FINAL REPORT

2019 ECONOMIC IMPACT STUDY

Norfolk International Airport (ORF)

PREPARED FOR

NORFOLK AIRPORT AUTHORITY

PREPARED BY

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a company of Royal HaskoningDHV

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Contents

Executive Summary

The Norfolk Airport Authority (NAA) engaged Inter*VISTAS* Consulting Inc. (Inter*VISTAS*) to conduct an economic impact study to account for the operations of Norfolk International Airport (ORF) during the calendar year 2019. This study serves as an update to a prior economic impact analysis of operations in 2016 (the 2016 Study) and provides a snapshot of the airport's economic contribution to the Commonwealth of Virginia in 2019. Since that earlier report was issued, passenger traffic at the airport rose by 776,000 (+24 percent). The airport has nonstop service to 11 more markets than it had in 2016, and two carriers – Allegiant and Frontier Airlines – launched new operations at ORF.

Airports play a critical role within the economy by facilitating the movement of people, goods, and services throughout the nation and world. The industry facilitates employment and economic development in the broader economy through a number of key mechanisms including tourism, investment, trade of goods and services, and productivity. ORF has experienced considerable growth in commercial passenger traffic and operations over the past few years, making it a major economic generator for the surrounding Virginia Beach-Norfolk-Newport News Metropolitan Statistical Area (MSA) and Virginia as a whole.

Economic impact is a measure of the spending and employment associated with a sector of the economy, a specific project, or a change in government policy or regulation. This analysis focuses on the economic contributions from ongoing activities at Norfolk International Airport, as well as tourism facilitated by the airport. The three major components of economic impact are classified as *direct, indirect, and induced impacts*.[1] Together, they provide a snapshot of how the business of the airport supports the local and statewide economy.

ORF's impact in the MSA is reflected first and foremost in the 3,180 direct jobs associated with ongoing airport operations and the $227 million in direct wages paid for these jobs. Direct employment located at the airport has grown 14 percent since 2016, driven by substantial growth in commercial air service and passenger traffic. Including indirect and induced impacts, ORF's ongoing operations generated a total of 5,910 jobs and $383 million in total wages within the Commonwealth of Virginia in 2019.

In addition to regular ongoing operations, capital improvement programs at airports support further significant economic impacts. Over the past several years, ORF has spent an average of $16 million annually on capital improvements, supporting an additional 200 direct jobs paying $12 million in direct wages. Including indirect and induced impacts, ORF's capital improvement programs supported a total of 290 jobs and $17 million in total wages throughout the Commonwealth of Virginia in 2019.

Beyond the economic effects associated with the airport's operations and capital improvements, ORF facilitates additional impacts from tourism by visitors to the region who arrive and depart via the airport rather than by other means (e.g., automobile). The hospitality industry in particular benefits from visitors who spend money on lodging, meals, entertainment, car rentals, and retail. Direct employment associated

[1] Direct impacts account for the economic activity of the airport itself. Indirect impacts are those that result because of the direct impacts and involve employment in upstream industries (suppliers) that depend upon activities at ORF. Induced employment is generated from the spending of wages and earnings by individuals employed directly or indirectly by the airport.

with these industries thanks to spending by air visitors via ORF accounts for an additional 8,460 direct jobs and $228 million in direct wages paid. Including indirect and induced impacts, spending by these visitors supported a total of 11,120 jobs and $376 million in total wages throughout the Commonwealth of Virginia in 2019.

In total, the consolidated economic impact of ORF in 2019 exceeded 17,300 jobs that paid about $775 million in earnings, with GDP in excess of $1.3 billion and total economic output of $2.2 billion. This represents an increase over the 2016 results of 2,400 jobs (16 percent), $140 million in wages (21 percent), $270 million in GDP (26 percent), and $280 million in economic output (15 percent).

Background: Overview of Economic Impact

Economic impact is a measure of the spending and employment associated with a sector of the economy, a specific project, or a change in government policy or regulation. This study seeks to measure the economic impact associated with the airport.

Economic impact can be measured along several dimensions. The most common include:

- ***Employment*** – the total number of jobs or employees engaged at a firm or organization.
- ***Earnings*** – the wages, salaries, and benefits associated with employment tied to the airport.
- ***Gross Domestic Product (GDP).*** Sometimes referred to as Value Added, this is a measure of the money value of final goods and services produced as a result of economic activity. This measure is net of the value of intermediate goods and services used up to produce the final goods and services.
- ***Economic output*** - the dollar value of industrial output produced. Sometimes referred to as "economic activity," it reflects the spending (e.g., capital improvement plus revenue) by firms, organizations, and individuals. In the case of organizations that do not generate revenue (e.g., government-provided air traffic control services), annual operating expenses are counted.

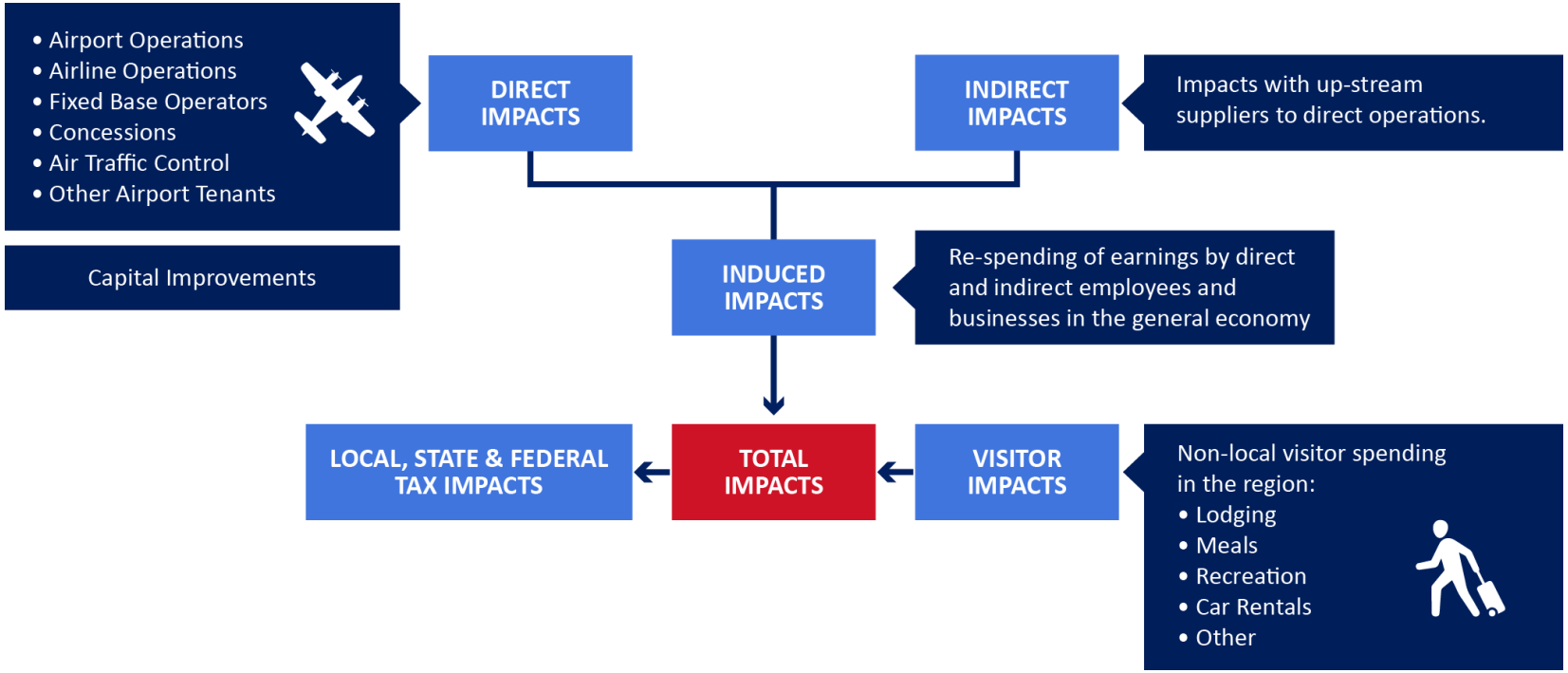
The three major components of economic impact are classified as direct, indirect, and induced impacts. These classifications are used as a base for the estimation of total economic impact of Norfolk International Airport. *Direct* economic impact measures the economic impact directly associated with the aviation sector. This includes, for instance, the employment of all tenants located at ORF. *Indirect* and *induced* impacts are measured as multiplier impacts in the wider economy stimulated by the airport's activities (e.g., other businesses that supply goods and services to the airport and spending by airport employees).[2]

In addition, this study separately estimates *visitor spending* impacts which capture the direct, indirect, and induced economic impacts associated with spending by visitors to the region who arrive and depart via the airport rather than by other means (e.g., auto).

Total impacts are calculated by adding together the *direct, indirect,* and *induced*, and *visitor spending* impacts.

[2] Multiplier impacts must be interpreted with caution since they may be illusory when the economy experiences high employment and output near industry capacity.

Figure E-1: Economic Impact - What Gets Counted



Note: Capital improvement and visitor spending activities have separate direct, indirect, and induced impacts that are not separately shown on this summary illustration.

Economic Impact of the Airport's Ongoing Operations

The economic impact of Norfolk International Airport's regular operations extends from the airport property itself throughout the entire MSA and the Commonwealth of Virginia as a whole. At commercial service airports, every arrival of a commercial flight generates employment hours for individuals with jobs involved in handling passengers, their baggage, cargo, and the aircraft. This employment includes customer service, airline crew, ground handling, air traffic control, security, cleaning, maintenance functions, and more. In 2019, nearly 4 million passengers – an historic high – moved through ORF. In addition, general aviation (GA) flights are supported by employees of other airport businesses, which may manage fueling, repairs, or other services.[3] According to data from the Federal Aviation Administration (FAA), ORF handled over 16,000 GA flights in 2019.[4]

Regular ongoing ORF operations directly accounted for 3,180 jobs earning $227 million in direct wages and generating $426 million in GDP and $696 million in economic output. Including multiplier effects (indirect and induced impacts), ongoing airport operations supported a total of 5,900 jobs and $383 million in wages throughout the Commonwealth of Virginia, with a contribution of $683 million in total GDP and over $1.1 billion in total economic output for the state, as shown in **Figure E-2**: Economic Impacts of ORF Airport Operations ($ Millions).

Figure E-2: Economic Impacts of ORF Airport Operations ($ Millions)

Impact	Jobs	Wages ($ Millions)	GDP ($ Millions)	Output ($ Millions)
Direct	3,180	$227	$426	$696
Indirect	1,320	$86	$124	$224
Induced	1,410	$70	$133	$223
Total	***5,910***	***$383***	***$683***	***$1,143***

Note: Dollar figures expressed in 2019 dollars. Totals may not sum due to rounding.

Economic Impact of Capital Improvements

In addition to regular operations, capital improvement programs at airports generate and sustain significant economic impacts. The economic effects of capital expenditures are considered separate from an airport's ongoing operations because capital spending can vary significantly over time and on a

[3] At commercial service airports like ORF, GA operations are typically managed by private companies called "fixed base operators" (FBOs). An FBO is a business authorized by the airport sponsor to operate on an airport and provide aeronautical services such as fueling, hangaring, tie-down and parking, aircraft rental, aircraft maintenance, flight instruction, etc. FBOs serve functions similar to terminals for commercial airline passengers.
[4] Data from the FAA's Operations Network system.

project-by-project basis. In 2019, the airport had major capital projects underway including a multi-year runway rehabilitation effort and the first phase of replacement of the passenger loading bridges.

As shown in **Figure E-3**: Economic Impact of ORF Capital Improvements ($ Millions), the average annual capital expenditure at ORF in recent years supported an additional 200 direct jobs that generated $12 million in direct earnings as well as $7 million in direct GDP and $16 million in direct economic output. Including multiplier effects, the overall economic impact of these projects amounts to a total of 290 jobs earning $17 million in wages, with a total contribution of $17 million in GDP and $33 million in economic output throughout the Commonwealth of Virginia.

Figure E-3: Economic Impact of ORF Capital Improvements ($ Millions)

Impact	Jobs	Wages ($ Millions)	GDP ($ Millions)	Output ($ Millions)
Direct	200	$12	$7	$16
Indirect	30	$2	$4	$7
Induced	60	$3	$6	$10
Total	***290***	***$17***	***$17***	***$33***

Note: Dollar figures expressed in 2019 dollars. Totals may not sum due to rounding.

Economic Impact of Airport-Related Visitor Spending

Individuals who visit the region via ORF support additional economic impacts by spending their travel dollars locally. Spending on hotels, restaurants, retail, and entertainment supports jobs and additional economic activity in the region.

Total visitor traffic that arrived via ORF was estimated at over 900,000 visitors in 2019, spending an estimated total of more than $620 million during their stay in Virginia. As summarized in **Figure E-4**: Economic Impact of Air Visitor Spending via ORF, 2019 ($ Millions), visitor spending associated with traffic flying in via ORF in 2019 supported 8,460 direct jobs that paid $228 million in wages and generated $348 million in direct GDP and $583 million in direct output. Including the indirect and induced impacts, visitor spending by ORF's air traffic supported a total of 11,120 jobs paying $376 million, along with $603 million in total GDP and $1,026 million in total output throughout the Commonwealth of Virginia.

Figure E-4: Economic Impact of Air Visitor Spending via ORF, 2019 ($ Millions)




Impact	Jobs	Wages ($ Millions)	GDP ($ Millions)	Output ($ Millions)
Direct	8,460	$228	$348	$583
Indirect	1,260	$80	$125	$224
Induced	1,400	$68	$131	$219
Total	***11,120***	***$376***	***$603***	***$1,026***

Note: Dollar figures expressed in 2019 dollars. Totals may not sum due to rounding.

ORF's Total Economic Impact on the Commonwealth of Virginia

The sum of the impacts of the airport's ongoing operations, capital improvements, and visitor spending constitute ORF's total economic impact on the Commonwealth of Virginia. As shown in **Figure E-5:** Total Economic Impact of ORF on the Commonwealth of Virginia ($ Millions), the consolidated economic impact of ORF, including multiplier impacts, surpassed 17,000 total jobs with wages of $775 million, along with a GDP contribution of $1.3 billion and $2.2 billion in economic output throughout the Commonwealth of Virginia.

Figure E-5: Total Economic Impact of ORF on the Commonwealth of Virginia ($ Millions)




Impact	Jobs	Wages ($ Millions)	GDP ($ Millions)	Output ($ Millions)
Direct	11,840	$467	$780	$1,295
Indirect	2,610	$168	$253	$456
Induced	2,870	$141	$269	$452
Total	***17,320***	***$775***	***$1,303***	***$2,203***

Note: Dollar figures expressed in 2019 dollars. Totals may not sum due to rounding.

Annual Tax Impacts

The economic footprint of ORF also includes contributions to government revenue at the federal, state, and local levels. Taxes associated with the total economic impacts across ongoing airport operations,

airport capital improvements, and visitor spending, are estimated at over $300 million per year. Roughly half of that amount supports the Commonwealth's and local government.

Figure E-6: Summary of Tax Impacts ($ in Thousands)

	Impact	Federal	State	Local	Total
Airport Operations	Direct	$47,330	$22,440	$37,500	$107,280
	Indirect	$16,510	$4,770	$5,920	$27,190
	Induced	$14,040	$5,240	$7,860	$27,130
	Subtotal	**$77,880**	**$32,450**	**$51,280**	**$161,610**
Capital Improvements	Direct	$2,100	$330	$70	$2,510
	Indirect	$460	$160	$230	$850
	Induced	$630	$240	$350	$1,220
	Subtotal	**$3,190**	**$730**	**$660**	**$4,580**
Visitor Spending	Direct	$45,300	$16,950	$25,060	$87,310
	Indirect	$15,700	$4,530	$5,660	$25,890
	Induced	$13,900	$5,190	$7,780	$26,860
	Subtotal	**$74,910**	**$26,660**	**$38,500**	**$140,070**
Total	Direct	$94,740	$39,730	$62,630	$197,100
	Indirect	$32,670	$9,450	$11,820	$53,940
	Induced	$28,570	$10,660	$15,990	$55,220
	Total	**$155,980**	**$59,840**	**$90,440**	**$306,260**

Note: Figures shown are rounded to the nearest ten thousand. Figures may not sum to totals due to rounding.

Comparison of 2019 vs. 2016 Results

Between 2016 and 2019, the economic impacts directly associated with ORF (including ongoing operations, capital improvements, and visitor spending) increased by nearly 2,000 direct jobs. Direct wages rose by nearly $100 million. Direct GDP rose by more than $200 and direct economic output increased by $185 million. Including multiplier (indirect and induced) impacts, the total economic impacts associated with ORF increased by nearly 2,400 total jobs, paying almost an additional $140 million in earnings and creating an additional $270 million in GDP and $280 million in output.

Figure E-7: Comparison of 2016 vs. 2019 Economic Impacts (Constant 2019 Dollars) below summarizes the estimated changes in direct and total (including multiplier impacts)[5] economic impacts related to ORF between 2016 and 2019. Dollar values from the 2016 Study have been converted to constant 2019 dollars for more relevant comparison.[6] Figures in both years have been rounded.

[5] Multiplier impacts are modelled estimates only. Further, the 2016 Study and current study used different versions of the IMPLAN Model which reflect changes that may not be comparable over time. As such, comparison of multiplier impacts (indirect and induced) should be regarded with caution.
[6] Inflators based on U.S. Bureau of Labor Statistics data.

Figure E-7: Comparison of 2016 vs. 2019 Economic Impacts (Constant 2019 Dollars)




Category	Impact	Jobs			Wages ($ Millions)			GDP ($ Millions)			Output ($ Millions)		
		2016	2019	Change	2016	2019	Change	2016	2019	Change	2016	2019	Change
Airport Operations	Direct	2,780	3,180	14%	$198	$227	15%	$314	$426	36%	$627	$696	11%
	Total	5,520	5,910	7%	$347	$383	10%	$563	$683	21%	$1,064	$1,143	7%
Capital Improvements	Direct	120	200	67%	$6	$12	100%	$9	$7	-22%	$17	$16	-6%
	Total	180	290	61%	$10	$17	70%	$14	$17	21%	$27	$33	22%
Visitor Spending	Direct	6,980	8,460	21%	$164	$228	39%	$251	$348	39%	$466	$583	25%
	Total	9,230	11,120	20%	$283	$376	33%	$456	$603	32%	$827	$1,026	24%
Total	**Direct**	**9,880**	**11,840**	**20%**	**$368**	**$467**	**27%**	**$574**	**$781**	**36%**	**$1,110**	**$1,295**	**17%**
	Total	**14,930**	**17,320**	**16%**	**$640**	**$776**	**21%**	**$1,033**	**$1,303**	**26%**	**$1,918**	**$2,202**	**15%**

1 Introduction

The Norfolk Airport Authority (NAA) engaged Inter*VISTAS* Consulting Inc. (Inter*VISTAS*) to conduct an economic impact study to account for the operations of Norfolk International Airport (ORF) during the calendar year 2019. This study serves as an update to a prior economic impact analysis of operations in 2016 (the 2016 Study) and provides a snapshot of the airport's economic contribution to the Commonwealth of Virginia in 2019.

Airports play a critical role within the economy by facilitating the movement of people, goods, and services throughout the nation and world. The industry facilitates employment and economic development in the broader economy through a number of key mechanisms including tourism, investment, trade of goods and services, and productivity. ORF in particular has experienced considerable growth in commercial passenger traffic and operations over the past few years, making it a robust economic generator for southeastern Virginia and the Commonwealth as a whole.

1.1 The Virginia Beach-Norfolk-Newport News Region

One of the major coastal areas in the United States, the region anchored by Norfolk is known for its expanse of Atlantic oceanfront, serving a variety of both recreational and industrial uses. Centrally located in this region includes the waterfront city of Norfolk, home to a sizeable maritime shipping sector as well as the Naval Station Norfolk, the largest concentration of U.S. Navy forces and the largest naval installation in the world.[7]

Norfolk is a central part of the broader Virginia Beach-Norfolk-Newport News Metropolitan Statistical Area (MSA) encompassing a population of over 1.7 million, total employment of over 1 million, and an annual GDP of $100 billion, which has grown 3 percent per annum over the past 5 years.[8] In addition to national defense, shipbuilding and general port operations form a large part of the overall area's economic contributions, while tourism is primarily centered around Virginia Beach and colonial Williamsburg. Per capita personal income for the area is currently $50,600 compared to $57,910 for Virginia as a whole.[9]

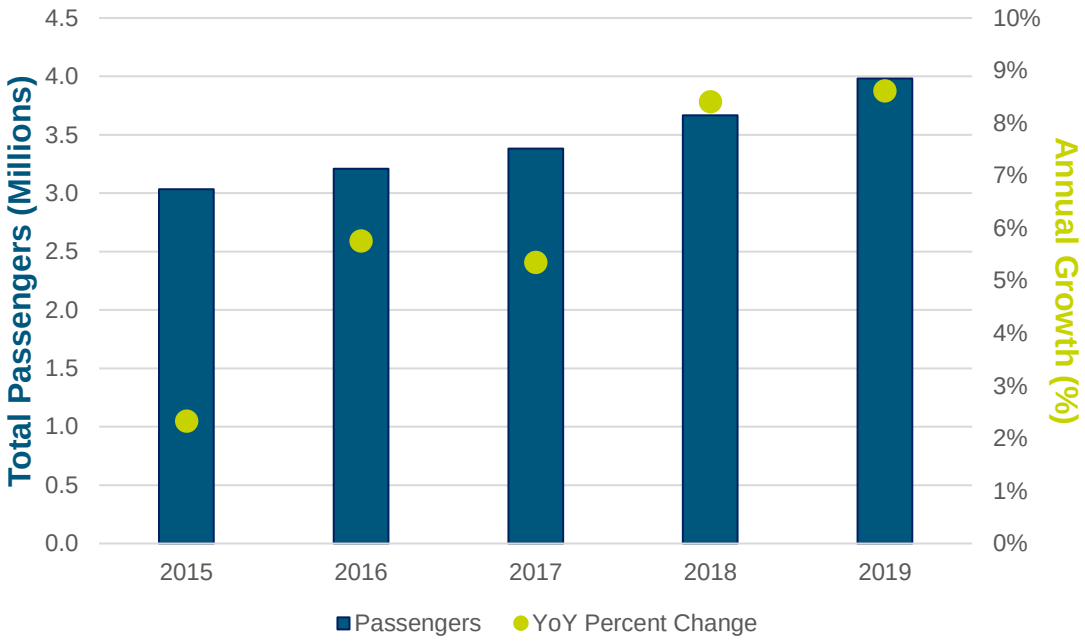
1.2 Norfolk International Airport

Norfolk International Airport is a primary commercial service airport located northeast of Norfolk's central business district. The airport is owned, operated, and sponsored by the Norfolk Airport Authority. It serves Coastal Virginia and Northeast North Carolina.

Commercial air service and passenger traffic at ORF has grown substantially in recent years. Enplaned/deplaned passengers increased by a total of 24 percent between 2016 and 2019, reaching an historic peak of nearly 4 million passengers in 2019, as illustrated in **Figure 1-1** below.

[7] Source: Commonwealth of Virginia website (virginia.gov).
[8] Source: U.S. Bureau of Economic Analysis (BEA), 2018. Data for the MSA for 2019 was not available at the time of this report.
[9] Ibid.

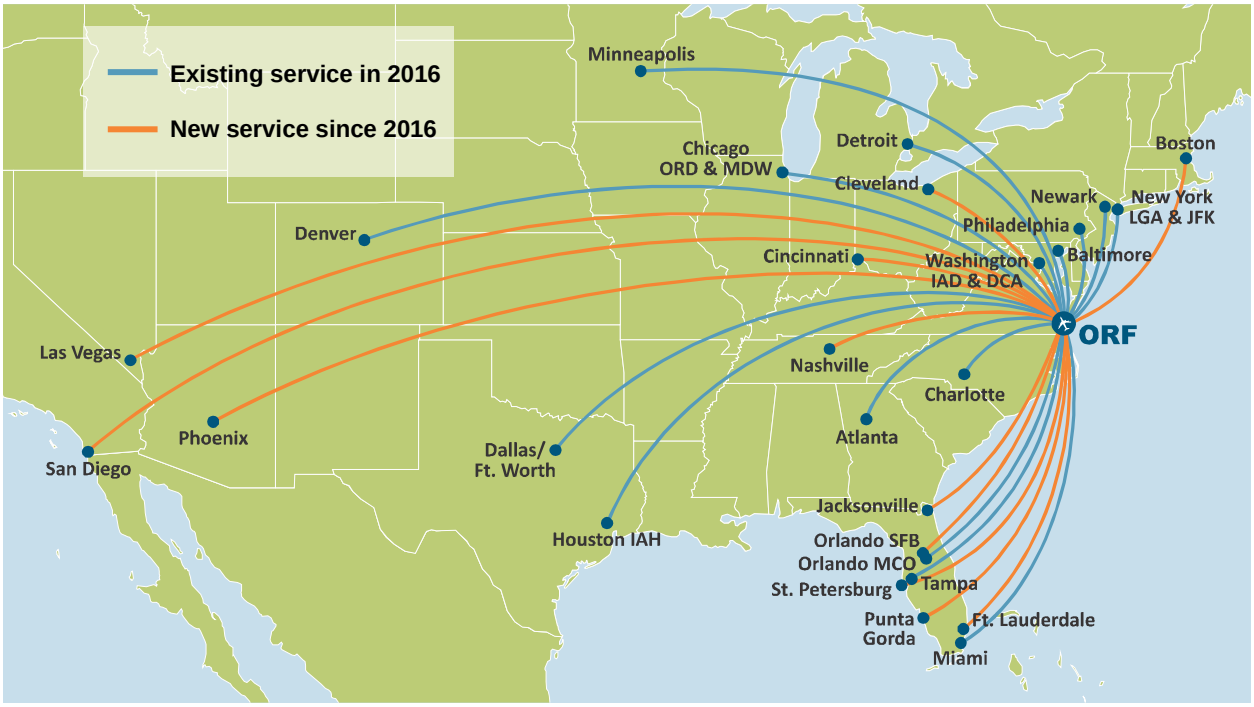
Figure 1-1: Total Enplaned/Deplaned Passengers at ORF, 2015-2019



Source: Norfolk Airport Authority.

Figure 1-2: and **Figure 1-3**: below compare the growth in scheduled air service and capacity between 2016 and 2019. In 2019, the airport supported daily departures from American Airlines, Delta Air Lines, Southwest Airlines, United Airlines, Allegiant Air, Frontier Airlines, and their regional airline partners. This includes nonstop connectivity to 31 airports, with 11 of those routes added in the last three years, primarily due to the entry of Allegiant and Frontier. Market entry by Allegiant and Frontier accounted for 35 percent of the net seat capacity increase during this time. In addition, all incumbent airlines serving ORF notably increased their capacity between 2016 and 2019, except for Southwest which dropped service to Tampa.

Figure 1-2: Nonstop Destinations Served from ORF (2019)



Source: Innovata Schedules, accessed via the Diio-Mi portal.

Figure 1-3: Nonstop Scheduled Departing Seat Capacity by Airline, 2016 vs. 2019

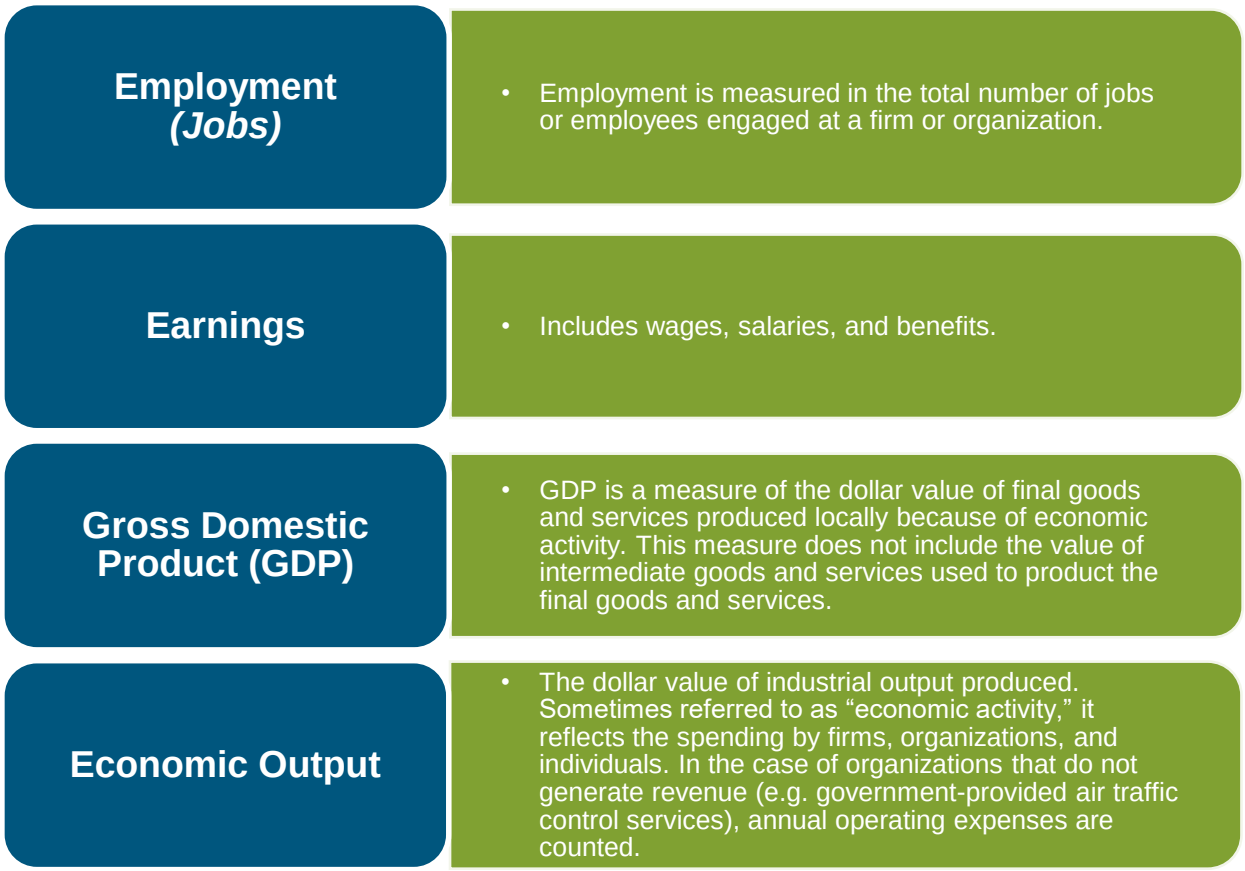
Carrier	Code	2016		2019		Change		% Change	
		Flights	Seats	Flights	Seats	Flights	Seats	Flights	Seats
American Airlines	AA	10,355	699,349	11,024	806,056	669	106,707	6.5%	15.3%
Delta Air Lines	DL	6,254	636,097	7,182	745,971	928	109,874	14.8%	17.3%
United Airlines	UA	4,969	306,937	5,455	418,709	486	111,772	9.8%	36.4%
Southwest Airlines	WN	2,818	419,480	2,566	380,858	(252)	(38,622)	-8.9%	-9.2%
Allegiant Air	G4	0	0	450	77,307	450	77,307		
Frontier Airlines	F9	0	0	425	77,056	425	77,056		
Total		**24,396**	**2,061,863**	**27,102**	**2,505,957**	**2,706**	**444,094**	**11.1%**	**21.5%**

Source: Innovata Schedules, accessed via the Diio-Mi portal.

1.3 Overview of Economic Impact

Economic impact is a measure of the spending and employment associated with a sector of the economy, a specific project, or a change in government policy or regulation. This project focuses on the employment and spending associated with Norfolk International Airport. Economic impact is most commonly measured in several ways including employment, earnings or income, gross domestic product (GDP), and economic output. These measures are defined in **Figure 1-4**.

Figure 1-4: Measures of Economic Impact



The three major components of economic impact are classified as direct, indirect, and induced impacts. These classifications are used as a base for the estimation of total economic impact of Norfolk International Airport. Each of these three components requires different tools of analysis. Employment impact analysis determines the economic impact in terms of jobs created and salaries and wages paid. The direct, indirect, induced, and total employment created at, or facilitated by, the airport is examined to produce a snapshot of the airport's economic footprint.

- ***Direct*** impacts account for the economic activity of the aviation sector itself. Direct employment impacts are measured by counting those individuals who work in this sector of the economy. In the case of an airport, all of those people who work in an aviation-related capacity either on-site or off-site would be considered direct employment (e.g., airline ticket or gate agents, fixed base operators, maintenance, airport staff members, employees from government agencies such as the Federal Aviation Administration (FAA) and Transportation Security Administration (TSA) for onsite functions related to air traffic control and security, etc.). For ease of labeling, these impacts are sometimes categorized as "airport operations" even if the employment occurs off airport properties.
    - ***Capital Development*.** Some of the direct economic impact of the airport arises from capital improvement at the airport (e.g., a renovated terminal or parking structure). The economic effects of an airport's capital development are considered separately from an airport's

ongoing operations because airports' capital spending tends to vary significantly over time on a project-by-project basis.

- ***Indirect impacts*** are the "upstream" impacts that arise because of the direct impacts. For an airport, indirect impacts originate from off-site firms that serve airport users. Indirect employment includes the portion of employment in supplier industries which are dependent on sales to the air transport sector. An example would be food wholesalers that supply food for catering on flights. Another example would be building suppliers that sell materials used for the construction of capital improvements at the airport.

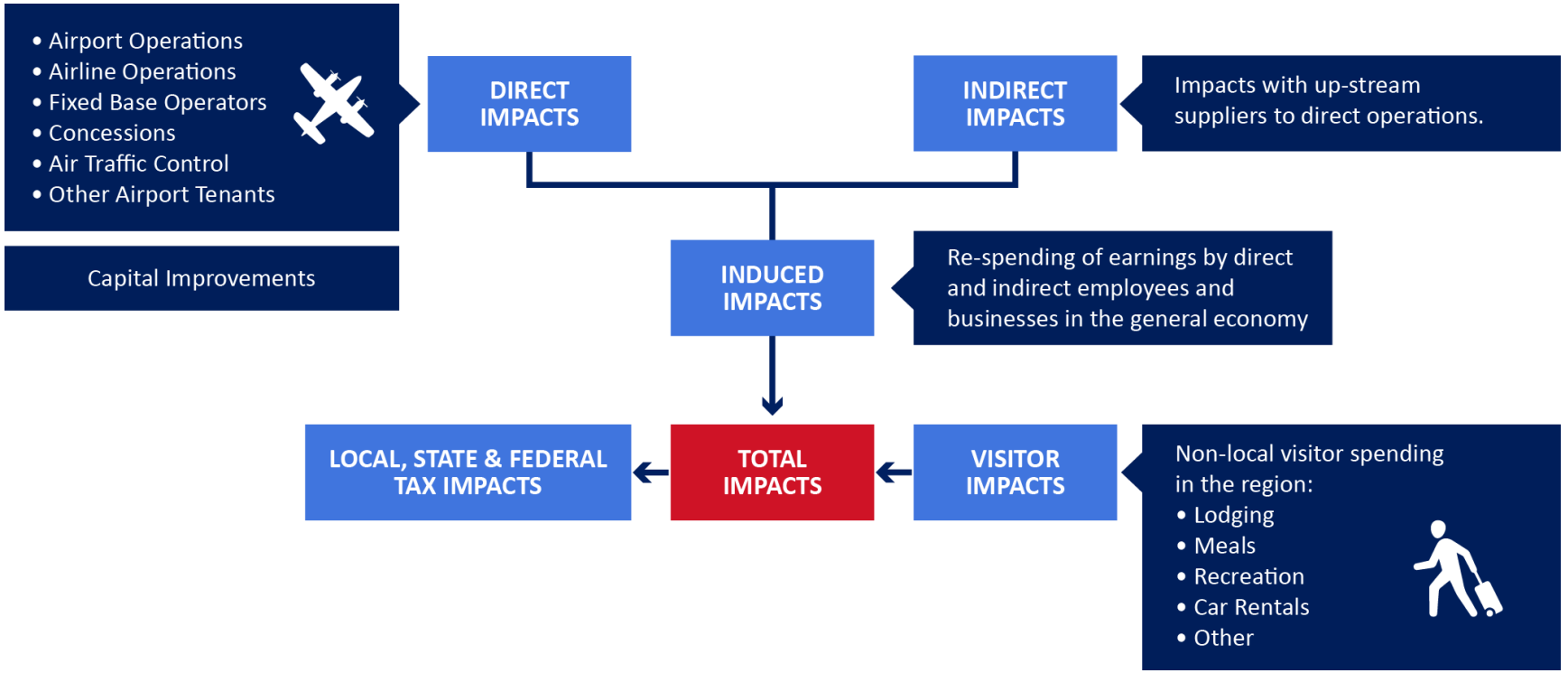
Indirect and induced impacts are sometimes collectively referred to as "multiplier impacts"

- ***Induced impacts*** are economic impacts created by the spending of wages, salaries, and profits earned in the course of the direct and indirect economic activities. Induced employment is employment generated from expenditures by individuals employed indirectly or directly. For instance, if an airline maintenance firm employee decides to re-model his/her home, this would result in additional (induced) employment hours in the general economy. The home renovation project would support hours of induced employment in the construction industry, the construction materials industry, etc.

- **Visitor spending impacts.** Another related economic impact that arises from the airport's operations flows from visitors to a region who arrive and depart via the airport rather than by other means (e.g., auto). The hospitality industry in particular benefits greatly from these visitors, who spend money on lodging, meals, entertainment, car rentals, and retail. The economic impacts associated with visitor spending include a distinct set of direct, indirect, and induced impacts which are separately identified in this report, with careful attention paid to ensure that the economic impacts associated with the hospitality industry do not overlap with the economic impacts of airport operations.

- ***Total impacts*** are the sum of direct, indirect, induced, and visitor spending impacts.

Figure 1-5: Economic Impact - What Gets Counted



Note: Capital improvement and visitor spending activities have separate direct, indirect, and induced impacts that are not separately shown on this summary illustration.

1.4 Study Approach

This section summarizes the methodology used to estimate the economic impact of Norfolk International Airport. The later sections that follow include more detailed discussions of the methods used.

Studies of the economic impact of airports build on data on the total number of employees who work at airports. As part of this study, the project team surveyed ORF's tenants about their employment and operations. The team worked closely with airport management to identify all the public organizations (e.g., the FAA) and private firms (e.g., airlines or FBOs) that have employees working at ORF. The project team surveyed all of those organizations and firms to gather data on total employment and compensation paid to their workforce, with a focus on following up directly with the largest employers at the airport, as well as new tenants that began operations since the 2016 Study. Employment information about non-respondents who did not complete the survey was inferred based on data provided by airport management.

Capital improvement programs at airports can generate and sustain significant economic impacts. While routine maintenance of an airport's assets is a part of ordinary operations, major capital improvement programs are not. Major capital improvements differ fundamentally in scope, scale, cost, and time. The team estimated the impact of spending on capital improvement at ORF based on financial data provided by airport management. Because the annual amount of spending on capital improvement can vary considerably over time, the project team used the average amount of spending for the latest 4-year period as representative of "normal" or average annual spending.

The team relied on a variety of sources of information to estimate the amount and distribution of spending by travelers who visited the region and surrounding area by flying in via ORF. For passengers arriving by commercial service, airport management conducts intercept surveys each year to develop statistically reliable data on passenger behavior, including spending by non-resident visitors. The project team adopted these existing estimates on average spending by commercial visitors in 2019, applied to estimates of total inbound, non-resident visitor traffic developed based on U.S. Department of Transportation (DOT) Origin-Destination (O&D) data, accessed via the Diio-Mi online portal, in conjunction with the airport authority's own statistics on passenger enplanements.

In addition, the project team developed estimates of the amount and type of spending by visitors who arrived at ORF via general aviation (GA), rather than commercial service. Because of the inherent nature of GA travel (i.e., little or no hard data are available on GA operations and travelers, etc.), the number of travelers and amounts that they spend in a location must be estimated through statistical techniques or other modeling efforts. The team estimated the number of visitors who arrived by GA based on data from the FAA on the number of itinerant GA operations at ORF, as well as information collected via interview with staff at the airport's FBO, Signature Flight Support, which serves the airport's GA traffic and provides additional services for non-local GA visitors and flight crew including making arrangements during their stay in the area (e.g. catering, hotel and ground transport bookings, etc.). Using insights from those meetings, the team generated estimates of the number of "true visitors" who arrived at ORF on GA, their average length of stay, and the average spending per visitor.

Estimating Indirect and Induced Impacts with Economic Models

Measurement of indirect and induced economic activity is difficult. While it may be possible to conduct a survey of associated employers, the survey would need to cover thousands of firms in order to completely cover indirect employment. For induced employment, the entire economy would need to be scrutinized. In addition to the time and financial resources needed to conduct such surveys, the quality of responses would be suspect.

The most commonly accepted mechanism for estimating indirect economic impacts is via econometric modeling that relies on national economic data and analyses. These data quantify the linkages between industries and economic sectors – between the sales of one and the purchases of another. The linkages between firms are referred to as "input-output" (I-O) tables, because the output (product) of one firm becomes the input (supply) to another.

The input-output tables are derived from national and regional economic data that quantify the relationships between industrial sectors, including those between supplier industries and final producers. They show the intermediate goods and services used by an industry to produce its output.[10] In other words, for airlines and airports, they document the relationship between the final demand for air service (by passengers or shippers) upon users (airports and airlines) and the suppliers (e.g., aircraft manufacturers, fuel wholesalers). Changes in the level of air services demanded and consumed (e.g., increases or decreases in airline passenger traffic and aircraft arrivals and departures) lead to changes in the amount of inputs (supplies) required. Each industry that produces goods and services generates demands for other goods and services and so on. I-O models thus create "multipliers" used to calculate the indirect effect on jobs, income, and output generated per dollar of spending on various types of goods and services.

The IMPLAN model is an industry-recognized economic model, which is used to identify interrelationships in a regional economy and estimate the impacts of changes on that economy. [11] The IMPLAN model is developed from hundreds of data sources, most notably the Bureau of Economic Analysis's (BEA) Benchmark I-O tables, the Bureau of Labor Statistics (BLS) Quarterly Census of Earnings and Wages, the Census Bureau, and the U.S. Department of Agriculture.[12]

For this study, Inter*VISTAS* applied the IMPLAN model to estimate the multiplier (indirect and induced) impacts, as well as certain *direct* economic impacts which were not explicitly measured by the project team. For instance, the estimates of direct jobs located at the airport, collected via surveys and badge count data, were then used as inputs into the IMPLAN model for the Commonwealth of Virginia in order to estimate the other direct impacts such as GDP and economic output.

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[10] Readers interested in more background on the national input-output tables are encouraged to review U.S. Department of Commerce, Bureau of Economic Analysis, *Concepts and Methods of the U.S. Input-Output Accounts*, Sept. 2006, updated April 2009. https://www.bea.gov/resources/methodologies/concepts-methods-io-accounts

[11] IMPLAN is an economic impact assessment software system. The system traces its roots to the U.S. Forest Service, which needed an analytic tool to better understand the resource outputs of alternative land management strategies. Responsibility for IMPLAN (short for "impact analysis for planning") eventually shifted to the University of Minnesota before it was established as an independent corporation (then known as the Minnesota IMPLAN Group, or MIG) for developing and selling all future iterations of the IMPLAN database and software. The name changed to IMPLAN in 2013.

[12] More specific information on the model's data sources can be found on its website: https://implan.com/wp-content/uploads/IMPLAN-Data-Overview-and-Sources.pdf

The multipliers and ratios used in this study were based on the 2018 dataset by IMPLAN, the most recent currently available. The economic ratios and multipliers have been updated to reflect 2019 price levels, but no structural changes have been assumed. As the indirect impacts of an airport extend beyond an airport's catchment area, IMPLAN's Multi-Regional Input-Output (MRIO) analysis is used to determine the total impacts of ORF within the entire Commonwealth of Virginia.

The economic multipliers applied in this analysis have been updated by IMPLAN since the previous economic impact study conducted in 2016.[13] As a result, the indirect and induced impacts calculated here for 2019 are not directly comparable to the results in prior years.

The multipliers used in the current analysis better represents the structure of the U.S. economy than those used previously, as the national economy has become less integrated domestically and more integrated internationally. As a consequence, indirect and induced job impacts are generally expected to be lower. As the national economy becomes more global, more spending occurs outside of the U.S., leading to lower domestic employment impacts. In addition, the updated (lower) multipliers represent increased productivity in the aviation industry. This is consistent with data on employment in the post global economic downturn era, as worker productivity generally increased.

Note on Rounded Results in this Report

The findings presented in this report are rounded to avoid giving readers a false sense of precision about the results. Readers should remember that the economic and tax impacts presented are estimates generated by models and not the result of an audit or accounting exercise. The intent is not to obscure but to provide maximum reliability without misleading readers as to the overall level of precision.

[13] For instance, the 2018 dataset from IMPLAN (the latest version currently available) was released in late 2019, and this dataset is based largely on the BEA's benchmark input-output tables for 2012. Conversely, the 2016 study referred to an older version of the IMPLAN model derived largely from the 2007 BEA benchmark input-output tables, the most recent available at the time. In addition to updates in BEA benchmark data, IMPLAN's other data sources as well as its methodologies often change from year to year. As such, IMPLAN advises that users should not treat the different versions of the IMPLAN model as a time series.

2 Economic Impact of Ongoing Airport Operations

This section describes the direct, indirect, induced, and total impacts of the regular, ongoing operations of ORF. The impacts of capital development at the airport as well as visitor spending are discussed separately in the subsequent section.

2.1 Direct Impacts of Ongoing Airport Operations

The direct impacts are those attributed to employment located directly on airport property or nearby but directly related to airport or airline operations.

The project team worked closely with airport management to identify all tenant companies and organizations that operate on airport property such as airlines, government agencies (FAA, TSA, CBP, etc.), concessionaires, etc. The project team then sent surveys to key contacts within each of these operations with the objective of gathering data on total employment and payroll. Additional information was collected related to full-time versus part-time employees, permanent versus seasonal jobs, and occupation types to gain a better understanding of the nature of employment at ORF.[14] The survey also solicited information on whether firms contract out certain functions or services to guard against undercounting or double counting employment levels.

To supplement the data obtained via the survey, airport management provided badge count data identifying the number of each tenant's employees with authorization to work on airport property. This data was reconciled with information collected from the tenant surveys. For tenants that declined or did not respond to the project team's request to complete a survey, the badge count data was used to infer employee headcount.

Refer to **Appendix A** for further details on the employment survey and data analysis.

The results of the employment survey and badge count data were compiled by the project team to determine the direct employment of ORF's ongoing operations. Using the direct employment figures from the surveys and badge counts as inputs, the direct wage, GDP, and economic activity impacts were then estimated using the IMPLAN model. Refer to **Section 1.4** for details on the IMPLAN model.

Direct Impacts of Ongoing Airport Operations

Through its regular operations, ORF contributes directly to employment and the economy in the MSA. It also acts as an economic catalyst, facilitating the growth of regional businesses and industrial sectors. Every arrival of a flight at ORF generates employment hours for individuals with jobs involved in handling passengers, their baggage, cargo, and the aircraft. This employment includes customer service, airline crew, ground handling, cleaning, maintenance functions, ground transportation, etc. The direct impacts

[14] All employment figures in the analysis and report are measured in jobs or headcount.

are generated largely within the aviation sector associated with the operating and servicing of air services.

Figure 2-1 summarizes the direct impacts of ongoing operations at ORF in 2019. Altogether, ongoing airport operations directly supported 3,180 jobs that paid $227 million in earnings, providing an average of about $71,500 per job. This compares to the average annual state wage of $57,799 and average national wage of $54,400.

In addition to employment and wages, the airport directly contributes $426 million in direct GDP and $696 million in direct economic output.

Figure 2-1: Direct Impacts of ORF Airport Operations ($ Millions)

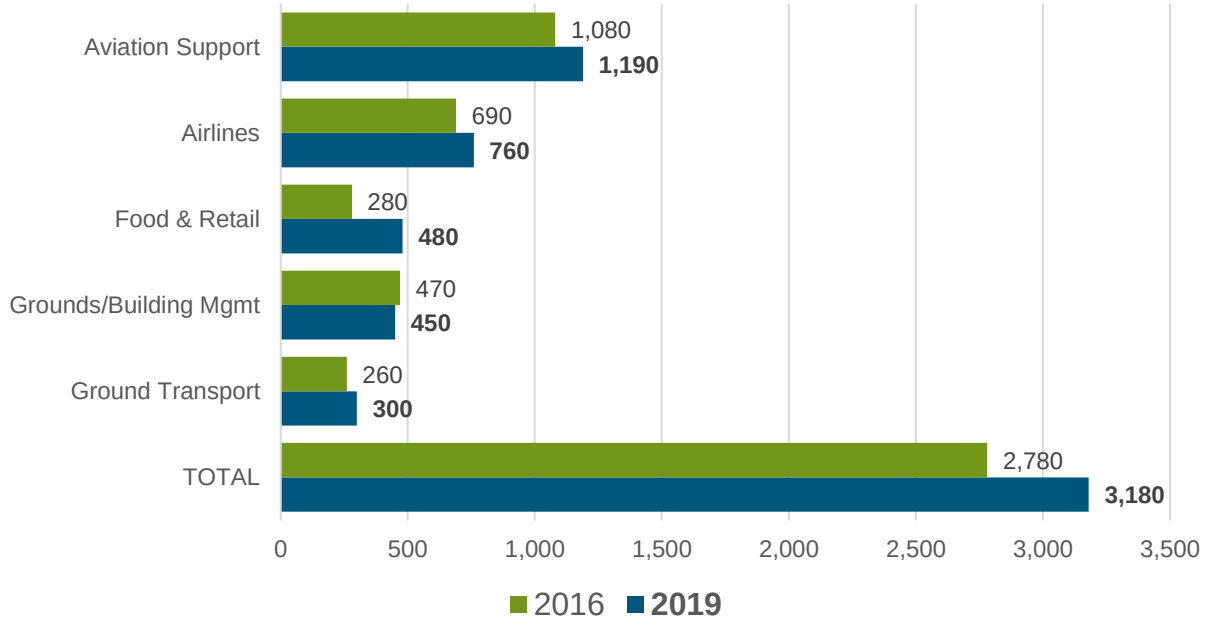
Impact	Jobs	Wages ($ Millions)	GDP ($ Millions)	Output ($ Millions)
Direct	3,180	$227	$426	$696

Growth in Direct Employment at ORF

Since the last study conducted in 2016, direct employment related to ongoing airport operations has grown by 14 percent, with a net increase of 400 jobs created between 2016 and 2019. **Figure 2-2** below compares the change in direct employment across key business types at ORF between 2016 and 2019.

A significant proportion of airport employment relates to firms and employees directly involved in air service operations. Given the substantial growth in commercial air service since 2016, much of the net job growth at ORF is attributable to these operations, including airlines and related aviation support services. Other operations directly involved with serving the growing flow of passengers, such as in-terminal concessionaires and ground transportation, have also driven the growth in direct employment.

Figure 2-2: Direct Employment by Business Category at ORF



Note: Figures rounded and may not sum to totals.

The business categories charted above can be further described as follows:

- **Aviation Support Services** include employment related to aircraft servicing, airline support, and air transport oversight. This includes ground handling, cargo handling, aircraft maintenance, fixed base operators and fueling, and government agencies such as the FAA and TSA. Employment related to these sectors represented 1,190 jobs (37 percent of direct employment) at ORF in 2019.

- **Airlines** include employment related to air carrier operations. This includes all staff employed by the airlines such as ticket agents, gate agents, and locally based flight crew. This category accounted for 760 jobs (24 percent) of direct employment.

- **Food & Retail** accounts for employees associated with in-terminal dining and retail outlets as well as catering. This category accounted for 480 jobs, representing 15 percent of direct employment in 2019.

- **Grounds/Building Management & Other** includes all employment associated with the care of airport grounds and buildings. This includes security, cleaning, janitorial, and maintenance staff along with miscellaneous contractors such as routine repairmen, which accounted for approximately 450 jobs or 14 percent of total jobs at ORF in 2019.

- **Ground Transportation** primarily involves passenger transport services such as taxi, limo, and transportation network companies (TNCs), as well as trucking. These operations accounted for an estimated 300 jobs, or 9 percent of the total direct jobs related to ORF in 2019.

2.2 Indirect and Induced Impacts of Airport Operations

Indirect Impacts of Ongoing Airport Operations

Indirect economic impacts are those that result from the direct impacts. For an airport, indirect impacts encompass the economic activities of firms that supply airport operations. For instance, indirect employment includes the portion of employment in supplier industries dependent on sales to the air transport sector, such as food wholesalers supplying food for catering on flights and to restaurant concessionaires that serve passengers in airport terminals.

For 2019, the ORF operations supported 1,320 indirect jobs that paid $86 million (see **Figure 2-3**). This activity generated $124 million in GDP and $224 million in economic activity.

Figure 2-3: Indirect Impacts of ORF Airport Operations ($ Millions)

Impact	Jobs	Wages ($ Millions)	GDP ($ Millions)	Output ($ Millions)
Indirect	1,320	$86	$124	$224

Induced Impacts of Ongoing Airport Operations

Induced impacts are those created by the spending of wages, salaries, and profits earned in direct and indirect economic activities. These are the “ripple effects” of successive rounds of spending through the economy. Induced employment is employment generated from expenditures by individuals employed indirectly or directly. For instance, if a ground handling employee at ORF decides to remodel his/her home, this would result in additional (induced) employment hours in the general economy. The home renovation project would support hours of induced employment in the construction industry, the construction materials industry, etc. Induced impact is often called the household-spending effect. Induced effects typically reflect changes in spending from households as income increases or decreases due to the changes in production (in this case, air service).

As shown in **Figure 2-4**, ORF operations supported another 1,410 induced jobs that paid $70 million in earnings. This activity amounted to $133 million in GDP and $223 million in economic activity.

Figure 2-4: Induced Impacts of ORF Airport Operations ($ Millions)

Impact	Jobs	Wages ($ Millions)	GDP ($ Millions)	Output ($ Millions)
Induced	1,410	$70	$133	$223

2.3 Total Economic Impact of Ongoing Airport Operations

Ongoing ORF operations, including multiplier (indirect and induced) effects, supported over 5,900 jobs and $380 million in wages throughout the Commonwealth of Virginia in 2019. Including multiplier impacts, operations at the airport also contributed over $680 million in total GDP and $1,140 million in total economic output for the state, as shown in **Figure 2-5**.

Figure 2-5: Total Economic Impact of ORF Ongoing Airport Operations ($ Millions)

Impact	Jobs	Wages ($ Millions)	GDP ($ Millions)	Output ($ Millions)
Direct	3,180	$227	$426	$696
Indirect	1,320	$86	$124	$224
Induced	1,410	$70	$133	$223
Total	***5,910***	***$383***	***$683***	***$1,143***

3 Other Economic Impacts Associated with ORF

3.1 Capital Improvements

Capital improvement programs at airports generate and sustain significant economic impacts. These impacts are treated separately from those associated with the normal or ordinary course of everyday airport business(es). While routine maintenance of an airport's assets is a part of ordinary operations, major capital improvement programs are not. Major capital improvements differ fundamentally in scope, scale, cost, and time.

Because the annual amount of spending on capital improvement can vary considerably over time, the project team used the average amount of spending for the latest four-year period as representative of "normal" or average. The IMPLAN estimates of employment and related economic activity were based on those averages.

The project team obtained data on ORF's capital expenditures from the airport's annual financial statements. Over the four-year period 2016 to 2019 (inclusive), ORF spent an average of $16 million annually on capital development projects including refurbishing a portion of the primary runway, replacing passenger loading bridges, and designing the new parking garage.[15] As shown in **Figure 3-1**, this capital spending supported 200 direct jobs that generated $12 million in direct earnings as well as $7 million in direct GDP and $16 million in direct economic output. Including multiplier effects, the average annual capital spending at ORF supports a total of 290 jobs earning $17 in wages, with a total contribution of $17 million in GDP and over $30 million in economic output throughout the Commonwealth of Virginia.

Figure 3-1: Total Economic Impact of ORF Capital Improvements ($ Millions)

Impact	Jobs	Wages ($ Millions)	GDP ($ Millions)	Output ($ Millions)
Direct	200	$12	$7	$16
Indirect	30	$2	$4	$7
Induced	60	$3	$6	$10
Total	***290***	***$17***	***$17***	***$33***

[15] Source: ORF Financial Statement for FY 2019.

3.2 Visitor Spending

A separate but related element of ORF's economic footprint flows from spending by the business and leisure visitors who arrive in the area by flying via ORF. In recent years, ORF has increasingly become a primary air travel gateway to the MSA. Spending by non-resident visitors who arrive by aviation contributes to local and regional economic activity, particularly for the hospitality industry. Most of the local economic impact of passengers who move through airports is attributable to visitors who spend money on local transportation, hotels, restaurants, retail, and the recreation and entertainment industries. The impact of these travelers is additional to the impacts associated with ongoing operations and capital improvement projects at the airport itself.

The economic impact of visitor spending can be analyzed by generating an estimate of the share of passenger traffic at ORF that is attributable to inbound, non-resident visitors, applied to estimates of the average amount spent by each of these visitors during their stay on key items such as hotel, food, ground transportation, etc. These estimates are then used in the IMPLAN model to derive the associated economic impacts.

Estimating Visitor Air Traffic

The share of passenger traffic attributable to outbound residents versus inbound visitors can vary widely by airport. Many smaller and/or spoke airports tend to predominantly serve local residents flying to other destinations for business or personal reasons, while other airports (e.g., Las Vegas; Vail, Colorado) may primarily be destinations for visitors. At ORF, the markets are more balanced between inbound and outbound passengers, as the economies in the MSA – and especially the activity driven by the Department of Defense facilities – generate relatively balanced amounts of locally-originating outbound traffic and outside-originating inbound traffic.

The project team estimated the number of visitor arrivals at ORF using the U.S. DOT Origin-Destination (O&D) database which includes information on the directionality of travel as well as point-of-origin for origin-and-destination passengers at ORF.[16] **Figure 3-2** summarizes the findings of this analysis, showing the breakdown of connecting versus O&D passengers as well as the share of traffic at ORF whose "true" point-of-origin was ORF (i.e., assumed local residents) in 2019. Visitors are estimated to account for 44 percent of all passengers at ORF. These estimates pertain specifically to traffic flying on scheduled commercial service at ORF.[17]

[16] Connecting passengers are effectively visitors who may spend money in or near the airport. However, there are relatively few such passengers at ORF, and the impact of this spending is already captured as part of the economic impact of airport operations. Including connecting passenger spending as part of this visitor spend analysis would result in double-counting, therefore connecting passenger traffic is excluded.

[17] To aid in comparability of results, this method of estimating the number of "true" visitors to the area is the same as that used in the 2016 study. Other sources of data may produce different estimates. The in-terminal surveys of passengers conducted by Bonney & Company estimated that 35 percent of travelers at ORF were "true visitors."

Figure 3-2: ORF Connecting and Point-of-Origin Traffic, 2019

Traffic Type	Percent of Enplanements
Connecting	**3%**
O&D	**97%**
Residents	*53%*
Visitors	*44%*

Source: Inter*VISTAS* analysis of directionality of travel data from DOT O&D data via Diio Mi.

In addition to visitors flying in on commercial service, some visitors will arrive via GA operations such as charters. GA visitors comprise a small percentage of overall visitors, because GA operations account for a small share of total aircraft movements at ORF and they are generally served by far smaller aircraft than scheduled commercial operations.

Because of the inherent nature of GA travel that values anonymity and because no data are available on the number of individuals who visit the region via GA, the impact of these travelers must be estimated through other modeling efforts. The team estimated the number of visitors who arrived by GA based on data from the FAA on the number of itinerant GA operations at ORF, as well as information collected via interview with staff at the airport's fixed base operator, which serves the airport's GA traffic. The project team applied the insights from Signature to develop estimates of the percent of GA operations made by "true visitors" rather than aircraft based at the airport, as well as estimates of the average number of individuals onboard each of those transient aircraft.

Figure 3-3 below shows the estimate of total visitors who flew into ORF in 2019, with comparison to the estimates developed in the 2016 study. Approximately 872,000 non-resident visitors arrived via ORF in 2019, with approximately 96 percent flying via scheduled commercial service. Total visitor traffic grew by approximately 23 percent between 2016 and 2019, attributable to ORF's substantial growth in commercial air service which has continued to serve a consistent share of inbound visitor vs. outbound resident traffic. GA visitor traffic shows an estimated decline over the years, consistent with the overall decline in GA aircraft movements reported by the FAA; however, GA operations represent a minority of overall visitor traffic.

Figure 3-3: Estimated Visitors at ORF, 2016 vs. 2019

Air Service Type	Number of Visitors		
	2016	2019	Percent Change
Commercial	697,000	872,000	+25%
General Aviation	44,000	37,000	-16%
TOTAL	***741,000***	***909,000***	***+23%***

Source: Inter*VISTAS* analysis.

Estimating Average Visitor Spending

The project team relied on a variety of sources of information to estimate the amount of spending by travelers who visited the area by flying in via ORF. For passengers arriving by commercial service, the airport management commissions a local market research firm to survey passengers each year. These surveys are used to develop statistically-reliable data on passenger demographics and behavior, including spending by non-resident visitors. This research collected over 1,200 in-terminal passenger surveys throughout all service hours of the day, all days of the week, and all months of the year in order to comprehensively sample all traffic flows through the airport.

The project team adopted this survey's estimates of the average amount of spending by commercial visitors in 2019. **Figure 3-4** summarizes those data and compares them to the estimates used in the 2016 study. The average trip spend across all commercial visitors flying via ORF was $706 in 2019, relative to $666 in 2016. Expressed in real terms, these figures are roughly equivalent, indicating that average spend patterns have not significantly changed between 2016 and 2019. On average, business visitors spend substantially more than leisure visitors. In 2019, an average business visitor spent $915 in 2019, or roughly 84 percent more than the average leisure visitor. This is partly due to the fact that large percentages of inbound travelers often visit friends and relatives and thus spend less on accommodations and other items.

Figure 3-4: Average Trip Spending by Commercial Visitors via ORF, 2016 vs. 2019

Visitor Type	Average Spend per Trip		
	2016 *(2016 dollars)*	2016 *(2019 dollars)*	2019 *(2019 dollars)*
Business	$890	$946	$915
Leisure	$442	$470	$498
TOTAL	***$666***	***$708***	***$706***

Source: Bonney & Company, *Characteristics of Passengers Using Norfolk International Airport: 2019*. 2016 figures expressed in current (2019) dollars by Inter*VISTAS* using inflators based on U.S. Bureau of Labor Statistics data.

Spending by GA visitors likely differs from the commercial visitor rates shown above. Most GA visitors are traveling for business purposes, either corporate- or military-related. These travelers are less price-sensitive than commercial travelers but tend to have shorter trip lengths (many likely arrive for day-visits only) thereby reducing average trip spend. Overall, total spending by GA visitors is estimated at $5.4 million in 2019, with a larger share of this amount attributable to day-trip expenses such as meals and ground transportation to and from the airport, relative to commercial visitors' higher incidence of spending on hotels and discretionary items (e.g. retail and entertainment).

Including both commercial and GA visitor traffic at ORF, total visitor spending is estimated at over $620 million in 2019, shown in **Figure 3-5** below. Based on the relative shares from the commercial passenger intercept survey, and assuming that GA visitors are predominantly business travelers, approximately 65 percent of this total visitor spending is attributable to business traffic with the remaining 35 percent attributable to leisure visitors. This accounts for the findings from the intercept survey which indicate that, while business travelers make up a slightly smaller share of visitor traffic relative to leisure travelers, they tend to spend larger amounts on average (as previously shown in **Figure 3-4**).[18]

Figure 3-5: Total Visitor Spending by ORF Air Traffic, 2016 vs. 2019

Year / Type	Total Visitor Expenditure ($ Millions)
Total Visitors - 2016	**$470**
Total Visitors - 2019	**$621**
Est. Share from Business	*65%*
Est. Share from Leisure	*35%*

Source: Inter*VISTAS* analysis.
Note: Figures expressed in nominal dollars, unadjusted for inflation.

Economic Impact of Visitor Spending

The economic impacts of non-local visitors who used air travel through ORF and spent money in the region are summarized below in **Figure 3-6**.

In 2019, visitor spending associated with traffic flying in via ORF supported 8,460 direct jobs that paid $228 million in wages and generated $348 million in direct GDP and $583 million in direct output. Including the indirect and induced impacts, visitor spending by ORF's air traffic supported a total of

[18] The split of business vs. leisure for non-resident visitors is estimated at 48% vs. 52%, respectively. Some visitors report travelling for both business and leisure purposes. For example, some may attend a local conference and then spend additional time vacationing in the area afterwards. However, this is a small proportion of visitor traffic. In this analysis, those travelers are included in the "Business" category. (Source: Bonney & Company, *Characteristics of Passengers Using Norfolk International Airport: 2019*).

11,120 jobs paying $376 million, along with $603 million in total GDP and $1,026 million in total output throughout the Commonwealth of Virginia.

Figure 3-6: Economic Impact of Air Visitor Spending via ORF, 2019 ($ Millions)

Impact	Jobs	Wages ($ Millions)	GDP ($ Millions)	Output ($ Millions)
Direct	8,460	$228	$348	$583
Indirect	1,260	$80	$125	$224
Induced	1,400	$68	$131	$219
Total	***11,120***	***$376***	***$603***	***$1,026***

4 Consolidated Economic Impact of ORF

The consolidated total economic impact of ORF incorporates the impacts associated with ongoing airport operations, capital improvement projects at the airport, and spending from visitors who fly into the area via ORF. They include the impacts linked directly to each of these components, as well as the associated supply chain effects (indirect impacts) and the resulting household spending effects (induced impacts).

As shown in **Figure 4-1**, the consolidated economic impact of ORF surpassed 17,000 total jobs with wages of $775 million, along with a GDP contribution of $1.3 billion and $2.2 billion in economic output throughout the Commonwealth of Virginia.

Figure 4-1: Consolidated Economic Impact of ORF, 2019 ($ Millions)

	Impact	Jobs	Wages ($ Millions)	GDP ($ Millions)	Output ($ Millions)
Airport Operations	Direct	3,180	$227	$426	$696
	Indirect	1,320	$86	$124	$224
	Induced	1,410	$70	$133	$223
	Total	**5,910**	**$383**	**$683**	**$1,143**
Capital Improvements	Direct	200	$12	$7	$16
	Indirect	30	$2	$4	$7
	Induced	60	$3	$6	$10
	Total	**290**	**$17**	**$17**	**$33**
Visitor Spending	Direct	8,460	$228	$348	$583
	Indirect	1,260	$80	$125	$224
	Induced	1,400	$68	$131	$219
	Total	**11,120**	**$376**	**$603**	**$1,026**
Consolidated	Direct	11,840	$467	$780	$1,295
	Indirect	2,610	$168	$253	$456
	Induced	2,870	$141	$269	$452
	Total	**17,320**	**$775**	**$1,303**	**$2,203**

Note: Figures may not sum to totals due to rounding.

5 Tax Revenues

A related part of the airport's economic impact is the significant amount of tax revenue generated for federal, state, and local governments. Direct employment impacts involve millions of dollars of tax revenue to public treasuries, and there are other taxes levied locally and by the Commonwealth. The supply chain also contributes to government revenues, as does employment supported via the ripple effects of indirect and induced economic activity.

The tax impacts of ongoing airport operations, capital improvements, and visitor spending activity on the federal government and Virginia's state and local governments were generated from the IMPLAN model.[19] This study reports all tax impacts as produced from the IMPLAN model except for corporate profits taxes which, based on prior experience, tend to be inaccurate when estimated from models that rely on regional averages rather than company-specific results.

Revenue contributions are divided into the following groupings, based on the origins of the resulting impacts:

Federal Taxes

- ***Personal Taxes.*** This category contains the personal income tax impacts generated by households linked to ORF payable at the federal level, as well as estate and gift taxes.
- ***Other Taxes and Fees.*** This category includes taxes on production and imports, net of subsidies, paid by businesses at the federal level such as excise and customs taxes. In addition, this category includes employee and employer contributions to federal social insurance taxes.

State and Local Taxes

- ***Property Taxes.*** This category contains all property taxes paid by either households or businesses.
- ***Sales Taxes.*** This category contains all state and local sales taxes.
- ***Other Personal Taxes.*** Excluding property taxes (noted above), this category contains other taxes and fees paid by households at the state and local level including state income taxes, motor vehicle licensing fees, and other applicable taxes.
- ***Other Taxes and Fees.*** Excluding sales and property taxes noted separately above, this category includes other taxes on productions and imports, net of subsidies, paid by businesses at the state and local levels including motor vehicle licensing fees, severance taxes, as well as other taxes and special assessments. In addition, this category includes employee and employer contributions to state social insurance taxes.

Figure 5-1 below summarizes the estimated federal, state, and local tax revenues generated via airport operations, capital improvements, and visitor spending. Altogether, total tax revenues attributable to ORF (including direct, indirect, and induced impacts) exceeded $300 million in 2019. Approximately 51 percent of this is attributable to contributions to the federal government while nearly 20 percent goes toward state revenues, primarily through state sales taxes and income taxes. The remaining 29 percent is attributable to local revenues driven primarily by property taxes.

[19] IMPLAN makes use of regional averages per industry to estimate tax impacts.

Figure 5-1: Summary of Tax Impacts ($ in Thousands)

Source	Impact	Federal			State					Local					TOTAL
		Personal Taxes	Other Taxes/Fees	Total Federal	Property Taxes	Sales Taxes	Other Personal Taxes	Other Taxes/Fees	Total State	Property Taxes	Sales Taxes	Other Personal Taxes	Other Taxes/Fees	Total Local	TOTAL TAX
Airport Operations	Direct	$18,320	$29,010	$47,330	$70	$14,610	$5,670	$2,090	$22,440	$28,750	$6,020	$40	$2,690	$37,500	$107,280
	Indirect	$6,910	$9,600	$16,510	$10	$2,300	$2,130	$330	$4,770	$4,530	$950	$10	$420	$5,920	$27,190
	Induced	$5,590	$8,450	$14,040	$10	$3,060	$1,730	$440	$5,240	$6,020	$1,260	$10	$560	$7,860	$27,130
	Subtotal	**$30,820**	**$47,060**	**$77,880**	**$100**	**$19,970**	**$9,540**	**$2,850**	**$32,450**	**$39,300**	**$8,230**	**$60**	**$3,680**	**$51,280**	**$161,610**
Capital Improvements	Direct	$1,000	$1,110	$2,100	<$5	$30	$300	<$5	$330	$60	$10	<$5	<$5	$70	$2,510
	Indirect	$180	$270	$460	<$5	$90	$60	$10	$160	$180	$40	<$5	$20	$230	$850
	Induced	$250	$380	$630	<$5	$140	$80	$20	$240	$270	$60	<$5	$30	$350	$1,220
	Subtotal	**$1,430**	**$1,760**	**$3,190**	**<$5**	**$250**	**$440**	**$40**	**$730**	**$500**	**$100**	**<$5**	**$50**	**$660**	**$4,580**
Visitor Spending	Direct	$18,720	$26,580	$45,300	$50	$9,750	$5,760	$1,390	$16,950	$19,210	$4,020	$40	$1,800	$25,060	$87,310
	Indirect	$6,480	$9,220	$15,700	$10	$2,200	$2,010	$310	$4,530	$4,340	$910	$10	$410	$5,660	$25,890
	Induced	$5,530	$8,370	$13,900	$10	$3,030	$1,710	$430	$5,190	$5,960	$1,250	$10	$560	$7,780	$26,860
	Subtotal	**$30,730**	**$44,170**	**$74,910**	**$70**	**$14,970**	**$9,480**	**$2,140**	**$26,660**	**$29,510**	**$6,170**	**$60**	**$2,760**	**$38,500**	**$140,070**
Total	Direct	$38,030	$56,710	$94,740	$120	$24,390	$11,740	$3,480	$39,730	$48,010	$10,050	$70	$4,500	$62,630	$197,100
	Indirect	$13,570	$19,090	$32,670	$20	$4,580	$4,190	$660	$9,450	$9,050	$1,890	$30	$840	$11,820	$53,940
	Induced	$11,370	$17,200	$28,570	$30	$6,220	$3,520	$890	$10,660	$12,250	$2,560	$20	$1,150	$15,990	$55,220
	TOTAL	**$62,980**	**$93,000**	**$155,980**	**$170**	**$35,190**	**$19,460**	**$5,030**	**$59,840**	**$69,320**	**$14,510**	**$120**	**$6,490**	**$90,440**	**$306,260**

Note: Figures shown are rounded to the nearest ten thousand. Figures may not sum to totals due to rounding.
Source: Inter*VISTAS* analysis of IMPLAN data.

6 Comparison of 2016 and 2019 Results

Between 2016 and 2019, there have been significant changes in the scale of operations at ORF. Commercial air service expanded both in seat capacity and nonstop destinations served, supporting a net increase of 772,000 (+24 percent) passengers. In turn, this drove growth in the employment needed to sustain ongoing airport operations, particularly in areas directly related to the provision of scheduled air service (e.g., commercial airlines and aviation support functions based at ORF) and operations directly involved with the increased flow of passengers (e.g., in-terminal concessions and ground transportation). Additionally, some of this passenger growth includes non-resident visitors who are now more willing or able to visit the region by flying via ORF. Visitor traffic at ORF grew by an estimated 168,000 (+23 percent) passengers, resulting in an estimated increase of $151 million[20] in local spending by visitors via ORF.

Figure 6-1 (overleaf) summarizes the estimated changes in direct and total (including multiplier impacts)[21] economic impacts related to ORF between 2016 and 2019. Dollar values from the 2016 study have been converted to constant 2019 dollars for more relevant comparison.[22] Figures in both years have been rounded.

Between 2016 and 2019, the economic impacts directly associated with ORF (including ongoing operations, capital improvements, and visitor spending) increased by nearly 2,000 direct jobs, nearly $100 million in direct wages, over $200 million in direct GDP, and $185 million in direct output. Including multiplier (indirect and induced) impacts, the total economic impacts associated with ORF increased by nearly 2,400 total jobs, paying almost an additional $140 million in earnings and creating an additional $270 million in GDP and $280 million in output.

Figure 6-2 (overleaf) compares the change in estimated tax impacts between 2016 and 2019. Since the 2016 study reported only the *direct* tax impacts associated with ongoing airport operations and visitor spending, only those tax components are available for comparison. Dollar values from the 2016 study have been converted to constant 2019 dollars for more relevant comparison. Figures in both years have been rounded.

Direct tax impacts associated with ongoing airport operations and visitor spending increased by $20 million at the federal level and almost $30 million at the combined state and local level, driven directly by the growth in employment headcount at the airport as well as the growth in spending from more visitors flying into via ORF.

[20] Expressed in nominal dollars, unadjusted for inflation.
[21] Multiplier impacts are modelled estimates only. Further, the 2016 Study and current study used different versions of the IMPLAN model which reflect changes that may not be comparable over time. As such, comparison of multiplier impacts (indirect and induced) should be regarded with caution. Refer to **Section 1.4** and **Section 2.2** for details.
[22] Inflators based on U.S. Bureau of Labor Statistics data.

Figure 6-1: Comparison of 2016 vs. 2019 Economic Impacts (Constant 2019 Dollars)

Category	Impact	Jobs			Wages ($ Millions)			GDP ($ Millions)			Output ($ Millions)		
		2016	2019	Change	2016	2019	Change	2016	2019	Change	2016	2019	Change
Airport Operations	Direct	2,780	3,180	14%	$198	$227	15%	$314	$426	36%	$627	$696	11%
	Total	5,520	5,910	7%	$347	$383	10%	$563	$683	21%	$1,064	$1,143	7%
Capital Improvements	Direct	120	200	67%	$6	$12	100%	$9	$7	-22%	$17	$16	-6%
	Total	180	290	61%	$10	$17	70%	$14	$17	21%	$27	$33	22%
Visitor Spending	Direct	6,980	8,460	21%	$164	$228	39%	$251	$348	39%	$466	$583	25%
	Total	9,230	11,120	20%	$283	$376	33%	$456	$603	32%	$827	$1,026	24%
Total	**Direct**	**9,880**	**11,840**	**20%**	**$368**	**$467**	**27%**	**$574**	**$781**	**36%**	**$1,110**	**$1,295**	**17%**
	Total	**14,930**	**17,320**	**16%**	**$640**	**$776**	**21%**	**$1,033**	**$1,303**	**26%**	**$1,918**	**$2,202**	**15%**

Note: Figures may not sum to totals due to rounding. Dollars expressed in constant 2019 dollars.

Figure 6-2: Comparison of 2016 vs. 2019 Tax Impacts (Constant 2019 Dollars)

Source	Impact	Federal			State & Local			Total		
		2016	2019	Change	2016	2019	Change	2016	2019	Change
Airport Operations	Direct	$39,890	$47,330	$7,440	$40,060	$59,940	$19,880	$79,960	$107,280	$27,320
Visitor Spending	Direct	$32,610	$45,300	$12,690	$32,860	$42,010	$9,150	$65,470	$87,310	$21,840
Sum	**Direct**	**$72,500**	**$92,630**	**$20,130**	**$72,920**	**$101,950**	**$29,030**	**$145,430**	**$194,590**	**$49,160**

Note: Figures may not sum to totals due to rounding. Dollars expressed in constant 2019 dollars.

Appendix A: Surveying Airport Operations

To quantify the employment directly attributable to ongoing ORF operations, i.e., the *direct job impact* of ongoing airport operations, the project team first surveyed tenants and operations located at the airport. The Norfolk Airport Authority provided a list of all tenant companies and organizations that operate on airport property including airlines, government agencies (Federal Aviation Administration, Transportation Security Administration, etc.), concessionaires, etc. This list included the organization name, key contact information, as well as firm badge counts representing the sum of each organization's employees with authorization to work on airport property.

Since the badge count list included contractors in addition to onsite tenants, the project team worked with airport management to identify which contractors were related to the normal or ordinary course of everyday airport business (such as repairmen hired for routine maintenance jobs) and which were related to major capital improvement projects. The latter group was then excluded from the survey analysis in order to avoid double-counting impacts between ongoing airport operations and capital improvements, which were modelled separately.

The project team conducted the employment survey during the spring of 2020. Key contacts from all tenant organizations were emailed with a cover letter from NAA introducing the study and explaining the survey, along with a link to complete the survey online. All non-respondents were periodically reminded to complete the survey. The largest employers at the airport as well as tenants new to the airport since 2016 also received follow-up calls asking that they report their data. The project team directly called all non-respondents from the top 25 employers representing over 80 percent of jobs at the airport. This targeted follow-up produced a survey response rate of 76 percent from these top employers.

A sample copy of the cover letter and survey sent to tenants is provided at the end of this appendix.

Inferring Employment

To supplement the data obtained via the survey, airport management provided badge count data identifying the number of each tenant's employees with authorization to work on airport property. For tenants that declined or did not respond to the project team's request to complete a survey, the badge count data was used to infer employee headcount. These estimates were compared against survey results from the 2016 study to mitigate the risk of inflated headcounts from the badge counts. Inferred jobs from the badge count data accounted for 29 percent of the final direct job tally for airport operations.

Accommodations and Ground Transportation Impacts

The survey included questions to air carriers at ORF about their use of nearby hotels to accommodate non-locally based airline crew as part of the airport operations impacts (i.e., impacts associated with airline activity at ORF). Only the proportion of accommodations employment associated with hotel stays by airline crew were included in the airport operations impacts. All other economic impacts associated with accommodations are considered to be captured as part of the visitor spending analysis.

Ground transportation operations involved in transporting passengers to and from the airport were not directly surveyed in this study. Instead, an employment estimate for passenger ground transportation operations relied on information from the 2016 study, including survey data collected from ORF and ground transportation statistics collected from other commercial airports in Virginia. The data available from the 2016 study allowed the project team to relate the ratio of for-hire ground transportation trips per airport passenger, along with average driver times per trip, to the growth in passenger traffic since 2016.

Survey Design

The objective of the tenant survey was to gather data on total employment and payroll. Additional information was collected related to full-time versus part-time employees, permanent versus seasonal jobs, and occupation types to gain a better understanding of the nature of employment at ORF. The survey also solicited information on whether firms contract out certain functions or services to guard against undercounting or double counting employment levels.

A sample copy of the cover letter and survey sent to tenants is provided below. Survey pages with questions related to offsite hotels and ground transportation firms, which were ultimately not surveyed, are excluded in the sample below.

NORFOLK AIRPORT AUTHORITY
Norfolk International Airport / 2200 Norview Avenue / Norfolk, Virginia 23518-5807
757-857-3351 / Fax: 757-857-3265

March 2020

Re: Economic Impact Study - Norfolk International Airport

Dear Norfolk International Airport Stakeholder,

The Norfolk Airport Authority is conducting a study to update its estimate of the economic impact of the airport's operations throughout the Hampton Roads area. Since the last study completed in 2016, our airport has experienced significant traffic growth – seat capacity has increased by +26% and total enplanements by +23%. As such, it is timely to undertake a new study to quantify the full economic impact of the airport's operations, how they have changed over time, and how ORF and its partners in aviation continue to contribute to the local economy.

The results of the study will be used to raise public awareness of the airport, the airlines', and other related businesses' contribution to local employment and economic activity. We receive many requests for economic impact information, and it is important that the public continues to understand the contributions that the airport makes to the local economy.

As with the last study, this research is being led by the Washington office of Inter*VISTAS* Consulting Inc. (Inter*VISTAS)*.

A key part of the study is a survey of all airport tenants - including government agencies and private businesses. We ask that you cooperate with the study by participating in this employment survey. **Some key information that we are seeking about your organization include: employee headcount, full-time vs. part-time employees, occupation types, and general payroll.** We ask that you complete the survey to best of your ability and knowledge.

Please click on the following link to your secure online survey access:
https://www.surveygizmo.com/s3/5477581/ORF-2019-Employment

Should you have any questions about the study or this survey, please contact Steve Martin at 202-688-2236 or Kathryn Tooley at 1-877-717-6246, extension 1810.

We appreciate that some of the information requested in the survey may be of a sensitive nature to your firm. Please be assured that Inter*VISTAS* will maintain the confidentiality of your survey response, and that the completed surveys will not be viewed by any other party other than researchers at Inter*VISTAS*. Inter*VISTAS* will not provide individual firm results to the Norfolk Airport Authority. Only the aggregate survey totals will be provided in the final report. The published document will not reveal employment figures or other data for any individual firm.

Please complete this survey as soon as possible and no later than **March 30, 2020**.

We thank you again and encourage you to participate in this important study. The greater the participation, the better the results will be, and the better the story will be for the entire Hampton Roads Area.

Sincerely,

Robert S. Bowen, A.A.E.
Executive Director of the
Norfolk Airport Authority

Norfolk International Airport
Airport Employment Survey March 2020

The figures you provide in the following sections are **strictly confidential**. Only aggregate survey totals will be published in the final report.

Please complete this survey as soon as possible and within two weeks of receipt.

For the purposes of this study, it is important that the figures you provide are as accurate as possible. However, where it is not possible to provide precise information, we would appreciate estimates rather than no response at all.

Name of Company: _____

Address of Company: _____

Contact Person: _____ Phone number: _____

Email: _____

Q1. Principal Business Activity

Please indicate your principal business activity. If you are involved in more than one of the business types below, please choose the one that best describes your business (i.e., contributes the largest proportion of revenues).

Air Carriers

- ☐ 1. Scheduled Air Passenger Carrier
- ☐ 2. Charter Air Passenger Carrier
- ☐ 3. Dedicated Cargo Carrier
- ☐ 4. Courier / Integrator
- ☐ 5. General Aviation Operator
- ☐ 6. Other Air Carrier: _____

Other Business Types

- ☐ 7. Freight Forwarder, Cargo Agent, etc.
- ☐ 8. Warehousing
- ☐ 9. Customs Broker
- ☐ 10. Aircraft Maintenance, Repair and Overhaul
- ☐ 11. Airport Ground Handler
- ☐ 12. Fueling Company
- ☐ 13. Fixed Base Operator
- ☐ 14. Aircraft Parts Supplier
- ☐ 15. Aviation Related Manufacturing
- ☐ 16. Aviation Related Training
- ☐ 17. In-flight Catering Company
- ☐ 18. Security Services
- ☐ 19. Airport Retail Outlet, Restaurant, etc.
- ☐ 20. Government Agency/Department
- ☐ 21. Car Rental
- ☐ 22. Taxi, Bus, Limousine, Shuttle (**please go to Q7**)
- ☐ 23. Hotel/Accommodations Provider (**please go to Q9**)
- ☐ 24. Other: _____

AIR CARRIERS AND OTHER BUSINESS TYPES

If your answer to Q1. Principal Business Activity is any of the following answers ("Taxi, Bus, Limousine, Shuttle", "Hotel/Accommodations Provider") then please do not answer this section. If you are a Taxi, Bus, Limousine or Shuttle business please go to Q7. If you are a Hotel/Accommodations provider please go to Q9.

Q2. Employment at Your Company

Please state the number of **permanent & seasonal** staff employed by your company at Norfolk International Airport in 2019. This should include employees both on-site at the airport and off-site (where off-site employees are involved with providing service to the airport, e.g. catering employees at an off-site location). For airlines, please only include employees (e.g. pilots, flight attendants, etc.) who are based at Norfolk International Airport.

Please break down the employment into permanent, seasonal, full-time and part-time. *This should not include employment for work done on contract.*

	Full-Time	Part-Time
Permanent Employees		
Seasonal Employees		

Please indicate how many hours per week **permanent, part-time employees** worked *on average* in 2019.

	Number of Weekly Hours
Permanent, Part-Time Employees	

For **seasonal employees** in general, please indicate how many weeks per year and how many hours per week **seasonal employees** worked *on average* in 2019.

	Number of Weeks per Year	Number of Weekly Hours
Full-Time Seasonal Employees		
Part-Time Seasonal Employees		

Q3. Employment by Occupation

Please estimate the number of employees included in Question 2 that are in the following occupation categories.

The figures entered below should sum to the same total as Question 2.

Employment by Occupation		Number of Employees
General	Managerial/Supervisory	
	Clerical	
	Craft Trades (Electricians, Steam Fitters, etc.)	
Airline & Airline Servicing Trades	Pilots	
	Flight Attendants	
	Aircraft & Vehicle Mechanics	
	Customer Service Agents	
	Aircraft Servicing	
Support Trades	Security Agents	
	Food Service Workers	
	Drivers / Delivery / Couriers	
	Dispatchers	
	Call Center / Reservations	
	Air Traffic Control	
Retail Trades	Sales / Cashiers	
	Food & Beverage Staff	
Other (Please specify)		

Q4. Outsourcing and Contracting Out

Since we do not want to exclude any employment from Norfolk International Airport, please indicate whether your firm contracts out any important services.

Individuals on Contract: If you pay some individuals through a contract, as opposed to through payroll, please indicate the number of such employees, how many hours per week worked in 2019, as well as how many weeks worked in 2019, on average.

Number of Contract Employees	Number of Weeks per Year	Number of Weekly Hours

Firms on Contract: If you outsource or contract out any work to other companies (e.g., cleaning services, IT, ground handling, etc.), please complete the following table, indicating the functions you outsource to third party companies, and provide an estimate of the annual contracted hours of work completed in 2019. Also, please specify the company's name(s) and indicate whether they are located at the airport. This will allow us to avoid any double counting of work performed by other companies which may also be surveyed as a part of this study.

Function	Name of Firm	Located On-site? (Check if Yes)	Number of Hours Performed by the Company in 2019
Example: Cleaning services	*Spic and Span Cleaners*	☐	*100 hours per year (2 hours per week)*
		☐	
		☐	
		☐	

Q5. Business Related to Airport

If your answer to **Q1. Principal Business Activity** is any of the following answers ("Scheduled Air Passenger Carrier", "Charter Air Passenger Carrier", "Dedicated Cargo Carrier", "Courier / Integrator", "General Aviation Operator", "Other Air Carrier", "Government Agency / Department), please skip this question and go to Question 6.

Please estimate the proportion of your company's business revenues that is related to activities at Norfolk International Airport (ORF). For example, some businesses will derive all their business from airport related activities, while others will do business in other sectors of the economy (e.g., manufacturing or ground transportation).

% ORF-Related Business Revenue (2019)	%

Q6. Hotel Accommodation for Airline Crew

If your answer to **Q1. Principal Business Activity** is **not** ("Scheduled Air Passenger Carrier", "Charter Air Passenger Carrier", "Dedicated Cargo Carrier", "Courier / Integrator", "General Aviation Operator", "Other Air Carrier"), please skip this question and go to Question 15.

If you use any hotels for the layover of airline crew, please complete the following table indicating the name and location of the hotel, and the estimated number of room nights booked with the hotel in 2019.

Hotel Name	Hotel Location (City or Area)	Number of Room Nights Booked in 2019

Unless you are a Taxi, Bus, Limousine and Shuttle Business, or a Hotel / Accommodation Provider, please go to Q15 below. If you are a Taxi, Bus, Limousine or Shuttle business please go to Q7. If you are a Hotel/Accommodations provider please go to Q9.

ALL BUSINESSES AND ORGANIZATIONS

Q15. Payroll and Wages

Please state the total gross payroll paid by your company in 2019 for the employees included in your answer above.

This figure should include all full-time, part-time and seasonal employees. If you are unable to estimate payroll for 2019, please provide figures for your last financial period, and indicate which period that was.

Total Payroll (2019):	$
Financial Period *(if not 2019):*	

Note: Total payroll includes gross (pre-tax) wages or salaries, including overtime pay, commissions, allowances and bonuses.

Alternatively, if you are unable to answer this question, please provide an estimate of the average annual wage/salary **per employee** (including overtime pay, commissions, allowances and bonuses), or select one of the options below.

Average Annual Salary/Wage per Employee: $ _____ per annum.

Or: Estimate of the average annual salary range per employee.

- ☐ Less than $20,000
- ☐ $20,000 - $39,999
- ☐ $40,000 - $59,999
- ☐ $60,000 - $79,999
- ☐ $80,000 - $99,999
- ☐ $100,000 or more

Q16. Contributing to General Public

Please use the space below to provide information on how your business or organization contributes value to the general public or other organizations that use Norfolk International Airport that you serve.

Contribution to the General Public

Additional Comments

Please use the space below to provide any additional comments.

Additional Comments

Thank you.

Please enter your responses to this questionnaire online at:

https://www.surveygizmo.com/s3/5477581/ORF-2019-Employment

Alternatively you can email a scanned copy of your response to orfeconimpact@intervistas.com, or fax it to: +1-604-717-1818

If you have any questions, please call
Kathryn Tooley at +1-604-717-1810
or email kathryn.tooley@intervistas.com.

Appendix B: Glossary of Terms

Contract Work: Any work which is done for a company by an individual who is not on the payroll or work done for a company by another company. Generally speaking, firms will contract out work in areas in which they do not have expertise or when there are cost advantages to doing so.

Direct Employment: Direct employment is employment that can be directly attributable to the operations in an industry, firm, etc. It is a literal head count of those people who work in a sector of the economy.

Economic Activity: (also Output, Production) The end product of transforming inputs into goods. The end product does not necessarily have to be a tangible good (for example, knowledge), nor does it have to create utility (for example, pollution). Or, more generally, the process of transforming the factors of production into goods and services desired for consumption.

Economic Output: (also Economic Activity, Production) The end product of transforming inputs into goods. The end product does not necessarily have to be a tangible good (for example, knowledge), nor does it have to create utility (for example, pollution). More generally, it is defined as the process of transforming the factors of production into goods and services desired for consumption.

Employment Impact: Employment impact analysis determines the economic impact of employment in terms of jobs created and salaries and wages paid out. In the case of the airport, the direct, indirect, induced and total number of jobs created at the airport is examined to produce a snapshot of airport operations.

Gross Domestic Product: (**GDP**, also value-added) A measure of the money value of final goods and services produced as a result of economic activity in the nation. This measure is net of the value of intermediate goods and services used up to produce the final goods and services.

Indirect Employment: Indirect employment is employment which results because of direct employment. For the airport, it would include that portion of employment in supplier industries which are dependent on sales to the air transport sector. In some cases, contract work would be considered indirect employment.

Induced Employment: Induced employment is employment created because of expenditures by direct and indirect employees.

Multiplier Analysis: Analysis using economic multipliers in which indirect and induced economic impacts is quantified. Essentially, a multiplier number is applied to the "directly traceable economic impact" to produce indirect and total effects (see Multiplier.)

Multiplier: Economic multipliers are used to infer indirect and induced effects from a particular sector of the economy. They come in a variety of forms and differ in definition and application. A multiplier is a number which would be multiplied by direct effects in order to calculate indirect or induced effects. In the case of the airport, as in many other cases, multipliers can lead to illusory results, and thus must be used with great care.

Seasonality: Seasonality results when the supply and demand for a good is directly related to the season in which is consumed. For example, ski resorts experience changes in net income as a result of seasonality. Airports and airport services also experience seasonality as a result of vacation times for families (typically during the summer) and/or temperatures abroad (typically at Christmas time). As a

result of seasonality in demand for flights, some air carriers increase frequency of flights to certain areas during the busy season.

Tenant: A firm which pays a lease to a leasing company or to the airport authority directly.

Value-Added: (also GDP) A measure of the money value of final goods and services produced as a result of economic activity in the nation. This measure is net of the value of intermediate goods and services used up to produce the final goods and service.

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