	\$930,000	\$22,324,000
Ashtabula	Northeast Ohio Regional	\$15,371,000	\$17,118,000	\$5,117,000	\$1,570,000	\$5,876,000	\$3,918,000	\$48,970,000
Athens/Albany	Ohio University-Snyder Field	\$10,333,000	\$24,928,000	\$5,676,000	\$4,420,000	\$6,803,000	\$4,536,000	\$56,696,000
Barnesville	Barnesville-Bradfield	\$1,424,000	\$15,198,000	\$2,080,000	\$905,000	\$2,941,000	\$980,000	\$23,528,000
Batavia	Clermont County	\$2,367,000	\$10,153,000	\$23,735,000	\$1,835,000	\$5,714,000	\$1,905,000	\$45,709,000
Bellefontaine	Bellefontaine Regional	\$6,746,000	\$16,783,000	\$3,511,000	\$1,570,000	\$4,291,000	\$2,861,000	\$35,762,000
Bluffton	Bluffton	\$7,675,000	\$9,421,000	\$3,943,000	\$842,000	\$3,282,000	\$1,094,000	\$26,257,000
Bowling Green	Wood County	\$13,536,000	\$15,563,000	\$2,492,000	\$1,770,000	\$5,004,000	\$1,668,000	\$40,033,000
Bryan	Williams County	\$2,944,000	\$10,666,000	\$2,526,000	\$1,200,000	\$2,600,000	\$867,000	\$20,803,000
Bucyrus	Port Bucyrus-Crawford County	\$5,299,000	\$9,697,000	\$3,263,000	\$1,570,000	\$2,974,000	\$991,000	\$23,794,000
Cadiz	Harrison County	\$234,000	\$7,271,000	\$2,258,000	\$850,000	\$1,592,000	\$531,000	\$12,736,000
Caldwell	Noble County	\$1,751,000	\$4,999,000	\$737,000	\$770,000	\$1,239,000	\$413,000	\$9,909,000
Cambridge	Cambridge Municipal	\$12,617,000	\$7,571,000	\$1,988,000	\$1,610,000	\$3,568,000	\$1,189,000	\$28,543,000
Carrollton	Carroll County-Tolson	\$3,429,000	\$10,125,000	\$1,889,000	\$1,400,000	\$2,526,000	\$842,000	\$20,211,000
Celina	Lakefield	\$10,791,000	\$9,729,000	\$1,471,000	\$855,000	\$3,427,000	\$1,142,000	\$27,415,000
Chesapeake/Huntington	Lawrence County Airpark	\$4,336,000	\$8,036,000	\$3,308,000	\$360,000	\$2,406,000	\$802,000	\$19,248,000
Chillicothe	Ross County	\$10,668,000	\$24,398,000	\$3,992,000	\$1,610,000	\$6,100,000	\$4,067,000	\$50,835,000
Cincinnati	Cincinnati Municipal-Lunken Field	\$109,430,000	\$80,648,000	\$59,904,000	\$12,410,000	\$39,359,000	\$26,239,000	\$327,990,000
Circleville	Pickaway County Memorial	\$7,101,000	\$9,018,000	\$7,610,000	\$860,000	\$3,688,000	\$1,229,000	\$29,506,000
Cleveland	Burke Lakefront	\$35,306,000	\$26,909,000	\$46,938,000	\$5,895,000	\$17,257,000	\$17,257,000	\$149,562,000
Cleveland	Cuyahoga County	\$28,702,000	\$50,371,000	\$21,360,000	\$4,595,000	\$15,754,000	\$10,503,000	\$131,285,000
Columbus	Bolton Field	\$112,952,000	\$61,616,000	\$22,804,000	\$5,410,000	\$30,417,000	\$30,417,000	\$263,616,000
Columbus	Ohio State University	\$136,917,000	\$26,834,000	\$14,791,000	\$4,065,000	\$27,391,000	\$18,261,000	\$228,259,000
Coshocton	Richard Downing	\$10,508,000	\$15,089,000	\$6,140,000	\$1,610,000	\$5,002,000	\$1,667,000	\$40,016,000
Dayton	Dayton-Wright Brothers	\$14,417,000	\$15,900,000	\$10,317,000	\$2,245,000	\$6,432,000	\$2,144,000	\$51,455,000
Dayton	Greene County-Lewis A. Jackson Regional	\$3,716,000	\$11,550,000	\$4,806,000	\$1,570,000	\$3,246,000	\$1,082,000	\$25,970,000
Dayton	Moraine Air Park	\$2,713,000	\$6,556,000	\$7,240,000	\$320,000	\$2,524,000	\$841,000	\$20,194,000
Defiance	Defiance Memorial	\$7,860,000	\$9,662,000	\$5,150,000	\$1,265,000	\$3,591,000	\$1,197,000	\$28,725,000
Delaware	Delaware Municipal-Jim Moore Field	\$36,045,000	\$19,432,000	\$7,395,000	\$1,845,000	\$9,707,000	\$6,472,000	\$80,896,000
Deshler	Deshler Municipal Landing Strip	\$1,472,000	\$1,635,000	\$1,422,000	\$100,000	\$694,000	\$0	\$5,323,000
East Liverpool	Columbiana County	\$2,231,000	\$7,725,000	\$1,971,000	\$1,120,000	\$1,957,000	\$652,000	\$15,656,000
Findlay	Findlay	\$25,676,000	\$43,694,000	\$4,634,000	\$2,005,000	\$11,401,000	\$7,601,000	\$95,011,000
Fostoria	Fostoria Metropolitan	\$4,710,000	\$16,449,000	\$2,126,000	\$1,935,000	\$3,783,000	\$2,522,000	\$31,525,000
Fremont	Sandusky County Regional	\$17,368,000	\$17,248,000	\$3,822,000	\$1,650,000	\$6,013,000	\$4,009,000	\$50,110,000

Table 8-4
Valuation of Ohio General Aviation Airports

City	Airport Name	Land and Land Development	Runway, Taxiway, Apron	Hangars, Buildings, Auto Parking	NAVAIDS, Lights, Fuel	Engineering, Planning, Permitting, Environment	ARC Adjustment	Total
Galion	Galion Municipal	\$5,876,000	\$7,378,000	\$5,345,000	\$1,120,000	\$2,958,000	\$986,000	\$23,663,000
Gallipolis	Gallia-Meigs Regional	\$1,284,000	\$15,314,000	\$1,535,000	\$1,229,000	\$2,904,000	\$968,000	\$23,234,000
Georgetown	Brown County	\$1,653,000	\$4,894,000	\$1,014,000	\$1,040,000	\$1,290,000	\$430,000	\$10,321,000
Hamilton	Butler County Regional	\$34,577,000	\$22,572,000	\$15,891,000	\$4,195,000	\$11,585,000	\$7,724,000	\$96,544,000
Harrison	Cincinnati West	\$3,192,000	\$3,977,000	\$2,551,000	\$1,340,000	\$1,659,000	\$553,000	\$13,272,000
Hillsboro	Highland County	\$5,330,000	\$7,792,000	\$3,608,000	\$1,490,000	\$2,733,000	\$911,000	\$21,864,000
Jackson	James A. Rhodes	\$4,670,000	\$9,076,000	\$1,776,000	\$1,455,000	\$2,547,000	\$849,000	\$20,373,000
Kelleys Island	Kelleys Island Municipal	\$613,000	\$3,759,000	\$1,731,000	\$100,000	\$930,000	\$0	\$7,133,000
Kent	Kent State University	\$15,353,000	\$9,622,000	\$3,408,000	\$1,425,000	\$4,471,000	\$1,490,000	\$35,769,000
Kenton	Hardin County	\$2,649,000	\$8,431,000	\$3,076,000	\$685,000	\$2,226,000	\$742,000	\$17,809,000
Lancaster	Fairfield County	\$14,738,000	\$17,244,000	\$7,031,000	\$1,875,000	\$6,133,000	\$4,089,000	\$51,110,000
Lebanon	Warren County/John Lane Field	\$4,148,000	\$10,050,000	\$7,007,000	\$1,470,000	\$3,401,000	\$1,134,000	\$27,210,000
Lima	Lima Allen County	\$21,047,000	\$40,380,000	\$3,161,000	\$3,875,000	\$10,270,000	\$6,846,000	\$85,579,000
London	Madison County	\$7,527,000	\$10,934,000	\$2,158,000	\$1,175,000	\$3,269,000	\$1,090,000	\$26,153,000
Lorain/Elyria	Lorain County Regional	\$27,767,000	\$26,605,000	\$13,362,000	\$4,065,000	\$10,770,000	\$7,180,000	\$89,749,000
Mansfield	Mansfield Lahm Regional	\$53,303,000	\$72,465,000	\$13,386,000	\$4,590,000	\$21,562,000	\$14,374,000	\$179,680,000
Marion	Marion Municipal	\$60,156,000	\$25,456,000	\$6,959,000	\$1,625,000	\$14,129,000	\$4,710,000	\$113,035,000
Marysville	Union County	\$14,979,000	\$10,623,000	\$5,246,000	\$1,345,000	\$4,829,000	\$1,610,000	\$38,632,000
McArthur	Vinton County	\$2,831,000	\$5,830,000	\$1,179,000	\$280,000	\$1,518,000	\$506,000	\$12,144,000
McConnelsville	Morgan County	\$3,532,000	\$5,201,000	\$1,006,000	\$240,000	\$1,497,000	\$499,000	\$11,975,000
Medina	Medina Municipal	\$10,353,000	\$11,809,000	\$3,694,000	\$1,320,000	\$4,077,000	\$1,359,000	\$32,612,000
Middle Bass	Middle Bass Island	\$1,535,000	\$5,386,000	\$513,000	\$260,000	\$1,154,000	\$0	\$8,848,000
Middlefield	Geauga County	\$1,686,000	\$5,890,000	\$3,104,000	\$935,000	\$1,742,000	\$581,000	\$13,938,000
Middletown	Middletown Regional/Hook Field	\$29,258,000	\$23,879,000	\$11,502,000	\$2,195,000	\$10,025,000	\$3,342,000	\$80,201,000
Millersburg	Holmes County	\$4,507,000	\$7,424,000	\$3,215,000	\$1,450,000	\$2,489,000	\$830,000	\$19,915,000
Mount Gilead	Morrow County	\$5,290,000	\$7,028,000	\$1,933,000	\$345,000	\$2,189,000	\$730,000	\$17,515,000
Mount Vernon	Knox County	\$13,741,000	\$17,150,000	\$4,478,000	\$1,650,000	\$5,553,000	\$3,702,000	\$46,274,000
Napoleon	Henry County	\$2,469,000	\$12,261,000	\$2,970,000	\$965,000	\$2,800,000	\$933,000	\$22,398,000
New Lexington	Perry County	\$788,000	\$15,520,000	\$1,197,000	\$685,000	\$2,729,000	\$910,000	\$21,829,000
New Philadelphia	Harry Clever Field	\$3,448,000	\$10,428,000	\$6,337,000	\$1,670,000	\$3,282,000	\$1,094,000	\$26,259,000
Newark	Newark-Heath	\$14,829,000	\$12,924,000	\$7,706,000	\$2,060,000	\$5,628,000	\$1,876,000	\$45,023,000
North Bass Island	North Bass Island	\$971,000	\$2,200,000	\$8,000	\$100,000	\$492,000	\$0	\$3,771,000
Norwalk	Norwalk-Huron County	\$5,772,000	\$20,751,000	\$2,548,000	\$680,000	\$4,463,000	\$1,488,000	\$35,702,000
Ottawa	Putnam County	\$3,267,000	\$6,755,000	\$3,195,000	\$1,570,000	\$2,218,000	\$739,000	\$17,744,000
Oxford	Miami University	\$10,015,000	\$9,301,000	\$4,110,000	\$1,510,000	\$3,740,000	\$1,247,000	\$29,923,000
Piqua	Piqua-Hartzell Field	\$3,096,000	\$9,195,000	\$1,510,000	\$780,000	\$2,187,000	\$729,000	\$17,497,000
Port Clinton	Carl R. Keller Field	\$12,540,000	\$29,971,000	\$8,735,000	\$1,875,000	\$7,968,000	\$5,312,000	\$66,401,000
Portsmouth	Greater Portsmouth Regional	\$10,041,000	\$14,956,000	\$6,304,000	\$1,670,000	\$4,946,000	\$1,649,000	\$39,566,000
Put-In-Bay	Put In Bay	\$1,768,000	\$5,725,000	\$820,000	\$120,000	\$1,265,000	\$422,000	\$10,120,000

Table 8-4
Valuation of Ohio General Aviation Airports

City	Airport Name	Land and Land Development	Runway, Taxiway, Apron	Hangars, Buildings, Auto Parking	NAVAIDS, Lights, Fuel	Engineering, Planning, Permitting, Environment	ARC Adjustment	Total
Ravenna	Portage County	\$1,884,000	\$9,526,000	\$8,491,000	\$3,610,000	\$3,527,000	\$1,176,000	\$28,214,000
Sidney	Sidney Municipal	\$4,789,000	\$15,031,000	\$4,139,000	\$1,535,000	\$3,824,000	\$1,275,000	\$30,593,000
Springfield	Springfield-Beckley Municipal	\$30,964,000	\$109,398,000	\$10,796,000	\$4,370,000	\$23,329,000	\$15,553,000	\$194,410,000
Steubenville	Jefferson County Airpark	\$28,488,000	\$8,500,000	\$7,483,000	\$780,000	\$6,788,000	\$2,263,000	\$54,302,000
Tiffin	Seneca County	\$3,023,000	\$10,082,000	\$8,357,000	\$1,505,000	\$3,445,000	\$1,148,000	\$27,560,000
Toledo	Toledo Executive	\$13,247,000	\$24,254,000	\$7,229,000	\$1,380,000	\$6,916,000	\$6,916,000	\$59,942,000
Upper Sandusky	Wyandot County	\$751,000	\$7,192,000	\$288,000	\$345,000	\$1,286,000	\$429,000	\$10,291,000
Urbana	Grimes Field	\$10,806,000	\$11,436,000	\$7,617,000	\$1,570,000	\$4,714,000	\$1,571,000	\$37,714,000
Van Wert	Van Wert County	\$10,466,000	\$9,913,000	\$2,514,000	\$1,490,000	\$3,657,000	\$1,219,000	\$29,259,000
Versailles	Darke County	\$2,498,000	\$9,037,000	\$3,310,000	\$1,345,000	\$2,428,000	\$809,000	\$19,427,000
Wadsworth	Wadsworth Municipal	\$7,686,000	\$17,471,000	\$16,011,000	\$1,330,000	\$6,375,000	\$2,125,000	\$50,998,000
Wapakoneta	Neil Armstrong	\$6,800,000	\$21,378,000	\$6,771,000	\$3,050,000	\$5,700,000	\$3,800,000	\$47,499,000
Washington Court House	Fayette County	\$826,000	\$9,330,000	\$2,827,000	\$1,455,000	\$2,166,000	\$722,000	\$17,326,000
Wauseon	Fulton County	\$7,948,000	\$8,592,000	\$3,187,000	\$1,425,000	\$3,173,000	\$1,058,000	\$25,383,000
Waverly	Pike County	\$3,649,000	\$19,134,000	\$1,342,000	\$1,330,000	\$3,818,000	\$1,273,000	\$30,546,000
West Union	Alexander Salamon	\$2,248,000	\$5,456,000	\$1,463,000	\$720,000	\$1,483,000	\$494,000	\$11,864,000
Willard	Willard	\$2,886,000	\$4,945,000	\$1,338,000	\$445,000	\$1,442,000	\$481,000	\$11,537,000
Willoughby	Willoughby Lost Nation Municipal	\$14,430,000	\$26,696,000	\$7,634,000	\$1,353,000	\$7,517,000	\$2,506,000	\$60,136,000
Wilmington	Wilmington Air Park	\$39,221,000	\$246,826,000	\$75,928,000	\$70,710,000	\$64,903,000	\$64,903,000	\$562,491,000
Wilmington	Clinton Field	\$1,115,000	\$10,303,000	\$4,157,000	\$1,275,000	\$2,527,000	\$842,000	\$20,219,000
Woodsfield	Monroe County	\$5,458,000	\$7,447,000	\$1,028,000	\$805,000	\$2,211,000	\$737,000	\$17,686,000
Wooster	Wayne County	\$8,206,000	\$13,191,000	\$8,346,000	\$2,295,000	\$4,806,000	\$1,602,000	\$38,446,000
Zanesville	Zanesville Municipal	\$28,992,000	\$53,398,000	\$3,974,000	\$4,140,000	\$13,576,000	\$9,050,000	\$113,130,000
Total		\$1,358,067,000	\$1,928,341,000	\$681,529,000	\$239,954,000	\$631,179,000	\$380,141,000	\$5,219,211,000

Source: CDM Smith

Valuation Summary

The valuation of the general aviation airports assessed in this study demonstrates that the cost for each airport in the system can vary greatly. Cost variations are based on many variables including, but not limited to: size and category of the airport, facilities and services offered, and location.

As established earlier in this report, general aviation airports throughout Ohio can be classified into four distinct roles or levels (Levels 1 - 4). **Table 8-5** presents the average and total values for airports by role as well as by cost category.

Table 8-5
Valuation Summary of Ohio General Aviation Airports

Airport Role	Land and Land Development	Runway, Taxiway, Apron	Hangars, Buildings, Auto Parking	NAVAIDS, Lights, Fuel	Engineering, Planning, Permitting, Environment	ARC Adjustment	Total
Level 1							
Average	\$29,684,000	\$37,533,000	\$13,377,000	\$4,965,000	\$12,834,000	\$8,930,000	\$107,323,000
Total	\$979,565,000	\$1,238,579,000	\$441,439,000	\$163,840,000	\$423,513,000	\$294,691,000	\$3,541,627,000
Level 2							
Average	\$9,667,000	\$15,659,000	\$5,144,000	\$1,877,000	\$4,852,000	\$2,579,000	\$39,778,000
Total	\$174,004,000	\$281,858,000	\$92,588,000	\$33,790,000	\$87,333,000	\$46,429,000	\$716,002,000
Level 3							
Average	\$5,794,000	\$10,445,000	\$4,171,000	\$1,150,000	\$3,234,000	\$1,078,000	\$25,872,000
Total	\$168,012,000	\$302,906,000	\$120,966,000	\$33,354,000	\$93,785,000	\$31,261,000	\$750,284,000
Level 4							
Average	\$2,146,000	\$6,176,000	\$1,561,000	\$528,000	\$1,562,000	\$456,000	\$12,429,000
Total	\$36,486,000	\$104,998,000	\$26,536,000	\$8,970,000	\$26,548,000	\$7,760,000	\$211,298,000
Grand Average	\$14,001,000	\$19,880,000	\$7,026,000	\$2,474,000	\$6,507,000	\$3,919,000	\$53,807,000
Grand Total	\$1,358,067,000	\$1,928,341,000	\$681,529,000	\$239,954,000	\$631,179,000	\$380,141,000	\$5,219,211,000

Source: CDM Smith

Amounting to almost \$2.0 billion, the greatest cost associated with airports in Ohio is related to airfield pavement areas including runways, taxiways and aircraft aprons. Closely following pavement areas, the cost associated with land and land development to construct the airfields amounts to nearly \$1.4 billion.

Level 1 airports represent 67 percent of the total value of airports in the state and have an average cost more than twice of Level 2 airports. On average, Level 4 airports, representing the most basic airfields in the system, are half the cost of Level 3 airports.

Based on the analysis presented above, this study estimates that the total value of general aviation airports in Ohio is approximately \$5.2 billion. While the average costs per airport are consistent with other similar airports across the country, the total value of general aviation airports in Ohio represents a significant infrastructure investment for not only the state, but the nation.

Appendix A

Table A-1
Estimates of General Aviation Itinerant Arrivals to Ohio Airports

Associated City	Airport Name	Total GA Operations	GA Itinerant Percent	GA Itinerant Operations	GA True Transient Arrivals
<i>Commercial Service Airports</i>					
Akron	Akron-Canton	69,137	74%	51,242	12,811
Cleveland	Cleveland-Hopkins International	8,779	100%	8,779	2,195
Columbus	Port Columbus International (Note 1)	24,096	100%	24,096	5,542
Columbus	Rickenbacker International (Note 1)	8,124	47%	3,850	578
Dayton	James M. Cox Dayton International	41,626	69%	28,746	7,187
Toledo	Toledo Express	28,835	72%	20,757	5,189
Youngstown/Warren	Youngstown-Warren Regional	21,016	63%	13,252	3,313
Commercial Service Airports Total		201,613	75%	150,722	36,814
<i>General Aviation Airports</i>					
Akron	Akron Fulton International	29,950	33%	9,950	2,488
Ashland	Ashland County	11,010	9%	1,010	167
Ashtabula	Northeast Ohio Regional	16,886	34%	5,734	1,434
Athens/Albany	Ohio University-Snyder Field	55,400	20%	11,182	2,236
Barnesville	Barnesville-Bradfield	10,150	24%	2,450	404
Batavia	Clermont County	38,650	28%	10,650	2,130
Bellefontaine	Bellefontaine Regional	16,650	17%	2,850	570
Bluffton	Bluffton	72,130	8%	6,043	1,511
Bowling Green	Wood County	27,405	27%	7,405	1,851
Bryan	Williams County	12,010	17%	2,010	402
Bucyrus	Port Bucyrus-Crawford County	24,871	29%	7,309	1,206
Cadiz	Harrison County	11,900	19%	2,210	365
Caldwell	Noble County	5,950	29%	1,750	289
Cambridge	Cambridge Municipal	4,219	60%	2,528	417
Carrollton	Carroll County-Tolson	34,550	22%	7,554	1,246
Celina	Lakefield	16,212	20%	3,273	540
Chesapeake/Huntington, WV	Lawrence County Airpark	41,910	8%	3,410	563
Chillicothe	Ross County	47,600	21%	9,820	2,455
Cincinnati	Cincinnati Municipal-Lunken Field	65,753	84%	55,085	13,771
Circleville	Pickaway County Memorial	35,450	23%	8,310	1,662
Cleveland	Burke Lakefront	72,950	64%	47,042	11,761
Cleveland	Cuyahoga County	34,466	62%	21,380	5,345
Columbus	Bolton Field (Note 1)	20,434	60%	12,216	611
Columbus	Ohio State University (Note 2)	68,306	57%	38,807	9,702
Coshocton	Richard Downing	19,550	23%	4,550	1,138
Dayton	Dayton-Wright Brothers	89,045	29%	25,684	6,421
Dayton	Greene County-Lewis A. Jackson Regional	38,900	10%	3,900	644
Dayton	Moraine Air Park	19,188	64%	12,188	2,011
Defiance	Defiance Memorial	9,230	44%	4,030	1,008
Delaware	Delaware Municipal-Jim Moore Field	39,300	16%	6,300	1,575
Deshler	Deshler Municipal Landing Strip	2,000	40%	800	132
East Liverpool	Columbiana County	31,156	15%	4,756	785
Findlay	Findlay	25,000	25%	6,295	1,259
Fostoria	Fostoria Metropolitan	6,700	63%	4,200	840
Fremont	Sandusky County Regional	5,616	64%	3,616	723
Galion	Galion Municipal	6,216	29%	1,816	300
Gallipolis	Gallia-Meigs Regional	19,800	35%	6,930	1,143
Georgetown	Brown County	8,212	39%	3,212	530
Hamilton	Butler County Regional	61,687	73%	45,150	11,288
Harrison	Cincinnati West	20,712	6%	1,185	196
Hillsboro	Highland County	14,000	35%	4,850	800
Jackson	James A. Rhodes	6,053	26%	1,553	311
Kelleys Island	Kelleys Island Municipal	25,495	71%	18,195	3,002
Kent	Kent State University	72,500	14%	10,324	1,703

Table A-1
Estimates of General Aviation Itinerant Arrivals to Ohio Airports

Associated City	Airport Name	Total GA Operations	GA Itinerant Percent	GA Itinerant Operations	GA True Transient Arrivals
Kenton	Hardin County	6,582	32%	2,082	344
Lancaster	Fairfield County	43,066	8%	3,366	673
Lebanon	Warren County/John Lane Field	31,525	21%	6,525	1,631
Lima	Lima Allen County	32,500	31%	10,072	2,518
London	Madison County	43,665	29%	12,842	2,119
Lorain/Elyria	Lorain County Regional	18,823	28%	5,315	1,329
Mansfield	Mansfield Lahm Regional	17,879	76%	13,623	3,406
Marion	Marion Municipal	42,650	48%	20,650	5,163
Marysville	Union County	30,560	38%	11,560	2,890
McArthur	Vinton County	5,225	47%	2,475	408
McConnelsville	Morgan County	5,625	31%	1,725	285
Medina	Medina Municipal	79,685	26%	20,900	3,449
Middle Bass	Middle Bass Island	6,500	92%	6,000	990
Middlefield	Geauga County	7,450	14%	1,050	173
Middletown	Middletown Regional/Hook Field	40,050	56%	22,250	5,563
Millersburg	Holmes County	13,350	29%	3,850	770
Mount Gilead	Morrow County	22,608	12%	2,608	430
Mount Vernon	Knox County	20,150	37%	7,550	1,510
Napoleon	Henry County	15,637	4%	637	105
New Lexington	Perry County	4,550	12%	550	91
New Philadelphia	Harry Clever Field	16,650	16%	2,650	530
Newark	Newark-Heath	12,457	50%	6,262	1,252
North Bass Island	North Bass Island	1,000	50%	500	83
Norwalk	Norwalk-Huron County	10,100	41%	4,100	677
Ottawa	Putnam County	11,910	16%	1,930	483
Oxford	Miami University	4,160	12%	510	102
Piqua	Piqua-Hartzell Field	10,900	57%	6,200	1,023
Port Clinton	Carl R. Keller Field	22,150	73%	16,150	3,230
Portsmouth	Greater Portsmouth Regional	45,830	15%	7,051	1,763
Put In Bay	Put In Bay	12,075	87%	10,500	2,625
Ravenna	Portage County	9,621	65%	6,296	1,259
Sidney	Sidney Municipal	20,500	28%	5,800	1,450
Springfield	Springfield-Beckley Municipal	9,174	19%	1,787	447
Steubenville	Jefferson County Airpark	7,898	35%	2,798	462
Tiffin	Seneca County	60,165	13%	8,058	2,015
Toledo	Toledo Executive	90,700	14%	12,842	3,211
Upper Sandusky	Wyandot County	7,410	31%	2,310	381
Urbana	Grimes Field	23,480	54%	12,770	2,554
Van Wert	Van Wert County	20,516	22%	4,516	745
Versailles	Darke County	9,238	20%	1,838	303
Wadsworth	Wadsworth Municipal	15,325	78%	12,025	1,984
Wapakoneta	Neil Armstrong	29,456	26%	7,554	1,889
Washington Court House	Fayette County	29,405	14%	4,029	665
Wauseon	Fulton County	26,223	5%	1,223	245
Waverly	Pike County	2,012	60%	1,212	200
West Union	Alexander Salamon	5,210	42%	2,210	365
Willard	Willard	2,715	93%	2,515	415
Willoughby	Willoughby Lost Nation Municipal	45,085	45%	20,323	2,032
Wilmington	Clinton Field	27,860	28%	7,806	1,288
Wilmington	Wilmington Air Park	900	100%	900	225
Woodsfield	Monroe County	3,324	55%	1,824	301
Wooster	Wayne County	96,520	11%	10,324	2,581
Zanesville	Zanesville Municipal	33,312	14%	4,533	1,133
General Aviation Airports Total		2,506,533	32%	796,488	170,692
All Airports Total		2,708,146	35%	947,210	207,506

Note 1: Data is from *Columbus Regional Airport Authority Economic Impact Study Update, 2012*, by CDM Smith; Note 2: Data is from *The Ohio State University Airport Economic Impact Study Update, 2012*, by CDM Smith
Source: FAA 5010 data and airport records. Totals may not sum due to rounding.

Table A-2
Estimates of General Aviation Visitors to Ohio Airports

Associated City	Airport	GA True Transient Arrivals	Visitors per Arrival	Estimated GA Visitors
<i>Commercial Service Airports</i>				
Akron	Akron-Canton	12,811	3.6	46,118
Cleveland	Cleveland-Hopkins International	2,195	3.6	7,901
Columbus	Port Columbus International (Note 1)	5,542	3.9	21,648
Columbus	Rickenbacker International (Note 1)	578	3.8	2,195
Dayton	James M. Cox Dayton International	7,187	3.6	25,871
Toledo	Toledo Express	5,189	3.6	18,681
Youngstown/Warren	Youngstown-Warren Regional	3,313	3.6	11,927
Commercial Service Airports Total		36,814	3.6	134,341
<i>General Aviation Airports</i>				
Akron	Akron Fulton International	2,488	3.6	8,955
Ashland	Ashland County	167	2.2	367
Ashtabula	Northeast Ohio Regional	1,434	3.6	5,161
Athens/Albany	Ohio University-Snyder Field	2,236	3.7	8,275
Barnesville	Barnesville-Bradfield	404	2.2	889
Batavia	Clermont County	2,130	2.2	4,686
Bellefontaine	Bellefontaine Regional	570	3.7	2,109
Bluffton	Bluffton	1,511	3.6	5,439
Bowling Green	Wood County	1,851	3.6	6,665
Bryan	Williams County	402	3.7	1,487
Bucyrus	Port Bucyrus-Crawford County	1,206	2.2	2,653
Cadiz	Harrison County	365	2.2	802
Caldwell	Noble County	289	1.8	520
Cambridge	Cambridge Municipal	417	2.2	918
Carrollton	Carroll County-Tolson	1,246	2.2	2,742
Celina	Lakefield	540	2.2	1,188
Chesapeake/Huntington, WV	Lawrence County Airpark	563	2.2	1,238
Chillicothe	Ross County	2,455	3.6	8,838
Cincinnati	Cincinnati Municipal-Lunken Field	13,771	3.6	49,577
Circleville	Pickaway County Memorial	1,662	3.7	6,149
Cleveland	Burke Lakefront	11,761	3.6	42,338
Cleveland	Cuyahoga County	5,345	3.6	19,242
Columbus	Bolton Field (Note 1)	611	3.3	2,012
Columbus	Ohio State University (Note 2)	9,702	4.6	44,628
Coshocton	Richard Downing	1,138	3.6	4,095
Dayton	Dayton-Wright Brothers	6,421	3.6	23,116
Dayton	Greene County-Lewis A. Jackson Regional	644	2.2	1,416
Dayton	Moraine Air Park	2,011	1.8	3,620
Defiance	Defiance Memorial	1,008	3.6	3,627
Delaware	Delaware Municipal-Jim Moore Field	1,575	3.6	5,670
Deshler	Deshler Municipal Landing Strip	132	1.8	238
East Liverpool	Columbiana County	785	1.8	1,413
Findlay	Findlay	1,259	3.7	4,658
Fostoria	Fostoria Metropolitan	840	3.7	3,108
Fremont	Sandusky County Regional	723	3.7	2,676
Galion	Galion Municipal	300	2.2	659
Gallipolis	Gallia-Meigs Regional	1,143	2.2	2,516
Georgetown	Brown County	530	1.8	954
Hamilton	Butler County Regional	11,288	3.6	40,635
Harrison	Cincinnati West	196	2.2	430
Hillsboro	Highland County	800	2.2	1,761
Jackson	James A. Rhodes	311	3.7	1,149
Kelleys Island	Kelleys Island Municipal	3,002	2.2	6,605
Kent	Kent State University	1,703	2.2	3,748
Kenton	Hardin County	344	2.2	756
Lancaster	Fairfield County	673	3.7	2,491

Table A-2
Estimates of General Aviation Visitors to Ohio Airports

Associated City	Airport	GA True Transient Arrivals	Visitors per Arrival	Estimated GA Visitors
Lebanon	Warren County/John Lane Field	1,631	3.6	5,873
Lima	Lima Allen County	2,518	3.6	9,065
London	Madison County	2,119	2.2	4,662
Lorain/Elyria	Lorain County Regional	1,329	3.6	4,784
Mansfield	Mansfield Lahm Regional	3,406	3.6	12,261
Marion	Marion Municipal	5,163	3.6	18,585
Marysville	Union County	2,890	3.6	10,404
McArthur	Vinton County	408	2.2	898
McConnelsville	Morgan County	285	1.8	512
Medina	Medina Municipal	3,449	2.2	7,587
Middle Bass	Middle Bass Island	990	1.8	1,782
Middlefield	Geauga County	173	2.2	381
Middletown	Middletown Regional/Hook Field	5,563	3.6	20,025
Millersburg	Holmes County	770	3.7	2,849
Mount Gilead	Morrow County	430	1.8	775
Mount Vernon	Knox County	1,510	3.7	5,587
Napoleon	Henry County	105	2.2	231
New Lexington	Perry County	91	1.8	163
New Philadelphia	Harry Clever Field	530	3.7	1,961
Newark	Newark-Heath	1,252	3.7	4,634
North Bass Island	North Bass Island	83	1.8	149
Norwalk	Norwalk-Huron County	677	2.2	1,488
Ottawa	Putnam County	483	3.6	1,737
Oxford	Miami University	102	3.7	377
Piqua	Piqua-Hartzell Field	1,023	2.2	2,251
Port Clinton	Carl R. Keller Field	3,230	3.7	11,951
Portsmouth	Greater Portsmouth Regional	1,763	3.6	6,346
Put In Bay	Put In Bay	2,625	3.6	9,450
Ravenna	Portage County	1,259	3.7	4,659
Sidney	Sidney Municipal	1,450	3.6	5,220
Springfield	Springfield-Beckley Municipal	447	3.6	1,608
Steubenville	Jefferson County Airpark	462	2.2	1,016
Tiffin	Seneca County	2,015	3.6	7,252
Toledo	Toledo Executive	3,211	3.6	11,558
Upper Sandusky	Wyandot County	381	1.8	686
Urbana	Grimes Field	2,554	3.7	9,450
Van Wert	Van Wert County	745	2.2	1,639
Versailles	Darke County	303	2.2	667
Wadsworth	Wadsworth Municipal	1,984	2.2	4,365
Wapakoneta	Neil Armstrong	1,889	3.6	6,799
Washington Court House	Fayette County	665	1.8	1,197
Wauseon	Fulton County	245	3.7	905
Waverly	Pike County	200	2.2	440
West Union	Alexander Salamon	365	1.8	656
Willard	Willard	415	1.8	747
Willoughby	Willoughby Lost Nation Municipal	2,032	3.6	7,316
Wilmington	Clinton Field	1,288	2.2	2,834
Wilmington	Wilmington Air Park	225	3.6	810
Woodsfield	Monroe County	301	1.8	542
Wooster	Wayne County	2,581	3.6	9,292
Zanesville	Zanesville Municipal	1,133	3.6	4,080
General Aviation Airports Total		170,692	3.4	572,718
All Airports Total		207,506	3.4	707,059

Note 1: Data is from *Columbus Regional Airport Authority Economic Impact Study Update*, 2012, by CDM Smith; Note 2: Data is from *The Ohio State University Airport Economic Impact Study Update*, 2012, by CDM Smith

Source: CDM Smith. Totals may not sum due to rounding.

Table A-3
Estimates of General Aviation Visitor Expenditures at Ohio Airports

Associated City	Airport	Estimated GA Visitors	Avg. Visitor Spending per Trip	Annual GA Visitor Expenditures (Output)
<i>Commercial Service Airports</i>				
Akron	Akron-Canton	46,118	\$115	\$5,304,000
Cleveland	Cleveland-Hopkins International	7,901	\$115	\$909,000
Columbus	Port Columbus International (Note 1)	21,648	\$160	\$3,464,000
Columbus	Rickenbacker International (Note 1)	2,195	\$110	\$241,000
Dayton	James M. Cox Dayton International	25,871	\$115	\$2,975,000
Toledo	Toledo Express	18,681	\$115	\$2,148,000
Youngstown/Warren	Youngstown-Warren Regional	11,927	\$115	\$1,372,000
Commercial Service Airports Total		134,341	\$122	\$16,413,000
<i>General Aviation Airports</i>				
Akron	Akron Fulton International	8,955	\$115	\$1,030,000
Ashland	Ashland County	367	\$70	\$26,000
Ashtabula	Northeast Ohio Regional	5,161	\$115	\$593,000
Athens/Albany	Ohio University-Snyder Field	8,275	\$115	\$952,000
Barnesville	Barnesville-Bradfield	889	\$70	\$62,000
Batavia	Clermont County	4,686	\$70	\$328,000
Bellefontaine	Bellefontaine Regional	2,109	\$115	\$243,000
Bluffton	Bluffton	5,439	\$115	\$625,000
Bowling Green	Wood County	6,665	\$115	\$766,000
Bryan	Williams County	1,487	\$115	\$171,000
Bucyrus	Port Bucyrus-Crawford County	2,653	\$70	\$186,000
Cadiz	Harrison County	802	\$70	\$56,000
Caldwell	Noble County	520	\$40	\$21,000
Cambridge	Cambridge Municipal	918	\$70	\$64,000
Carrollton	Carroll County-Tolson	2,742	\$70	\$192,000
Celina	Lakefield	1,188	\$70	\$83,000
Chesapeake/Huntington, WV	Lawrence County Airpark	1,238	\$70	\$87,000
Chillicothe	Ross County	8,838	\$115	\$1,016,000
Cincinnati	Cincinnati Municipal-Lunken Field	49,577	\$115	\$5,701,000
Circleville	Pickaway County Memorial	6,149	\$115	\$707,000
Cleveland	Burke Lakefront	42,338	\$115	\$4,869,000
Cleveland	Cuyahoga County	19,242	\$115	\$2,213,000
Columbus	Bolton Field (Note 1)	2,012	\$110	\$221,000
Columbus	Ohio State University (Note 2)	44,628	\$145	\$6,471,000
Coshocton	Richard Downing	4,095	\$115	\$471,000
Dayton	Dayton-Wright Brothers	23,116	\$115	\$2,658,000
Dayton	Greene County-Lewis A. Jackson Regional	1,416	\$70	\$99,000
Dayton	Moraine Air Park	3,620	\$40	\$145,000
Defiance	Defiance Memorial	3,627	\$115	\$417,000
Delaware	Delaware Municipal-Jim Moore Field	5,670	\$115	\$652,000
Deshler	Deshler Municipal Landing Strip	238	\$40	\$10,000
East Liverpool	Columbiana County	1,413	\$40	\$57,000
Findlay	Findlay	4,658	\$115	\$536,000
Fostoria	Fostoria Metropolitan	3,108	\$115	\$357,000
Fremont	Sandusky County Regional	2,676	\$115	\$308,000
Galion	Galion Municipal	659	\$70	\$46,000
Gallipolis	Gallia-Meigs Regional	2,516	\$70	\$176,000
Georgetown	Brown County	954	\$40	\$38,000
Hamilton	Butler County Regional	40,635	\$115	\$4,673,000
Harrison	Cincinnati West	430	\$70	\$30,000
Hillsboro	Highland County	1,761	\$70	\$123,000
Jackson	James A. Rhodes	1,149	\$115	\$132,000
Kelleys Island	Kelleys Island Municipal	6,605	\$70	\$462,000

Table A-3
Estimates of General Aviation Visitor Expenditures at Ohio Airports

Associated City	Airport	Estimated GA Visitors	Avg. Visitor Spending per Trip	Annual GA Visitor Expenditures (Output)
Kent	Kent State University	3,748	\$70	\$262,000
Kenton	Hardin County	756	\$70	\$53,000
Lancaster	Fairfield County	2,491	\$115	\$286,000
Lebanon	Warren County/John Lane Field	5,873	\$115	\$675,000
Lima	Lima Allen County	9,065	\$115	\$1,042,000
London	Madison County	4,662	\$70	\$326,000
Lorain/Elyria	Lorain County Regional	4,784	\$115	\$550,000
Mansfield	Mansfield Lahm Regional	12,261	\$115	\$1,410,000
Marion	Marion Municipal	18,585	\$115	\$2,137,000
Marysville	Union County	10,404	\$115	\$1,196,000
McArthur	Vinton County	898	\$70	\$63,000
McConnelsville	Morgan County	512	\$40	\$20,000
Medina	Medina Municipal	7,587	\$70	\$531,000
Middle Bass	Middle Bass Island	1,782	\$40	\$71,000
Middlefield	Geauga County	381	\$70	\$27,000
Middletown	Middletown Regional/Hook Field	20,025	\$115	\$3,036,000
Millersburg	Holmes County	2,849	\$115	\$328,000
Mount Gilead	Morrow County	775	\$40	\$31,000
Mount Vernon	Knox County	5,587	\$115	\$643,000
Napoleon	Henry County	231	\$70	\$16,000
New Lexington	Perry County	163	\$40	\$7,000
New Philadelphia	Harry Clever Field	1,961	\$115	\$226,000
Newark	Newark-Heath	4,634	\$115	\$533,000
North Bass Island	North Bass Island	149	\$40	\$6,000
Norwalk	Norwalk-Huron County	1,488	\$70	\$104,000
Ottawa	Putnam County	1,737	\$115	\$200,000
Oxford	Miami University	377	\$115	\$43,000
Piqua	Piqua-Hartzell Field	2,251	\$70	\$158,000
Port Clinton	Carl R. Keller Field	11,951	\$115	\$1,374,000
Portsmouth	Greater Portsmouth Regional	6,346	\$115	\$730,000
Put In Bay	Put In Bay	9,450	\$115	\$1,087,000
Ravenna	Portage County	4,659	\$115	\$536,000
Sidney	Sidney Municipal	5,220	\$115	\$600,000
Springfield	Springfield-Beckley Municipal	1,608	\$115	\$185,000
Steubenville	Jefferson County Airpark	1,016	\$70	\$71,000
Tiffin	Seneca County	7,252	\$115	\$834,000
Toledo	Toledo Executive	11,558	\$115	\$1,329,000
Upper Sandusky	Wyandot County	686	\$40	\$27,000
Urbana	Grimes Field	9,450	\$115	\$1,087,000
Van Wert	Van Wert County	1,639	\$70	\$115,000
Versailles	Darke County	667	\$70	\$47,000
Wadsworth	Wadsworth Municipal	4,365	\$70	\$306,000
Wapakoneta	Neil Armstrong	6,799	\$115	\$782,000
Washington Court House	Fayette County	1,197	\$40	\$48,000
Wauseon	Fulton County	905	\$115	\$104,000
Waverly	Pike County	440	\$70	\$31,000
West Union	Alexander Salamon	656	\$40	\$26,000
Willard	Willard	747	\$40	\$30,000
Willoughby	Willoughby Lost Nation Municipal	7,316	\$115	\$841,000
Wilmington	Clinton Field	2,834	\$70	\$198,000
Wilmington	Wilmington Air Park	810	\$115	\$93,000
Woodsfield	Monroe County	542	\$40	\$22,000
Wooster	Wayne County	9,292	\$115	\$1,069,000
Zanesville	Zanesville Municipal	4,080	\$115	\$469,000
General Aviation Airports Total		572,718	\$112	\$64,094,000

Table A-3
Estimates of General Aviation Visitor Expenditures at Ohio Airports

Associated City	Airport	Estimated GA Visitors	Avg. Visitor Spending per Trip	Annual GA Visitor Expenditures (Output)
All Airports Total		707,059	\$114	\$80,507,000

Note 1: Data is from *Columbus Regional Airport Authority Economic Impact Study Update*, 2012, by CDM Smith; Note 2: Data is from *The Ohio State University Airport Economic Impact Study Update*, 2012, by CDM Smith

Source: CDM Smith. Totals may not sum due to rounding.

Table A-4
Estimates of Commercial Service Visitors to Ohio Airports

Associated City	Airport Name	Enplanements 2012	Percent Visitors	Visitors
Akron	Akron-Canton	921,767	38%	350,271
Cleveland	Cleveland-Hopkins International	4,346,941	33%	1,434,491
Columbus	Port Columbus International (Note 1)	3,190,068	41%	1,307,928
Columbus	Rickenbacker International (Note 1)	7,541	5%	377
Dayton	James M. Cox Dayton International	1,304,313	39%	508,682
Toledo	Toledo Express	78,757	45%	35,441
Youngstown/Warren	Youngstown-Warren Regional	40,102	5%	2,005
Commercial Service Airports Total		9,889,489	37%	3,639,195

Note 1: Data is from *Columbus Regional Airport Authority Economic Impact Study Update*, 2012, by CDM Smith

Source: FAA data, airport records, and *Ohio Commercial Service Airports Economic Impact Study*, 2012, by CDM Smith.

Table A-5
Estimates of Commercial Service Visitor Expenditures at Ohio Airports

Associated City	Airport Name	Visitors	Spending per Visitor	Visitor Expenditures
Akron	Akron-Canton (Note 1)	350,271	\$600	\$189,733,000
Cleveland	Cleveland-Hopkins International	1,434,491	\$674	\$966,847,000
Columbus	Port Columbus International (Note 2)	1,307,928	\$674	\$788,548,000
Columbus	Rickenbacker International (Note 3)	377	\$250	\$94,000
Dayton	James M. Cox Dayton International (Note 1)	508,682	\$600	\$271,951,000
Toledo	Toledo Express (Note 1)	35,441	\$600	\$20,765,000
Youngstown/Warren	Youngstown-Warren Regional	2,005	\$250	\$501,000
Commercial Service Airports Total		3,639,195	\$615	\$2,238,439,000

Note 1: Visitor expenditures presented are adjusted to remove on-airport rental car expenditures in order to avoid double counting. Note 2: Data is from *Columbus Regional Airport Authority Economic Impact Study Update*, 2012, by CDM Smith. Visitor expenditures presented were adjusted in that study to remove on-airport rental car and hotel expenditures in order to avoid double counting.

Note 3: Data is from *Columbus Regional Airport Authority Economic Impact Study Update*, 2012, by CDM Smith.

Source: CDM Smith and *Ohio Commercial Service Airports Economic Impact Study*, 2012, by CDM Smith.

Table A-6
On-Airport Employment from Ohio Airports

Associated City	Airport Name	System Plan Level	On-Airport Direct Employment	Multiplier Employment	Total On-Airport Employment
<i>Commercial Service Airports</i>					
Akron	Akron-Canton	Air Carrier	1,086	1,273	2,359
Cleveland	Cleveland-Hopkins International	Air Carrier	8,250	8,526	16,776
Columbus	Port Columbus International (Note 1)	Air Carrier	4,902	5,584	10,486
Columbus	Rickenbacker International (Note 1)	Air Carrier	2,288	2,059	4,347
Dayton	James M. Cox Dayton International	Air Carrier	1,616	2,097	3,713
Toledo	Toledo Express	Air Carrier	1,319	1,682	3,001
Youngstown/Warren	Youngstown-Warren Regional	Air Carrier	2,148	2,435	4,583
Commercial Service Airports Total			21,609	23,656	45,265
<i>General Aviation Airports</i>					
Akron	Akron Fulton International	1	31	52	83
Ashland	Ashland County	3	39	68	107
Ashtabula	Northeast Ohio Regional	1	10	15	25
Athens/Albany	Ohio University-Snyder Field	2	53	90	143
Barnesville	Barnesville-Bradfield	3	1	2	3
Batavia	Clermont County	3	88	153	241
Bellefontaine	Bellefontaine Regional	2	6	9	15
Bluffton	Bluffton	1	37	61	98
Bowling Green	Wood County	1	16	26	42
Bryan	Williams County	2	5	7	12
Bucyrus	Port Bucyrus-Crawford County	3	3	4	7
Cadiz	Harrison County	3	8	14	22
Caldwell	Noble County	4	1	0	1
Cambridge	Cambridge Municipal	3	6	7	13
Carrollton	Carroll County-Tolson	3	17	12	29
Celina	Lakefield	3	1	2	3
Chesapeake/Huntington, WV	Lawrence County Airpark	3	9	14	23
Chillicothe	Ross County	1	13	21	34
Cincinnati	Cincinnati Municipal-Lunken Field	1	663	1,064	1,727
Circleville	Pickaway County Memorial	2	7	11	18
Cleveland	Burke Lakefront	1	281	478	759
Cleveland	Cuyahoga County	1	398	704	1,102
Columbus	Bolton Field (Note 1)	1	44	48	92
Columbus	Ohio State University (Note 2)	1	271	286	557
Coshocton	Richard Downing	1	48	78	126
Dayton	Dayton-Wright Brothers	1	81	143	224
Dayton	Greene County-Lewis A. Jackson Regional	3	41	72	113
Dayton	Moraine Air Park	4	18	29	47
Defiance	Defiance Memorial	1	32	57	89
Delaware	Delaware Municipal-Jim Moore Field	1	24	41	65
Deshler	Deshler Municipal Landing Strip	4	1	0	1
East Liverpool	Columbiana County	4	15	25	40
Findlay	Findlay	2	28	45	73
Fostoria	Fostoria Metropolitan	2	9	13	22
Fremont	Sandusky County Regional	2	7	11	18
Galion	Galion Municipal	3	16	28	44
Gallipolis	Gallia-Meigs Regional	3	3	5	8
Georgetown	Brown County	4	1	0	1
Hamilton	Butler County Regional	1	68	120	188
Harrison	Cincinnati West	3	17	28	45
Hillsboro	Highland County	3	17	30	47
Jackson	James A. Rhodes	2	3	3	6
Kelleys Island	Kelleys Island Municipal	4	1	0	1
Kent	Kent State University	3	33	53	86
Kenton	Hardin County	3	3	5	8
Lancaster	Fairfield County	2	37	66	103

Table A-6
On-Airport Employment from Ohio Airports

Associated City	Airport Name	System Plan Level	On-Airport Direct Employment	Multiplier Employment	Total On-Airport Employment
Lebanon	Warren County/John Lane Field	1	30	52	82
Lima	Lima Allen County	1	12	20	32
London	Madison County	3	8	13	21
Lorain/Elyria	Lorain County Regional	1	62	103	165
Mansfield	Mansfield Lahm Regional	1	919	1,062	1,981
Marion	Marion Municipal	1	13	18	31
Marysville	Union County	1	8	14	22
McArthur	Vinton County	3	2	2	4
McConnelsville	Morgan County	4	20	34	54
Medina	Medina Municipal	3	15	24	39
Middle Bass	Middle Bass Island	4	1	0	1
Middlefield	Geauga County	3	23	41	64
Middletown	Middletown Regional/Hook Field	1	65	113	178
Millersburg	Holmes County	2	10	16	26
Mount Gilead	Morrow County	4	13	22	35
Mount Vernon	Knox County	2	7	9	16
Napoleon	Henry County	3	5	8	13
New Lexington	Perry County	4	1	2	3
New Philadelphia	Harry Clever Field	2	34	48	82
Newark	Newark-Heath	2	11	19	30
North Bass Island	North Bass Island	4	1	0	1
Norwalk	Norwalk-Huron County	3	3	4	7
Ottawa	Putnam County	1	1	2	3
Oxford	Miami University	2	2	2	4
Piqua	Piqua-Hartzell Field	3	5	8	13
Port Clinton	Carl R. Keller Field	2	49	57	106
Portsmouth	Greater Portsmouth Regional	1	13	10	23
Put In Bay	Put In Bay	4	5	4	9
Ravenna	Portage County	2	14	23	37
Sidney	Sidney Municipal	1	7	12	19
Springfield	Springfield-Beckley Municipal	1	646	749	1,395
Steubenville	Jefferson County Airpark	3	19	31	50
Tiffin	Seneca County	1	37	65	102
Toledo	Toledo Executive	1	16	27	43
Upper Sandusky	Wyandot County	4	1	0	1
Urbana	Grimes Field	2	32	36	68
Van Wert	Van Wert County	3	3	4	7
Versailles	Darke County	3	4	6	10
Wadsworth	Wadsworth Municipal	3	9	17	26
Wapakoneta	Neil Armstrong	1	29	51	80
Washington Court House	Fayette County	4	2	3	5
Wauseon	Fulton County	2	26	45	71
Waverly	Pike County	3	1	1	2
West Union	Alexander Salamon	4	1	0	1
Willard	Willard	4	1	0	1
Willoughby	Willoughby Lost Nation Municipal	1	35	57	92
Wilmington	Clinton Field	3	16	27	43
Wilmington	Wilmington Air Park	1	917	1,638	2,555
Woodsfield	Monroe County	4	3	5	8
Wooster	Wayne County	1	38	66	104
Zanesville	Zanesville Municipal	1	14	20	34
General Aviation Airports Total			5,720	8,590	14,310
All Airports Total			27,329	32,246	59,575

Note 1: Data is from *Columbus Regional Airport Authority Economic Impact Study Update*, 2012, by CDM Smith; Note 2: Data is from *The Ohio State University Airport Economic Impact Study Update*, 2012, by CDM Smith

Source: CDM Smith and IMPLAN

Table A-7
CIP Employment from Ohio Airports

Associated City	Airport Name	System Plan Level	CIP Direct Employment	Multiplier Employment	Total CIP Employment
<i>Commercial Service Airports</i>					
Akron	Akron-Canton	Air Carrier	230	183	413
Cleveland	Cleveland-Hopkins International	Air Carrier	430	343	773
Columbus	Port Columbus International (Note 1)	Air Carrier	664	638	1,302
Columbus	Rickenbacker International (Note 1)	Air Carrier	230	221	451
Dayton	James M. Cox Dayton International	Air Carrier	316	252	568
Toledo	Toledo Express	Air Carrier	260	207	467
Youngstown/Warren	Youngstown-Warren Regional	Air Carrier	57	45	102
Commercial Service Airports Total			2,187	1,889	4,076
<i>General Aviation Airports</i>					
Akron	Akron Fulton International	1	5	3	8
Ashland	Ashland County	3	18	15	33
Ashtabula	Northeast Ohio Regional	1	3	2	5
Athens/Albany	Ohio University-Snyder Field	2	9	8	17
Barnesville	Barnesville-Bradfield	3	2	1	3
Batavia	Clermont County	3	8	6	14
Bellefontaine	Bellefontaine Regional	2	3	3	6
Bluffton	Bluffton	1	6	4	10
Bowling Green	Wood County	1	1	1	2
Bryan	Williams County	2	1	1	2
Bucyrus	Port Bucyrus-Crawford County	3	2	1	3
Cadiz	Harrison County	3	3	3	6
Caldwell	Noble County	4	1	0	1
Cambridge	Cambridge Municipal	3	2	2	4
Carrollton	Carroll County-Tolson	3	2	1	3
Celina	Lakefield	3	0	0	0
Chesapeake/Huntington, WV	Lawrence County Airpark	3	2	2	4
Chillicothe	Ross County	1	7	6	13
Cincinnati	Cincinnati Municipal-Lunken Field	1	158	126	284
Circleville	Pickaway County Memorial	2	1	1	2
Cleveland	Burke Lakefront	1	39	32	71
Cleveland	Cuyahoga County	1	58	46	104
Columbus	Bolton Field (Note 1)	1	3	3	6
Columbus	Ohio State University (Note 2)	1	40	38	78
Coshocton	Richard Downing	1	4	4	8
Dayton	Dayton-Wright Brothers	1	18	14	32
Dayton	Greene County-Lewis A. Jackson Regional	3	10	9	19
Dayton	Moraine Air Park	4	3	2	5
Defiance	Defiance Memorial	1	7	6	13
Delaware	Delaware Municipal-Jim Moore Field	1	8	7	15
Deshler	Deshler Municipal Landing Strip	4	0	0	0
East Liverpool	Columbiana County	4	4	2	6
Findlay	Findlay	2	2	2	4
Fostoria	Fostoria Metropolitan	2	8	7	15
Fremont	Sandusky County Regional	2	4	4	8
Galion	Galion Municipal	3	2	2	4
Gallipolis	Gallia-Meigs Regional	3	2	1	3
Georgetown	Brown County	4	2	1	3
Hamilton	Butler County Regional	1	16	12	28
Harrison	Cincinnati West	3	3	3	6
Hillsboro	Highland County	3	4	3	7
Jackson	James A. Rhodes	2	1	2	3
Kelleys Island	Kelleys Island Municipal	4	1	1	2
Kent	Kent State University	3	5	4	9
Kenton	Hardin County	3	3	2	5
Lancaster	Fairfield County	2	6	5	11

Table A-7
CIP Employment from Ohio Airports

Associated City	Airport Name	System Plan Level	CIP Direct Employment	Multiplier Employment	Total CIP Employment
Lebanon	Warren County/John Lane Field	1	10	7	17
Lima	Lima Allen County	1	12	9	21
London	Madison County	3	3	2	5
Lorain/Elyria	Lorain County Regional	1	19	15	34
Mansfield	Mansfield Lahm Regional	1	103	82	185
Marion	Marion Municipal	1	8	6	14
Marysville	Union County	1	1	1	2
McArthur	Vinton County	3	1	1	2
McConnelsville	Morgan County	4	1	1	2
Medina	Medina Municipal	3	6	4	10
Middle Bass	Middle Bass Island	4	0	1	1
Middlefield	Geauga County	3	4	3	7
Middletown	Middletown Regional/Hook Field	1	8	6	14
Millersburg	Holmes County	2	6	5	11
Mount Gilead	Morrow County	4	2	1	3
Mount Vernon	Knox County	2	4	3	7
Napoleon	Henry County	3	3	3	6
New Lexington	Perry County	4	5	4	9
New Philadelphia	Harry Clever Field	2	4	4	8
Newark	Newark-Heath	2	15	12	27
North Bass Island	North Bass Island	4	0	1	1
Norwalk	Norwalk-Huron County	3	0	1	1
Ottawa	Putnam County	1	1	0	1
Oxford	Miami University	2	2	1	3
Piqua	Piqua-Hartzell Field	3	1	0	1
Port Clinton	Carl R. Keller Field	2	32	25	57
Portsmouth	Greater Portsmouth Regional	1	4	3	7
Put In Bay	Put In Bay	4	9	7	16
Ravenna	Portage County	2	4	4	8
Sidney	Sidney Municipal	1	4	3	7
Springfield	Springfield-Beckley Municipal	1	29	23	52
Steubenville	Jefferson County Airpark	3	8	6	14
Tiffin	Seneca County	1	5	3	8
Toledo	Toledo Executive	1	4	3	7
Upper Sandusky	Wyandot County	4	0	0	0
Urbana	Grimes Field	2	2	2	4
Van Wert	Van Wert County	3	1	0	1
Versailles	Darke County	3	5	4	9
Wadsworth	Wadsworth Municipal	3	6	5	11
Wapakoneta	Neil Armstrong	1	4	4	8
Washington Court House	Fayette County	4	1	1	2
Wauseon	Fulton County	2	3	1	4
Waverly	Pike County	3	2	1	3
West Union	Alexander Salamon	4	1	1	2
Willard	Willard	4	0	0	0
Willoughby	Willoughby Lost Nation Municipal	1	2	2	4
Wilmington	Clinton Field	3	3	2	5
Wilmington	Wilmington Air Park	1	6	4	10
Woodsfield	Monroe County	4	3	2	5
Wooster	Wayne County	1	10	7	17
Zanesville	Zanesville Municipal	1	7	5	12
General Aviation Airports Total			861	689	1,550
All Airports Total			3,048	2,578	5,626

Note 1: Data is from *Columbus Regional Airport Authority Economic Impact Study Update*, 2012, by CDM Smith; Note 2: Data is from *The Ohio State University Airport Economic Impact Study Update*, 2012, by CDM Smith

Source: CDM Smith and IMPLAN

Table A-8
General Aviation Visitor Employment from Ohio Airports

Associated City	Airport Name	System Plan Level	GA Visitor-Related Employment	Multiplier Employment	Total GA Visitor-Related Employment
<i>Commercial Service Airports</i>					
Akron	Akron-Canton	Air Carrier	90	44	134
Cleveland	Cleveland-Hopkins International	Air Carrier	15	8	23
Columbus	Port Columbus International (Note 1)	Air Carrier	60	35	95
Columbus	Rickenbacker International (Note 1)	Air Carrier	4	2	6
Dayton	James M. Cox Dayton International	Air Carrier	51	24	75
Toledo	Toledo Express	Air Carrier	37	17	54
Youngstown/Warren	Youngstown-Warren Regional	Air Carrier	23	12	35
Commercial Service Airports Total			280	142	422
<i>General Aviation Airports</i>					
Akron	Akron Fulton International	1	18	8	26
Ashland	Ashland County	3	0	1	1
Ashtabula	Northeast Ohio Regional	1	10	5	15
Athens/Albany	Ohio University-Snyder Field	2	16	8	24
Barnesville	Barnesville-Bradfield	3	1	1	2
Batavia	Clermont County	3	6	2	8
Bellefontaine	Bellefontaine Regional	2	4	2	6
Bluffton	Bluffton	1	11	5	16
Bowling Green	Wood County	1	13	6	19
Bryan	Williams County	2	3	1	4
Bucyrus	Port Bucyrus-Crawford County	3	3	2	5
Cadiz	Harrison County	3	1	0	1
Caldwell	Noble County	4	0	1	1
Cambridge	Cambridge Municipal	3	1	1	2
Carrollton	Carroll County-Tolson	3	3	2	5
Celina	Lakefield	3	1	1	2
Chesapeake/Huntington, WV	Lawrence County Airpark	3	1	1	2
Chillicothe	Ross County	1	17	9	26
Cincinnati	Cincinnati Municipal-Lunken Field	1	97	47	144
Circleville	Pickaway County Memorial	2	12	6	18
Cleveland	Burke Lakefront	1	83	40	123
Cleveland	Cuyahoga County	1	38	18	56
Columbus	Bolton Field (Note 1)	1	4	2	6
Columbus	Ohio State University (Note 2)	1	112	66	178
Coshocton	Richard Downing	1	8	4	12
Dayton	Dayton-Wright Brothers	1	45	22	67
Dayton	Greene County-Lewis A. Jackson Regional	3	2	1	3
Dayton	Moraine Air Park	4	2	2	4
Defiance	Defiance Memorial	1	7	4	11
Delaware	Delaware Municipal-Jim Moore Field	1	11	5	16
Deshler	Deshler Municipal Landing Strip	4	0	0	0
East Liverpool	Columbiana County	4	1	0	1
Findlay	Findlay	2	9	5	14
Fostoria	Fostoria Metropolitan	2	6	3	9
Fremont	Sandusky County Regional	2	5	3	8
Galion	Galion Municipal	3	1	0	1
Gallipolis	Gallia-Meigs Regional	3	3	1	4
Georgetown	Brown County	4	1	0	1
Hamilton	Butler County Regional	1	80	38	118
Harrison	Cincinnati West	3	1	0	1
Hillsboro	Highland County	3	2	1	3
Jackson	James A. Rhodes	2	2	1	3
Kelleys Island	Kelleys Island Municipal	4	8	4	12
Kent	Kent State University	3	4	3	7
Kenton	Hardin County	3	1	0	1
Lancaster	Fairfield County	2	5	2	7

Table A-8
General Aviation Visitor Employment from Ohio Airports

Associated City	Airport Name	System Plan Level	GA Visitor-Related Employment	Multiplier Employment	Total GA Visitor-Related Employment
Lebanon	Warren County/John Lane Field	1	11	6	17
Lima	Lima Allen County	1	18	8	26
London	Madison County	3	6	2	8
Lorain/Elyria	Lorain County Regional	1	9	5	14
Mansfield	Mansfield Lahm Regional	1	24	12	36
Marion	Marion Municipal	1	36	18	54
Marysville	Union County	1	20	10	30
McArthur	Vinton County	3	1	1	2
McConnelsville	Morgan County	4	0	1	1
Medina	Medina Municipal	3	9	4	13
Middle Bass	Middle Bass Island	4	1	1	2
Middlefield	Geauga County	3	0	1	1
Middletown	Middletown Regional/Hook Field	1	52	25	77
Millersburg	Holmes County	2	6	2	8
Mount Gilead	Morrow County	4	1	0	1
Mount Vernon	Knox County	2	11	5	16
Napoleon	Henry County	3	0	0	0
New Lexington	Perry County	4	0	0	0
New Philadelphia	Harry Clever Field	2	4	2	6
Newark	Newark-Heath	2	9	4	13
North Bass Island	North Bass Island	4	0	0	0
Norwalk	Norwalk-Huron County	3	2	1	3
Ottawa	Putnam County	1	3	2	5
Oxford	Miami University	2	1	0	1
Piqua	Piqua-Hartzell Field	3	3	1	4
Port Clinton	Carl R. Keller Field	2	23	12	35
Portsmouth	Greater Portsmouth Regional	1	12	6	18
Put In Bay	Put In Bay	4	18	9	27
Ravenna	Portage County	2	9	5	14
Sidney	Sidney Municipal	1	10	5	15
Springfield	Springfield-Beckley Municipal	1	3	2	5
Steubenville	Jefferson County Airpark	3	1	1	2
Tiffin	Seneca County	1	14	7	21
Toledo	Toledo Executive	1	23	11	34
Upper Sandusky	Wyandot County	4	0	1	1
Urbana	Grimes Field	2	18	9	27
Van Wert	Van Wert County	3	2	1	3
Versailles	Darke County	3	1	0	1
Wadsworth	Wadsworth Municipal	3	5	3	8
Wapakoneta	Neil Armstrong	1	13	7	20
Washington Court House	Fayette County	4	1	0	1
Wauseon	Fulton County	2	2	1	3
Waverly	Pike County	3	1	0	1
West Union	Alexander Salamon	4	0	1	1
Willard	Willard	4	1	0	1
Willoughby	Willoughby Lost Nation Municipal	1	14	7	21
Wilmington	Clinton Field	3	3	2	5
Wilmington	Wilmington Air Park	1	2	0	2
Woodsfield	Monroe County	4	0	1	1
Wooster	Wayne County	1	18	9	27
Zanesville	Zanesville Municipal	1	8	4	12
General Aviation Airports Total			1,088	549	1,637
All Airports Total			1,368	691	2,059

Note 1: Data is from *Columbus Regional Airport Authority Economic Impact Study Update*, 2012, by CDM Smith; Note 2: Data is from *The Ohio State University Airport Economic Impact Study Update*, 2012, by CDM Smith

Source: CDM Smith and IMPLAN

Table A-9
Commercial Service Visitor Employment from Ohio Airports

Associated City	Airport Name	System Plan Level	CS Visitor-Related Employment	Multiplier Employment	Total CS Visitor-Related Employment
<i>Commercial Service Airports</i>					
Akron	Akron-Canton	Air Carrier	3,029	1,753	4,782
Cleveland	Cleveland-Hopkins International	Air Carrier	14,325	8,289	22,614
Columbus	Port Columbus International (Note 1)	Air Carrier	13,117	8,464	21,581
Columbus	Rickenbacker International (Note 1)	Air Carrier	1	1	2
Dayton	James M. Cox Dayton International	Air Carrier	4,279	2,476	6,755
Toledo	Toledo Express	Air Carrier	286	165	451
Youngstown/Warren	Youngstown-Warren Regional	Air Carrier	7	4	11
Commercial Service Airports Total			35,044	21,152	56,196

Note 1: Data is from *Columbus Regional Airport Authority Economic Impact Study Update, 2012*, by CDM Smith

Source: CDM Smith and IMPLAN

Table A-10
Total Employment from Ohio Airports

Associated City	Airport Name	System Plan Level	Total Direct Employment	Total Multiplier Employment	Total Employment
<i>Commercial Service Airports</i>					
Akron	Akron-Canton	Air Carrier	4,435	3,253	7,688
Cleveland	Cleveland-Hopkins International	Air Carrier	23,020	17,166	40,186
Columbus	Port Columbus International (Note 1)	Air Carrier	18,743	14,721	33,464
Columbus	Rickenbacker International (Note 1)	Air Carrier	2,523	2,283	4,806
Dayton	James M. Cox Dayton International	Air Carrier	6,262	4,849	11,111
Toledo	Toledo Express	Air Carrier	1,902	2,071	3,973
Youngstown/Warren	Youngstown-Warren Regional	Air Carrier	2,235	2,496	4,731
Commercial Service Airports Total			59,120	46,839	105,959
<i>General Aviation Airports</i>					
Akron	Akron Fulton International	1	54	63	117
Ashland	Ashland County	3	57	84	141
Ashtabula	Northeast Ohio Regional	1	23	22	45
Athens/Albany	Ohio University-Snyder Field	2	78	106	184
Barnesville	Barnesville-Bradfield	3	4	4	8
Batavia	Clermont County	3	102	161	263
Bellefontaine	Bellefontaine Regional	2	13	14	27
Bluffton	Bluffton	1	54	70	124
Bowling Green	Wood County	1	30	33	63
Bryan	Williams County	2	9	9	18
Bucyrus	Port Bucyrus-Crawford County	3	8	7	15
Cadiz	Harrison County	3	12	17	29
Caldwell	Noble County	4	2	1	3
Cambridge	Cambridge Municipal	3	9	10	19
Carrollton	Carroll County-Tolson	3	22	15	37
Celina	Lakefield	3	2	3	5
Chesapeake/Huntington, WV	Lawrence County Airpark	3	12	17	29
Chillicothe	Ross County	1	37	36	73
Cincinnati	Cincinnati Municipal-Lunken Field	1	918	1,237	2,155
Circleville	Pickaway County Memorial	2	20	18	38
Cleveland	Burke Lakefront	1	403	550	953
Cleveland	Cuyahoga County	1	494	768	1,262
Columbus	Bolton Field (Note 1)	1	51	53	104
Columbus	Ohio State University (Note 2)	1	423	390	813
Coshocton	Richard Downing	1	60	86	146

Table A-10
Total Employment from Ohio Airports

Associated City	Airport Name	System Plan Level	Total Direct Employment	Total Multiplier Employment	Total Employment
Dayton	Dayton-Wright Brothers	1	144	179	323
Dayton	Greene County-Lewis A. Jackson Regional	3	53	82	135
Dayton	Moraine Air Park	4	23	33	56
Defiance	Defiance Memorial	1	46	67	113
Delaware	Delaware Municipal-Jim Moore Field	1	43	53	96
Deshler	Deshler Municipal Landing Strip	4	1	0	1
East Liverpool	Columbiana County	4	20	27	47
Findlay	Findlay	2	39	52	91
Fostoria	Fostoria Metropolitan	2	23	23	46
Fremont	Sandusky County Regional	2	16	18	34
Galion	Galion Municipal	3	19	30	49
Gallipolis	Gallia-Meigs Regional	3	8	7	15
Georgetown	Brown County	4	4	1	5
Hamilton	Butler County Regional	1	164	170	334
Harrison	Cincinnati West	3	21	31	52
Hillsboro	Highland County	3	23	34	57
Jackson	James A. Rhodes	2	6	6	12
Kelleys Island	Kelleys Island Municipal	4	10	5	15
Kent	Kent State University	3	42	60	102
Kenton	Hardin County	3	7	7	14
Lancaster	Fairfield County	2	48	73	121
Lebanon	Warren County/John Lane Field	1	51	65	116
Lima	Lima Allen County	1	42	37	79
London	Madison County	3	17	17	34
Lorain/Elyria	Lorain County Regional	1	90	123	213
Mansfield	Mansfield Lahm Regional	1	1,046	1,156	2,202
Marion	Marion Municipal	1	57	42	99
Marysville	Union County	1	29	25	54
McArthur	Vinton County	3	4	4	8
McConnelsville	Morgan County	4	21	36	57
Medina	Medina Municipal	3	30	32	62
Middle Bass	Middle Bass Island	4	2	2	4
Middlefield	Geauga County	3	27	45	72
Middletown	Middletown Regional/Hook Field	1	125	144	269
Millersburg	Holmes County	2	22	23	45
Mount Gilead	Morrow County	4	16	23	39
Mount Vernon	Knox County	2	22	17	39
Napoleon	Henry County	3	8	11	19
New Lexington	Perry County	4	6	6	12
New Philadelphia	Harry Clever Field	2	42	54	96
Newark	Newark-Heath	2	35	35	70
North Bass Island	North Bass Island	4	1	1	2
Norwalk	Norwalk-Huron County	3	5	6	11
Ottawa	Putnam County	1	5	4	9
Oxford	Miami University	2	5	3	8
Piqua	Piqua-Hartzell Field	3	9	9	18
Port Clinton	Carl R. Keller Field	2	104	94	198
Portsmouth	Greater Portsmouth Regional	1	29	19	48
Put In Bay	Put In Bay	4	32	20	52
Ravenna	Portage County	2	27	32	59
Sidney	Sidney Municipal	1	21	20	41
Springfield	Springfield-Beckley Municipal	1	678	774	1,452
Steubenville	Jefferson County Airpark	3	28	38	66
Tiffin	Seneca County	1	56	75	131
Toledo	Toledo Executive	1	43	41	84
Upper Sandusky	Wyandot County	4	1	1	2

Table A-10
Total Employment from Ohio Airports

Associated City	Airport Name	System Plan Level	Total Direct Employment	Total Multiplier Employment	Total Employment
Urbana	Grimes Field	2	52	47	99
Van Wert	Van Wert County	3	6	5	11
Versailles	Darke County	3	10	10	20
Wadsworth	Wadsworth Municipal	3	20	25	45
Wapakoneta	Neil Armstrong	1	46	62	108
Washington Court House	Fayette County	4	4	4	8
Wauseon	Fulton County	2	31	47	78
Waverly	Pike County	3	4	2	6
West Union	Alexander Salamon	4	2	2	4
Willard	Willard	4	2	0	2
Willoughby	Willoughby Lost Nation Municipal	1	51	66	117
Wilmington	Clinton Field	3	22	31	53
Wilmington	Wilmington Air Park	1	925	1,642	2,567
Woodsfield	Monroe County	4	6	8	14
Wooster	Wayne County	1	66	82	148
Zanesville	Zanesville Municipal	1	29	29	58
General Aviation Airports Total			7,669	9,828	17,497
All Airports Total			66,789	56,667	123,456

Note 1: Data is from *Columbus Regional Airport Authority Economic Impact Study Update*, 2012, by CDM Smith; Note 2: Data is from *The Ohio State University Airport Economic Impact Study Update*, 2012, by CDM Smith

Source: CDM Smith and IMPLAN

Table A-11
On-Airport Payroll from Ohio Airports

Associated City	Airport Name	System Plan Level	On-Airport Payroll	Multiplier Payroll	Total On-Airport Payroll
Commercial Service Airports					
Akron	Akron-Canton	Air Carrier	\$54,731,000	\$48,337,000	\$103,068,000
Cleveland	Cleveland-Hopkins International	Air Carrier	\$385,203,000	\$310,128,000	\$695,331,000
Columbus	Port Columbus International (Note 1)	Air Carrier	\$256,588,000	\$173,399,000	\$429,987,000
Columbus	Rickenbacker International (Note 1)	Air Carrier	\$155,809,000	\$93,306,000	\$249,115,000
Dayton	James M. Cox Dayton International	Air Carrier	\$84,939,000	\$76,381,000	\$161,320,000
Toledo	Toledo Express	Air Carrier	\$79,544,000	\$69,768,000	\$149,312,000
Youngstown/Warren	Youngstown-Warren Regional	Air Carrier	\$52,233,000	\$44,700,000	\$96,933,000
Commercial Service Airports Total			\$1,069,047,000	\$816,019,000	\$1,885,066,000
General Aviation Airports					
Akron	Akron Fulton International	1	\$1,375,000	\$1,304,000	\$2,679,000
Ashland	Ashland County	3	\$2,233,000	\$2,158,000	\$4,391,000
Ashtabula	Northeast Ohio Regional	1	\$668,000	\$636,000	\$1,304,000
Athens/Albany	Ohio University-Snyder Field	2	\$3,364,000	\$3,223,000	\$6,587,000
Barnesville	Barnesville-Bradfield	3	\$30,000	\$29,000	\$59,000
Batavia	Clermont County	3	\$3,412,000	\$3,269,000	\$6,681,000
Bellefontaine	Bellefontaine Regional	2	\$130,000	\$122,000	\$252,000
Bluffton	Bluffton	1	\$2,174,000	\$2,053,000	\$4,227,000
Bowling Green	Wood County	1	\$543,000	\$512,000	\$1,055,000
Bryan	Williams County	2	\$164,000	\$155,000	\$319,000
Bucyrus	Port Bucyrus-Crawford County	3	\$72,000	\$69,000	\$141,000
Cadiz	Harrison County	3	\$299,000	\$290,000	\$589,000
Caldwell	Noble County	4	\$2,000	\$2,000	\$4,000
Cambridge	Cambridge Municipal	3	\$84,000	\$70,000	\$154,000
Carrollton	Carroll County-Tolson	3	\$294,000	\$259,000	\$553,000
Celina	Lakefield	3	\$21,000	\$20,000	\$41,000
Chesapeake/Huntington, WV	Lawrence County Airpark	3	\$338,000	\$326,000	\$664,000
Chillicothe	Ross County	1	\$428,000	\$410,000	\$838,000

Table A-11
On-Airport Payroll from Ohio Airports

Associated City	Airport Name	System Plan Level	On-Airport Payroll	Multiplier Payroll	Total On-Airport Payroll
Cincinnati	Cincinnati Municipal-Lunken Field	1	\$41,952,000	\$39,867,000	\$81,819,000
Circleville	Pickaway County Memorial	2	\$335,000	\$323,000	\$658,000
Cleveland	Burke Lakefront	1	\$14,734,000	\$14,000,000	\$28,734,000
Cleveland	Cuyahoga County	1	\$28,657,000	\$27,663,000	\$56,320,000
Columbus	Bolton Field (Note 1)	1	\$1,261,000	\$836,000	\$2,097,000
Columbus	Ohio State University (Note 2)	1	\$16,586,000	\$10,830,000	\$27,416,000
Coshocton	Richard Downing	1	\$2,115,000	\$2,004,000	\$4,119,000
Dayton	Dayton-Wright Brothers	1	\$4,014,000	\$3,875,000	\$7,889,000
Dayton	Greene County-Lewis A. Jackson Regional	3	\$1,560,000	\$1,496,000	\$3,056,000
Dayton	Moraine Air Park	4	\$736,000	\$706,000	\$1,442,000
Defiance	Defiance Memorial	1	\$1,594,000	\$1,545,000	\$3,139,000
Delaware	Delaware Municipal-Jim Moore Field	1	\$1,206,000	\$1,149,000	\$2,355,000
Deshler	Deshler Municipal Landing Strip	4	\$5,000	\$4,000	\$9,000
East Liverpool	Columbiana County	4	\$753,000	\$728,000	\$1,481,000
Findlay	Findlay	2	\$2,925,000	\$2,786,000	\$5,711,000
Fostoria	Fostoria Metropolitan	2	\$383,000	\$368,000	\$751,000
Fremont	Sandusky County Regional	2	\$352,000	\$330,000	\$682,000
Galion	Galion Municipal	3	\$1,205,000	\$1,167,000	\$2,372,000
Gallipolis	Gallia-Meigs Regional	3	\$114,000	\$109,000	\$223,000
Georgetown	Brown County	4	\$5,000	\$4,000	\$9,000
Hamilton	Butler County Regional	1	\$4,303,000	\$4,156,000	\$8,459,000
Harrison	Cincinnati West	3	\$593,000	\$563,000	\$1,156,000
Hillsboro	Highland County	3	\$722,000	\$695,000	\$1,417,000
Jackson	James A. Rhodes	2	\$60,000	\$57,000	\$117,000
Kelleys Island	Kelleys Island Municipal	4	\$5,000	\$4,000	\$9,000
Kent	Kent State University	3	\$1,292,000	\$1,220,000	\$2,512,000
Kenton	Hardin County	3	\$106,000	\$103,000	\$209,000
Lancaster	Fairfield County	2	\$1,260,000	\$1,219,000	\$2,479,000
Lebanon	Warren County/John Lane Field	1	\$869,000	\$842,000	\$1,711,000
Lima	Lima Allen County	1	\$709,000	\$678,000	\$1,387,000
London	Madison County	3	\$165,000	\$154,000	\$319,000
Lorain/Elyria	Lorain County Regional	1	\$3,272,000	\$3,088,000	\$6,360,000
Mansfield	Mansfield Lahm Regional	1	\$44,106,000	\$37,750,000	\$81,856,000
Marion	Marion Municipal	1	\$646,000	\$589,000	\$1,235,000
Marysville	Union County	1	\$319,000	\$309,000	\$628,000
McArthur	Vinton County	3	\$13,000	\$12,000	\$25,000
McConnelsville	Morgan County	4	\$819,000	\$793,000	\$1,612,000
Medina	Medina Municipal	3	\$722,000	\$693,000	\$1,415,000
Middle Bass	Middle Bass Island	4	\$18,000	\$15,000	\$33,000
Middlefield	Geauga County	3	\$1,347,000	\$1,303,000	\$2,650,000
Middletown	Middletown Regional/Hook Field	1	\$2,214,000	\$2,127,000	\$4,341,000
Millersburg	Holmes County	2	\$475,000	\$458,000	\$933,000
Mount Gilead	Morrow County	4	\$521,000	\$505,000	\$1,026,000
Mount Vernon	Knox County	2	\$297,000	\$271,000	\$568,000
Napoleon	Henry County	3	\$126,000	\$122,000	\$248,000
New Lexington	Perry County	4	\$20,000	\$19,000	\$39,000
New Philadelphia	Harry Clever Field	2	\$1,315,000	\$1,216,000	\$2,531,000
Newark	Newark-Heath	2	\$811,000	\$785,000	\$1,596,000
North Bass Island	North Bass Island	4	\$18,000	\$15,000	\$33,000
Norwalk	Norwalk-Huron County	3	\$83,000	\$80,000	\$163,000
Ottawa	Putnam County	1	\$30,000	\$29,000	\$59,000
Oxford	Miami University	2	\$87,000	\$73,000	\$160,000
Piqua	Piqua-Hartzell Field	3	\$383,000	\$371,000	\$754,000
Port Clinton	Carl R. Keller Field	2	\$1,769,000	\$1,560,000	\$3,329,000
Portsmouth	Greater Portsmouth Regional	1	\$335,000	\$271,000	\$606,000
Put In Bay	Put In Bay	4	\$156,000	\$121,000	\$277,000
Ravenna	Portage County	2	\$592,000	\$570,000	\$1,162,000
Sidney	Sidney Municipal	1	\$245,000	\$236,000	\$481,000

Table A-11
On-Airport Payroll from Ohio Airports

Associated City	Airport Name	System Plan Level	On-Airport Payroll	Multiplier Payroll	Total On-Airport Payroll
Springfield	Springfield-Beckley Municipal	1	\$41,327,000	\$35,208,000	\$76,535,000
Steubenville	Jefferson County Airpark	3	\$913,000	\$874,000	\$1,787,000
Tiffin	Seneca County	1	\$1,614,000	\$1,564,000	\$3,178,000
Toledo	Toledo Executive	1	\$649,000	\$630,000	\$1,279,000
Upper Sandusky	Wyandot County	4	\$5,000	\$4,000	\$9,000
Urbana	Grimes Field	2	\$629,000	\$554,000	\$1,183,000
Van Wert	Van Wert County	3	\$60,000	\$54,000	\$114,000
Versailles	Darke County	3	\$388,000	\$372,000	\$760,000
Wadsworth	Wadsworth Municipal	3	\$253,000	\$246,000	\$499,000
Wapakoneta	Neil Armstrong	1	\$1,872,000	\$1,802,000	\$3,674,000
Washington Court House	Fayette County	4	\$36,000	\$30,000	\$66,000
Wauseon	Fulton County	2	\$999,000	\$963,000	\$1,962,000
Waverly	Pike County	3	\$34,000	\$32,000	\$66,000
West Union	Alexander Salamon	4	\$14,000	\$12,000	\$26,000
Willard	Willard	4	\$5,000	\$4,000	\$9,000
Willoughby	Willoughby Lost Nation Municipal	1	\$1,080,000	\$1,028,000	\$2,108,000
Wilmington	Clinton Field	3	\$666,000	\$646,000	\$1,312,000
Wilmington	Wilmington Air Park	1	\$47,421,000	\$45,911,000	\$93,332,000
Woodsfield	Monroe County	4	\$221,000	\$213,000	\$434,000
Wooster	Wayne County	1	\$2,283,000	\$2,203,000	\$4,486,000
Zanesville	Zanesville Municipal	1	\$555,000	\$514,000	\$1,069,000
General Aviation Airports Total			\$307,970,000	\$280,633,000	\$588,603,000
All Airports Total			\$1,377,017,000	\$1,096,652,000	\$2,473,669,000

Note 1: Data is from *Columbus Regional Airport Authority Economic Impact Study Update*, 2012, by CDM Smith; Note 2: Data is from *The*

Ohio State University Airport Economic Impact Study Update, 2012, by CDM Smith

Source: CDM Smith and IMPLAN

Table A-12
CIP Payroll from Ohio Airports

Associated City	Airport Name	System Plan Level	CIP Direct Payroll	Multiplier Payroll	Total CIP Payroll
Commercial Service Airports					
Akron	Akron-Canton	Air Carrier	\$9,258,000	\$6,035,000	\$15,293,000
Cleveland	Cleveland-Hopkins International	Air Carrier	\$17,317,000	\$11,288,000	\$28,605,000
Columbus	Port Columbus International (Note 1)	Air Carrier	\$26,958,000	\$24,866,000	\$51,824,000
Columbus	Rickenbacker International (Note 1)	Air Carrier	\$9,338,000	\$8,613,000	\$17,951,000
Dayton	James M. Cox Dayton International	Air Carrier	\$12,721,000	\$8,292,000	\$21,013,000
Toledo	Toledo Express	Air Carrier	\$10,458,000	\$6,817,000	\$17,275,000
Youngstown/Warren	Youngstown-Warren Regional	Air Carrier	\$2,286,000	\$1,490,000	\$3,776,000
Commercial Service Airports Total			\$88,336,000	\$67,401,000	\$155,737,000
General Aviation Airports					
Akron	Akron Fulton International	1	\$189,000	\$123,000	\$312,000
Ashland	Ashland County	3	\$736,000	\$479,000	\$1,215,000
Ashtabula	Northeast Ohio Regional	1	\$103,000	\$67,000	\$170,000
Athens/Albany	Ohio University-Snyder Field	2	\$383,000	\$249,000	\$632,000
Barnesville	Barnesville-Bradfield	3	\$76,000	\$50,000	\$126,000
Batavia	Clermont County	3	\$318,000	\$208,000	\$526,000
Bellefontaine	Bellefontaine Regional	2	\$125,000	\$81,000	\$206,000
Bluffton	Bluffton	1	\$228,000	\$148,000	\$376,000
Bowling Green	Wood County	1	\$51,000	\$33,000	\$84,000
Bryan	Williams County	2	\$39,000	\$25,000	\$64,000
Bucyrus	Port Bucyrus-Crawford County	3	\$77,000	\$50,000	\$127,000
Cadiz	Harrison County	3	\$133,000	\$87,000	\$220,000
Caldwell	Noble County	4	\$33,000	\$22,000	\$55,000
Cambridge	Cambridge Municipal	3	\$91,000	\$60,000	\$151,000
Carrollton	Carroll County-Tolson	3	\$72,000	\$47,000	\$119,000
Celina	Lakefield	3	\$5,000	\$3,000	\$8,000

Table A-12
CIP Payroll from Ohio Airports

Associated City	Airport Name	System Plan Level	CIP Direct Payroll	Multiplier Payroll	Total CIP Payroll
Chesapeake/Huntington, WV	Lawrence County Airpark	3	\$80,000	\$52,000	\$132,000
Chillicothe	Ross County	1	\$292,000	\$190,000	\$482,000
Cincinnati	Cincinnati Municipal-Lunken Field	1	\$6,376,000	\$4,156,000	\$10,532,000
Circleville	Pickaway County Memorial	2	\$48,000	\$31,000	\$79,000
Cleveland	Burke Lakefront	1	\$1,582,000	\$1,031,000	\$2,613,000
Cleveland	Cuyahoga County	1	\$2,329,000	\$1,519,000	\$3,848,000
Columbus	Bolton Field (Note 1)	1	\$122,000	\$113,000	\$235,000
Columbus	Ohio State University (Note 2)	1	\$1,624,000	\$1,498,000	\$3,122,000
Coshocton	Richard Downing	1	\$178,000	\$116,000	\$294,000
Dayton	Dayton-Wright Brothers	1	\$710,000	\$463,000	\$1,173,000
Dayton	Greene County-Lewis A. Jackson Regional	3	\$419,000	\$274,000	\$693,000
Dayton	Moraine Air Park	4	\$101,000	\$66,000	\$167,000
Defiance	Defiance Memorial	1	\$285,000	\$185,000	\$470,000
Delaware	Delaware Municipal-Jim Moore Field	1	\$332,000	\$216,000	\$548,000
Deshler	Deshler Municipal Landing Strip	4	\$0	\$0	\$0
East Liverpool	Columbiana County	4	\$143,000	\$94,000	\$237,000
Findlay	Findlay	2	\$88,000	\$58,000	\$146,000
Fostoria	Fostoria Metropolitan	2	\$334,000	\$217,000	\$551,000
Fremont	Sandusky County Regional	2	\$178,000	\$116,000	\$294,000
Galion	Galion Municipal	3	\$80,000	\$52,000	\$132,000
Gallipolis	Gallia-Meigs Regional	3	\$71,000	\$47,000	\$118,000
Georgetown	Brown County	4	\$66,000	\$43,000	\$109,000
Hamilton	Butler County Regional	1	\$630,000	\$411,000	\$1,041,000
Harrison	Cincinnati West	3	\$125,000	\$82,000	\$207,000
Hillsboro	Highland County	3	\$146,000	\$96,000	\$242,000
Jackson	James A. Rhodes	2	\$59,000	\$38,000	\$97,000
Kelleys Island	Kelleys Island Municipal	4	\$37,000	\$24,000	\$61,000
Kent	Kent State University	3	\$200,000	\$131,000	\$331,000
Kenton	Hardin County	3	\$105,000	\$68,000	\$173,000
Lancaster	Fairfield County	2	\$253,000	\$165,000	\$418,000
Lebanon	Warren County/John Lane Field	1	\$385,000	\$251,000	\$636,000
Lima	Lima Allen County	1	\$475,000	\$309,000	\$784,000
London	Madison County	3	\$116,000	\$76,000	\$192,000
Lorain/Elyria	Lorain County Regional	1	\$765,000	\$499,000	\$1,264,000
Mansfield	Mansfield Lahm Regional	1	\$4,142,000	\$2,700,000	\$6,842,000
Marion	Marion Municipal	1	\$324,000	\$211,000	\$535,000
Marysville	Union County	1	\$52,000	\$34,000	\$86,000
McArthur	Vinton County	3	\$45,000	\$29,000	\$74,000
McConnelsville	Morgan County	4	\$37,000	\$25,000	\$62,000
Medina	Medina Municipal	3	\$226,000	\$148,000	\$374,000
Middle Bass	Middle Bass Island	4	\$20,000	\$12,000	\$32,000
Middlefield	Geauga County	3	\$152,000	\$100,000	\$252,000
Middletown	Middletown Regional/Hook Field	1	\$323,000	\$210,000	\$533,000
Millersburg	Holmes County	2	\$256,000	\$167,000	\$423,000
Mount Gilead	Morrow County	4	\$61,000	\$40,000	\$101,000
Mount Vernon	Knox County	2	\$167,000	\$108,000	\$275,000
Napoleon	Henry County	3	\$129,000	\$84,000	\$213,000
New Lexington	Perry County	4	\$193,000	\$125,000	\$318,000
New Philadelphia	Harry Clever Field	2	\$178,000	\$116,000	\$294,000
Newark	Newark-Heath	2	\$597,000	\$389,000	\$986,000
North Bass Island	North Bass Island	4	\$14,000	\$8,000	\$22,000
Norwalk	Norwalk-Huron County	3	\$17,000	\$11,000	\$28,000
Ottawa	Putnam County	1	\$27,000	\$18,000	\$45,000
Oxford	Miami University	2	\$69,000	\$45,000	\$114,000
Piqua	Piqua-Hartzell Field	3	\$23,000	\$15,000	\$38,000
Port Clinton	Carl R. Keller Field	2	\$1,269,000	\$827,000	\$2,096,000
Portsmouth	Greater Portsmouth Regional	1	\$154,000	\$100,000	\$254,000
Put In Bay	Put In Bay	4	\$368,000	\$240,000	\$608,000

Table A-12
CIP Payroll from Ohio Airports

Associated City	Airport Name	System Plan Level	CIP Direct Payroll	Multiplier Payroll	Total CIP Payroll
Ravenna	Portage County	2	\$176,000	\$114,000	\$290,000
Sidney	Sidney Municipal	1	\$163,000	\$107,000	\$270,000
Springfield	Springfield-Beckley Municipal	1	\$1,169,000	\$762,000	\$1,931,000
Steubenville	Jefferson County Airpark	3	\$310,000	\$201,000	\$511,000
Tiffin	Seneca County	1	\$182,000	\$118,000	\$300,000
Toledo	Toledo Executive	1	\$154,000	\$101,000	\$255,000
Upper Sandusky	Wyandot County	4	\$0	\$0	\$0
Urbana	Grimes Field	2	\$82,000	\$53,000	\$135,000
Van Wert	Van Wert County	3	\$33,000	\$22,000	\$55,000
Versailles	Darke County	3	\$211,000	\$137,000	\$348,000
Wadsworth	Wadsworth Municipal	3	\$257,000	\$167,000	\$424,000
Wapakoneta	Neil Armstrong	1	\$170,000	\$111,000	\$281,000
Washington Court House	Fayette County	4	\$52,000	\$34,000	\$86,000
Wauseon	Fulton County	2	\$101,000	\$65,000	\$166,000
Waverly	Pike County	3	\$75,000	\$49,000	\$124,000
West Union	Alexander Salamon	4	\$47,000	\$31,000	\$78,000
Willard	Willard	4	\$0	\$0	\$0
Willoughby	Willoughby Lost Nation Municipal	1	\$90,000	\$59,000	\$149,000
Wilmington	Clinton Field	3	\$106,000	\$69,000	\$175,000
Wilmington	Wilmington Air Park	1	\$232,000	\$152,000	\$384,000
Woodsfield	Monroe County	4	\$102,000	\$67,000	\$169,000
Wooster	Wayne County	1	\$390,000	\$254,000	\$644,000
Zanesville	Zanesville Municipal	1	\$269,000	\$175,000	\$444,000
General Aviation Airports Total			\$34,607,000	\$23,029,000	\$57,636,000
All Airports Total			\$122,943,000	\$90,430,000	\$213,373,000

Note 1: Data is from *Columbus Regional Airport Authority Economic Impact Study Update*, 2012, by CDM Smith; Note 2: Data is from *The Ohio State University Airport Economic Impact Study Update*, 2012, by CDM Smith

Source: CDM Smith and IMPLAN

Table A-13
General Aviation Visitor Payroll from Ohio Airports

Associated City	Airport Name	System Plan Level	Visitor-Related Payroll	Multiplier Payroll	Total Visitor-Related Payroll
Commercial Service Airports					
Akron	Akron-Canton	Air Carrier	\$1,995,000	\$1,420,000	\$3,415,000
Cleveland	Cleveland-Hopkins International	Air Carrier	\$342,000	\$243,000	\$585,000
Columbus	Port Columbus International (Note 1)	Air Carrier	\$1,356,000	\$1,220,000	\$2,576,000
Columbus	Rickenbacker International (Note 1)	Air Carrier	\$90,000	\$81,000	\$171,000
Dayton	James M. Cox Dayton International	Air Carrier	\$1,119,000	\$797,000	\$1,916,000
Toledo	Toledo Express	Air Carrier	\$808,000	\$575,000	\$1,383,000
Youngstown/Warren	Youngstown-Warren Regional	Air Carrier	\$516,000	\$368,000	\$884,000
Commercial Service Airports Total			\$6,226,000	\$4,704,000	\$10,930,000
General Aviation Airports					
Akron	Akron Fulton International	1	\$387,000	\$275,000	\$662,000
Ashland	Ashland County	3	\$10,000	\$7,000	\$17,000
Ashtabula	Northeast Ohio Regional	1	\$223,000	\$159,000	\$382,000
Athens/Albany	Ohio University-Snyder Field	2	\$358,000	\$255,000	\$613,000
Barnesville	Barnesville-Bradfield	3	\$23,000	\$16,000	\$39,000
Batavia	Clermont County	3	\$123,000	\$88,000	\$211,000
Bellefontaine	Bellefontaine Regional	2	\$91,000	\$65,000	\$156,000
Bluffton	Bluffton	1	\$235,000	\$168,000	\$403,000
Bowling Green	Wood County	1	\$288,000	\$205,000	\$493,000
Bryan	Williams County	2	\$64,000	\$46,000	\$110,000
Bucyrus	Port Bucyrus-Crawford County	3	\$70,000	\$50,000	\$120,000

Table A-13
General Aviation Visitor Payroll from Ohio Airports

Associated City	Airport Name	System Plan Level	Visitor-Related Payroll	Multiplier Payroll	Total Visitor-Related Payroll
Cadiz	Harrison County	3	\$21,000	\$15,000	\$36,000
Caldwell	Noble County	4	\$8,000	\$6,000	\$14,000
Cambridge	Cambridge Municipal	3	\$24,000	\$17,000	\$41,000
Carrollton	Carroll County-Tolson	3	\$72,000	\$52,000	\$124,000
Celina	Lakefield	3	\$31,000	\$22,000	\$53,000
Chesapeake/Huntington, WV	Lawrence County Airpark	3	\$33,000	\$23,000	\$56,000
Chillicothe	Ross County	1	\$382,000	\$272,000	\$654,000
Cincinnati	Cincinnati Municipal-Lunken Field	1	\$2,145,000	\$1,527,000	\$3,672,000
Circleville	Pickaway County Memorial	2	\$266,000	\$189,000	\$455,000
Cleveland	Burke Lakefront	1	\$1,832,000	\$1,304,000	\$3,136,000
Cleveland	Cuyahoga County	1	\$833,000	\$592,000	\$1,425,000
Columbus	Bolton Field (Note 1)	1	\$90,000	\$81,000	\$171,000
Columbus	Ohio State University (Note 2)	1	\$2,531,000	\$2,278,000	\$4,809,000
Coshocton	Richard Downing	1	\$177,000	\$126,000	\$303,000
Dayton	Dayton-Wright Brothers	1	\$1,000,000	\$712,000	\$1,712,000
Dayton	Greene County-Lewis A. Jackson Regional	3	\$37,000	\$27,000	\$64,000
Dayton	Moraine Air Park	4	\$55,000	\$38,000	\$93,000
Defiance	Defiance Memorial	1	\$157,000	\$112,000	\$269,000
Delaware	Delaware Municipal-Jim Moore Field	1	\$245,000	\$175,000	\$420,000
Deshler	Deshler Municipal Landing Strip	4	\$4,000	\$2,000	\$6,000
East Liverpool	Columbiana County	4	\$21,000	\$16,000	\$37,000
Findlay	Findlay	2	\$202,000	\$143,000	\$345,000
Fostoria	Fostoria Metropolitan	2	\$134,000	\$96,000	\$230,000
Fremont	Sandusky County Regional	2	\$116,000	\$82,000	\$198,000
Galion	Galion Municipal	3	\$17,000	\$13,000	\$30,000
Gallipolis	Gallia-Meigs Regional	3	\$66,000	\$47,000	\$113,000
Georgetown	Brown County	4	\$14,000	\$10,000	\$24,000
Hamilton	Butler County Regional	1	\$1,758,000	\$1,252,000	\$3,010,000
Harrison	Cincinnati West	3	\$11,000	\$8,000	\$19,000
Hillsboro	Highland County	3	\$46,000	\$33,000	\$79,000
Jackson	James A. Rhodes	2	\$50,000	\$35,000	\$85,000
Kelleys Island	Kelleys Island Municipal	4	\$174,000	\$124,000	\$298,000
Kent	Kent State University	3	\$99,000	\$70,000	\$169,000
Kenton	Hardin County	3	\$20,000	\$14,000	\$34,000
Lancaster	Fairfield County	2	\$108,000	\$76,000	\$184,000
Lebanon	Warren County/John Lane Field	1	\$254,000	\$181,000	\$435,000
Lima	Lima Allen County	1	\$392,000	\$279,000	\$671,000
London	Madison County	3	\$123,000	\$87,000	\$210,000
Lorain/Elyria	Lorain County Regional	1	\$207,000	\$147,000	\$354,000
Mansfield	Mansfield Lahm Regional	1	\$530,000	\$378,000	\$908,000
Marion	Marion Municipal	1	\$804,000	\$572,000	\$1,376,000
Marysville	Union County	1	\$450,000	\$320,000	\$770,000
McArthur	Vinton County	3	\$24,000	\$17,000	\$41,000
McConnelsville	Morgan County	4	\$8,000	\$5,000	\$13,000
Medina	Medina Municipal	3	\$200,000	\$142,000	\$342,000
Middle Bass	Middle Bass Island	4	\$27,000	\$19,000	\$46,000
Middlefield	Geauga County	3	\$10,000	\$7,000	\$17,000
Middletown	Middletown Regional/Hook Field	1	\$1,142,000	\$813,000	\$1,955,000
Millersburg	Holmes County	2	\$123,000	\$88,000	\$211,000
Mount Gilead	Morrow County	4	\$12,000	\$8,000	\$20,000
Mount Vernon	Knox County	2	\$242,000	\$172,000	\$414,000
Napoleon	Henry County	3	\$6,000	\$4,000	\$10,000
New Lexington	Perry County	4	\$3,000	\$2,000	\$5,000
New Philadelphia	Harry Clever Field	2	\$85,000	\$61,000	\$146,000
Newark	Newark-Heath	2	\$201,000	\$142,000	\$343,000
North Bass Island	North Bass Island	4	\$2,000	\$2,000	\$4,000

Table A-13
General Aviation Visitor Payroll from Ohio Airports

Associated City	Airport Name	System Plan Level	Visitor-Related Payroll	Multiplier Payroll	Total Visitor-Related Payroll
Norwalk	Norwalk-Huron County	3	\$39,000	\$28,000	\$67,000
Ottawa	Putnam County	1	\$75,000	\$54,000	\$129,000
Oxford	Miami University	2	\$16,000	\$12,000	\$28,000
Piqua	Piqua-Hartzell Field	3	\$59,000	\$43,000	\$102,000
Port Clinton	Carl R. Keller Field	2	\$517,000	\$368,000	\$885,000
Portsmouth	Greater Portsmouth Regional	1	\$275,000	\$195,000	\$470,000
Put In Bay	Put In Bay	4	\$409,000	\$291,000	\$700,000
Ravenna	Portage County	2	\$202,000	\$143,000	\$345,000
Sidney	Sidney Municipal	1	\$226,000	\$160,000	\$386,000
Springfield	Springfield-Beckley Municipal	1	\$70,000	\$49,000	\$119,000
Steubenville	Jefferson County Airpark	3	\$27,000	\$19,000	\$46,000
Tiffin	Seneca County	1	\$314,000	\$223,000	\$537,000
Toledo	Toledo Executive	1	\$500,000	\$356,000	\$856,000
Upper Sandusky	Wyandot County	4	\$10,000	\$7,000	\$17,000
Urbana	Grimes Field	2	\$409,000	\$291,000	\$700,000
Van Wert	Van Wert County	3	\$43,000	\$31,000	\$74,000
Versailles	Darke County	3	\$18,000	\$12,000	\$30,000
Wadsworth	Wadsworth Municipal	3	\$115,000	\$82,000	\$197,000
Wapakoneta	Neil Armstrong	1	\$294,000	\$210,000	\$504,000
Washington Court House	Fayette County	4	\$18,000	\$13,000	\$31,000
Wauseon	Fulton County	2	\$39,000	\$28,000	\$67,000
Waverly	Pike County	3	\$12,000	\$8,000	\$20,000
West Union	Alexander Salamon	4	\$10,000	\$7,000	\$17,000
Willard	Willard	4	\$11,000	\$8,000	\$19,000
Willoughby	Willoughby Lost Nation Municipal	1	\$316,000	\$226,000	\$542,000
Wilmington	Clinton Field	3	\$74,000	\$54,000	\$128,000
Wilmington	Wilmington Air Park	1	\$35,000	\$25,000	\$60,000
Woodsfield	Monroe County	4	\$8,000	\$6,000	\$14,000
Wooster	Wayne County	1	\$402,000	\$286,000	\$688,000
Zanesville	Zanesville Municipal	1	\$176,000	\$126,000	\$302,000
General Aviation Airports Total			\$24,215,000	\$17,730,000	\$41,945,000
All Airports Total			\$30,441,000	\$22,434,000	\$52,875,000

Note 1: Data is from *Columbus Regional Airport Authority Economic Impact Study Update, 2012*, by CDM Smith; Note 2: Data is from *The Ohio State University Airport Economic Impact Study Update, 2012*, by CDM Smith
Source: CDM Smith and IMPLAN

Table A-14
Commercial Service Visitor Payroll from Ohio Airports

Associated City	Airport Name	System Plan Level	Visitor-Related Payroll	Multiplier Payroll	Total Visitor-Related Payroll
Commercial Service Airports					
Akron	Akron-Canton	Air Carrier	\$65,919,000	\$54,496,000	\$120,415,000
Cleveland	Cleveland-Hopkins International	Air Carrier	\$316,726,000	\$261,842,000	\$578,568,000
Columbus	Port Columbus International (Note 1)	Air Carrier	\$293,707,000	\$283,158,000	\$576,865,000
Columbus	Rickenbacker International (Note 1)	Air Carrier	\$23,000	\$22,000	\$45,000
Dayton	James M. Cox Dayton International	Air Carrier	\$91,600,000	\$75,727,000	\$167,327,000
Toledo	Toledo Express	Air Carrier	\$5,965,000	\$4,931,000	\$10,896,000
Youngstown/Warren	Youngstown-Warren Regional	Air Carrier	\$155,000	\$128,000	\$283,000
Commercial Service Airports Total			\$774,095,000	\$680,304,000	\$1,454,399,000

Note 1: Data is from *Columbus Regional Airport Authority Economic Impact Study Update, 2012*, by CDM Smith
Source: CDM Smith and IMPLAN

Table A-15
Total Payroll from Ohio Airports

Associated City	Airport Name	System Plan Level	Total Direct Payroll	Total Multiplier Payroll	Total Payroll
Commercial Service Airports					
Akron	Akron-Canton	Air Carrier	\$131,903,000	\$110,288,000	\$242,191,000
Cleveland	Cleveland-Hopkins International	Air Carrier	\$719,588,000	\$583,501,000	\$1,303,089,000
Columbus	Port Columbus International (Note 1)	Air Carrier	\$578,609,000	\$482,643,000	\$1,061,252,000
Columbus	Rickenbacker International (Note 1)	Air Carrier	\$165,260,000	\$102,022,000	\$267,282,000
Dayton	James M. Cox Dayton International	Air Carrier	\$190,379,000	\$161,197,000	\$351,576,000
Toledo	Toledo Express	Air Carrier	\$96,775,000	\$82,091,000	\$178,866,000
Youngstown/Warren	Youngstown-Warren Regional	Air Carrier	\$55,190,000	\$46,686,000	\$101,876,000
Commercial Service Airports Total			\$1,937,704,000	\$1,568,428,000	\$3,506,132,000
General Aviation Airports					
Akron	Akron Fulton International	1	\$1,951,000	\$1,702,000	\$3,653,000
Ashland	Ashland County	3	\$2,979,000	\$2,644,000	\$5,623,000
Ashtabula	Northeast Ohio Regional	1	\$994,000	\$862,000	\$1,856,000
Athens/Albany	Ohio University-Snyder Field	2	\$4,105,000	\$3,727,000	\$7,832,000
Barnesville	Barnesville-Bradfield	3	\$129,000	\$95,000	\$224,000
Batavia	Clermont County	3	\$3,853,000	\$3,565,000	\$7,418,000
Bellefontaine	Bellefontaine Regional	2	\$346,000	\$268,000	\$614,000
Bluffton	Bluffton	1	\$2,637,000	\$2,369,000	\$5,006,000
Bowling Green	Wood County	1	\$882,000	\$750,000	\$1,632,000
Bryan	Williams County	2	\$267,000	\$226,000	\$493,000
Bucyrus	Port Bucyrus-Crawford County	3	\$219,000	\$169,000	\$388,000
Cadiz	Harrison County	3	\$453,000	\$392,000	\$845,000
Caldwell	Noble County	4	\$43,000	\$30,000	\$73,000
Cambridge	Cambridge Municipal	3	\$199,000	\$147,000	\$346,000
Carrollton	Carroll County-Tolson	3	\$438,000	\$358,000	\$796,000
Celina	Lakefield	3	\$57,000	\$45,000	\$102,000
Chesapeake/Huntington, WV	Lawrence County Airpark	3	\$451,000	\$401,000	\$852,000
Chillicothe	Ross County	1	\$1,102,000	\$872,000	\$1,974,000
Cincinnati	Cincinnati Municipal-Lunken Field	1	\$50,473,000	\$45,550,000	\$96,023,000
Circleville	Pickaway County Memorial	2	\$649,000	\$543,000	\$1,192,000
Cleveland	Burke Lakefront	1	\$18,148,000	\$16,335,000	\$34,483,000
Cleveland	Cuyahoga County	1	\$31,819,000	\$29,774,000	\$61,593,000
Columbus	Bolton Field (Note 1)	1	\$1,473,000	\$1,030,000	\$2,503,000
Columbus	Ohio State University (Note 2)	1	\$20,741,000	\$14,606,000	\$35,347,000
Coshocton	Richard Downing	1	\$2,470,000	\$2,246,000	\$4,716,000
Dayton	Dayton-Wright Brothers	1	\$5,724,000	\$5,050,000	\$10,774,000
Dayton	Greene County-Lewis A. Jackson Regional	3	\$2,016,000	\$1,797,000	\$3,813,000
Dayton	Moraine Air Park	4	\$892,000	\$810,000	\$1,702,000
Defiance	Defiance Memorial	1	\$2,036,000	\$1,842,000	\$3,878,000
Delaware	Delaware Municipal-Jim Moore Field	1	\$1,783,000	\$1,540,000	\$3,323,000
Deshler	Deshler Municipal Landing Strip	4	\$9,000	\$6,000	\$15,000
East Liverpool	Columbiana County	4	\$917,000	\$838,000	\$1,755,000
Findlay	Findlay	2	\$3,215,000	\$2,987,000	\$6,202,000
Fostoria	Fostoria Metropolitan	2	\$851,000	\$681,000	\$1,532,000
Fremont	Sandusky County Regional	2	\$646,000	\$528,000	\$1,174,000
Galion	Galion Municipal	3	\$1,302,000	\$1,232,000	\$2,534,000
Gallipolis	Gallia-Meigs Regional	3	\$251,000	\$203,000	\$454,000
Georgetown	Brown County	4	\$85,000	\$57,000	\$142,000
Hamilton	Butler County Regional	1	\$6,691,000	\$5,819,000	\$12,510,000
Harrison	Cincinnati West	3	\$729,000	\$653,000	\$1,382,000
Hillsboro	Highland County	3	\$914,000	\$824,000	\$1,738,000
Jackson	James A. Rhodes	2	\$169,000	\$130,000	\$299,000
Kelleys Island	Kelleys Island Municipal	4	\$216,000	\$152,000	\$368,000
Kent	Kent State University	3	\$1,591,000	\$1,421,000	\$3,012,000
Kenton	Hardin County	3	\$231,000	\$185,000	\$416,000
Lancaster	Fairfield County	2	\$1,621,000	\$1,460,000	\$3,081,000

Table A-15
Total Payroll from Ohio Airports

Associated City	Airport Name	System Plan Level	Total Direct Payroll	Total Multiplier Payroll	Total Payroll
Lebanon	Warren County/John Lane Field	1	\$1,508,000	\$1,274,000	\$2,782,000
Lima	Lima Allen County	1	\$1,576,000	\$1,266,000	\$2,842,000
London	Madison County	3	\$404,000	\$317,000	\$721,000
Lorain/Elyria	Lorain County Regional	1	\$4,244,000	\$3,734,000	\$7,978,000
Mansfield	Mansfield Lahm Regional	1	\$48,778,000	\$40,828,000	\$89,606,000
Marion	Marion Municipal	1	\$1,774,000	\$1,372,000	\$3,146,000
Marysville	Union County	1	\$821,000	\$663,000	\$1,484,000
McArthur	Vinton County	3	\$82,000	\$58,000	\$140,000
McConnelsville	Morgan County	4	\$864,000	\$823,000	\$1,687,000
Medina	Medina Municipal	3	\$1,148,000	\$983,000	\$2,131,000
Middle Bass	Middle Bass Island	4	\$65,000	\$46,000	\$111,000
Middlefield	Geauga County	3	\$1,509,000	\$1,410,000	\$2,919,000
Middletown	Middletown Regional/Hook Field	1	\$3,679,000	\$3,150,000	\$6,829,000
Millersburg	Holmes County	2	\$854,000	\$713,000	\$1,567,000
Mount Gilead	Morrow County	4	\$594,000	\$553,000	\$1,147,000
Mount Vernon	Knox County	2	\$706,000	\$551,000	\$1,257,000
Napoleon	Henry County	3	\$261,000	\$210,000	\$471,000
New Lexington	Perry County	4	\$216,000	\$146,000	\$362,000
New Philadelphia	Harry Clever Field	2	\$1,578,000	\$1,393,000	\$2,971,000
Newark	Newark-Heath	2	\$1,609,000	\$1,316,000	\$2,925,000
North Bass Island	North Bass Island	4	\$34,000	\$25,000	\$59,000
Norwalk	Norwalk-Huron County	3	\$139,000	\$119,000	\$258,000
Ottawa	Putnam County	1	\$132,000	\$101,000	\$233,000
Oxford	Miami University	2	\$172,000	\$130,000	\$302,000
Piqua	Piqua-Hartzell Field	3	\$465,000	\$429,000	\$894,000
Port Clinton	Carl R. Keller Field	2	\$3,555,000	\$2,755,000	\$6,310,000
Portsmouth	Greater Portsmouth Regional	1	\$764,000	\$566,000	\$1,330,000
Put In Bay	Put In Bay	4	\$933,000	\$652,000	\$1,585,000
Ravenna	Portage County	2	\$970,000	\$827,000	\$1,797,000
Sidney	Sidney Municipal	1	\$634,000	\$503,000	\$1,137,000
Springfield	Springfield-Beckley Municipal	1	\$42,566,000	\$36,019,000	\$78,585,000
Steubenville	Jefferson County Airpark	3	\$1,250,000	\$1,094,000	\$2,344,000
Tiffin	Seneca County	1	\$2,110,000	\$1,905,000	\$4,015,000
Toledo	Toledo Executive	1	\$1,303,000	\$1,087,000	\$2,390,000
Upper Sandusky	Wyandot County	4	\$15,000	\$11,000	\$26,000
Urbana	Grimes Field	2	\$1,120,000	\$898,000	\$2,018,000
Van Wert	Van Wert County	3	\$136,000	\$107,000	\$243,000
Versailles	Darke County	3	\$617,000	\$521,000	\$1,138,000
Wadsworth	Wadsworth Municipal	3	\$625,000	\$495,000	\$1,120,000
Wapakoneta	Neil Armstrong	1	\$2,336,000	\$2,123,000	\$4,459,000
Washington Court House	Fayette County	4	\$106,000	\$77,000	\$183,000
Wauseon	Fulton County	2	\$1,139,000	\$1,056,000	\$2,195,000
Waverly	Pike County	3	\$121,000	\$89,000	\$210,000
West Union	Alexander Salamon	4	\$71,000	\$50,000	\$121,000
Willard	Willard	4	\$16,000	\$12,000	\$28,000
Willoughby	Willoughby Lost Nation Municipal	1	\$1,486,000	\$1,313,000	\$2,799,000
Wilmington	Clinton Field	3	\$846,000	\$769,000	\$1,615,000
Wilmington	Wilmington Air Park	1	\$47,688,000	\$46,088,000	\$93,776,000
Woodsfield	Monroe County	4	\$331,000	\$286,000	\$617,000
Wooster	Wayne County	1	\$3,075,000	\$2,743,000	\$5,818,000
Zanesville	Zanesville Municipal	1	\$1,000,000	\$815,000	\$1,815,000
General Aviation Airports Total			\$366,792,000	\$321,392,000	\$688,184,000
All Airports Total			\$2,304,496,000	\$1,889,820,000	\$4,194,316,000

Note 1: Data is from *Columbus Regional Airport Authority Economic Impact Study Update*, 2012, by CDM Smith; Note 2: Data is from *The Ohio State University Airport Economic Impact Study Update*, 2012, by CDM Smith
Source: CDM Smith and IMPLAN

Table A-16
On-Airport Output from Ohio Airports

Associated City	Airport Name	System Plan Level	On-Airport Output	Multiplier Output	Total On-Airport Output
<i>Commercial Service Airports</i>					
Akron	Akron-Canton	Air Carrier	\$164,821,000	\$124,764,000	\$289,585,000
Cleveland	Cleveland-Hopkins International	Air Carrier	\$1,490,942,000	\$1,229,360,000	\$2,720,302,000
Columbus	Port Columbus International (Note 1)	Air Carrier	\$1,199,095,000	\$926,893,000	\$2,125,988,000
Columbus	Rickenbacker International (Note 1)	Air Carrier	\$445,411,000	\$404,456,000	\$849,867,000
Dayton	James M. Cox Dayton International	Air Carrier	\$278,754,000	\$204,771,000	\$483,525,000
Toledo	Toledo Express	Air Carrier	\$165,391,000	\$126,460,000	\$291,851,000
Youngstown/Warren	Youngstown-Warren Regional	Air Carrier	\$89,381,000	\$74,170,000	\$163,551,000
Commercial Service Airports Total			\$3,833,795,000	\$3,090,874,000	\$6,924,669,000
<i>General Aviation Airports</i>					
Akron	Akron Fulton International	1	\$5,398,000	\$3,727,000	\$9,125,000
Ashland	Ashland County	3	\$8,640,000	\$5,898,000	\$14,538,000
Ashtabula	Northeast Ohio Regional	1	\$2,278,000	\$1,639,000	\$3,917,000
Athens/Albany	Ohio University-Snyder Field	2	\$7,667,000	\$5,320,000	\$12,987,000
Barnesville	Barnesville-Bradfield	3	\$179,000	\$124,000	\$303,000
Batavia	Clermont County	3	\$14,919,000	\$10,309,000	\$25,228,000
Bellefontaine	Bellefontaine Regional	2	\$630,000	\$438,000	\$1,068,000
Bluffton	Bluffton	1	\$7,530,000	\$5,142,000	\$12,672,000
Bowling Green	Wood County	1	\$271,000	\$236,000	\$507,000
Bryan	Williams County	2	\$586,000	\$409,000	\$995,000
Bucyrus	Port Bucyrus-Crawford County	3	\$456,000	\$318,000	\$774,000
Cadiz	Harrison County	3	\$1,510,000	\$1,031,000	\$2,541,000
Caldwell	Noble County	4	\$5,000	\$4,000	\$9,000
Cambridge	Cambridge Municipal	3	\$202,000	\$176,000	\$378,000
Carrollton	Carroll County-Tolson	3	\$1,305,000	\$950,000	\$2,255,000
Celina	Lakefield	3	\$143,000	\$124,000	\$267,000
Chesapeake/Huntington, WV	Lawrence County Airpark	3	\$1,477,000	\$1,005,000	\$2,482,000
Chillicothe	Ross County	1	\$2,047,000	\$1,404,000	\$3,451,000
Cincinnati	Cincinnati Municipal-Lunken Field	1	\$147,314,000	\$102,545,000	\$249,859,000
Circleville	Pickaway County Memorial	2	\$1,085,000	\$761,000	\$1,846,000
Cleveland	Burke Lakefront	1	\$53,139,000	\$36,992,000	\$90,131,000
Cleveland	Cuyahoga County	1	\$100,571,000	\$68,714,000	\$169,285,000
Columbus	Bolton Field (Note 1)	1	\$5,607,000	\$4,519,000	\$10,126,000
Columbus	Ohio State University (Note 2)	1	\$76,404,000	\$60,211,000	\$136,615,000
Coshocton	Richard Downing	1	\$8,198,000	\$5,747,000	\$13,945,000
Dayton	Dayton-Wright Brothers	1	\$16,324,000	\$11,180,000	\$27,504,000
Dayton	Greene County-Lewis A. Jackson Regional	3	\$3,156,000	\$2,266,000	\$5,422,000
Dayton	Moraine Air Park	4	\$3,501,000	\$2,495,000	\$5,996,000
Defiance	Defiance Memorial	1	\$5,421,000	\$3,700,000	\$9,121,000
Delaware	Delaware Municipal-Jim Moore Field	1	\$4,659,000	\$3,349,000	\$8,008,000
Deshler	Deshler Municipal Landing Strip	4	\$7,000	\$6,000	\$13,000
East Liverpool	Columbiana County	4	\$3,347,000	\$2,300,000	\$5,647,000
Findlay	Findlay	2	\$10,904,000	\$7,552,000	\$18,456,000
Fostoria	Fostoria Metropolitan	2	\$1,516,000	\$1,045,000	\$2,561,000
Fremont	Sandusky County Regional	2	\$1,455,000	\$1,048,000	\$2,503,000
Galion	Galion Municipal	3	\$7,090,000	\$4,839,000	\$11,929,000
Gallipolis	Gallia-Meigs Regional	3	\$553,000	\$397,000	\$950,000
Georgetown	Brown County	4	\$5,000	\$4,000	\$9,000
Hamilton	Butler County Regional	1	\$17,265,000	\$11,805,000	\$29,070,000
Harrison	Cincinnati West	3	\$1,452,000	\$1,033,000	\$2,485,000
Hillsboro	Highland County	3	\$3,866,000	\$2,635,000	\$6,501,000
Jackson	James A. Rhodes	2	\$226,000	\$157,000	\$383,000
Kelleys Island	Kelleys Island Municipal	4	\$5,000	\$4,000	\$9,000
Kent	Kent State University	3	\$1,879,000	\$1,409,000	\$3,288,000
Kenton	Hardin County	3	\$603,000	\$421,000	\$1,024,000
Lancaster	Fairfield County	2	\$4,306,000	\$2,962,000	\$7,268,000

Table A-16
On-Airport Output from Ohio Airports

Associated City	Airport Name	System Plan Level	On-Airport Output	Multiplier Output	Total On-Airport Output
Lebanon	Warren County/John Lane Field	1	\$6,297,000	\$4,302,000	\$10,599,000
Lima	Lima Allen County	1	\$2,720,000	\$1,909,000	\$4,629,000
London	Madison County	3	\$1,184,000	\$893,000	\$2,077,000
Lorain/Elyria	Lorain County Regional	1	\$16,754,000	\$11,714,000	\$28,468,000
Mansfield	Mansfield Lahm Regional	1	\$71,947,000	\$60,639,000	\$132,586,000
Marion	Marion Municipal	1	\$2,198,000	\$1,628,000	\$3,826,000
Marysville	Union County	1	\$1,466,000	\$1,014,000	\$2,480,000
McArthur	Vinton County	3	\$65,000	\$54,000	\$119,000
McConnelsville	Morgan County	4	\$2,339,000	\$1,592,000	\$3,931,000
Medina	Medina Municipal	3	\$3,254,000	\$2,252,000	\$5,506,000
Middle Bass	Middle Bass Island	4	\$255,000	\$223,000	\$478,000
Middlefield	Geauga County	3	\$5,958,000	\$4,091,000	\$10,049,000
Middletown	Middletown Regional/Hook Field	1	\$8,958,000	\$6,258,000	\$15,216,000
Millersburg	Holmes County	2	\$1,822,000	\$1,253,000	\$3,075,000
Mount Gilead	Morrow County	4	\$3,867,000	\$2,635,000	\$6,502,000
Mount Vernon	Knox County	2	\$943,000	\$682,000	\$1,625,000
Napoleon	Henry County	3	\$678,000	\$467,000	\$1,145,000
New Lexington	Perry County	4	\$57,000	\$40,000	\$97,000
New Philadelphia	Harry Clever Field	2	\$3,780,000	\$2,633,000	\$6,413,000
Newark	Newark-Heath	2	\$3,219,000	\$2,204,000	\$5,423,000
North Bass Island	North Bass Island	4	\$255,000	\$223,000	\$478,000
Norwalk	Norwalk-Huron County	3	\$482,000	\$353,000	\$835,000
Ottawa	Putnam County	1	\$211,000	\$152,000	\$363,000
Oxford	Miami University	2	\$257,000	\$224,000	\$481,000
Piqua	Piqua-Hartzell Field	3	\$1,463,000	\$1,001,000	\$2,464,000
Port Clinton	Carl R. Keller Field	2	\$5,565,000	\$4,112,000	\$9,677,000
Portsmouth	Greater Portsmouth Regional	1	\$1,395,000	\$1,057,000	\$2,452,000
Put In Bay	Put In Bay	4	\$598,000	\$484,000	\$1,082,000
Ravenna	Portage County	2	\$2,888,000	\$1,998,000	\$4,886,000
Sidney	Sidney Municipal	1	\$1,216,000	\$903,000	\$2,119,000
Springfield	Springfield-Beckley Municipal	1	\$59,854,000	\$50,969,000	\$110,823,000
Steubenville	Jefferson County Airpark	3	\$3,777,000	\$2,607,000	\$6,384,000
Tiffin	Seneca County	1	\$7,104,000	\$4,841,000	\$11,945,000
Toledo	Toledo Executive	1	\$2,911,000	\$1,993,000	\$4,904,000
Upper Sandusky	Wyandot County	4	\$5,000	\$5,000	\$10,000
Urbana	Grimes Field	2	\$3,931,000	\$2,783,000	\$6,714,000
Van Wert	Van Wert County	3	\$124,000	\$100,000	\$224,000
Versailles	Darke County	3	\$866,000	\$602,000	\$1,468,000
Wadsworth	Wadsworth Municipal	3	\$1,204,000	\$838,000	\$2,042,000
Wapakoneta	Neil Armstrong	1	\$5,173,000	\$3,651,000	\$8,824,000
Washington Court House	Fayette County	4	\$102,000	\$84,000	\$186,000
Wauseon	Fulton County	2	\$4,922,000	\$3,361,000	\$8,283,000
Waverly	Pike County	3	\$147,000	\$108,000	\$255,000
West Union	Alexander Salamon	4	\$55,000	\$49,000	\$104,000
Willard	Willard	4	\$60,000	\$52,000	\$112,000
Willoughby	Willoughby Lost Nation Municipal	1	\$4,427,000	\$3,049,000	\$7,476,000
Wilmington	Clinton Field	3	\$2,896,000	\$1,976,000	\$4,872,000
Wilmington	Wilmington Air Park	1	\$102,049,000	\$70,934,000	\$172,983,000
Woodsfield	Monroe County	4	\$794,000	\$545,000	\$1,339,000
Wooster	Wayne County	1	\$10,602,000	\$7,320,000	\$17,922,000
Zanesville	Zanesville Municipal	1	\$2,449,000	\$1,749,000	\$4,198,000
General Aviation Airports Total			\$900,644,000	\$652,956,000	\$1,553,600,000
All Airports Total			\$4,734,439,000	\$3,743,830,000	\$8,478,269,000

Note 1: Data is from *Columbus Regional Airport Authority Economic Impact Study Update*, 2012, by CDM Smith; Note 2: Data is from *The Ohio State University Airport Economic Impact Study Update*, 2012, by CDM Smith
Source: CDM Smith and IMPLAN

Table A-17
CIP Output from Ohio Airports

Associated City	Airport Name	System Plan Level	CIP Direct Output	Multiplier Output	Total CIP Output
<i>Commercial Service Airports</i>					
Akron	Akron-Canton	Air Carrier	\$24,392,000	\$23,458,000	\$47,850,000
Cleveland	Cleveland-Hopkins International	Air Carrier	\$45,634,000	\$43,888,000	\$89,522,000
Columbus	Port Columbus International (Note 1)	Air Carrier	\$79,869,000	\$74,848,000	\$154,717,000
Columbus	Rickenbacker International (Note 1)	Air Carrier	\$27,618,000	\$25,882,000	\$53,500,000
Dayton	James M. Cox Dayton International	Air Carrier	\$33,516,000	\$32,234,000	\$65,750,000
Toledo	Toledo Express	Air Carrier	\$27,553,000	\$26,499,000	\$54,052,000
Youngstown/Warren	Youngstown-Warren Regional	Air Carrier	\$6,022,000	\$5,791,000	\$11,813,000
Commercial Service Airports Total			\$244,604,000	\$232,600,000	\$477,204,000
<i>General Aviation Airports</i>					
Akron	Akron Fulton International	1	\$498,000	\$479,000	\$977,000
Ashland	Ashland County	3	\$1,938,000	\$1,865,000	\$3,803,000
Ashtabula	Northeast Ohio Regional	1	\$271,000	\$260,000	\$531,000
Athens/Albany	Ohio University-Snyder Field	2	\$1,008,000	\$969,000	\$1,977,000
Barnesville	Barnesville-Bradfield	3	\$201,000	\$193,000	\$394,000
Batavia	Clermont County	3	\$838,000	\$807,000	\$1,645,000
Bellefontaine	Bellefontaine Regional	2	\$329,000	\$317,000	\$646,000
Bluffton	Bluffton	1	\$600,000	\$577,000	\$1,177,000
Bowling Green	Wood County	1	\$134,000	\$129,000	\$263,000
Bryan	Williams County	2	\$102,000	\$98,000	\$200,000
Bucyrus	Port Bucyrus-Crawford County	3	\$203,000	\$194,000	\$397,000
Cadiz	Harrison County	3	\$351,000	\$339,000	\$690,000
Caldwell	Noble County	4	\$88,000	\$85,000	\$173,000
Cambridge	Cambridge Municipal	3	\$241,000	\$231,000	\$472,000
Carrollton	Carroll County-Tolson	3	\$189,000	\$182,000	\$371,000
Celina	Lakefield	3	\$13,000	\$12,000	\$25,000
Chesapeake/Huntington, WV	Lawrence County Airport	3	\$211,000	\$204,000	\$415,000
Chillicothe	Ross County	1	\$768,000	\$740,000	\$1,508,000
Cincinnati	Cincinnati Municipal-Lunken Field	1	\$16,799,000	\$16,156,000	\$32,955,000
Circleville	Pickaway County Memorial	2	\$126,000	\$121,000	\$247,000
Cleveland	Burke Lakefront	1	\$4,167,000	\$4,008,000	\$8,175,000
Cleveland	Cuyahoga County	1	\$6,137,000	\$5,902,000	\$12,039,000
Columbus	Bolton Field (Note 1)	1	\$328,000	\$307,000	\$635,000
Columbus	Ohio State University (Note 2)	1	\$4,855,000	\$4,550,000	\$9,405,000
Coshocton	Richard Downing	1	\$470,000	\$451,000	\$921,000
Dayton	Dayton-Wright Brothers	1	\$1,871,000	\$1,799,000	\$3,670,000
Dayton	Greene County-Lewis A. Jackson Regional	3	\$1,105,000	\$1,062,000	\$2,167,000
Dayton	Moraine Air Park	4	\$267,000	\$257,000	\$524,000
Defiance	Defiance Memorial	1	\$750,000	\$721,000	\$1,471,000
Delaware	Delaware Municipal-Jim Moore Field	1	\$873,000	\$840,000	\$1,713,000
Deshler	Deshler Municipal Landing Strip	4	\$0	\$0	\$0
East Liverpool	Columbiana County	4	\$378,000	\$363,000	\$741,000
Findlay	Findlay	2	\$233,000	\$224,000	\$457,000
Fostoria	Fostoria Metropolitan	2	\$879,000	\$846,000	\$1,725,000
Fremont	Sandusky County Regional	2	\$469,000	\$451,000	\$920,000
Galion	Galion Municipal	3	\$211,000	\$203,000	\$414,000
Gallipolis	Gallia-Meigs Regional	3	\$188,000	\$180,000	\$368,000
Georgetown	Brown County	4	\$174,000	\$166,000	\$340,000
Hamilton	Butler County Regional	1	\$1,660,000	\$1,597,000	\$3,257,000
Harrison	Cincinnati West	3	\$330,000	\$318,000	\$648,000
Hillsboro	Highland County	3	\$386,000	\$371,000	\$757,000
Jackson	James A. Rhodes	2	\$155,000	\$148,000	\$303,000
Kelleys Island	Kelleys Island Municipal	4	\$97,000	\$94,000	\$191,000
Kent	Kent State University	3	\$528,000	\$508,000	\$1,036,000
Kenton	Hardin County	3	\$276,000	\$266,000	\$542,000
Lancaster	Fairfield County	2	\$667,000	\$642,000	\$1,309,000

Table A-17
CIP Output from Ohio Airports

Associated City	Airport Name	System Plan Level	CIP Direct Output	Multiplier Output	Total CIP Output
Lebanon	Warren County/John Lane Field	1	\$1,015,000	\$976,000	\$1,991,000
Lima	Lima Allen County	1	\$1,251,000	\$1,203,000	\$2,454,000
London	Madison County	3	\$307,000	\$295,000	\$602,000
Lorain/Elyria	Lorain County Regional	1	\$2,015,000	\$1,939,000	\$3,954,000
Mansfield	Mansfield Lahm Regional	1	\$10,913,000	\$10,496,000	\$21,409,000
Marion	Marion Municipal	1	\$853,000	\$821,000	\$1,674,000
Marysville	Union County	1	\$136,000	\$132,000	\$268,000
McArthur	Vinton County	3	\$118,000	\$114,000	\$232,000
McConnelsville	Morgan County	4	\$98,000	\$95,000	\$193,000
Medina	Medina Municipal	3	\$596,000	\$573,000	\$1,169,000
Middle Bass	Middle Bass Island	4	\$52,000	\$49,000	\$101,000
Middlefield	Geauga County	3	\$401,000	\$386,000	\$787,000
Middletown	Middletown Regional/Hook Field	1	\$850,000	\$817,000	\$1,667,000
Millersburg	Holmes County	2	\$675,000	\$650,000	\$1,325,000
Mount Gilead	Morrow County	4	\$161,000	\$155,000	\$316,000
Mount Vernon	Knox County	2	\$439,000	\$422,000	\$861,000
Napoleon	Henry County	3	\$340,000	\$326,000	\$666,000
New Lexington	Perry County	4	\$508,000	\$488,000	\$996,000
New Philadelphia	Harry Clever Field	2	\$468,000	\$451,000	\$919,000
Newark	Newark-Heath	2	\$1,572,000	\$1,512,000	\$3,084,000
North Bass Island	North Bass Island	4	\$36,000	\$34,000	\$70,000
Norwalk	Norwalk-Huron County	3	\$44,000	\$43,000	\$87,000
Ottawa	Putnam County	1	\$71,000	\$69,000	\$140,000
Oxford	Miami University	2	\$181,000	\$175,000	\$356,000
Piqua	Piqua-Hartzell Field	3	\$60,000	\$58,000	\$118,000
Port Clinton	Carl R. Keller Field	2	\$3,343,000	\$3,215,000	\$6,558,000
Portsmouth	Greater Portsmouth Regional	1	\$405,000	\$390,000	\$795,000
Put In Bay	Put In Bay	4	\$970,000	\$933,000	\$1,903,000
Ravenna	Portage County	2	\$463,000	\$445,000	\$908,000
Sidney	Sidney Municipal	1	\$430,000	\$414,000	\$844,000
Springfield	Springfield-Beckley Municipal	1	\$3,079,000	\$2,962,000	\$6,041,000
Steubenville	Jefferson County Airpark	3	\$816,000	\$784,000	\$1,600,000
Tiffin	Seneca County	1	\$479,000	\$461,000	\$940,000
Toledo	Toledo Executive	1	\$406,000	\$391,000	\$797,000
Upper Sandusky	Wyandot County	4	\$0	\$0	\$0
Urbana	Grimes Field	2	\$216,000	\$207,000	\$423,000
Van Wert	Van Wert County	3	\$87,000	\$84,000	\$171,000
Versailles	Darke County	3	\$555,000	\$534,000	\$1,089,000
Wadsworth	Wadsworth Municipal	3	\$676,000	\$650,000	\$1,326,000
Wapakoneta	Neil Armstrong	1	\$448,000	\$430,000	\$878,000
Washington Court House	Fayette County	4	\$138,000	\$132,000	\$270,000
Wauseon	Fulton County	2	\$265,000	\$256,000	\$521,000
Waverly	Pike County	3	\$197,000	\$190,000	\$387,000
West Union	Alexander Salamon	4	\$125,000	\$120,000	\$245,000
Willard	Willard	4	\$0	\$0	\$0
Willoughby	Willoughby Lost Nation Municipal	1	\$237,000	\$228,000	\$465,000
Wilmington	Clinton Field	3	\$279,000	\$269,000	\$548,000
Wilmington	Wilmington Air Park	1	\$612,000	\$588,000	\$1,200,000
Woodsfield	Monroe County	4	\$270,000	\$260,000	\$530,000
Wooster	Wayne County	1	\$1,027,000	\$987,000	\$2,014,000
Zanesville	Zanesville Municipal	1	\$708,000	\$680,000	\$1,388,000
General Aviation Airports Total			\$91,753,000	\$88,121,000	\$179,874,000
All Airports Total			\$336,357,000	\$320,721,000	\$657,078,000

Note 1: Data is from *Columbus Regional Airport Authority Economic Impact Study Update*, 2012, by CDM Smith; Note 2: Data is from *The Ohio State University Airport Economic Impact Study Update*, 2012, by CDM Smith

Source: CDM Smith and IMPLAN

Table A-18
General Aviation Visitor Output from Ohio Airports

Associated City	Airport Name	System Plan Level	Visitor-Related Output	Multiplier Output	Total Visitor Related Output
Commercial Service Airports					
Akron	Akron-Canton	Air Carrier	\$5,304,000	\$4,076,000	\$9,380,000
Cleveland	Cleveland-Hopkins International	Air Carrier	\$909,000	\$698,000	\$1,607,000
Columbus	Port Columbus International (Note 1)	Air Carrier	\$3,464,000	\$2,817,000	\$6,281,000
Columbus	Rickenbacker International (Note 1)	Air Carrier	\$241,000	\$196,000	\$437,000
Dayton	James M. Cox Dayton International	Air Carrier	\$2,975,000	\$2,286,000	\$5,261,000
Toledo	Toledo Express	Air Carrier	\$2,148,000	\$1,650,000	\$3,798,000
Youngstown/Warren	Youngstown-Warren Regional	Air Carrier	\$1,372,000	\$1,054,000	\$2,426,000
Commercial Service Airports Total			\$16,413,000	\$12,777,000	\$29,190,000
General Aviation Airports					
Akron	Akron Fulton International	1	\$1,030,000	\$791,000	\$1,821,000
Ashland	Ashland County	3	\$26,000	\$20,000	\$46,000
Ashtabula	Northeast Ohio Regional	1	\$593,000	\$456,000	\$1,049,000
Athens/Albany	Ohio University-Snyder Field	2	\$952,000	\$732,000	\$1,684,000
Barnesville	Barnesville-Bradfield	3	\$62,000	\$48,000	\$110,000
Batavia	Clermont County	3	\$328,000	\$252,000	\$580,000
Bellefontaine	Bellefontaine Regional	2	\$243,000	\$187,000	\$430,000
Bluffton	Bluffton	1	\$625,000	\$480,000	\$1,105,000
Bowling Green	Wood County	1	\$766,000	\$589,000	\$1,355,000
Bryan	Williams County	2	\$171,000	\$131,000	\$302,000
Bucyrus	Port Bucyrus-Crawford County	3	\$186,000	\$143,000	\$329,000
Cadiz	Harrison County	3	\$56,000	\$43,000	\$99,000
Caldwell	Noble County	4	\$21,000	\$16,000	\$37,000
Cambridge	Cambridge Municipal	3	\$64,000	\$49,000	\$113,000
Carrollton	Carroll County-Tolson	3	\$192,000	\$148,000	\$340,000
Celina	Lakefield	3	\$83,000	\$64,000	\$147,000
Chesapeake/Huntington, WV	Lawrence County Airpark	3	\$87,000	\$67,000	\$154,000
Chillicothe	Ross County	1	\$1,016,000	\$781,000	\$1,797,000
Cincinnati	Cincinnati Municipal-Lunken Field	1	\$5,701,000	\$4,381,000	\$10,082,000
Circleville	Pickaway County Memorial	2	\$707,000	\$543,000	\$1,250,000
Cleveland	Burke Lakefront	1	\$4,869,000	\$3,741,000	\$8,610,000
Cleveland	Cuyahoga County	1	\$2,213,000	\$1,700,000	\$3,913,000
Columbus	Bolton Field (Note 1)	1	\$221,000	\$180,000	\$401,000
Columbus	Ohio State University (Note 2)	1	\$6,471,000	\$5,262,000	\$11,733,000
Coshocton	Richard Downing	1	\$471,000	\$362,000	\$833,000
Dayton	Dayton-Wright Brothers	1	\$2,658,000	\$2,042,000	\$4,700,000
Dayton	Greene County-Lewis A. Jackson Regional	3	\$99,000	\$76,000	\$175,000
Dayton	Moraine Air Park	4	\$145,000	\$111,000	\$256,000
Defiance	Defiance Memorial	1	\$417,000	\$320,000	\$737,000
Delaware	Delaware Municipal-Jim Moore Field	1	\$652,000	\$501,000	\$1,153,000
Deshler	Deshler Municipal Landing Strip	4	\$10,000	\$8,000	\$18,000
East Liverpool	Columbiana County	4	\$57,000	\$44,000	\$101,000
Findlay	Findlay	2	\$536,000	\$412,000	\$948,000
Fostoria	Fostoria Metropolitan	2	\$357,000	\$274,000	\$631,000
Fremont	Sandusky County Regional	2	\$308,000	\$237,000	\$545,000
Galion	Galion Municipal	3	\$46,000	\$35,000	\$81,000
Gallipolis	Gallia-Meigs Regional	3	\$176,000	\$135,000	\$311,000
Georgetown	Brown County	4	\$38,000	\$29,000	\$67,000
Hamilton	Butler County Regional	1	\$4,673,000	\$3,591,000	\$8,264,000
Harrison	Cincinnati West	3	\$30,000	\$23,000	\$53,000
Hillsboro	Highland County	3	\$123,000	\$95,000	\$218,000
Jackson	James A. Rhodes	2	\$132,000	\$101,000	\$233,000
Kelleys Island	Kelleys Island Municipal	4	\$462,000	\$355,000	\$817,000
Kent	Kent State University	3	\$262,000	\$201,000	\$463,000
Kenton	Hardin County	3	\$53,000	\$41,000	\$94,000
Lancaster	Fairfield County	2	\$286,000	\$220,000	\$506,000

Table A-18
General Aviation Visitor Output from Ohio Airports

Associated City	Airport Name	System Plan Level	Visitor-Related Output	Multiplier Output	Total Visitor Related Output
Lebanon	Warren County/John Lane Field	1	\$675,000	\$519,000	\$1,194,000
Lima	Lima Allen County	1	\$1,042,000	\$801,000	\$1,843,000
London	Madison County	3	\$326,000	\$250,000	\$576,000
Lorain/Elyria	Lorain County Regional	1	\$550,000	\$423,000	\$973,000
Mansfield	Mansfield Lahm Regional	1	\$1,410,000	\$1,083,000	\$2,493,000
Marion	Marion Municipal	1	\$2,137,000	\$1,642,000	\$3,779,000
Marysville	Union County	1	\$1,196,000	\$919,000	\$2,115,000
McArthur	Vinton County	3	\$63,000	\$48,000	\$111,000
McConnelsville	Morgan County	4	\$20,000	\$15,000	\$35,000
Medina	Medina Municipal	3	\$531,000	\$408,000	\$939,000
Middle Bass	Middle Bass Island	4	\$71,000	\$55,000	\$126,000
Middlefield	Geauga County	3	\$27,000	\$21,000	\$48,000
Middletown	Middletown Regional/Hook Field	1	\$3,036,000	\$2,332,000	\$5,368,000
Millersburg	Holmes County	2	\$328,000	\$252,000	\$580,000
Mount Gilead	Morrow County	4	\$31,000	\$24,000	\$55,000
Mount Vernon	Knox County	2	\$643,000	\$494,000	\$1,137,000
Napoleon	Henry County	3	\$16,000	\$12,000	\$28,000
New Lexington	Perry County	4	\$7,000	\$5,000	\$12,000
New Philadelphia	Harry Clever Field	2	\$226,000	\$174,000	\$400,000
Newark	Newark-Heath	2	\$533,000	\$410,000	\$943,000
North Bass Island	North Bass Island	4	\$6,000	\$5,000	\$11,000
Norwalk	Norwalk-Huron County	3	\$104,000	\$80,000	\$184,000
Ottawa	Putnam County	1	\$200,000	\$154,000	\$354,000
Oxford	Miami University	2	\$43,000	\$33,000	\$76,000
Piqua	Piqua-Hartzell Field	3	\$158,000	\$121,000	\$279,000
Port Clinton	Carl R. Keller Field	2	\$1,374,000	\$1,056,000	\$2,430,000
Portsmouth	Greater Portsmouth Regional	1	\$730,000	\$561,000	\$1,291,000
Put In Bay	Put In Bay	4	\$1,087,000	\$835,000	\$1,922,000
Ravenna	Portage County	2	\$536,000	\$412,000	\$948,000
Sidney	Sidney Municipal	1	\$600,000	\$461,000	\$1,061,000
Springfield	Springfield-Beckley Municipal	1	\$185,000	\$142,000	\$327,000
Steubenville	Jefferson County Airpark	3	\$71,000	\$55,000	\$126,000
Tiffin	Seneca County	1	\$834,000	\$641,000	\$1,475,000
Toledo	Toledo Executive	1	\$1,329,000	\$1,021,000	\$2,350,000
Upper Sandusky	Wyandot County	4	\$27,000	\$21,000	\$48,000
Urbana	Grimes Field	2	\$1,087,000	\$835,000	\$1,922,000
Van Wert	Van Wert County	3	\$115,000	\$88,000	\$203,000
Versailles	Darke County	3	\$47,000	\$36,000	\$83,000
Wadsworth	Wadsworth Municipal	3	\$306,000	\$235,000	\$541,000
Wapakoneta	Neil Armstrong	1	\$782,000	\$601,000	\$1,383,000
Washington Court House	Fayette County	4	\$48,000	\$37,000	\$85,000
Wauseon	Fulton County	2	\$104,000	\$80,000	\$184,000
Waverly	Pike County	3	\$31,000	\$24,000	\$55,000
West Union	Alexander Salamon	4	\$26,000	\$20,000	\$46,000
Willard	Willard	4	\$30,000	\$23,000	\$53,000
Willoughby	Willoughby Lost Nation Municipal	1	\$841,000	\$646,000	\$1,487,000
Wilmington	Clinton Field	3	\$198,000	\$152,000	\$350,000
Wilmington	Wilmington Air Park	1	\$93,000	\$71,000	\$164,000
Woodsfield	Monroe County	4	\$22,000	\$17,000	\$39,000
Wooster	Wayne County	1	\$1,069,000	\$821,000	\$1,890,000
Zanesville	Zanesville Municipal	1	\$469,000	\$360,000	\$829,000
General Aviation Airports Total			\$64,094,000	\$49,548,000	\$113,642,000
All Airports Total			\$80,507,000	\$62,325,000	\$142,832,000

Note 1: Data is from *Columbus Regional Airport Authority Economic Impact Study Update*, 2012, by CDM Smith; Note 2: Data is from *The Ohio State University Airport Economic Impact Study Update*, 2012, by CDM Smith
Source: CDM Smith and IMPLAN

Table A-19
Commercial Service Visitor Output from Ohio Airports

Associated City	Airport Name	System Plan Level	Visitor-Related Output	Multiplier Output	Total Visitor Related Output
<i>Commercial Service Airports</i>					
Akron	Akron-Canton	Air Carrier	\$189,733,000	\$153,657,000	\$343,390,000
Cleveland	Cleveland-Hopkins International	Air Carrier	\$966,847,000	\$783,012,000	\$1,749,859,000
Columbus	Port Columbus International (Note 1)	Air Carrier	\$788,548,000	\$643,159,000	\$1,431,707,000
Columbus	Rickenbacker International (Note 1)	Air Carrier	\$94,000	\$77,000	\$171,000
Dayton	James M. Cox Dayton International	Air Carrier	\$271,951,000	\$220,243,000	\$492,194,000
Toledo	Toledo Express	Air Carrier	\$20,765,000	\$16,817,000	\$37,582,000
Youngstown/Warren	Youngstown-Warren Regional	Air Carrier	\$501,000	\$406,000	\$907,000
Commercial Service Airports Total			\$2,238,439,000	\$1,817,371,000	\$4,055,810,000

Note 1: Data is from *Columbus Regional Airport Authority Economic Impact Study Update*, 2012, by CDM Smith

Source: CDM Smith and IMPLAN

Table A-20
Total Output from Ohio Airports

Associated City	Airport Name	System Plan Level	Total Direct Output	Total Multiplier Output	Total Output
<i>Commercial Service Airports</i>					
Akron	Akron-Canton	Air Carrier	\$384,250,000	\$305,955,000	\$690,205,000
Cleveland	Cleveland-Hopkins International	Air Carrier	\$2,504,332,000	\$2,056,958,000	\$4,561,290,000
Columbus	Port Columbus International (Note 1)	Air Carrier	\$2,070,976,000	\$1,647,717,000	\$3,718,693,000
Columbus	Rickenbacker International (Note 1)	Air Carrier	\$473,364,000	\$430,611,000	\$903,975,000
Dayton	James M. Cox Dayton International	Air Carrier	\$587,196,000	\$459,534,000	\$1,046,730,000
Toledo	Toledo Express	Air Carrier	\$215,857,000	\$171,426,000	\$387,283,000
Youngstown/Warren	Youngstown-Warren Regional	Air Carrier	\$97,276,000	\$81,421,000	\$178,697,000
Commercial Service Airports Total			\$6,333,251,000	\$5,153,622,000	\$11,486,873,000
<i>General Aviation Airports</i>					
Akron	Akron Fulton International	1	\$6,926,000	\$4,997,000	\$11,923,000
Ashland	Ashland County	3	\$10,604,000	\$7,783,000	\$18,387,000
Ashtabula	Northeast Ohio Regional	1	\$3,142,000	\$2,355,000	\$5,497,000
Athens/Albany	Ohio University-Snyder Field	2	\$9,627,000	\$7,021,000	\$16,648,000
Barnesville	Barnesville-Bradfield	3	\$442,000	\$365,000	\$807,000
Batavia	Clermont County	3	\$16,085,000	\$11,368,000	\$27,453,000
Bellefontaine	Bellefontaine Regional	2	\$1,202,000	\$942,000	\$2,144,000
Bluffton	Bluffton	1	\$8,755,000	\$6,199,000	\$14,954,000
Bowling Green	Wood County	1	\$1,171,000	\$954,000	\$2,125,000
Bryan	Williams County	2	\$859,000	\$638,000	\$1,497,000
Bucyrus	Port Bucyrus-Crawford County	3	\$845,000	\$655,000	\$1,500,000
Cadiz	Harrison County	3	\$1,917,000	\$1,413,000	\$3,330,000
Caldwell	Noble County	4	\$114,000	\$105,000	\$219,000
Cambridge	Cambridge Municipal	3	\$507,000	\$456,000	\$963,000
Carrollton	Carroll County-Tolson	3	\$1,686,000	\$1,280,000	\$2,966,000
Celina	Lakefield	3	\$239,000	\$200,000	\$439,000
Chesapeake/Huntington, WV	Lawrence County Airpark	3	\$1,775,000	\$1,276,000	\$3,051,000
Chillicothe	Ross County	1	\$3,831,000	\$2,925,000	\$6,756,000
Cincinnati	Cincinnati Municipal-Lunken Field	1	\$169,814,000	\$123,082,000	\$292,896,000
Circleville	Pickaway County Memorial	2	\$1,918,000	\$1,425,000	\$3,343,000
Cleveland	Burke Lakefront	1	\$62,175,000	\$44,741,000	\$106,916,000
Cleveland	Cuyahoga County	1	\$108,921,000	\$76,316,000	\$185,237,000

Table A-20
Total Output from Ohio Airports

Associated City	Airport Name	System Plan Level	Total Direct Output	Total Multiplier Output	Total Output
Columbus	Bolton Field (Note 1)	1	\$6,156,000	\$5,006,000	\$11,162,000
Columbus	Ohio State University (Note 2)	1	\$87,730,000	\$70,023,000	\$157,753,000
Coshocton	Richard Downing	1	\$9,139,000	\$6,560,000	\$15,699,000
Dayton	Dayton-Wright Brothers	1	\$20,853,000	\$15,021,000	\$35,874,000
Dayton	Greene County-Lewis A. Jackson Regional	3	\$4,360,000	\$3,404,000	\$7,764,000
Dayton	Moraine Air Park	4	\$3,913,000	\$2,863,000	\$6,776,000
Defiance	Defiance Memorial	1	\$6,588,000	\$4,741,000	\$11,329,000
Delaware	Delaware Municipal-Jim Moore Field	1	\$6,184,000	\$4,690,000	\$10,874,000
Deshler	Deshler Municipal Landing Strip	4	\$17,000	\$14,000	\$31,000
East Liverpool	Columbiana County	4	\$3,782,000	\$2,707,000	\$6,489,000
Findlay	Findlay	2	\$11,673,000	\$8,188,000	\$19,861,000
Fostoria	Fostoria Metropolitan	2	\$2,752,000	\$2,165,000	\$4,917,000
Fremont	Sandusky County Regional	2	\$2,232,000	\$1,736,000	\$3,968,000
Galion	Galion Municipal	3	\$7,347,000	\$5,077,000	\$12,424,000
Gallipolis	Gallia-Meigs Regional	3	\$917,000	\$712,000	\$1,629,000
Georgetown	Brown County	4	\$217,000	\$199,000	\$416,000
Hamilton	Butler County Regional	1	\$23,598,000	\$16,993,000	\$40,591,000
Harrison	Cincinnati West	3	\$1,812,000	\$1,374,000	\$3,186,000
Hillsboro	Highland County	3	\$4,375,000	\$3,101,000	\$7,476,000
Jackson	James A. Rhodes	2	\$513,000	\$406,000	\$919,000
Kelleys Island	Kelleys Island Municipal	4	\$564,000	\$453,000	\$1,017,000
Kent	Kent State University	3	\$2,669,000	\$2,118,000	\$4,787,000
Kenton	Hardin County	3	\$932,000	\$728,000	\$1,660,000
Lancaster	Fairfield County	2	\$5,259,000	\$3,824,000	\$9,083,000
Lebanon	Warren County/John Lane Field	1	\$7,987,000	\$5,797,000	\$13,784,000
Lima	Lima Allen County	1	\$5,013,000	\$3,913,000	\$8,926,000
London	Madison County	3	\$1,817,000	\$1,438,000	\$3,255,000
Lorain/Elyria	Lorain County Regional	1	\$19,319,000	\$14,076,000	\$33,395,000
Mansfield	Mansfield Lahm Regional	1	\$84,270,000	\$72,218,000	\$156,488,000
Marion	Marion Municipal	1	\$5,188,000	\$4,091,000	\$9,279,000
Marysville	Union County	1	\$2,798,000	\$2,065,000	\$4,863,000
McArthur	Vinton County	3	\$246,000	\$216,000	\$462,000
McConnelsville	Morgan County	4	\$2,457,000	\$1,702,000	\$4,159,000
Medina	Medina Municipal	3	\$4,381,000	\$3,233,000	\$7,614,000
Middle Bass	Middle Bass Island	4	\$378,000	\$327,000	\$705,000
Middlefield	Geauga County	3	\$6,386,000	\$4,498,000	\$10,884,000
Middletown	Middletown Regional/Hook Field	1	\$12,844,000	\$9,407,000	\$22,251,000
Millersburg	Holmes County	2	\$2,825,000	\$2,155,000	\$4,980,000
Mount Gilead	Morrow County	4	\$4,059,000	\$2,814,000	\$6,873,000
Mount Vernon	Knox County	2	\$2,025,000	\$1,598,000	\$3,623,000
Napoleon	Henry County	3	\$1,034,000	\$805,000	\$1,839,000
New Lexington	Perry County	4	\$572,000	\$533,000	\$1,105,000
New Philadelphia	Harry Clever Field	2	\$4,474,000	\$3,258,000	\$7,732,000
Newark	Newark-Heath	2	\$5,324,000	\$4,126,000	\$9,450,000
North Bass Island	North Bass Island	4	\$297,000	\$262,000	\$559,000
Norwalk	Norwalk-Huron County	3	\$630,000	\$476,000	\$1,106,000
Ottawa	Putnam County	1	\$482,000	\$375,000	\$857,000
Oxford	Miami University	2	\$481,000	\$432,000	\$913,000
Piqua	Piqua-Hartzell Field	3	\$1,681,000	\$1,180,000	\$2,861,000
Port Clinton	Carl R. Keller Field	2	\$10,282,000	\$8,383,000	\$18,665,000
Portsmouth	Greater Portsmouth Regional	1	\$2,530,000	\$2,008,000	\$4,538,000
Put In Bay	Put In Bay	4	\$2,655,000	\$2,252,000	\$4,907,000
Ravenna	Portage County	2	\$3,887,000	\$2,855,000	\$6,742,000
Sidney	Sidney Municipal	1	\$2,246,000	\$1,778,000	\$4,024,000
Springfield	Springfield-Beckley Municipal	1	\$63,118,000	\$54,073,000	\$117,191,000
Steubenville	Jefferson County Airpark	3	\$4,664,000	\$3,446,000	\$8,110,000
Tiffin	Seneca County	1	\$8,417,000	\$5,943,000	\$14,360,000
Toledo	Toledo Executive	1	\$4,646,000	\$3,405,000	\$8,051,000

Table A-20
Total Output from Ohio Airports

Associated City	Airport Name	System Plan Level	Total Direct Output	Total Multiplier Output	Total Output
Upper Sandusky	Wyandot County	4	\$32,000	\$26,000	\$58,000
Urbana	Grimes Field	2	\$5,234,000	\$3,825,000	\$9,059,000
Van Wert	Van Wert County	3	\$326,000	\$272,000	\$598,000
Versailles	Darke County	3	\$1,468,000	\$1,172,000	\$2,640,000
Wadsworth	Wadsworth Municipal	3	\$2,186,000	\$1,723,000	\$3,909,000
Wapakoneta	Neil Armstrong	1	\$6,403,000	\$4,682,000	\$11,085,000
Washington Court House	Fayette County	4	\$288,000	\$253,000	\$541,000
Wauseon	Fulton County	2	\$5,291,000	\$3,697,000	\$8,988,000
Waverly	Pike County	3	\$375,000	\$322,000	\$697,000
West Union	Alexander Salamon	4	\$206,000	\$189,000	\$395,000
Willard	Willard	4	\$90,000	\$75,000	\$165,000
Willoughby	Willoughby Lost Nation Municipal	1	\$5,505,000	\$3,923,000	\$9,428,000
Wilmington	Clinton Field	3	\$3,373,000	\$2,397,000	\$5,770,000
Wilmington	Wilmington Air Park	1	\$102,754,000	\$71,593,000	\$174,347,000
Woodsfield	Monroe County	4	\$1,086,000	\$822,000	\$1,908,000
Wooster	Wayne County	1	\$12,698,000	\$9,128,000	\$21,826,000
Zanesville	Zanesville Municipal	1	\$3,626,000	\$2,789,000	\$6,415,000
General Aviation Airports Total			\$1,056,491,000	\$790,625,000	\$1,847,116,000
All Airports Total			\$7,389,742,000	\$5,944,247,000	\$13,333,989,000

Note 1: Data is from *Columbus Regional Airport Authority Economic Impact Study Update*, 2012, by CDM Smith; Note 2: Data is from *The Ohio State University Airport Economic Impact Study Update*, 2012, by CDM Smith
Source: CDM Smith and IMPLAN

Table A-21
Total Economic Impacts from Ohio Airports

Associated City	Airport Name	System Plan Level	Total Employment	Total Payroll	Total Output
Commercial Service Airports					
Akron	Akron-Canton	Air Carrier	7,688	\$242,191,000	\$690,205,000
Cleveland	Cleveland-Hopkins International	Air Carrier	40,186	\$1,303,089,000	\$4,561,290,000
Columbus	Port Columbus International (Note 1)	Air Carrier	33,464	\$1,061,252,000	\$3,718,693,000
Columbus	Rickenbacker International (Note 1)	Air Carrier	4,806	\$267,282,000	\$903,975,000
Dayton	James M. Cox Dayton International	Air Carrier	11,111	\$351,576,000	\$1,046,730,000
Toledo	Toledo Express	Air Carrier	3,973	\$178,866,000	\$387,283,000
Youngstown/Warren	Youngstown-Warren Regional	Air Carrier	4,731	\$101,876,000	\$178,697,000
Commercial Service Airports Total			105,959	\$3,506,132,000	\$11,486,873,000
General Aviation Airports					
Akron	Akron Fulton International	1	117	\$3,653,000	\$11,923,000
Ashland	Ashland County	3	141	\$5,623,000	\$18,387,000
Ashtabula	Northeast Ohio Regional	1	45	\$1,856,000	\$5,497,000
Athens/Albany	Ohio University-Snyder Field	2	184	\$7,832,000	\$16,648,000
Barnesville	Barnesville-Bradfield	3	8	\$224,000	\$807,000
Batavia	Clermont County	3	263	\$7,418,000	\$27,453,000
Bellefontaine	Bellefontaine Regional	2	27	\$614,000	\$2,144,000
Bluffton	Bluffton	1	124	\$5,006,000	\$14,954,000
Bowling Green	Wood County	1	63	\$1,632,000	\$2,125,000
Bryan	Williams County	2	18	\$493,000	\$1,497,000
Bucyrus	Port Bucyrus-Crawford County	3	15	\$388,000	\$1,500,000
Cadiz	Harrison County	3	29	\$845,000	\$3,330,000
Caldwell	Noble County	4	3	\$73,000	\$219,000
Cambridge	Cambridge Municipal	3	19	\$346,000	\$963,000
Carrollton	Carroll County-Tolson	3	37	\$796,000	\$2,966,000
Celina	Lakefield	3	5	\$102,000	\$439,000
Chesapeake/Huntington, WV	Lawrence County Airpark	3	29	\$852,000	\$3,051,000
Chillicothe	Ross County	1	73	\$1,974,000	\$6,756,000
Cincinnati	Cincinnati Municipal-Lunken Field	1	2,155	\$96,023,000	\$292,896,000

Table A-21
Total Economic Impacts from Ohio Airports

Associated City	Airport Name	System Plan Level	Total Employment	Total Payroll	Total Output
Circleville	Pickaway County Memorial	2	38	\$1,192,000	\$3,343,000
Cleveland	Burke Lakefront	1	953	\$34,483,000	\$106,916,000
Cleveland	Cuyahoga County	1	1,262	\$61,593,000	\$185,237,000
Columbus	Bolton Field (Note 1)	1	104	\$2,503,000	\$11,162,000
Columbus	Ohio State University (Note 2)	1	813	\$35,347,000	\$157,753,000
Coshocton	Richard Downing	1	146	\$4,716,000	\$15,699,000
Dayton	Dayton-Wright Brothers	1	323	\$10,774,000	\$35,874,000
Dayton	Greene County-Lewis A. Jackson Regional	3	135	\$3,813,000	\$7,764,000
Dayton	Moraine Air Park	4	56	\$1,702,000	\$6,776,000
Defiance	Defiance Memorial	1	113	\$3,878,000	\$11,329,000
Delaware	Delaware Municipal-Jim Moore Field	1	96	\$3,323,000	\$10,874,000
Deshler	Deshler Municipal Landing Strip	4	1	\$15,000	\$31,000
East Liverpool	Columbiana County	4	47	\$1,755,000	\$6,489,000
Findlay	Findlay	2	91	\$6,202,000	\$19,861,000
Fostoria	Fostoria Metropolitan	2	46	\$1,532,000	\$4,917,000
Fremont	Sandusky County Regional	2	34	\$1,174,000	\$3,968,000
Galion	Galion Municipal	3	49	\$2,534,000	\$12,424,000
Gallipolis	Gallia-Meigs Regional	3	15	\$454,000	\$1,629,000
Georgetown	Brown County	4	5	\$142,000	\$416,000
Hamilton	Butler County Regional	1	334	\$12,510,000	\$40,591,000
Harrison	Cincinnati West	3	52	\$1,382,000	\$3,186,000
Hillsboro	Highland County	3	57	\$1,738,000	\$7,476,000
Jackson	James A. Rhodes	2	12	\$299,000	\$919,000
Kelleys Island	Kelleys Island Municipal	4	15	\$368,000	\$1,017,000
Kent	Kent State University	3	102	\$3,012,000	\$4,787,000
Kenton	Hardin County	3	14	\$416,000	\$1,660,000
Lancaster	Fairfield County	2	121	\$3,081,000	\$9,083,000
Lebanon	Warren County/John Lane Field	1	116	\$2,782,000	\$13,784,000
Lima	Lima Allen County	1	79	\$2,842,000	\$8,926,000
London	Madison County	3	34	\$721,000	\$3,255,000
Lorain/Elyria	Lorain County Regional	1	213	\$7,978,000	\$33,395,000
Mansfield	Mansfield Lahm Regional	1	2,202	\$89,606,000	\$156,488,000
Marion	Marion Municipal	1	99	\$3,146,000	\$9,279,000
Marysville	Union County	1	54	\$1,484,000	\$4,863,000
McArthur	Vinton County	3	8	\$140,000	\$462,000
McConnelsville	Morgan County	4	57	\$1,687,000	\$4,159,000
Medina	Medina Municipal	3	62	\$2,131,000	\$7,614,000
Middle Bass	Middle Bass Island	4	4	\$111,000	\$705,000
Middlefield	Geauga County	3	72	\$2,919,000	\$10,884,000
Middletown	Middletown Regional/Hook Field	1	269	\$6,829,000	\$22,251,000
Millersburg	Holmes County	2	45	\$1,567,000	\$4,980,000
Mount Gilead	Morrow County	4	39	\$1,147,000	\$6,873,000
Mount Vernon	Knox County	2	39	\$1,257,000	\$3,623,000
Napoleon	Henry County	3	19	\$471,000	\$1,839,000
New Lexington	Perry County	4	12	\$362,000	\$1,105,000
New Philadelphia	Harry Clever Field	2	96	\$2,971,000	\$7,732,000
Newark	Newark-Heath	2	70	\$2,925,000	\$9,450,000
North Bass Island	North Bass Island	4	2	\$59,000	\$559,000
Norwalk	Norwalk-Huron County	3	11	\$258,000	\$1,106,000
Ottawa	Putnam County	1	9	\$233,000	\$857,000
Oxford	Miami University	2	8	\$302,000	\$913,000
Piqua	Piqua-Hartzell Field	3	18	\$894,000	\$2,861,000
Port Clinton	Carl R. Keller Field	2	198	\$6,310,000	\$18,665,000
Portsmouth	Greater Portsmouth Regional	1	48	\$1,330,000	\$4,538,000
Put In Bay	Put In Bay	4	52	\$1,585,000	\$4,907,000
Ravenna	Portage County	2	59	\$1,797,000	\$6,742,000
Sidney	Sidney Municipal	1	41	\$1,137,000	\$4,024,000

Table A-21
Total Economic Impacts from Ohio Airports

Associated City	Airport Name	System Plan Level	Total Employment	Total Payroll	Total Output
Springfield	Springfield-Beckley Municipal	1	1,452	\$78,585,000	\$117,191,000
Steubenville	Jefferson County Airpark	3	66	\$2,344,000	\$8,110,000
Tiffin	Seneca County	1	131	\$4,015,000	\$14,360,000
Toledo	Toledo Executive	1	84	\$2,390,000	\$8,051,000
Upper Sandusky	Wyandot County	4	2	\$26,000	\$58,000
Urbana	Grimes Field	2	99	\$2,018,000	\$9,059,000
Van Wert	Van Wert County	3	11	\$243,000	\$598,000
Versailles	Darke County	3	20	\$1,138,000	\$2,640,000
Wadsworth	Wadsworth Municipal	3	45	\$1,120,000	\$3,909,000
Wapakoneta	Neil Armstrong	1	108	\$4,459,000	\$11,085,000
Washington Court House	Fayette County	4	8	\$183,000	\$541,000
Wauseon	Fulton County	2	78	\$2,195,000	\$8,988,000
Waverly	Pike County	3	6	\$210,000	\$697,000
West Union	Alexander Salamon	4	4	\$121,000	\$395,000
Willard	Willard	4	2	\$28,000	\$165,000
Willoughby	Willoughby Lost Nation Municipal	1	117	\$2,799,000	\$9,428,000
Wilmington	Clinton Field	3	53	\$1,615,000	\$5,770,000
Wilmington	Wilmington Air Park	1	2,567	\$93,776,000	\$174,347,000
Woodsfield	Monroe County	4	14	\$617,000	\$1,908,000
Wooster	Wayne County	1	148	\$5,818,000	\$21,826,000
Zanesville	Zanesville Municipal	1	58	\$1,815,000	\$6,415,000
General Aviation Airports Total			17,497	\$688,184,000	\$1,847,116,000
All Airports Total			123,456	\$4,194,316,000	\$13,333,989,000

Note 1: Data is from *Columbus Regional Airport Authority Economic Impact Study Update, 2012*, by CDM Smith; Note 2: Data is from *The Ohio State University Airport Economic Impact Study Update, 2012*, by CDM Smith

Source: CDM Smith and IMPLAN



For more information on the Ohio Airports Economic Impact Study, go to www.dot.state.oh.us/Divisions/Operations/Aviation/OhioAirportsFocusStudy/Pages/default.aspx, or contact:

ODOT Office of Aviation
2892 W. Dublin-Granville Road
Columbus, Ohio 43235-2786
Office: (614) 387-2352

Prepared for the Ohio
Department of Transportation,
Office of Aviation by:

**CDM
Smith**

Assisted by: RS&H | Engage Public
Affairs | CAD Concepts, Inc.