

2023 ECONOMIC IMPACT STUDY OF NORFOLK INTERNATIONAL AIRPORT



**PREPARED FOR:
NORFOLK AIRPORT AUTHORITY**

**PREPARED BY:
OLD DOMINION UNIVERSITY
DRAGAS CENTER FOR ECONOMIC ANALYSIS AND POLICY**



Executive Summary

Norfolk International Airport (ORF) is a critical regional asset that powers economic development in Hampton Roads and its surrounding communities. Whether it's for the timely movement of people or cargo, ORF's presence provides an unquestionable benefit for both commercial activity and the overall quality of life in Coastal Virginia and beyond.

A recently completed economic analysis quantifies the airport's ongoing impact to the region's economy. A comprehensive review by the Dragas Center for Economic Analysis and Policy at Old Dominion University found the airport drove more than \$2.2 billion in direct, indirect and induced spending in 2023 within Virginia and North Carolina. That's up 7.8% from 2019.

Over that same five-year span, the number of jobs in both states associated with the airport's presence increased slightly from 15,574 in 2019 to 16,768 in 2023, while annual earnings by those workers rose from \$908.1 million to \$981.6 million. The airport also invested nearly \$200 million in capital projects to improve its airfield and terminal infrastructure within the five-year period included in ODU's analysis.

Total Economic Impact of ORF (Virginia and North Carolina), 2019 - 2023

	2019	2020	2021	2022	2023
Jobs	15,574	8,484	12,170	15,011	16,768
Earnings (Millions of Dollars)	\$908.1	\$584.2	\$727.7	\$881.1	\$981.6
GDP (Millions of Dollars)	\$1,277.5	\$752.1	\$1,009.5	\$1,234.4	\$1,377.1
Output (Millions of Dollars)	\$2,043.3	\$1,182.7	\$1,610.8	\$1,973.7	\$2,202.6

ORF is the primary commercial airport for Coastal Virginia, which includes the cities of Chesapeake, Hampton, Newport News, Norfolk, Portsmouth, Suffolk and Virginia Beach and several nearby cities and counties. Its catchment area also spans Virginia's Eastern Shore and northeastern North Carolina, including the Outer Banks.

With many high-volume leisure travel destinations close by, out-of-state passengers provided a sizable contribution to the airport's economic prowess. From 2016 through 2023, visitors from outside the Commonwealth, on average, comprised nearly 45% of ORF's annual passenger counts.

ORF ended 2023 with more than 40 nonstop destinations, up 33% from 2019’s total of 30 available markets. The airport was serviced by eight air carriers, including the four largest U.S. airlines (American, Delta, Southwest and United) as well as four additional low-cost carriers (Allegiant, Breeze, Frontier and Spirit).

“The Dragas Center study substantiates our long-held position that Norfolk International Airport is inarguably among the most important elements of our area’s continual success,” said Mark Perryman, President and Chief Executive Officer of the Norfolk Airport Authority. “As the air travel industry emerged and expanded following the pandemic, ORF added new airlines, new routes and new travelers, all of which contributed to the airport’s expanded economic impact.

“As we continue to expand our network of destinations, air carriers and frequencies, coupled with a sizable capital improvement program that will bring close to \$1 billion in reinvestment in ORF’s facilities over the next several years, the airport’s importance to the region will deepen even further. Our board and I look forward to the role ORF will play in our region’s progress for decades to come.”



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1. Preface

The Norfolk Airport Authority (NAA) engaged the Dragas Center for Economic Analysis and Policy (Dragas Center) at Old Dominion University to conduct an Economic Impact Analysis (EIA) of operations at Norfolk International Airport (ORF). This study estimates the economic impact of ORF from 2019 to 2023 and complements previous analyses conducted for 2016 and 2019. This study provides a snapshot of economic activity for each year and, in particular, discusses the impact and recovery from the COVID-19 pandemic. In 2019, approximately 4.0 million commercial passengers traveled through ORF. In 2020, passenger arrivals and departures fell to about 1.8 million, a decline of 55.2% from 2019. Passenger traffic rebounded to 3.3 million in 2021, reached 4.1 million in 2022, and set a new record of over 4.5 million in 2023. While 2024 is not included in the analysis, preliminary data suggests that 2024 will be another record year for ORF.

Airports can play a significant role in the economic development of a city, region, state, and nation. Airports not only facilitate the movement of individuals and cargo, they also generate positive spillovers by attracting firms and capital to localities, spurring increasing innovation, entrepreneurship, and, in turn, economic growth. The Virginia Beach – Chesapeake – Norfolk metropolitan statistical area (MSA), more commonly known as Hampton Roads, is home to more than 1.8 million residents. ORF complements the three pillars of the Hampton Roads' economy: national defense, the Port

of Virginia, and travel and tourism. Now, with the region leaning into key industry clusters, ORF is well positioned to have a significant effect on regional economic development efforts.

Quantifying the **economic impact** of the NAA and ORF is an important element in local, regional, and state economic development efforts. A vibrant, growing airport not only generates jobs on its grounds but also contributes to the growth in jobs across the region and state. ORF, by attracting business and tourism travel, generates spending in the region that contributes to economic growth beyond its borders. The task of this study is to estimate **how much** ORF increases economic activity across the Commonwealth of Virginia and **how many** more jobs exist in Virginia because of ORF.

Economic impact analyses (EIAs) estimate the impact of an event of specific duration and location on economic activity at the local, regional, or national level. The activity may range from a public event, organization, sector, industry, or a change in public policy, regulation, or law. To estimate the economic impact of ORF, this study estimates the number of jobs located at ORF, consumer and capital spending at ORF, and spending outside of ORF that occurs because individuals are attracted to the region by the presence of ORF. The EIA classifies the impacts of spending and employment into **direct impacts, indirect impacts, and induced impacts**. The sum of direct, indirect, and induced economic impacts

is the total economic impact of ORF on the economy of the Commonwealth of Virginia.

Table 1 illustrates the total economic impacts associated with ORF from 2019 to 2023 in 2023 dollars. In 2019, ORF, in total, supported more than 15,100 jobs throughout the Commonwealth, with earnings from those jobs equaling \$889.0 million. Virginia's GDP and industry output were approximately \$1,245.2 million and \$1,990.2 million higher, respectively, due to the presence of ORF. The COVID-19 pandemic significantly disrupted operations at ORF and the economic impact of ORF on Virginia's GDP and output declined by more than 40% in 2020 when compared to 2019.

The estimates in Table 1 illustrate the importance of estimating economic impact across a span of several years. The pandemic related shocks to traffic and associated spending were largely dissipated by 2022 and the airport exceeded pre-pandemic economic impacts in 2023. The story of recovery is remarkable. The employment impact of ORF declined by 45.2% in 2020 relative to 2019. By 2022, the employment impacts were only 3.0% below 2019 levels. In 2023, ORF's economic impacts eclipsed pre-pandemic levels, illustrating the recovery of airport from a historic shock.

As visitor numbers and operations returned to near pre-pandemic levels in 2021 and 2022, the economic impacts associated with ORF recovered as well. If 2020 was a historic disruption to ORF, 2021 and 2022 were years of recovery. By 2023, the number of jobs associated with ORF increased to 15,972, a 5.6% increase relative to

2019. Earnings were \$947.5 million in 2023, an increase of almost \$60 million relative to 2019. ORF's contribution to Virginia's real GDP was \$1,319.5 million in 2023 and industry output was 2,107.7 million in the same year.

In 2019, out-of-state visitor spending associated with travel through ORF supported approximately 9,950 jobs that paid \$426.4 million in wages. These visitors increased Virginia's GDP by \$720.0 million and industry output by \$1,186.5 million in 2019. In 2023, out-of-state visitor travel through ORF increased the number of jobs in Virginia by 10,275. Wages and GDP in the Commonwealth were \$440.4 million and \$743.5 million higher, respectively, in 2023 as the result of out-of-state travelers transiting through ORF. In 2023, industry output across the state was \$1,225.8 million higher due to out-of-state travelers via ORF. Preliminary data suggests that 2024 will be another record year for out-of-state visitors transiting to Virginia through ORF.

This report highlights the total economic impact of ORF from 2019 to 2023. If there is a story that emerges from the data, it is one of resilience and opportunity. ORF has not only recovered from the pandemic, it is now experiencing a new expansion that contributes to the economies of Hampton Roads, Virginia, and North Carolina. Now, with data signaling increased passenger demand and traffic through ORF in 2024 and beyond, is the time for ORF to draw in even more visitors to the Commonwealth of Virginia by investing in facilities and capabilities to improve its already significant economic impact.

Table 1 – Total Economic Impact of ORF in Virginia, 2019 – 2023

	2019	2020	2021	2022	2023
Jobs	15,128	8,294	11,777	14,660	15,972
Earnings (Millions of Dollars)	\$889.0	\$576.0	\$710.9	\$866.1	\$947.5
GDP (Millions of Dollars)	\$1,245.2	\$738.3	\$981.1	\$1,209.0	\$1,319.5
Output (Millions of Dollars)	\$1,990.2	\$1,160.0	\$1,563.9	\$1,931.9	\$2,107.7

Notes: Dollar values expressed in 2023 dollars. Total economic impact includes estimates of direct, indirect, and induced economic impact at ORF. Economic impact estimates for the Commonwealth of Virginia.

2. Biographies and Qualifications

Robert McNab, Principal Investigator, is the Director of the Dragas Center for Economic Analysis and Policy. He is a Professor of Economics and Chair of the Department of Economics in the Strome College of Business at Old Dominion University. His research focuses on topics in public finance, defense economics, and fiscal decentralization. He has worked at all levels of government on topics related to public budgeting and finance in more than 30 countries. He has published in *Applied Economics*, *Cornell Hospitality Quarterly*, *Defense and Peace Economics*, *National Tax Journal*, *Public Budgeting and Finance*, and *World Development*, among others. Professor McNab is a member of the Survey of Professional Forecasters of the Federal Reserve Bank of Philadelphia. He earned his PhD in Economics from the Andrew Young School of Policy Studies at Georgia State University.

Vinod Agarwal, Co-Principal Investigator, is the Director of the Economic Forecasting Project in the Dragas Center for Economic Analysis and Policy and Professor of Economics in the Department of Economics in the Strome College of Business at Old Dominion University. His research interests are in applied economics. His articles have appeared in various journals such as *Cornell Hotel and Restaurant Quarterly*, *Journal of Travel Research*, *Economic Development and Cultural Change*, *Eastern Economic Journal*, *Economics of Education Review*, *Growth and Change*, *Journal of the American Real Estate and Urban Economic Association*, *Social Science Quarterly*, and *Southern Economic Journal*. He earned his doctoral degree from the University of California at Santa Barbara.

Samuel Brown is a Professor of Public Policy at ODU. He received a PhD in Public Policy from the University of Maryland, Baltimore County, an M.B.A. from the University of Baltimore and a Bachelor's degree in Economics from Towson State

University. Previously he was Director of the Hugo Wall School of Public Affairs and tenured Professor of Public Affairs at Wichita State University.

Old Dominion University (ODU), located in Norfolk, Virginia, is one of the eight colleges and universities in Hampton Roads. ODU is an accredited R1 research university offering 90 bachelor's degrees, 42 master's degrees, 22 doctoral degrees, and 2 educational specialist degrees. Over 23,000 students are enrolled at ODU and 25% of students had a military affiliation in 2024.

The Dragas Center for Economic Analysis and Policy (Dragas Center) undertakes a wide range of socio-economic, demographic, transportation, and defense-oriented studies. The Dragas Center produces the State of the Region Report for Hampton Roads and the State of the Commonwealth reports. The faculty of the Dragas Center have provided advice and assistance to numerous clients on economic impact analyses, regional economic development, and a wide range of public policy issues, including the impact of the opioid crisis and the emergence of Airbnb. More recently, the Dragas Center produced an analysis of the economic impact of a hurricane making landfall in Hampton Roads to inform local and state policymakers.

The views, opinions, and commentary expressed in this report are those of the primary authors and do not represent the official positions of the Commonwealth of Virginia, Norfolk Airport Authority, Old Dominion University, or the donors of the Dragas Center for Economic Analysis and Policy.

3. Introduction

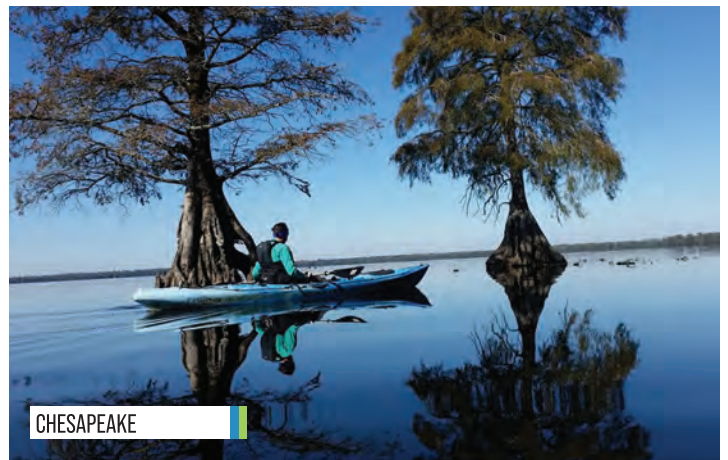
The Norfolk Airport Authority (NAA) engaged the Dragas Center for Economic Analysis and Policy (Dragas Center) at Old Dominion University to conduct an Economic Impact Analysis (EIA) of operations at Norfolk International Airport (ORF). ORF is a major airport serving the Virginia Beach – Chesapeake – Norfolk (“Hampton Roads”) metropolitan statistical area (MSA) as well as areas of northeast North Carolina, including the Outer Banks. In 2023, more than 4.5 million passengers traveled through the airport, and ORF served more than 75,000 flights. As the NAA embarks on an expansion of capital facilities at ORF, understanding how ORF contributes to the economy of the Commonwealth of Virginia contributes to the conversation about how to spur economic growth across Hampton Roads and Virginia.

This study estimates the economic impact of ORF from 2019 to 2023 and complements previous analyses conducted in 2016 and 2019. This study provides a snapshot of economic activity for each year and discusses the impact and recovery from the COVID-19 pandemic. From 2019 to 2020, passenger traffic at ORF dropped by 55.2%, reflecting an industry-

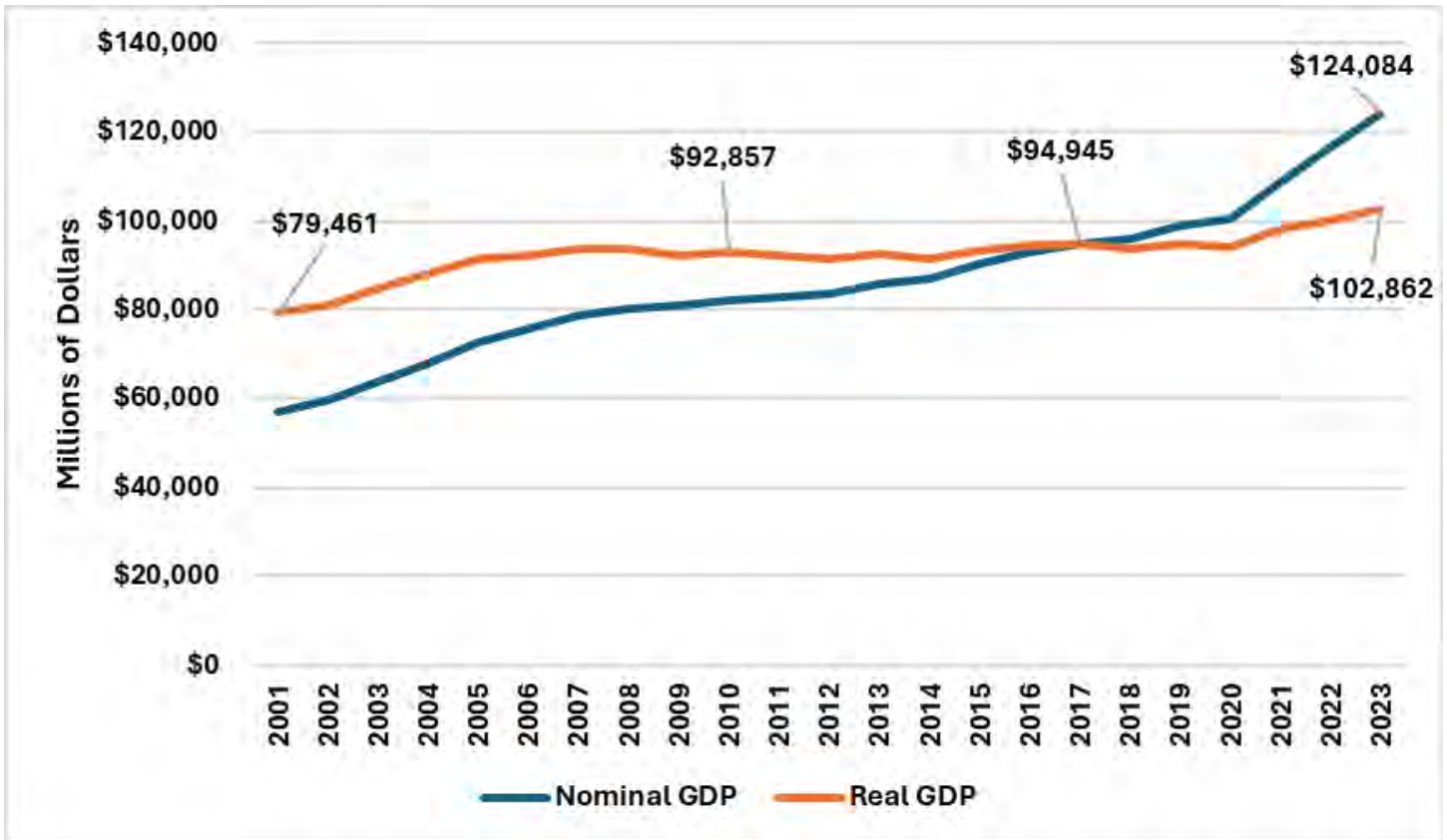
wide downturn in traffic and revenues. Since the nadir of 2020, passenger traffic has rebounded and surpassed 2019 levels. In 2023, passenger traffic at ORF was 14.4% higher than 2019. While data for 2024 are not included in this report, preliminary data suggests that 2024 will be another record year for passenger traffic at ORF.

3.1 The Virginia Beach – Chesapeake – Norfolk Metro Area

According to the United States Census Bureau, in 2023, the Hampton Roads MSA was home to approximately 1.8 million residents. Economic activity in the region rests on three pillars: federal spending (specifically, defense expenditures), the Port of Virginia, and the travel and tourism industry. In 2023, economic activity in the region, as measured by Gross Domestic Product (GDP), likely exceeded \$124 billion dollars as the metropolitan area continued its recovery from the COVID-19 related economic shock of 2020. As illustrated in Figure 1, the region’s economic performance was relatively tepid during the previous decade, however, its post-COVID performance has changed the narrative. Vibrant economic conditions are positively correlated with passenger traffic at ORF.



**Figure 1 - Nominal and Real Gross Domestic Product
Hampton Roads Metropolitan Statistical Area, 2001 - 2023**



Sources: U.S. Bureau of Economic Analysis and Dragas Center for Economic Analysis and Policy. Data on GDP incorporates latest BEA revisions in November 2024. 2023 represents our estimate. Base year of real GDP is 2017.

In 2023, the Bureau of Labor Statistics (BLS) reported that about 880,000 individuals were in the civilian labor force in Hampton Roads and approximately 853,000 were employed. The region’s unemployment rate averaged 3.1% in 2023 and declined even further in the first nine months of 2024. According to the BLS, employers reported an average of 807,000 jobs in 2023, and the number of jobs in the region continued to increase in the first ten months of 2024.

According to the 2022 American Community Survey (ACS) from the U.S. Census Bureau, median household income in the Hampton Roads metropolitan area was \$74,556, approximately the same amount as the nation (\$74,755). The median age of the resident population in 2022 was 37.3 years, 1.7 years younger than the state and nation. Hampton Roads is distinctive given the role of the military in regional economic activity. More than 85,000 active-duty service members are stationed in the region. Among metropolitan areas with populations greater than one million, Hampton Roads ranked first in 2022 for the share of military veterans in its resident population and, not surprisingly, for the share

of military retirees in its resident population. Recent estimates suggest that direct Department of Defense spending in the region exceeded \$25 billion in 2023 and, in total, accounts for 4 out of every 10 dollars in economic activity in Hampton Roads.

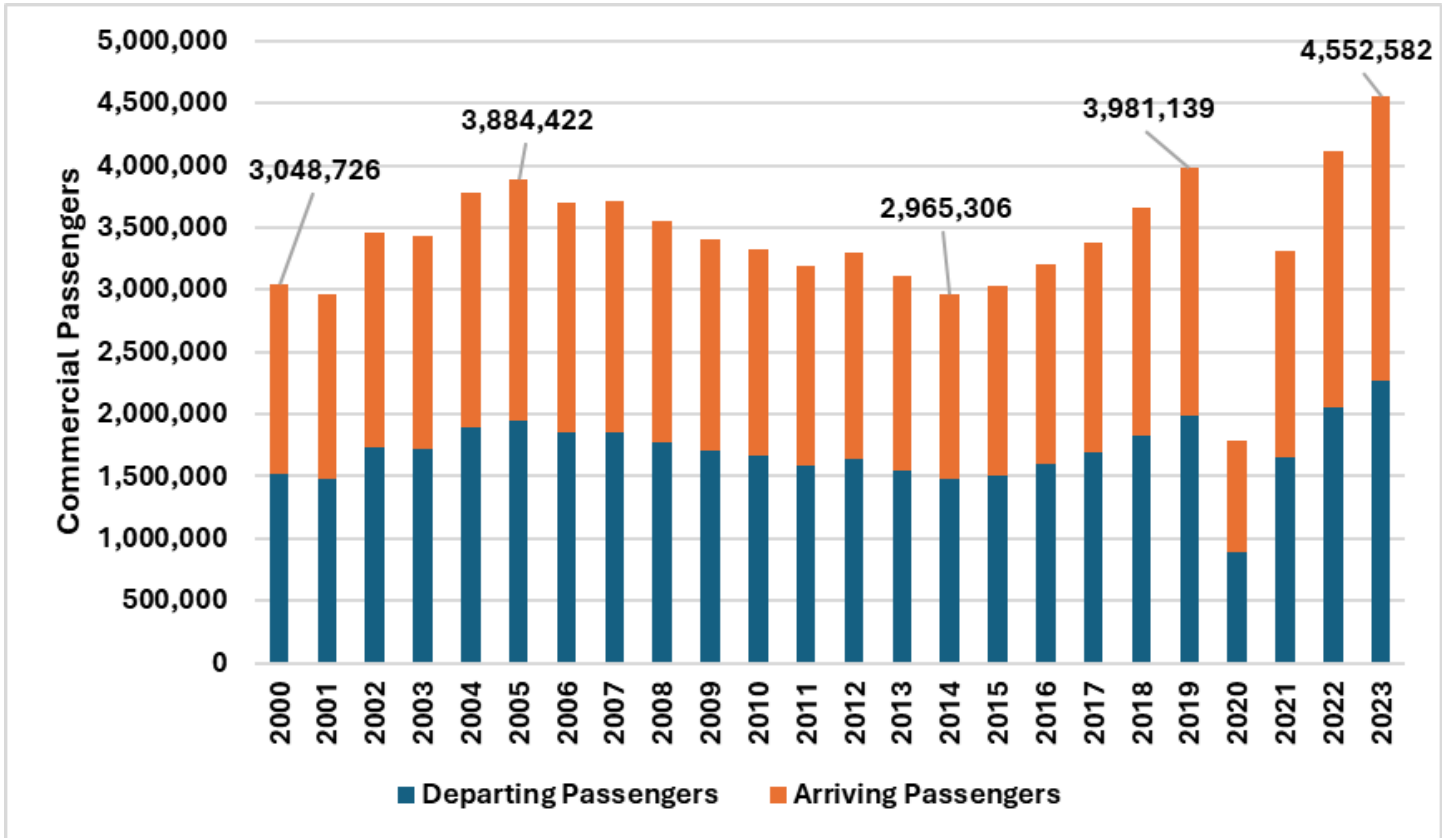
3.2 Norfolk International Airport

Norfolk International Airport (ORF) is a commercial service airport located in Norfolk, Virginia, and is one of two commercial service airports in the Hampton Roads metropolitan area. The Norfolk Airport Authority (NAA) owns and operates ORF. The NAA is primarily responsible for the safe, efficient, and effective operation of the airport and for the long-term growth of ORF. As such, the NAA is responsible for the management of airport facilities, collaborating with passenger and cargo service providers, compliance with local, state, and federal regulations, and implementing capital improvement projects to increase the capacity of ORF.

Figure 2 illustrates the flow of commercial service passenger traffic arriving and departing from ORF from 2000 to 2023. Not surprisingly, passenger traffic is highly correlated with economic conditions in the Hampton Roads metropolitan area. Prior to the Great Recession of 2007 to 2009, commercial passenger traffic peaked at 3.88 million in 2005. Following the Great Recession and coinciding with the impacts of federal budget sequestration, passenger traffic reached a nadir in 2014, with almost 2.97 million passengers transiting through ORF. Traffic rebounded in the subsequent years, reaching a record 3.98 million passengers in 2019.



**Figure 2 - Arriving and Departing Commercial Service Passengers
Norfolk International Airport, 2000 - 2023**

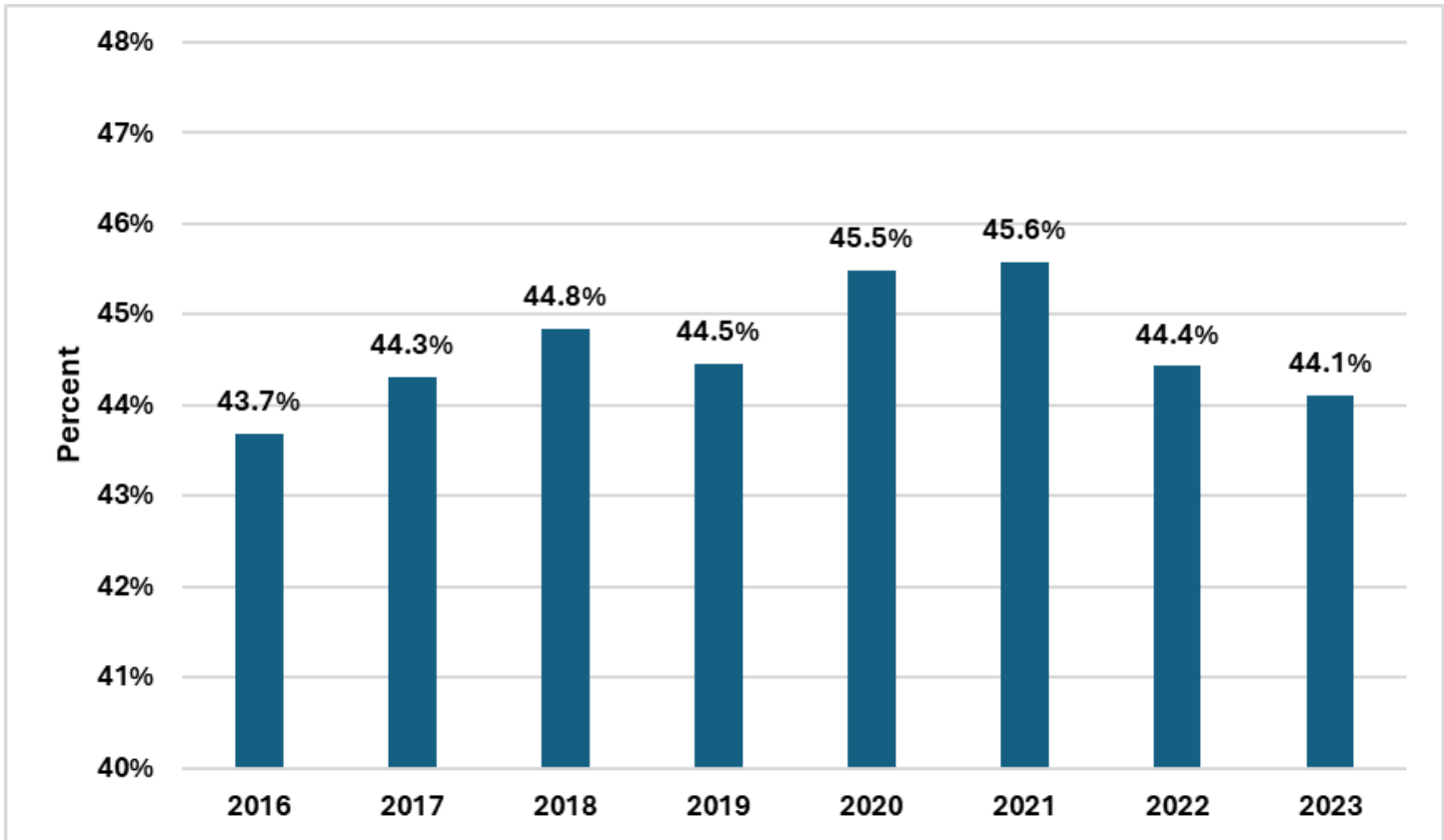


Source: Norfolk Airport Authority (2024)

Passenger traffic dropped 55.2% in 2020 to 1.8 million passengers due to the COVID-19 pandemic. Traffic rebounded sharply, reaching 3.3 million in 2021 and exceeded pre-pandemic levels in 2022 (4.12 million). In 2023, approximately 4.6 million commercial service passengers transited through ORF, a 10.6% increase from 2022 and a 14.4% increase from 2019. While data for 2024 are not included in this report, preliminary data suggests that 2024 will be a record year for passenger traffic at ORF.

As illustrated in Figure 3, the proportion of commercial service non-resident passenger traffic at ORF has been remarkably consistent from 2016 to 2023. On average, from 2016 to 2023, 44.6% of arriving passengers at ORF would be considered visitors to the metropolitan area based on origin-destination data. To maintain consistency with previous studies, we utilize data from the U.S. Department of Transportation’s Origin-Destination database. The data captures information on where passenger originate as well as the direction of travel.

**Figure 3 - Share of Non-Resident Commercial Service Passengers
Norfolk International Airport, 2016 - 2023**



Source: U.S Department of Transportation and Norfolk Airport Authority [2024]

From an economic impact perspective, out-of-state passengers deliver the largest ‘bang for the buck’ when transiting through ORF. A local resident who travels through ORF may spend money at the airport but, since they are local, much of their airport related spending would likely occur with or without the airport. In other words, a resident of Norfolk could travel through ORF or drive to Richmond or Northern Virginia. An out-of-state passenger, on the other hand, is likely transiting through ORF because of ORF’s geographical location in the Hampton Roads metropolitan area and its geographical proximity to northeastern North Carolina.

4. Methodology

This section discusses the modeling approaches, assumptions, and the measures of economic impact. Understanding the different approaches to modeling economic impact is an important input to the model development and selection process. In the following subsections, we discuss why we selected IMPLAN for the generation of economic impacts

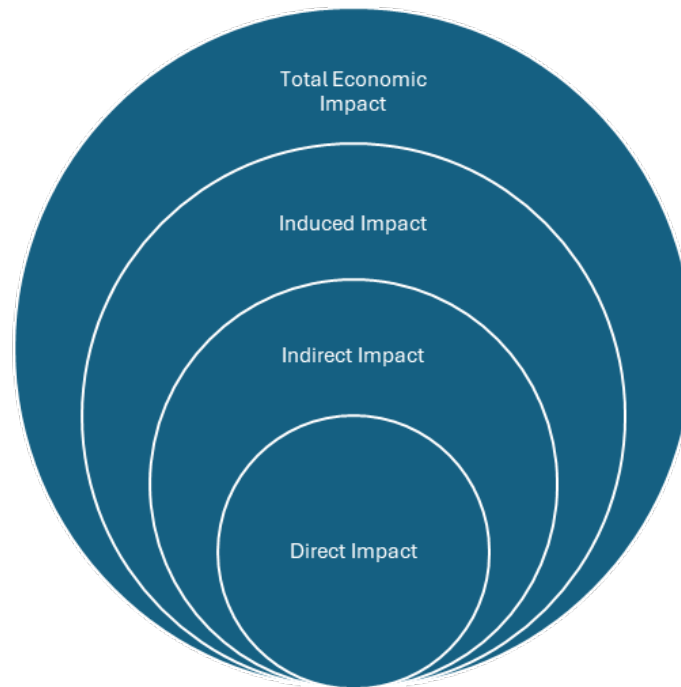
estimates. We then define direct, indirect, and induced economic impact. The section concludes with a discussion of the measures of economic impact.

4.1 Modeling Approach

There are two general approaches for conducting an EIA, Computable General Equilibrium (CGE) models and Input-Output (I-O) models. As discussed below, this study utilizes IMPLAN, a commercially available economic impact software, to generate estimates of indirect, induced, and total economic impact. As illustrated in Picture 1, the direct impacts of ORF generate indirect (supply-chain) and induced (economy-wide) impacts which, when summed with the direct impacts, form estimates of total economic impact.

One possible approach to estimating the economic impacts associated with ORF is the use of a CGE model. A CGE model is a system of equations that model the economy and the interdependencies between the sectors in the economy (Burfisher, 2021; Dixon & Jorgenson, 2012). A CGE model includes demand and supply equations for all goods and services and estimates how changes in the demand and supply of each good impact wages, employment, and household income (Kehoe et al., 2005). The Social Accounting Matrix (SAM), which is derived from the Input-Output (I-O) tables, provides the circular flow framework for economic activity for a specific year, including the value of production and the income from the sale of goods and services. The CGE model also includes demand and supply elasticities to measure responses to changes in prices and incomes. Regional CGE models can provide estimates of the impact of an event at the subnational level, however, the cost and complexity of these models often limits their adoption with regards to sub-state issues (Ghaith et al., 2021; Partridge & Rickman, 2010). A localized CGE model for Virginia would require significant time, labor, and resources and would not be practical for the purposes of this study.

Illustration of Economic Impacts



A second approach to the question of the impact of ORF is the use of regional I-O multipliers for regions as small as counties. In most systems, the core is based on the BEA's national I-O accounts. The national I-O accounts illustrate how goods and services produced by an industry are used by other industries and end users (Bureau of Economic Analysis, 2009). The BEA publishes the national IO accounts and the Regional Input-Output Modeling System (RIMS II) which accounts for variations in regional supply conditions (Bureau of Economic Analysis, 2018).

This study uses IMPLAN to generate estimates of economic impact to complement previous modeling efforts. IMPLAN estimates are comparable to other modeling systems (RIMS II, REMI) (Gc et al., 2024; Kashian et al., 2021; Khalaf et al., 2022). IMPLAN uses a SAM to augment its estimates, however, IMPLAN Industry Schemes require a manual bridge to the NAICS industry codes. The IMPLAN multipliers and estimates, however, are static; that is, they fail to account for feedback effects of a change in direct expenditures or employment over time. Since this study presents annual estimates from 2019 to 2023, the dynamic impacts are implicitly captured by the annual estimates.

4.2 Defining Economic Impact

Total economic impact consists of three measures: direct economic impact, indirect economic impact, and induced economic impact. Quantifying the **economic impact** of the NAA and ORF is an important element in local, regional,

and state economic development efforts. A vibrant, growing airport not only generates jobs on its grounds but also contributes to the growth in jobs across the region and state. ORF, by attracting business and tourism travel, generates spending in the region that contributes to economic growth beyond its borders. The task of this study is to estimate **how much** ORF increases economic activity across the Commonwealth of Virginia and **how many** more jobs exist in Virginia because of ORF.

Economic impact analyses (EIAs) estimate the impact of an event of specific duration and location on economic activity at the local, regional, or national level. The activity may range from a public event, organization, sector, industry, or a change in public policy, regulation, or law. To estimate the economic impact of ORF, this study estimates the number of jobs located at ORF, consumer and capital spending at ORF, and spending outside of ORF that occurs because individuals are attracted to the region by the presence of ORF. The EIA classifies the impacts of spending and employment into **direct impacts, indirect impacts, and induced impacts**. The sum of direct, indirect, and induced economic impacts is the total economic impact of ORF on the Commonwealth of Virginia's economy.

4.3 Measures of Economic Impact

While the term **economic impact** is generally used to present estimates of the influence of an activity, organization, or policy on economic impact, there are actually several measures of economic impact to consider. The most straightforward measure of economic impact is **employment**, which is typically measured in terms of nonfarm payrolls (jobs) or individual employment (people). **Earnings** or **compensation** is a measure of wages, salaries, and benefits associated with employment impacted by the activity, organization, or policy. A business located at the airport, for example, creates jobs that, in turn, compensate individuals for their labor. Without the airport, these jobs would likely not exist, and thus a measure of economic impact are the direct jobs associated with the airport. In this case of this study, we estimate the change in nonfarm payrolls (jobs) associated with traveler spending via ORF, capital improvements at ORF, and operations at and associated with ORF. **Value added** or **Gross Domestic Product (GDP)** is a measure of the value of final goods and services in the study area for a given period of time. Value added is net of the cost of **intermediate inputs**, that is, goods and services used to produce the final product or service in question. Value added represents the level of economic activity in an area. Why is it important not to include the value of intermediate inputs? If a manufacturer in Virginia Beach ships \$1 million in goods through the airport and uses the \$1 million of goods to create final products for sale worth \$3 million, we want to capture the additional value created by the manufacturer. In other words, economic activity increased by \$2 million (the added value) not \$3 million (the added value and the value of intermediate inputs).

Economic output or **industry output** is equal to the sum of value added and intermediate inputs. For analyses focused on a specific industry, output captures the impact of a spending or policy change on industry activity. Output is typically considered the total value of production and is equal to the sum of intermediate inputs and value added. As output includes the value of intermediate inputs, it encompasses parts of the value of other industries' outputs. If, for example, an air carrier brings parts to ORF that are then used in the production of a final good or service, industry output would include the value of the parts even though the parts are used in another industry.

EIAs are 'snapshots' of economic activity during a specific period of time. This study endeavors to estimate the level of impact of ORF on the economy of Virginia. This study also discusses the impact of out-of-state visitors who travel via ORF to locations in North Carolina. For the interested reader, the study discusses the methodology and assumptions that underlie the results. These, along with the data, are necessary to replicate the results of the study.



5. The Economic Impact of Visitors to ORF

In 2023, over 4.5 million leisure and business travelers departed from and arrived at ORF. As visitor traffic through ORF increases, the spending by leisure and business travelers increases as well. As ORF has become the primary air gateway to Hampton Roads, non-resident visitor spending has increased. The most visible impacts of this spending are on the accommodation and hospitality industry, with visitors booking hotel rooms, dining at restaurants, and engaging in recreational activities throughout the region. Business travelers to the region, often associated with the federal government, engage in fewer recreational activities but spend money on car rentals, accommodations, conference facilities, and other business-oriented services. In this section, we discuss the data on business and leisure travelers, the estimates that inform us on how business and leisure travelers spend their money in Virginia, the development of the inputs into the economic impact modeling process, and the economic impact estimates for visitors through ORF on the Commonwealth of Virginia.



5.1 Out-of-State Visitors Arriving at ORF

We obtained data on commercial service arriving and departing passengers at ORF from 2016 to 2023 from NAA. On average, from 2016 to 2023, 44.6% of arriving passengers at ORF would be considered out-of-state visitors based on origin-destination data.¹ Table 3 contains data on total arrivals at ORF from 2016 to 2023 as well as estimates of resident arrivals and out-of-state arrivals. On the basis of the origin-destination estimates, we generated annual estimates of visitors to the metropolitan area and out-of-state visitors to ORF. We use the origin-destination estimates to replicate the approach in previous studies of economic impact. We also note the origin-destination estimates are lower than other methods, resulting in more conservative estimates of the share of visitors from outside of Virginia arrivals at ORF.

**Table 2 – Estimated Resident and Out-of-State Arrivals at ORF
2016 - 2023**

Year	Total Arrivals	Share of Visitors Out-of-State	Estimated Resident Arrivals	Estimated Out-of-State Arrivals
2016	1,609,268	43.7%	906,340	702,928
2017	1,694,049	44.3%	943,416	750,633
2018	1,832,981	44.8%	1,011,072	821,909
2019	1,993,987	44.5%	1,107,460	886,527
2020	899,393	45.5%	490,259	409,134
2021	1,655,727	45.6%	901,212	754,515
2022	2,060,345	44.4%	1,144,934	915,411
2023	2,277,471	44.1%	1,272,879	1,004,592

Source: Norfolk Airport Authority (2024) and authors' calculations. Numbers may not sum to totals due to rounding.

The NAA contracted with Bonney & Company to survey passengers at ORF, and we use the survey data to estimate the shares of arriving out-of-state business and leisure travels from 2016 to 2023.² As illustrated in Table 4, for example, Bonney & Company surveyed 602 arriving passengers in 2023. Of the 602 arriving passengers, 297 resided outside

¹ To maintain consistency with previous studies, we utilize data from the U.S. Department of Transportation's Origin-Destination database. The data captures information on where passenger originate as well as the direction of travel.

² b For example, see Bonney & Company. (2024). "Characteristics of Passengers Using Norfolk International Airport: 2023." Virginia Beach, VA.

Virginia [49.3%]. Of the 297 out-of-state visitors arriving at ORF, 136 identified themselves as business travelers [22.6% of the total] and 161 identified themselves as leisure travelers [26.7% of the total].

**Table 3 – Shares of Out-of-State Business and Leisure Passengers
2016 - 2023**

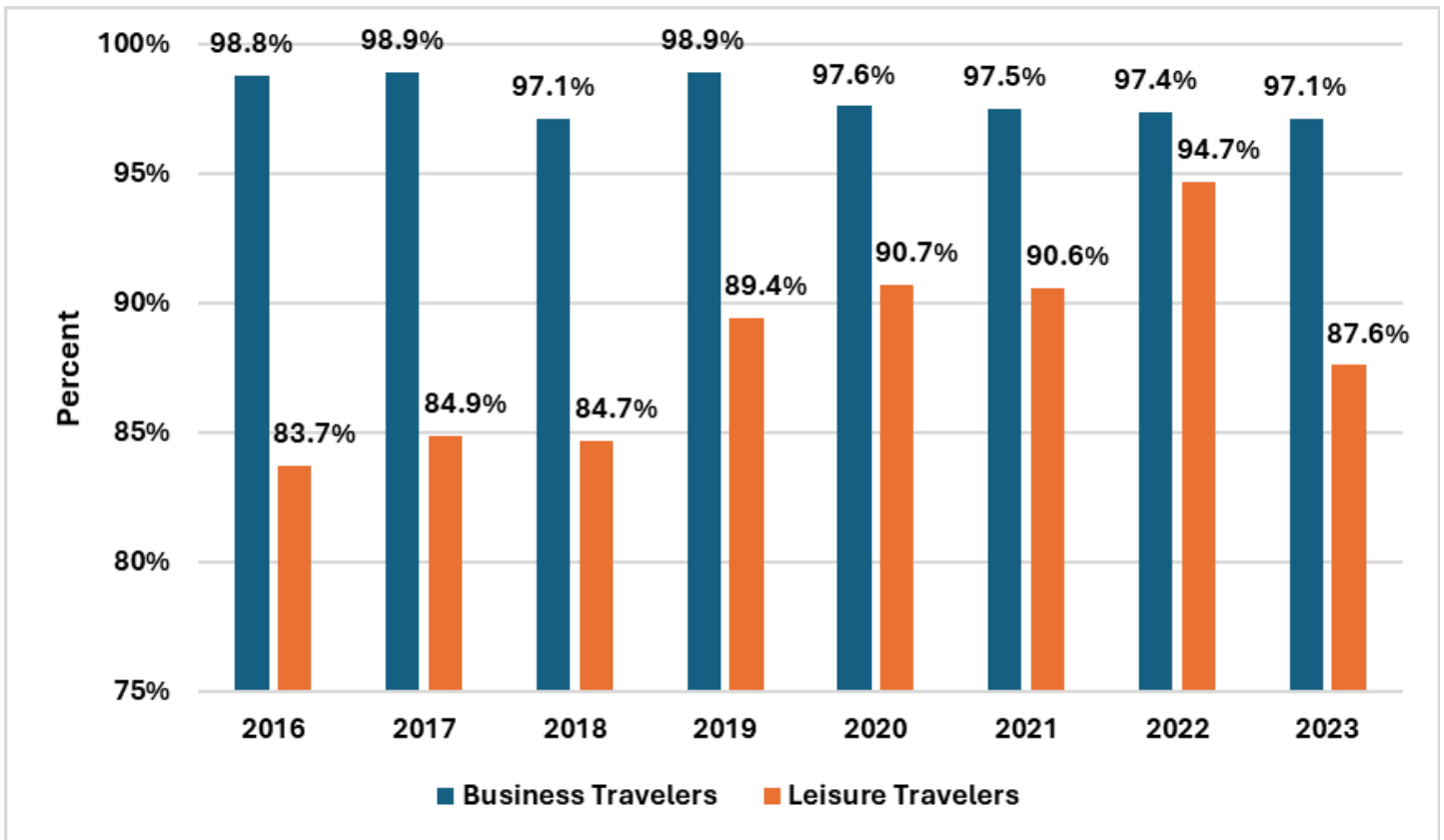
Year	Surveyed Arriving Passengers at ORF	Out-Of-State Passengers	Out-of-State Business Passengers	Out-of-State Leisure Passengers
2016	628	46.7%	26.1%	20.5%
2017	635	47.7%	27.9%	19.8%
2018	595	57.6%	29.1%	28.6%
2019	602	65.8%	31.2%	34.6%
2020	368	49.5%	23.1%	26.4%
2021	599	53.3%	26.7%	22.6%
2022	580	52.8%	26.6%	26.2%
2023	602	49.3%	22.6%	26.7%

Source: Bonney & Company (various years) and authors' calculations. The shares of business and leisure passengers may not sum to the share of out-of-state total passengers due to rounding.

We employ the estimates of business and leisure travelers to obtain numerical estimates of business and leisure arrivals at ORF. We note that the variation in the survey estimates is more significant than the origin-destination data, which is to be expected given the origin-destination data sample is much larger than the ORF passenger survey sample. We note, however, that not all out-of-state visitors may stay in Virginia. Using the Bonney & Company survey data from 2016 to 2023, we obtain estimates for the proportion of business and leisure travelers that remain in the Commonwealth. From 2016 through 2023, on average, 97.9% of out-of-state business travelers stayed in Virginia compared to 88.3% of out-of-state leisure travelers. While the share of business travelers staying in Virginia is relatively stable, there is more variation with respect to the number of out-of-state travelers via ORF who then go to locations in North Carolina. Figure 4 provides the annual shares of business and leisure travelers remaining in the Commonwealth.



**Figure 4 – Share of Out-of-State Business and Leisure Travelers Staying in Virginia
2016 - 2023**



Source: Bonney & Company (various years) and authors' calculations. The shares of business and leisure passengers may not sum to the share of out-of-state total passengers due to rounding.

Table 5 provides estimates of out-of-state visitors arriving at ORF from 2016 to 2023 and estimates of how many of these visitors remain in Virginia. This table also provides estimates of out-of-state business and leisure travelers that stay in the Commonwealth from 2016 to 2023. These estimates form one part of the foundation of gauging how much money out-of-state visitors arriving at ORF spend in the state. The next part of the foundation is to determine how much an “average” traveler spends in Virginia on goods and services.

**Table 4 – Out-of-State Business and Leisure Passengers Staying in Virginia
2016 - 2023**

Year	Out-of-State Visitors	Out-of-State Visitors Staying in Virginia	Out-of-State Business Travelers Staying in Virginia	Out-of-State Leisure Travelers Staying in Virginia
2016	702,928	647,750	388,650	259,100
2017	750,633	698,609	433,534	265,075
2018	821,909	747,625	402,568	345,058
2019	886,527	832,798	416,399	416,399
2020	409,134	384,406	186,583	197,823
2021	754,515	709,575	368,979	340,596
2022	915,411	879,513	448,731	430,782
2023	1,004,592	923,413	446,486	476,928

Source: Norfolk Airport Authority (2024) and authors' calculations. Numbers may not sum to totals due to rounding.

5.2 Non-Airport Spending by Out-of-State Visitors

We obtain estimates of spending for out-of-state business and leisure travelers from Bonney & Company survey data. In Table 6, we present the survey estimates of nominal average spending by passenger type and the estimated spending in real dollars by passenger type from 2016 to 2023. These expenditures per person include spending on hotels, restaurants, entertainment, and other expenditures including car rentals or Uber & Lyft and taxis. We convert the nominal estimates to constant dollar price estimates using the Bureau of Labor Statistics (BLS) Consumer Price Index. The real (inflation-adjusted) spending estimates are expressed in 2023 dollars. We were not able to obtain separate spending estimates for travelers remaining in Virginia and those traveling outside of Virginia. Given this data

restriction, we assume that average spending per traveler is the same, regardless of whether the traveler remained in the state or traveled to an out-of-state location.

**Table 5 – Nominal and Real Business and Leisure Spending Per Traveler
2016 - 2023**

Year	Nominal Business Traveler Spending	Nominal Leisure Traveler Spending	Real Business Traveler Spending in 2023 Dollars	Real Leisure Traveler Spending in 2023 Dollars
2016	\$890	\$442	\$1,130	\$561
2017	\$877	\$487	\$1,090	\$605
2018	\$860	\$515	\$1,044	\$625
2019	\$915	\$498	\$1,091	\$594
2020	\$625	\$461	\$736	\$543
2021	\$750	\$540	\$843	\$607
2022	\$825	\$645	\$859	\$672
2023	\$881	\$708	\$881	\$708

Source: Bonney & Company (various years) for spending data and Bureau of Labor Statistics (various years) for the Consumer Price Index (CPI). We average seasonally adjusted CPI for each year and use 2023 as the base year for the CPI.

Table 7 provides estimates of non-airport spending by out-of-state commercial service travelers from 2016 to 2023. We use the estimates of business and leisure out-of-state spending per traveler in 2023 dollars and estimates of the number of out-of-state business and leisure travelers staying in Virginia to provide insight with respect to total non-airport out-of-state traveler spending from 2016 to 2023.

**Table 6 – Non-Airport Spending by Out-of-State Visitors Staying in Virginia in 2023 Dollars
2016 - 2023**

Year	Out-of-State Business Travelers Staying in Virginia	Out-of-State Leisure Travelers Staying in Virginia	Real Business Travel Spending (Millions)	Real Leisure Travel Spending (Millions)
2016	388,650	259,100	\$439.1	\$145.4
2017	433,534	265,075	\$472.6	\$160.5
2018	402,568	345,058	\$420.1	\$215.6
2019	416,399	416,399	\$454.1	\$247.2
2020	186,583	197,823	\$137.3	\$107.4
2021	368,979	340,596	\$311.2	\$206.8
2022	448,731	430,782	\$385.5	\$289.3
2023	446,486	476,928	\$393.4	\$337.7

Sources: Norfolk Airport Authority (various years) for passenger data, Bonney & Company (various years) for spending data, and Bureau of Labor Statistics (various years) for the Consumer Price Index (CPI).

5.3 Spending at ORF by Residents and Visitors

NAA provided information on revenue collected by businesses or expenditures incurred by travelers at the airport from 2018 to 2023. These revenues included revenues from car rentals, Turo, food and beverages, retail sales, ATMs, Fuel ROD, Wi-Fi and SmarteCarte. NAA also provided data on numbers of Uber/Lyft rides used by travelers. We assume an average of \$20 per Uber/Lyft ride. We assume that these expenditures are incurred by travelers. If airport personnel use Uber/Lyft, we will overestimate the number of rides, but our trip estimate is also likely below average. We also assumed that spending by airport employees on food and beverages accounts for 10% of all spending on food and beverages at the airport.

We utilize estimated proportion of state and local travelers from origin and destination surveys to get the estimated spending at the airport by out-of-state and resident travelers with some exclusion of spending categories. For resident travelers, we exclude car rental expenditures including Turo. For out-of-state travelers, we excluded expenditures on car rentals, Turo, and Uber and Lyft as these expenditures are most likely already included in their expenditures during their stay. Since we are not including expenditures (during their stay) by out-of-state visitors who are not staying

in Virginia, for our analysis, the exclusion of their spending on car rentals, Turo, and Uber and Lyft, at the airport will represent an underestimate of this type of spending. However, this type of spending would be included in estimating their economic impact on North Carolina.

Expenditures of out-of-state travelers staying in Virginia estimated earlier together with expenditures of out-of-state visitors at the airport on restaurants and other purchases provide us with direct spending impact of out-of-state travelers. Spending by resident travelers at the airport on restaurants and other purchases including Uber and Lyft provides the direct spending impact of resident travelers at the airport.

We provide the aggregate estimates of resident and visitor spending at ORF in Table 8. Total spending by visitors at ORF was \$7.8 million in 2019 and fell to \$4.1 million in 2020. This spending rebounded in 2021 and 2022 and reached \$11.0 million in 2023. Total spending by residents at ORF was \$15.0 million in 2019 and fell to \$7.0 million in 2020. This spending rebounded in 2021 and was \$16.4 million in 2022. In 2023, spending by residents at ORF was \$19.1 million. We note that it is important to capture different types of spending as the economic impacts differ by spending type and location.

**Table 7 – Resident and Visitor Spending at ORF in 2023 Dollars
2019 - 2023**

Year	Food and Beverage Spending by Visitors (Millions)	Other Spending by Visitors (Millions)	Food and Beverage Spending by Residents (Millions)	Other Spending by Residents (Millions)
2019	\$4.0	\$3.8	\$5.0	\$10.0
2020	\$2.0	\$2.1	\$2.4	\$4.6
2021	\$3.4	\$3.9	\$4.0	\$7.5
2022	\$5.8	\$4.0	\$7.2	\$9.2
2023	\$6.6	\$4.4	\$8.4	\$10.7

Sources: Norfolk Airport Authority (various years) for expenditure data and Bureau of Labor Statistics (various years) for the Consumer Price Index (CPI). Detailed estimates of spending by function are available upon request.

5.4 Total Spending by Commercial Visitors to ORF

Table 9 provides estimates of the total spending of commercial travelers at ORF from 2019 to 2023 in 2023 dollars. Prior to the onset of the COVID-19 pandemic, the direct spending of commercial travelers at ORF was approximately \$724.0 million. Out-of-state visitors accounted for 97.9% of total spending associated with traveler spending. Resident spending accounted for only 2.3% of commercial visitor spending. Unlike out-of-state travelers, residents would spend on housing, food, and other goods and services with or without ORF. We only count the spending by residents at ORF as this would occur at another airport if ORF was not available. This avoids overestimating resident spending at ORF and resulting measures of economic impact.



**Table 8 – Total Spending of Commercial Travelers at ORF
Virginia, 2019 - 2023**

Year	Out-of-State Visitor Spending in Virginia (Millions)	Out-of-State Visitor Spending at ORF (Millions)	Resident Spending at ORF (Millions)	Total Spending of Commercial Travelers (Millions)
2019	\$701.3	\$7.8	\$15.0	\$724.0
2020	\$244.6	\$4.2	\$7.0	\$255.8
2021	\$518.0	\$7.2	\$11.5	\$536.7
2022	\$674.8	\$9.8	\$16.4	\$701.0
2023	\$731.0	\$11.0	\$19.0	\$761.1

Sources: Norfolk Airport Authority (various years) for expenditure data and Bureau of Labor Statistics (various years) for the Consumer Price Index (CPI). Detailed estimates of spending by function are available upon request. Sum may not equal total due to rounding.

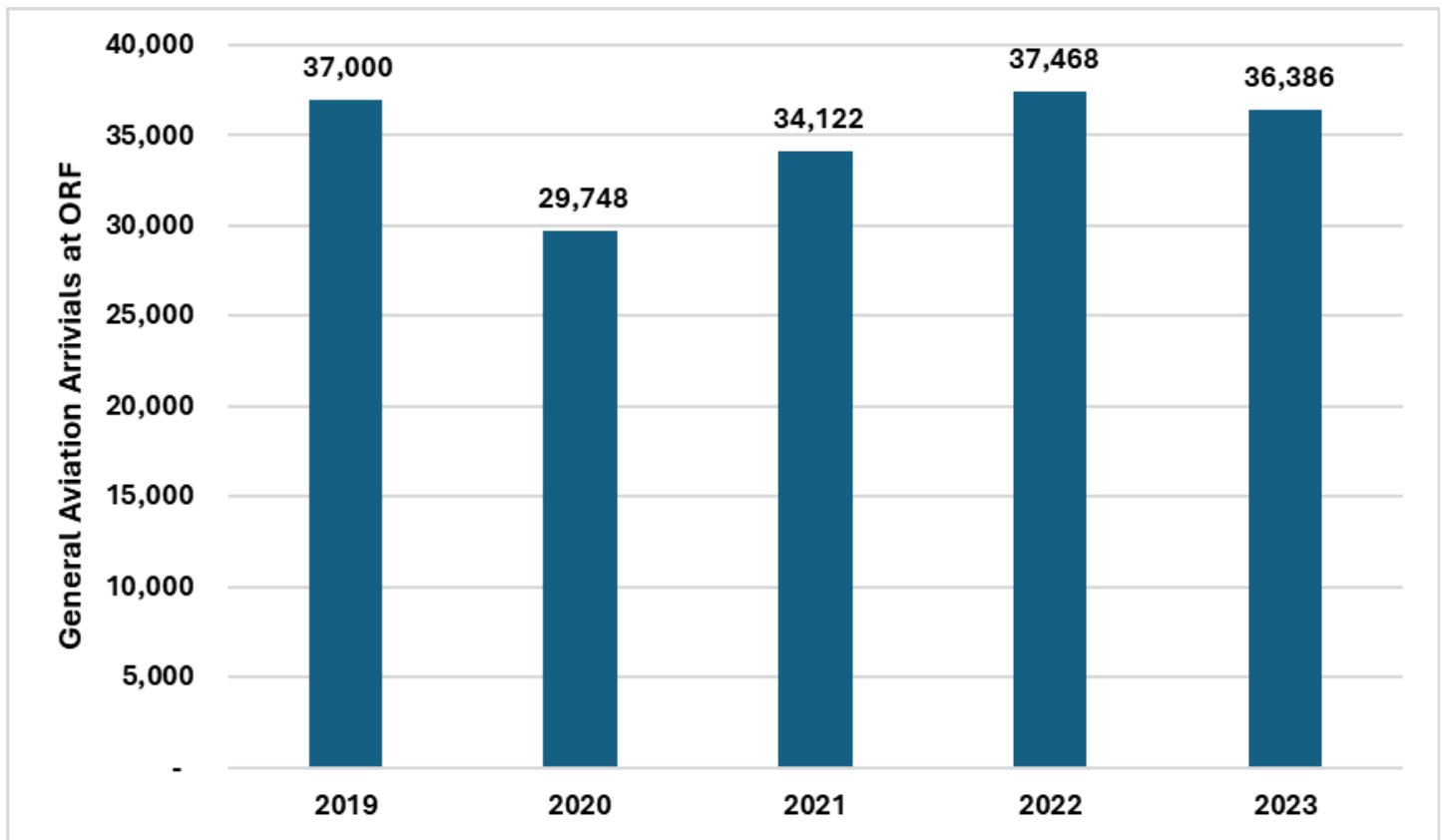
The direct economic impact of visitors using commercial airlines to ORF is equal to the spending by out-of-state visitors in Virginia and spending by out-of-state visitors and residents at ORF. In 2019, estimated total spending by commercial service passengers was \$724.0 million. The onset of the COVID-19 pandemic and reductions in commercial service travel led to a decline in total spending by commercial service passengers to \$255.8 million in 2020. After the 64.7% fall in total spending by 2020, direct economic impact rebounded in 2021 to \$536.7 million (109.8%) and increased again in 2022 to \$701.0 million (30.6%). In 2023, the total direct economic impact increased to \$761.1 million (8.6%). The record level of spending by out-of-state visitors in Virginia and visitors at ORF highlights the recovery from the economic shock of 2020 and the potential for future growth in 2024 and beyond.

5.5 Spending by General Aviation Visitors at ORF

General Aviation (GA) passengers also spend money across Virginia and at the airport. We obtained data on 2019 GA arrivals from the 2020 economic impact report. We were not able to get data on GA passengers for 2020 through 2023, however, we do have landing data and information on GA activities and operation for 2019 through 2023 from NAA. We apply the percent changes in GA activities at ORF from 2019 through 2023 to estimate changes in GA visitors from 2020 through 2023 given the baseline estimate of 37,000 GA visitors in 2019. Figure 5 represents these estimates.



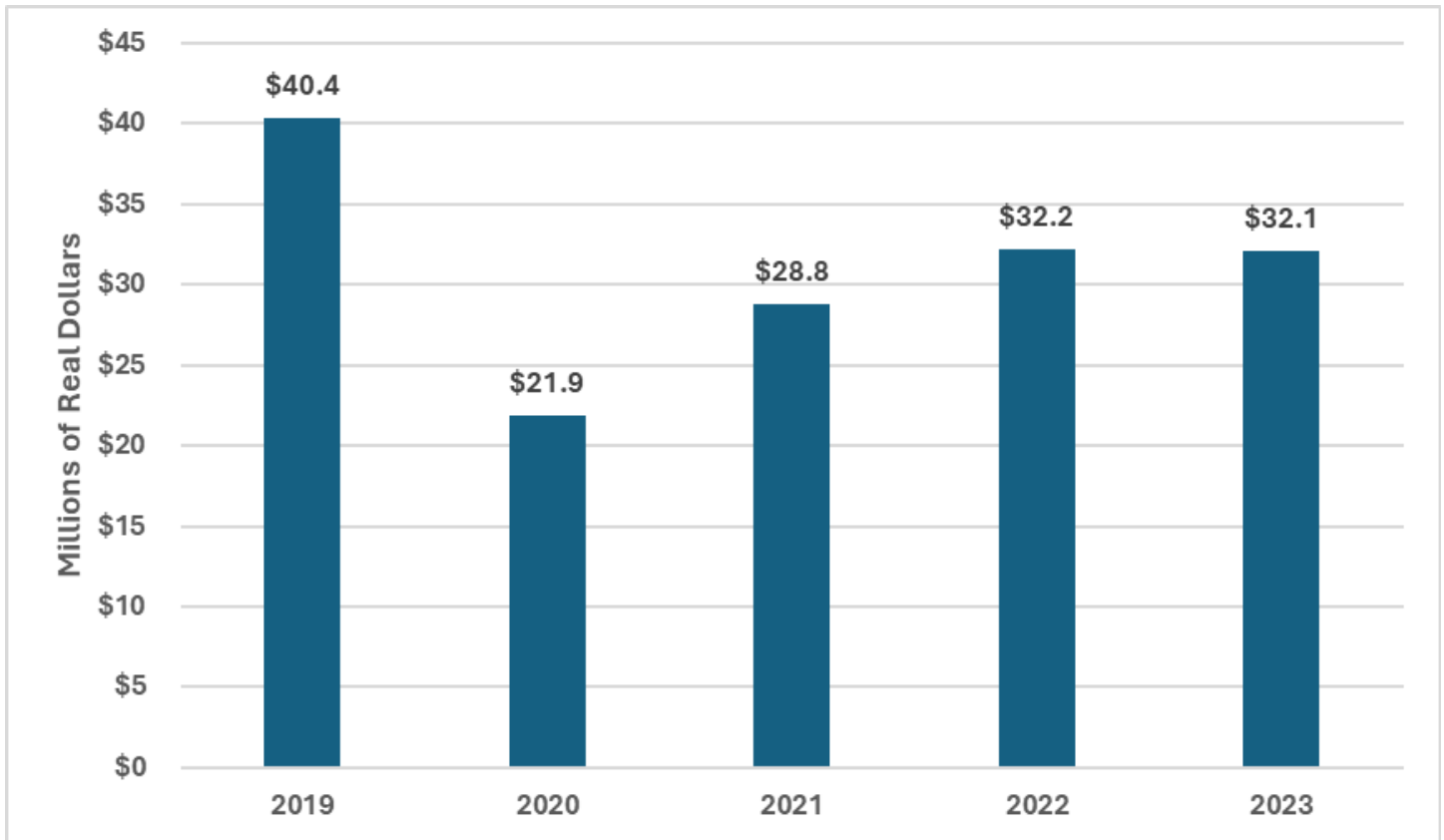
**Figure 5 – General Aviation Arrivals at ORF
2019 - 2023**



Source: InterVISTAS (2020), Norfolk Airport Authority (2024), and authors' estimates.

We follow the 2020 economic impact report in noting that while spending by GA visitors likely differs from the leisure and business travelers' estimates obtained from survey data, we also do not have survey data on GA visitors. Many GA visitors are likely traveling on business-related purposes and these visitors are likely to have spending patterns that mirror those of business travelers arriving at ORF on commercial service flights. We assume that the survey data estimates of spending patterns of business travelers are sufficiently close to actual spending by GA visitors. Figure 6 presents spending estimates for GA visitors at ORF from 2019 to 2023 in 2023 constant dollars.

Figure 6 – General Aviation Arrivals at ORF – Spending in 2023 Dollars
2019 - 2023



Source: InterVISTAS (2020), Norfolk Airport Authority (2024), and authors' estimates.



5.6 Economic Impact of Out-of-State Visitors on Virginia

We can now estimate the total direct economic impact of commercial and general aviation visitors as well as local residents. As illustrated in Table 10, in 2019, total direct spending by out-of-state visitors in Virginia and out-of-state visitors and residents at ORF was approximately \$764.3 million in 2023 dollars. In 2020, total direct economic impact declined to \$277.7 million. Direct spending rebounded in 2021 (\$565.5 million) and 2022 (\$733.1 million). In 2023, the total direct economic impact reached \$793.1 million. Relative to pre-COVID levels, total spending by visitors in Virginia and residents at ORF was 3.8% higher in 2023 than 2019.

Table 9 – Estimated Total Direct Economic Impact of Visitors and Residents in Virginia, 2019 - 2023

Year	Out-of-State Commercial Visitors Spending (Millions)	Out-of-State General Aviation Visitors Spending (Millions)	Total Out-of-State Visitors Spending (Millions)	Resident Spending at ORF (Millions)	Total Direct Economic Impact (Millions)
2019	\$709.0	\$40.4	\$749.4	\$15.0	\$764.3
2020	\$248.8	\$21.9	\$270.7	\$7.0	\$277.7
2021	\$525.2	\$28.8	\$554.0	\$11.5	\$565.5
2022	\$684.6	\$32.2	\$716.8	\$16.4	\$733.1
2023	\$742.0	\$32.1	\$774.0	\$19.1	\$793.1

Sources: Norfolk Airport Authority (various years) for expenditure data and Bureau of Labor Statistics (various years) for the Consumer Price Index (CPI). Bonney & Company for survey data and InterVISTAS (2020) for 2019 general aviation data. Detailed estimates of spending by function are available upon request. Sum may not equal total due to rounding.

One important caveat is that direct spending by residents at ORF does not have a multiplier effect like out-of-state visitor spending. We assume that resident spending at ORF would occur elsewhere in Virginia if it did not occur at ORF. Residents would either drive to another Virginia airport or take another form of transportation. In other words, residents have a transportation and entertainment budget and ORF does not induce ‘new’ spending in Virginia. On the other hand, out-of-state visitor spending is attracted by the presence of ORF and thus ‘ripples’ through the Virginia economy, such that each new dollar of spending creates more than a one dollar increase in economic activity.

To estimate the economic impact of total out-of-state visitor spending, we assume that 50% of spending occurs at hotels, 20% of spending is related to food and related establishments, 15% of spending is related to entertainment activities, and 15% of spending can be attributed to general retail activities. We use IMPLAN to generate the estimates of economic impact and our study region is the Commonwealth of Virginia. We present the economic impacts of out-of-state visitors who used air travel through ORF and spent money in Virginia in Table 11.

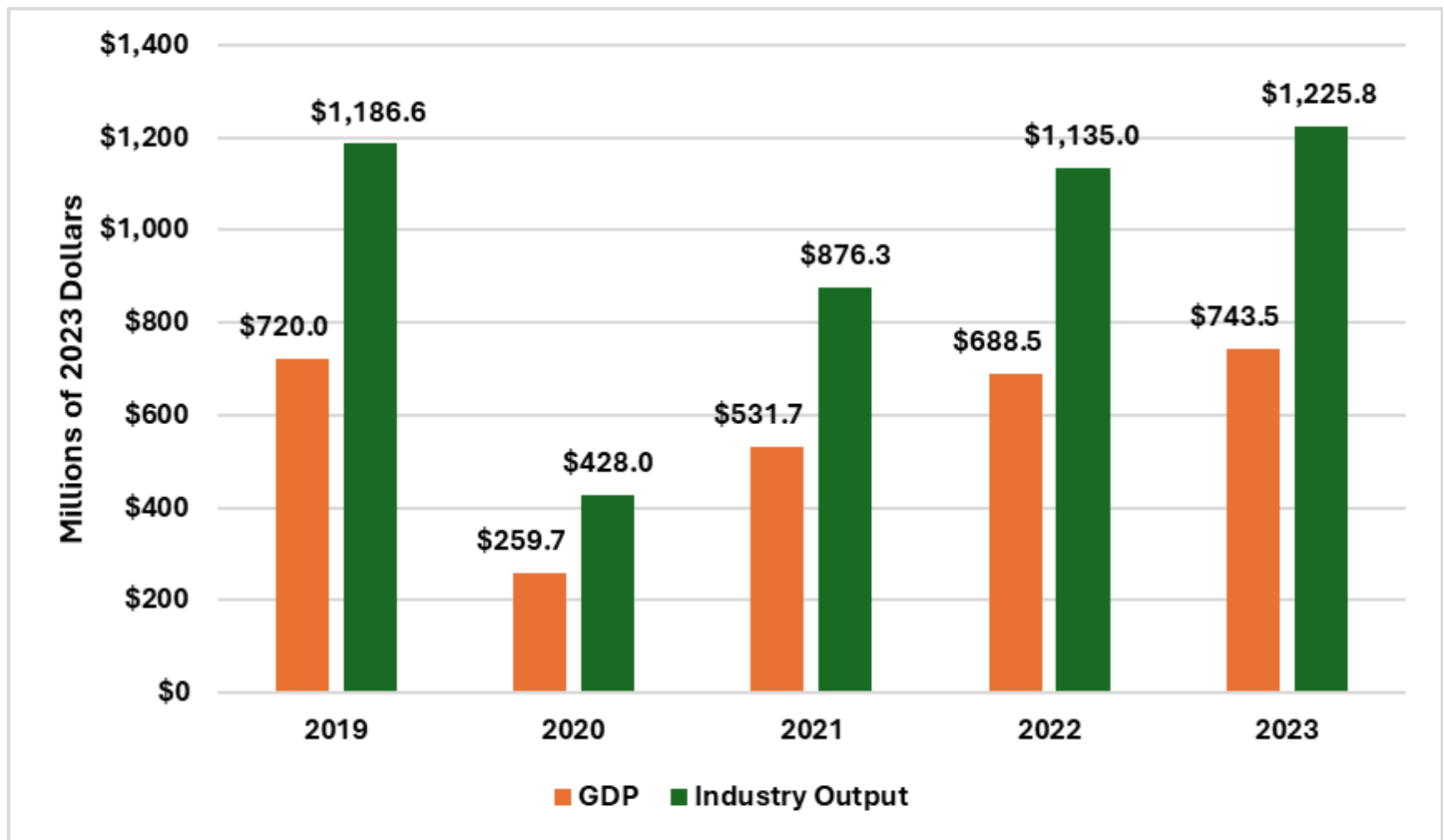
Table 10 – Economic Impact of Out-of-State Visitors via ORF in Virginia, 2019 - 2023

	2019	2020	2021	2022	2023
Jobs	9,948	3,587	7,346	9,514	10,275
Earnings (Millions of Dollars)	\$426.4	\$153.8	\$314.9	\$408.0	\$440.4
GDP (Millions of Dollars)	\$720.0	\$259.6	\$531.7	\$688.5	\$743.5
Output (Millions of Dollars)	\$1,186.5	\$428.0	\$876.3	\$1,135.0	\$1,225.8

Notes: Dollar values expressed in 2023 dollars. Total economic impact estimates include estimates of direct, indirect, and induced economic impact of out-of-state visitor spending in Virginia associated with ORF.

In 2019, out-of-state visitor spending associated with travel through ORF supported approximately 9,950 jobs that paid \$426.4 million in wages. These visitors increased Virginia’s GDP by \$720.0 million and industry output by \$1,186.5 million in 2019. The impact of the COVID-19 pandemic is apparent with jobs, wages, GDP, and output all falling significantly in 2020. The rebound from the pandemic is apparent in the estimates for 2021 and continuing into 2022. In 2023, out-of-state visitor travel through ORF increased the number of jobs in Virginia by 10,275. Wages and GDP in the Commonwealth were \$440.4 million and \$743.6 million higher, respectively, in 2023 as the result of out-of-state travelers transiting through ORF. In 2023, industry output across the state was \$1,225.9 million higher. We highlight the impacts on GDP and industry output in Figure 7.

Figure 7 – Impact of Out-of-State Visitors Via ORF on GDP and Industry Output in Virginia, 2019 - 2023



Notes: Dollar values expressed in 2023 dollars. Total economic impact includes estimates of direct, indirect, and induced economic impact of out-of-state visitor spending associated with ORF.

5.7 Economic Impact on Local Residents via ORF

In 2019, direct spending by residents at ORF was approximately \$15.0 million in 2023 dollars. In 2020, their spending declined to \$7.0 million (Table 10). Direct spending by residents rebounded in 2021 to \$11.5 million and to \$16.4 million in 2022. In 2023, spending by residents reached \$19.1 million. Relative to pre-COVID levels, total spending by residents at ORF was 27.3% higher in 2023 than 2019. In Table 12, we present the estimates of economic impact for local residents traveling via ORF. The direct spending by these residents does not have a multiplier effect like out-of-state visitor spending.



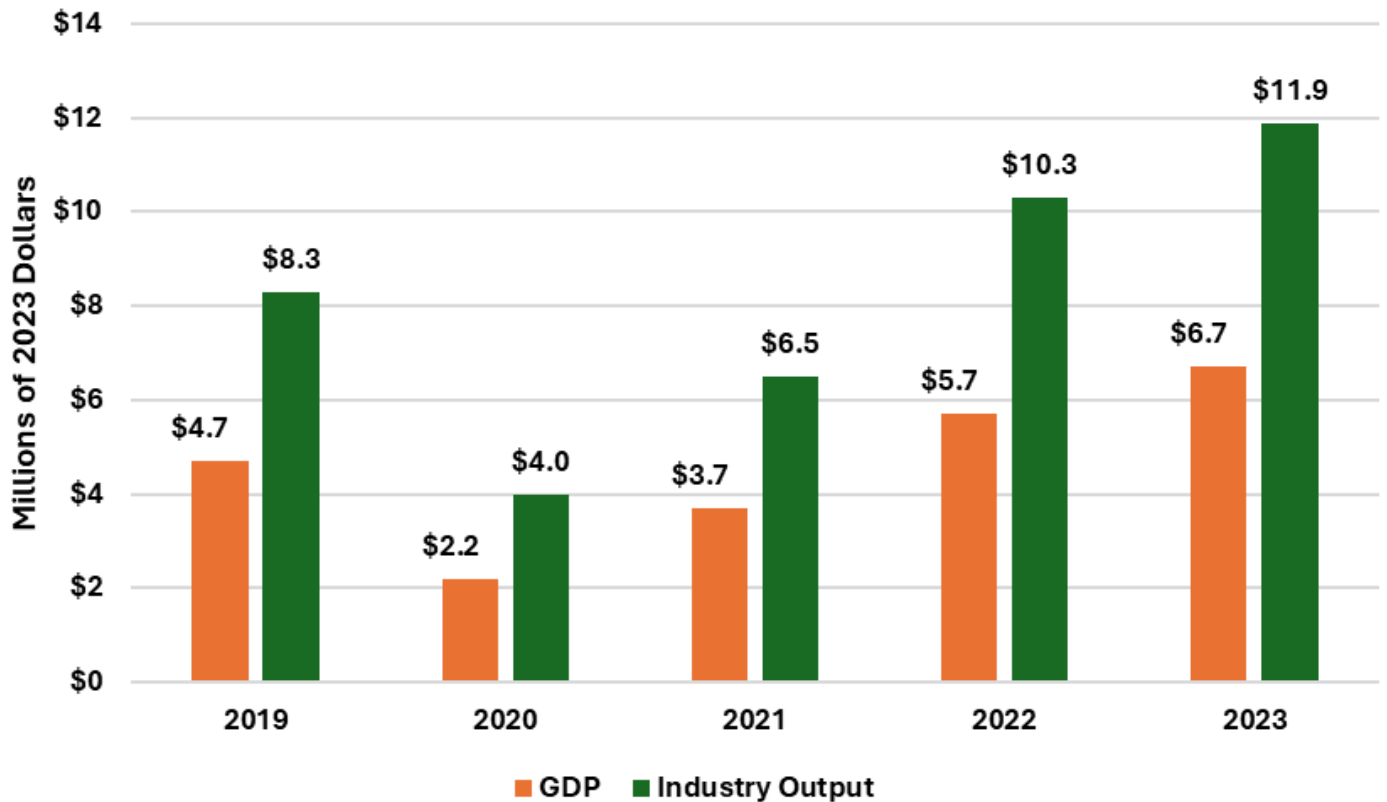
Table 11 – Economic Impact of Local Residents via ORF in Virginia, 2019 - 2023

	2019	2020	2021	2022	2023
Jobs	83	40	65	104	121
Earnings (Millions of Dollars)	\$2.9	\$1.4	\$2.3	\$3.6	\$4.1
GDP (Millions of Dollars)	\$4.7	\$2.2	\$3.7	\$5.7	\$6.7
Output (Millions of Dollars)	\$8.3	\$4.0	\$6.5	\$10.3	\$11.9

Notes: Dollar values expressed in 2023 dollars. Economic impact estimates include impacts of direct spending of local residents associated with ORF.

In 2019, local residents' spending associated with travel through ORF supported 83 jobs across Virginia that paid \$2.9 million in wages. This spending by local residents increased Virginia's GDP by \$4.7 million and industry output by \$8.3 million in 2019. Local resident spending fits a familiar pattern: a significant decline in 2020 followed by a rebound in 2021. In 2022, the economic impacts associated with local residents traveling via ORF exceeded those observed in 2019. By 2023, local resident travel through ORF increased the number of jobs in Virginia by 121. Wages and GDP in the Commonwealth were \$4.1 million and \$6.7 million higher, respectively, in 2023 as the result of these travelers transiting through ORF. In 2023, industry output across the state was \$11.9 million higher. We highlight the impacts on GDP and industry output in Figure 8. We use the estimates of local resident economic impact and out-of-state visitor economic impact to arrive at the estimated impact of travelers via ORF on the economy of the Commonwealth of Virginia.

Figure 8 – Impact of Local Residents Via ORF on GDP and Industry Output in Virginia, 2019 - 2023



Notes: Dollar values expressed in 2023 dollars. Economic impact estimates include impacts of direct spending of local residents associated with ORF.

5.8 Economic Impact of Travelers via ORF

The total economic impacts of travelers, shown in Table 13, via ORF on the economy of Virginia is equal to the sum of the economic impacts associated with out-of-state visitors who remain in Virginia and local residents who travel via ORF. In 2019, traveler spending associated with travel through ORF supported 10,031 jobs that paid \$429.3 million in wages. In 2019, These travelers increased Virginia’s GDP by \$724.7 million and industry output by \$1,194.8 million. In 2020, the number of jobs supported by travelers via ORF declined to 3,627 while state GDP and industry output declined to \$261.9 million and \$432.0 million, respectively. In other words, travelers’ contributions to jobs, state GDP, and industry output declined by approximately 64.0% as the pandemic disrupted travel and spending throughout the United States.

Table 12 – Economic Impact of Travelers via ORF in Virginia, 2019 - 2023

	2019	2020	2021	2022	2023
Jobs	10,031	3,627	7,411	9,618	10,396
Earnings (Millions of Dollars)	\$429.3	\$155.2	\$317.1	\$411.4	\$444.5
GDP (Millions of Dollars)	\$724.7	\$261.9	\$535.4	\$694.3	\$750.2
Output (Millions of Dollars)	\$1,194.8	\$432.0	\$882.8	\$1,145.3	\$1,237.8

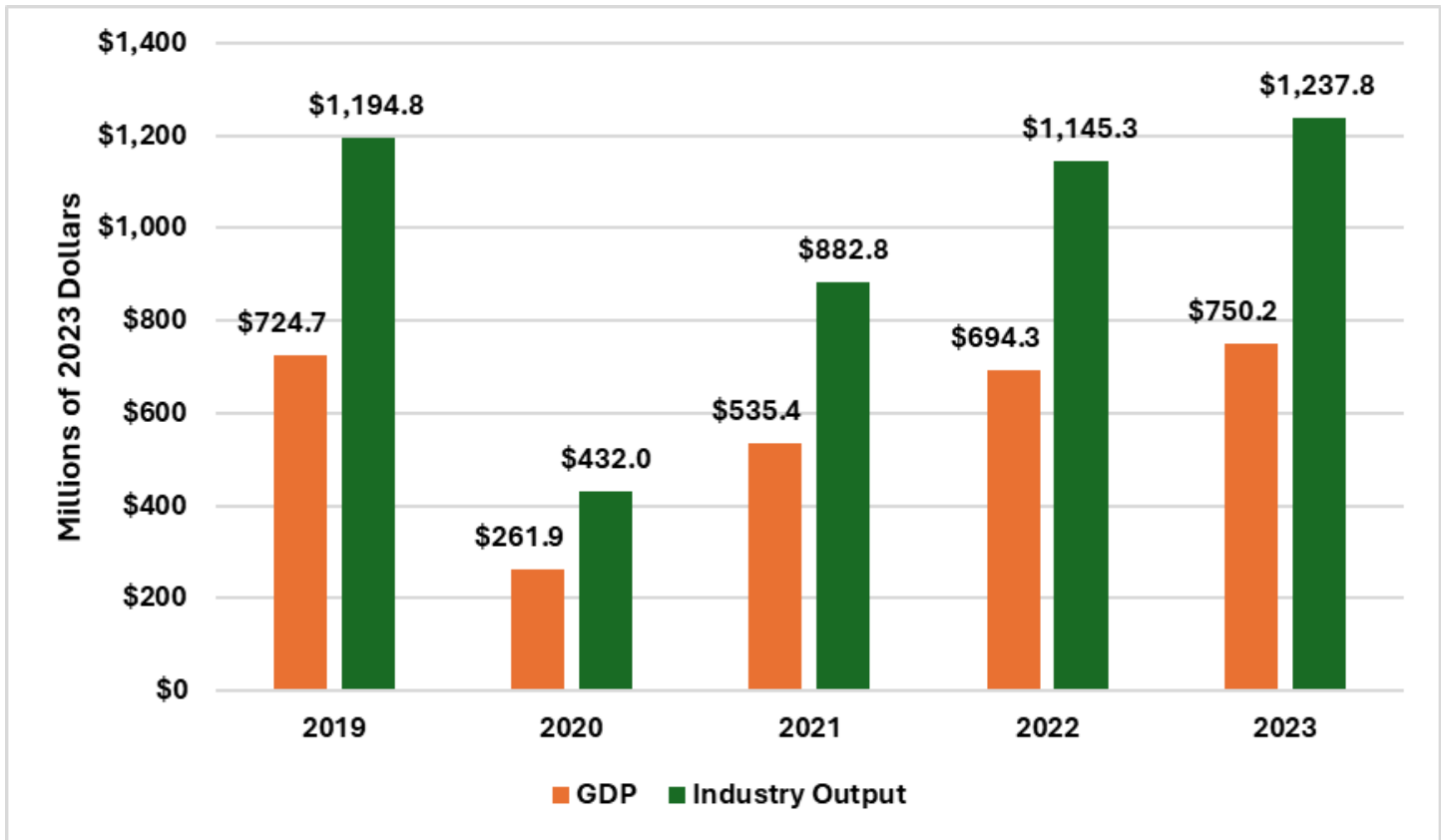
Notes: Dollar values expressed in 2023 dollars. Total economic impact estimates include estimates of direct impact of local residents and direct, indirect, and induced economic impact of out-of-state visitor spending in Virginia associated with ORF.



Figure 9 highlights the impact of travelers via ORF on Virginia’s GDP and industry output from 2019 to 2023 in 2023 dollars. After falling by approximately 64.0% in 2020, travelers’ contributions to Virginia’s jobs, earnings, GDP, and industry output more than doubled in 2021. The recovery continued in 2022 as these contributions to jobs, earnings, GDP, and industry output rose by approximately 30.0%. In 2023, as passenger traffic set a new record at ORF, it should be no surprise that travelers’ contributions achieved a new record. In 2023, traveler spending supported 10,396 jobs across the Commonwealth and \$444.5 million in employee compensation. In the same year, traveler spending increased Virginia’s GDP by \$750.2 million and industry output by \$1,237.8 million.

These findings illustrate the importance of traveler spending to the overall economic impact of ORF and to the economy of the Commonwealth of Virginia. By attracting out-of-state visitors and serving as a local airport for residents, ORF attracts new economic activity to the metropolitan area and the state. As ORF invests in new facilities, it is likely these impacts will continue to grow.

Figure 9 – Impact of Travelers Via ORF on GDP and Industry Output in Virginia, 2019 - 2023



Notes: Dollar values expressed in 2023 dollars. Total economic impact includes estimates of direct impact of local residents and direct, indirect, and induced economic impacts of out-of-state visitor spending associated with ORF.

5.9 Economic Impact on North Carolina

At the request of NAA, we include an analysis of the economic impact of out-of-state visitors who travel through ORF but do business or engage in leisure activities in North Carolina. We note that the estimates in this section are not included in the estimates of out-of-state visitors' economic impact for Virginia and are not included in the estimates of the total economic impact of ORF on the Commonwealth. The study region for this report is Virginia and including North Carolina estimates would overstate the economic impact of ORF on the Commonwealth. If the study region were expanded, however, the interested reader could use these estimates to approximate the total economic impact of ORF on the economies of Virginia and North Carolina. Such an exercise, however, is out of scope for this report.

Using survey data from Bonney & Company, we estimate the number of out-of-state business arrivals and out-of-state leisure arrivals via ORF who then travel to North Carolina. We develop estimates of out-of-state spending by business and leisure travelers in North Carolina. We present these estimates in Table 14.



**Table 13 – Business and Leisure Travelers and Spending in North Carolina in 2023 Dollars
2019 - 2023**

Year	Out-of-State Business Travelers Staying in North Carolina	Out-of-State Leisure Travelers Staying in North Carolina	Spending by Out-of-State Business Travelers in North Carolina (Millions)	Spending by Out-of-State Leisure Travelers in North Carolina (Millions)
2019	4,477	49,251	\$4.9	\$29.2
2020	4,496	20,232	\$3.3	\$11.0
2021	9,461	35,479	\$8.0	\$21.5
2022	11,966	23,932	\$10.3	\$16.1
2023	13,530	67,649	\$11.9	\$47.9

Sources: Bonney & Company (various years), Norfolk Airport Authority (various years) for expenditure data and Bureau of Labor Statistics (various years) for the Consumer Price Index (CPI). Detailed estimates of spending by function are available upon request. Sum may not equal total due to rounding.

To estimate the economic impact of out-of-state visitor spending in North Carolina, we again assume that 50% of spending occurs at hotels, 20% of spending is related to food and related establishments, 15% of spending is related to entertainment activities, and 15% of spending can be attributed to general retail activities. We use IMPLAN to generate the estimates of economic impact and our study region for this section is North Carolina. We present the economic impacts of out-of-state visitors who used air travel through ORF and spent money in North Carolina in Table 15.

Table 14 – Economic Impact of Out-of-State Visitors via ORF in North Carolina, 2019 - 2023

	2019	2020	2021	2022	2023
Jobs	446	190	393	351	796
Earnings (Millions of Dollars)	\$19.1	\$8.2	\$16.8	\$15.0	\$34.1
GDP (Millions of Dollars)	\$32.3	\$13.8	\$28.4	\$25.4	\$57.6
Output (Millions of Dollars)	\$53.1	\$22.7	\$46.9	\$41.8	\$94.9

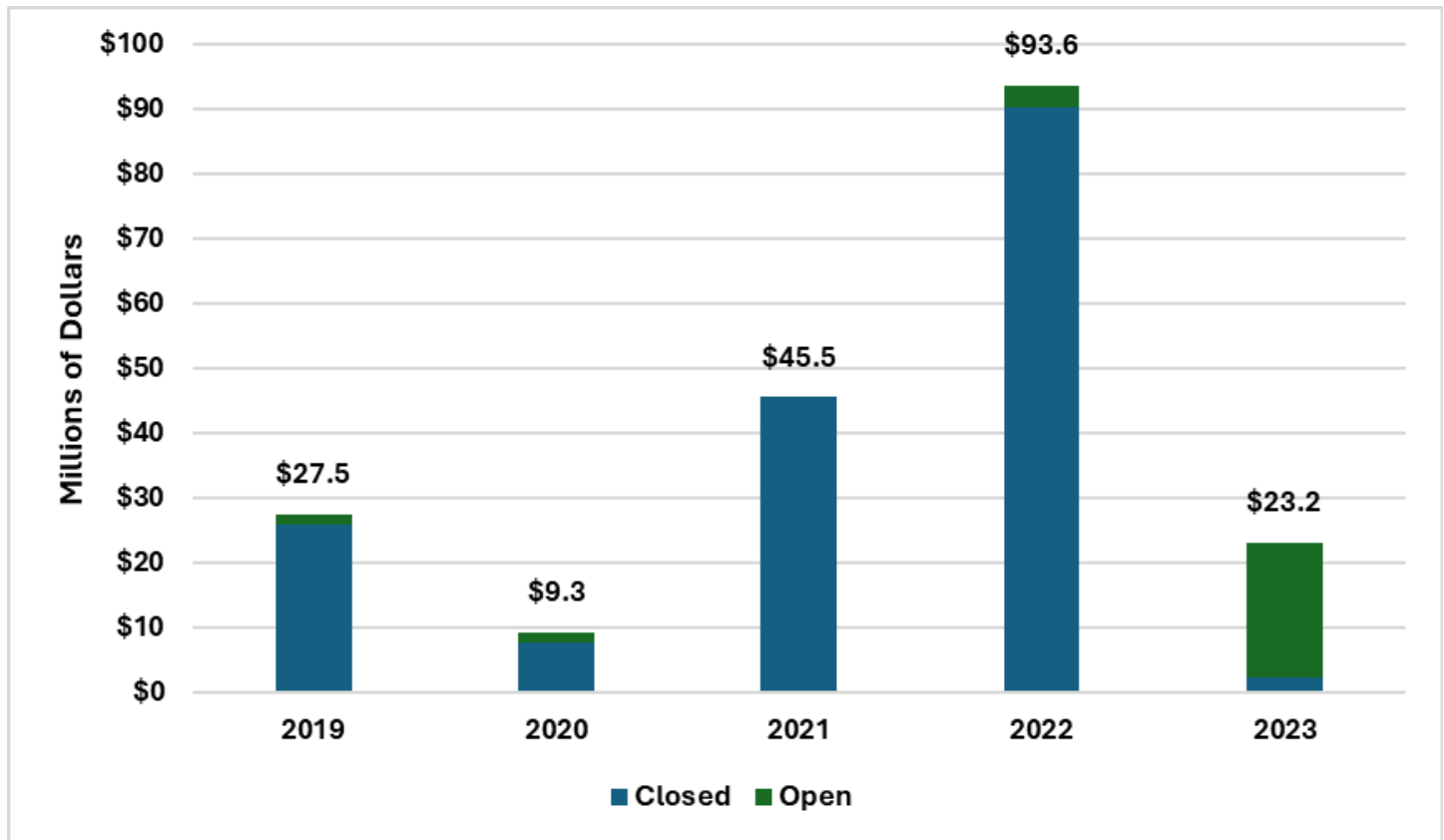
Notes: Dollar values expressed in 2023 dollars. Total economic impact estimates include estimates of direct, indirect, and induced economic impact of out-of-state visitor spending in North Carolina associated with ORF.

6. The Economic Impact of Capital Improvements

Capital improvement programs at airports can generate significant bursts of economic activity for the duration of the project and, if capacity enhancing, have longer-term impacts on airport operations. Capital operations can range from investments in plant and equipment to the construction of new facilities. Capital expenditures vary significantly by year, and we have obtained capital expenditure data from NAA for 2019 to 2023. Given the significant variation in capital expenditure, we do not use the actual level of expenditure for the economic impact analysis. Figure 10 presents real annual capital expenditures for ORF in 2023 dollars.



Figure 10 – Real Expenditures on Capital Projects at ORF, 2019 - 2023

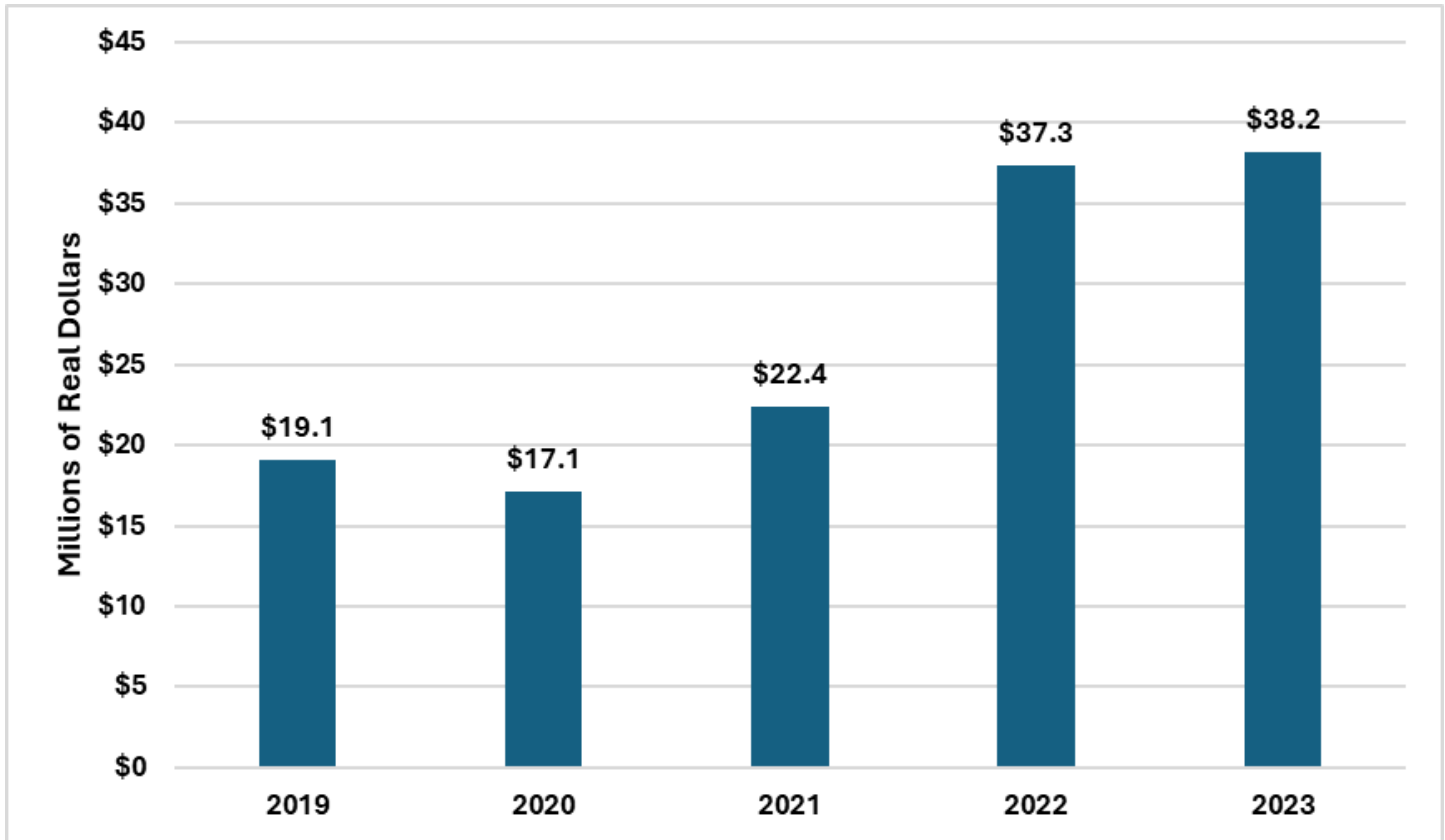


Source: Norfolk Airport Authority (2024). Dollar values expressed in 2023 dollars.

Capital expenditures, as shown in Graph 10, vary significantly year-to-year. Given the timing and variability issues, it was determined that it would be more appropriate to utilize a ‘normal’ or average level of capital expenditure. Thus we utilize a rolling five-year average of capital expenditure across this period.³ Figure 11 presents rolling average real capital expenditures at ORF from 2019 to 2023 in 2023 dollars.

³ We note that the average for 2019 is based on the 2020 economic impact study and represents average capital expenditure over a four-year period.

Figure 11 – 5-Year Average Real Expenditures on Capital Projects at ORF, 2019 - 2023



Source: Norfolk Airport Authority (2024). Dollar values expressed in 2023 dollars. 2019 estimates based on 4-year average.

We present the economic impacts of capital expenditures at ORF from 2019 to 2023 in Table 16. The number of jobs increases from 244 in 2019 to 489 in 2023 as average real capital expenditures increased in 2022 and again in 2023. Employee compensation increased as employment increased, rising from \$22.1 million in 2019 to \$44.1 million in 2023. Economic activity, as measured by GDP, across the Commonwealth increased from \$25.0 million in 2019 to \$49.9 million in 2023.

Examining industry output, we note that in 2019, average capital expenditures at ORF increased industry output by \$38.2 million. By 2021, the economic impact in terms of industry output had increased to \$44.8 million (17.5%). In 2022, the contribution to industry output increased to \$74.7 million (66.7%), reflecting a rise in real capital expenditures and its contribution to the five-year rolling average of capital expenditures. The relatively modest increase in the five-year rolling average in 2023 relative to 2022 is reflected in the 2.2% increase in the economic impact on industry output, which rose from \$74.7 million in 2022 to \$76.3 million in 2023. Given the number and scope of announced projects at

ORF in the second half of the current decade, it would be reasonable to expect that the economic impact of capital expenditures will rise as these projects come to fruition.

Table 15 – Economic Impact of Capital Expenditures at ORF, 2019 - 2023

	2019	2020	2021	2022	2023
Jobs	244	220	287	479	489
Earnings (Millions of Dollars)	\$22.1	\$19.8	\$25.9	\$43.2	\$44.1
GDP (Millions of Dollars)	\$25.0	\$22.4	\$29.3	\$48.9	\$49.9
Output (Millions of Dollars)	\$38.2	\$34.3	\$44.8	\$74.7	\$76.3

Notes: Dollar values expressed in 2023 dollars. Total economic impact includes estimates of direct, indirect, and induced economic impact for capital spending associated with ORF.

7. The Economic Impact of Airport Operations

The third part of the triad of ORF economic impacts consists of estimating the impact of airport operations. Economic impacts are often estimated using inputs either in the form of expenditures or direct employment, depending on data availability. In previous sections, we employ the expenditure approach to estimate the economic impact of visitor spending and the impact of capital expenditures. As spending data were not available from the tenants at the airport, this report uses a direct employment approach to estimate the impact of airport operations.

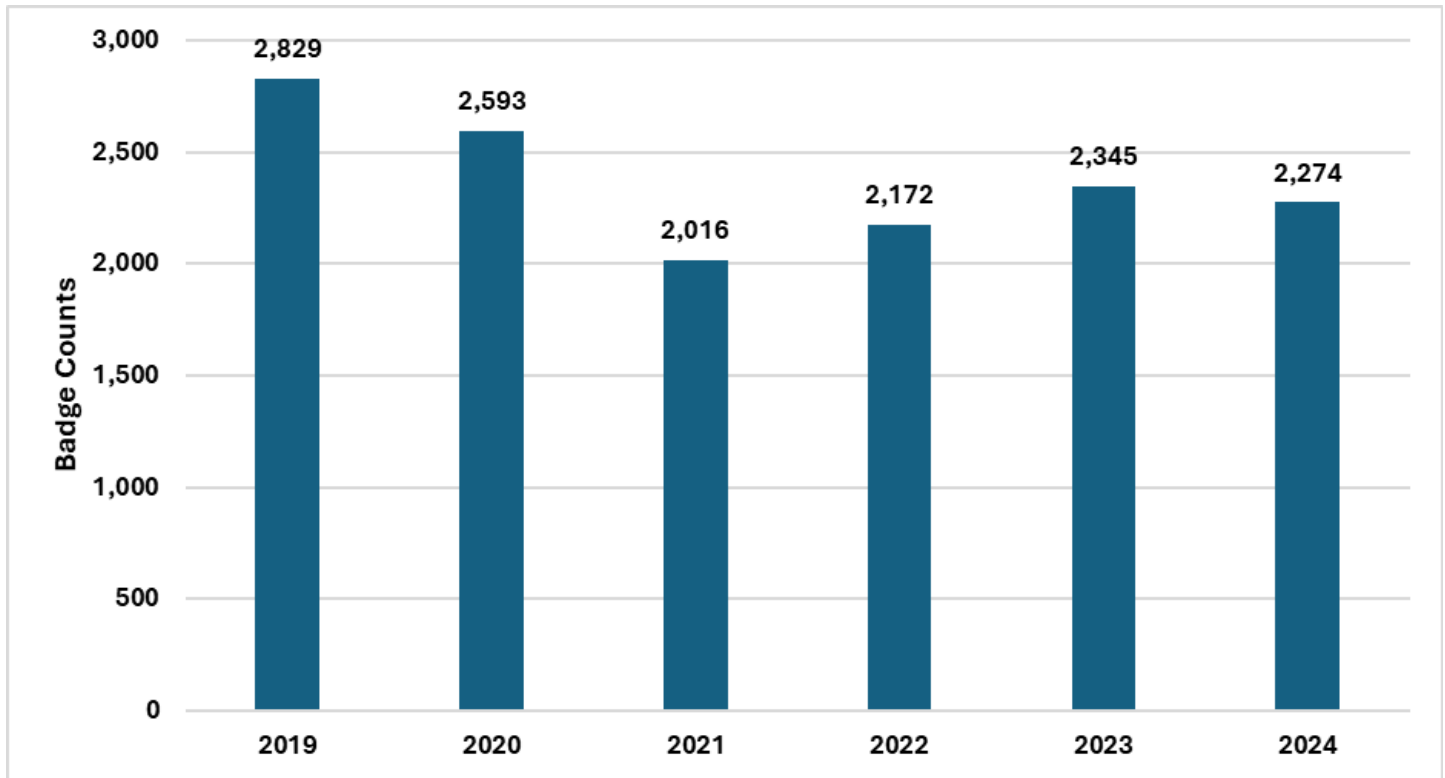


To estimate the number of jobs directly connected with ORF, we obtained data from the NAA on employee counts and badge counts (a badge allows access to secure areas of the facility). We noted that the data on employee and badge counts includes information related to vendors and contractors providing services to the tenants and NAA. From an economic impact perspective, these vendors and contractors are not employees of the tenants, or the NAA and their services simply represent expenditures incurred either for the airport operations or for capital projects. Since we are using direct employment approach to estimate the impact of airport operations, we exclude them from the overall employee count to avoid double counting.

Figure 12 presents employee badge counts at ORF from 2019 to 2023. The badge count data suggest that the number of individuals needing access to secure areas at ORF declined in 2020 and then again in 2021. While one might reasonably expect that badge counts might decline during 2020 at the height of the COVID-19 pandemic, the most significant decline in badge counts occurred in 2021. As badge counts appear to be highly correlated with employment at ORF, the 8.3% decline in badges in 2020 and 22.3% decline in 2021 might lead one to conclude that employment also dropped over this period. From 2019 to 2023, the number of reported badges declined by 17.1%, however, over the same period, passenger traffic increased, and interviews with NAA personnel highlighted the increases in economic activity at ORF.



Figure 12 – Badge Counts at ORF, 2019 - 2023

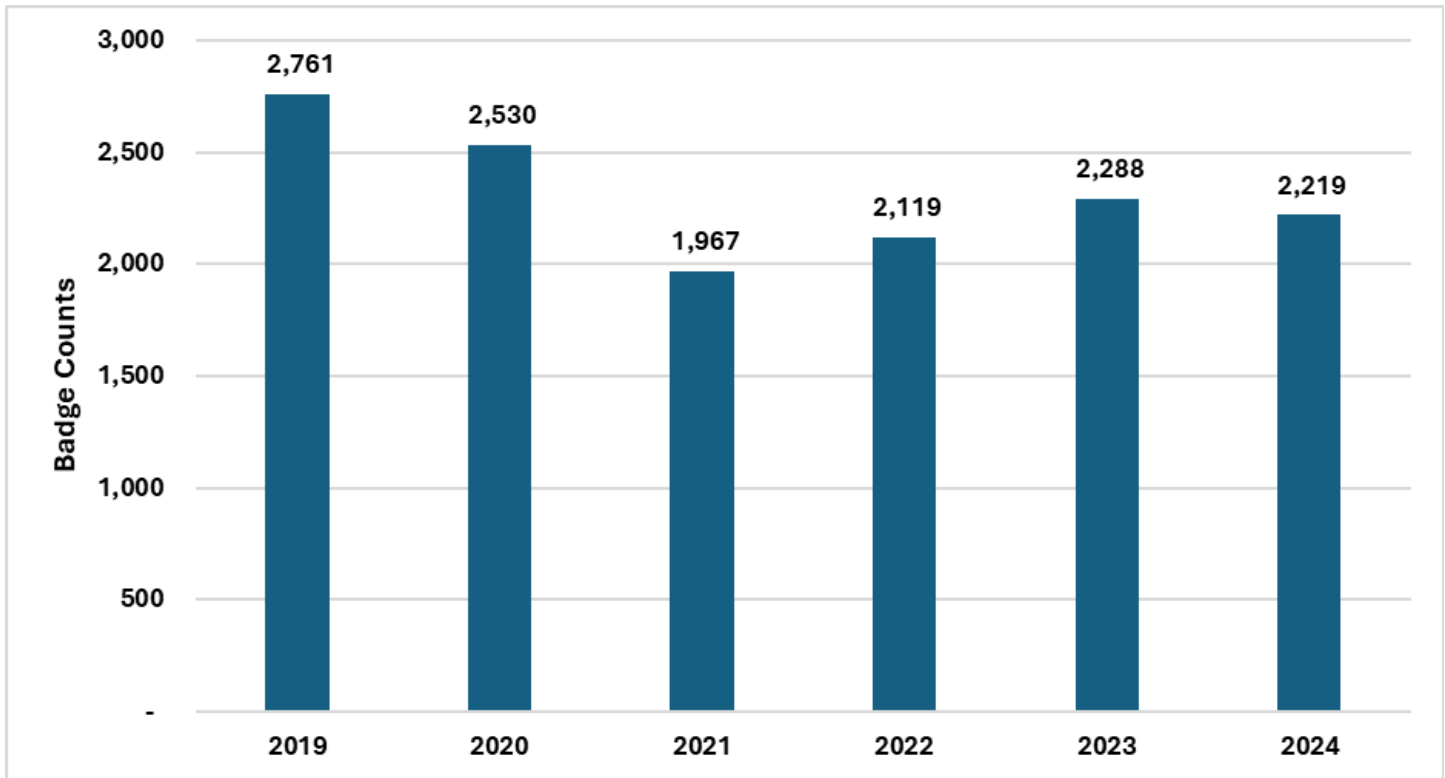


Source: Norfolk Airport Authority (various years).

NAA provided employment estimates for tenants at ORF as of June 2024. NAA noted that some car rental companies may not procure badges for all their employees, and the employment estimates were adjusted to reflect this behavior. Estimated tenant employment for June 2024 along with employees of NAA was 2,219 individuals with another 477 individuals employed by vendors and contractors. Unfortunately, historical employment data were not available and discussions with NAA suggested that the correlation between badge counts and employment at ORF was stable over the 2019 to 2023 period. Given the high observed correlation between badge counts and employment counts at ORF, this report uses badge counts as the basis for the estimation of base employment counts.

Figure 13 provides the estimated base employment counts from 2019 to 2024. In June 2024, NAA reported that 2,219 individuals were employed at ORF. The 2,219 individuals accounted for 97.6% of badges. Using historical badge counts and this proportion, we generate estimates of base employment at ORF from 2019 to 2023. However, given the estimated base employment is derived from badge counts, and badge counts declined in 2020 and 2021, Figure 13 would suggest that employment at ORF remained considerably lower in 2024 than 2019.

Figure 13 – Estimated Base Employment at ORF, 2019 - 2024

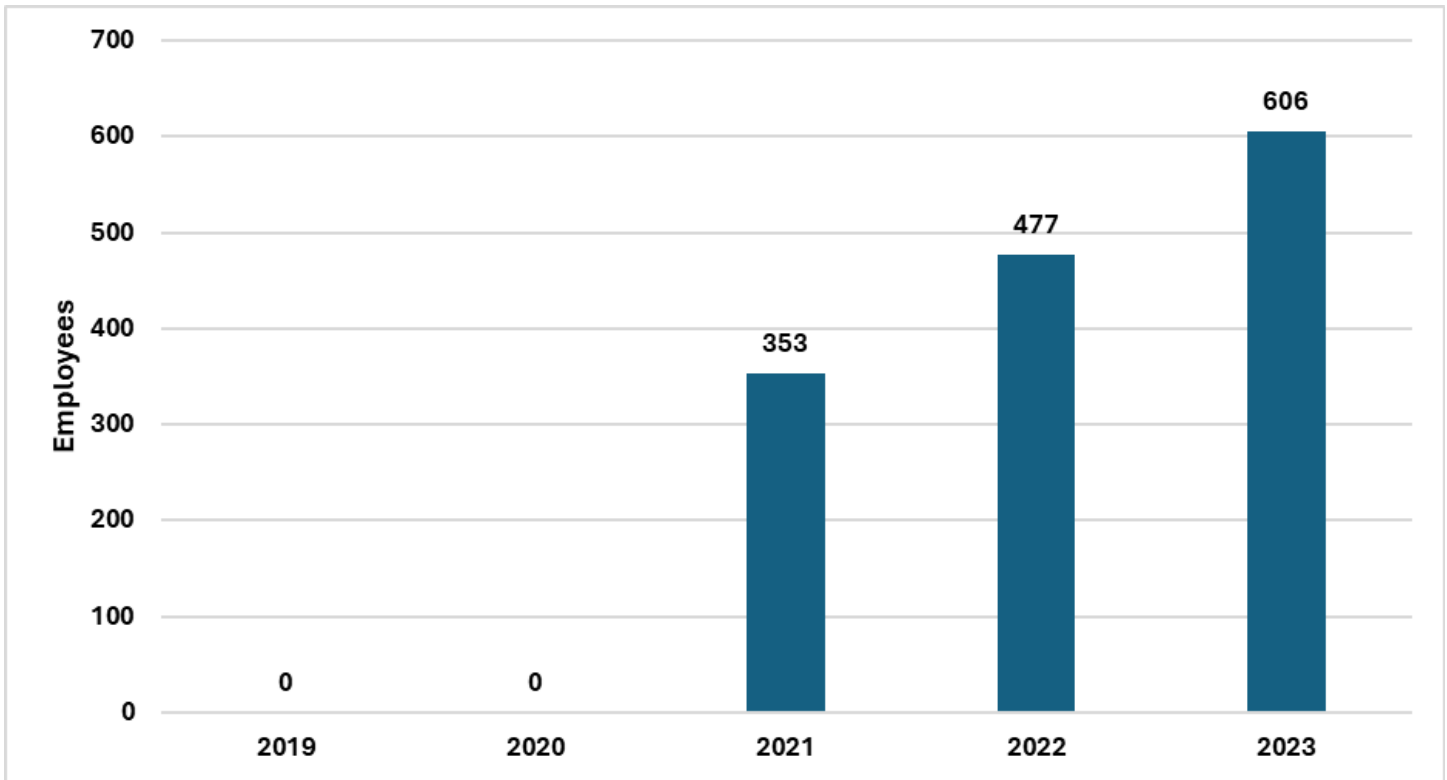


Source: Authors estimates (various years).

While there was consensus that the badge counts may have reflected employment trends in 2019 and 2020, additional discussions with NAA revealed a change in the treatment of non-domiciled employees in 2021. A non-domiciled employee is an individual who resides in the local area by choice and uses ORF to commute to their duty station. For example, an airline pilot who works for a passenger carrier may live in Virginia Beach but is based out of Atlanta or Charlotte. The individual, in the absence of ORF, would not be able to live in the local area and maintain employment for the passenger carrier without significant difficulty. Excluding non-domiciled employees from the employment estimates would understate the contribution of ORF to the Virginia economy.

Figure 14 illustrates the additional non-domiciled employee estimates for 2019 to 2023. The badge data captures these employees in 2019 and 2020. Based on discussions with NAA, there were estimated 353 additional non-domiciled employees not captured by the badge data in 2021, rising to 477 in 2022. For 2023, there were, on average, 606 non-domiciled employees that were not captured by the badge data.

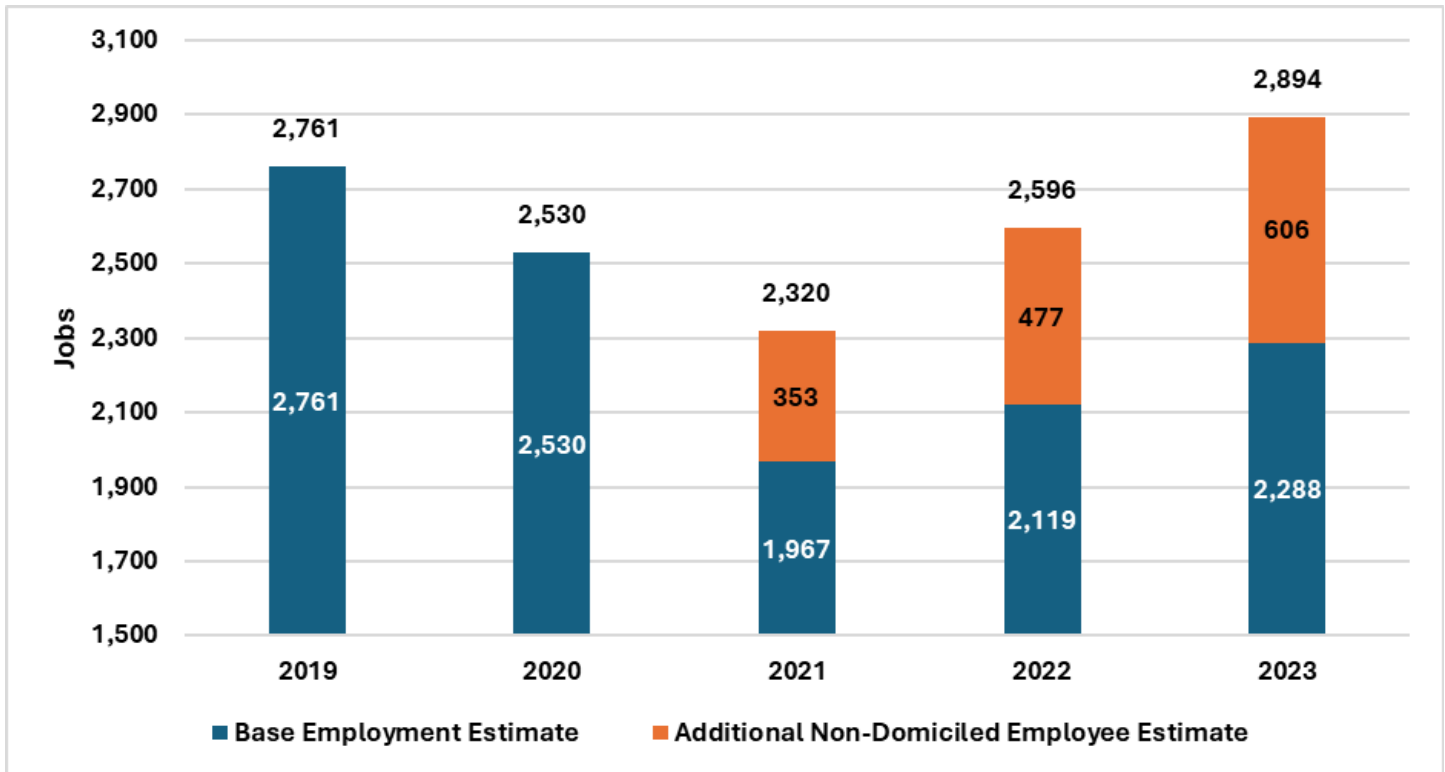
Figure 14 – Additional Non-Domiciled Employee Estimates at ORF, 2019 - 2023



Source: Norfolk Airport Authority and Authors' estimates (various years).

Figure 15 presents the base employment estimate (derived from badge counts), additional non-domiciled employee estimate, and total employment estimates for ORF from 2019 to 2023. Including the additional non-domiciled employees yields a starkly different picture than one derived solely from badge count estimates. Total employment (base + non-domicile) was 2,761 employees in 2019. In 2020, total employment declined by 8.3% and by another 8.3% in 2021. These declines are more in line with industry practice than the declines observed solely on badge counts. Employment then increased from 2,320 in 2021 to 2,596 in 2022, an increase of 11.9%. In 2023, estimated total employment was 2,894, an increase of 11.5% from 2022 and an increase of 4.8% from 2019.

Figure 15 – Total Employment Estimate at ORF, 2019 - 2023



Source: Norfolk Airport Authority (various years) and authors' estimates.

We present the economic impacts of operations associated with ORF from 2019 to 2023 in Table 17. In 2019, approximately 4,850 jobs were associated with operations at ORF, increasing compensation in Virginia by almost \$438.0 million. In 2019, state GDP was \$495.5 million higher and industry output increased by \$757.2 million due to operations at ORF facilities. In 2020, earnings declined to \$401.1 million while contributions to GDP and industry output fell to \$454.0 million and \$693.8 million, respectively.

The number of jobs in Virginia resulting from the presence of ORF declined to a low of 4,078 in 2021, illustrating the lingering impacts of the pandemic. In 2022, the recovery began in earnest, with the number of jobs increasing to 4,563 and employee earnings rising to \$411.6 million. In 2022, the contribution to Virginia's economy was \$465.9 million and industry output was \$711.9 million higher due to the presence of ORF.

By 2023, the recovery was complete, and a new expansion was underway at ORF. The number of jobs in Virginia due to the presence of ORF (5,087) was 4.8% higher in 2023 than 2019. Employee earnings reached \$458.8 million and economic activity across the state was \$519.4 million higher due to operations at ORF. Industry output also reached a high of \$793.7 million, illustrating the resiliency of ORF in the aftermath of the COVID-19 pandemic. Given rising levels of

commercial passenger traffic, it is likely, barring an unexpected economic shock that the economic impacts associated with operations at ORF will continue to rise in the near-term.

Table 16 – Economic Impact of Operations at ORF, 2019 - 2023

	2019	2020	2021	2022	2023
Jobs	4,853	4,447	4,078	4,563	5,087
Earnings (Millions of Dollars)	\$437.7	\$401.1	\$367.8	\$411.6	\$458.8
GDP (Millions of Dollars)	\$495.5	\$454.0	\$416.4	\$465.9	\$519.4
Output (Millions of Dollars)	\$757.2	\$693.8	\$636.2	\$711.9	\$793.7

Notes: Dollar values expressed in 2023 dollars. Total economic impact includes estimates of direct, indirect, and induced economic impact for operations at ORF.

8. The Total Economic Impact of ORF (Virginia)

We now turn to the question of the total economic impact of ORF. As the study area for this report is the Commonwealth of Virginia, we do not include the economic impacts of visitors to North Carolina in the following estimates. The interested reader can, if they so desire, sum the estimates for Virginia and North Carolina to obtain an approximate estimate of the total economic impact of ORF on the economies of the two states. We model the economic impacts in aggregate, that is, we use the direct spending of visitors and residents, average rolling real expenditures for capital improvements, and direct jobs for operations as inputs to generate estimates of economic impacts on the commonwealth of Virginia.

We present the various measures of total economic impact of ORF in Table 17 and then discuss each in turn. The estimates in Table 17 illustrate the importance of estimating economic impact across a span of several years. These estimates also provide insight into how the various elements of ORF’s contributions come together such that ORF’s recovery and expansion contributions to the overall health of the economy of the region and the state.

Table 17 – Total Economic Impact of ORF on Virginia, 2019 - 2023

	2019	2020	2021	2022	2023
Jobs	15,128	8,294	11,777	14,660	15,972
Earnings (Millions of Dollars)	\$889.0	\$576.0	\$710.9	\$866.1	\$947.5
GDP (Millions of Dollars)	\$1,245.2	\$738.3	\$981.1	\$1,209.0	\$1,319.5
Output (Millions of Dollars)	\$1,990.2	\$1,160.0	\$1,563.9	\$1,931.9	\$2,107.7

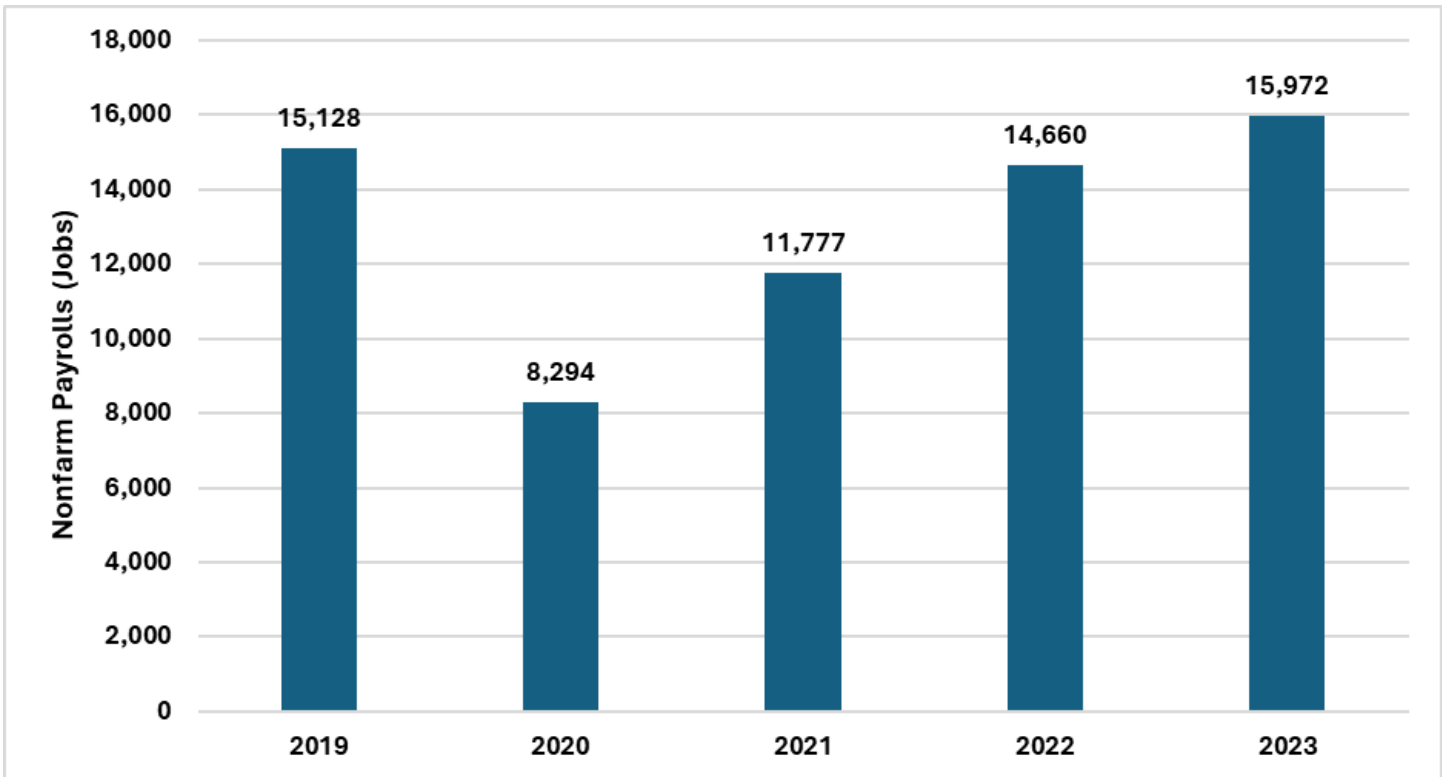
Notes: Dollar values expressed in 2023 dollars. Total economic impact includes estimates of direct, indirect, and induced economic impact at ORF.



Figure 16 illustrates the total economic impact of ORF on nonfarm payrolls (jobs) in Virginia from 2019 to 2023. In 2019, the presence of ORF contributed more than 15,000 jobs to the Virginia economy. In 2020, declines in passenger traffic and employment at the airport reduced the contribution of jobs due to ORF by 45.2%. In 2021, the contribution of jobs due to ORF increased by 42.0% and another 24.5% in 2022. In 2023, the presence of ORF increased nonfarm payrolls across the Commonwealth by 15,972, an increase of 5.6% from 2019 and a signal of the recovery of ORF from the pandemic related shock of 2020. The number of jobs associated with the presence of ORF illustrates how the airport is a ‘job generator’ by attracting visitors to the state.



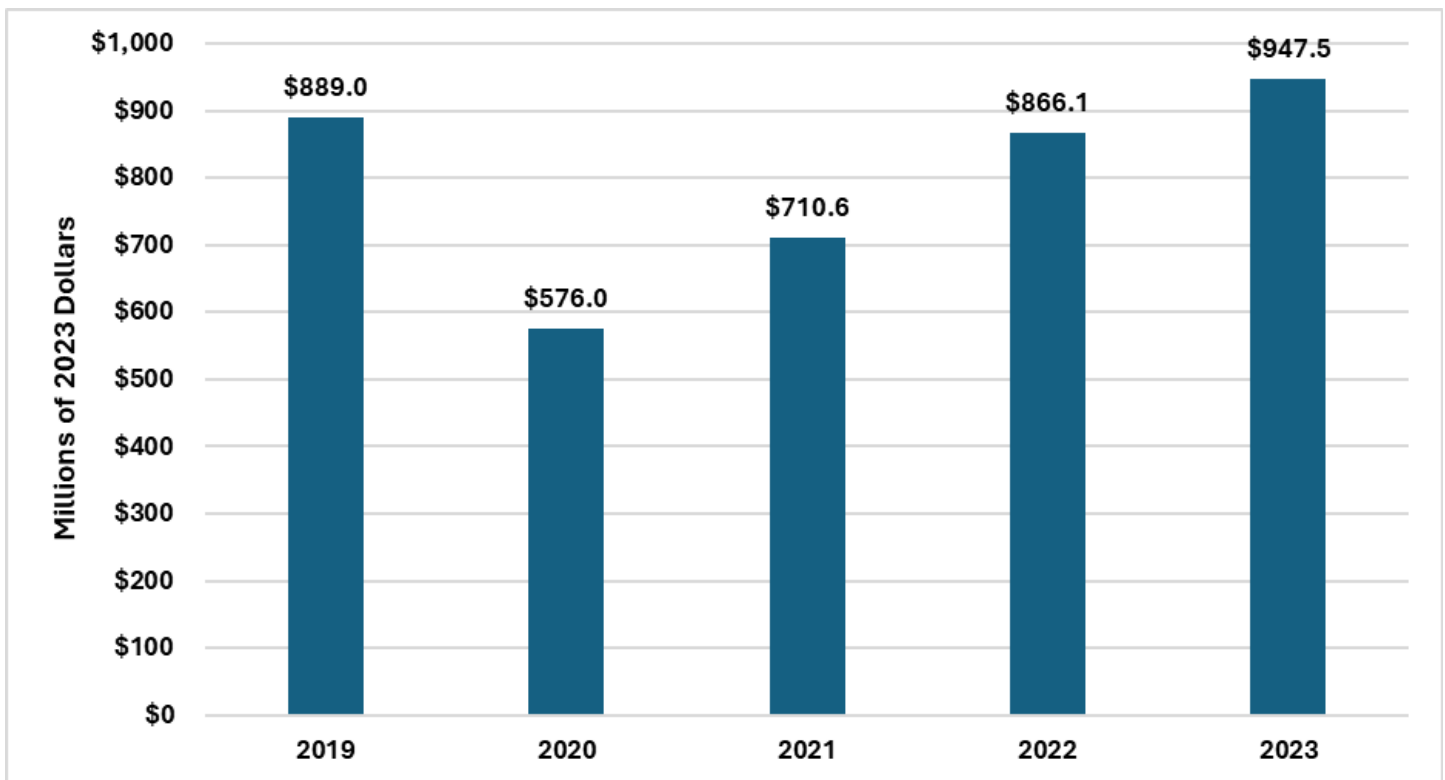
Figure 16 – Economic Impact of ORF on Virginia Nonfarm Payrolls, 2019 - 2023



Source: Authors estimates (various years).

In Figure 17, we focus on the contributions of ORF to employee compensation across the Commonwealth. It should be no surprise that employee compensation follows the same pattern as nonfarm payrolls. In 2019, employee compensation was \$889.0 million before declining to \$576.0 million in 2020. Employment compensation then rose as passenger traffic and other spending recovered at ORF. In 2023, employee compensation reached \$947.5 million, almost \$60 million higher than 2019.

Figure 17 – Economic Impact of ORF on Virginia’s Employee Earnings, 2019 - 2023

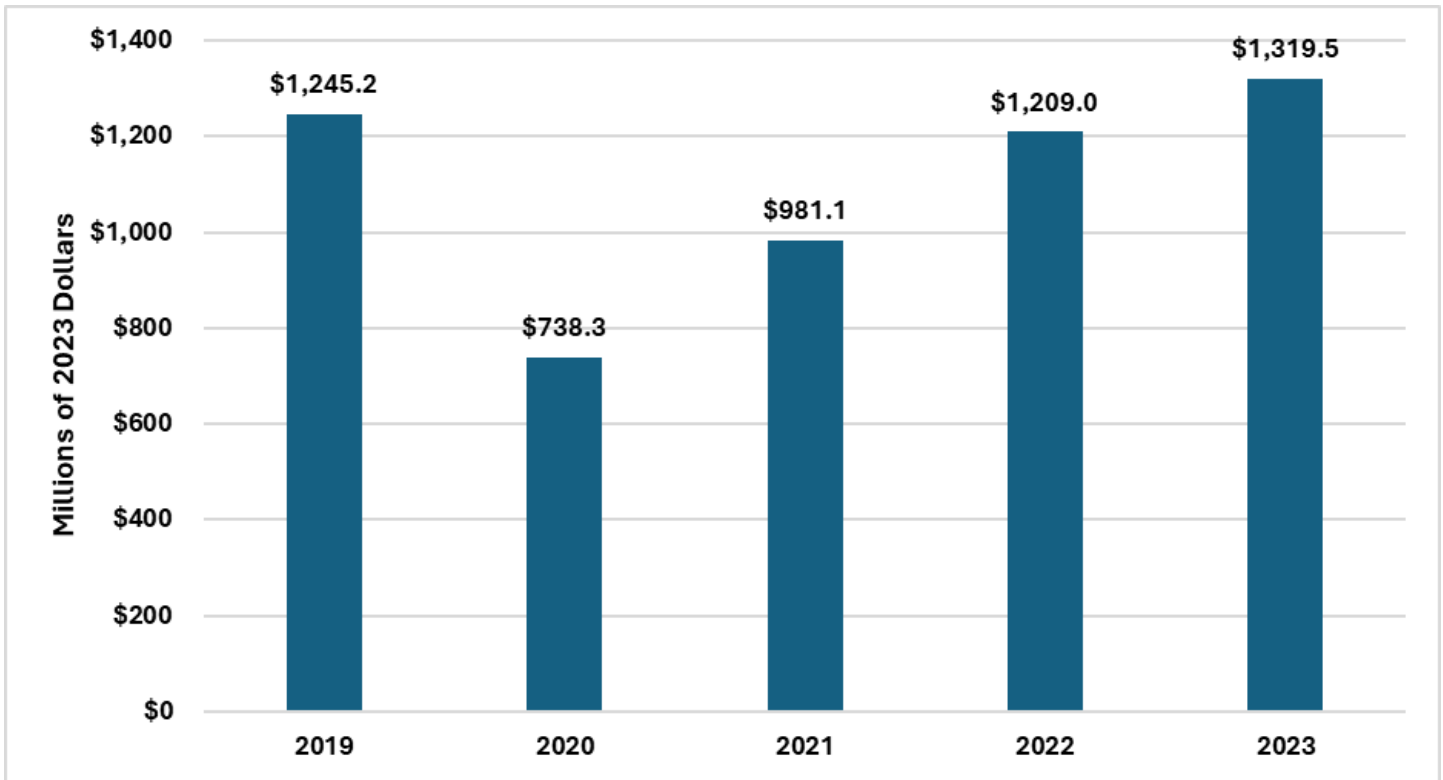


Source: Authors estimates (various years).

In Figure 18, we focus on the contributions of ORF to Virginia’s GDP. We note for the reader that GDP includes employee compensation and GDP is a part of industry output. GDP, however, is a measure of the final value added for goods and services produced in the Virginia economy and represents a measure of the overall increase in economy activity associated with the presence of ORF. If one is interested in knowing the contribution of ORF to the economy of Virginia, GDP would be the preferred measure. If one is inquiring about the impact of ORF on industry activity, industry output would be a useful measure.

Prior to the onset of the COVID-19 pandemic in 2019, the economic impact of ORF on Virginia’s real GDP was approximately \$1,245.2 million. As with employment, this contribution declined in 2020 to \$738.3 million before increasing to \$981.1 million in 2021. In 2022, the economic impact of ORF was nearly that of 2019. In 2023, we estimate the economic impact of ORF on Virginia’s real GDP was \$1,319.5 million.

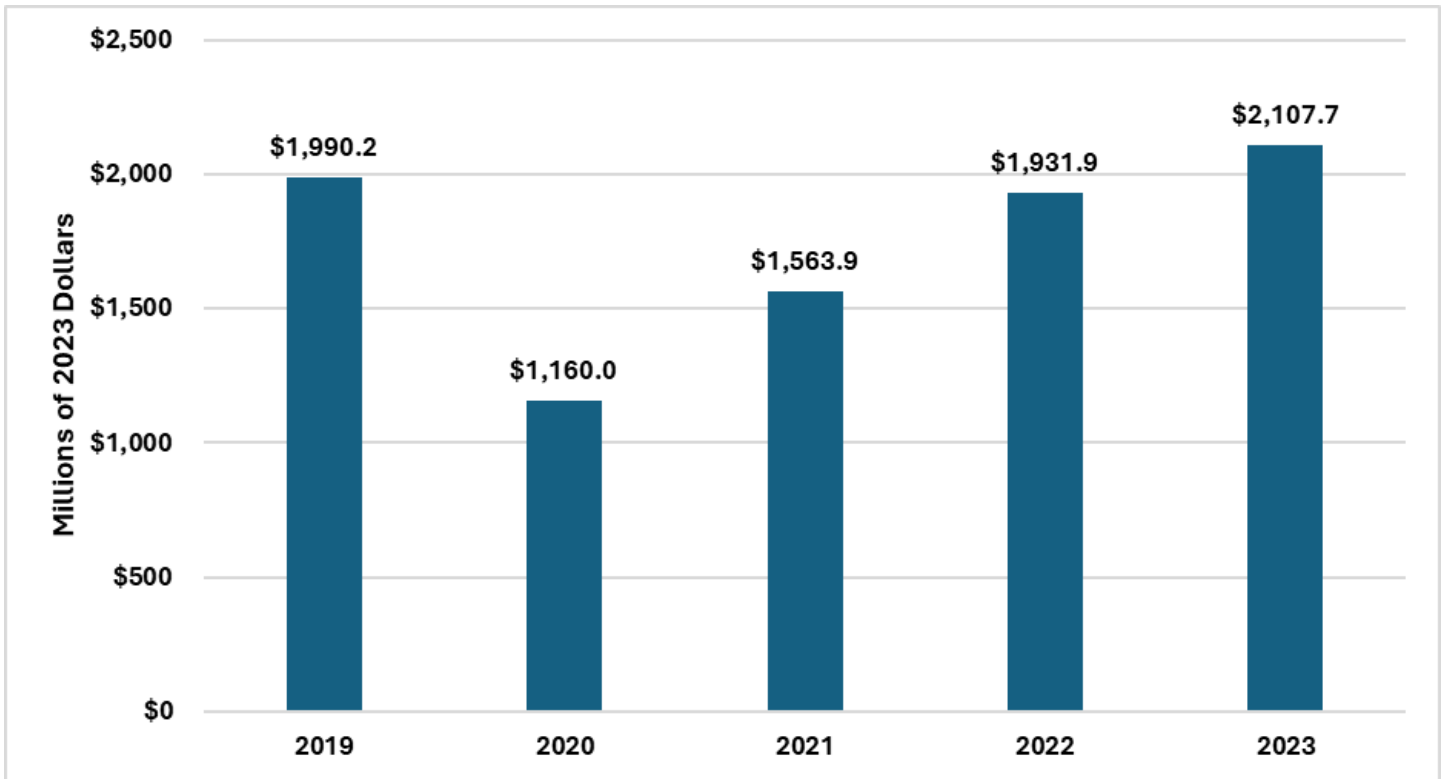
Figure 18 – Economic Impact of ORF on Virginia’s Real GDP, 2019 - 2023



Source: Authors estimates (various years).

In Figure 19, we highlight the contributions of ORF to industry output in the Commonwealth. As with real GDP, real GDP declined from 2019 (\$1,990.2 million) to 2020 (\$1,160 million) and then recovered in 2021 (\$1,563.9 million) and 2022 (\$1,931.9 million). In 2023, ORF’s contribution to industry output across Virginia exceeded \$2 billion, reaching \$2,107.7 million.

Figure 19 – Economic Impact of ORF on Virginia’s Industry Output, 2019 - 2023



Source: Authors estimates (various years).

In Table 18, we present the tax-related impacts of ORF based on spending and employment activity in the Commonwealth of Virginia. Table 19 illustrates a now familiar story of the impact of the COVID-19 pandemic. In 2019, total estimated tax revenues associated with ORF was \$351.0 million in 2023 dollars. The total tax impact fell to \$204.5million in 2020 and recovered in 2021 and 2022. In 2023, the total tax impact of ORF was approximately \$370.6 million, an increase relative to the total tax impact of 2019.

Table 18 – Estimated Tax Impacts of ORF, 2019 - 2023

	2019	2020	2021	2022	2023
Local (Millions of Dollars)	\$70.4	\$34.8	\$54.0	\$67.9	\$73.8
State (Millions of Dollars)	\$76.3	\$41.6	\$59.3	\$73.8	\$80.4
Federal (Millions of Dollars)	\$203.4	\$120.1	\$161.9	\$198.0	\$216.4
Total (Millions of Dollars)	\$350.1	\$204.5	\$275.2	\$339.7	\$370.6

Notes: Dollar values expressed in 2023 dollars. Total tax impact includes estimates of direct, indirect, and induced economic impact at ORF. Sum may not equal total due to rounding.

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Appendix - Previous Studies of Economic Impact

The NAA commissioned a study of the economic impact of ORF in 2020 and engaged InterVISTAS Consulting Inc. for the conduct of the study. InterVISTAS Consulting Inc. had also completed an economic impact study of the Virginia Airport System in 2017 for the Virginia Department of Aviation. Table 19 provides the economic impact estimates for airport operations, capital improvements, and visitor spending and the aggregated total economic impact. In total, the estimated economic impact on the Commonwealth in 2019 was 17,320 jobs, \$775.0 million in compensation, \$1.3 billion dollars in GDP, and \$2.2 billion in economic output.

The 2020 study estimated that ongoing airport operations in 2019 created 3,180 direct jobs and approximately \$227.0 million in direct compensation. These jobs and wages created indirect impacts (created by direct employment) and induced impacts (created by spending of wages and earnings) throughout the Commonwealth of Virginia. For 2019, the total economic impact associated with ongoing operations was 5,910 jobs and \$383.0 million in total wages. Airport operations increased state GDP by \$683.0 million dollars while economic output rose by \$1.14 billion dollars. Capital improvements associated with ORF during the period of study created approximately 290 jobs in 2019. Earnings increased by about \$17.0 million. Capital improvements at ORF increased state GDP and economic output by \$17.0 million and \$33.0 million, respectively.

The largest economic impacts in the 2020 study were associated with visitor spending. Approximately 44% of enplanements in 2019 at ORF were classified as visitors. General aviation visitors were a very small percentage of overall enplanements. An estimated 872,000 visitors arrived at ORF in 2019 on commercial flights, with another 37,000 on general aviation flights. InterVISTAS' s 2020 study estimated that visitor-related spending generated significantly larger impacts on the Commonwealth than ongoing operations or capital improvements. Visitor-related spending generated about 11,120 total jobs with \$376.0 million in compensation. Virginia's GDP and economic output rose by \$603.0 million and \$1.0 billion, respectively, in 2019 dollars.

We note that the 2020 InterVISTAS study and this study are not directly comparable due to differences in assumptions, differences in IMPLAN models used in 2020 and in 2024, estimates for the number of employees, and the treatment of visitors traveling through ORF to stay in North Carolina. If contractors were included in the estimates of employment at ORF in the 2020 study, for example, the economic impact estimates would have overestimated the economic impact of airport operations. We, unfortunately, do not have clear insight into the employment and modeling assumptions, and present these estimates for information only rather than for direct comparison with our 2019 economic impact estimates.

**Table 19 – Previous Estimates of Economic Impact for ORF, 2019
InterVISTAS Consulting Study**

	Airport Operations	Capital Improvements	Visitor Spending	Total Impact
Jobs	5,910	290	11,120	17,320
Earnings (Millions of Dollars)	\$383	\$17	\$376	\$776
GDP (Millions of Dollars)	\$683	\$17	\$603	\$1,303
Output (Millions of Dollars)	\$1,143	\$33	\$1,026	\$2,202

Source: InterVISTAS Consulting (2020). *2019 Economic Impact Study: Norfolk International Airport*. Dollar values expressed in 2019 dollars. Economic impacts include estimates of direct, indirect, and induced economic impact. Totals may not sum due to rounding. The 2020 report is available at: <https://www.norfolkairport.com/about-us/economic-impact/>