

Fueling Ohio's Economy



COLUMBUS
REGIONAL AIRPORT AUTHORITY



Economic Impacts of the
Columbus Regional Airport Authority in 2017

Conducted by:
Economic Development Research Group

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This report is accessible online at ColumbusAirports.com/Impact. More details about the Columbus Regional Airport Authority, its airports and business segments are available at the following websites:

- ColumbusAirports.com
- FlyColumbus.com
- RickenbackerAdvantage.com
- FTZ138.com
- RickenbackerAviation.com

Chapter 1. Study Overview and Summary Results

1.1. Introduction and Approach

This study examines the ways in which the Columbus Regional Airport Authority (CRAA) airport system serves as a driver of economic impact within the Columbus Region and Ohio. The study presents impacts for 2017 and updates findings from a previous study of 2011 impacts (released in 2012).¹

1.1.1. Scope of Study: Sources of Impact

CRAA contributes to the economies of the Columbus Region and the state of Ohio through many different sources of impact. The following four components serve as the basis for valuing the economic impact of CRAA:

Airports. Each of CRAA's three airports—John Glenn Columbus International (CMH), Rickenbacker International (LCK), and Bolton Field (TZR)—serve as job centers for airlines and other on-airport airside and landside operations. This impact component includes CRAA administration, in-terminal concessions, airside tenants, construction activity, federal agencies such as the FAA and TSA, and the military at Rickenbacker International.

Visitor Spending. CRAA airports also enable business travel and tourism, enhancing the economy by supporting off-airport hospitality businesses that serve air travelers.

Foreign-Trade Zone. CRAA is the Grantee of Foreign-Trade Zone (FTZ) 138, which is centered in Columbus at cargo-dedicated Rickenbacker International. Nearly \$9.26 billion of goods moved through FTZ 138 in 2017, which in turn supports employment for companies within the FTZ that receive and ship these goods.

Other Airport/CRAA Related Companies. CRAA's airports anchor a cluster of business activity located near CMH and in the Rickenbacker area that is reliant on CRAA. This includes businesses engaged in support activities related to the provision of air service on-airport as well as logistics activities related to the movement of air cargo such as warehousing, distribution, freight forwarding, and air freight trucking. It also includes businesses located on land owned by CRAA or developed and later sold by CRAA.

¹ CDM Smith. Columbus Regional Airport Authority Economic Impact Study Update. November 2012.

1.1.2. Study Structure: Impact Geography

This study examines economic impacts of CRAA in two nested geographies (Figure 1):

- **Economic Impacts in the Columbus Region**, defined as the 11 counties served by the Columbus 2020 economic development organization including Delaware, Fairfield, Franklin, Knox, Licking, Logan, Madison, Marion, Morrow, Pickaway and Union counties.
- **Economic Impacts in the State of Ohio**, which includes impacts in the Columbus Region, as well as impacts in a separately modeled economic impact area of the rest of Ohio.

Figure 1. Columbus Region



Source: Columbus 2020

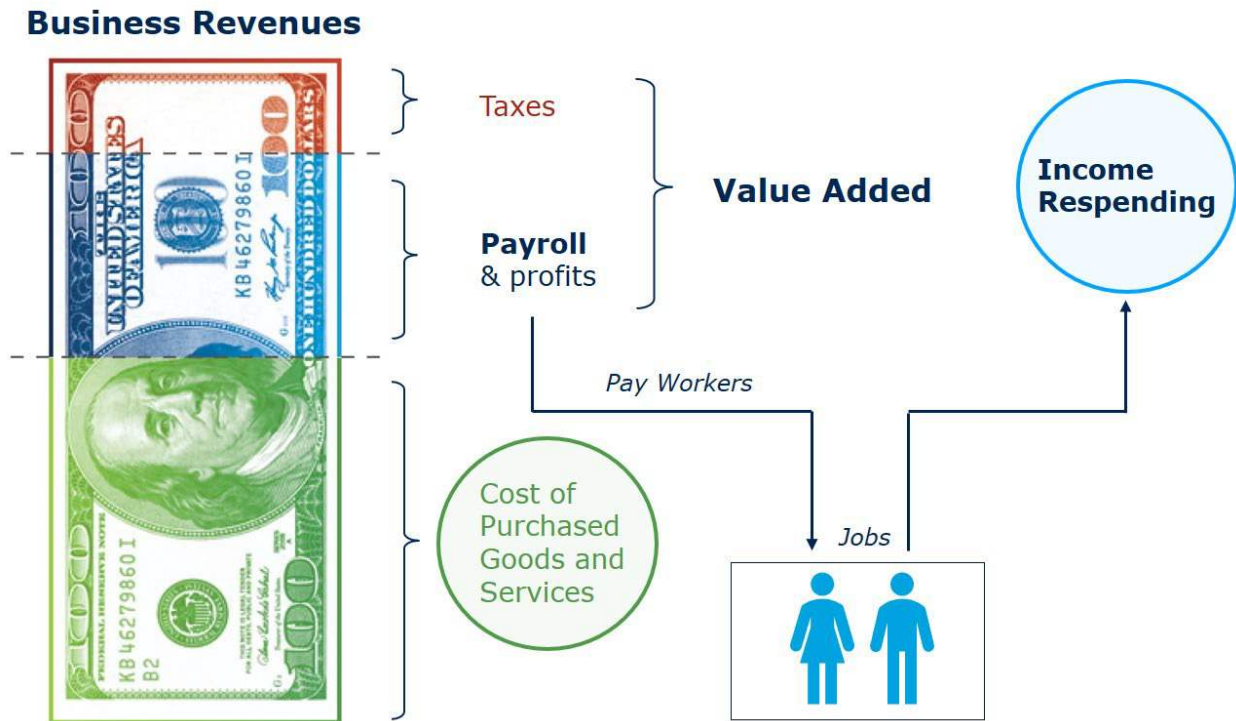
1.1.3. Economic Terminology

All economic impacts in this study are described using the measures of *jobs*, *payroll*, *value added*, and *business revenue*, as shown in Figure 2 and described below:

- Jobs represent the sum of fulltime and part-time workers.
- Payroll includes total compensation for work, including gross wages, salaries, proprietor income, employer provided benefits and taxes paid to governments on behalf of employees.
- Value added consists of compensation of employees, taxes paid on production and imports, and gross operating surplus. Value added equals the difference

- between an industry’s gross business revenue and the cost of its intermediate inputs (purchased goods and services). Value added for companies across industries and across the U.S. is a measure of “gross domestic product.”
- Business revenue is value added plus the cost of intermediate inputs (including energy, raw materials, semi-finished goods, and services that are purchased from all sources). This is largely the value of sales or receipts and other operating income along with any inventory change. Business revenue can also be referred to as “output” or “economic output” by economists. When business revenue is reported, it includes the revenue or operating income of both private companies and public sector entities such as CRAA.

Figure 2. Measures of Economic Impact



Source: EDR Group

In addition to these different measures of economic activity, total economic impacts for jobs, labor income, value added and business revenues are comprised of three distinct categories of economic impact that result from CRAA-related activities—direct impacts, supplier sales, and income respending, as defined below and illustrated in Figure 3:

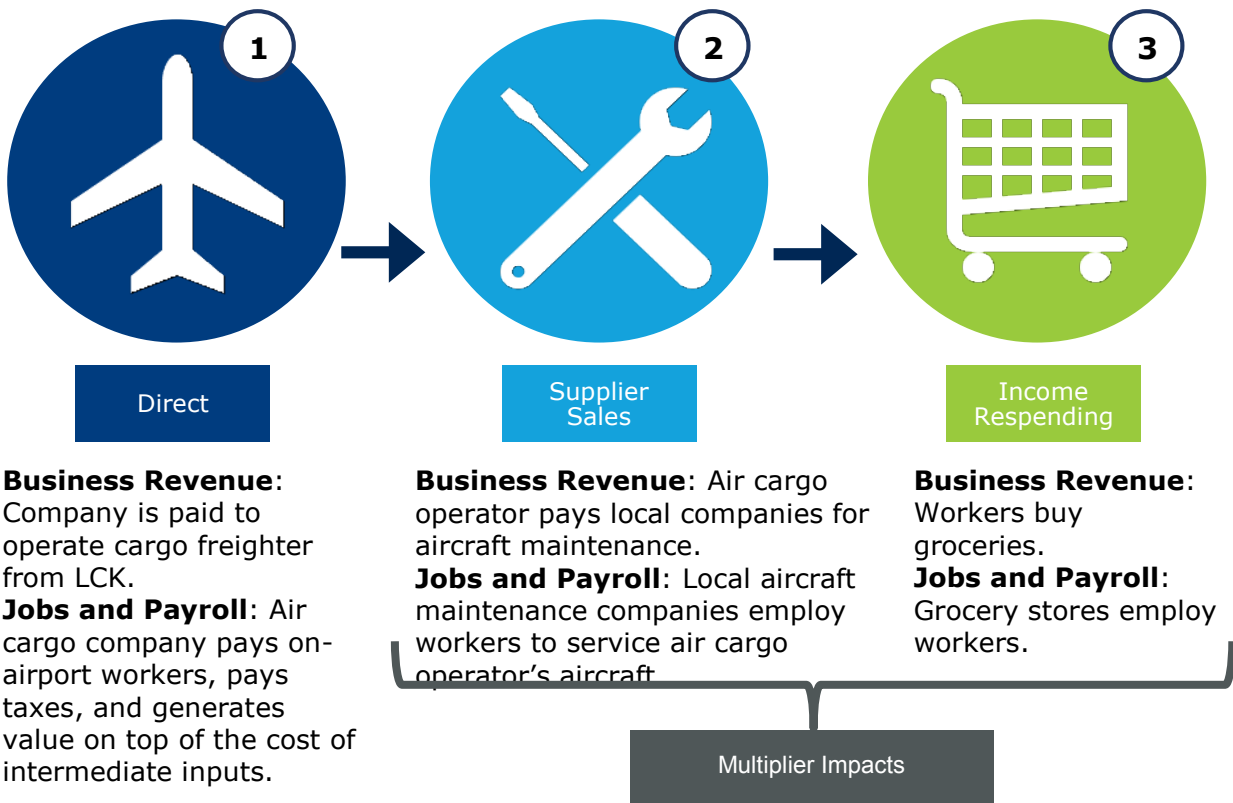
- Direct impacts represent the initial economic activity or transactions that are supported by CRAA. These include the jobs and associated income, business revenue, and value added directly associated with each of the four components of impact outlined in section 1.1.1, namely: on-airport activity, off-airport activity supported by visitor spending, businesses that make use of

FTZ 138, and other airport/CRAA related companies located in the immediate vicinity of CMH and in the Rickenbacker Area.

- Supplier sale impacts, sometimes referred to as *indirect impacts* by economists, represent the additional economic activity associated with business-to-business purchase of goods and services. For example, if a restaurant supported by visitor spending sources its produce from a wholesaler in Columbus, then the wholesaler has a portion of its revenue supported by the airport and will also use that revenue to pay workers as well as pay its own suppliers.
- Income respending impacts, also referred to as *induced impacts*, are additional impacts associated with spending of worker income on items such as housing, retail purchases, and services. Those expenditures in turn support jobs in associated industries whose workers then spend their salaries in the Columbus Region or Ohio. These impacts measure the effects of the changes in household income, meaning the effects from the spending of wages earned by workers of directly and indirectly affected industries.

Supplier sale and income respending impacts together make up what are also referred to as **multiplier impacts**. Total impacts are the sum of direct and multiplier impacts.

Figure 3. Illustration of Direct, Supplier Sales, and Income Respending Impacts



Source: EDR Group

1.1.4. Methodology

Data collected for this study falls into three broad categories:

1.1.4.1. Primary Data Collection

Data provided by CRAA and Airport Fixed-Base Operators (FBOs). This includes data on CRAA construction expenditures, concession sales at CMH and LCK², the number of commercial visitors and transient general aviation operations (GA)³, CRAA staffing, payroll and budget information, and FTZ 138 activity, military activity at LCK, and federal agency activity such as the TSA located on-airport at CMH and LCK.

Data collected through surveys and interviews and supplemented by business activity databases. To supplement the above data, the research team also conducted surveys of airport visitors about their spending patterns and of businesses not already accounted for regarding their activities including airport tenants, other businesses in the Rickenbacker area and near CMH, and the military. As necessary, these surveys were supplemented through interviews and with information in the InfoGroup's ReferenceUSAGov database⁴ to fill in gaps.

Descriptive information provided by CRAA staff to ensure correct characterization of business activity. CRAA staff vetted businesses located on each of three airports, in the Rickenbacker area and near CMH to: (1) verify operation; (2) confirm location on- or off-airport, and (3) for off-airport activity, verify the connection between the identified business activity and CRAA activities.

1.1.4.2. Use of IMPLAN County Based Economic Package

This study also employs the IMPLAN software package which utilizes data from the U.S. Commerce Department, Bureau of Economic Analysis (BEA), Bureau of Labor Statistics (BLS), and U.S. Census. The IMPLAN model provides industry detail at the level of 536 industry sectors that correspond to two- to five-digit groups in the North American Industry Classification System (NAICS). The primary economic data used from IMPLAN includes ratios and multipliers.

The ratios reflect productivity (e.g., the ratio of jobs to business revenue) and income level (jobs to payroll) measures associated with each category of economic contribution (e.g., tenants, visitors spending, and freight shippers). These ratios are used to impute missing metrics based on available impact metrics (e.g., jobs, sales, and income), as shown in Table 1. For example, in cases where payroll was not directly provided by tenants, it was

² Concession sales were not provided for TZR. The Restaurant on Airport was collected in the tenant survey.

³ "General aviation is all civilian flying except scheduled passenger airline service" (Aircraft Owners and Pilots Association).

⁴ www.referenceusagov.com

calculated based on average (mean) wages per worker by economic sector in the Columbus Region, as reported by IMPLAN.

Table 1. Use of IMPLAN to Address Missing Direct Impact Values

Data Availability	Jobs	Payroll	Business Revenue
Option 1	X	O	O
Option 2	X	X	O
Option 3	O	O	X
Option 4	X	X	X
KEY: X = Data Directly Available O = Data Imputed Based on the Columbus Regional Economy as derived from IMPLAN			

Source: EDR Group

Multipliers (see Figure 3, above) for each of industry category are also employed to estimate the additional multiplier economic activity generated. To estimate the economic impact of CRAA to the various levels of geography, multipliers are used for two distinct geographies: 1) the 11-county Columbus Region and 2) the rest of Ohio. This data at different spatial scales enables a multi-regional analysis including how economic activity in one region can cross geographic boundaries into another region. For example, the modeling is able to isolate visitor spending occurring in Columbus Region and the portion of supplier sales and income respending that crosses boundaries into the rest of Ohio.

1.2. Total Economic Impacts

1.2.1. Total impacts

In 2017, CRAA airports and related activity directly accounted for \$8.8 billion in business revenues supporting on the order of 32,000 jobs (Table 2). Multiplier effects in the Columbus Region and rest of Ohio, calculated using the IMPLAN multi-regional input-output model, result in additional impacts associated with supplier sales and income respending by workers. Including these multiplier impacts, the total economic impact of CRAA in Ohio increases to \$12.9 billion in business revenue, including \$5.1 billion in value added that contributes to the overall Gross State Product of Ohio. This economic activity also supports approximately 59,000 jobs whose workers earn \$3.1 billion in payroll. The 59,000 jobs indicate that CRAA contributes to one in every twenty-five jobs in the Columbus region. This overall contribution includes impacts associated with the three CRAA airports, the FTZ and other businesses near LCK and CMH that are associated with the airports.

Table 2. Summary of CRAA Economic Impacts in Ohio

Impact	Jobs	Payroll	Value Added	Business Revenues
Direct Impacts	32,000	\$1.8 B	\$2.6 B	\$8.8 B
Total Impacts in the Columbus Region	57,000	\$3.0 B	\$4.8 B	\$12.4 B
Total Impacts in Ohio	59,000	\$3.1 B	\$5.1 B	\$12.9 B

Source: EDR Group analysis. Dollars in constant 2017 dollars. Jobs rounded to the thousands.
B=billions.

Table 3 provides additional detail for these overall results, showing the breakout of direct and multiplier impacts by geography. All direct impacts occur within the Columbus Region. Overall, multiplier impacts increase the total job impacts of CRAA by over 26,000 and add an additional \$2.4 billion in value added across the state.

Table 3. CRAA Direct and Multiplier Impacts by Geography

Impact Type	Jobs	Payroll	Dollars in Millions	
			Value Added	Business Revenues
Columbus Region				
Direct Impact	32,047	\$1,765	\$2,630	\$8,772
Multiplier Impact	25,006	\$1,211	\$2,218	\$3,677
Subtotals	57,053	\$2,976	\$4,848	\$12,449
Rest of Ohio				
Direct Impact	0	\$0	\$0	\$0
Multiplier Impact	1,672	\$103	\$228	\$482
Subtotals	1,672	\$103	\$228	\$482
Total Ohio				
Direct Impact	32,047	\$1,765	\$2,630	\$8,772
Multiplier Impact	26,678	\$1,314	\$2,446	\$4,158
Total Ohio Impact	58,725	\$3,079	\$5,076	\$12,931

Source: EDR Group analysis. Dollars in constant 2017 dollars. Columns may not add due to rounding.

1.2.2. Impacts by source

Table 4 through Table 6 show the subcomponents of each major category of total CRAA impacts: on-airport, visitor spending, and FTZ 138 and other airport/CRAA-related off-airport impacts. John Glenn Columbus International Airport (CMH) accounts for the majority of both on-airport and visitor-spending impacts, supporting on the order of 16,000 jobs in both cases. Additional airport/CRAA related off-airport activities add considerably to overall impacts, with the FTZ supporting \$5.2 billion in business revenues and the Rickenbacker area adding another \$1.3 billion in business revenues.

Table 4. On-airport Impacts in Ohio by Airport

Impact Source	Jobs	Payroll	Value Added	Business Revenues
CMH	16,282	\$1,113,530,000	\$1,801,972,000	\$3,255,926,000
LCK	5,658	\$374,415,000	\$707,189,000	\$1,127,689,000
TZR	79	\$3,284,000	\$4,760,000	\$8,703,000
Total	22,019	\$1,491,229,000	\$2,513,921,000	\$4,392,318,000

Source: EDR Group analysis. Dollars in constant 2017 dollars. Dollars rounded to the thousands.
Columns may not add due to rounding.

Table 5. Visitor Spending Impacts in Ohio by Airport Source

Impact Source	Jobs	Payroll	Value Added	Business Revenues
CMH	15,747	\$521,691,000	\$915,699,000	\$1,673,213,000
LCK	370	\$12,172,000	\$21,366,000	\$39,177,000
TZR	31	\$974,000	\$1,682,000	\$3,079,000
Total	16,148	\$534,837,000	\$938,747,000	\$1,715,469,000

Source: EDR Group analysis. Dollars in constant 2017 dollars. Dollars rounded to the thousands.
Columns may not add due to rounding.

Table 6. FTZ and Other Airport/CRAA Related Off-airport Impacts in Ohio by Source

Impact Component	Jobs	Payroll	Value Added	Business Revenues
FTZ 138	9,977	\$480,399,000	\$732,600,000	\$5,170,760,000
Rickenbacker Area	9,252	\$493,760,000	\$743,758,000	\$1,319,658,000
Near CMH	1,331	\$78,949,000	\$146,986,000	\$332,550,000
Total	20,560	\$1,053,108,000	\$1,623,344,000	\$6,822,968,000

Source: EDR Group analysis. Dollars in constant 2017 dollars. Dollars rounded to the thousands.
Columns may not add due to rounding.

1.2.3. Impacts by airport

Impacts of each airport are based on the combination of on-airport, visitor spending and off-airport related sources (shown above in Table 4 through Table 6).

1.2.3.1. John Glenn Columbus International Airport



JOHN GLENN
INTERNATIONAL

In 2017, 3.8 million travelers boarded commercial airlines at John Glenn Columbus International Airport (CHM). CMH offers more than 150 departures daily to 42 destinations. The airport also served over 20,000 general aviation operations in the same year. As CRAA's flagship commercial service airport, CMH generates economic impacts by serving as a dynamic job center for people who work in a variety of air service and support industries and by facilitating the tourism economy by

allowing easy access for outside visitors. All told, visitor spending plus on-airport activity at CMH creates approximately 32,000 jobs in Ohio and \$4.9 billion in business revenue. With additional off-airport activity located near CMH, the total economic impact of CMH and its surroundings is over 33,000 jobs and \$5.3 billion in revenue for Ohio businesses (Table 7). This includes both direct and multiplier impacts associated with supplier purchases and spending of income earned by workers.

Table 7. Total Economic Impacts of CMH in Ohio

Impact Source	Jobs	Payroll	Value Added	Business Revenues
On-Airport Impacts	16,282	\$1,113,530,000	\$1,801,972,000	\$3,255,926,000
Visitor Spending	15,747	\$521,691,000	\$915,699,000	\$1,673,213,000
Airport subtotal	32,030	\$1,635,221,000	\$2,717,671,000	\$4,929,139,000
Off-Airport, Near CMH	1,331	\$78,949,000	\$146,986,000	\$332,550,000
Total	33,361	\$1,714,170,000	\$2,864,657,000	\$5,261,689,000

Source: EDR Group analysis. Dollars in constant 2017 dollars. Dollars rounded to the thousands. Columns may not add due to rounding.

1.2.3.2. Rickenbacker International Airport



RICKENBACKER
INTERNATIONAL AIRPORT

Rickenbacker International Airport (LCK) is one of the world's only cargo-dedicated airports, with the capacity to support the world's largest aircraft. Open 24 hours a day, 7 days a week,

365 days a year, the airport offers U.S. importers and exporters access to worldwide markets with scheduled service provided by AirBridgeCargo, Cargolux, Cathay Pacific Cargo, Emirates SkyCargo and Etihad Cargo, among others. China Airlines service was added in early 2018 and is not reflected in this study. Passenger air service also operates from Rickenbacker. On-airport and visitor spending impact of LCK support over 6,000 jobs in the Ohio economy. The surrounding Rickenbacker area supports even more economic activity in the form of a successful logistics cluster and other CRAA-owned or CRAA-developed properties. With these off-airport impacts, the total impact generated by LCK reaches \$2.5 billion in business revenue in Ohio (Table 8). This includes both direct and multiplier impacts associated with supplier purchases and spending of income earned by workers.

Table 8. Total Economic Impacts of LCK in Ohio

Impact Source	Jobs	Payroll	Value Added	Business Revenues
On-Airport Impacts	5,658	\$374,415,000	\$707,189,000	\$1,127,689,000
Visitor Spending	370	\$12,172,000	\$21,366,000	\$39,177,000
Airport subtotal	6,028	\$386,587,000	\$728,555,000	\$1,166,866,000
Rickenbacker Area	9,252	\$493,760,000	\$743,758,000	\$1,319,658,000
Total	15,280	\$880,347,000	\$1,472,313,000	\$2,486,524,000

Source: EDR Group analysis. Dollars in constant 2017 dollars. Dollars rounded to the thousands. Columns may not add due to rounding.

1.2.3.3. Bolton Field Airport



**BOLTON
FIELD**

Bolton Field Airport (TZR) is dedicated to General Aviation activity and in 2017 nearly 23,000 aircraft operations, about 23 percent of which served to provide easy access for visitors from outside the Columbus Region. In addition to the Fixed Base Operator, other major on-airport tenants include Columbus State Community College's Aviation Maintenance Technology facility and JPs Barbeque restaurant and catering facility. Based on its role as an employment center and the visitor spending effects generated by general aviation travelers, TZR supports 110 jobs in the Ohio state economy and \$11.8 million in business revenue, including both direct and multiplier impacts (Table 9).

Table 9. Total Economic Impacts of TZR in Ohio

Impact Source	Jobs	Payroll	Value Added	Business Revenues
On-Airport Impacts	79	\$3,284,000	\$4,760,000	\$8,703,000
Visitor Spending	31	\$974,000	\$1,682,000	\$3,079,000
Total	110	\$4,258,000	\$6,442,000	\$11,782,000

Source: EDR Group analysis. Dollars in constant 2017 dollars. Dollars rounded to the thousands. Columns may not add due to rounding.

1.2.4. Tax impacts

The total economic activity supported by CRAA also in turn contributes to sales and income taxes in the state of Ohio. Table 10 summarizes the total tax impact of CRAA for the entire state of Ohio in 2017. The total tax impact is estimated at \$614 million for the state of Ohio in 2017. Local and state taxes in Ohio generated \$26 billion to \$30 billion in sales and income tax revenue in 2017. Thus, CRAA economic activity contributes between 2.2 percent and 2.5 percent of the state's combined sales and income tax revenue.

Table 10. CRAA's Total Tax Impact in the State of Ohio, 2017

Income Tax from Labor Income	Sales Tax from Pre-Margined Output	Total Tax Impacts
\$85,128,000	\$528,450,000	\$613,578,000

Source: EDR Group team analysis. Dollars rounded to the thousands.

1.2.5. Comparison to prior study

Table 11 presents a summary comparison of results from this study with findings from the prior study in 2011. Impacts for 2011 are presented in both nominal dollars (the middle row) and adjusted 2017 dollars to facilitate comparison in common terms. The overall impacts of CRAA have increased compared to findings of the prior study. Gains in business revenue are particularly strong, in part due to the strong influence of growth at FTZ 138. More detailed comparisons are presented in Chapter 9.

Table 11. Summary Comparison of Impacts in Ohio to Prior Study

	Jobs	Payroll	Business Revenue
These Findings	58,725	\$3.1 Billion	\$12.9 Billion
2011 Study	54,172	\$1.8 Billion	\$6.6 Billion
2011 Study in 2017 Dollars		\$2.0 Billion	\$7.1 Billion
Percent Change (\$s in 2017 values)	8%	55%	82%

Source: EDR Group analysis and CDM Smith. Columbus Regional Airport Authority Economic Impact Study Update. November 2012.

1.3. Key Findings

1.3.1. Impact from three perspectives

The distribution of economic impacts from CRAA can be interpreted from three impact perspectives, depending on the economic measure used. Figure 4 shows that when measured in terms of jobs, each of the three major impact components—airports, visitor spending, and other off-airport activity—each contributed about a third of the overall impacts. Sixty-five percent of jobs are driven by CRAA’s airports themselves, from jobs on-airport and visitor spending.

Figure 4. Economic Contribution to Ohio by Component – Job Perspective



Source: EDR Group analysis.

However, when measured in terms of business revenue, as shown in Figure 5, other off-airport activities comprise the greatest share of impact. This reflects the fact that the logistics related industries located in the FTZ and Rickenbacker areas tend to be more capital- or goods-intensive than labor intensive. Forty percent of business revenue are generated by the FTZ due to its thriving role in distributing merchandise. LCK and its immediate vicinity (the Rickenbacker area) and the 25 counties covered by FTZ 138 account for 59 percent of all business revenues generated by CRAA in Ohio.

Figure 5. Economic Contribution to Ohio by Component – Business Revenue Perspective (dollars in millions)



Source: EDR Group analysis. Dollars in constant 2017 dollars.

Figure 6 shows the distribution of impacts expressed in terms of value added. This adds yet another dimension to the analysis. In this case, airport-based activity contributes most significantly to overall value added. Economic activities on CMH, LCK and TZR produce 50 percent of all value-added calculated as part of this study. This is largely due to the high earnings of airport-based workers. Value added represents CRAA’s contribution to the Ohio Gross State Product and the U.S. Gross Domestic Product (GDP).

Figure 6. Economic Contribution to Ohio by Component – Value Added Perspective (dollars in millions)



Source: EDR Group analysis. Dollars in constant 2017 dollars.

1.3.2. Multiplier impacts

Another key finding of this study is the power of multiplier impacts. Multiplier impacts lead to the circulation of \$4.2 billion in business revenues in the Ohio economy following direct business sales and budget expenditures. These revenues in turn support almost 27,000 jobs, \$1.3 billion in payroll, and \$2.4 billion in value added, demonstrating the importance of dollars used for additional business sales and consumer purchases. For the state of Ohio, multipliers increase impacts by between 47 percent and 93 percent above direct impacts, depending on the economic measure used (Table 12). This means that for every dollar of direct impacts, an additional 47 cents to 93 cents are generated from the circulation of money, leading to 0.83 jobs in Ohio in addition to direct jobs.

Table 12. Ohio Multiplier Impacts as a Percent Above Direct Impacts

Multiplier Effects	Jobs	Payroll	Value Added	Business Revenues
Supplier Sales	36%	36%	43%	23%
Income Responding	48%	38%	50%	25%
Total Over Direct	83%	74%	93%	47%

Source: EDR Group analysis.

Table 13 presents the distribution of business revenue multiplier impacts by industry. Top industries affected by supplier sale impacts include support activities for transportation, wholesale, real estate, and professional, scientific, and technical services. Wholesale and real estate are also key impact sectors for income respending effects. However, additional sectors that cater to individual consumers such as health care and restaurants also rise to the top of the list.

**Table 13. Business Revenue Multiplier Impacts in Ohio by Industry
(dollars in millions)**

Supplier Sales		Income Respending	
Support Activities for Transportation	\$342.6	Wholesale	\$277.5
Wholesale	\$223.4	Real Estate	\$162.0
Real Estate	\$182.5	Ambulatory Health Care Services	\$159.7
Professional, Scientific & Technical Services	\$139.4	Food Services and Drinking Places	\$126.2
Administrative and Support Services	\$110.4	Insurance Carriers and Related Activities	\$102.9
Utilities	\$109.4	Credit Intermediation & Related Activities	\$101.8
Petroleum and Coal Products Manufacturing	\$97.0	Hospitals	\$90.1
Warehousing and Storage	\$60.0	Professional, Scientific & Technical Services	\$87.3
Management of Companies and Enterprises	\$58.5	Telecommunications	\$78.5
Credit Intermediation and Related Activities	\$56.6	Monetary Authorities-Central Bank	\$73.7
Insurance Carriers and Related Activities	\$48.8	Utilities	\$61.7
Couriers and Messengers	\$47.1	Administrative and Support Services	\$61.4
Telecommunications	\$38.9	Securities, Commodity Contracts	\$46.1
Rental and Leasing Services	\$36.4	Nonstore Retailers	\$40.9
Monetary Authorities-Central Bank	\$33.9	Repair and Maintenance	\$39.5
Other (81 Sectors)	\$390	Other (81 Sectors)	\$674
Total	\$1,975	Total	\$2,183

Source: EDR Group analysis. Dollars in constant 2017 dollars. Presented by 3-digit NAICS Sectors (North American Industrial Classification), except for Wholesale Trade.

The recirculation of dollars to purchase business goods and services from other businesses in Ohio generates more than 11,000 jobs across the state. Wages earned from both direct and supplier sales generate an additional 15,000 jobs as workers spend their incomes at Ohio businesses. Table 14 shows the different industry sectors in Ohio that generate jobs as consequences of selling goods and services to businesses and to households that spend wages earned from CRAA-related activities. CRAA-related businesses generate more than 5,000 jobs in Ohio from purchases of support activities for transportation, administrative and professional support services, professional scientific and technical services and wholesaling. Income earned by workers primarily support jobs in restaurant and bars (i.e., food services and drinking places) and health care.

Together, Table 13 and Table 14 show the statewide industries affected by multiplier impacts that are connected to the Columbus Regional Airport Authority. Moreover, the tables show the different levels of impacts from both supplier sales and income respending from the perspectives of business revenues and jobs produced by those revenues.

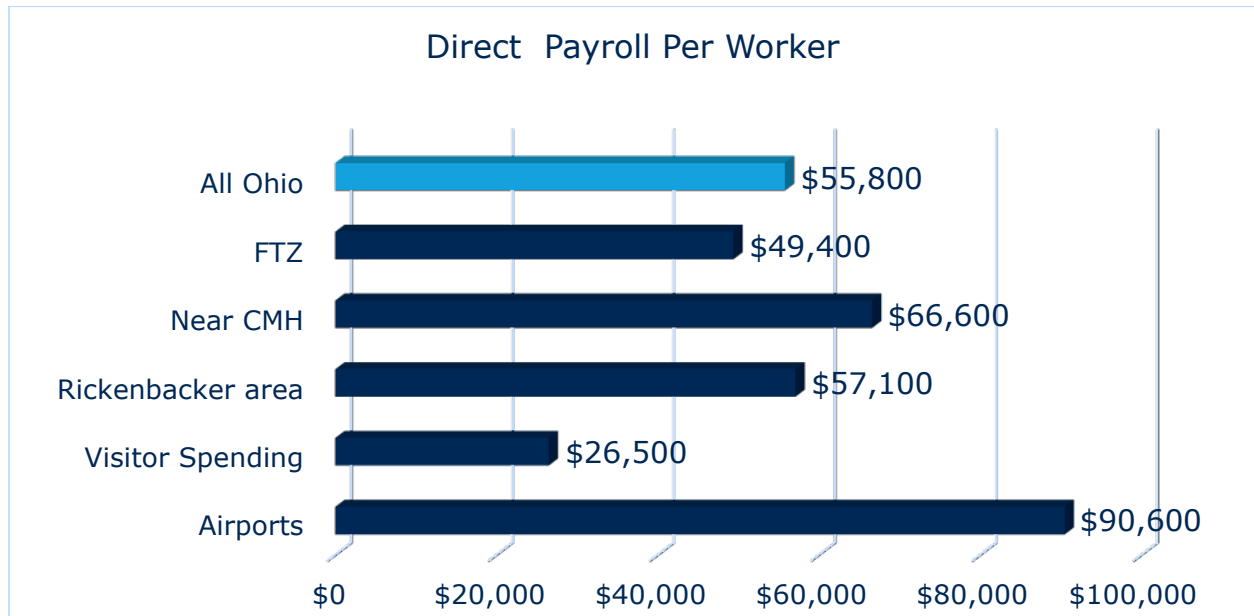
Table 14 Job Multiplier Impacts in Ohio by Industry

Supplier Sales		Income Responding	
Support Activities for Transportation	2,030	Food Services and Drinking Places	1,966
Administrative and Support Services	1,509	Ambulatory Health Care Services	1,331
Professional, Scientific, and Technical Services	1,085	Wholesale	1,071
Wholesale	963	Administrative and Support Services	793
Real Estate	852	Social Assistance	721
Food Services and Drinking Places	678	Real Estate	684
Warehousing and Storage	624	Professional, Scientific, and Technical Services	612
Couriers and Messengers	471	Personal and Laundry Services	600
Repair & Maintenance	272	Educational Services	587
Postal Service	262	Food and Beverage Stores	387
Performing Arts, Spectator Sports, Related Industries	247	Religious, Grantmaking, Civic, Professional, and Similar Organizations	376
Management of Companies and Enterprises	239	Repair and Maintenance	371
Credit Intermediation and Related Activities	208	Credit Intermediation and Related Activities	292
Rental and Leasing Services	190	Amusement, Gambling, and Recreation Industries	286
Insurance Carriers and Related Activities	152	Securities, Commodity Contracts, and Other Financial Investments and Related Activities	269
Other (81 Sectors)	1,603	Other (81 Sectors)	4,946
Total	11,384	Total	15,292

1.3.3. Average Payroll per Worker

Figure 7 compares the average payroll per worker for each category of direct impacts to the overall average in the state of Ohio. The three off-airport categories of impact show direct payroll per worker that is within 20 percent of the statewide average. Earnings of workers supported by visitor spending tend to be lower than average, reflect the nature of service industries such as restaurants and hotels. Airport-based jobs have considerably higher earnings than the statewide average.

Figure 7. Direct Payroll per Worker by Impact Component in Comparison to the State of Ohio



Source: EDR Group analysis. Dollars in constant 2017 dollars.

Chapter 2. CRAA in the Columbus and Ohio Economy

2.1. Introduction

The airports of the Columbus Regional Airport Authority play a vital role in the Columbus and the surrounding 11-county Columbus Region's economy. CRAA airports -- John Glenn Columbus International Airport (CMH), Rickenbacker International Airport (LCK), and Bolton Field (TZR) -- serve as the region's primary passenger and cargo gateways to the nation's air transportation network. The airports support general aviation activity, attract business, trade, and commerce into the region, and energize land use in the airports' surrounding vicinities.

This section will provide an overview of the Columbus Region and CRAA's airports support the region's economy.

2.2. The Columbus Region

The airports of CRAA are located in the vicinity of Columbus, Ohio. The City of Columbus serves as the state's capital and geographic center and economic focal point of the greater Columbus region. Columbus 2020, the region's economic development organization, defines the 11-county Columbus Region to include Delaware, Fairfield, Franklin, Knox, Licking, Logan, Madison, Marion, Morrow, Pickaway and Union counties of Central Ohio.

In 2017, Columbus 2020 reported a total population of 2,185,780 in the Columbus Region, adding 176,751 residents between 2010 and 2017⁵, a growth rate of slightly less than 10 percent during that period. Total Gross Domestic Product (GDP) for the Columbus Region totaled \$1.36 billion in 2017, a Compound Annual Gross Rate (CAGR) of 5 percent between 2010 and 2017. Per Capita Personal (PCP) income in the Columbus Region reached \$49,644 in 2017, a CAGR of 3.7 percent between 2010 and 2017.

Columbus 2020 touts the region's geographic location and transportation infrastructure as key attractors to business development. Columbus 2020 specifically highlights the population accessible within a 10-hour drive, the volume of container lifts handled, the

⁵ Source U.S. Census Bureau as reported by Columbus Business Journal. <https://www.bizjournals.com/columbus/news/2018/03/22/fast-growing-columbus-region-moves-past-cleveland.html>)

region's four intermodal terminals, and CRAA airports, as critical factors in reaching the region's goals of attracting 150,000 new jobs and \$8 billion in capital investment by 2020.

The Columbus Region is home to more than 20 Fortune 1000 companies in multiple industry sectors including insurance and financial services, health care, manufacturing, and retail. Leading private sector employers are shown in Table 15.

Table 15. Top Private Sector Employers

Top Private Sector Employers in the Columbus Region (Source: Columbus 2020)		
Company	FTE	Industry
JP Morgan Chase & Co.	20,475	Financial Services
Nationwide	13,400	Insurance
Ascena Retail Group, Inc	11,615	IT, Procurement, Apparel Distribution & Fulfillment
Honda of America Mfg., Inc	10,701	Automotive assembly, R&D, testing
L Brands Inc.	7,800	Retail
Cardinal Health	5,058	Pharmaceuticals, medical devices
Huntington Bancshares Inc.	5,502	Financial Services
Amazon	4,620	e-commerce
American Electric Power	3,627	Utilities
Alliance Data Card Services	3,057	Data processing

Source: Columbus 2020

Major public sector and non-profit employers in the region include the main campus of The Ohio State University (30,393 FTE), Ohio Health (19,936 FTE), and national, state, county, and local government entities.

2.3. CRAA Airports: Supporting the Region's Economy

John Glenn Columbus International Airport (CMH)

The role of CRAA's airports in the Columbus Region dates back to 1929, when the city succeeded in opening Columbus Municipal Hangar (CMH) -- formerly Port Columbus International Airport and now John Glenn Columbus International Airport, -- serving as the easternmost air terminus of the nation's first air-rail transcontinental route. Over its history, CMH has also served as a military facility (Naval Air Station Columbus, 1942-1946), a hub for commercial airlines America West Airlines and SkyBus Airlines, the corporate headquarters of NetJets, Inc., the Ohio regional training center for Flight Safety International, and home of the primary maintenance facilities for Republic Airline. CMH over the years has expanded passenger terminal facilities (current terminal opened in 1958, with

subsequent expansions and enhancements as recently as 2017), expanded airfield infrastructure including a relocated south parallel runway (10R-28L) opened in 2013, and developed hundreds of thousands of square feet of business park. In 1991 airport operation transferred from the City of Columbus to the independent Columbus Airport Authority, becoming the Columbus Regional Airport Authority in 2003 after assuming operation of Rickenbacker.

Rickenbacker International Airport (LCK), located on the site of the former Lockbourne Air Force Base, was operated by the Rickenbacker Port Authority until 2003, when it was merged with Columbus Airport Authority to become Columbus Regional Airport Authority. The airport continues to support the military as the home of the 121st Air Refueling Wing of the Ohio Air National Guard. Primarily, Rickenbacker International Airport serves as the cargo hub for the Rickenbacker area and entire Columbus Region, providing scheduled and charter freighter service by several domestic and global air freight carriers and numerous charters. The airport also serves commercial low-cost carrier Allegiant Airlines. The area serves as a focal point for Central Ohio's logistics hub, working in concert with the Norfolk Southern Rickenbacker Intermodal Terminal at Rickenbacker. The world's largest freight transporters have located in the region in part due to efficiencies in location and operation that LCK provides.

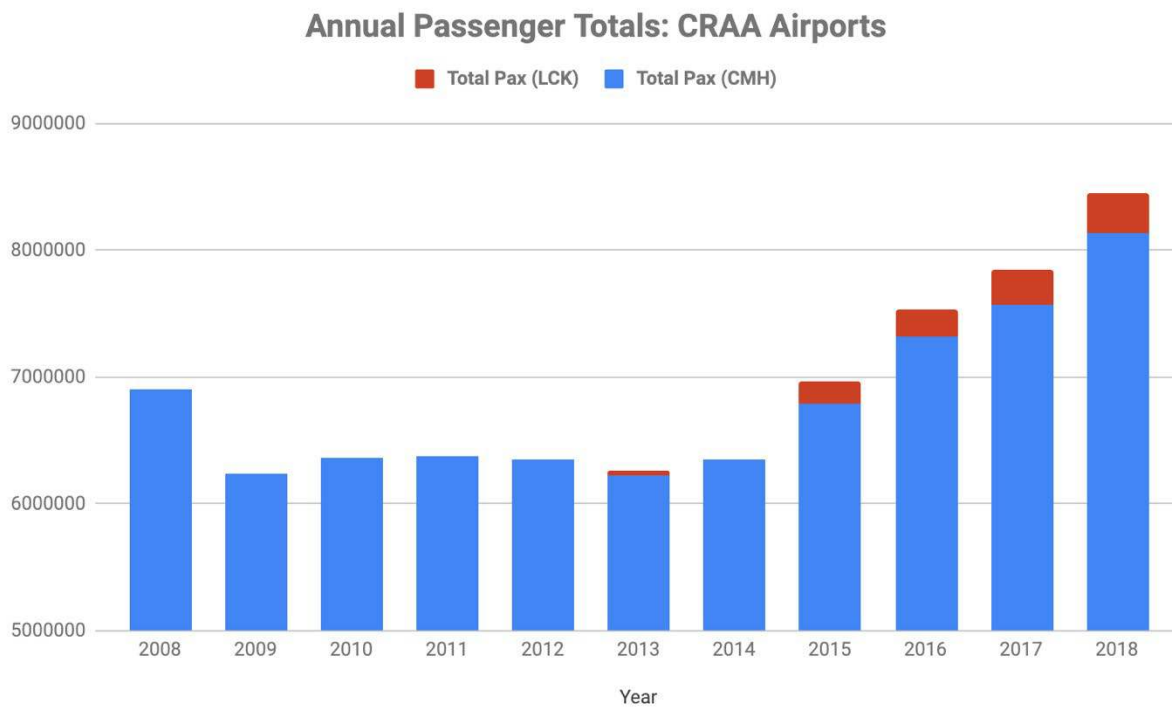
Bolton Field (TZR), opened in 1970 as a general aviation reliever airport for private and corporate services to enable commercial growth at the then Port Columbus. Bolton Field was operated by the City of Columbus until 1991 when it was transferred to the Columbus Airport Authority. Today, Bolton Field is the home of Columbus State Community College's Aviation Maintenance education program and JP's Barbeque restaurant and catering business.

2.3.1. Supporting Commercial Air Transportation

CRAA airports support the region's economic development with commercial air carrier service serving nearly 50 nonstop destinations from coast to coast, including all major network hubs. This service has allowed the Columbus Region to be accessed through nonstop, one-stop or connecting service from nearly every major metropolitan area in the world. Passenger volumes at CRAA airports have increased significantly since 2008, coinciding with the global economic recovery and the economic growth of Columbus and the Central Ohio region (Figure 8).

CMH served 7.54 million total passengers in 2017, the largest annual passenger volume in the airport's history through that year (which has since increased to 8.14 million in 2018). With increases in service volumes to 10 nonstop markets, passenger volumes at LCK have grown to more than 260,000 total passengers served in 2017 (307,000 in 2018). This growth is reflective of the overall growth of the Columbus region economy as well as the increase of visitors to the region.

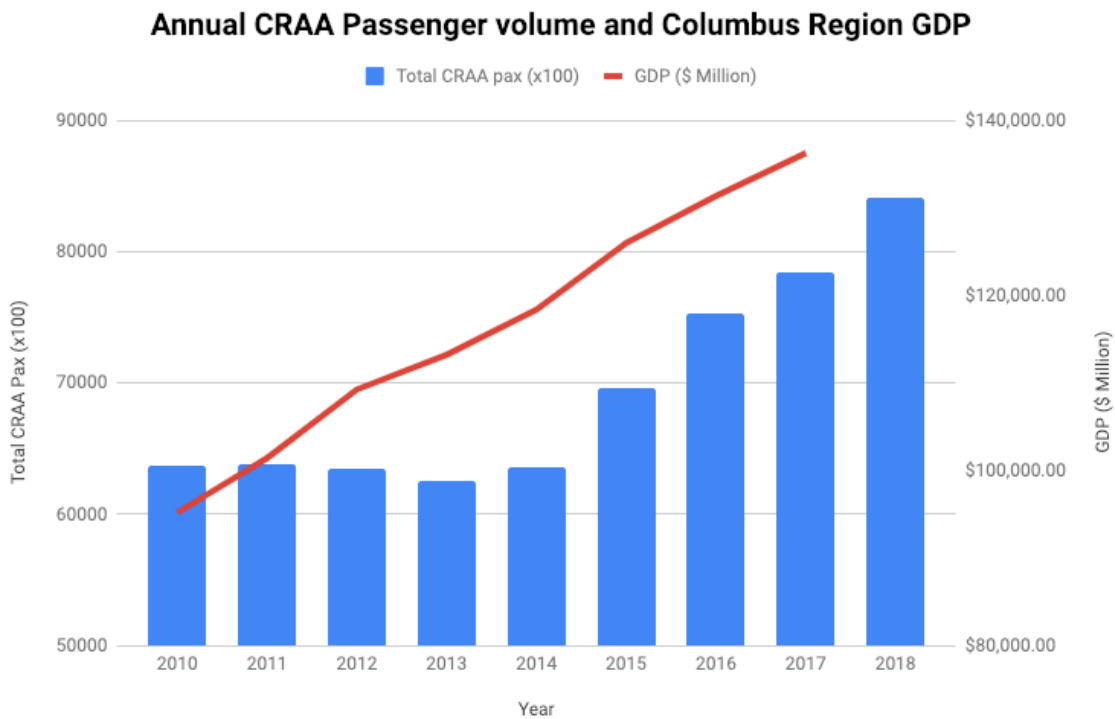
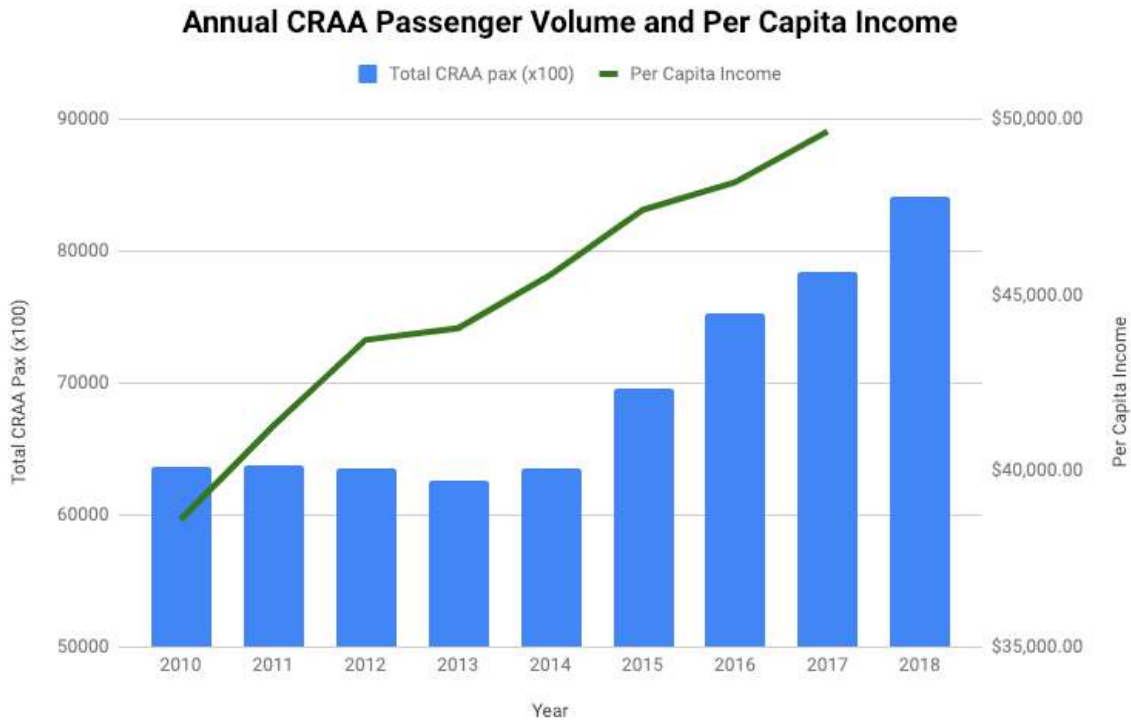
Figure 8. Annual Passenger Totals: CRAA Airports (2008-2018)



Source: CRAA

The rise in passenger volumes is aligned with the region’s growth in GDP and per capita income, as illustrated in Figure 9.

Figure 9. GDP and Per Capita Income, and Passenger Volume



Source: CRAA and the Bureau of Economic Analysis

2.3.2. Supporting Air Freight, Logistics, and Intermodal Activity

In recent years, CRAA has made significant investments to support the growth of air cargo through the Columbus Region.

CRAA recently completed construction of LCK's Air Cargo Terminal 5, providing a central location for both airlines and freight forwarders using LCK. In addition, CRAA constructed a new Air Traffic Control Tower and took ownership of the airport's Fixed Base Operator, Rickenbacker Aviation, providing aircraft services and ground handling for the users of LCK. LCK recently upgraded its dedicated animal transport facility, providing USDA-approved animal and agricultural inspection and export services. CRAA has expanded the footprint of the Rickenbacker area, now including more than 75 million square feet of warehouse and distribution space in the area's Rickenbacker Global Logistics Park and adjacent developments.

CRAA has facilitated the movement of international cargo with the development of U.S. Foreign Trade Zone (FTZ) 138, serving a 25-county region which includes the 11-county Columbus Region.

In 2017, LCK moved approximately 116,000 metric tons of cargo, a 27 percent increase from 2016, and the highest volume served since 2003 when CRAA assumed operation of Rickenbacker. Major logistics providers operating out of LCK include AirNet II, Forward Air, RCS Logistics, Total Airport Services, Trinity Logistics USA Inc., and WFS Transport Ltd.

Also, in recent years, CRAA has developed portions of its properties for non-aviation use, including the Airside One, Two, and Three development of corporate office and warehouse space at CMH, development of hotels at CMH and several corporate office and warehouse spaces at LCK.

2.3.3. Supporting General Aviation

General Aviation activity at CRAA airports ranges from private recreational flying to corporate and charter operations by Fortune 1000 companies. NetJets, Inc., the nation's largest provider of private aviation services, has its corporate headquarters and primary maintenance center on CMH's airfield. Major employers including American Electric Power (AEP), Nationwide, L Brands and MPW base their corporate aircraft at CMH, providing access to major markets for its employees. As of 2018, TZR based 81 aircraft, CMH housed 76 based aircraft, and LCK based 28 aircraft, of which 19 were military aircraft.⁶

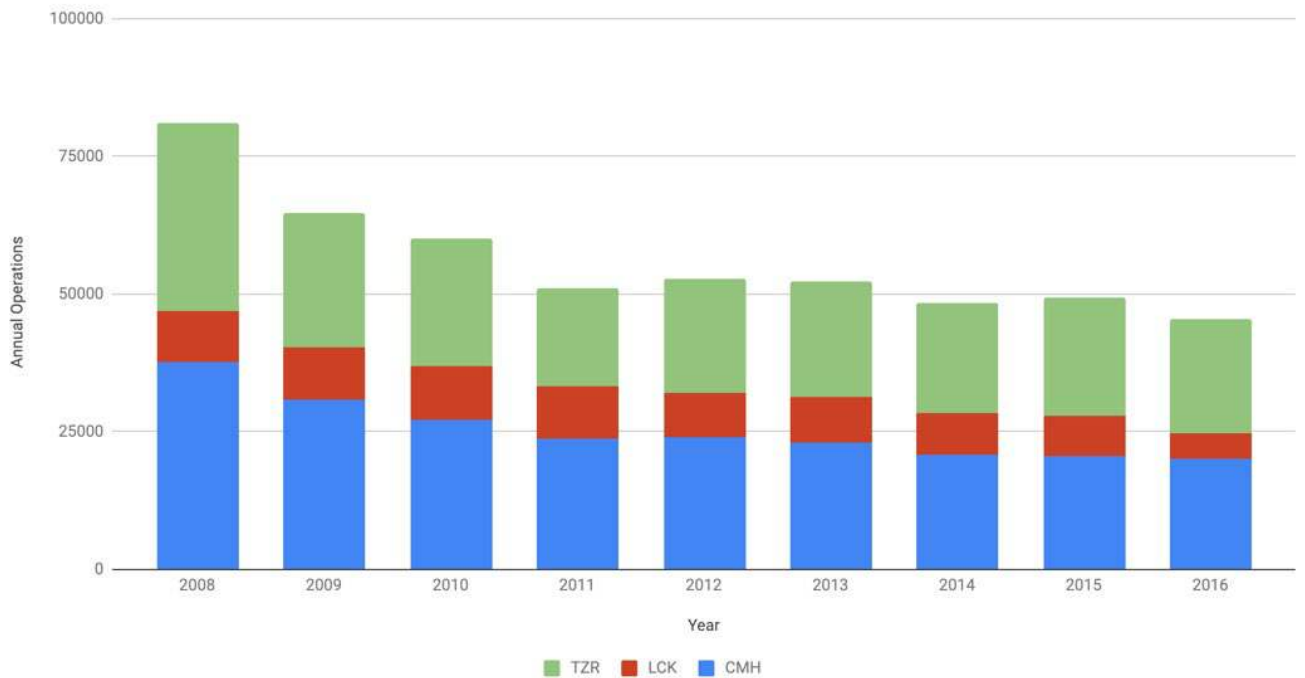
⁶ Source: Federal Aviation Administration master records for each airport.

General Aviation activity is supported through fixed base operators at each airport. Lane Aviation and Signature Flight Support serve CMH, CAA-owned Rickenbacker Aviation serves LCK, and Columbus Jet, Inc. serves TZR.

During the recent recession, general aviation activity declined at CAA airports, coinciding with the nationwide trend. Since the economic recovery, CAA airports have maintained steady levels of general aviation activity, both in the number of annual general aviation operations and in the number of based aircraft.

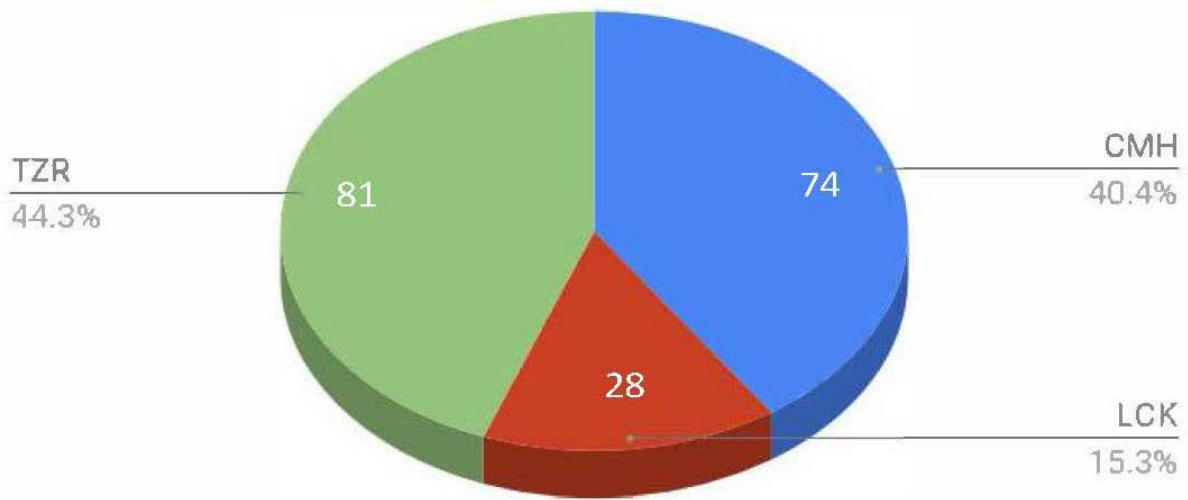
Trends of GA operations at CMH, LCK and TZR are illustrated by Figure 10, and based aircraft at CAA airports are shown on Figure 11.

Figure 10. GA Operations at CAA Airports, 2008-2016



Source: FAA

Figure 11. Based Aircraft at CRAA Airports



Source: FAA

Chapter 3. On-Airport Impacts

3.1. Sources of On-Airport Impact

On-airport impacts for CMH, LCK and TZR stem from a wide variety of employment and expenditures occurring on-airport including CRAA's own operations, commercial airlines, in-terminal concessions that provide services to travelers, ground transportation, CRAA and private sector construction expenditures, military and non-military federal employment, and other on-airport tenants that provide air transportation and other support services.

Table 16 summarizes coverage of each of these on-airport impact sources and their respective data sources.

Table 16. Data Sources for On-Airport Impacts

Impact Source	Description of Impact Source Coverage	Data Sources
CRAA Operations	<ul style="list-style-type: none"> • CRAA employees & operations • CRAA-hired temporary contract workers • CRAA-contracted services: safety & security, fire & EMS, ground transportation 	<ul style="list-style-type: none"> • CRAA provided data on employment, payroll, and contract service amounts • Wages and benefits for non-contractor jobs from the <i>2017 Comprehensive Annual Finance Report</i>. • Total CRAA expenditures from the <i>Budget Summary: 2018 Operating and 2018-2019 Capital Budget</i>, which includes 2017 data.
Airlines	<ul style="list-style-type: none"> • Eight commercial passenger airlines that serve CMH & LCK 	<ul style="list-style-type: none"> • Airline survey
Concessions	<ul style="list-style-type: none"> • Concessions operators located within CMH and LCK • Includes advertising, car rentals, financial services, food & beverage, retail, vending, and other services 	<ul style="list-style-type: none"> • CRAA provided data on concessions sales by company
Ground Transportation	<ul style="list-style-type: none"> • Ground transportation operators serving CMH & LCK • Includes taxis, Transportation Network Companies (TNCs), chartered buses, and public buses (municipal and express) 	<ul style="list-style-type: none"> • CRAA provided data on trip pick-ups by mode • Estimates of average fares to/from major origins/destinations based on web searches

<p>Construction</p>	<ul style="list-style-type: none"> • CRAA Capital Improvement Program • Construction expenditures by individual Concessionaires at CMH • Construction expenditures by companies that hold on-airport, property ground-leases at CMH 	<ul style="list-style-type: none"> • CRAA provided data on average annual construction expenditures, 2014-2017 • CRAA provided data on private square footage of new construction and per square foot development costs
<p>Non-Military Federal Agencies</p>	<ul style="list-style-type: none"> • Transportation Security Administration (TSA) • Federal Aviation Administration (FAA) • U.S. Customs and Border Protection 	<ul style="list-style-type: none"> • CRAA collected data from agency contacts
<p>Military</p>	<ul style="list-style-type: none"> • Active duty uniformed personnel, civilian employees, and reservists • Includes 121st Air Refueling Wing, Army Reserve, Navy/Marine Reserve, and Army National Guard 	<ul style="list-style-type: none"> • Data received from military contacts (via email or phone interview)
<p>Other On-Airport Tenants</p>	<ul style="list-style-type: none"> • Additional on-airport tenants not already included in other analyses 	<ul style="list-style-type: none"> • InfoGroup’s ReferenceUSAGov database⁷ and CRAA input to identify businesses on-airport • CRAA staff vetting to identify companies still in operation • Survey of businesses • ReferenceUSAGov database to fill in gaps as needed

Below are additional discussions of data inputs and modeling assumptions for each individual component:

CRAA Operations. CRAA provided employee counts at each of the three airports as well as employee payroll, including wages and benefits, and overall operating expenditures. Two workers were assumed for each full-time-equivalent job reported by CRAA. CRAA also provided data on the number of temporary contract employees hired. For contracts covering safety and security, fire and EMS, and ground transportation services, CRAA provided the “labor only” component of the contract value. Jobs were then calculated based on the industry sectors identified by CRAA and sector-specific regional ratios of payroll per worker.

⁷ www.referenceusagov.com

The IMPLAN model was customized to reflect the data provided by CRAA, in consultation with staff on proper classification and interpretation. Proprietor income was set at zero.

Airlines. The project team surveyed the eight airlines that provide services at CMH and LCK with the active assistance of CRAA staff. The airlines reported total employment of 579 jobs. The IMPLAN model was customized to reflect the jobs provided by tenants, incorporating payroll data when it was provided by airlines. Where data was not available, regional averages for the Columbus Region were used.

Concessions. Concessions sales were provided by CRAA for 20 companies. The total concession value for all 20 companies is \$124.3 million. Table 17 presents the distribution of sales among types of concession businesses. Car rental, food and beverage, and retail sales comprise over 97 percent of all concession sales. The IMPLAN model was driven by the gross sale totals provided by CRAA. Jobs, labor income, and value added were calculated from the sales totals using industry averages for the Columbus Region. Retail and vending machine sales were margined before impacts were calculated.⁸ The direct economic impacts (job generation and labor income) at CMH from the sale is based on the retail mark-up reflected by the margined effect.

Table 17. Gross Business Sales According to Concession Category

Category	Gross Business Sales	Percent of Total
Advertising	\$1,317,632	1.1%
Car Rental	\$87,119,714	70.1%
Financial	\$238,478	0.2%
Food & Beverage	\$24,313,672	19.6%
Retail	\$9,688,388	7.8%
Services	\$456,059	0.4%
Vending	\$1,193,371	1.0%
Total	\$124,327,315	100%

Source: EDR Group analysis of CRAA concessions data.

Ground Transportation. CRAA provided ground transportation data specifying the number of pick-up trips from CMH and LCK by type of service. We assumed that each pick-up has a corresponding drop-off, so the number of pick-ups was doubled to arrive at the total trips taken to and from the airports using commercial services. In 2017, this estimate is over 900,000 total trips (Table 18).⁹ The volumes are dominated by taxi cabs and transportation network companies (TNCs) such as Uber and Lyft. Note that the number of TNC rides is almost double the volume of taxis.

⁸ "Margining" is the act of excluding the costs of producing a good and transporting to its point of sale (e.g., CMH retailers) from the calculation of the sale's local economic impact. For example, for a doll manufactured in China but purchased at CMH, the cost of production and transportation to the airport retailer are excluded from analysis.

⁹ This is based on a general observation from multiple airports studied.

Table 18. Ground Transportation Trips To and From CMH and LCK

Ground Transportation Service	# of Pick-Ups	Estimated Total Trips
Taxis	147,726	295,452
TNCs	276,366	552,732
Chartered Buses	2,064	4,128
Public Buses (Municipal)	16,761	33,522
Public Buses (Express)	12,775	25,550
Total	455,692	911,384

EDR Group analysis of CRAA data on pick-ups. Note: CRAA advised using a 90%/10% split to account for service at CMH and LCK respectively.

Calculating economic impacts from these services required estimating the gross revenues spent by passengers for these services. For this, "typical" costs were estimated based on a web search. Popular destinations were identified, including The Ohio State University, major employers, and downtown Columbus destinations. Average taxi and TNC fares were calculated assuming an even distribution of trips to each of these destinations. Standard transit fares were also identified. Results of the search are shown in Table 19.

Table 19. Estimated Fares to Destinations in Columbus and the Region

CMH to Select Destinations:	TNC	Taxi ¹
OSU	\$ 25.22	\$ 30.22
Columbus Museum of Art	\$ 17.85	\$ 23.87
1 Nationwide Blvd	\$ 18.15	\$ 24.49
Limited Parkway	\$ 16.77	\$ 25.01
505 King Avenue	\$ 21.20	\$ 28.59
1 Riverside Plaza	\$ 18.75	\$ 26.56
Average fare	\$ 19.66	\$ 26.46
With 15% gratuity	\$ 22.61	\$ 30.43
Regional Bus Service ²	\$15.00	
Public Transportation to Downtown ³	\$2.75	

Source: EDR Group Analysis. ¹Data pulled Friday, October 26, 2018, 7:30 PM.

²GoBus - Wooster and Marietta. ³Central Ohio Transit Authority.

COTA fares are based on "AirConnect Service".

Multiplying the number of total trips (Table 18) by fares according to each service (Table 19) yields an estimate of \$21.6 million paid by passengers using ground transportation to be dropped off or picked up at CMH and LCK (Table 20). The IMPLAN model was driven by the gross sale totals in Table 20. Jobs, labor income and value added were calculated from the sales according to industry averages for the Columbus Region.

Table 20. Revenues Generated by Ground Transportation Services

Service	Revenues
Taxis	\$8,989,000
TNCs	\$12,495,000
Chartered Buses	\$31,000
Public Buses	\$81,000
Total	\$21,596,000

Source: EDR Group analysis.

Construction. The construction analysis includes CRAA expenditures made as part of the ongoing Capital Improvement Program (CIP) at the three airports, and investments made by individual concessionaires at CMH as well as firms that hold on-airport property ground-leases. CRAA provided data on its CIP from the period 2014 to 2017, to smooth out any year-to-year irregularities. The CMH expenditures include major improvements such as the ticket lobby modernization, baggage claim renovations, updates to Concourses A, B, and C, a runway rehabilitation and curb front improvements. At LCK, capital projects included a new Air Traffic Control Tower, and improvements to taxiways and reconstruction of the ramp at Air Cargo Terminal 5. The CIP also includes runway improvements at TZR. CRAA additionally provided data on concessionaire construction expenditures and square footage of construction and average costs per square foot for on-airport construction by tenants. This included construction of new hangars and buildings, including a flight safety school and Airside One, Two, and Three, a collective 300,000 square feet of office and warehouse space situated on Bridgeway Avenue between CMH and I-270.

Non-Military Federal Agencies. CRAA worked with government agencies to provide data for TSA, FAA, and U.S. Customs and Border Patrol employees at CMH and LCK. Overall 418 federal government employees work at these airports, including 370 at CMH and 48 at LCK. The IMPLAN model was driven by employment at CMH and LCK.

Military. Military units located at Rickenbacker International Airport include active duty uniformed personnel, civilian employees, and reservists of the 121st Air Refueling Wing, Army Reserve, Navy/Marine Reserve, and Army National Guard. Data for each of these units were collected from military representatives. We estimated that each reservist worked 15 percent of the year (calculated as one weekend per month and two weeks a year, or 38 days, out of 251 weekdays per year). We also estimated budget expenditures for the Navy/Marine Reserves and the Army National Guard using the IMPLAN model for the Columbus Region to complement data on expenditures received from the 121st Air Refueling Wing and the Army Reserve. The IMPLAN model was driven by gross expenditures.

Other On-Airport Tenants. This section considers additional tenants of the three CRAA airports, exclusive of any tenants already identified in the prior sections. Data were developed as follows:

- Company names were downloaded from InfoGroup’s ReferenceUSAGov database and provided to CRAA. Companies were identified through the use of customized polygons drawn around each airport.
- CRAA staff verified companies that are currently in operation and were located on-airport (i.e. had direct access to the airfield).
- The consultant team then surveyed the list, with follow-up phone calls where necessary. Employment for non-responding companies were identified using the InfoGroup or Manta¹⁰ company databases.
- CRAA staff also directly identified additional employment for a series of distribution-related office and warehouse operations at LCK.

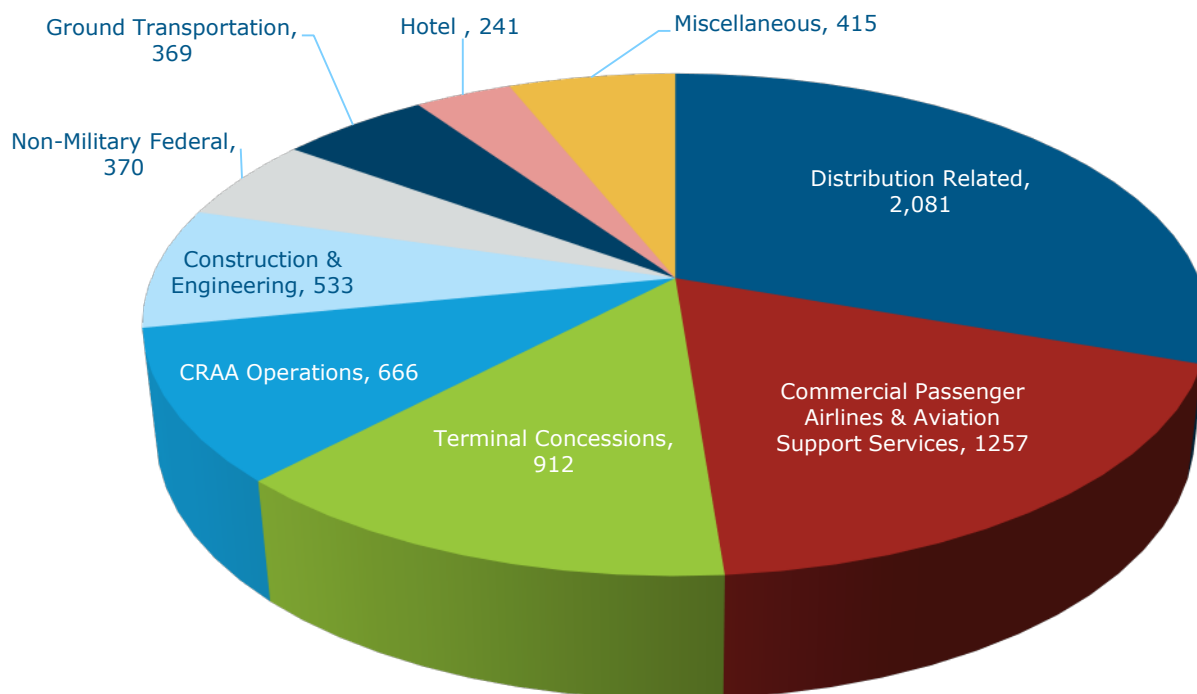
The IMPLAN model was customized to reflect the jobs provided by these businesses and payroll data, where provided. Any gaps were filled in using IMPLAN regional averages as described in section 1.1.4.2.

3.2. John Glenn Columbus International Airport

3.2.1. Direct CMH On-Airport Impacts by Component

Figure 12 shows the composition of on-airport jobs by source component. The largest sources of employment are distribution related industries (such as warehousing, trucking and air cargo), airlines and aviation support services (FBOs, aircraft maintenance and ground support services), terminal concessions (primarily retail, restaurants and drinking establishments), airport operations (CRAA employment) and construction activities (including engineering). Together, these sectors comprise 80 percent of jobs on CMH.

¹⁰ www.manta.com

Figure 12. Mix of On-Airport Jobs at CMH

Source: CRAA, tenant survey, interviews and database searches

3.2.2. Total CMH On-Airport Impacts by Geography

Private and public sector companies located on John Glenn Columbus International Airport together generate \$1.7 billion in direct business revenue for airport operations and business activities, which includes \$636 million earned by the more than 6,800 workers stationed on the airport grounds. These direct economic activities at CMH lead to additional impacts on suppliers, as well as impacts from the spending of worker income, as shown in Table 21. With these additional multiplier impacts, the total impact of on-airport activities at CMH rises to over 16,000 jobs in Ohio, contributing \$1.8 billion in value added to the overall Gross State Product.

Table 21. On-Airport Impacts at CMH, by Geography

Impact Type	Jobs	Payroll	Value Added	Business Revenues
Columbus Region				
Direct Impact	6,844	\$635,868,000	\$925,153,000	\$1,747,290,000
Supplier Sales	3,525	\$201,479,000	\$323,481,000	\$551,811,000
Income Responding	5,202	\$230,797,000	\$446,317,000	\$735,234,000
Subtotal	15,572	\$1,068,143,000	\$1,694,951,000	\$3,034,336,000
Rest of Ohio				
Direct Impact	-	-	-	-
Supplier Sales	404	\$30,855,000	\$78,432,000	\$167,151,000
Income Responding	306	\$14,533,000	\$28,589,000	\$54,438,000
Subtotal	710	\$45,387,000	\$107,022,000	\$221,589,000
Total Ohio				
Direct Impact	6,844	\$635,868,000	\$925,153,000	\$1,747,290,000
Supplier Sales	3,929	\$232,334,000	\$401,913,000	\$718,962,000
Income Responding	5,508	\$245,330,000	\$474,906,000	\$789,673,000
Total Impact	16,282	\$1,113,530,000	\$1,801,972,000	\$3,255,926,000

Source: EDR Group analysis. Dollars in constant 2017 dollars. Dollars rounded to the thousands.

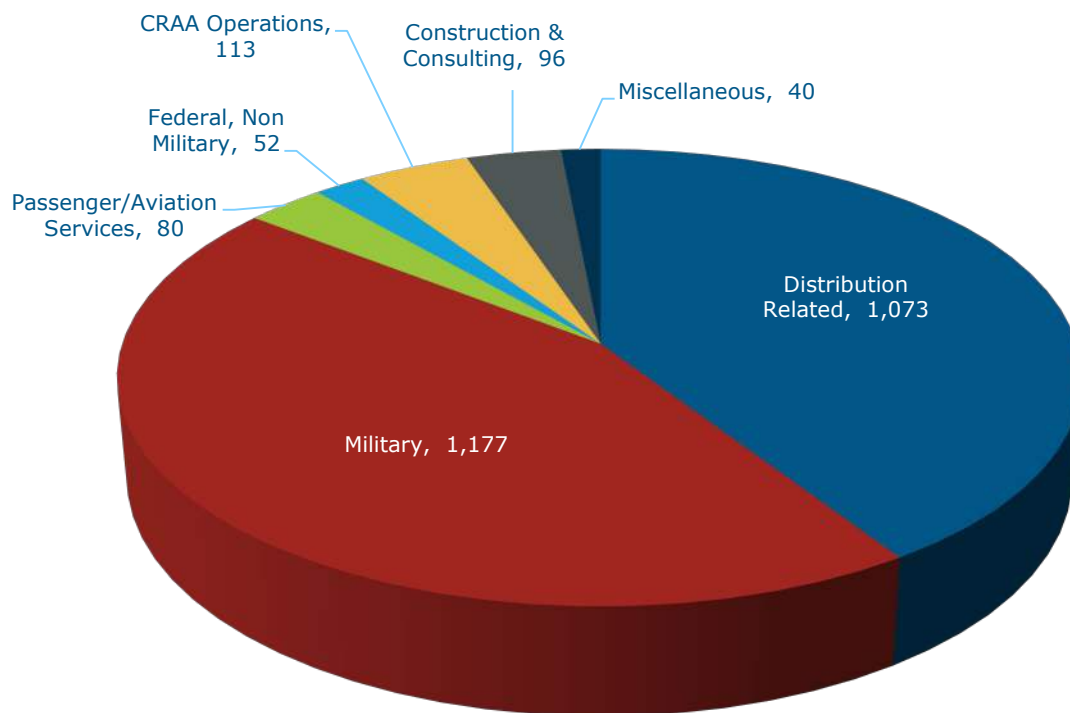
Columns may not add due to rounding.

3.3. Rickenbacker International Airport

3.3.1. Direct LCK On-Airport Impacts by Component

More than 85 percent of the 2,631 jobs located on LCK are military (including both uniformed and civilian personnel), and jobs related to distribution, including air cargo services, warehousing, trucking and brokerage services. Both sectors employ more than 1,000 people on the airport. The next largest employer is CRAA, which stations 113 workers to administer LCK, including temporary contractors. The mix of jobs at LCK are illustrated on Figure 13.

Figure 13. Mix of On-Airport Jobs at LCK



Source: CCAA, tenant survey, interviews and database searches

Note: In the cases of "construction & consulting" and "passenger/aviation services" companies were combined to preserve confidentiality of one airline, one consulting firm and one aircraft maintenance firm, among others.

3.3.2. Total LCK On-Airport Impacts by Geography

On airport employment at Rickenbacker International Airport totaled upwards of 2,600 jobs in 2017 (Table 22). These jobs generated approximately \$656 million in business revenue and earned workers \$225 million in payroll. Supplier sales and income respending effects generated additional business activity in both the Columbus Region and rest of Ohio. Overall, the total impact of LCK on-airport activities, including multiplier impacts, is \$1.1 billion in additional business revenue earned by Ohio businesses, contributing more than \$700 million in value added to the Ohio Gross State Product.

Table 22. On-Airport Impacts at LCK, by Geography

Impact Type	Jobs	Payroll	Value Added	Business Revenues
Columbus Region				
Direct Impact	2,631	\$224,720,000	\$432,061,000	\$655,762,000
Supplier Sales	1,005	\$57,039,000	\$90,437,000	\$154,605,000
Income Responding	1,826	\$80,319,000	\$155,327,000	\$255,880,000
Subtotal	5,461	\$362,079,000	\$677,826,000	\$1,066,245,000
Rest of Ohio				
Direct Impact	-	-	-	-
Supplier Sales	106	\$8,030,000	\$20,824,000	\$44,909,000
Income Responding	88	\$4,307,000	\$8,540,000	\$16,534,000
Subtotal	197	\$12,338,000	\$29,364,000	\$61,445,000
Total Ohio				
Direct Impact	2,631	\$224,720,000	\$432,061,000	\$655,762,000
Supplier Sales	1,111	\$65,071,000	\$111,260,000	\$199,514,000
Income Responding	1,916	\$84,627,000	\$163,867,000	\$272,413,000
Total Impact	5,658	\$374,415,000	\$707,189,000	\$1,127,689,000

Source: EDR Group analysis. Dollars in constant 2017 dollars. Dollars rounded to the thousands.
Columns may not add due to rounding.

3.4. Bolton Field Airport

3.4.1. Direct TZR On-Airport Impacts by Component

Bolton Field is the address of employment for 50 workers, including two CRAA employees and five construction workers based on the average capital investment at the airport over the past four years. Because of the relatively small size of the airport's economic footprint, listing other sectors and employment will violate confidentiality of the single companies that comprise various sectors. The major tenants at TZR include Columbus Jet (the FBO), JP's Barbeque (a restaurant), and the Columbus State Community College Aviation Maintenance Technician program. In addition, companies that occupy various hangars on-airport employ pilots.

3.4.2. Total TZR On-Airport Impacts by Geography

The tenants, along with CRAA and construction activities, directly generate \$4.3 million in business revenue (Table 23). Supplier sales and income responding increase this impact by an additional \$4.4 million in revenue for Ohio businesses, yielding a total economic impact of \$8.7 million. This includes \$3.3 million earned by workers in the state. On-airport activity at Bolton Field adds nearly \$4.8 million in value added to the Ohio Gross State Product.

Table 23. On-Airport Impacts at TZR, by Geography

Impact Type	Jobs	Payroll	Value Added	Business Revenues
Columbus Region				
Direct Impact	50	\$1,835,000	\$2,164,000	\$4,279,000
Supplier Sales	12	\$657,000	\$1,070,000	\$1,816,000
Income Responding	16	\$681,000	\$1,317,000	\$2,170,000
Subtotal	76	\$3,174,000	\$4,550,000	\$8,266,000
Rest of Ohio				
Direct Impact	-	-	-	-
Supplier Sales	1	\$72,000	\$135,000	\$293,000
Income Responding	1	\$38,000	\$75,000	\$144,000
Subtotal	2	\$110,000	\$210,000	\$437,000
Total Ohio				
Direct Impact	50	\$1,835,000	\$2,164,000	\$4,279,000
Supplier Sales	13	\$729,000	\$1,205,000	\$2,109,000
Income Responding	16	\$719,000	\$1,392,000	\$2,314,000
Total Impact	79	\$3,284,000	\$4,760,000	\$8,703,000

Source: EDR Group analysis. Dollars in constant 2017 dollars. Dollars rounded to the thousands.
Columns may not add due to rounding.

3.5. Combined On-Airport Impacts

Airport-based activity across all three of CRAA's airports supports a total of 22,000 jobs in the Ohio statewide economy, generating \$4.4 billion in revenue for businesses and adding \$2.5 billion to the Gross State Product. Of the overall business revenue impact, \$2.4 billion is associated with activity occurring directly on the airports (Table 24), while an additional \$1.9 billion is generated by multiplier effects off airport (the sum of supplier sales and income responding in the Columbus Region and the rest of Ohio).

Table 24. Total On-Airport Impacts (all 3 airports), by Geography

Impact Type	Jobs	Payroll	Value Added	Business Revenues
Columbus Region				
Direct Impact	9,524	\$862,423,000	\$1,359,378,000	\$2,407,331,000
Supplier Sales	4,542	\$259,175,000	\$414,988,000	\$708,232,000
Income Responding	7,044	\$311,797,000	\$602,961,000	\$993,284,000
Subtotal	21,109	\$1,433,396,000	\$2,377,327,000	\$4,108,847,000
Rest of Ohio				
Direct Impact	-	-	-	-
Supplier Sales	512	\$38,957,000	\$99,391,000	\$212,353,000
Income Responding	396	\$18,878,000	\$37,204,000	\$71,116,000
Subtotal	908	\$57,835,000	\$136,596,000	\$283,471,000
Total Ohio				
Direct Impact	9,524	\$862,423,000	\$1,359,378,000	\$2,407,331,000
Supplier Sales	5,053	\$298,134,000	\$514,378,000	\$920,585,000
Income Responding	7,441	\$330,676,000	\$640,165,000	\$1,064,400,000
Total Impact	22,019	\$1,491,229,000	\$2,513,921,000	\$4,392,318,000

Source: EDR Group analysis. Dollars in constant 2017 dollars. Dollars rounded to the thousands.

Columns may not add due to rounding.

Chapter 4. Visitor Spending Impacts

Visitor expenditures represent a primary source of economic impacts associated with both commercial air service and general aviation. This chapter summarizes visitor spending impacts, based on the number of annual air visitors and a profile of their spending patterns.

4.1. Profile of Air Visitors

4.1.1. Commercial Service

In 2017, more than 3.9 million commercial service passengers boarded commercial airlines in Columbus, of which 3.8 million traveled from CMH, and nearly 134,000 flew commercially from LCK (Table 25). Of this total volume of passenger travel, roughly 39 percent were visiting Ohio and, therefore, contributing additional money to the regional and state economy.

Table 25. Enplanements and visitors at CMH and LCK in 2017

Airport	Total 2017 Enplanements	Connecting Enplanements	Origin is Columbus (Non-Connecting Travelers)	Assumed Visitors
CMH	3,784,507	45,514	2,255,617	1,483,376
LCK	133,831	N/A	98,916	34,915
TOTAL	3,918,338	45,514	2,354,533	1,518,291

Source: CRAA.

4.1.2. General Aviation

General aviation (GA) operations are classified as either local or itinerant, with local referring to aircraft operations within an airport's local flight pattern or a nearby practice area, and itinerant referring to the remaining flights. While itinerant operations are sometimes used to estimate the number of GA visitors, true transient (i.e. true visitor) operations are actually a subset of itinerant operations. This is because itinerant operations include any aircraft that are going to (or coming from) another location outside Columbus, regardless of whether those aircraft represent local based aircraft returning home after a trip, or visitors from outside. At CMH and TZR, the consultant team estimated that half of the reported itinerant operations are transient, based on input from Fixed Base Operators (FBOs), airports' 5010 data,¹¹ and an analysis of fleet mix. In the case of LCK, CRAA estimated a smaller proportion of true transient operations, encompassing flights destined for Columbus rather than simply stopping en-route for fuel.

To translate estimates of aircraft operations into the number of visitors requires additional data on average occupancy per trip. These are based on input directly from CRAA in the

¹¹ Pulled from GCR1.COM 5010 reports

case of LCK and on profiles of aircraft at each of CMH and TZR, as developed from discussions with FBOs and research team site observations. Higher occupancy at CMH reflects its large aircraft GA operations including company shuttles, sports teams, charters, etc. Moreover, as transient operations include both arrival and departure trips for visitors, the total number of visitors requires a further reduction of the total passenger crew counts by a factor of half. The number of GA visitors to the Columbus Region is profiled in Table 26.

Table 26. Derivation of the Number of General Aviation Visitors

	Total GA Operations	Itinerant Operations	Transient Operations	Passengers per Operation	Crew per Operation	Total Visitors
CMH	20,005	20,005	10,002	7.80	1.85	48,262
LCK	4,624	2,000	500	2.00	1.00	750
TZR	22,649	10,621	5,310	3.20	1.40	12,214
TOTAL	47,278	32,626	15,812	6.14	1.68	61,226

Source: CRAA and FBOs at TZR and CMH

Total GA Operations Counts for CMH and TZR Airports from <https://www.gcr1.com/5010web/>, 5010 reports. Total operations for LCK provided by CRAA.

Itinerant operations for CMH and TZR sourced from GCR1.com. LCK data provided by CRAA. Itinerant operations for LCK are twice the reported itinerant arrivals from CRAA.

Estimate of transient operations for LCK are twice the transient arrivals reported by CRAA. Transient operations at CMH and TZR estimated to be half of total itinerant operations.

Passenger and Crew per operation for CMH and TZR estimated based on profiles of aircraft at each airport, derived from discussions with FBOs and site observations. CRAA provided occupancy estimates for LCK directly.

4.2. Visitor Spending Patterns

4.2.1. Data Collection

Commercial Visitors. A commercial passenger intercept survey was conducted at CMH in July 2018 to profile visitors according to their trip destination, purpose, origin, and spending levels outside the airport, as well as to elicit certain details about travelers' chosen airport access mode and type of lodging. The passenger intercept survey process resulted in the collection of 372 individual survey responses. The survey includes initial screening questions to eliminate connecting passengers and those who live in the area so that the set of data represents visitors only. As with any survey effort, the survey results necessitated some data cleaning and corrections to remove a small number of responses that either had insufficient information, or that reported illogical or internally inconsistent (31 surveys and 53 passengers) information. Following this cleaning process, the final survey data set represents a total of 559 visitors (a survey respondent is invited to provide information for his or her entire traveling party). The distribution of those visitors is shown in Table 27.

Segmentation by trip origin and purpose is used to separate groups with similar visitor spending behavior.

Table 27. Distribution of Commercial Visitors in Survey

Trip Purpose	Number	Percent
Business	204	36.5%
Personal	355	63.5%
Total	559	100%

Source: Visitors Survey, 2018.

During 2017, 1.5 million visitors arrived in the region using CMH or LCK (1,483,000 at CMH and 35,000 at LCK). These numbers are used as a basis to calculate confidence intervals and margins of error for the 559 visitors included in the survey responses. The sample of 559 visitors exceeds the standards of a 95 percent confidence interval with a 5 percent margin of error.¹²

General Aviation. A visitor spending survey was distributed to aircraft crew and passengers through cooperation with the FBOs at each of CRAA's three airports. The survey collected information on GA spending per trip in each of five categories: lodging, entertainment, ground transportation, food and beverage, and retail. The sample of GA responses collected from CRAA airports did not meet a minimum standard of at least a 90% confidence level with a 5% margin of error. Therefore, the sample was enriched with information collected through a recent survey effort at two other airports with similar GA markets: Pittsburgh International Airport and Allegheny County Airport to exceed that standard.¹³

4.2.2. Profiles of Visitors Spending

Commercial Visitors Spending. Survey results indicate an average spending per commercial visitor of \$624. Table 28 presents the distribution of total reported spending in the survey sample by spending category. Note that spending on car rentals at the airport and other transportation to and from the airport (as reflected in airport ground

¹² Confidence levels reflect the amount of uncertainty associated with a survey. With a confidence level of 95 percent, it is expected that 95 out of 100 times visitors who are surveyed will fall between the margins of error from the true answer, which is the result that would be achieved if every visitor was surveyed. Allowing for a 5 percent margin of error indicates that for 100 surveys, 95 percent of the time the results are between 95 percent and 105 percent of the true mean. The remaining 5 percent of surveys will produce results outside of the margin of error. To achieve a 95 percent confidence interval with a 5 percent margin of error, the survey required surveys accounting for 385 visitors. This threshold was exceeded, and 559 responses represent a 98 percent confidence interval with a 5 percent margin of error.

¹³ This is similar to the approach taken in the 2011 study, which states: "The economic activity generated by general aviation visitors at CRAA's airports was determined by using data from surveys of visiting pilots and passengers, data from CRAA's *Regional Airports Economic Impact Study*, and general aviation visitor data from similar airports located in the Midwest."

transportation data) is accounted for separately in Chapter 3 and, therefore, not included in this analysis.

Table 28. Average Spending per Visitor per Trip

Spending Category	Total	% of Total
Lodging	\$282	45%
Food/Beverage	\$127	20%
Entertainment	\$87	14%
Retail (shopping)	\$92	15%
Off Airport Transportation	\$37	6%
Total	\$624	100%

Source: Visitors Survey, 2018. Columns may not add due to rounding.

Applying the average spending in Table 28 to the total visitors from Table 25 above, generates an estimate of almost \$950 million spent by commercial air visitors in the Columbus Region (Table 29). The number of visitors was calculated by CRAA staff using airlines' monthly self-report data to CRAA and the Diio software system.¹⁴

Table 29. Distribution of Reported Spending, by Spending Category at CMH and LCK

Spending Category	CMH	LCK	Total
Lodging	\$417,597,000	\$9,829,000	\$427,426,000
Food/Beverage	\$187,798,000	\$4,420,000	\$192,219,000
Entertainment	\$128,816,000	\$3,032,000	\$131,848,000
Retail (shopping)	\$136,471,000	\$3,212,000	\$139,683,000
Off-Airport Transportation	\$54,442,000	\$1,281,000	\$55,724,000
Total	\$925,124,000	\$21,775,000	\$946,899,000

Source: Analysis by EDR Group using visitor volume data from CRAA and results of the 2018 Visitors Survey. Dollars rounded to the thousands. Rows and columns may not add due to rounding.

General Aviation Visitor Spending. The combined analysis of survey data collected and data enrichment from other similar airports yields an estimate of GA visitor per trip spending of approximately \$137. Combined with the estimated annual number of visitors, this yields a total of \$8.39 million in expenditures made by visitors to the Columbus Region arriving through CRAA airports. Table 30 shows the distribution of spending by category and airport.

¹⁴ Diio (Data in, intelligence out) is an aggregator and vendor of airline data, and is a leading provider of airline market intelligence data and tools.

Table 30. Total GA Visitor Spending by Category

Spending Category	Percentage	CMH	LCK	TZR
Lodging	40%	\$2,618,000	\$41,000	\$663,000
Entertainment	8%	\$529,000	\$8,000	\$134,000
Ground transportation	19%	\$1,230,000	\$19,000	\$311,000
Food and Beverage	25%	\$1,666,000	\$26,000	\$422,000
Retail	9%	\$569,000	\$9,000	\$144,000
Total	100%	\$6,612,000	\$103,000	\$1,673,000

Source: GA Visitor Spending Surveys at CMH, LCK, and TZR, as well as PIT and ACA. Dollars rounded to the thousands. Columns may not add due to rounding.

4.3. John Glenn Columbus International Airport

In 2017, commercial visitors arriving at John Glenn Columbus International airport spent an estimated \$925 million in the Columbus Region economy. This spending directly supported nearly 11,000 jobs. Money spent in the Columbus Region by visitors in turn leads to additional multiplier impacts associated with purchases from suppliers and spending of earned worker income. These impacts raise the total impact of CMH commercial visitor spending to approximately 15,600 jobs, generating \$1.7 billion in business revenues in Ohio (Table 31).

Table 31. Commercial Visitor Spending Impacts - CMH

Impact Type	Jobs	Payroll	Value Added	Business Revenues
Columbus Region				
Direct Impact	10,839	\$287,046,000	\$475,408,000	\$925,124,000
Supplier Sales	2,092	\$108,600,000	\$195,505,000	\$328,376,000
Income Responding	2,444	\$108,108,000	\$209,058,000	\$344,092,000
Subtotal	15,375	\$503,754,000	\$879,971,000	\$1,597,592,000
Rest of Ohio				
Direct Impact	-	-	-	-
Supplier Sales	144	\$8,809,000	\$18,574,000	\$42,900,000
Income Responding	106	\$5,255,000	\$10,472,000	\$20,520,000
Subtotal	250	\$14,064,000	\$29,046,000	\$63,420,000
Total Ohio				
Direct Impact	10,839	\$287,046,000	\$475,408,000	\$925,124,000
Supplier Sales	2,236	\$117,409,000	\$214,079,000	\$371,276,000
Income Responding	2,550	\$113,363,000	\$219,529,000	\$364,612,000
Total Impact	15,625	\$517,819,000	\$909,016,000	\$1,661,012,000

Source: EDR Group analysis. Dollars in constant 2017 dollars. Dollars rounded to the thousands.

Columns may not add due to rounding.

General aviation adds to the visitor spending impacts of CMH. Visitors arriving via GA to CMH spent \$6.6 million at regional businesses as a result of their travels. This directly

supports an additional 87 jobs that pay workers \$2.1 million. With multipliers, impacts reach 123 jobs and \$12.2 million in business revenue statewide.

Table 32. General Aviation Visitor Spending Impacts - CMH

Impact Type	Jobs	Payroll	Value Added	Business Revenues
Columbus Region				
Direct Impact	87	\$2,107,000	\$3,398,000	\$6,612,000
Supplier Sales	16	\$848,000	\$1,494,000	\$2,513,000
Income Responding	18	\$807,000	\$1,561,000	\$2,572,000
Subtotal	121	\$3,763,000	\$6,453,000	\$11,697,000
Rest of Ohio				
Direct Impact	-	-	-	-
Supplier Sales	1	\$69,000	\$150,000	\$348,000
Income Responding	1	\$40,000	\$80,000	\$156,000
Subtotal	2	\$109,000	\$230,000	\$504,000
Total Ohio				
Direct Impact	87	\$2,107,000	\$3,398,000	\$6,612,000
Supplier Sales	17	\$917,000	\$1,644,000	\$2,861,000
Income Responding	19	\$847,000	\$1,641,000	\$2,728,000
Total Impact	123	\$3,872,000	\$6,683,000	\$12,201,000

Source: EDR Group analysis. Dollars in constant 2017 dollars. Dollars rounded to the thousands.

Columns may not add due to rounding.

Adding up the spending associated with all visitors arriving at CMH yields a total visitor spending impact in Ohio of \$1.7 billion in business sales. This includes \$916 million in value added as a result of CMH enabling personal and business tourism.

Table 33. Total Visitor Spending Impacts - CMH

Impact Type	Jobs	Payroll	Value Added	Business Revenues
Columbus Region				
Direct Impact	10,926	\$289,153,000	\$478,806,000	\$931,736,000
Supplier Sales	2,108	\$109,448,000	\$196,999,000	\$330,889,000
Income Responding	2,463	\$108,915,000	\$210,619,000	\$346,664,000
Subtotal	15,496	\$507,517,000	\$886,424,000	\$1,609,289,000
Rest of Ohio				
Direct Impact	-	-	-	-
Supplier Sales	145	\$8,878,000	\$18,724,000	\$43,248,000
Income Responding	107	\$5,295,000	\$10,552,000	\$20,676,000
Subtotal	252	\$14,173,000	\$29,276,000	\$63,924,000
Total Ohio				
Direct Impact	10,926	\$289,153,000	\$478,806,000	\$931,736,000
Supplier Sales	2,252	\$118,326,000	\$215,723,000	\$374,137,000
Income Responding	2,570	\$114,210,000	\$221,170,000	\$367,340,000
Total Impact	15,747	\$521,691,000	\$915,699,000	\$1,673,213,000

Source: EDR Group analysis. Dollars in constant 2017 dollars. Dollars rounded to the thousands.

Columns may not add due to rounding.

4.4. Rickenbacker International Airport

While Rickenbacker International Airport is primarily oriented toward the handling of air cargo, it also supports visitor spending impacts by hosting both commercial and general aviation passenger air service. Visitors arriving via commercial air service at LCK directly support \$21.8 million in business revenue and 255 jobs (Table 34). General aviation visitors arriving at LCK generated \$100,000 in regional business revenue in 2017 (Table 35). Supplier sales and income respending impacts from both commercial and GA visitor spending create an additional \$17.3 million in business revenues, for a total visitor spending impact of LCK of approximately \$39.2 million in revenue for Ohio businesses (Table 36).

Table 34. Commercial Visitor Spending Impacts - LCK

Impact Type	Jobs	Payroll	Value Added	Business Revenues
Columbus Region				
Direct Impact	255	\$6,714,000	\$11,120,000	\$21,775,000
Supplier Sales	49	\$2,540,000	\$4,573,000	\$7,676,000
Income Respending	58	\$2,529,000	\$4,890,000	\$8,055,000
Subtotal	362	\$11,783,000	\$20,583,000	\$37,506,000
Rest of Ohio				
Direct Impact	-	-	-	-
Supplier Sales	3	\$206,000	\$434,000	\$1,001,000
Income Respending	3	\$123,000	\$245,000	\$480,000
Subtotal	6	\$329,000	\$679,000	\$1,481,000
Total Ohio				
Direct Impact	255	\$6,714,000	\$11,120,000	\$21,775,000
Supplier Sales	53	\$2,746,000	\$5,007,000	\$8,677,000
Income Respending	60	\$2,652,000	\$5,135,000	\$8,535,000
Total Impact	368	\$12,112,000	\$21,262,000	\$38,987,000

Source: EDR Group analysis. Dollars in constant 2017 dollars. Dollars rounded to the thousands.

Columns may not add due to rounding.

Table 35. General Aviation Visitor Spending Impacts - LCK

Impact Type	Jobs	Payroll	Value Added	Business Revenues
Columbus Region				
Direct Impact	1	\$33,000	\$53,000	\$103,000
Supplier Sales	<1	\$13,000	\$23,000	\$39,000
Income Responding	<1	\$13,000	\$24,000	\$40,000
Subtotal	2	\$58,000	\$100,000	\$182,000
Rest of Ohio				
Direct Impact	-	-	-	-
Supplier Sales	<1	\$1,000	\$2,000	\$5,000
Income Responding	<1	\$1,000	\$1,000	\$2,000
Subtotal	<1	\$2,000	\$4,000	\$8,000
Total Ohio				
Direct Impact	1	\$33,000	\$53,000	\$103,000
Supplier Sales	<1	\$14,000	\$25,000	\$44,000
Income Responding	<1	\$14,000	\$25,000	\$42,000
Total Impact	2	\$60,000	\$104,000	\$190,000

Source: EDR Group analysis. Dollars in constant 2017 dollars. Dollars rounded to the thousands.
Columns may not add due to rounding.

Table 36. Total Visitor Spending Impacts - LCK

Impact Type	Jobs	Payroll	Value Added	Business Revenues
Columbus Region				
Direct Impact	256	\$6,747,000	\$11,173,000	\$21,878,000
Supplier Sales	49	\$2,553,000	\$4,596,000	\$7,715,000
Income Responding	58	\$2,542,000	\$4,914,000	\$8,095,000
Subtotal	364	\$11,841,000	\$20,683,000	\$37,688,000
Rest of Ohio				
Direct Impact	-	-	-	-
Supplier Sales	3	\$207,000	\$436,000	\$1,006,000
Income Responding	3	\$124,000	\$246,000	\$482,000
Subtotal	6	\$331,000	\$683,000	\$1,489,000
Total Ohio				
Direct Impact	256	\$6,747,000	\$11,173,000	\$21,878,000
Supplier Sales	53	\$2,760,000	\$5,032,000	\$8,721,000
Income Responding	60	\$2,666,000	\$5,160,000	\$8,577,000
Total Impact	370	\$12,172,000	\$21,366,000	\$39,177,000

Source: EDR Group analysis. Dollars in constant 2017 dollars. Dollars rounded to the thousands.
Columns may not add due to rounding.

4.5. Bolton Field Airport

Dedicated to corporate and recreational aviation activities, Bolton Field serves area businesses as well as private pilots and aviation enthusiasts. A subset of the general aviation activity at TZR brings visitors into the Columbus Region, resulting in visitor spending impacts. In 2017, these visitors spent \$1.7 million, directly supporting 22 jobs in the regional economy. With supplier sales and income respending, total visitor spending impacts of TZR reach just over \$3 million in regional business sales, supporting 31 jobs and including \$1.7 million in value added to the Ohio Gross State Product (Table 37)

Table 37. Total Visitor Spending Impacts (GA) - TZR

Impact Type	Jobs	Payroll	Value Added	Business Revenues
Columbus Region				
Direct Impact	22	\$530,000	\$855,000	\$1,673,000
Supplier Sales	4	\$213,000	\$376,000	\$632,000
Income Respending	5	\$203,000	\$393,000	\$647,000
Subtotal	30	\$947,000	\$1,624,000	\$2,952,000
Rest of Ohio				
Direct Impact	-	-	-	-
Supplier Sales	0	\$17,000	\$38,000	\$87,000
Income Respending	0	\$10,000	\$20,000	\$39,000
Subtotal	1	\$27,000	\$58,000	\$127,000
Total Ohio				
Direct Impact	22	\$530,000	\$855,000	\$1,673,000
Supplier Sales	4	\$230,000	\$414,000	\$719,000
Income Respending	5	\$213,000	\$413,000	\$686,000
Total Impact	31	\$974,000	\$1,682,000	\$3,079,000

Source: EDR Group analysis. Dollars in constant 2017 dollars. Dollars rounded to the thousands. Columns may not add due to rounding.

4.6. Combined Visitor Spending Impacts

Across all three of its airports, CRAA's role in facilitating tourism results in an additional \$909 million in value added to the Columbus Region economy. Including additional multiplier impacts in the rest of Ohio, visitor spending impacts result in a total of \$939 million added to the Ohio Gross State Product, which in turn employs over 16,000 people who earn \$535 million (Table 38).

Table 38. Total Visitor Spending Impacts – CRAA’s 3 Airports

Impact Type	Jobs	Payroll	Value Added	Business Revenues
Columbus Region				
Direct Impact	11,204	\$296,430,000	\$490,834,000	\$955,287,000
Supplier Sales	2,161	\$112,214,000	\$201,971,000	\$339,236,000
Income Responding	2,525	\$111,660,000	\$215,926,000	\$355,406,000
Subtotal	15,890	\$520,305,000	\$908,731,000	\$1,649,929,000
Rest of Ohio				
Direct Impact	-	-	-	-
Supplier Sales	148	\$9,102,000	\$19,198,000	\$44,341,000
Income Responding	110	\$5,429,000	\$10,818,000	\$21,197,000
Subtotal	258	\$14,531,000	\$30,017,000	\$65,540,000
Total Ohio				
Direct Impact	11,204	\$296,430,000	\$490,834,000	\$955,287,000
Supplier Sales	2,309	\$121,316,000	\$221,169,000	\$383,577,000
Income Responding	2,635	\$117,089,000	\$226,743,000	\$376,603,000
Total Impact	16,148	\$534,837,000	\$938,747,000	\$1,715,469,000

Source: EDR Group analysis. Dollars in constant 2017 dollars. Dollars rounded to the thousands.

Columns and rows may not add due to rounding.

Chapter 5. Foreign-Trade Zone

5.1. Foreign-Trade Zone 138

Foreign-Trade Zones (FTZs) are secure areas under U.S. Customs and Border Protection (CBP) supervision that are considered outside the U.S. stream of commerce for Customs duty collection purposes. FTZs are the United States' version of what are known internationally as free-trade zones.¹⁵ FTZs have been established in all 50 states and Puerto Rico. There are currently over 200 FTZs in the country, including nine in Ohio.

FTZs are important to international trade and the economies of many U.S. regions, including the Columbus, Ohio, region. They provide certain economic and logistical benefits to users, including:

- Under zone procedures, the usual formal CBP entry procedures and payments of duties are not required at the port of unloading. Instead, goods are brought directly to the FTZ warehouse and duties are deferred until they exit the FTZ.
- Foreign and domestic materials or parts can be used in producing a finished product. If the foreign inputs have a higher duty rate than the finished product, the duty can be reduced (inverted tariff benefit).
- No duties are paid on goods re-exported from an FTZ since they never enter the U.S. stream of commerce. No duties are paid on scrap or waste.
- Merchandise can move directly to the FTZ warehouse with no clearance delay at the port of entry.
- FTZs provide the ability to reduce fees by filing one Customs entry per week rather than one for each and every shipment imported.

FTZs are an attractive option for businesses, and many of the benefits that accrue to users also translate to benefits for employment and for the public. Specific employment benefits include:

- Jobs that otherwise might be located overseas are created and retained in the U.S.
- FTZs encourage multinational firms to establish U.S.-based operations, attracting foreign investment to the U.S.
- Firms are also more likely to utilize U.S.-made components, providing added stimulus to local and regional economies.¹⁶

The Columbus Regional Airport Authority (CRAA) is the Grantee of FTZ 138, which is centered in Columbus at cargo-dedicated Rickenbacker International Airport, a key component of the North American International Freight Center. FTZ 138 has been approved for the Alternative Site Framework (ASF). The ASF provides FTZs with greater flexibility to meet specific requests for zone status. The Foreign-Trade Zones Board (FTZB) has the

¹⁵ <https://www.cbp.gov/border-security/ports-entry/cargo-security/cargo-control/foreign-trade-zones/about>

¹⁶ <https://www.naftz.org/wp-content/uploads/2017/03/FTZ-Facts-2017.pdf>

ability to approve an ASF “service area” for the FTZ after a public input process, including input from CBP.

- The “service area” is the geographic area where the grantee wants to be able to propose sites for specific users. The most common geographic area is surrounding counties.
- The entire proposed service area must meet the ordinary FTZ adjacency requirement, which is a 60-mile or 90-minute drive, whichever is greater, from the Port of Entry.
- Defining the service area up front eliminates the need for full FTZB processes when new potential zone users appear and need FTZ designation quickly.^{17,18}

Figure 14. FTZ 138 Service Area



Source: <https://ftz138.com/service-area>

One of the highest-performing FTZs in the country and the largest of nine FTZs in Ohio, FTZ 138 provides access to the program to businesses inside the zone’s 25-county service area. Recent FTZ 138 rankings and designations include:

¹⁷ <https://ftzcorp.com/ftz-services/alternative-site-management-framework-asf.aspx>

¹⁸ https://enforcement.trade.gov/ftzpage/info/ASF_Info_for_CBP.pdf

- Nearly \$9.26 billion of goods moved through FTZ 138 in 2017.
- Rated among the top 10 FTZs for warehousing and distribution for the last five years.
- In 2017, FTZ 138 ranked number 9 out of 191 active U.S. FTZs for warehousing and distribution.¹⁹
- In 2017, FTZ 138 ranked 22 out of 191 active U.S. FTZs for exports out of an FTZ for warehousing and distribution.²⁰

Eleven companies are located in FTZ 138. These Businesses accrue financial benefits afforded to U.S. FTZs in lowering costs associated with importing merchandise. Additionally, the Columbus, Ohio, region markets itself as a strategic location for moving goods ideally situated within 500 miles of 44 percent of the U.S. population and manufacturing base²¹, and also 33 percent of the Canadian population, allowing companies in FTZ 138 to distribute to Canada without paying U.S. import duties on products, even if they reside within our zone for a time.

Among other benefits, businesses that are in the region can benefit from:

- The nation's second-lowest effective tax rate for new distribution centers
- Access to the global marketplace via Rickenbacker International Airport, which is one of only a few cargo-dedicated airports in the world.²²

5.2. Economic Impacts of FTZ 138

The 11 companies supported by FTZ 138 employ 5,897 Columbus area workers.²³ Eight of these companies receive and ship textiles, footwear and/or leather products. Two of the companies import pharmaceutical products, and the last company imports an amalgamation of electrical machinery and equipment, instruments, metals and minerals. Table 39 shows a profile of the FTZ.

In sum, FTZ 138 received and shipped goods valued at more than \$9.26 billion.²⁴ Including overhead, labor, income and other costs, the total value of shipments exceeded \$13.8 billion.²⁵ A little more than 10 percent of these goods in terms of value (and about 12 percent of textile, footwear and/or leather goods) were re-exported from Columbus to international destinations and almost \$13 billion of merchandise was entered into the United States stream of commerce.

¹⁹ 79th Annual Report of the Foreign Trade Zone Board to the Congress of the United States. <https://enforcement.trade.gov/ftzpage/annualreport/ar-2017.pdf>

²⁰ <https://ftz138.com/doing-business-with-us/about-ftz138>

²¹ Columbus 2020, Factbook 2018

²² <https://ftz138.com/doing-business-with-us>

²³ Data provided to study team by CRAA.

²⁴ <https://ftz138.com/doing-business-with-us/about-ftz138>

²⁵ Data provided to study team by CRAA

Table 39. Profile of FTZ 138 in 2017

Main Categories of Foreign Status Merchandise Received	Employees On-Site	Total Value of Shipments	Value of Shipments Exported Internationally
Electrical machinery & equipment, optical, photographic & medical instruments; other metals/minerals	58	\$463,533,000	\$0
Pharmaceutical products	35	\$1,532,516,000	\$0
Textiles/footwear/leather	5,804	\$11,853,842,000	\$1,411,790,000
TOTALS	5,897	\$13,849,891,000	\$1,411,790,000

Source: CRAA

FTZ 138 generates more than \$5 billion of business revenues in Ohio, including almost one-half billion dollars of wage income for almost 10,000 workers (Table 40). Business revenues include about \$4.6 billion in direct impacts generated at the FTZ (calculated as the difference between the \$13.8 billion in total value and the \$9.26 billion value of merchandise, both cited above) and \$614 million generated in the Columbus Region and across Ohio from (1) supplier sales of goods and services to companies in the FTZ and (2) the effects of workers in the FTZ and those from suppliers spending their wages in Ohio. Moreover, the FTZ accounts for more than \$700 million of Ohio's Gross State Product (value added).

Table 40. Economic Impact of FTZ 138

	Jobs	Payroll	Value Added	Business Revenues
Columbus Region				
Direct Impact	5,897	\$291,374,000	\$357,306,000	\$4,557,000,000
Supplier Sales	1,634	\$78,990,000	\$160,718,000	\$252,285,000
Income Responding	2,302	\$101,240,000	\$195,794,000	\$322,545,000
Subtotal	9,833	\$471,604,000	\$713,819,000	\$5,131,830,000
Rest of Ohio				
Direct Impact	-	-	-	-
Supplier Sales	66	\$4,824,000	\$10,757,000	\$22,775,000
Income Responding	77	\$3,971,000	\$8,024,000	\$16,155,000
Subtotal	143	\$8,795,000	\$18,781,000	\$38,930,000
Total Ohio				
Direct Impact	5,897	\$291,374,000	\$357,306,000	\$4,557,000,000
Supplier Sales	1,700	\$83,814,000	\$171,475,000	\$275,060,000
Income Responding	2,379	\$105,211,000	\$203,818,000	\$338,700,000
Total Impact	9,977	\$480,399,000	\$732,600,000	\$5,170,760,000

Source: EDR Group analysis using data from CRAA. All dollars rounded to the nearest thousand.

Columns may not add due to rounding.

Supplier sales and wage income spending spread the effects of FTZ 138 across 72 sectors of the 86 three-digit NAICS sectors, which comprise the Ohio economy²⁶, with supplier sales (indirect effects) being stimulated in 51 sectors and wage spending affecting 67 sectors. Goods and services purchased from suppliers in Ohio support over 1,600 jobs, with 88 percent of these jobs concentrated in 10 sectors, while the top 10 sectors that are stimulated from workers spending their wages account for 57 percent of the 2,300 jobs derived from income respending.

Table 41 displays the leading 10 three-digit NAICS sectors stimulated by multiplier effects in terms of Ohio jobs. Four sectors are significantly impacted by worker spending and are not affected at all due to supplier sales: ambulatory health care, hospitals, social assistance and education. As can be seen by Table 41, administrative support, warehousing, real estate and professional, scientific and technical services have substantial impacts in both types of multipliers but are far more significant in business services transactions than for household spending. Conversely, impacts from expenditures on food services are far more pronounced from income respending than from indirect supplier sales.

Table 41. Spread of Jobs in Ohio Due to Multiplier Effects

Supplier Sales Impacts		Income Respending Impacts	
Sector	Jobs	Sector	Jobs
Administrative support services	353	Food services & drinking places	313
Warehousing & storage	323	Ambulatory health care	213
Real estate	309	Administrative support services	125
Professional, scientific & technical services	173	Social assistance	116
Postal service, couriers & messengers	93	Real estate	109
Repair & maintenance	88	Personal & laundry services	96
Construction	36	Professional, scientific & technical services	96
Food services & drinking places	23	Educational services	93
Transportation Support	23	Hospitals	91
Insurance carriers & related	19	General merchandise stores	70
Other	194	Other	981
Total	1,634	Total	2,302

Source: Calculations by EDR Group using IMPLAN's multi-regional input-output tool. Columns may not add due to rounding.

²⁶ The North American Industry Classification System (NAICS) is the standard used by Federal statistical agencies in classifying business establishments for the purpose of collecting, analyzing, and publishing statistical data related to the U.S. business economy. NAICS classifies industries in two to six-digit codes, with two-digit being the most aggregated at 20 sectors. For example, Sector 48 is transportation, 481 is air travel, 4811 is scheduled air transportation, and 48111 is scheduled passenger transportation (not all sectors reach the six-digit level).

Chapter 6. Other CRAA-Related Economic Activity

6.1. Sources of Additional Off-Airport Impacts

The economic impact of CRAA and its airports extends “beyond the fence.” The vital passenger and freight air services provided at John Glenn Columbus International Airport and Rickenbacker International Airport anchor clusters of airport-oriented development that are so-situated due to the presence of the airports. This chapter details the economic impact of these additional activities including businesses located off-airport that support air service on-airport or that serve related warehousing, distribution, freight forwarding, and air freight trucking markets that are reliant on LCK’s role as an air freight hub.

This chapter also includes an analysis of businesses and construction located on land either owned by CRAA or initially developed by CRAA and then later sold. Examples of this include the Rickenbacker Global Logistics Park (RGLP), a 1,777-acre master-planned area of prime industrial land located within five campuses surrounding the airport, and Norfolk Southern Rickenbacker Intermodal Terminal.

Additional off-airport impacts are broken up into two geographies: the Rickenbacker area, and the area near CMH.

- **Rickenbacker Area:** This area includes the RGLP, Norfolk Southern Rickenbacker Intermodal Terminal, and businesses located near LCK that rely on the airport for their business operations. Impacts reported in this chapter exclude FTZ 138 businesses, which are separately accounted for in Chapter 5.
- **Area near CMH:** Many business establishments are located just outside of CMH. The businesses included in this analysis rely on the airport for their business operations. Business without connection to CMH are not included.

In the summary of impacts by airport in section 1.2.3, the Rickenbacker area is grouped with LCK and the area near CMH is reported with the CMH impacts.

Table 42 summarizes the data sources used to identify and characterize CRAA-related off-airport activity in the Rickenbacker area and near CMH.

Table 42. Data Sources for CRAA-Related Economic Activity in the Rickenbacker Area and Near CMH

Impact Source	Description of impact source coverage	Data Sources
CRAA Operations <i>(Rickenbacker area only)</i>	<ul style="list-style-type: none"> CRAA employees managing the RGLP 	<ul style="list-style-type: none"> CRAA provided data on employment and payroll Wages and benefits for non-contractor jobs from the <i>2017 Comprehensive Annual Finance Report</i>.
Construction <i>(Rickenbacker area only)</i>	<ul style="list-style-type: none"> Construction by CRAA's real estate partner Duke Realty in the RGLP between 2014-2017. Construction activity at the Norfolk Southern Rickenbacker Intermodal Terminal between 2014-2017. 	<ul style="list-style-type: none"> CRAA provided data on private square footage of new construction and per-square-foot development costs
Off-airport related businesses <i>(Rickenbacker area and near CMH, respectively)</i>	<ul style="list-style-type: none"> CRAA-related businesses near LCK and CMH Includes business activity that is reliant on LCK and CMH and businesses located on land either currently owned by CRAA or initially developed by CRAA and then later sold 	<ul style="list-style-type: none"> InfoGroup's ReferenceUSAGov database²⁷ and CRAA input to identify businesses using customized polygons drawn around satellite campuses and additional land in the Rickenbacker area and land area near CMH. CRAA staff vetting to identify companies still in operation and with connections to CRAA Survey of businesses ReferenceUSAGov database to fill in gaps as needed

6.2. Economic Impact of Near-Airport Activity

6.2.1. Rickenbacker Area

CRAA leverages its operations at Rickenbacker International Airport and its land and development partnerships to support a successful business cluster in the Rickenbacker area. The Rickenbacker area, which includes the Rickenbacker Global Logistics Park, is a vibrant logistics hub that takes advantage of cargo-dedicated LCK and the Norfolk Southern Rickenbacker Intermodal Terminal. It is also well situated for broader warehousing and

²⁷ www.referenceusagov.com

distribution due to its location within a one-day truck drive to nearly half of the U.S. population and one-third of Canada's.²⁸

Off-airport CRAA-related activity in the Rickenbacker area directly creates nearly 9,000 jobs and \$1.3 billion in business revenue. With statewide multiplier impacts, this CRAA-related activity succeeds in generating just shy of half a billion dollars of income (payroll) for workers in Ohio and adds \$744 million to the Gross State Product.

Table 43. Economic impact of CRAA-related activity in the Rickenbacker Area

	Jobs	Payroll	Value Added	Business Revenues
Columbus Region				
Direct Impact	4,856	\$277,233,000	\$348,771,000	\$653,085,000
Supplier Sales	1,792	\$97,511,000	\$165,082,000	\$273,043,000
Income Responding	2,330	\$102,431,000	\$198,081,000	\$326,290,000
Subtotal	8,978	\$477,174,000	\$711,934,000	\$1,252,419,000
Rest of Ohio				
Direct Impact	-	-	-	-
Supplier Sales	157	\$10,899,000	\$20,570,000	\$45,532,000
Income Responding	118	\$5,687,000	\$11,253,000	\$21,708,000
Subtotal	275	\$16,586,000	\$31,824,000	\$67,239,000
Total Ohio				
Direct Impact	4,856	\$277,233,000	\$348,771,000	\$653,085,000
Supplier Sales	1,948	\$108,410,000	\$185,652,000	\$318,575,000
Income Responding	2,448	\$108,118,000	\$209,334,000	\$347,998,000
Total Impact	9,252	\$493,760,000	\$743,758,000	\$1,319,658,000

Source: EDR Group analysis. All dollars rounded to the nearest thousand. Columns may not add due to rounding.

6.2.2. Near John Glenn Columbus International Airport

Similarly, John Glenn Columbus International Airport supports off-airport business activity that takes advantage of its proximity to CMH. As shown in Table 42, above, businesses off-airport were assessed by CRAA staff to ensure that only those related to CMH were included in this analysis.

The airport-related businesses include approximately 1,200 direct jobs that pay workers \$73 million. The total statewide impact in Ohio of these CMH-adjacent businesses is \$333 million in business revenue, supporting over 1,300 jobs and nearly \$79 million in earnings for workers.

²⁸ <https://rickenbackeradvantage.com/warehouse-distribution/rickenbacker-global-logistics-park>

Table 44. Economic impact of CRAA-related activity near CMH

	Jobs	Payroll	Value Added	Business Revenues
Columbus Region				
Direct Impact	566	\$37,684,000	\$73,337,000	\$199,617,000
Supplier Sales	319	\$19,842,000	\$32,374,000	\$56,110,000
Income Respending	358	\$15,739,000	\$30,433,000	\$50,134,000
Subtotal	1,243	\$73,265,000	\$136,144,000	\$305,861,000
Rest of Ohio				
Direct Impact	-	-	-	-
Supplier Sales	53	\$4,127,000	\$7,832,000	\$21,161,000
Income Respending	34	\$1,556,000	\$3,010,000	\$5,528,000
Subtotal	88	\$5,684,000	\$10,842,000	\$26,689,000
Total Ohio				
Direct Impact	566	\$37,684,000	\$73,337,000	\$199,617,000
Supplier Sales	372	\$23,969,000	\$40,206,000	\$77,271,000
Income Respending	392	\$17,295,000	\$33,443,000	\$55,662,000
Total Impact	1,331	\$78,949,000	\$146,986,000	\$332,550,000

Source: EDR Group analysis. All dollars rounded to the nearest thousand. Columns may not add due to rounding.

Chapter 7. Tax Impacts

7.1. Introduction and Approach

The chapter presents the magnitude of sales and income tax contributions stemming from economic activity at CRAA airport facilities. To facilitate communication with both state and local leadership, the sales and income tax results are aggregated into two geographies: the state of Ohio and the Columbus Region, which includes the following eleven counties: Delaware, Fairfield, Franklin, Knox, Licking, Logan, Madison, Marion, Morrow, Pickaway, and Union.

Section 7.1.1 summarizes the types of economic activity that were included in the tax impact assessment. While the methods in this report generate robust and defensible estimates, the methods are not a replication of the 2011 CRAA Economic Impact Study; Sections 7.1.2 and 7.1.3 describe the tax quantification methodology for sales tax and income tax. Finally, sections 7.2 through 7.5 summarize the results of the tax impact analysis. Tax impact values are reported to the nearest thousand in all tables.

Table 45 represents the total tax impact of economic activity at all CRAA's airport facilities (CMH, LCK, TZR), at all location categories (on-airport, off-airport visitor spending, airport dependent businesses near-airport) and across all multiplier effects (direct, indirect, induced) for the entire state of Ohio in 2017. The total tax impact is estimated at \$614 million for the State of Ohio in 2017. Local and state taxes in Ohio generated \$26-\$30 billion in sales and income tax revenue in 2017.²⁹

Table 45. CRAA's Total Tax Impact in the State of Ohio, 2017

Income Tax from Labor Income	Sales Tax from Pre-Margined Output	Total Tax Impacts
\$85,128,000	\$528,450,000	\$613,578,000

Row may not add due to rounding.

Defining Airport-Related Economic Activity

This section presents a summary of the types of economic activity included in the tax impact assessment. The reader may refer to prior chapters for more detailed discussions of the methods and results of the economic modeling. The types of economic activity in this report can be understood across three categories: (1) location, (2) accounting, and (3) the multiplier impacts.

²⁹ Though not called out separately, the Commercial Activity Tax and the Hotel/Motel Tax are implicitly counted in the total.

Within the location category, there are three distinctions: (1a) on-airport activity, (1b) off-airport visitor activity, and (1c) airport-dependent businesses near CRAA airports.

The on-airport activity (1a) includes economic transactions and employment that occur on-site at one of the three CRAA airport facilities (CMH, LCK, and TZR). See Chapter 3 for more details. The off-airport visitor activity (1b) includes sales and employment that occur at non-airport locations in Ohio as a result of spending from visitors who traveled through one of the three CRAA airports. This was estimated in the visitor spending analysis discussed in Chapter 4. Finally, the airport-dependent businesses near CRAA airports (1c) includes economic transactions and employment that occur at airport-dependent sites near CRAA airports and areas covered by Foreign Trade Zone 138. These businesses were verified by CRAA staff as known airport-dependent businesses. See Chapter 6 for more details.

Within the accounting category, there are also three distinctions: (2a) employee counts, (2b) labor income, and (2c) pre-margin output. The employee counts represent the estimated number of employees who support the economic activity, the labor income represents total employee monetary compensation (income and benefits), and the pre-margin output represents the business revenues that result from the economic activity.

Finally, within the economic effects, there are three further distinctions: (3a) direct, (3b) supplier sales, and (3c) income respending. Direct effects are estimates of aviation industry transactions in the region, business sales represent transactions related to downstream supplier transactions that support the regional aviation industry, and income respending are the result of income spending from employees involved in the direct and indirect transactions.

7.1.1. Method to Quantify Income Tax Impact³⁰

This section presents a description of the tax quantification methodology for income tax. The description begins with an overview of the applicable income taxes levied at the state and local levels in Ohio, then presents a description of the analysis methodology.

³⁰ References:

- Tax revenue at the state level for school district, municipal, and state income tax are available in the 2017 Fiscal Year Report from the Ohio Department of Taxation (link: https://www.tax.ohio.gov/Portals/0/communications/publications/annual_reports/2017AnnualReport/AR2017.pdf).
- Personal income, reported by county, is available from the Bureau of Economic Analysis (link: <https://apps.bea.gov/itable/iTable.cfm?ReqID=70&step=1>).
- Municipal income tax rates and school district income tax rates are available from the Ohio Department of Taxation (link: <https://thefinder.tax.ohio.gov/StreamlineSalesTaxWeb/Download/MuniRateTableInstructions.aspx>).
- Overview of Income Taxes and the Military available from the Ohio Department of Taxation (link: https://www.tax.ohio.gov/ohio_individual/individual/military_tax_provisions.aspx)

In the state of Ohio, employees are subject to up to four primary types of income tax: individual income tax levied by the state of Ohio, individual income tax levied by certain school districts throughout Ohio, income tax levied by certain municipalities throughout Ohio, and municipal income tax only applicable to employees of electric light and telephone companies. As reported in the most recent Annual Report from the Ohio Department of Taxation, 190 of Ohio's 614 school districts levied an income tax of 0.25 percent to 2 percent (in 2017), and 616 municipalities in Ohio levied their own municipal income tax of 0.5 percent to 3 percent (in 2015, the most up to date information available as of this writing). For the purposes of this report, the electric light and telephone company income tax is omitted from the analysis since it is unique to one industry and has negligible significance relative to the other income taxes.

The representative statewide income tax is quantified as 2.46 percent and determined in the following manner. First, we the net state income tax revenue in Ohio in 2017 is summed (approximately \$7.98 billion), the net municipal income tax revenue in Ohio in 2015 (approximately \$5.00 billion), and the net school district income tax revenue in Ohio in 2017 (approximately \$0.43 billion) to obtain the net income tax revenue statewide (approximately \$13.24 billion). Then, the net statewide income tax revenue is divided by the personal taxable income of Ohio in 2017 (approximately \$544.83 billion) to obtain a representative statewide income tax rate of 2.46 percent. The first row of Table 46 provides a summary of the calculation of the statewide representative tax rate.

The representative Columbus Region income tax rate is quantified as 3.38 percent and determined in the following manner. First, the net income tax revenue collected in the Columbus Region in 2017 is summed: state income tax revenue (approximately \$1.56 billion), municipal income tax revenue (approximately \$2.03 billion), and school district income tax revenue (approximately \$0.08 billion) to obtain the net income tax revenue region-wide (approximately \$3.58 billion). Then, the Columbus Region's net income tax revenue is divided by the personal taxable income in the Columbus Region in 2017 (approximately \$106.2 billion) to obtain a representative local income tax rate of 3.38 percent for the Columbus Region. The second row of Table 46 provides a summary of the calculation of the region-wide representative tax rate.

The income tax impact is then calculated in the following manner. In this report, the representative income tax rates are applied to accounting category (2b) labor income. Then, we apply ratio of taxes collected in Ohio and the region including benefits, such that we only consider taxable income by place of work (82.49 percent of labor income when evaluating statewide, or 82.55 percent of labor income when evaluating just the Columbus region). Finally, the appropriate income tax rates are applied (2.46 percent when evaluating

statewide, or 3.38 percent when evaluating just the Columbus region) to estimate income tax.³¹

Table 46 Calculations to Justify the Representative Income Tax Rates, 2017

Geography	State Income Tax Revenue	Municipal Income Tax Revenue	School District Income Tax Revenue	Personal Income (salary and wages)	Representative Income Tax Rate
State of Ohio	\$7.98 B	\$5.00 B	\$0.43 B	\$544.83 B	2.46%
Columbus Region	\$1.56 B	\$2.03 B	\$0.08 B	\$106.2 B	3.38%

Source: Ohio Department of Taxation & Bureau of Economic Analysis. B=billions.

7.1.2. Method to Quantify Sales Tax Impact³²

This section describes the tax quantification methodology for sales tax. The description begins with an overview of the applicable sales taxes levied at the state and local levels in Ohio, followed by a description of the analysis methodology.

In the state of Ohio, sales transactions are subject to up to three primary types of sales tax in 2017: the sales and use tax levied by the state (5.75 percent), the sales and use tax levied by Ohio counties (ranging from 0.5 percent to 1.5 percent), and sales and use tax levied by Ohio transit authorities (0.25 percent to 1 percent).

The representative statewide sales and use tax is 7.16 percent. To calculate this, the county and transit sales tax revenue for all Ohio counties and transit authorities in 2016 are summed (approximately \$2.55 billion) to obtain the net local sales tax revenue collected statewide. Then, the net, local sales tax revenue is divided by the statewide taxable sales in 2016 (approximately \$181.77 billion) to obtain a weighted statewide local sales tax rate of 1.405 percent. Then this rate is added on to the state sales tax rate of 5.75 percent to

³¹ Military employees are responsible for state and local taxes on income earned in Ohio. Although nonresidents of Ohio who are stationed in Ohio have access to certain deductions, this report does not take deductions into account.

³² References:

- A summary of the sales and use tax is available in the 2017 Fiscal Year Report from the Ohio Department of Taxation (link: https://www.tax.ohio.gov/Portals/0/communications/publications/annual_reports/2017AnnualReport/AR2017.pdf).
- Sales and use tax rates and revenue at the state, county, and transit authority level are available from the Ohio Department of Taxation (link: https://www.tax.ohio.gov/tax_analysis/tax_data_series/sales_and_use/publications_tds_sales/S1M1217.aspx).

obtain a representative statewide sales and use tax of 7.16 percent. The first row of Table 47 provides a summary of the calculation of the statewide representative tax rate.

The representative sales and use tax for the Columbus Region is 7.33 percent. To calculate this tax, the county and transit sales tax revenue are summed for the eleven regional counties and the Central Ohio Transit Authority in 2016 (approximately \$0.61 billion) to obtain the net local sales tax revenue collected state-wide. Then, the net, local sales tax revenue is divided by the taxable sales in the Columbus region in 2016 (approximately \$38.59 billion) to obtain a weighted Columbus Region sales tax rate of 1.581 percent. Then this rate is added on to the state sales tax rate of 5.75 percent to obtain a region-wide representative sales and use tax of 7.33 percent. The second row of Table 47 provides a summary of the calculation.

In this report, the representative sales tax rates are applied to one accounting categories (2c) pre-margin output, which represent consumers' purchase prices. Transactions by CRAA and the military are exempt, although employees are still responsible for state and local sales and use taxes in Ohio.

Table 47. Calculations to Justify the Representative Sales and Use Tax Rates, 2017

Geography - State Sales and Use Tax Rate	County & Transit Sales and Use Tax Revenue	Estimated Taxable Sales	Representative Sales Tax Rate
State of Ohio 5.75%	\$2.55 billion	\$181.77 billion	7.16%
Columbus Region 5.75%	\$0.61 billion	\$38.59 billion	7.33%

Source: Ohio Department of Taxation & Bureau of Economic Analysis.

7.2. Tax Impact of On-Airport and Off-Airport Visitor Spending

Table 48 summarizes the overall tax impact of on-airport economic activity at the three CRAA airport facilities as well as the off-airport visitor spending from travelers passing through those airports. The reported values represent total tax impact across all direct and multiplier impacts for the entire state of Ohio in 2017. The net on-airport tax impact is approximately \$328 million and the net off-airport tax impact from visitor spending is approximately \$140 million.

Table 48. State of Ohio Tax Impact from On-airport and Off-airport Visitor Spending Activity, 2017, by Location of Economic Activity

Location of economic activity	Income Tax from Labor Income	Sales Tax from Pre-margined Output	Total Tax Impact
On-airport	\$31,893,000 \$41,168,000	\$281,870,000	\$323,038,000
Off-airport visitor spending	\$14,812,000	\$125,632,000	\$140,444,000

Rows may not add due to rounding.

Table 49 breaks down Table 46 according to each facility's tax contribution across all direct and multiplier impacts in 2017. CMH accounts for a significant portion of the overall tax impact, including 78 percent of the on-airport impacts and 98 percent of the visitor spending off-airport impacts. Furthermore, these impacts primarily occur in the Columbus Region.

Table 49. Tax Impact from 2017 On-airport and Off-airport Visitor Spending Activity by Facility, Geography, and Location of Economic Activity

Location of Economic Activity	Geography	Income Tax from Labor Income	Sales Tax from Pre-margined Output	Total Tax Impact
CMH				
On-airport	Columbus Region	\$22,844,000	\$204,517,000	\$243,533,000
	Total Ohio	\$23,815,000 \$30,724,000	\$219,738,000	
Off-airport visitor spending	Columbus Region	\$14,161,000	\$117,961,000	\$136,986,000
	Total Ohio	\$14,448,000	\$122,538,000	
LCK				
On-airport	Columbus Region	\$10,103,000	\$57,500,000	\$71,933,000
	Total Ohio	\$10,353,000	\$61,580,000	
Off-airport visitor spending	Columbus Region	\$330,000	\$2,763,000	\$3,206,000
	Total Ohio	\$337,000	\$2,869,000	
TZR				
On-airport	Columbus Region	\$89,000	\$523,000	\$643,000
	Total Ohio	\$91,000	\$552,000	
Off-airport visitor spending	Columbus Region	\$26,000	\$216,000	\$252,000
	Total Ohio	\$27,000	\$225,000	

Columns and rows may not add due to rounding.

7.3. Itemized On-Airport Tax Impacts

Table 50 offers an itemized representation of the on-airport tax impacts. The reported values represent the total tax impact across all three airport facilities (CMH, LCK, and TZR), with all direct and multiplier impacts in 2017. The tenants spending category results in the largest tax impact of \$239 million. The airlines, on-airport concessions, and construction are the next most significant spending categories, accounting for \$38 million, \$17 million, and \$11 million respectively. Both CRAA and the military are exempt from state and local sales tax, so the business revenues were assumed to have no sales tax contribution. Although some induced business revenue may be subject to sales tax, this report assumes there is no sales tax since it would result in a more conservative estimate.

Table 50. Itemized On-airport Tax Impact 2017, by Geography and Spending Category

Spending category	Geography	Income Tax from Labor Income	Sales Tax from Pre-margined Output	Total Tax Impact
CRAA Operations	Columbus Region	\$2,171,000	\$-	\$2,195,000
	Total Ohio	\$2,195,000	\$-	
Airlines	Columbus Region	\$4,276,000	\$31,655,000	\$38,427,000
	Total Ohio	\$4,407,000	\$34,019,000	
Concessions	Columbus Region	\$1,549,000	\$15,271,000	\$17,402,000
	Total Ohio	\$1,584,000	\$15,818,000	
Commercial Ground Transportation	Columbus Region	\$389,000	\$3,109,000	\$3,590,000
	Total Ohio	\$398,000	\$3,192,000	
Construction	Columbus Region	\$1,376,000	\$9,401,000	\$11,535,000
	Total Ohio	\$1,424,000	\$10,111,000	
Non-Military Federal Employment	Columbus Region	\$944,000	\$5,626,000	\$6,796,000
	Total Ohio	\$961,000	\$5,836,000	
Military	Columbus Region	\$1,941,000	\$-	\$1,959,000
	Total Ohio	\$1,959,000	\$-	
Tenants	Columbus Region	\$27,143,000	\$200,545,000	\$239,554,000
	Total Ohio	\$28,033,000	\$211,521,000	
Miscellaneous	Columbus Region	\$205,000	\$1,329,000	\$1,581,000
	Total Ohio	\$208,000	\$1,373,000	

Columns and rows may not add due to rounding.

7.4. Tax Impact of Near-Airport Businesses

Table 51 provides a summary of the overall tax impact of airport dependent businesses that are located near CMH, LCK, and in the Foreign-Trade Zone. Businesses outside of CMH and LCK were identified by the Consultant Team and CRAA staff, and final evaluation was conducted by CRAA to ensure that each business either relies on one of its airports or is situated on land parcels currently or previously owned by CRAA.

The reported values represent the total tax impact across all impacts for the entire state of Ohio in 2017. The net tax impact of the airport dependent businesses is approximately \$150 million.

Table 51. State of Ohio Tax Impact of Airport-Dependent Businesses in the Rickenbacker Area and near CMH 2017

Location of economic activity	Income Tax from Labor Income	Sales Tax from Pre-margined Output	Total Tax Impact
Airport-dependent business	\$29,148,000	\$120,947,000	\$150,095,000

Row may not add due to rounding.

Table 52 breaks down findings shown in Table 51 according to the contributions of business near each facility. Businesses near CMH contribute \$26 million to the total tax impact. Airport-dependent businesses near LCK (outside of the FTZ) contribute \$110 million in tax impacts. The sales tax is not calculated for the Foreign Trade Zone. Eventually, the goods that pass through the FTZ will be subject to a sales tax, but it will not necessarily occur in Ohio.

Table 52. Tax Impact of Airport-Dependent Businesses Near CRAA Facilities, 2017, by Geography and Location of Economic Activity

Facility	Geography	Income Tax from Labor Income	Sales Tax from Pre-margined Output	Total Tax Impact
Near CMH	Columbus Region	\$2,044,000	\$22,420,000	\$26,491,000
	Ohio	\$2,160,000	\$24,331,000	
Near LCK	Columbus Region	\$13,314,000	\$91,802,000	\$110,277,000
	Ohio	\$13,651,000	\$96,617,000	
FTZ	Columbus Region	\$13,159,000	\$-	\$13,347,000
	Ohio	\$13,337,000	\$-	

Rows may not add due to rounding.

7.5. Real Estate & Land Use Tax Incentives

This section discusses tax incentives associated with property taxes within Franklin County in the context of CRAA airports. Tax incentives tied to property taxes or land use can attract new businesses or provide opportunities to expand businesses in geographic clusters. Thus, this section explores the role of tax incentives as a tool to encourage airport activity centers near airport facilities or near real estate owned by CRAA.

Three representative tax incentives within Franklin County were reviewed: 1) Tax Incremental Financing (TIF), 2) Enterprise Zones (EZ), and 3) Joint Economic Development Districts (JEDD). While Community Reinvestment Areas are also significant in land use incentives they are also used for residential development across Ohio. However, CRA is an important development tool for CRAA, particularly for LCK. The program provides property tax exemptions renovation or new construction. Sixteen designated CRAs are in the Rickenbacker area, with many pre-dating 1994, including the LCK airfield. Currently, CRAA has three active CRA agreements in Franklin and Pickaway counties that have attracted \$223 million of investment since 2006, encompass hundreds of acres and nearly all of CRAA off-airport development near LCK.

This focus below is on the TIF, EZ, and JEDD because they are more frequently intended to serve and attract business investment. TIF, which is a longstanding tax incentive in the U.S., proposes tax incentives to finance redevelopment projects. In general, TIF is widely applied across multiple property types, industry types, and development types. An Enterprise Zone provides special tax exemption to boost local economic conditions and was first introduced to reduce the declining number of businesses in city centers. The third incentive considered is the JEDD. Since Ohio has various types of municipalities (city, village, and township), commercial and industrial development requires cooperation between different municipalities. JEDDs focus on resolving the issues associated with cooperation between different municipalities. CRAA airports share multiple tax districts. Most tax districts around CMH and LCK levy a 2.8 percent property tax on businesses. However, TZR shares tax district boundaries with multiple township governments that levy a 1.0 percent property tax.

Tax Incremental Financing (TIF) districts are sponsored by the state of Ohio. Easton TIF, Lucent TIF, and East Broad Dominion TIF are within approximately 3 miles of CMH. West TIF is within approximately 3 miles of LCK. Finally, Blauser Summerly TIF is within approximately 3 miles of TZR. TIF is regarded as an economic development tool for infrastructure improvements, new investments, and residential rehabilitation. The main incentive of TIF is to provide funding on public infrastructure including public roads, highways, water and sewer lines, remediation, land acquisition, demolition, the provision of gas, electric, and the enhancement of public waterways. TIF also funds residential housing renovation. The tax benefit is to exempt the value of private improvements from property taxes up to 75 percent for a term of up to 10 years. If local governments obtain the

concurrence of the boards of education about the amount of tax benefits, the local jurisdictions can exempt the value of improvements up to 100 percent for a term of up to 30 years. Although TIF is more likely to induce infrastructure improvement than new economic investment, TIF may encourage businesses to renovate their facilities or to acquire new land for expansion. The renovation of facilities and additional land acquisition may be helpful to create positive impacts on economic development for airports and communities.

Enterprise Zones (EZ) are sponsored by the Ohio government. The purpose of an EZ is to provide tax incentives to businesses in the form of tax exemptions for new investments. If a municipality meets one of the specified six distress criteria, the local municipalities can receive the qualification of Enterprise Zones. The six standards are: 1) 125 percent of the state average unemployment during the most recent 12 months, 2) At least 10 percent population loss between 1980 and 2000, 3) Prevalence (minimum of 5 percent) of vacant or demolished commercial or industrial facilities, 4) 51 percent of the population is below 80 percent of the area's median income, 5) Specific vacant industrial facilities (zone applies to only those facilities), and 6) Income weighted tax capacity of the school district is below 70 percent of the state average. Both existing businesses and new businesses can receive these tax incentives. Regarding existing businesses, the firms are required to invest at least 10 percent of the value of the existing facilities to receive tax exemption. Furthermore, the renovation of existing businesses needs to exceed 50 percent of the total facility's value to receive the tax exemption. Also, if a business wants to occupy the vacant facility and invest, the firm needs to invest at least 20 percent of the facility's value in repairing to be eligible for the tax incentives. Tax exemptions are made for assessed values of up to 75 percent for up to 10 years or an average of 60 percent over the term of new investments in buildings, machinery, inventory, and improvements to existing land buildings for a specific project.

Enterprise Zones around CMH may offer direct economic benefits. We found several industries near the airport that already have an active EZ agreement. First is NetJets, Inc, which is directly adjacent to CMH. NetJets will receive a \$12.5 million tax exemption, and the expiration date is 2024. Second, UPS is another business around CMH, which will receive an \$80 million tax exemption and the expiration date is 2030. Airside One LCC, near CMH, has already received a \$6 million tax exemption because of new construction. The EZs around CRAA airports may become an important factor to attract new economic investment and to renovate or to expand current businesses.

The state government also sponsors the Joint Economic Development District (JEDD). The purpose of JEDD is to encourage more municipalities and townships to work together to develop land for commercial or industrial areas. The main incentives of JEDD are divided into two parts: 1) benefits to large municipalities and 2) benefits to small townships. Relatively large municipalities will receive a portion of the taxes levied in JEDD without having to annex it. Furthermore, township governments will not lose prime development and the governments will be able to collect property taxes as well as a portion of the income

tax levied. The JEDD agreement prohibits annexation by the city for at least three years. Additionally, JEDD creates a cooperative arrangement with two parties. For tax benefits to both governments, the municipalities and township work together to write the tax benefit contracts. Currently, designated JEDD areas are more than three miles from CRAA airports from CMH and TZR. However, two JEDD areas are located in Pickaway County, immediately south of LCK. CRAA should continue to consider the feasibility of JEDD developments as the airport activity centers further develop.

Chapter 8. Peer Regions Comparison

This chapter compares the findings of the economic impact analysis for CRAA to the findings of studies conducted for other airports located across the U.S. This comparison provides context for the findings of the economic contribution that CRAA has on the Columbus Region.

The first criterion for identifying peer airports is that the major airport in a region must be classified as a medium hub by the FAA, similar to John Glenn Columbus International Airport (CMH).³³ Second, the airport or regional airport systems must have completed an economic impact study no later than 2012. The exception to this rule is Mark Hopkins Airport in Cleveland, Ohio, which is included in this comparison due to its proximity to Columbus. These criteria identified 12 comparison studies, including four “airport systems” and eight studies that address single airports (Table 53).

³³ CMH is one of 31 medium hub airports in the United States, defined as airports that account for between 0.25 percent and 1 percent of total U.S. passenger enplanements (National Plan of Integrated Airport Systems (2019-2023)).

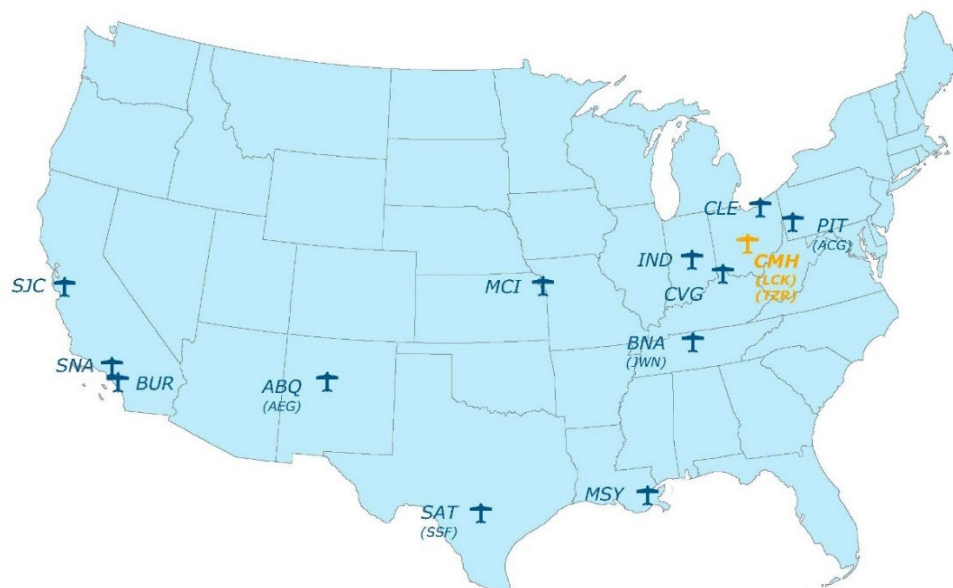
Table 53. Proposed Comparison Airports and Airport Authorities

Airport Authority Name	Commercial Airports <i>GA Airports</i>	Airport Code(s)	Year of Recent Studies	Hub/ASSET Classification ¹
Albuquerque Airport System	Albuquerque International Sunport	ABQ	2013	Medium
	<i>Double Eagle II</i>	AEG		<i>Regional</i>
Burbank-Glendale-Pasadena Airport Authority	Hollywood Burbank Airport	BUR	2013	Medium
Kenton County Airport Board	Cincinnati/Northern Kentucky International Airport	CVG	2013	Medium
City of Cleveland	Cleveland-Hopkins International Airport	CLE ²	2012	Medium
Indianapolis Airport Authority	Indianapolis International Airport	IND	2016	Medium
Orange County, CA	John Wayne Airport	SNA	2014	Medium
Kansas City Aviation Department	Kansas City International Airport	MCI	2015	Medium
New Orleans Aviation Board	Louis Armstrong New Orleans International Airport	MSY	2014	Medium
Nashville Area Airports	Nashville International Airport	BNA	2013	Medium
	<i>John C. Tune Airport</i>	JWN		<i>Regional</i>
City of San Jose	San Jose International Airport	SJC	2015	Medium
Allegheny County Airport Authority	Pittsburgh International Airport	PIT	2015	Medium
	<i>Allegheny County Airport</i>	ACG		<i>National</i>
San Antonio Airport System	San Antonio International Airport	SAT	2012	Medium
	<i>Stinson Municipal Airport</i>	SSF		<i>Local</i>

¹ Federal Aviation Administration, 2018 National Plan of Integrated Airport Systems

² Data are from *Ohio Airports Economic Impact Study*

Figure 15. Map of Comparison Airports



8.1. Contexts of Airports and Regional Economies

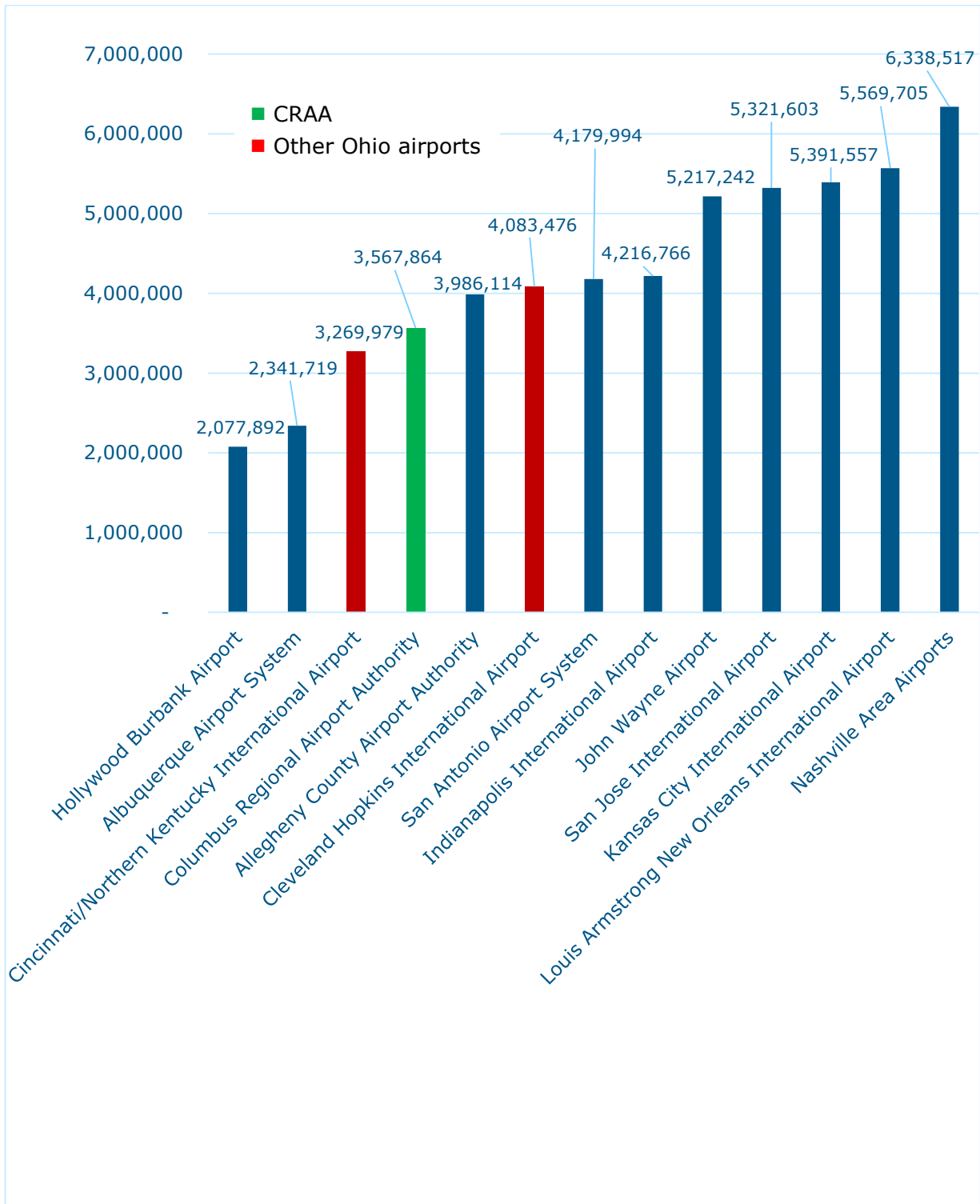
In this section, the 13 airports and airport systems (including CRAA's airport system) are compared to CRAA's system in terms of general aviation operations, and the economies of the metropolitan regions are compared for Gross Domestic Product, total employment and population.

8.1.1. Aviation Context

Among the 13 airports/systems, including CRAA, the Columbus system ranks 9th in total commercial enplanements and 7th in general aviation operations. As shown in Figure 16, CRAA airports (CMH and LCK) served 3.7 million enplanements, which is roughly similar to Cincinnati/Northern Kentucky, Allegheny County, Cleveland Hopkins, San Antonio and Indianapolis, which all serve between 3.2 million and 4.2 million enplanements. Nashville and New Orleans, two national tourist areas serve more enplanements than the other peer airports, while Burbank and Albuquerque serve fewer (the Burbank area is also served by Los Angeles International Airport as well as John Wayne).

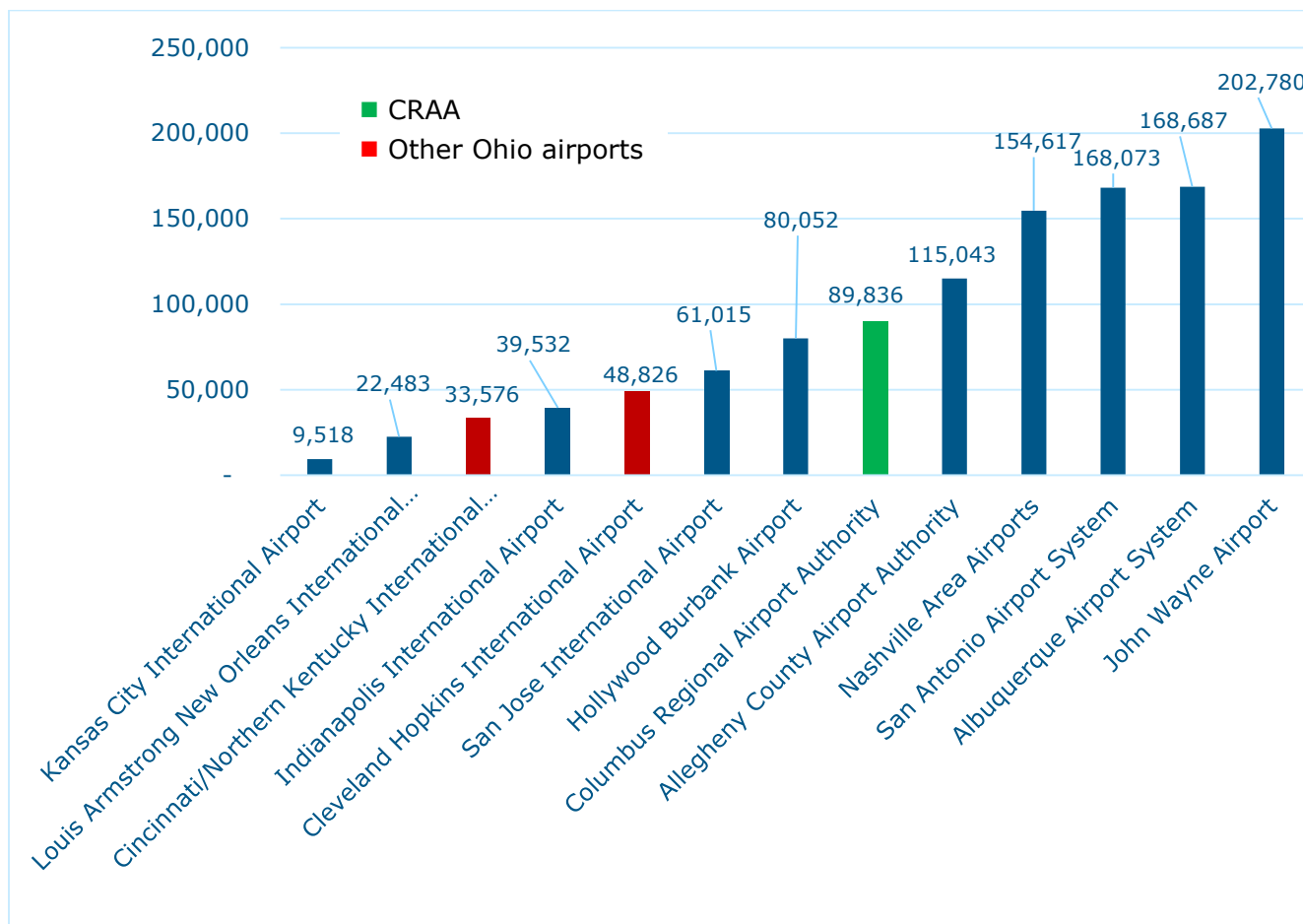
Figure 17 illustrates the levels of general aviation operations among the peer airports and airport systems during 2017. The spread among the peers for general aviation is much wider than shown for commercial enplanements, ranging from 9,500 operations at Kansas City International to more than 200,000 at John Wayne. CRAA's airports, with over 90,000 operations, are positioned between Burbank at 80,000 and Allegheny County at 115,000.

Figure 16. 2017 Commercial Enplanements of Peer Airports



Source: Federal Aviation Administration, 2018 National Plan of Integrated Airports

Figure 17. 2017 General Aviation Operations at Peer Airports/Systems



Source: GCR "Airport IQ" 5010

8.1.2. Economic Context

As each of the studies for the peer airports and systems addresses unique and sometimes undefined study regions, metropolitan statistical areas (MSA) are chosen as the basis of comparison for the economic geographies. MSAs are defined by the United States Office of Management and Budget (OMB) and applied to U.S. Census Bureau data.³⁴

The 13 airports/systems are spread among 12 MSAs (the Los Angeles-Long Beach- Anaheim MSA includes two peer airports: John Wayne and Hollywood Burbank airports). Moreover, Los Angeles International Airport (LAX), one of the world’s busiest airports lies between these two peer airports in the Los Angeles MSA. Los Angeles represents the largest economy among the MSAs of the peer airport/system analysis, with a Gross Domestic

³⁴ An MSA consists of a core county or counties with an urban area of a population at least 50,000, plus adjacent counties having a high degree of social and economic integration with the core counties as measured through commuting ties.

Product of more than \$1 trillion dollars, a population of 13.4 million, and a job base of 8.7 million. Notably, the San Jose-Sunnyvale-Santa Clara MSA includes Silicon Valley, which is reflected in exceptionally high GDP per-capita. Also, the Albuquerque and New Orleans MSAs are significantly smaller regions in terms of employment and population.

Table 54 compares the population and economy of the Columbus MSA to the regions of its peer airport and shows that Columbus is equivalent to its peers. As shown, the Columbus MSA's contribution to the national GDP is about one percent lower than the median values of the peers' regions, while per-capita GDP, population, and overall employment are slightly higher than the corresponding peer values.

Table 54. Regional Economies of Peer Airports/Systems

Metropolitan Statistical Area	GDP (Billions)	GDP Per Capita	Population	Employment
Los Angeles-Long Beach-Anaheim, CA	\$1,044	\$78,160	13,353,907	8,691,132
San Jose-Sunnyvale-Santa Clara, CA	\$275	\$137,753	1,998,463	1,427,593
Pittsburgh, PA	\$147	\$63,157	2,333,367	1,479,848
Indianapolis-Carmel-Anderson, IN	\$144	\$70,922	2,028,614	1,318,788
Cleveland-Elyria, OH	\$139	\$67,504	2,058,844	1,331,464
Cincinnati, OH-KY-IN	\$138	\$63,345	2,179,082	1,356,969
Columbus, OH	\$136	\$65,567	2,078,725	1,370,011
Nashville-Davidson-Murfreesboro-Franklin, TN	\$133	\$70,020	1,903,045	1,315,055
Kansas City, MO-KS	\$131	\$61,577	2,128,912	1,385,161
San Antonio-New Braunfels, TX	\$129	\$52,263	2,473,974	1,436,173
New Orleans-Metairie, LA	\$79	\$62,151	1,275,762	798,242
Albuquerque, NM	\$44	\$48,369	910,726	501,552
<i>Median of Regions Excluding Columbus</i>	\$138	\$63,345	2,058,844	1,356,969
<i>Columbus MSA</i>	\$136	\$65,567	2,078,725	1,370,011
<i>Columbus Compared to Median of Each Benchmark</i>	-1.3%	3.5%	1.0%	1.0%

Source: United States Bureau of Economic Analysis. Census Bureau mid-year population estimates. Estimates for 2017 reflect county population estimates available as of March 2018. MSAs are ordered according to GDP.

8.2. Comparison of Economic Impacts

Comparing findings of the economic impacts of the CRAA system to the peer airports/systems requires comparing the following five study elements:

1. Studies that comprise one medium hub airport or multiple airports. For the purpose of this analysis, the impacts of single airports are compared to CMH and the studies that address multiple airports (local airport systems) are compared to the findings of the full CRAA study.
2. Scale of the study regions. Some studies are statewide, others reflect a single county, or a region used by local development, planning or transportation agencies, or a region created specifically for the study. In several studies among the peer airport/systems the regions are not defined. As 10 of the 12 airports/systems address regional impacts, the 11-county Columbus Region is used as a basis of comparison.
3. The components of the economic contributions to regional and state economies that are presented. Virtually all studies address on-airport activities (including construction) and visitor spending. Other studies include the contribution of air cargo, regional business dependence for air travel, and off-airport land use. To be conservative, the comparison of CMH is based on on-airport (including construction) and visitor spending impacts. When comparing CRAA to other regional analyses we also include LCK, TZR, the FTZ, the Rickenbacker area, and airport-related activity near CMH.
4. Model package used. The IMPLAN modeling package is used in five of the 12 comparison studies. RIMS2 is used in an additional five studies. Two studies did not specify a model. CRAA's study employed IMPLAN (which is reasonably compatible with RIMS2).
5. Data year. Studies are generally released one to two years after data is collected. Table 53 presents study release dates. The data years range from 2010 to 2015. Four studies are based on fiscal years (FY) and eight are based on calendar years (CY). The data for CRAA's study is from the 2017 calendar year.

Table 55 highlights the study regions and the dates for data reported in the peer airport and system studies. Note that the Indianapolis study reported data collected over three years because the 2016 study is an update of previous work.

Table 55. Study Regions and Data Collected for Peer Airport Studies

Title	Region	Study Release
Economic Impacts of the Albuquerque Airport System on the New Mexico Economy	Statewide	2013
Hollywood Burbank Airport in FY2013: Economic Analysis	Los Angeles County	2014
Economic Impact of Cincinnati/Northern Kentucky International Airport	Cincinnati/Northern Kentucky MSA (state tax impacts to Ohio and Kentucky)	2013
The Economic Contribution of the Indianapolis International Airport	Marion County	2016
John Wayne Airport Economic Impact Study	Orange County, Los Angeles County, Riverside County, San Bernardino County	2014
Economic Impact of Kansas City International Airport, 2014	17 County Primary Service Area	2015
The Economic Impact of the Louis Armstrong New Orleans International Airport	City of Kenner, St. Charles Parish, Jefferson Parish, Orleans Parish	2014
The Economic Impacts of Nashville International Airport and John C. Tune Airport	"Nashville Region"	2013
The Economic Impact of San Jose International Airport	San Jose/Silicon Valley area and greater San Francisco Bay region.	2015
Pittsburgh International Airport, Allegheny County Airport and the Allegheny County Airport Authority Economic Impact Study	Ten County Southwest Pennsylvania	2016
Economic Impact of the San Antonio Airport System	Eight county San Antonio-New Braunfels Metropolitan Statistical Area	2012
Ohio Airports Economic Impact Study	Ohio	2014
Economic Impacts of Columbus Regional Airport Authority	11-County Region	2019

¹Albuquerque International Sunport, Double Eagle II Airport

²San Antonio International Airport and Stinson Municipal Airport

³John Glenn International Airport, Rickenbacker International Airport and Bolton Field

Methodologies used in these studies integrate scopes of analysis, data collection and modeling. The “scope” simply refers to the components of airports’ economic contributions that are parts of each study. Data collection ranges from surveys to assembling data sources from airports and from third-party sources such as published databases or private vendors. Lastly, each study provides modeling to calculate multiplier impacts and to “fill-in” missing direct data. For example, modeling is required to estimate jobs supported by visitor spending. These factors are presented in Table 56 on a study-by-study basis. The scopes of each analyses and identification of the modeling packages are gleaned from each study.

The EDR Group team compared the approach of the peer airports/systems to the CMH or full CRAA studies on scope, data collection methods, and modeling. Three levels of comparison are noted:

- **Similar** – where the scopes, data collection methodologies, and modeling approaches are equivalent for those employed in CRAA’s study or the CMH portion of the study.
- **Somewhat Similar** – where most parts of the scopes, data collection methodologies, and modeling approaches are equivalent, but there are some significant differences within one or more of these aspects.
- **Different** – When the scopes, data collection methodologies, and modeling approaches were clearly not equivalent to those employed in CRAA’s study or the CMH portion of the study.

Study approaches of peer airports/systems that different from those for CRAA/CMH do not by any means imply the studies unsound, as scopes reflect differing needs of airport sponsors, aspects of economic impacts investigated, and available budget. Also, though models differ, both IMPLAN and RIMS2 are reputable modeling packages based on U.S Department of Commerce data and other approaches are not necessarily better or worse than using one of these packages.

Table 56. Study Approaches of Peer Airports/Systems Compared to CRAA

Airport/s	Scope of Analysis	Modeling Package	Match of Approach to CRAA 2017
Albuquerque International Sunport, Double Eagle II Airport	Airports administration and tenants, commercial and GA visitor spending and capital investments	IMPLAN	Similar
Hollywood Burbank Airport	Airports administration and tenants, commercial visitor spending, crew spending and capital investments	IMPLAN	Different. On-airport tenants by badge count, visitor spending based on 2008 survey and other secondary data
Cincinnati/Northern Kentucky International Airport	Airport administration and tenants, construction, commercial visitor spending	RIMS2	Different. Output was updated from a 2010 study and then impacts were estimated using RIMS2
Indianapolis International Airport	On-airport and prominent users	IMPLAN	Different. Visitor Spending was not profiled. Prominent users were not described or identified.
John Wayne Airport	On airport, construction and visitor spending	RIMS2	Somewhat Similar. It does not appear that a visitor survey was conducted.
Kansas City International Airport	On-airport, including construction, visitor spending	RIMS2	Somewhat Similar. An on-airport employment survey was not conducted. A strong visitor survey was conducted.
Louis Armstrong New Orleans International Airport	On Airport, construction and visitor spending. Study also counted hotels near the airport as direct on-airport impacts	IMPLAN	Different. Not clear how visitor spending was derived. Did conduct an on-airport employment survey and surveyed nearby hotels. Large proportion of findings is due to visitor spending (expected).

Nashville International Airport and John C. Tune Airport	On Airport, construction, freight and visitor spending.	RIMS2 and other not specified	Different. Data development and modeling are not clear
Norman Y. Mineta San Jose International Airport	On Airport and visitor spending.	Not specified	Different. Data development and modeling are not clear
Pittsburgh International Airport and Allegheny County Airport	On Airports, construction, visitor spending, business parks on airport property and air reliance (business travel and freight)	IMPLAN	Similar. Methodology is the same. Multi-regional for Allegheny County and the rest of Southwest PA. No statewide analysis.
San Antonio International Airport and Stinson Municipal Airport	On Airports, construction, visitor spending and crew spending	RIMS2	Different. Did not develop visitor survey. Direct revenues based on applying 2007 economic census.
Cleveland-Hopkins International Airport	On Airports, construction and visitor spending	Not mentioned in airport summary	No recent standalone study. One-page summary from Ohio Statewide Economic Impact Report
John Glenn International Airport	On Airports, construction and visitor spending	IMPLAN	N/A
John Glenn International Airport, Rickenbacker International Airport, Bolton Field	On Airports, construction, real estate, FTZ, Rickenbacker Area, area near CMH and visitor spending	IMPLAN	N/A

Note that CMH is listed by itself in the second to last row of Table 56, and all three CRAA airports are listed in the last row. The reason is that it is reasonable to compare CMH to single peer airports, and to compare CRAA's system to peer airport systems.

In the case of the four peer airport systems, Allegheny County, Albuquerque, Nashville and San Antonio, each system consisted of a medium hub airport and one GA airport. Among these systems CRAA ranks second in jobs, first in labor income, and second in business sales (see Table 57). Note that Table 57 presents impacts in the dollar values reported in each study. CRAA's study reports 2017 dollars, which are about 2 percent to 12 percent higher than the peer studies due to inflation. Overall findings show much higher business sales for CRAA than its peers, mostly attributable to Foreign Trade Zone activity. CRAA also shows robust employment and labor income compared to its peers, ranking second of four in total jobs and (after accounting for inflation) roughly equivalent to Allegheny County in labor income.

**Table 57. Comparative Findings of Peer Airport System
Economic Impact Studies**

Airport System	Jobs	Labor Income	Value Added/	Business Revenues
CRAA Airport System	57,053	\$2,976	\$4,848	\$12,449
Allegheny County Airport System	47,880	\$2,719	\$4,436	\$7,196
Albuquerque Airport System	20,062	\$701	Not Reported	\$1,949
Nashville Airport System	37,921	\$1,374	Not Reported	\$3,839
San Antonio Airport System	98,676	\$1,899	Not Reported	\$5,078

Source: Respective Economic Impact Studies

Eight peer economic impact studies analyzed single medium-hub airports. Accordingly, findings of these studies are compared to CMH. As noted in section 8.2, the CMH impacts are limited to on-airport operations, including construction, and visitor spending for this comparison. As seen in Table 58, CMH ranks 4th among the airports in total jobs, 4th in labor income, and 6th in business sales. These rankings will not change if inflation is considered. In terms of labor income per job, CMH ranks third, behind Indianapolis and Hollywood Burbank.

Table 58. Comparative Findings of Peer Airport Economic Impact Studies

Airport	Jobs	Labor Income	Value Added	Business Revenues
John Glenn International Airport	31,068	\$1,576	\$2,581	\$4,552
Hollywood Burbank Airport	12,440	\$663	Not reported	\$1,767
Cincinnati/Northern Kentucky International Airport	22,724	\$1,084	Not reported	\$3,443
Cleveland-Hopkins International Airport	40,186	\$1,300	Not reported	\$4,600
Indianapolis International Airport	22,583	\$2,043	Not reported	\$5,402
John Wayne Airport (Santa Ana)	44,300	\$1,760	\$3,400	\$6,190
Kansas City International Airport	41,625	\$1,410	\$2,790	\$5,020
Louis Armstrong New Orleans International Airport	53,360	\$2,007	Not reported	\$5,263
Norman Y. Mineta San Jose International Airport	32,226	\$1,038	Not reported	\$3,397

Source: Various Economic Impact Studies

Numbers for airports and airport systems cannot be evaluated at face value. However, as noted previously, the Columbus MSA ranked fifth among the peer airport/system MSAs in GDP and sixth in GDP per capita. In one respect findings are consistent with the size of the Columbus economy. The size of an airport's economy is not the only noteworthy

characteristic. New Orleans, for example, is the leading job generator among airports as an international tourist magnet (88 percent of jobs and 83 percent of business sales are attributed to visitor spending).

As discussed above, studies vary widely by methodologies. Studies used different data collection approaches, examined different facets of airports' economic contribution to regions, and varied by model application and the sizes of impact regions.

Chapter 9. Comparison of Findings with Prior Study

The previous economic impact study of CRAA was released in 2012, based on 2011 data. The overall contribution of CRAA to the state of Ohio reported in the 2011 study included:

- 54,172 jobs
- \$1,846,278,000 in payroll
- \$6,560,044,000 in business revenues

In constant 2017-dollar value, these 2011 payroll and business revenues are estimated at \$2,011,922,000 and \$7,148,596,000 respectively.³⁵ As the previous study did not include an analysis of “value-added” and did not measure the economic contribution of CRAA to the 11-county Columbus Region, the comparison below applies to only jobs, payroll and business revenues for the state of Ohio.

The overall comparison between 2011 and 2017 findings across Ohio are shown in Table 59. The growth of the contribution of CRAA to the state economy is primarily a “dollars story” and a productivity increase. The general findings of the two studies show that more dollars circulated in Ohio today due to business revenues and payroll, supporting a regional increase of employment of 8.4 percent compared to statewide growth of 7.3 percent from 2011, and a 55% increase in payroll compared to 11% statewide.

Table 59. Overall Comparison of 2017 and 2011 Findings

	Jobs	Payroll	Business Revenues
2017	59,000	\$3.1 Billion	\$12.9 Billion
2011	54,000	\$2.0 Billion	\$7.1 Billion

Columbus Regional Airport Authority, Economic Impact Study Update, Technical Report. November 2012. Dollars for the 2011 study are inflated to 2017 values.

The following sections will address significant differences in these overall findings.

9.1. Foreign-Trade Zone 138

The dollar change underneath these overall findings reflects the growth of FTZ 138. As discussed above in Chapter 5, the FTZ contributed \$5.2 billion in business revenues to Ohio.

The economic impact of Foreign-Trade Zone 138 was not reported separately in the 2011 study. Rather, it appears that this portion of the analysis was imbedded in the examination of off-airport businesses. The previous study states that “...only those businesses utilizing

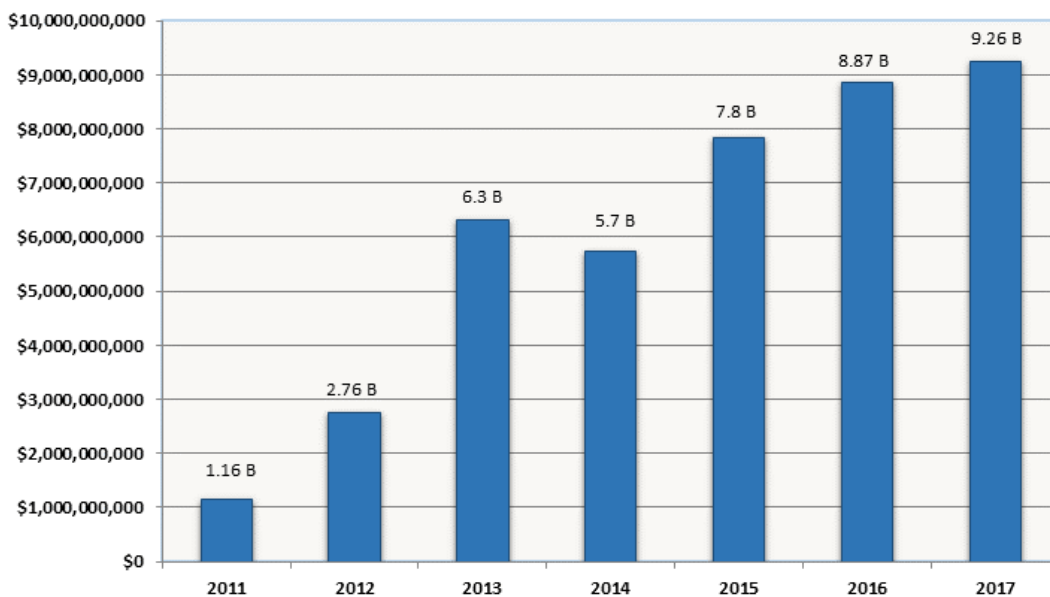
³⁵ In this report, all conversions from past years to 2017 dollars are calculated from the U.S. Consumer Price Index (CPI) reported by the U.S. Bureau of Labor Statistics (BLS). Using the BLS CPI facilitates comparison across time without inflation.

the FTZ within the Rickenbacker Inland Port³⁶ were included in the economic impact analysis.”

The 2011 study reported that “nearly \$1.2 billion in international and domestic products” passed through the FTZ. The equivalent value in 2017 dollars is about \$1.3 billion, compared to \$9.26 billion in the value of goods shipped in 2017. This is more than a sevenfold increase in the volume of goods admitted to FTZ 138. The explosive growth of the FTZ is illustrated by Figure 24.

Note that the Rickenbacker area is a much smaller geographic area than FTZ 138’s service area. Just four of the 11 companies in the FTZ are in the Rickenbacker area.³⁷ The companies in the Rickenbacker area account for 42 percent of FTZ employment (almost 2,500 workers) and 15 percent of the total value of goods shipped (\$2 billion of the \$13.8 billion).

Figure 18. FTZ 138 – Total Admissions



Source: CRAA

Two components of the 2017 economic impact analysis show lower impacts than the 2011 study, commercial visitor spending and construction.

³⁶ Rickenbacker Inland Port is a term that formerly defined, in general, the multimodal logistics hub of businesses that includes Rickenbacker International Airport. This term is no longer in use and is generally referred to in this report as the “Rickenbacker area.”

³⁷ Source is CRAA staff.

9.2. Commercial Visitor Spending

Between 2011 and 2017, 16 percent more visitors arrived in Columbus via commercial air service to CMH and LCK. Total visitor spending in nominal terms increased by 7 percent. Notwithstanding the increase of visits, however, the value of total spending decreased by 3 percent, accounting for inflation (see Table 60). The more recent survey observed \$624 in spending per visitor, while the 2011 study reported average spending of \$674 (\$749 in current value).³⁸

Table 60. Visitors and Direct Spending Due to Commercial Service in Columbus, 2011 and 2017

Year	Visitors	Total Spending	Spending Adjusted to Current Value
2017	1,518,290	\$946,899,000	\$946,899,000
2011	1,308,305	\$881,637,000	\$980,210,000
Difference	16%	7%	-3%

Sources: Columbus Regional Airport Authority Economic Impact Update, November 2012, Visitor survey 2018, CRAA. Current value calculated using Consumer Price Index of U.S. Consumers, U.S. Bureau of Labor Statistics.

9.2.1. Impacts

Due to the difference in direct spending and shifts in the national and state economies, visitor spending impacts across Ohio are lower than what was presented in the 2011 study, as shown in Table 61. While business revenues over the two studies are equivalent, jobs and payroll are significantly lower in the current study (based on 2017 data) than reported in the last study (based on 2011 data). Note that the previous study (properly) subtracted on-airport car rental and hotel from visitor spending. These factors were not included in the current visitor spending calculations. Moreover, in the current study retail spending was “margined,” meaning that economic impacts from the retail purchases of visitors are limited to the economic activities associated with the retail sale and did not include the manufacture or transportation of goods sold. It is not clear from the text of the 2011 study if retail sales were margined previously (without margining, the effect reported for jobs and payroll in 2011 would be slightly inflated).

³⁸ The \$674 benchmark was derived from the *JobsOhio’s Ohio Commercial Service Airports Economic Impact Study* and was reported as a single value for Cleveland Hopkins International Airport as well as CMH.

Table 61. Comparison of Findings of Economic Impacts Due to Commercial Service in Columbus, 2011 and 2017 (dollars in thousands)

Year	Direct Effects			Total Effects Across Ohio		
	Jobs	Payroll	Net Business Revenue	Jobs	Payroll	Net Business Revenue
2017	11,094	\$293,802	\$853,051	15,992	\$530,007	\$1,606,260
2011	13,118	\$293,730	\$788,642	21,583	\$576,910	\$1,431,878
Difference (Nominal \$s or Jobs)	-15%	0%	8%	-26%	-8%	12%
Difference (Constant \$s)	N/A	-10%	-3%	N/A	-17%	1%

Note: Net business revenues account for adjustments in 2011 to account for on-airport car rental and hotels, and margined impacts in the 2017 study.

Sources: Columbus Regional Airport Authority Economic Impact Update, November 2012; Ohio Airport Economic Impacts Study, 2014, Visitor survey 2018, CRAA

Current value calculated using Consumer Price Index of U.S. Consumers, U.S. Bureau of Labor Statistics

9.2.2. Trends Affecting Economic Impacts

In addition to the methodology used to determine spending per visitor, several national trends have affected the relationships of direct revenue to jobs and payroll, as well as multiplier impacts in Ohio, including:

1. E-commerce effects. Nationally in 2011 e-commerce retail accounted for \$199.6 billion in sales; in 2016 it was \$389.1 billion. Similarly, in 2016 \$3.5 billion in manufactured goods were sold by e-commerce, compared to \$2.7 billion in 2011.³⁹ For Ohio, this means more and more people (and businesses) are buying from the suppliers located worldwide instead of local suppliers.
2. Related to the above, improved transportation logistics allows suppliers to sell globally and allows many businesses to purchase goods and services globally.
3. Greater productivity of businesses, including trends of investment in technology (e.g. ticket kiosks at airports and fewer check-in agents, automatic teller machines in banks, self-checkout machines in retailing and others).
4. These general economic changes are reflected in IMPLAN model accounting of the national business to business sales (indirect) and household spending (induced).

9.3. Construction

Construction spending reported for the 2017 study was slightly more than the \$163.6 million in average capital spending during the years 2014-2017 (with expenditures from 2014-2016 converted to 2017-dollar value). The 2011 economic impact study calculated \$154.7 million in annual average expenditures over the years 2008-2011, which is

³⁹ Source: US Census Bureau E Commerce Multi Sector Census Tables.

equivalent to \$168.6 million in 2017 dollars. As shown in Table 62, the 2011 study reported notably higher levels of investment for CMH and LCK, and the 2017 study observed higher investment in the Rickenbacker area, as well as a small increase at TZR.

Table 62. Comparison of Construction Spending of the 2011 and 2017 Studies

Category	Study			Percent Change in \$2017s
	2017	2011 (as reported)	2011 in \$2017s	
On-Airport at CMH	\$61,664,000	\$79,869,000	\$87,034,000	-29%
On-Airport at LCK	\$11,351,000	\$27,618,000	\$30,096,000	-62%
On-Airport at TZR	\$715,000	\$328,000	\$357,000	100%
Off-Airport Rickenbacker Area	\$89,873,000	\$46,944,000	\$51,123,000	76%
Totals	\$163,603,000	\$154,759,000	\$168,610,000	-3%

Sources: CRAA, November 2012 Technical Report. Calculations by EDR Group

One important methodological difference should be noted. The current includes only documented construction projects provided by CRAA staff for on- and off-airport investments. The 2011 study included ratios of capital expenditures per employee to estimate capital expenditures.

The 3-percent reduction of construction spending has led to a 5-percent reduction in direct jobs. Notably, results show direct labor income increasing by 25 percent since the 2011 study. Essentially, the study comparison indicated that fewer construction workers are being paid more in CRAA-related projects (Table 63).

Table 63. Direct Impacts 2017 and 2011 Studies

Study	Direct Jobs	Direct Labor Income	Capital Expenditures
2017	1,220	\$70,903,000	\$163,603,000
2011 in 2017\$s	1,287	\$56,940,000	\$168,611,000
Difference	-5%	25%	-3%

Source: CRAA, November 2012 Technical Report. Calculations by EDR Group.

After applying IMPLAN multipliers to both the 2011 and 2017 studies, total impacts across Ohio show a 7 percent decline in direct revenues and a 17 percent drop in jobs, while showing a 5 percent increase in compensation to Ohio workers. Construction multiplier effects for Ohio are lower in 2017 (based on the 2016 Ohio economy) than they were in the 2011 study (the IMPLAN model year was not identified in the report; presumably it was

2009 or 2010).⁴⁰ These effects are summarized in Table 64. The overall impacts of construction are shown in Table 65.

Table 64. Comparison of Ohio Multipliers for Construction Impacts

Impact Element	Study	
	2017	2011
Business Revenues	1.87	1.94
Employment	1.72	1.96
Labor income	1.63	1.92

Sources: November 2012 Technical Report and EDR Group modeling using IMPLAN MRIO tool. Calculations by EDR Group.

Table 65. Total Impacts 2017 and 2011 Studies in Ohio

Study	Total Jobs	Payroll	Total Business Revenues, Including Capital Expenditures
2017	2,104	\$115,464,000	\$306,639,000
2011 in 2017 \$s	2,524	\$109,461,000	\$326,620,000
Difference	-17%	5%	-6%

Sources: CRAA, November 2012 Technical Report. Calculations by EDR Group.

9.4. Comparison by Major Element

The comparison of findings by element from the 2011 and 2017 studies are shown in Table 66. Note that 25 percent of the overall job increase, and overall business revenue increase is from the combined totals of the three airports, notably, LCK. About 75 percent of these increases are from the Rickenbacker area and the FTZ, noted as "Rickenbacker Off-Airport" in the table (the Rickenbacker area and FTZ were combined in the Summary Table 4-34 in the 2011 study). However, 61 percent of the overall increase in payroll are from the three airports, while 39 percent is from the Rickenbacker Off-Airport area. This is because of the preponderance of logistics industry jobs in the FTZ and elsewhere in the Rickenbacker area.

⁴⁰ The multiplier comparison was determined by dividing construction impacts in the 2011 study of tables 4-7, 4-8, 4-9 and 4-29 for total impacts of the CMH, LCK, TZR and the Rickenbacker Area by the corresponding direct impacts from tables 4-1, 4-2, 4-3 and 4-27.

Table 66. Comparison of 2017 and 2011 Impacts in Ohio

Element	2017	2011
Employment		
CMH	33,361	33,464
LCK	6,028	4,806
TZR	110	104
Rickenbacker Off-Airport	19,229	15,798
TOTAL	58,728	54,172
Payroll		
CMH	\$1,714,170,000	\$1,156,465,000
LCK	\$386,587,000	\$291,262,000
TZR	\$4,258,000	\$2,728,000
Rickenbacker Off-Airport	\$974,159,000	\$561,467,000
TOTAL	\$3,079,174,000	\$2,011,922,000
Business Revenue		
CMH	\$5,261,689,000	\$4,052,325,000
LCK	\$1,166,866,000	\$985,078,000
TZR	\$11,782,000	\$12,163,000
Rickenbacker Off-Airport	\$6,490,418,000	\$2,099,029,000
TOTAL	\$12,930,755,000	\$7,148,595,000

Note: Rickenbacker Off-Airport includes FTZ 138, other businesses in the Rickenbacker Area and associated capital investment activity. CMH includes airport related businesses outside the airport. 2011 data is based on Table 4-34 of the 2011 study.

9.5. Tax Revenue Generated

As reported in Chapter 7, the total tax impact is estimated at \$614 million for the state of Ohio in 2017. In contrast, the 2011 findings concluded that the total CRAA impact was just \$129 million (\$141 million in 2017 value).

Results of the 2017 study are higher than the 2011 findings for a few key reasons. First, this report's economic modeling appears to capture more downstream impacts than the 2011 study. Second, this report also specifically considers airport-dependent businesses near the airport, which was not a direct consideration in 2011. Third, there were changes to the sales tax rate and the income tax rate since the last report. The overall sales tax for the state of Ohio increased from 5.5 percent to 5.75 percent in 2013 and the income tax bracket rates also changed. Finally, the growth in operations across CRAA airports would naturally result in growth in economic activity. The 2011 methodology does not enable a direct comparison of the extent of the tax impact growth stemming solely from CRAA's operations growth.

As compared to the 2011 findings, the income tax revenues are higher, but the same order of magnitude for each airport. The largest differences are with respect to the sales tax impacts (reported at less than \$80 million in the 2011 research). This may be a result of differences in estimating downstream effects across different industries. It is also reasonable to conclude that growth in operations activity at CRAA airports led to subsequent economic activity growth, which may explain a substantial portion of the increase in the sales tax impact.