
Economic Impact Study—2004
Norfolk International Airport

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ECONOMIC IMPACT STUDY

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ECONOMIC IMPACT STUDY

1 INTRODUCTION

In 2005, Jacobs Consultancy* assessed the economic impacts that Norfolk International Airport (the Airport) had on the Airport Service Region and the Commonwealth of Virginia in 2004.

As part of the economic impact study, Jacobs Consultancy did the following:

- Conducted surveys of on-Airport organizations to update and validate employment and expenditure data for the Airport.
- Completed an inventory of off-Airport economic benefits of air travel, such as tourism-related expenditures.
- Developed an input/output model to define the relationship among Airport activity, employment and expenditures, and economic contribution. Two versions of the Regional Input-Output Modeling System (RIMS II) developed by the U.S. Department of Commerce were used in this subtask—one for the Commonwealth of Virginia and another for Virginia Beach-Norfolk-Newport News Metropolitan Statistical Area (MSA) (the Airport Service Region).
- Estimated the economic impact of the Airport on the Airport Service Region and on the Commonwealth of Virginia, based on data collected in the surveys, the inventory of off-Airport economic benefits, and the RIMS II modeling.

2 METHODOLOGY

The methodology used to evaluate the current economic impact of the Airport involved (1) gathering primary data on the direct economic impact of on-Airport organizations, (2) supplementing these primary data with applicable data from prior Airport economic impact studies and related data gathering efforts, (3) using tourism and visitor information for the Airport Service Region to estimate the indirect economic impact, and (4) using models and other statistical techniques to estimate the induced economic impacts of on-Airport activity.

The data sources used in this evaluation were: (1) on-Airport data collected via surveys of on-Airport organizations conducted by Cordell & Crumley Communications Strategists, (2) off-Airport data collected via surveys of Hampton Roads Area

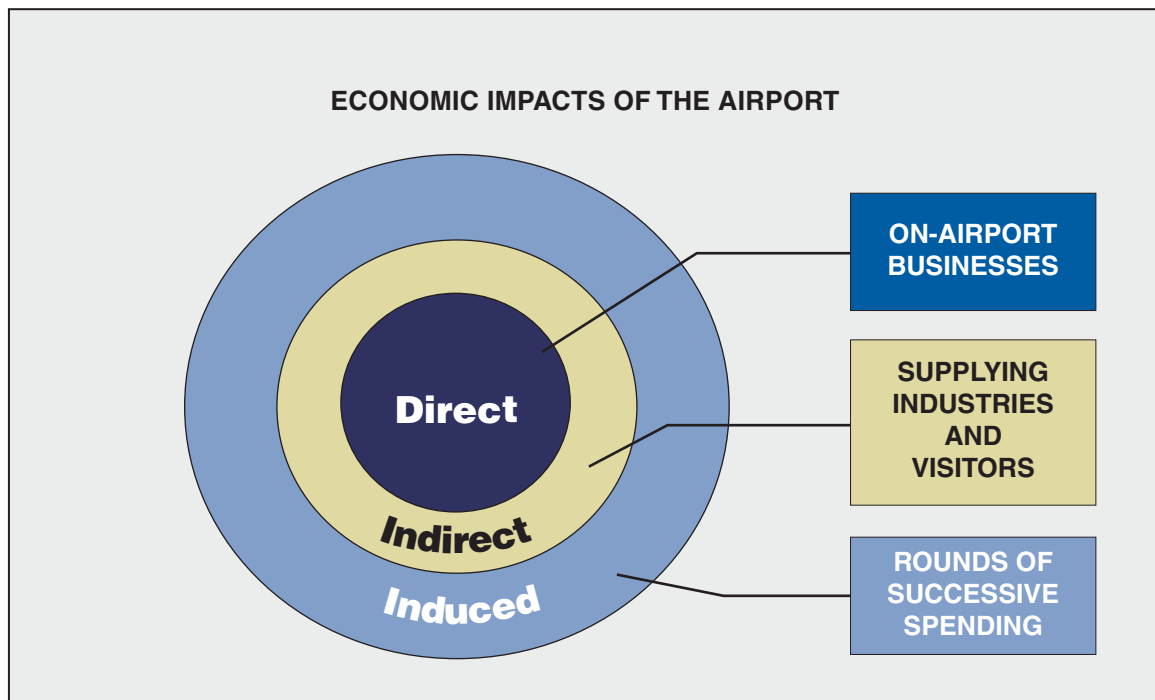
* When Jacobs Consultancy performed the Economic Impact Study in late 2005, the firm was known as Leigh Fisher Associates.

businesses conducted by Cordell & Crumley Communications Strategists, (3) relevant regional, state, and national economic indicators, (4) surveys of Airport passengers conducted by Bonney & Company published in February 2004, (5) the results of economic impact studies for the Airport prepared by the Airport Technology and Planning Group for 1992 and 1997, and (6) where required, inputs from other reports prepared for Norfolk Airport Authority (the Authority) by Jacobs Consultancy.

Whenever possible, calendar year data was used in this study. However, for many of the data sources listed, information was captured for a single point in time and not easily attributed to a specific twelve-month period. For example, the number of employees obtained from the survey of on-Airport organizations conducted by Cordell & Crumley Communications Strategists represents how many people each organization employed when they responded to the survey.

2.1 Definition of Terms

The total economic impact of the Airport is the sum of related direct, indirect, and induced impacts. Figure 1 illustrates the relationship among the direct, indirect, and induced economic impacts of the Airport.



- Direct Economic Impact.** The direct economic impact of the Airport is the impact generated on-site, including the employment, payroll, and local expenditures of all organizations located at the Airport—airlines, terminal concessionaires, general aviation businesses, ground transportation providers, government agencies such as the Federal Aviation Administra-

tion (FAA), and other organizations. These organizations have a direct and quantifiable impact on the economy of the region served by the Airport.

- ***Indirect Economic Impact.*** The indirect economic impact of the Airport is the impact of visitors coming to the area via the Airport, including employment, payroll, and local expenditures in the area but outside the Airport. Visitors to the area spend money locally on lodging, food and beverages, entertainment, retail, and other items; such spending has an indirect but quantifiable impact on the economy of the region and state served by the Airport.
- ***Induced Economic Impact.*** The induced economic impact of the Airport is the off-Airport impact above and beyond the combined direct and indirect impacts of an economic activity, where additional income is created by successive rounds of spending known as the “multiplier” effect. Induced economic impact includes the employment and expenditures of (1) supplying industries that provide the services, materials, or machinery to support industries that derive business from on-Airport businesses, such as wholesale food distributors, office supply firms, and jet fuel suppliers and (2) expenditures by airport employees on goods and services within the area.

The direct, indirect, induced, and total economic impacts of the Airport are measured in terms of total economic impact, expenditures, payroll, and employment.

- ***Total economic impact dollars.*** The value of output measured in dollars. Total economic impact (expenditures and payroll) was assumed to equal output. This assumption is equivalent to assuming zero profits (revenues = expenses), and ensures conservative results.
- ***Expenditure.*** Total dollars spent on goods and services.
- ***Payroll.*** Total wages or salaries.
- ***Employment.*** The number of jobs.

The results of this study are intended to be estimates of economic impact, stated in terms of expenditures, payroll, and employment related to operations at the Airport. They should not be interpreted as benefits of Airport operations in the sense that such expenditures, payroll, or employment would not occur if the Airport were not in existence; they simply represent dollar flows and jobs in the economy related to activity at the Airport.

In general, the economic impacts presented in this report correspond to the long-term demand for aviation services in the region, regardless of the fluctuations in economic activity that may occur as a result of the entry or exit of specific organizations at the Airport.

2.2 Assessment of Direct Economic Impact

The direct economic impact of the Airport is the impact generated on-site at the Airport, and includes the employment, payroll, and local expenditures of all enterprises located at the Airport—airlines, terminal concessionaires, general aviation businesses, ground transportation providers, government agencies, and other businesses. These enterprises have a direct and quantifiable impact on the economy of the region.

On-Airport Business Survey. A survey form entitled “2004 Airport Tenant Survey” (reprinted here as Figure 2) was used to obtain employment and expenditure data for analysis of direct on-Airport economic impacts. Airport staff provided guidance on the survey content and design.

The survey form was designed to elicit information on employment and associated wage data; expenditures on services and supplies, capital improvements, and local taxes; and other expenditures contributing to the Airport’s economic impact.

The names and addresses of the on-Airport organizations to be surveyed were compiled with the assistance of Authority staff. Survey forms were faxed to the organizations listed in Table 1 in October 2004.

During November and December 2004, telephone calls were made to organizations that had not yet responded. Additional follow-up calls were made until a major portion of the organizations had responded and Jacobs Consultancy and Cordell & Crumley jointly determined that no more responses would be received.

Survey Responses. Table 2 summarizes the response rate for the on-Airport organizations surveyed, by type of organization. Of the 53 on-Airport organizations surveyed, 30 completed the survey form, for an overall response rate of 56.6%. Those 30 on-Airport organizations represent approximately 74.9% of the employment at the Airport and 90% of the employers with over 50 employees. Figure 3 shows the survey response rate in terms of number of surveys and employment represented. The overall response rate is better than the 33% to 35% average response rate for a survey of this type. The employment, payroll, and total economic impact estimates provided in this report, therefore, reflect an above-average sample size.

Partial Responses and Nonresponses. The economic impact of organizations that either did not respond to the survey or provided only partial information was estimated using survey information obtained from similar responding organizations.

2004 Airport Tenant Survey

Airports are significant contributors to the economy of the regions they serve, specifically in terms of employment, non-wage expenditures and local taxes. The Norfolk Airport Authority is conducting this confidential survey of on-Airport and Airport-related businesses to determine how great an economic contribution Norfolk International Airport makes to the region. Your assistance in providing the information requested below is appreciated. If you have any questions, please contact Cordell & Crumley at 757-460-4183.

Firm or Agency Information

1. Name: _____

Phone: _____ Fax: _____

Form completed by: _____

Employment Information for 2004

2. Number of employees at Norfolk International Airport: _____

3. Number of employees in the Hampton Roads Region supporting operations at Norfolk International Airport: _____

Expenditure Information for 2004

4. How much does your firm (or agency) anticipate it will spend locally supporting operations at Norfolk International Airport in 2004 for:

a. Gross payroll? \$ _____

b. Other expenditures including services, materials, supplies, equipment and capital improvements? \$ _____

c. Local taxes (property/school/special district)? \$ _____

d. Total \$ _____

5. Do you plan to expand your operation at Norfolk International Airport in the next 5 years? If so, please describe your plans.

Please fax this confidential survey to Cordell & Crumley at **757-460-8023**.

Table 1

ON-AIRPORT ORGANIZATIONS SURVEYEDNorfolk International Airport
Fall/Winter 2004

Passenger airlines	Rental car companies
American Eagle	Avis Rent A Car
Continental Airlines	Budget Rent-A-Car Corporation
Delta Air Lines	Dollar Rent A Car Systems <i>(a)</i>
Delta Global Services (United Express)	Enterprise Rent-A-Car Company
Independence Air	The Hertz Corporation
Northwest Airlines	National Car Rental System
Piedmont Airlines (US Airways Express)	Thrifty Rent-A-Car System <i>(a)</i>
Southwest Airlines	
US Airways	
Cargo airlines	Fixed base operators
Airborne Express/DHL	Piedmont Hawthorne Aviation
Beamon & Lassiter Air Freight	
FedEx	Government agencies
Hipage Company	Airport mail facility
Majestic Terminal Services	Customs & Border Protection
Quantem Aviation Services	Federal Aviation Administration
Superior Air Freight	Norfolk Airport Authority
	Transportation Security Administration
Terminal sales/concessionaires	Other entities
Anton Airfood of Norfolk	Armed Services YMCA
Airport Barber Shop – Shoeshine	BB&T
Hudson News Group	CI Travel
Gourmet Group	Court One Corporation
	Huntleigh Corporation
Ground transportation operators	International Protection
Ascom Transport Systems	Navy Family Services Center
Ace Cab/Andy's Cab	
Black & White Cabs	
Carey VIP & Celebrity Limousines	
City Wide Cabs	
Duke's Cab Company	
East Side Cab Company	
Eden Cab Company	
Lewis/Waterside Taxi Company	
LPR (Airport Express)	
Norfolk Checker Taxi	
Oceanside Executive Transportation	
Southside Cab Company	

(a) Owned and operated by Dollar Thrifty Group Operations (DTG Operations).

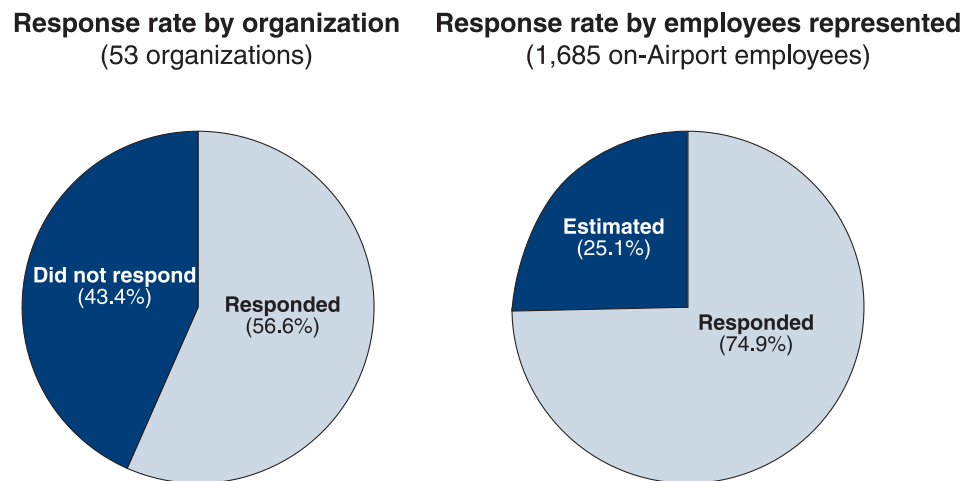
Source: Cordell & Crumley Communications Strategists, fall/winter 2004.

Table 2
ON-AIRPORT SURVEY RESPONSES, BY INDUSTRY TYPE

	<u>Total surveyed</u>	<u>Number of survey responses</u>	<u>Response rate (percent)</u>
Passenger airlines	9	5	55.6%
Cargo airlines	7	6	85.7
Concessionaires/terminal services	4	3	75.0
Rental car companies	7	3	42.9
Ground transportation operators	13	4	30.8
Fixed base operators	1	1	100.0
Government agencies	5	4	80.0
Other businesses	<u>7</u>	<u>4</u>	57.1
Total/average	53	30	56.6%

Source: Cordell & Crumley Communications Strategists, surveys of on-Airport organizations, fall/winter 2004.

Figure 3
ON-AIRPORT SURVEY RESPONSE RATES FOR ORGANIZATIONS AND EMPLOYEES REPRESENTED



Source: Jacobs Consultancy, January 2005, based on surveys of on-Airport organizations, November 2004.

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For those airlines that did not respond to the survey, employment and expenditures were estimated on the basis of the responses by similar responding airlines and the nonresponding airline's passenger numbers. The average number of employees per passenger for the responding airlines was used to estimate the number of employees for the nonresponding airlines. Similarly, the average expenditures (payroll, services, materials and supplies, capital, and others) per passenger for nonresponding passenger airlines were estimated using data from the responding airlines and financial data submitted to the U.S. Department of Transportation (U.S. DOT) by major airlines. The U.S. DOT data were used to account for varying cost structures and labor agreements among airlines.

Employment and expenditures for the nonresponding passenger terminal concessionaires were estimated on the basis of gross revenue data provided by the Authority. The average number of employees per revenue dollar for the responding concessionaires was used to estimate the number of employees for the nonresponding terminal concessionaires. The average expenditure per employee for the responding concessionaires was used to estimate expenditures for the nonresponding concessionaires.

The employees and expenditures of other on-Airport businesses that have revenue-based contracts at the Airport but did not respond to the survey were estimated on the basis of gross revenue data in a manner similar to that used to estimate the employees and expenditures of nonresponding concessionaires.

2.3 Assessment of Indirect Economic Impact

The spending of air passenger visitors in the Airport Service Region composes the indirect economic impact. This spending includes any goods or services purchased by air passenger visitors while in the Airport Service Region, excluding money spent at the Airport. Visitor spending is used by local businesses toward payroll and local expenditures and generates jobs in the Airport Service Region. A survey of enplaning passengers conducted by Bonney & Company in 2004 was used to quantify spending of air passenger visitors.

The total amount spent by air passenger visitors is derived from the number of enplaning passengers, the percentage of visitors (in relation to residents) using the Airport, and the average expenditure per visitor per trip, as follows:

$$\text{Air visitor spending in 2004} = \text{number of enplaned passengers in 2004} \times \text{percent visitors} \times \text{average amount spent per visitor per trip.}$$

Out-of-state travelers were asked to estimate their total amount spent on various items, including lodging, food and beverages, retail stores, rental cars, and other items. Indirect impact excludes spending made by air passenger visitors while at the Airport. This spending, such as rental cars, are already included as part of the

on-Airport tenant survey and are therefore part of direct economic impact. Spending by residents of the Hampton Roads Area using the Airport is not included in indirect spending because it would have been spent locally regardless.

2.4 Assessment of Induced Economic Impact

Induced economic impact is generated by the labor, services, materials, and other items purchased by the companies and employees of on-Airport businesses and visitor industries that provide the direct and indirect economic impacts of the Airport. An airline produces a direct impact; an oil company that sells fuel to the airline produces an induced impact. The goods and services purchased by households as a result of the employment and wages paid to industries with direct Airport-related economic impact are also considered induced impacts. Household spending (personal consumption) by both airline and oil company employees also produces an induced economic impact.

Hampton Roads Area Business Survey. A survey form entitled “2004 Hampton Roads Area Business Survey” (reprinted here as Figure 4) was used to qualitatively assess the impact of the Airport on the Hampton Roads region. The survey was used to validate the results of the Regional Input-Output Analysis described in the following sections. Authority staff provided guidance on the survey content and design.

A total of 52 businesses was surveyed and 13 responded (25.0% response rate). The responding businesses are frequent users of the Airport and all considered access to an airport important to their business. All companies considered business travel important and 85% considered air freight important to their business. All respondents used the Airport more than competing airports in the region, and 62% of respondents have one or more employees that travel for business almost daily. Air cargo services provided at the Airport, such as air freight or air mail, are used by 46% of respondents almost daily. Approximately 40% of the companies responding use both passenger air travel services and cargo air services almost daily.

The average annual gross revenues in the Hampton Roads Area for companies that responded were \$199 million. Responding companies employed, on average 1,120 employees per company. The average annual payroll to local employees was approximately \$80 million, corresponding to an average annual payroll of \$53,340 per employee.

As shown on Figure 4, company representatives were asked to rate the Airport in terms of ease of use, concessions and services, road access, and destinations served:

- 92% rated the ease of use of the Airport as good or better, with 46% rating it very good or excellent
- 83% rated the concessions and services provided at the Airport as good or better, with 50% rating them very good or excellent
- 85% rated access to the Airport as good or better, with 62% rating it very good or excellent
- 92% rated the number of destinations served at the Airport as good or better, with 54% rating it very good or excellent

Illustrating the importance of road access to users of the Airport, all of the respondents that rated ease of use as very good or excellent also rated getting to and from the Airport as very good or excellent. Similarly, respondents that rated ease of getting to and from the Airport as bad or poor, rated ease of use as good or poor. While all but one of the responding companies were within 15 miles of the Airport, companies that use Interstate 64 and the Hampton Roads Bridge Tunnel to reach the Airport tended to rate road access as bad or poor.

2.5 Induced Economic Impacts Modeling Methodology

The Hampton Roads Area Business Survey provided qualitative input from the companies in the region and confirmed that the Airport was important to many of their day-to-day operations. Input-output modeling quantifies the induced effects of the direct and indirect economic impact of the Airport on the Airport Service Region's economy.

RIMS II, which was used for this study, is based on a national input-output model created and maintained by the U.S. Department of Commerce, Bureau of Economic Analysis. The model was adjusted for the specific regions and designed to account for the differences between the economies of these regions and the nation as a whole. Two versions of the regional input-output model were used in this analysis: one for the entire Commonwealth of Virginia and another for the Airport Service Region, consisting of Virginia Beach-Norfolk-Newport News Metropolitan Statistical Area (MSA). In some cases, coefficients in the model were adjusted to account for the Airport-specific nature of certain on-Airport businesses. The coefficients in the model express the change in expenditures, payroll, or employment generated by a unit change in the direct and indirect economic impacts.



2004 Hampton Roads Area Business Survey

1. Zip code of business location: _____
2. Type of business: _____
3. Number of local employees (number of full-time equivalent employees): _____
4. Total annual payroll to local employees: _____
5. Estimated annual gross revenues (in the Hampton Roads Area): _____

6. Please rate the following:
- | | Not important | | Somewhat important | | Very important |
|---|---------------|---|--------------------|---|----------------|
| How important is it for your business to have access to an airport? | 1 | 2 | 3 | 4 | 5 |
| How important is business travel to your business? | 1 | 2 | 3 | 4 | 5 |
| How important are air mail and freight services to your business? | 1 | 2 | 3 | 4 | 5 |

7. Please rate Norfolk International Airport on the following:
- | | Poor | | Good | | Excellent |
|---------------------------------|------|---|------|---|-----------|
| Ease of use | 1 | 2 | 3 | 4 | 5 |
| Concessions and services | 1 | 2 | 3 | 4 | 5 |
| Getting to and from the airport | 1 | 2 | 3 | 4 | 5 |
| Destinations served | 1 | 2 | 3 | 4 | 5 |

8. How frequently do one or more employees from your company travel for business?
- | | | | |
|--|---|---|--------------------------------|
| <input type="checkbox"/> Once per year | <input type="checkbox"/> Several times per year | <input type="checkbox"/> Once per month | |
| <input type="checkbox"/> Every 2 weeks | <input type="checkbox"/> Once per week | <input type="checkbox"/> Almost daily | <input type="checkbox"/> Never |

9. How frequently does your company use air cargo services such as air freight or air mail?
- | | | | |
|--|---|---|--------------------------------|
| <input type="checkbox"/> Once per year | <input type="checkbox"/> Several times per year | <input type="checkbox"/> Once per month | |
| <input type="checkbox"/> Every 2 weeks | <input type="checkbox"/> Once per week | <input type="checkbox"/> Almost daily | <input type="checkbox"/> Never |

10. Please estimate the percentage of visitors to your business arriving via Norfolk International Airport: _____

11. Which airport do you and your colleagues use most? Norfolk Newport News Richmond

Please provide any general comments you have about Norfolk International Airport:

Optional Information

Name of company: _____

Name of respondent: _____

Address: _____

Phone: _____

Please fax this confidential survey to Cordell & Crumley at 757-460-8023.

2.5 Distribution of Economic Impact by Community

The direct economic impact generated by the Airport was allocated to the surrounding communities based on on-Airport employees' residence. For security purposes, a majority of on-Airport employees receive identification badges. Summary information was obtained from these records to indicate the distribution of the community of residence for on-Airport employees. These data were used to allocate on-Airport employment, payroll, and total direct economic impact to the communities in the Airport Service Region. Induced economic impact associated with on-Airport tenants was assumed to mirror the distribution of direct economic impacts.

The indirect economic impact generated by the Airport was allocated to the surrounding communities based on the destination of visitors to the Airport Service Region using the Airport. The Booney & Company survey provided a distribution of where air passenger visitors would stay in the Airport Service Region. These data were used to allocate the indirect economic impact to the communities in the Airport Service Region. Induced economic impact associated with air passenger visitors was assumed to mirror the distribution of indirect economic impacts.

3 ECONOMIC IMPACT OF THE AIRPORT

This section presents the impact of the Airport on the economy of the Airport Service Region and the Commonwealth of Virginia in 2004, determined using the methodology outlined in the previous section. The economic impact of the Airport is presented in terms of the direct, indirect, and induced impact of Airport activity on the overall economy of these areas.

3.1 Direct Economic Impact

Direct economic impact is defined as the employment, payroll, and local expenditures of all organizations located at the Airport directly dependent on aviation, including passenger airlines, cargo airlines, fixed base operators, passenger terminal concessionaires, government agencies, rental car companies, and other aviation support businesses.

Employment. Figure 5 and Table 3 present summaries of on-Airport employment and payroll by industry and show on-Airport tenant expenditures by industry. The data reported represent a combination of data furnished by survey respondents and estimates to account for nonresponses. As shown on Figure 5 and in Table 3, 1,685 people were employed by on-Airport organizations in 2004.

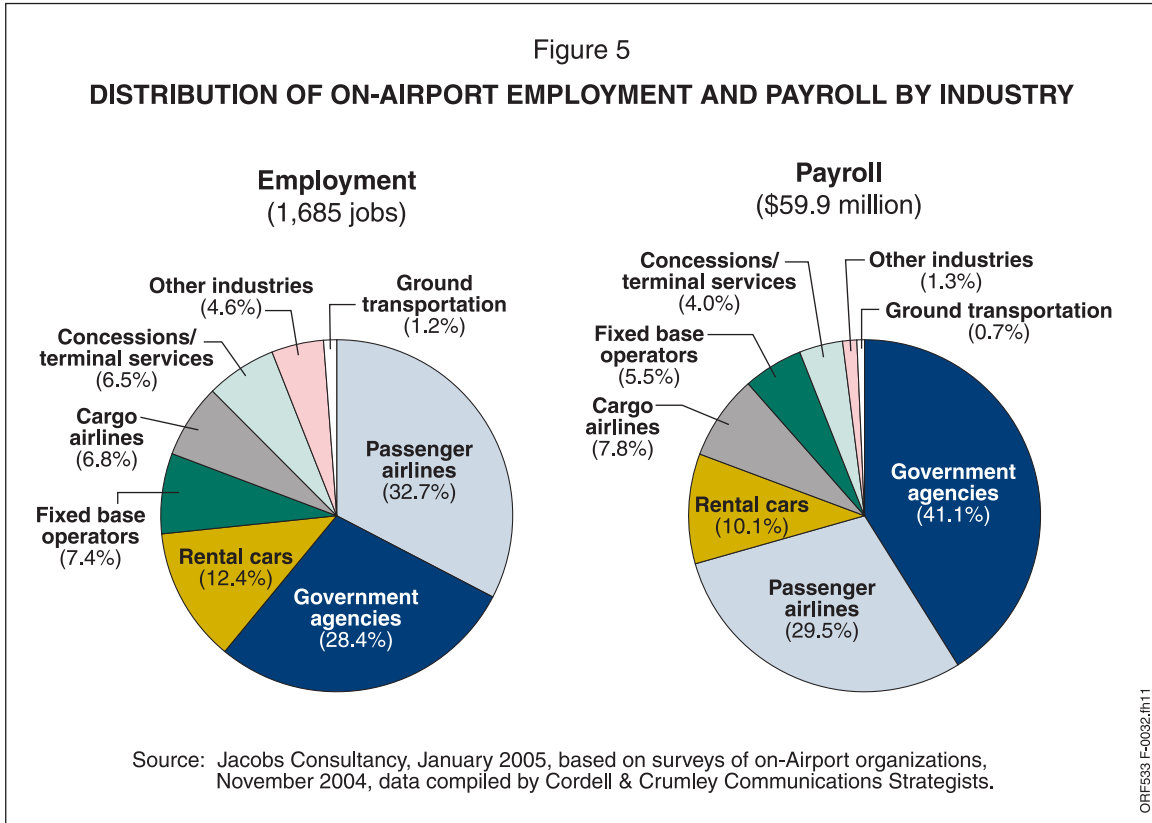


Table 3
ESTIMATED DIRECT ECONOMIC IMPACT BY INDUSTRY IN 2004

Type of organization	Number of on-Airport employees	(millions)		
		Payroll (a)	+ Expenditures (b)	= Direct economic impact
Airlines				
Passenger	551	\$17.6	\$ 6.0	\$ 23.6
Cargo	<u>115</u>	<u>4.7</u>	<u>2.9</u>	<u>7.6</u>
	666	\$22.3	\$ 8.9	\$ 31.2
Terminal concessionaires				
Concessionaires/ terminal services	109	\$ 2.4	\$ 5.5	\$ 7.9
Rental car companies	<u>209</u>	<u>6.1</u>	<u>37.7</u>	<u>43.8</u>
	318	\$ 8.5	\$43.2	\$ 51.7
Other				
Ground transportation	20	\$ 0.4	\$ 0.3	\$ 0.7
Fixed base operators	125	3.2	2.4	5.6
Government agencies	479	24.7	21.4	46.1
Other industries	<u>77</u>	<u>0.8</u>	<u>0.2</u>	<u>1.0</u>
	<u>701</u>	<u>\$29.1</u>	<u>\$24.3</u>	<u>\$ 53.4</u>
Total	1,685	\$59.9	\$76.4	\$136.3

(a) Includes wages, salaries, and proprietors' income.

(b) Includes any other local expenditures.

Sources: Jacobs Consultancy, January 2005, based on surveys of on-Airport organizations, November 2004; data compiled by Cordell & Crumley Communications Strategists.

On-Airport employment has increased steadily since 1997 (2.3% per year on average). The greatest increase has been in governmental agencies, which grew by 23.5% from 1997. A majority of this increase can be attributed to the creation of the Transportation Security Administration (TSA), which oversees baggage and passenger screening at the Airport. In addition, the number of people employed by the passenger airlines has increased since 1997 due to new service from Southwest Airlines (2001) as well as expansion by other carriers.

Table 4 presents the direct impact on employment by municipality in the Airport Service Region in 1997 and 2004. While the percent of direct impact on employment in Virginia Beach was at 37% in both 1997 and 2004, the percent of direct impact on employment in Norfolk decreased by 5% from 36% in 1997 to 31% in 2004.

Table 4

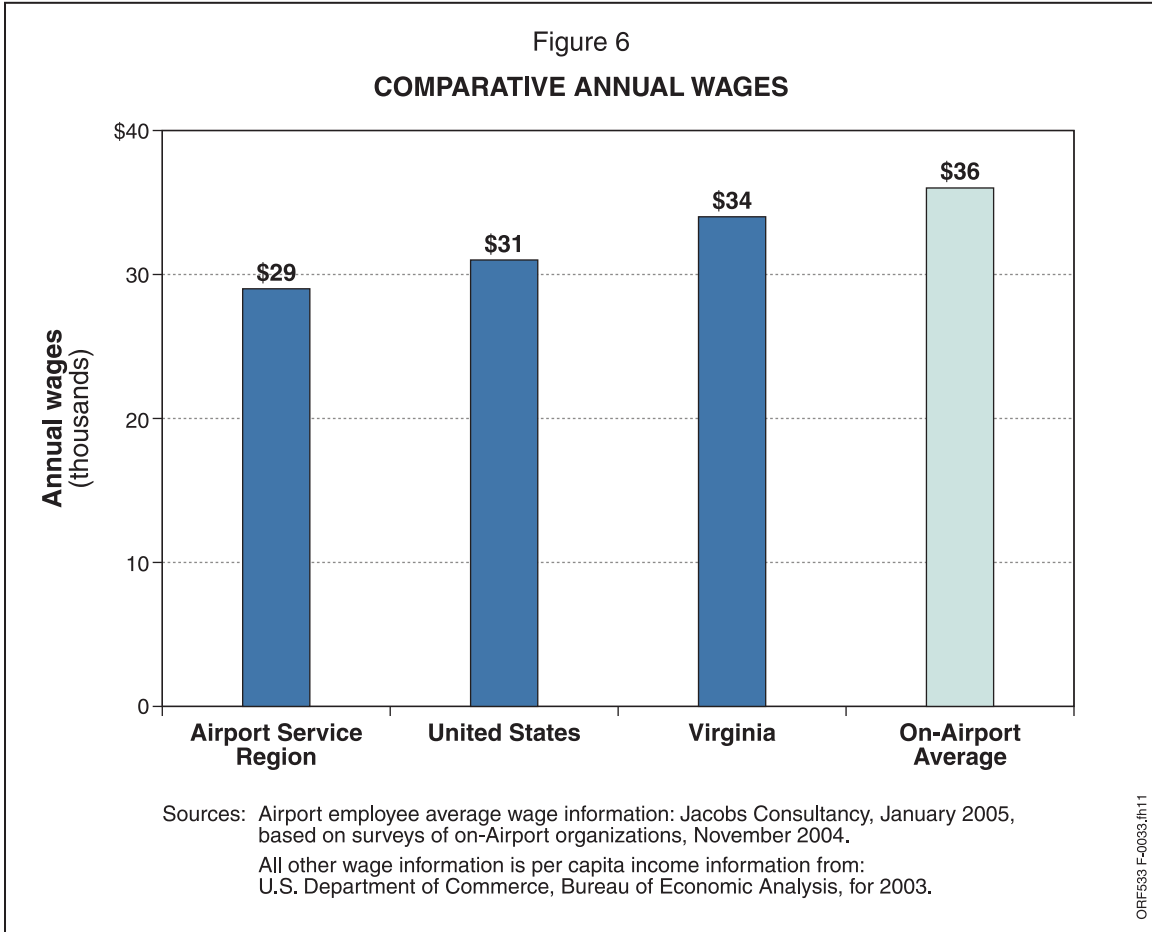
**DIRECT IMPACT ON EMPLOYMENT BY MUNICIPALITY
IN THE AIRPORT SERVICE REGION IN 2004**

Municipality	1997		2004	
Norfolk	36%	518	31%	516
Virginia Beach	37	532	37	631
Chesapeake	16	230	15	252
Portsmouth	2	29	5	77
Suffolk	1	14	3	47
Hampton	3	43	4	69
Newport News	3	43	3	58
North Carolina	na	na	1	11
Other	<u>2</u>	<u>29</u>	<u>1</u>	<u>24</u>
Total	100%	1,439	100%	1,685

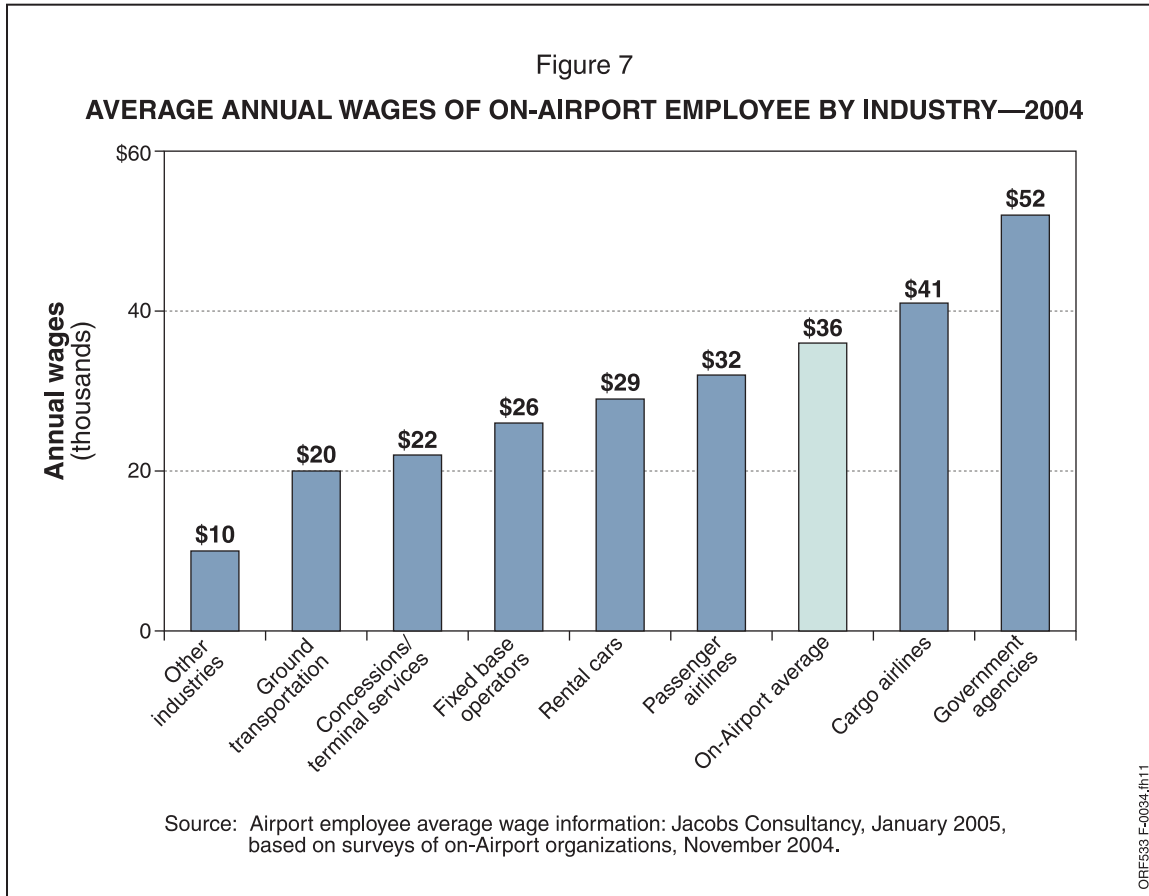
Sources: 1997: *The Economic Impact of Norfolk International Airport*, The Technology and Planning Group, Inc., March 1998; 2004: Jacobs Consultancy interpretation of data provided by the Airport Authority.

Payroll. As shown in Table 3, payroll paid to employees of on-Airport organizations totaled about \$60 million in 2004, an increase of \$16 million compared with the \$44 million in payroll in 1997. Payroll has increased faster between 1997 and 2004 (4.5%) than between 1992 and 1997 (1.1%), attributable to increases in passengers and types of services provided at the Airport since 1997.

Payroll expenditures are increasing faster than employment levels due to inflation and overall increases in the average salary received by on-Airport employees over the same timeframe. The average salary for on-Airport employees was \$27,374 in 1992; \$30,535 in 1997; and \$35,576 in 2004. As illustrated on Figure 6, the estimated average wage per on-Airport employee was 24.1% higher than the per capita income for the Airport Service Region and 5.9% higher than that of the Commonwealth of Virginia.

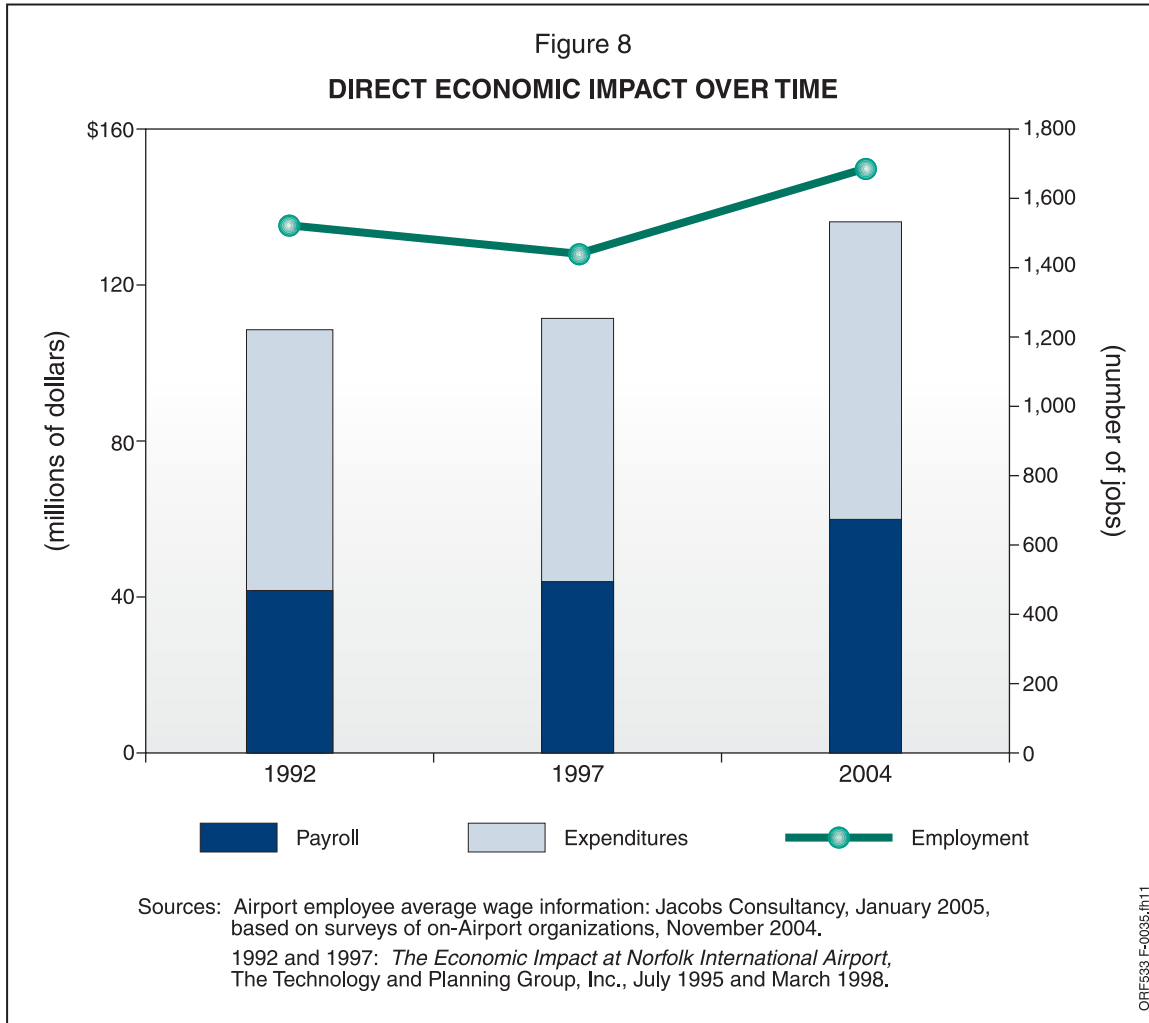


The distribution of the average annual salaries paid to on-Airport employees by industry is shown on Figure 7. Government agencies provide some of the highest paying jobs on-Airport, representing only 28.4% of employees but 41.1% of payroll at the Airport.



Expenditures. Non-payroll expenditures by on-Airport organizations were about \$76 million in 2004 compared with \$68 million in 1997 and \$67 million in 1992. While expenditures grew between 1997 and 2004 (1.8% increase per year), expenditures are a smaller portion of total direct economic impact in 2004 (56.0%) than in 1997 (60.6%).

Total Direct Economic Impact. Overall, the payroll and non-payroll local expenditures of on-Airport businesses—the direct economic impact of the Airport—totaled an estimated \$136 million in 2004, a 22.4% increase from 1997 (\$111 million). Commensurate with payroll, expenditures, and passengers, total direct economic impact grew at an annual average rate of 2.9% between 1997 and 2004, as shown on Figure 8. This growth rate is significantly higher than the 0.5% growth rate between 1992 and 1997.



3.2 Indirect Economic Impact

The indirect impact of the Airport is defined in this evaluation as the spending made locally by air passenger visitors while in the Airport Service Region and in the Commonwealth of Virginia.

The number of air passenger visitors was estimated using enplaned passenger information from the Authority and out-of-state passenger data from the Booney & Company survey. Using out-of-state passengers to estimate the number of visitors does not account for visitors living inside the Commonwealth of Virginia but outside the Airport Service Region. Information regarding visitors who reside outside the Airport Service Region, but in the Commonwealth of Virginia (such as the Washington, D.C. area) is not available. On the basis of data interpreted from the Booney & Company survey of Airport passengers, such visitors represent a small portion of total air passenger visitors. Not accounting for these air passenger visitors understates the indirect economic impact.

According to data provided by the Authority, the number of enplaned passengers at the Airport increased from 1,455,660 in 1997 to 1,891,797 in 2004. According to the Bonney & Company passenger survey, 41% of the passengers were out-of-state travelers. The Bonney & Company survey also found that the average visitor spent a total of \$868 during his or her trip. This spending includes amounts paid for car rentals on-Airport, which are already included in the direct economic impact. With approximately \$139 of visitor spending being transportation-related, the average visitor spent \$729 per trip off-Airport. On the basis of this information, air passenger visitors were estimated to spend about \$566 million in 2004, up from \$236 million in 1997. The number of jobs generated by this visitor spending also increased over the same period from 7,428 in 1997 to 12,580 in 2004.

Of the \$566 million spent by visitors in the Airport Service Region in 2004, an estimated \$211 million funded payroll for local employees. Employment generated by air passengers grew at an annual average rate of 7.6% from 1997 to 2004; whereas, air passenger visitor spending grew at a much faster annual average rate of 13.1% between 1997 and 2004.

While inflation is partly responsible for the higher growth rates of spending than employment, other factors contribute to why these aspects of the local economy were impacted more than employment. First, a moderate increase in impact on employment can be partly justified by the number of air passenger visitors to the Airport Service Region, increasing at an annual average rate of 3.7% between 1997 and 2004. This data suggests that normal hiring rates were sufficient to keep up with demand. Second, the dramatic increase in impact on spending can be largely justified by significant increases in the average amount spent per air passenger visitor per trip. As mentioned previously, the average amount spent per trip off-Airport in 2004 was estimated to be \$729, up from \$335 in 1997. The growth rate of the average amount spent per trip was 11.7% per year between 1997 and 2004.

Increased spending by visitors can be attributed to the higher annual average incomes of air travelers and longer average stays. According to a survey of Airport passengers published by Bonney & Company, the median annual household income of passengers interviewed at the Airport rose from \$52,100 in 1997 to \$64,100 in 2002. Between 2002 and 2003, however, the median household income of Airport passengers increased to \$75,000 for a 17.0% gain in one year, by far the largest increase since the study began. In 2004, the median household income was \$74,100, a slight decrease from record levels in 2003. The same survey also reports that non-local arriving passengers stayed an average of 3.9 nights in the area in 2004, compared with 3.5 nights in 1997. These findings suggest that the average air passenger visitor spends more money over a longer period of time, which would explain why visitor spending increased substantially more than employment from 1997 to 2004. Table 5 and Figure 9 present a breakdown of estimated visitor spending.

Table 5
VISITOR SPENDING BY TYPE

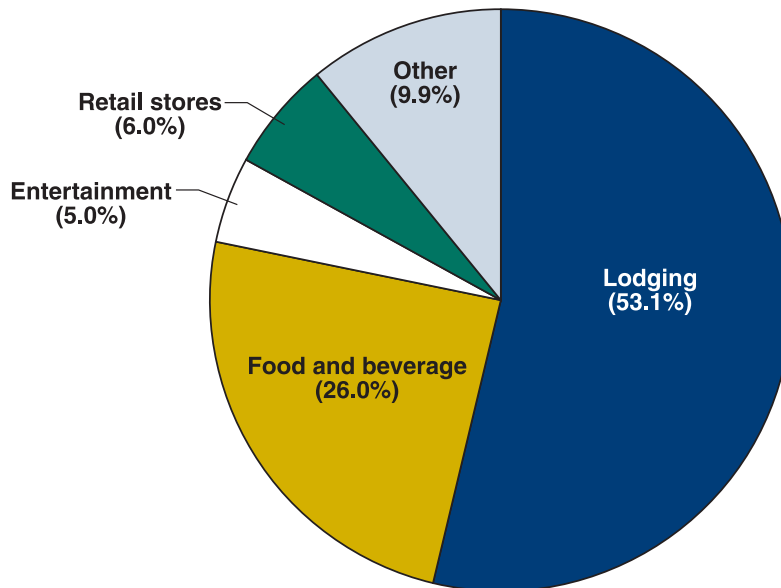
Type of expenditure	Amount (millions)		Percent of total	
	1997	2004	1997	2004
Lodging	\$133.9	\$299.7	56.8%	53.1%
Food and beverages	63.9	147.0	27.1	26.0
Entertainment	14.6	28.3	6.2	5.0
Retail stores	--	33.9	n.a.	6.0
Other (a)	<u>23.4</u>	<u>56.6</u>	<u>9.9</u>	<u>9.9</u>
Total	\$235.8	\$565.5	100.0%	100.0%

(a) Includes retail for 1997 data.

Source: 1997 – The Airport Technology and Planning Group, Inc., *The Economic Impact of Norfolk International Airport*, March 1998. Breakdown by type of expenditure derived by Jacobs Consultancy.

2004 – Jacobs Consultancy, based on data provided by the Norfolk, Virginia Convention and Visitors Bureau and contained in surveys of Airport passengers conducted by Cooney & Company, February 2004.

Figure 9
DISTRIBUTION OF VISITOR SPENDING



Sources: Jacobs Consultancy, based on data contained in surveys of Airport passengers conducted by Booney & Company, February 2004.

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Table 6 presents the indirect impact on employment by municipality in the Airport Service Region in 1997 and 2004. Like the change in direct impact on employment, the percent of indirect impact on employment in Norfolk also decreased by 5% from 36% in 1997 to 31% in 2004. The percent of indirect impact on employment in Virginia Beach, however, increased substantially from 18% in 1997 to 30% in 2004.

Table 6

**DIRECT IMPACT ON EMPLOYMENT BY MUNICIPALITY
IN THE AIRPORT SERVICE REGION IN 2004**

Municipality	1997		2004	
Norfolk	36%	4,928	31%	3,900
Virginia Beach	18	2,464	30	3,774
Chesapeake	7	958	12	1,510
Portsmouth	3	411	4	503
Suffolk	1	137	2	252
Hampton	12	1,643	6	755
Newport News	6	821	3	377
North Carolina	na	na	6	755
Other	<u>17</u>	<u>2,327</u>	<u>6</u>	<u>755</u>
Total	100%	13,689	100%	12,580

Sources: 1997: *The Economic Impact of Norfolk International Airport*, The Technology and Planning Group, Inc., March 1998; 2004: Jacobs Consultancy interpretation of data provided by the Booney & Company Airport passenger survey, February 2004.

3.3 Induced Economic Impact

As discussed previously, the induced impacts are defined in this evaluation as the additional local business that is generated specifically because of the Airport's presence, including related employment, payroll, and employer expenditures. Induced impact also includes the successive rounds of spending caused by the direct and indirect impacts. This "multiplier effect" measures the extent to which the indirect and induced impacts flow from the direct impact. Table 7 presents the induced economic impacts of the Airport on the Airport Service Region and the Commonwealth of Virginia, respectively.

Table 7
INDUCED ECONOMIC IMPACT IN 2004

Source of impact	Employment	Local expenditures (millions)		
		Payroll	Expenditures	Total
Airport Service Region				
On-Airport tenants	2,672	\$ 67.6	\$ 76.3	\$143.9
Air passenger visitors	<u>5,339</u>	<u>148.2</u>	<u>363.0</u>	<u>511.2</u>
Total induced impact	8,011	\$215.8	\$493.3	\$655.1
Commonwealth of Virginia				
On-Airport tenants	2,829	\$ 74.2	\$ 76.7	\$150.9
Air passenger visitors	<u>7,316</u>	<u>161.2</u>	<u>411.1</u>	<u>572.3</u>
Total induced impact	10,145	\$235.4	\$487.8	\$723.2

Source: Jacobs Consultancy, December 2005.

Airport Service Region Induced Economic Impact. Off-Airport companies providing supplies and services to businesses located on-Airport were estimated to employ 2,672 people with a total payroll of about \$68 million in 2004 for an induced economic impact of \$144 million in the Hampton Roads Area. In 1997, off-Airport companies were estimated to have employed 1,712 people with a total payroll of \$37 million for an induced economic impact of \$104 million.

The induced impact of visitors arriving at the Airport, whose destination was in the Airport Service Region, contributed to an additional \$511 million locally, increasing from \$337 million in 1997. An estimated \$148 million of this induced impact was used toward payroll, creating an additional 5,339 jobs.

Commonwealth of Virginia Induced Economic Impact. Off-Airport companies in Virginia, but outside of the Airport Service Region, which provide supplies and services to organizations located on-Airport, employed an additional 157 people in 2004, for a total induced employment of 2,829 in Virginia that can be attributed to the Airport. These organizations created an additional induced impact of \$7 million, for a total induced impact of approximately \$151 million. An additional \$7 million is estimated to have been used toward payroll, for a total induced impact on payroll of \$74 million.

The induced impact of visitors arriving at the Airport, whose destination was the Commonwealth of Virginia but was outside the Airport Service Region, contributed to the employment of an additional 1,977 people, for a total induced employment of

7,316 in Virginia that can be attributed to the Airport. Air passenger visitors to Virginia also spent an additional \$61 million outside the Airport Service Region, for a total induced visitor impact of \$572 million. An additional \$13 million was used toward payroll, for a total induced impact on payroll of \$161 million.

Total Induced Economic Impact. The total induced impact of the Airport on the economy of the Airport Service region totaled an estimated \$655 million in 2004. The total induced impact of the Airport on the economy of the Commonwealth of Virginia totaled an estimated \$723 million in 2004.

3.4 Total Economic Impact

Total economic impact is the sum of direct, indirect, and induced impacts. The multiplier effect measures the extent to which the induced impact flows from the direct and indirect impacts. Thus, the direct employment and expenditures of on-Airport employers and indirect expenditures of all visitors “multiply” themselves throughout the regional economy, resulting in the total impact (or contribution) of Airport activity.

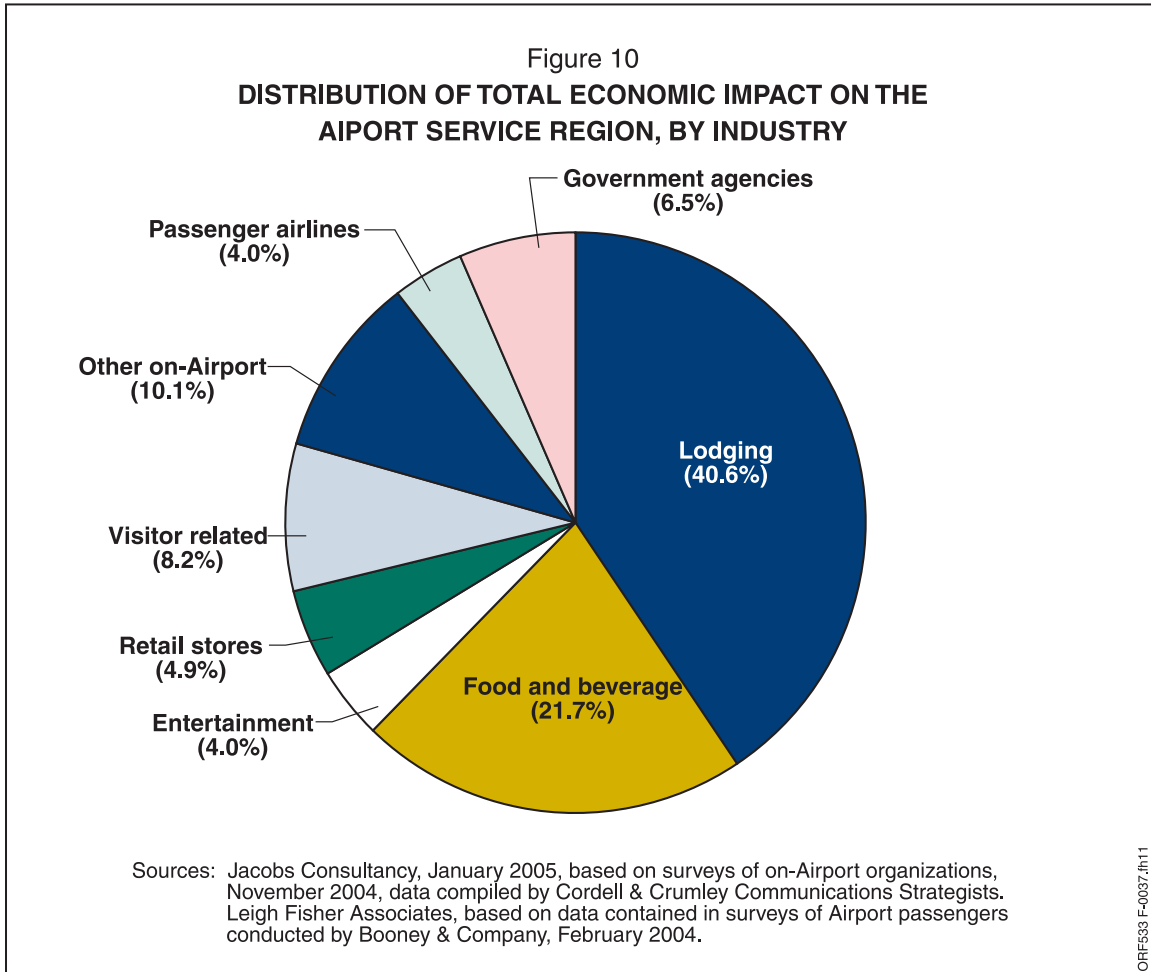
Airport Service Region Total Economic Impact. The overall contribution of Airport activity to the economy of the Airport Service Region is summarized in Table 8 and detailed on Figure 10 and in Table 9. The total economic impact—direct, indirect, and induced—in 2004 is estimated to be approximately \$1.36 billion, compared with \$795 million in 1997.

Table 8

TOTAL ECONOMIC IMPACT ON THE AIRPORT SERVICE REGION IN 2004

	Employment	Local expenditures (millions)		
		Payroll	Expenditures	Total
Direct	1,685	\$ 59.9	\$ 76.4	\$ 136.3
Indirect	12,580	210.9	354.6	565.5
Induced	<u>8,011</u>	<u>215.8</u>	<u>439.3</u>	<u>655.1</u>
Total	22,276	\$486.6	\$870.3	\$1,356.9

Source: Jacobs Consultancy, December 2005.



The total impact on employment estimated to result from direct employment is also presented in Table 9. In 2004, a total of 22,276 (16,839 in 1997) direct, indirect, and induced jobs are estimated to result from the direct employment of 1,685 people (1,439 in 1997). In terms of total impact on employment, one job was created for every 5.3 aircraft movements. In 2004, the total impact on employment was 2.9% of the Airport Service Region's total employment.

The total economic impact in terms of payroll is estimated to be about \$487 million in 2004 (\$300.6 million in 1997), or 35.9% of the total economic impact of \$1.36 billion.

Figure 11 illustrates the historical relationship between growth in the numbers of enplaned passengers and growth in area employment and economic impact in the Airport Service Region. As illustrated, employment in the Airport Service Region related to the Airport has increased at a rate consistent with enplaned passengers, while the total economic impact of the Airport grew at a rate that was approximately double that of enplaned passengers.

Table 10 compares the total economic impact of the Airport on the Airport Service Region in 1992, 1997, and 2004.

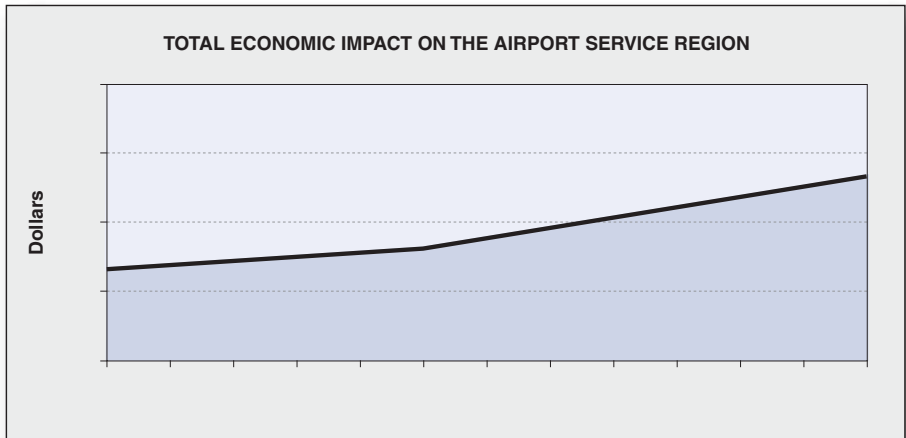
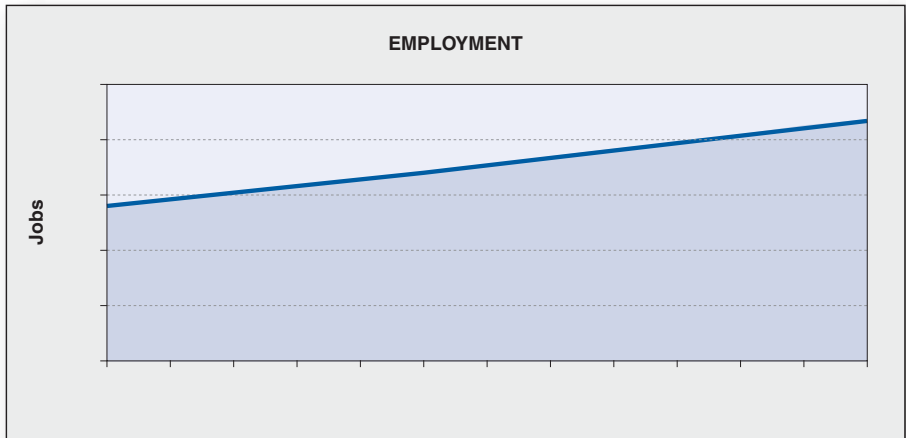
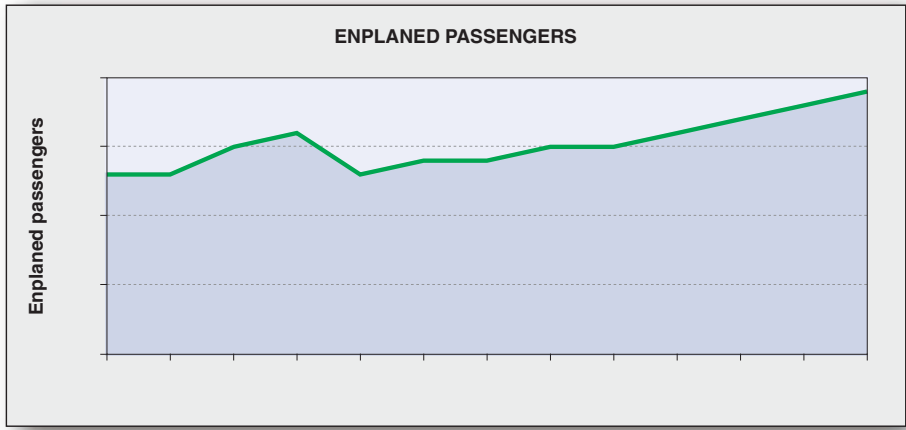
Table 9
**ESTIMATED TOTAL ECONOMIC IMPACT BY INDUSTRY IN 2004
 IN THE AIRPORT SERVICE REGION**

Type of organization	Number of employees	(millions)			Total economic impact
		Payroll (a)	+	Expenditures (b)	
On-Airport (Direct and Induced)					
Airlines					
Passenger	1,916	\$ 41.0		\$ 12.8	\$ 53.8
Cargo	<u>400</u>	<u>10.8</u>		<u>6.2</u>	<u>17.0</u>
	2,316	\$ 51.8		\$ 19.0	\$ 70.8
Terminal concessionaires					
Concessionaires/ terminal services					
	157	\$ 4.2		\$ 10.9	\$ 15.1
Rental car companies	<u>287</u>	<u>10.9</u>		<u>77.8</u>	<u>88.7</u>
	444	\$ 15.1		\$ 88.7	\$ 103.8
Other					
Ground transportation	27	\$ 0.7		\$ 0.5	\$ 1.2
Fixed base operators	435	7.6		5.0	12.6
Government agencies	1,011	50.9		39.0	89.9
Other industries	<u>123</u>	<u>1.5</u>		<u>0.4</u>	<u>1.9</u>
	<u>1,597</u>	<u>\$ 60.7</u>		<u>\$ 44.9</u>	<u>\$ 105.6</u>
Subtotal on-Airport	<u>4,357</u>	<u>\$127.6</u>		<u>\$152.6</u>	<u>\$ 280.2</u>
Air Passenger Visitors (Indirect and Induced)					
Lodging	8,726	\$183.0		\$367.2	\$ 550.2
Food and beverages	5,838	100.9		193.4	294.3
Entertainment	1,038	18.8		35.1	53.9
Retail Stores	997	23.0		43.9	66.9
Other (b)	<u>1,320</u>	<u>33.3</u>		<u>78.1</u>	<u>111.4</u>
Subtotal Air Passenger Visitors	<u>17,919</u>	<u>\$359.0</u>		<u>\$717.7</u>	<u>\$1,076.7</u>
Total economic impact	22,276	\$486.6		\$870.3	\$1,356.9

(a) Includes wages, salaries, and proprietors' income.

(b) Includes any other local expenditures.

Sources: Jacobs Consultancy, January 2005, based on surveys of on-Airport organizations. November 2004; data compiled by Cordell & Crumley Communications Strategists.
 Data obtained from Hampton Roads Chamber of Commerce, March 2002. Bureau of Economic Analysis, Regional Input-Output Multiplier, RIMS II.



The Economic Impact of Norfolk International Airport

**SUMMARY OF ENPLANED PASSENGERS,
EMPLOYMENT, AND TOTAL ECONOMIC IMPACT ON
THE AIRPORT SERVICE REGION FROM 1992-2004**

Table 10

TOTAL ECONOMIC IMPACT ON THE AIRPORT SERVICE REGION OVER TIME

	Employment			Payroll (millions)			Expenditures (millions) (a)			Total (millions)		
	1992	1997	2004	1992	1997	2004	1992	1997	2004	1992	1997	2004
Direct	1,521	1,439	1,685	\$ 41.6	\$ 43.9	\$ 59.9	\$ 66.9	\$ 67.5	\$ 76.4	\$108.5	\$111.4	\$ 136.3
Indirect	5,679	7,521	12,580	70.9	98.6	210.9	109.4	140.2	354.6	180.3	238.8	565.5
Induced (b)	<u>6,483</u>	<u>7,879</u>	<u>8,011</u>	<u>122.0</u>	<u>158.1</u>	<u>215.8</u>	<u>255.6</u>	<u>287.0</u>	<u>439.3</u>	<u>359.6</u>	<u>445.1</u>	<u>655.1</u>
Total	13,683	16,839	22,276	\$234.5	\$300.6	\$486.6	\$431.9	\$494.7	\$870.3	\$648.4	\$795.3	\$1,356.9

(a) Expenditures from 1992 and 1997 were not reported and were calculated by subtracting payroll from total.

(b) Due to differences in reporting methods for induced impacts, induced impacts for 1992 and 1997 were calculated by subtracting direct and indirect impact from total impact.

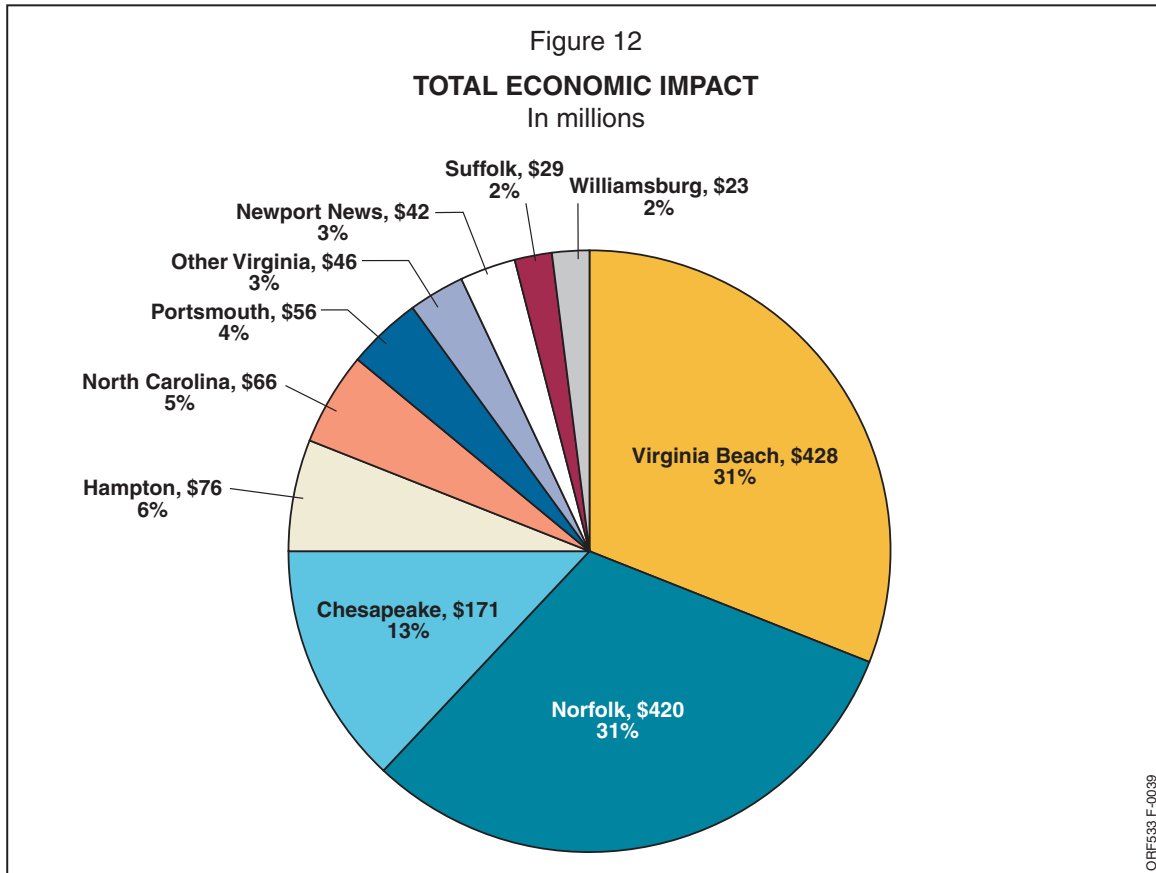
Sources: 1992 and 1997: *The Economic Impact of Norfolk International Airport*, The Technology and Planning Group, Inc., July 1995 and March 1998; 2004: Jacobs Consultancy.

Table 11 presents the total economic impact on employment, payroll, and output by municipality in the Airport Service Region in 1997 and 2004, and Figure 12 presents a distribution of total economic impact by municipality in the Airport Service Region in 2004. The total economic impacts in Virginia Beach, Chesapeake, Portsmouth, and Suffolk each increased by more than 11% per year from 1997 to 2004. The total economic impact in Newport News, however, increased by less than 1% over the entire 7-year period, and the total economic impact in Hampton decreased slightly over the same period. The total economic impact in Norfolk increased by 6% per year from 1997 to 2004.

Table 11
TOTAL ECONOMIC IMPACT BY MUNICIPALITY

Municipality	Employment		Payroll		Total	
	1997	2004	1997	2004	1997	2004
Norfolk	6,062	6,890	\$104,473,100	\$150,396,300	\$282,526,600	\$419,650,700
Virginia Beach	3,629	7,006	70,060,000	155,451,300	193,628,000	427,884,500
Chesapeake	1,462	2,801	30,319,700	62,124,400	65,568,500	171,030,400
Portsmouth	474	916	8,594,800	20,202,800	22,901,400	55,899,700
Suffolk	168	479	3,814,400	10,719,000	9,213,600	29,307,100
Hampton	1,738	1,254	28,136,000	26,767,300	76,262,000	76,076,500
Newport News	916	687	14,949,500	15,152,100	41,689,300	41,924,800
North Carolina	na	1,104	na	22,388,100	na	66,452,700
Other	<u>2,390</u>	<u>1,138</u>	<u>40,226,200</u>	<u>23,398,700</u>	<u>103,515,100</u>	<u>68,673,600</u>
Total	16,839	22,276	\$300,573,700	\$486,600,000	\$795,304,500	\$1,356,900,000

Sources: 1997: *The Economic Impact of Norfolk International Airport*, The Technology and Planning Group, Inc., March 1998; 2004: Jacobs Consultancy interpretation of data provided by the Airport Authority and the Booney & Company Airport passenger survey, February 2004.



Commonwealth of Virginia Total Economic Impact. The overall economic contribution of Airport activity on the economy of the Commonwealth of Virginia is summarized in Table 8. The total economic impact is estimated to be \$1.43 billion, as calculated using the input-output analysis described in Section 2. This represents an additional \$68 million in total economic impact in Virginia outside the Airport Service Region.

The total impact on employment in Virginia estimated to result from direct employment related to the Airport is also presented in Table 12. In 2004, a total of 24,410 direct, indirect, and induced jobs is estimated to result from the direct employment of 1,685, an additional 2,134 jobs created in Virginia outside the Airport Service Region.

The total economic impact in terms of wages in Virginia is estimated to equal \$506 million in 2004, an additional \$19 million in payroll for the 2,134 jobs in Virginia outside the Airport Service Area. These wages accounted for 35.5% of the total output of \$1.43 billion.

Table 12

TOTAL ECONOMIC IMPACT ON THE COMMONWEALTH OF VIRGINIA

	<u>Employment</u>	<u>Local expenditures (millions)</u>		
		<u>Payroll</u>	<u>Expenditures</u>	<u>Total</u>
Direct	1,685	\$ 59.9	\$ 76.4	\$ 136.3
Indirect	12,580	210.9	354.6	565.5
Induced	<u>10,145</u>	<u>235.4</u>	<u>487.8</u>	<u>723.2</u>
Total	24,410	\$506.2	\$918.8	\$1,425.0

Source: Jacobs Consultancy, December 2005.