VIRGINIA AIRPORT SYSTEM
Economic Impact Study

TECHNICAL REPORT

VIRGINIA DEPARTMENT OF AVIATION

VIRGINIA AIRPORT SYSTEM
ECONOMIC IMPACT STUDY

airporteconimpactva.com

Virginia Aviation System
Economic Impact Study

Prepared for

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Chapter 1. Study Introduction

Airports serve as the dynamic centers of business activity, supporting a wide range of industries beyond air transportation. These airports contribute to local, regional, and statewide economies by generating jobs, attracting investment, and enabling efficient movement of people and goods. Their presence enhances connectivity and strengthens the economic vitality of the communities they serve.

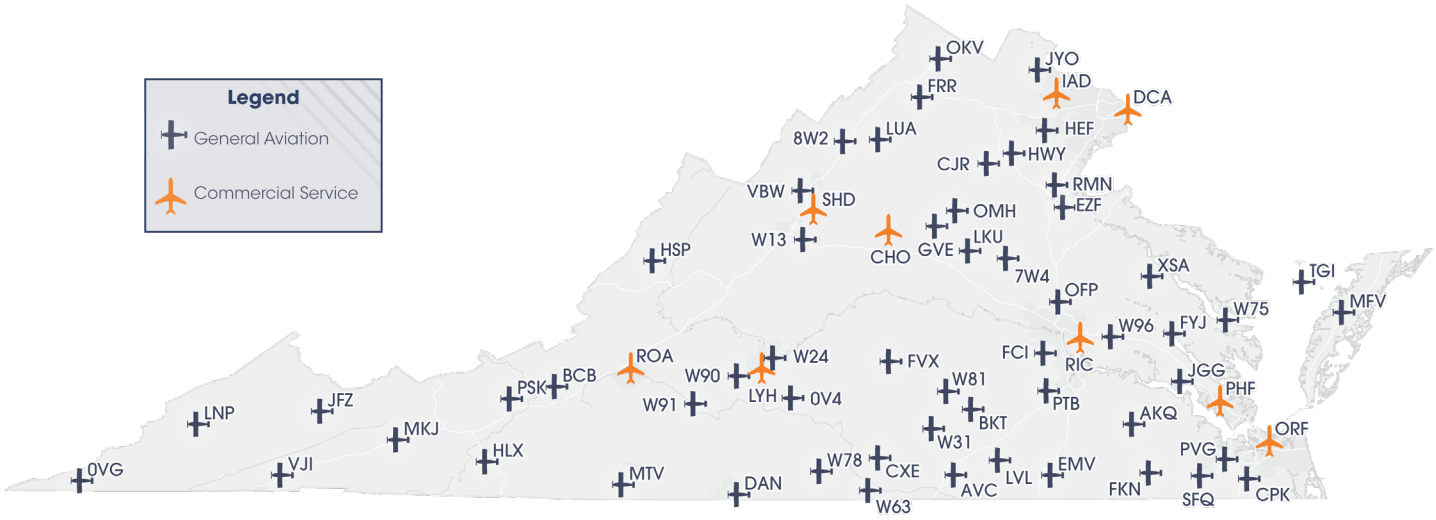
To display the role aviation plays within the Commonwealth's economy, the Virginia Department of Aviation (DOAV) launched the Virginia Airport System Economic Impact Study. This study quantifies the economic value of the State's airport system, offering clear, data-driven insights into how residents, businesses, and visitors rely on these facilities. Additionally, it serves as a strategic tool for airport stakeholders, including airport sponsors, legislators, and community leaders, providing them with the information needed to advocate for future investment and support.

1.1. Study Airports

The Virginia airport system (VAS) includes 65 airports across the state. Of these, 54 are publicly owned, 10 are privately owned, and one is military-owned—all designated for public use. These airports serve a range of functions and are classified by service level: either commercial service or general aviation (GA).

Virginia's nine commercial service airports provide direct connections to five continents, linking the Commonwealth to global markets. The remaining 56 GA airports support non-commercial operations, including private and regional mobility along the East Coast, throughout the United States, and to international destinations. **Figure 1.1** illustrates the geographic distribution of these VAS airports, while **Table 1.1** organizes them by their associated cities.

Figure 1.1. Virginia Airport System



Source: Kimley-Horn, 2025

Table 1.1. Virginia Airport System

Associated City	Airport Name	FAA ID	Ownership
Commercial Service			
Charlottesville	Charlottesville-Albemarle	CHO	Public
Lynchburg	Lynchburg Regional	LYH	Public
Newport News	Newport News-Williamsburg International	PHF	Public
Norfolk	Norfolk International	ORF	Public
Richmond	Richmond International	RIC	Public
Roanoke	Roanoke-Blacksburg	ROA	Public
Staunton/Waynesboro/ Harrisonburg	Shenandoah Valley Regional	SHD	Public
Washington	Dulles International	IAD	Public
Washington	Ronald Reagan Washington National	DCA	Public
General Aviation			
Abingdon	Virginia Highlands	VJI	Public
Blacksburg	Virginia Tech Montgomery Executive	BCB	Public
Blackstone	Allen C. Perkinson Municipal	BKT	Army
Bridgewater	Bridgewater Air Park	VBW	Private
Brookneal	Brookneal-Campbell County	0V4	Public
Bumpass	Lake Anna	7W4	Private
Chase City	Chase City Municipal	CXE	Public
Clarksville	Lake Country Regional	W63	Public
Crewe	Crewe Municipal	W81	Public
Culpeper	Culpeper Regional	CJR	Public
Danville	Danville Regional	DAN	Public
Dublin	New River Valley	PSK	Public
Emporia	Emporia-Greensville Regional	EMV	Public
Farmville	Farmville Regional	FVX	Public
Forest	New London	W90	Private
Franklin	Franklin Regional	FKN	Public
Fredericksburg	Shannon	EZF	Private
Front Royal	Front Royal-Warren County	FRR	Public
Galax/Hillsville	Twin County	HLX	Public
Gordonsville	Gordonsville Municipal	GVE	Public
Hot Springs	Ingalls Field	HSP	Public
Jonesville	Lee County	0VG	Public
Kenbridge	Lunenburg County	W31	Public

Associated City	Airport Name	FAA ID	Ownership
Lawrenceville	Brunswick Municipal	LVL	Public
Leesburg	Leesburg Executive	JYO	Public
Louisa	Louisa County	LKU	Public
Luray	Luray Caverns	LUA	Public
Lynchburg	Falwell	W24	Private
Manassas	Manassas Regional	HEF	Public
Marion/Wytheville	Mountain Empire	MKJ	Public
Martinsville	Blue Ridge Regional	MTV	Public
Melfa	Accomack County	MFV	Public
Moneta	Smith Mountain Lake	W91	Private
New Market	New Market	8W2	Private
Norfolk	Chesapeake Regional	CPK	Public
Norfolk	Hampton Roads Executive	PVG	Private
Orange	Orange County	OMH	Public
Petersburg	Dinwiddie County	PTB	Public
Quinton	New Kent County	W96	Public
Richlands	Tazewell County	JFZ	Public
Richmond	Richmond Executive-Chesterfield County	FCI	Public
Richmond/Ashland	Hanover County Municipal	OFP	Public
South Boston	William M. Tuck	W78	Public
South Hill	Mecklenburg-Brunswick Regional	AVC	Public
Stafford	Stafford Regional	RMN	Public
Suffolk	Suffolk Executive	SFQ	Public
Tangier	Tangier Island	TGI	Public
Tappahannock	Tappahannock-Essex County	XSA	Public
Topping	Hummel Field	W75	Public
Wakefield	Wakefield Municipal	AKQ	Public
Warrenton	Warrenton-Fauquier	HWY	Public
Waynesboro	Eagles Nest	W13	Private
West Point	Middle Peninsula Regional	FYJ	Public
Williamsburg	Williamsburg-Jamestown	JGG	Private
Winchester	Winchester Regional	OKV	Public
Wise	Lonesome Pine	LNP	Public

Source: FAA-ADIP[1]; Kimley-Horn, 2025

[1] Data primarily sourced from the FAA's Airport Data and Information Portal (ADIP) with minor updates and clarifications based on publicly available information from the airport's website.

Chapter 2. Aviation Activity and Industry Trends in Virginia

Aviation activity, including operations and passenger traffic, remains a cornerstone of employment and economic vitality at Virginia's airports. Since the previous statewide economic impact study was published in 2018, the aviation industry has undergone significant changes driven by market dynamics, global events, and evolving consumer behavior. Understanding these changes is essential to interpreting the economic impacts presented in this report.

In 2024, Virginia's nine commercial service airports welcomed nearly 23,000,000 passengers, reflecting the critical role these facilities play in connecting the Commonwealth to national and global markets. While commercial airports dominate passenger traffic, GA operations continue to provide vital connectivity and support for business activity across Virginia's 65 airports.

This chapter provides the industry context necessary to evaluate the economic impact results by comparing current aviation activity to 2016, the baseline year for the previous study. By examining trends in operations and passenger activity, we can better understand the drivers behind Virginia's aviation-related economic contributions. Specifically, this chapter will review:

- Changes in passenger traffic at Virginia's commercial airports—highlighting growth at eight of the nine airports.
- Changes in airline activity at commercial airports—illustrating the emergence of ultra low-cost carriers (ULCC) at small hub airports.
- Aviation issues impacting passenger traffic and service levels—discussing the impacts of COVID-19 and resulting challenges.
- Changes in GA activity—reviewing the return to growth in GA.
- Changes in air freight and cargo—examining the influence of e-commerce on cargo volumes.
- Changes in socio-economic factors—exploring demographic and economic trends that drive air travel demand in Virginia.

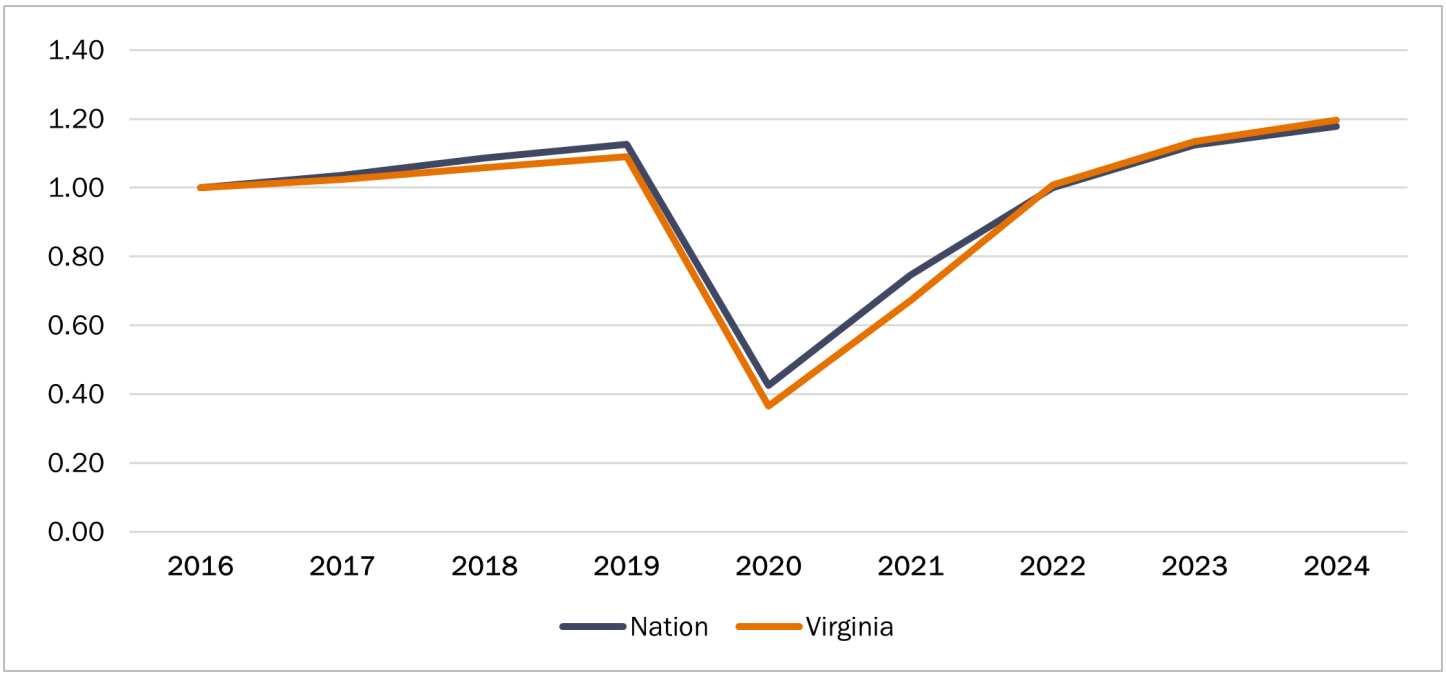
By providing this context, the chapter sets the stage for understanding how industry trends, external shocks, and market developments have shaped Virginia's aviation landscape since the last study. These insights are critical for interpreting the economic impact findings and informing future planning and policy decisions.

2.1. Changes in Passenger Traffic at Virginia's Commercial Service Airports

As shown in **Figure 2.1**, Virginia's passenger traffic has mirrored national trends while outperforming them in key areas. Since 2016, passenger volumes nationwide grew by 18 percent, but Virginia's commercial service airports exceeded that pace with a 20-percent increase. Like the rest of the country, Virginia experienced a sharp decline in 2020 due to the COVID-19 pandemic. However, the Commonwealth's recovery has been exceptional: by 2024, passenger levels were 10 percent above 2019 volumes, double the national growth rate.

In total, Virginia's commercial service airports enplaned 31,000,000 passengers in 2024, an increase of more than 5,000,000 enplanements since 2016. This growth underscores the resilience of Virginia's aviation sector and its critical role in supporting economic activity and connectivity across the state.

Figure 2.1. Commercial Service Passengers at US and Virginia Airports, Indexed to 2016 (CY 2016-CY 2024)



Source: United States Department of Transportation (USDOT) T-100, Indexed to 2016

Since the previous study, eight of Virginia's nine commercial service airports have posted gains in passenger enplanements, signaling broad-based growth across the Commonwealth. The two large hub airports—Ronald Reagan Washington National (DCA) and Washington Dulles International (IAD)—accounted for the largest absolute increases, reinforcing their role as Virginia's primary gateways.

Beyond the hubs, growth at the smaller airports has been striking. All other commercial service airports grew by an average of 36 percent since 2016, driven in part by expanded service from ULCC. As shown in **Table 2.1**, Richmond International (RIC) and Norfolk International (ORF) led the surge, with enplanements up 45 percent on average—underscoring the competitive impact of ULCCs in these markets.

Not all airports shared in the gains. Newport News-Williamsburg (PHF) saw enplanements decline by 66 percent, primarily due to Delta Air Lines' exit and reduced daily operations by American Airlines. This sharp contrast highlights the vulnerability of smaller airports to carrier decisions and market shifts.

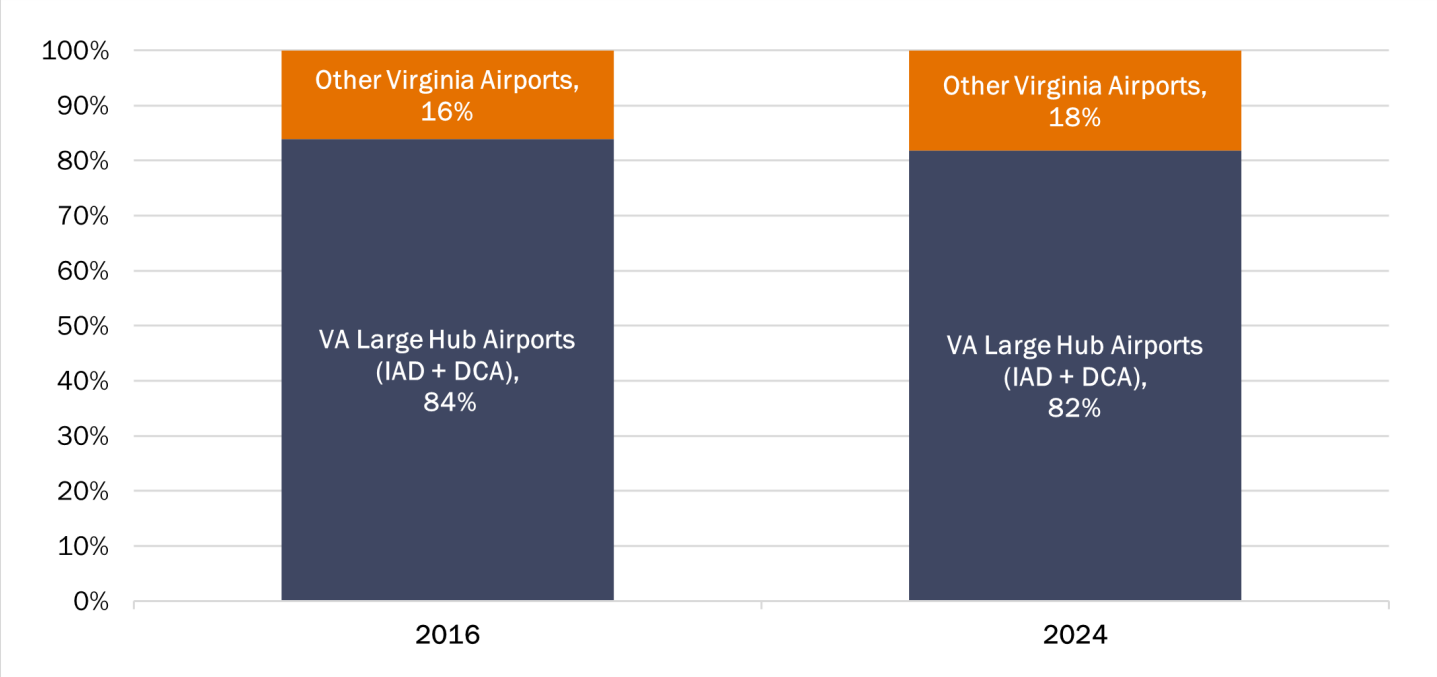
Table 2.1. Passenger Enplanements at Virginia's Commercial Service Airports (CY 2016 vs. CY 2024)

Airport Name	FAA ID	Hub Size	Enplanements		Absolute Change	Percent Change
			CY 2016	CY 2024		
Ronald Reagan Washington National	DCA	Large	11,434,899	12,650,423	1,215,524	11%
Washington Dulles International	IAD	Large	10,540,988	12,997,606	2,456,619	23%
Norfolk International	ORF	Small	1,590,840	2,409,964	819,124	51%
Richmond International	RIC	Small	1,747,416	2,419,566	672,151	38%
Charlottesville-Albemarle	CHO	Non	291,341	344,664	53,323	18%
Lynchburg Regional	LYH	Non	74,962	78,996	4,034	5%
Newport News-Williamsburg International	PHF	Non	198,211	67,719	-130,492	-66%
Roanoke-Blacksburg Regional	ROA	Non	298,055	374,313	76,258	26%
Shenandoah Valley Regional	SHD	Non	6,769	7,561	793	12%
Total Virginia		**N/A**	**26,183,478**	**31,350,810**	**5,167,332**	**20%**
Total US		**N/A**	**467,886,475**	**551,156,123**	**83,269,648**	**18%**

Source: US DOT T-100; Nondirectional Average

As shown in **Figure 2.2**, IAD and DCA dominate Virginia's air travel market, accounting for 82 percent of all passengers in 2024. This overwhelming share has remained remarkably stable since 2016, underscoring the critical role these two large hub airports play in connecting the Commonwealth to national and international destinations.

Figure 2.2. Virginia's Large Hub Airports Share of Virginia's Passengers (CY 2016 vs. CY 2024)



Source: USDOT T-100

2.2. Changes in Airline Activity at Commercial Service Airports

As shown in **Table 2.2**, overall departures at Virginia's commercial service airports have remained essentially flat since 2016, while available seats grew by 17 percent. This shift reflects a clear trend toward larger aircraft and higher seating capacity, resulting in an increase in average seats per departure.

Among individual airports, ORF, Roanoke-Blacksburg (ROA), and the two large hubs—DCA and IAD—posted modest increases in departures of one to three percent. In contrast, three airports—Lynchburg Regional (LYH), Newport News-Williamsburg International (PHF), and Shenandoah Valley Regional (SHD)—experienced declines in both departures and seats. Notably, LYH saw enplanements rise even as departures and seats contracted by three percent, signaling improved load factors and more efficient operations. However, PHF and SHD faced sharper reductions, underscoring ongoing challenges for smaller airports in maintaining service levels.

Table 2.2. Commercial Service Departures and Seats at Virginia's Commercial Airports

FAA ID	2016		2024		# Change		% Change	
	Departures (Depts)	Seats	Depts	Seats	Depts	Seats	Depts	Seats
DCA	143,180	14,499,328	144,025	15,662,119	845	1,162,791	1%	8%
IAD	109,700	12,999,267	112,788	15,629,986	3,088	2,630,720	3%	20%
ORF	23,473	1,997,818	24,154	2,957,405	681	959,588	3%	48%
RIC	25,143	2,148,518	24,766	2,932,032	(378)	783,514	-2%	36%
CHO	6,824	356,254	6,603	416,799	(222)	60,546	-3%	17%
LYH	1,965	97,780	1,897	94,850	(68)	(2,930)	-3%	-3%
PHF	4,171	256,281	1,627	81,350	(2,544)	(174,931)	-61%	-68%
ROA	6,785	377,984	6,848	454,859	64	76,875	1%	20%
SHD	810	29,061	590	17,637	(220)	(11,424)	-27%	-39%
Total Virginia	**322,049**	**32,762,289**	**323,297**	**38,247,037**	**1,248**	**5,484,748**	**0%**	**17%**

Source: USDOT T-100; Non-Directional Average

As shown in **Table 2.3**, the number of markets served and airlines operating at Virginia's commercial service airports has shifted notably since 2016. IAD and the small hub airports, RIC and ORF, saw increases in airline presence, while DCA and most non-hub airports experienced flat or declining service.

IAD strengthened its position as Virginia's international gateway, growing to 39 airlines in 2024, including 34 international carriers. United Airlines alone connects IAD to 54 international markets, reinforcing its global reach.

RIC and ORF benefitted from the expansion of ULCCs, adding Spirit Airlines and Breeze Airways to their rosters. These additions helped drive significant growth in connectivity: ORF added 10 new markets since 2016, while RIC added eight.

In contrast, three of Virginia's non-hub airports now rely on a single carrier serving one market, Charlotte Douglas International Airport (CLT), highlighting the vulnerability of smaller airports to airline consolidation and market shifts.

Table 2.3. Number of Airlines and Markets Served at Virginia Commercial Service Airports

FAA ID	Number of Markets Served			Number of Airlines		
	2016	2024	Change	2016	2024	Change
DCA	84	103	19	10	8	-2
IAD	118	128	10	37	39	2
ORF	17	27	10	4	6	2
RIC	18	26	8	6	8	2
CHO	6	5	-1	3	3	0
LYH	1	1	0	1	1	0
PHF	3	1	-2	2	1	-1
ROA	8	8	0	4	4	0
SHD	1	1	0	1	1	0

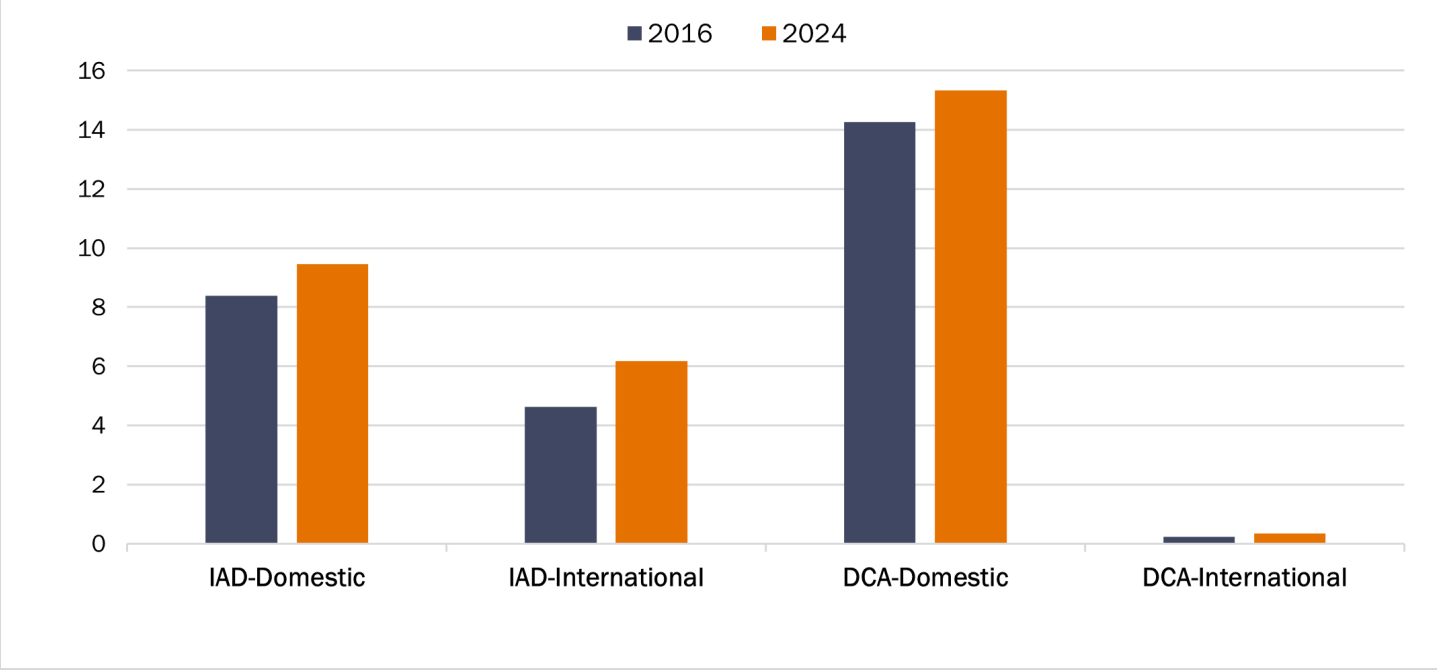
Note: Nonstop markets defined as two weekly departures to account for ULCC service
Source: Worldwide Schedules via Cirium

As one of United Airlines' hub airports, IAD has seen substantial growth in capacity since 2016; 26 percent domestically and 34 percent internationally. United remains the dominant carrier, connecting IAD to 54 international markets. Alaska Airlines has dramatically expanded its presence, growing by more than 400 percent and now serving four markets. IAD has also benefited from the rise of ULCCs, adding Allegiant and Breeze to its lineup.

However, growth has not been universal. JetBlue exited the market in 2019, and both American and Southwest have contracted significantly, by 66 percent and 40 percent, respectively. These reductions reflect competitive dynamics, as American maintains a hub at DCA and Southwest operates one of its largest focus cities just 56 miles away at Baltimore/Washington International (BWI).

Located closest to downtown Washington, DCA remains highly sought after by airlines. Since 2016, domestic seat capacity has grown seven percent, while international capacity surged 43 percent—though the airport remains overwhelmingly domestic, with 98 percent of seats serving US destinations. American Airlines operates as the largest carrier and connecting hub, accounting for 53 percent of all seat departures in 2024. American's seat capacity grew 15 percent since 2016, nearly double the airport's overall growth rate. Additional gains came from Air Canada, Alaska Airlines, Delta Air Lines, and Frontier Airlines, reinforcing DCA's role as a critical domestic gateway.

Figure 2.3. Virginia's Large Hub Seat Departures (CY 2016 vs. CY 2024, Millions)



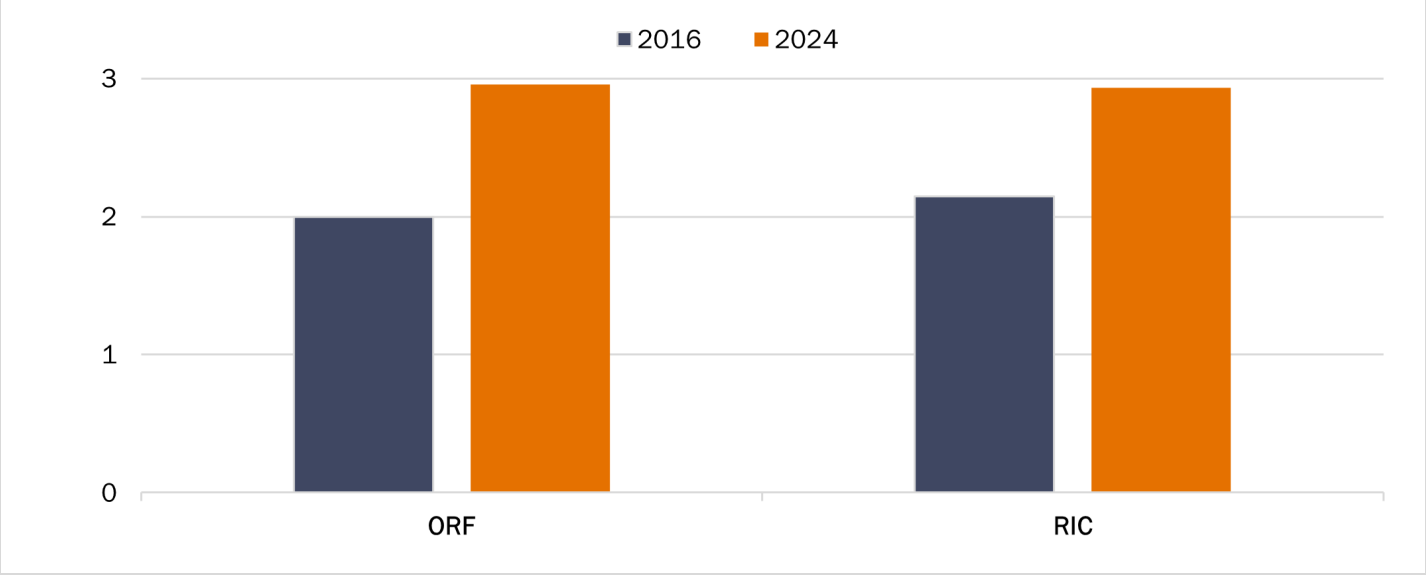
Source: USDOT T-100

As shown in **Figure 2.4**, both ORF and RIC have experienced strong growth since 2016, driven largely by new entrants and expanded service. Breeze Airways has been a key catalyst, accounting for 26 percent of seat capacity growth at ORF and 23 percent at RIC. Spirit Airlines also contributed to this upward trend, launching service at RIC in 2018 and at ORF in 2023.

Despite the rise of ULCCs, network carriers remain dominant at both airports, representing 67 percent of total seat capacity in 2024. At ORF, American Airlines leads with 29 percent of seat capacity, followed by Delta Air Lines at 23 percent. RIC shows a similar pattern: American Airlines holds the top position with 29 percent, Delta Air Lines follows at 27 percent, and United Airlines serves five markets but accounts for only 11 percent of capacity.

The growth of ULCCs has expanded access and stimulated competition, but the continued strength of network carriers highlights the importance of maintaining a balanced service mix to support both leisure and business travel demand.

Figure 2.4. Virginia Small Hub Airports Seat Departures (CY 2016 vs. CY 2024, Millions)



Source: USDOT T-100

As illustrated in **Figure 2.5**, Virginia's five non-hub airports have had varied experiences since 2016.

ROA is the largest non-hub airport and in 2024 was served by the three network carriers. Allegiant Air also provided ULCC service to two Florida markets. American Airlines was the largest carrier at ROA, accounting for 41 percent of seat departures. Overall, ROA's seat capacity has grown by 20 percent since 2016.

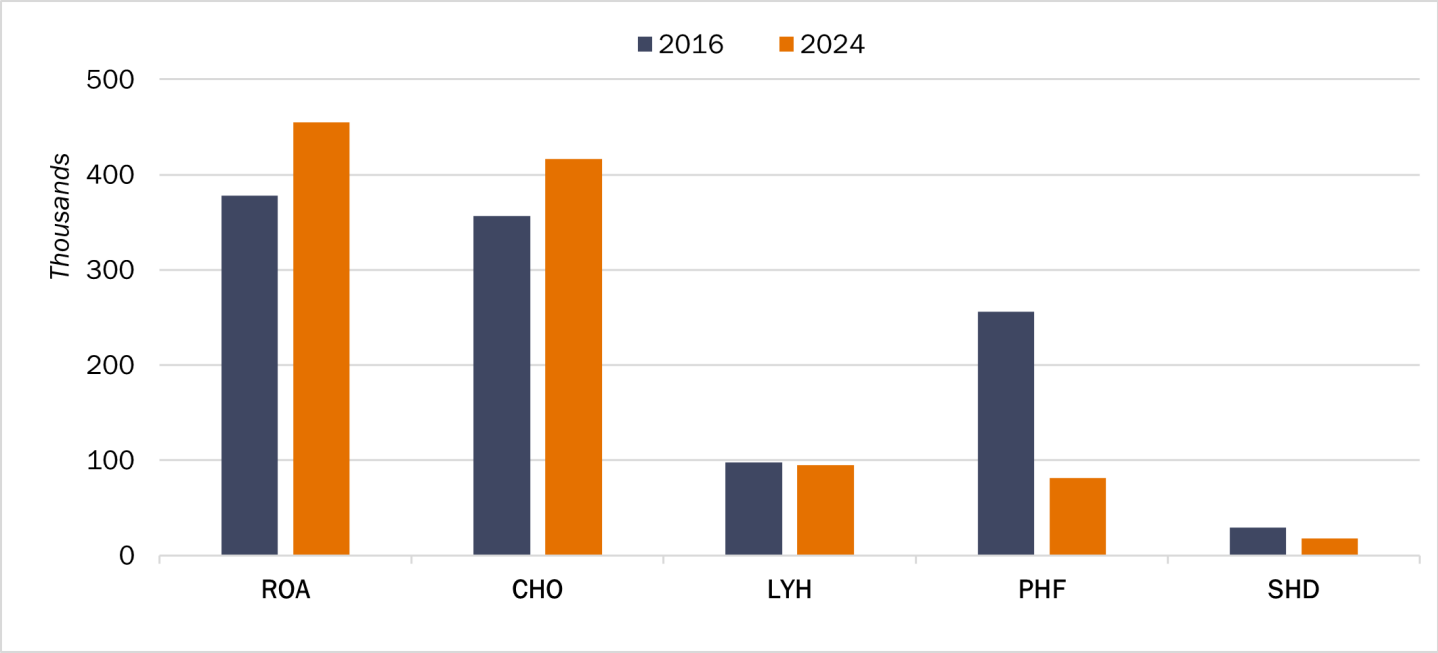
CHO was served by the three network carriers in 2024. American Airlines led with service to CLT and LGA, representing 39 percent of capacity, followed by Delta Air Lines at 38 percent with service to Hartsfield-Jackson Atlanta International Airport (ATL) and LaGuardia Airport (LGA). CHO's seat departures increased 17 percent since 2016, while operations declined by three percent, indicating a shift to larger aircraft.

LYH and PHF had more limited service. Both were served only by American Airlines to CLT in 2024. LYH's seat capacity declined slightly by three percent, maintaining five daily departures. PHF experienced a sharp 68 percent reduction in capacity compared to 2016 following Delta Air Lines' exit from ATL in 2020 and American Airlines' cancellation of Philadelphia International Airport (PHL) in 2022. In 2024, PHF operated four daily departures to CLT.

SHD, the only Virginia airport receiving subsidized service through the Essential Air Service (EAS) program, was served by Contour Airlines in 2024 with two daily departures to CLT under its partnership with American Airlines.

While ROA and CHO have maintained strong network carrier presence and modest growth, LYH, PHF, and SHD illustrate the vulnerability of smaller airports to carrier consolidation and route reductions, which can significantly impact regional connectivity.

Figure 2.5. Virginia's Non-Hub Airport Seat Departures (CY 2016 vs. CY 2024, Thousands)



Source: USDOT T-100

2.3. Aviation Issues Impacting Passenger Traffic and Service Levels

Since the last Virginia study in 2016, the commercial airline industry has undergone major changes, many of which were accelerated by the COVID-19 pandemic and continue to shape operations today. Additional factors include adjustments to DCA's slot and perimeter rule, the emergence of new carriers, and financial challenges within the ULCC segment. These issues are outlined below.

2.3.1. Impact of COVID-19

In 2020, US passenger traffic fell by 62 percent, forcing airlines to make rapid, unprecedented changes. Carriers exited markets, parked aircraft, retired fleets early, and restructured their networks—actions that disproportionately affected smaller communities. Virginia was not immune: passenger traffic declined by 66 percent in 2020. Yet by 2024, the Commonwealth had fully recovered to pre-pandemic levels, demonstrating resilience in the face of industry disruption.

COVID-19's impact extended beyond domestic travel. International demand, highly sensitive to global conditions, was among the last segments to rebound. This was particularly significant for IAD, where 45 percent of O&D passengers were tied to international markets. By 2024, IAD's international O&D traffic not only recovered but surged to 40 percent above 2016 levels. Statewide, international O&D grew from 7.8 million in 2016 to 10.6 million in 2024—a 35 percent increase. As a result, the share of international O&D rose from 19 percent to 21 percent, as shown in **Table 2.4.**

The pandemic reshaped airline strategies and accelerated structural changes in the industry. Virginia's recovery, particularly in international traffic, underscores the importance of IAD as a global gateway and highlights the Commonwealth's strong position in the post-pandemic aviation market.

Table 2.4. Virginia's Commercial Service Airports Origin and Destination (O&D) Passengers

FAA ID	2016			2024		
	Domestic	International (Int'l.)	% Int'l.	Domestic	Int'l.	% Int'l.
DCA	18,497	1,395	7.0%	19,708	1,492	7%
IAD	7,852	5,705	42%	9,655	8,013	45%
ORF	2,807	305	10%	4,296	460	10%
RIC	3,111	294	9%	4,294	457	10%
CHO	526	33	6%	624	46	7%
LYH	143	7	5%	149	9	6%
PHF	372	16	4%	129	6	4%
ROA	524	54	9%	650	73	10%
SHD	12	0*	3%	15	0*	0.3%
Total	**33,844**	**7,810**	**19%**	**39,522**	**10,555**	**21%**

Note: SHD had 379 international O&D in 2016 and 41 international O&D in 2024
Source: USDOT O&D Summary and International O&D from Sabre MIDT for DCA and IAD

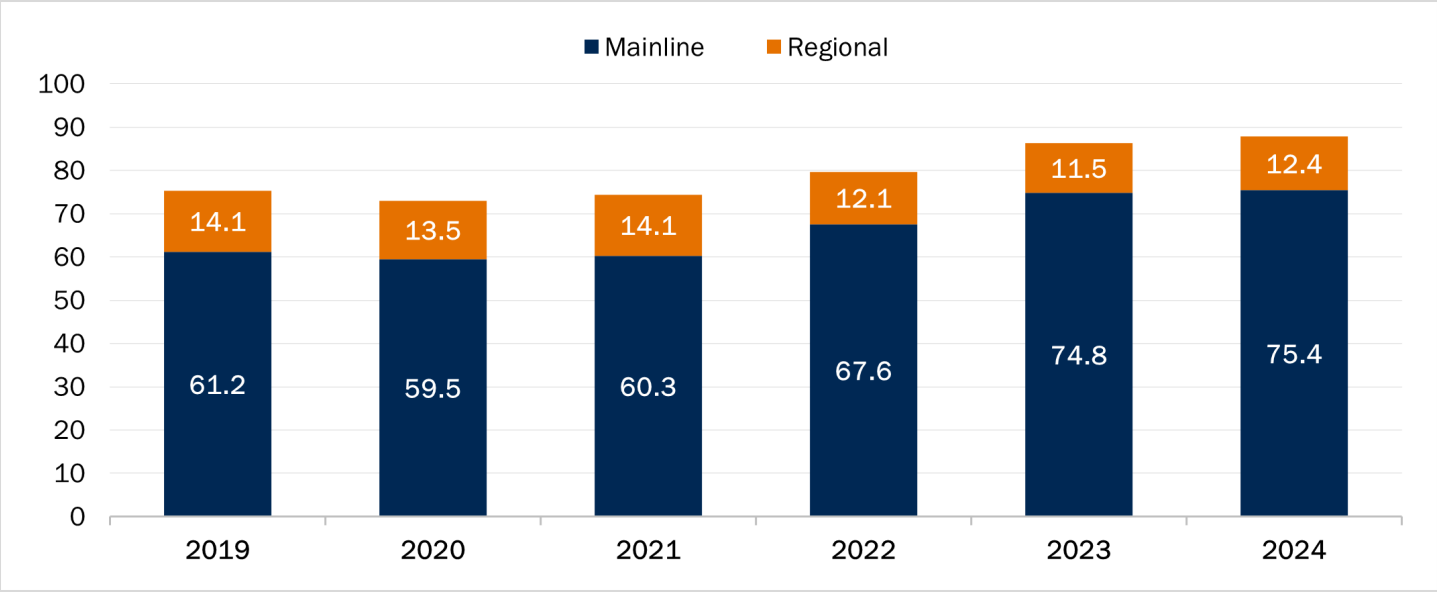
2.3.2. The Pilot Shortage

The pilot shortage had been a looming challenge for years, but COVID-19 accelerated the issue to critical levels. Airlines faced severe constraints in hiring enough pilots to maintain flight schedules, forcing carriers to rethink operations. ULCCs and regional airlines were hit hardest, as they had to raise salaries to compete with network carriers for talent. These carriers often provide the only air service to smaller communities, so the shortage disproportionately impacted regional connectivity.

As shown in **Figure 2.6**, the total number of pilots began to rebound in 2022 and surpassed 2019 levels by 2024. While this recovery is encouraging, the shortage has permanently reshaped the industry, driving consolidation, reducing service to smaller markets, and increasing costs for carriers across the board.

The pilot shortage remains a structural challenge for the aviation system. For Virginia, it has contributed to reduced service at non-hub airports and heightened reliance on larger hubs, reinforcing the need for strategies that support regional access.

Figure 2.6. Number of Active US Airline Pilots (Thousands)



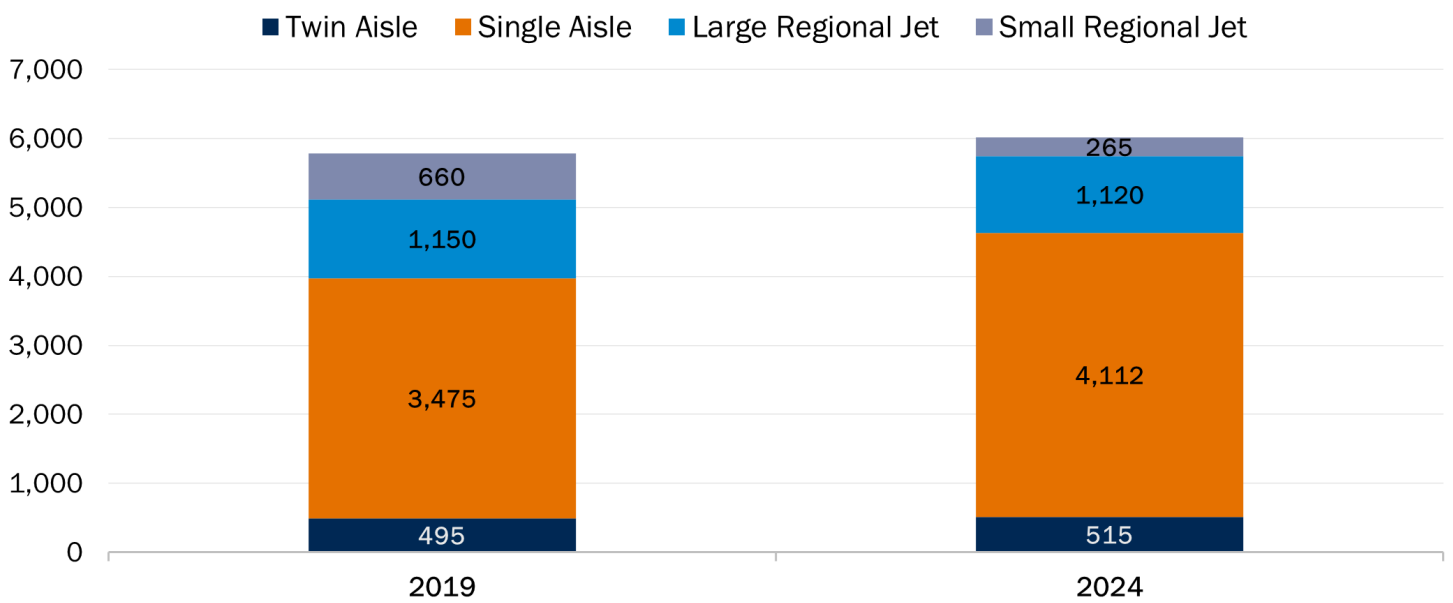
Note: Mainline defined as Alaska Airlines, American Airlines, Allegiant Air, Avelo Airlines, Breeze Airways, Delta Air Lines, Frontier Airlines, Hawaiian Airlines, JetBlue, Southwest Airlines, Spirit Airlines, Sun Country Airlines, and United Airlines; Regional defined as Endeavor Air, Envoy Air, Horizon Air, Mesa Airlines, Piedmont Airlines, PSA Airlines, and SkyWest Airlines.
Source: Airlines for America

2.3.3. Retirement of the Regional Jet Fleet

Network carriers have been phasing out smaller regional aircraft for years, particularly those with 50 seats or fewer. This trend accelerated during the pandemic as airlines sought to streamline operations and reduce costs. As shown in **Figure 2.7**, while the overall US fleet has grown, the regional fleet has declined by 24 percent since 2019.

The retirement of 50-seat regional jets has significantly affected service to smaller communities, where these aircraft were often the backbone of connectivity. For Virginia, this shift has contributed to reduced frequencies and limited options at non-hub airports, reinforcing the reliance on larger hubs for access to the national air transportation system.

Figure 2.7. Number of Active Commercial Aircraft

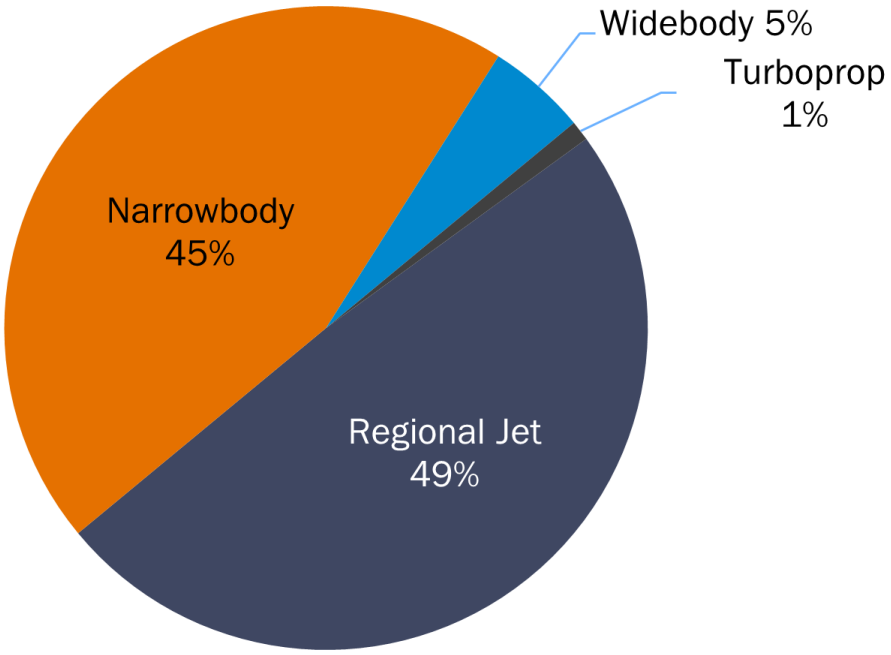


Source: Airlines for America; Anuvu data

Despite the ongoing retirement of smaller regional jets, these aircraft remain a critical component of Virginia's commercial service airports. While average seats per flight have increased since 2016, regional aircraft—including larger regional jets—still accounted for nearly 50 percent of all operations in 2024, as illustrated in **Figure 2.8.**

This continued reliance on regional aircraft highlights their importance in maintaining connectivity for smaller markets within the Commonwealth, even as the industry shifts toward larger aircraft and consolidated service patterns.

Figure 2.8. Share of Departures by Aircraft Type at Virginia's Commercial Service Airports (CY 2024)

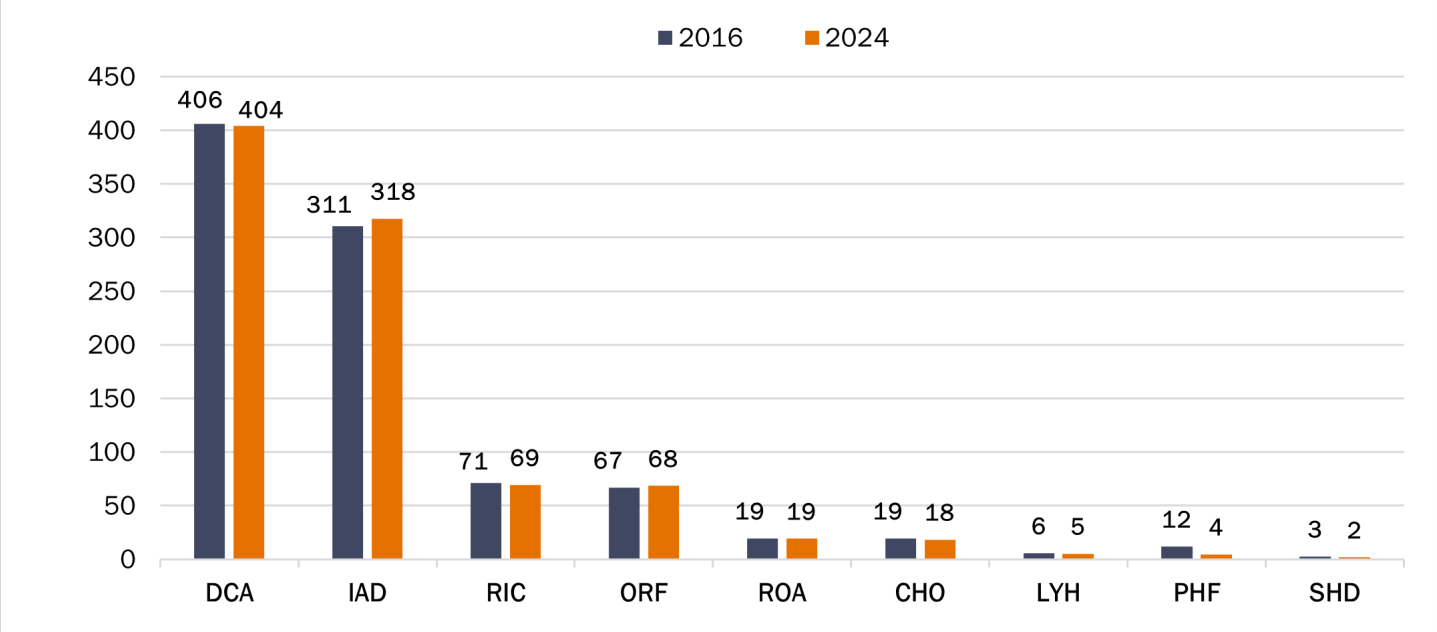


Source: Worldwide Schedules via Cirium

With the retirement of smaller regional jets, the increase in average aircraft size has led to a decline in operations at Virginia's small and non-hub airports. As shown in **Figure 2.9**, RIC, CHO, LYH, PHF, and SHD have lost between one and eight daily departures. PHF was the most negatively impacted, with a reduction of eight daily departures.

Fewer daily departures reduce connectivity for smaller communities and limit travel options, reinforcing the trend toward consolidation at larger hubs.

Figure 2.9. Average Daily Departures at Virginia's Commercial Service Airports (CY 2016 vs. CY 2024)



Source: Worldwide Schedules via Cirium

2.3.4. ULCCs

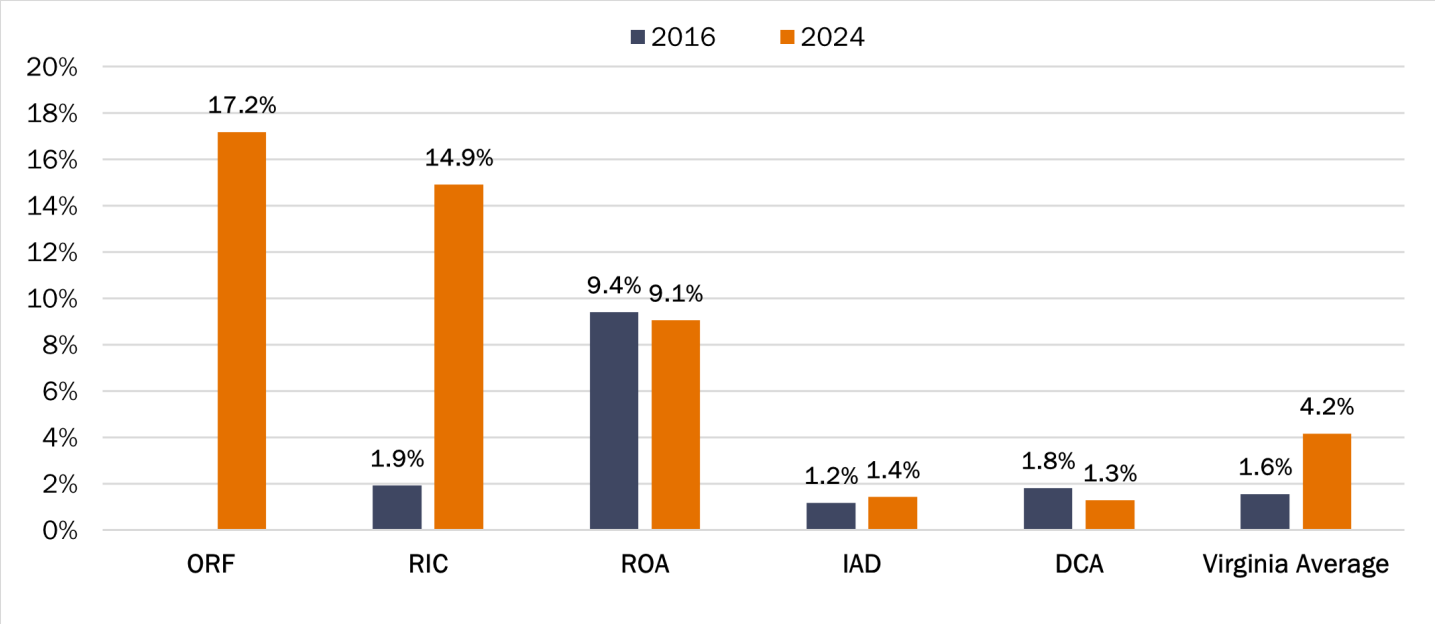
Before COVID-19, ULCCs were leading the industry in growth and profitability. The pandemic disrupted this trajectory, forcing some ULCCs to adjust their business models. Labor shortages and renegotiated agreements drove up costs, eroding the cost advantage that ULCCs had previously enjoyed. Since then, profitability has been elusive, and in November 2024, Spirit Airlines filed for bankruptcy protection.

Despite these challenges, the ULCC segment has expanded in Virginia. Two new entrants, Avelo Airlines and Breeze Airways, commenced operations in 2021. Breeze Airways now serves three of Virginia's nine commercial service airports: ORF and RIC were initial markets, and ORF became an operational base. Breeze Airways added service at IAD in 2024.

As shown in **Figure 2.10**, ULCCs have grown in importance, particularly at small hub airports. In 2016, ULCCs represented less than two percent of Virginia's seat departures; by 2024, they accounted for four percent. Their presence varies by airport, with only five of the nine commercial service airports served by a ULCC. ORF saw the most dramatic shift: from no ULCC service in 2016 to ULCCs representing 17 percent of its seat departures in 2024, the largest increase at any Virginia airport.

ULCCs have reshaped the competitive landscape at Virginia's small hubs, expanding access and stimulating demand. However, financial instability within the segment raises questions about long-term sustainability and service reliability.

Figure 2.10. ULCC's Share of Domestic Seats at Virginia Commercial Service Airports (CY 2016 vs. CY 2024)



Source: Worldwide Schedules via Cirium

2.3.5. The Slot and Perimeter Rule at DCA

DCA operates under two key restrictions: the slot rule and the perimeter rule.

The slot rule, introduced in 1969 to reduce congestion, limits DCA to 60 operations per hour, including arrivals and departures. These slots are allocated by airline type and have been adjusted over time. In 2024, an exemption added 10 additional slots, slightly increasing capacity.

The perimeter rule was designed to define the roles of the two airports managed by the Metropolitan Washington Airports Authority (MWAA). DCA, located closest to downtown Washington, was intended to serve short- and medium-haul domestic markets, restricting flights to destinations within 1,250 miles. IAD, by contrast, was designated as the region's international gateway and long-haul domestic airport. While exceptions to the perimeter rule have been rare, all 10 new slots granted in 2024 were allowed to operate beyond the perimeter, signaling a modest shift in policy.

These changes provide limited growth opportunities at DCA while reinforcing its primary role as a domestic airport. The additional beyond-perimeter slots may increase competition for long-haul markets and slightly alter the balance between DCA and IAD.[2]

[2] https://www.flyreagan.com/about-airport/aircraft-noise-information/dca-reagan-national-slot-perimeter-rules

2.4. Changes in GA

All 65 public-use airports in Virginia support GA operations. GA provides critical access to remote communities and includes all flights except those related to commercial service, cargo, and military. GA airports serve diverse roles, including flight training, charter operations, emergency services, corporate travel, and recreational flying.

2.4.1. Active Pilots

According to the FAA, the number of active US pilots grew by 10 percent since 2016, an increase of 47,000 pilots. While rotorcraft and recreational pilots declined, every other segment posted gains. Private pilots increased by six percent in 2024, reflecting continued interest in personal and business aviation.

2.4.2. GA Fleet

The GA fleet grew by one percent since 2016. Despite a two percent decline in piston aircraft (**Table 2.5**), turboprop and turbojet aircraft increased by 12 percent and 20 percent, respectively, offsetting losses in piston segments. The decline in piston aircraft, both single-engine (down 2,000) and multi-engine (down 1,250), is an ongoing trend. Rotorcraft also declined by five percent, while experimental and light sport aircraft grew by nine percent and 21 percent, respectively.

Table 2.5. Changes in US Active GA Fleet

Aircraft Type	2016	2023	Absolute Change	Percent Change
Piston	142,638	139,300	-3,338	-2%
Turboprop	9,779	10,951	1,172	12%
Turbojet	13,751	16,537	2,786	20%
Rotorcraft	10,577	10,051	-526	-5%
Other	35,049	37,383	2,334	7%
Total Aircraft	211,794	214,222	2,428	1%

Note: 2023 is the latest actual data.
Source: FAA Aerospace Forecast; Other includes experimental, light sport aircraft, and other.

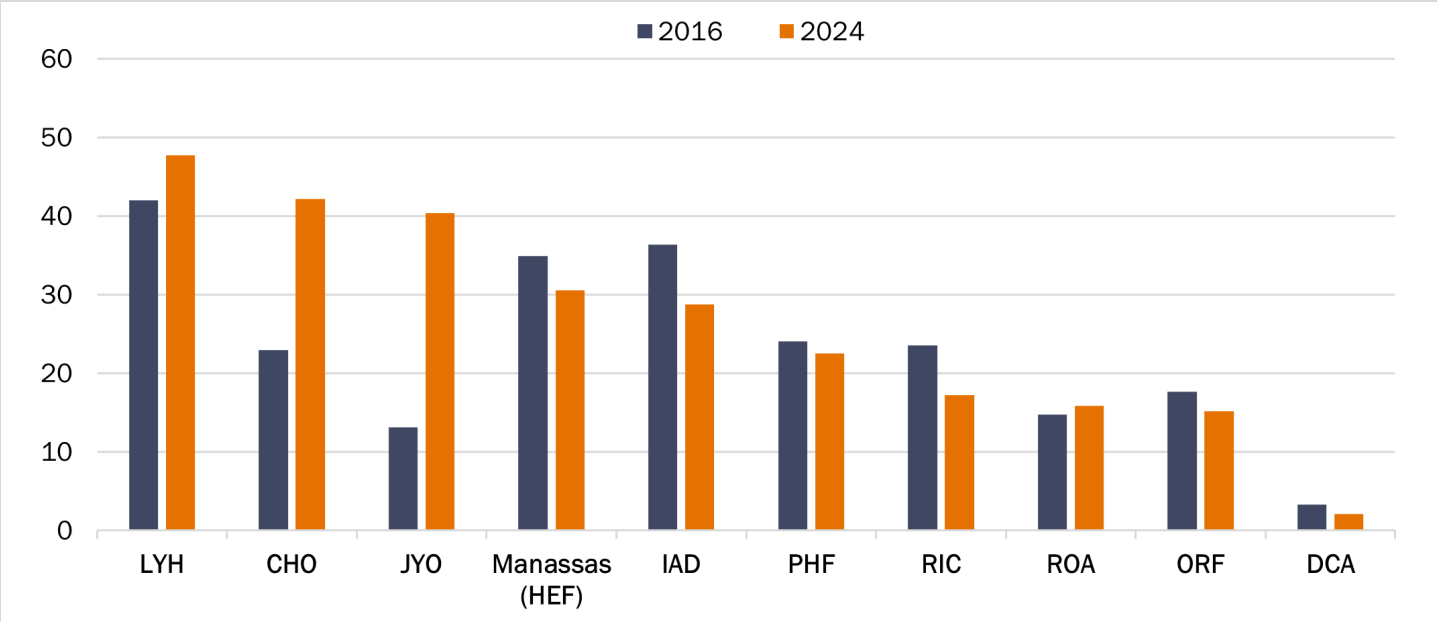
2.4.3. GA Hours Flown

GA hours flown in the US increased by 15 percent from 2016 to 2023. Growth occurred across all aircraft segments except rotorcraft, which declined by seven percent. Despite fewer piston aircraft, their hours flown rose by 19 percent—the largest segment increase—indicating higher utilization of existing aircraft.

2.4.4. GA Itinerant Operations in Virginia

GA itinerant operations at Virginia airports with air traffic control towers grew by 13 percent since 2016. As shown in **Figure 2.11**, notable gains occurred at LYH (+14%), CHO (+84%), Leesburg Executive (JYO) (+207%), and ROA (+8%). These increases offset declines at six other airports, underscoring the uneven distribution of GA activity across the Commonwealth.

Figure 2.11. Itinerant Operations at Virginia Airports (Thousands)



Note: This represents Itinerant GA operations only
Source: FAA Terminal Area Forecast; Itinerant operations at the 10 airports

2.5. Changes in Major Socioeconomic Factors

Socioeconomic conditions strongly influence a region's ability to sustain commercial air service. Key factors include population size, income levels, and employment; each shaping the demand for air travel and the economic viability of airports.

Since the previous study in 2016, Virginia has experienced broad-based growth across these indicators. Statewide population increased by nearly 400,000, reaching 8.8 million in 2024. This expansion strengthens the potential air travel market, particularly in the Washington, DC Metropolitan Statistical Area (MSA), which remains the largest population center at over 6.4 million residents and grew by five percent. Population growth across all seven MSAs ranged from one to seven percent, with Charlottesville-Albemarle (CHO) as the only area to experience a slight decline (-1 percent).

Income levels rose sharply across all MSAs, with per capita income increasing by 35 to 57 percent. While this reflects real gains in purchasing power, much of the increase was driven by inflationary pressures during and after the COVID-19 pandemic. Higher incomes generally support discretionary spending on air travel, but the inflationary context suggests caution in interpreting these gains as purely economic strength.

Employment growth further reinforces market stability. Most MSAs posted substantial gains, led by Charlottesville (+12 percent) and Richmond (+9 percent). Lynchburg was an outlier with minimal employment growth, which may constrain future air service demand. Overall, statewide employment grew by eight percent, signaling a healthy labor market that supports both business and leisure travel.

These socioeconomic trends point to a stronger foundation for air travel demand in Virginia, particularly in larger MSAs served by hub airports. However, areas with slower growth or mixed indicators—such as Lynchburg and Charlottesville—may face challenges in sustaining or expanding commercial service. **Table 2.6** summarizes the key socioeconomic factors for the MSAs with commercial service airports.

Table 2.6. Key Socioeconomic Factors for the MSAs with Commercial Service Airports

MSA	Socioeconomic Factor	2016	2024	Absolute Change	Percent Change
Charlottesville	Population	229,467	227,336	-2,131	-1%
	Per Capita Income	$57,656	$90,472	$32,816	57%
	Employment	111,033	124,217	13,183	12%
Lynchburg	Population	261,167	266,432	5,265	2%
	Per Capita Income	$37,119	$51,243	$14,124	38%
	Employment	103,942	104,225	283	0%
Richmond	Population	1,282,066	1,370,165	88,099	7%
	Per Capita Income	$51,605	$71,794	$20,189	39%
	Employment	657,750	719,742	61,992	9%
Roanoke	Population	312,576	315,749	3,173	1%
	Per Capita Income	$42,987	$59,820	$16,833	39%
	Employment	161,583	167,483	5,900	4%
Staunton-Stuarts Draft	Population	121,247	128,481	7,234	6%
	Per Capita Income	$40,156	$55,929	$15,773	39%
	Employment	50,075	53,967	3,892	8%
Virginia Beach-Chesapeake-Norfolk	Population	1,725,937	1,794,278	68,341	4%
	Per Capita Income	$46,133	$62,575	$16,442	36%
	Employment	776,358	822,392	46,033	6%
Washington-Arlington-Alexandria	Population	6,133,552	6,436,489	302,937	5%
	Per Capita Income	$66,178	$89,396	$23,218	35%
	Employment	3,185,700	3,388,100	202,400	6%
Total Virginia	**Population**	**8,411,808**	**8,811,195**	**399,387**	**5%**
	Per Capita Income	**$52,656**	**$73,681**	**$21,025**	**40%**
	Employment	**3,915,583**	**4,236,375**	**320,792**	**8%**

Note: Income was only available through 2023
Source: US Census Bureau; FRED and Bureau of Labor Statistics

2.6. Summary

Virginia's aviation sector has not only rebounded since the previous study in 2016—it has surged ahead of national trends. While passenger traffic across the US grew by 18 percent, Virginia outpaced the nation with a 20 percent increase, underscoring the strength and resilience of the Commonwealth's economy.

The two large hub airports—DCA and IAD—remain the backbone of Virginia's air travel, handling 82 percent of all passengers and posting a combined growth of 17 percent. Yet the real story of momentum lies with the small hub airports, ORF and RIC, which soared with a combined growth rate of 45 percent. This remarkable performance was fueled by the rise of ULCCs, reshaping the competitive landscape and expanding access for travelers.

Virginia's five non-hub airports faced headwinds, including the retirement of 50-seat regional jets and a persistent pilot shortage. Despite these challenges, all but one airport posted gains, resulting in a modest overall increase of 0.5 percent. Meanwhile, GA has returned to a growth trajectory, with active airmen, fleet size, and hours flown all climbing—signaling renewed vitality in this critical segment.

These shifts in aviation activity are more than statistics—they are the foundation of Virginia's economic impact story. Every passenger, every flight, and every operational trend described in this chapter feeds directly into the economic calculations that follow. Together, they paint a picture of an industry adapting, innovating, and driving economic opportunity across the Commonwealth.

Chapter 3. Economic Impact Definitions

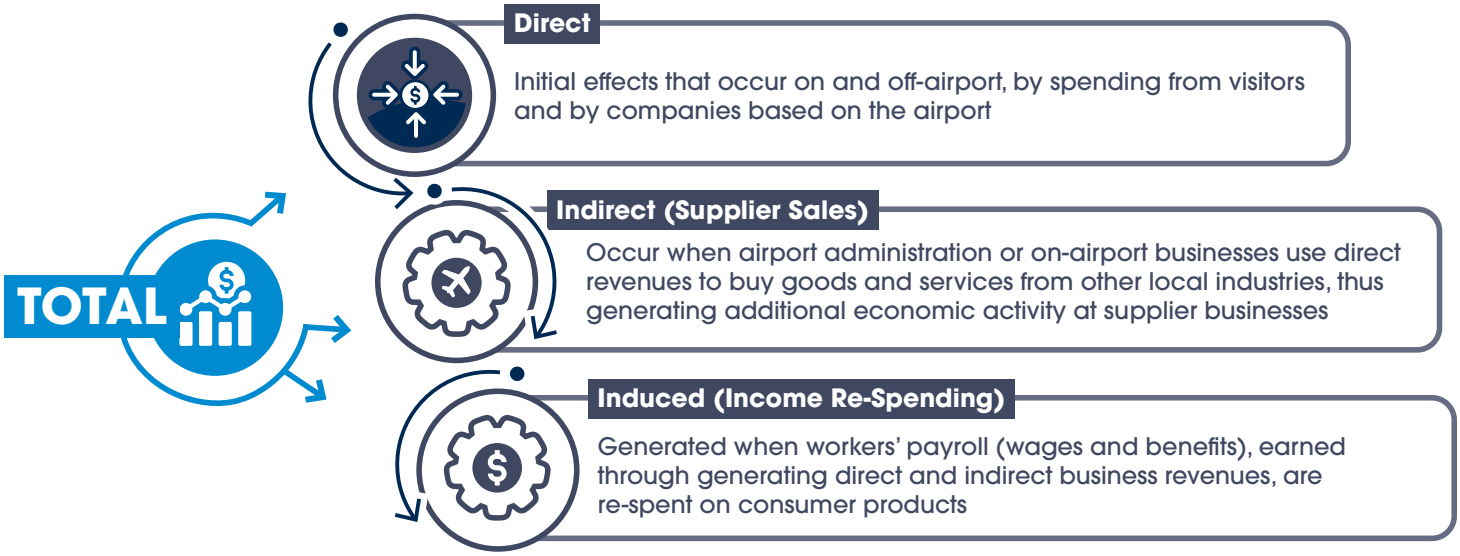
This chapter outlines the definitions of key terms, metrics, and categories used throughout the study to communicate economic impact.

3.1. Economic Impact Terms

This study used four economic terms to define economic impact: direct, indirect, induced, and total impacts. Direct impacts are determined from data collected by the project team from airport sponsors, on-airport tenants, and visitors. These impacts refer to the immediate economic activities generated or facilitated by the airport itself, such as jobs, wages, and business revenues from airport operations, concessions, and on-site services.

Indirect and induced impacts are quantified through the economic modeling process. Indirect impacts arise from the airport's supply chain; these include jobs and income generated by businesses that provide goods and services to the airport and its tenants. Induced impacts result from the spending of income earned through direct and indirect activities, such as employees spending their wages on housing, food, and other local goods and services, further stimulating the regional economy. The sum of direct, indirect, and induced impacts is equal to the total impacts. **Figure 3.1** defines each term and depicts their relationship.

Figure 3.1. Economic Impact Terms

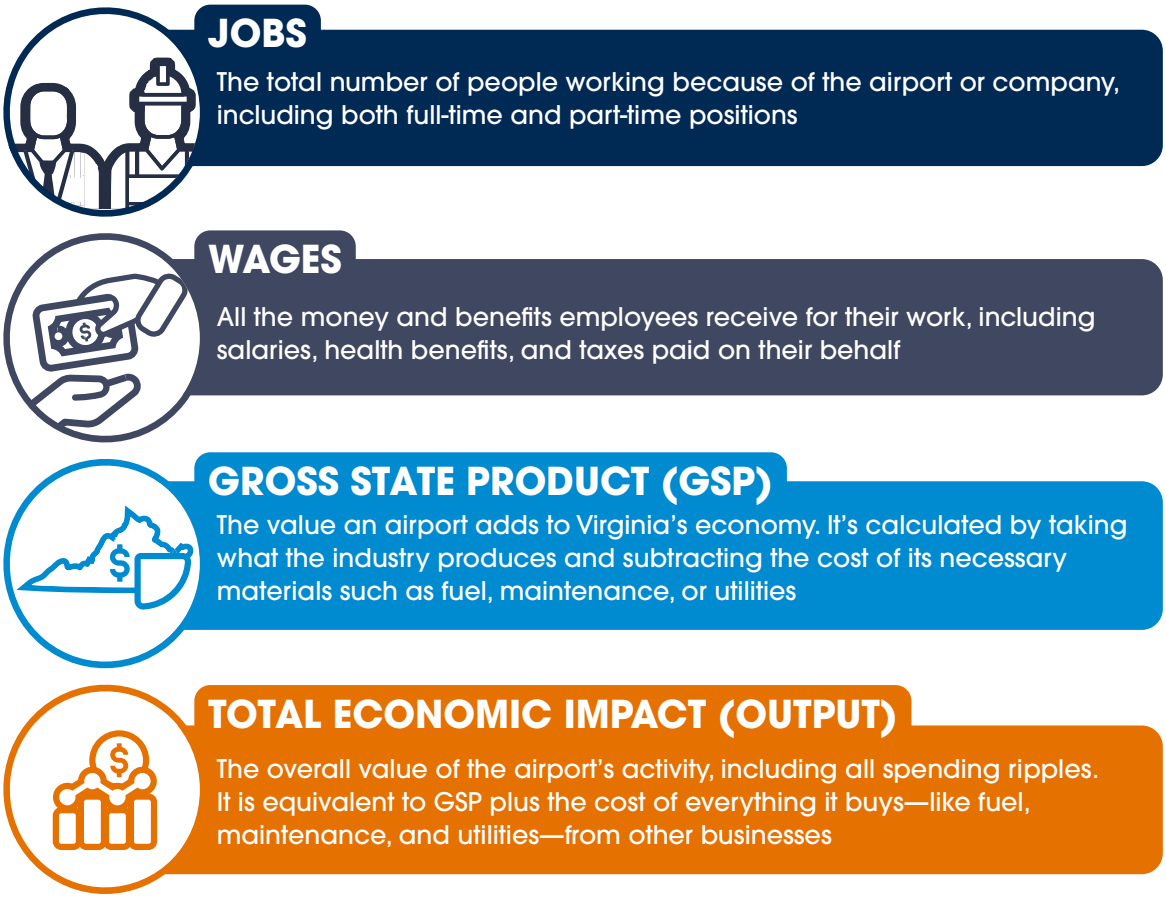


Source: Kimley-Horn, 2025

3.2. Economic Impact Measures

The economic impact terms referenced above are expressed in terms of jobs, wages, gross state product (GSP), and total economic impact (output). These standardized measures allow for consistent comparison of the economic contributions of Virginia's airports to the previous study. Definitions of each of these measures can be found in **Figure 3.2.**

Figure 3.2. Economic Impact Measures



Source: Kimley-Horn, 2025

3.3. Economic Impact Categories

This study groups aviation-related activities into four primary impact categories: on-airport, off-airport visitor spending, industry reliance, and tax impacts. This section outlines each category and its contributing factors, as shown in **Figure 3.3.** On-airport and visitor spending impacts were estimated at the individual airport level, while industry reliance and tax impacts were assessed at the statewide level only. The sections that follow provide additional context on each economic impact category.

Figure 3.3. Economic Impact Categories Overview

Source: Kimley-Horn, 2025

3.3.1. On-Airport

On-airport impacts refer to the economic activity generated by operations conducted on airport property. This includes employment from airport administrative staff, on-airport business tenants, and capital improvement projects, as shown in **Figure 3.4.**

Figure 3.4. On-Airport Impact Components

Source: Kimley-Horn, 2025

3.3.1.1. Airport Administration

Airport administration encompasses the personnel responsible for managing daily airport operations. This includes roles such as airport managers, operations and grounds staff, maintenance crews, finance administrators, security personnel, and human resources staff. These individuals may be employed directly by the airport or by an overseeing airport authority. Smaller airports may not require on-site staff. In such cases, administrative responsibilities may fall to a city or county-appointed official tasked with airport oversight.

3.3.1.2. On-Airport Business Tenants

Airport business tenants are entities that operate under a rental, lease, or other formal agreement with the airport, granting them the right to conduct business on airport property. These tenants may be located within the terminals, such as retail vendors and food services, or elsewhere on airport grounds in dedicated facilities, such as flight schools; fixed-base operators (FBOs); maintenance, repair, and overhaul (MRO) operations, cargo handling facilities, and rental car companies.

Businesses that own aircraft and lease hangar space but are based off-site are not considered on-airport business tenants. The designation is reserved for official businesses that maintain a consistent employment presence directly on airport property.

3.3.1.3. Capital Improvements

This category refers to the economic contributions from construction projects on airport property. The study captured expenditures by either the airport or its business tenants. These expenditures represent the total cost of the improvement—including any local, state, and federal funding.

Construction activity data were reported by airport managers and on-airport business tenants for the four-year period from 2021 to 2024. To account for the variability in spending patterns, the reported figures were averaged across the four years, providing a more consistent representation of capital investment trends.

3.3.2. Off-Airport Visitor Spending

In 2024, roughly 30,000,000 visitors traveled through one of Virginia's commercial service airports.[3] These business and leisure visitors support the Commonwealth's (State's) economy by spending money on goods and services including recreational activities, lodging, food and beverage, local transportation, entertainment, and retail. Visitor spending impacts represent the expenditures made in Virginia by out-of-state travelers who arrive via the Commonwealth's airports. This study measured the average spending by out-of-state visitors during their stay and uses it to quantify visitor spending at the airport and statewide levels.

Virginia residents were excluded from the analysis, as the focus is on new money entering the State's economy rather than funds already circulating within it. Commercial service and GA visitor spending impacts were calculated at the airport level and can be found in **Chapter 6.**

As shown in **Figure 3.5**, off-airport visitor spending is considered in two categories – commercial service or GA.

Figure 3.5. Off-Airport Visitor Spending Impact Components

Source: Kimely-Horn, 2025

3.3.2.1. Commercial Service Visitors

A commercial service visitor is an individual traveling for business or leisure who arrives in Virginia from another state or country via a commercial airline, landing at one of Virginia's nine commercial service airports. This study focused on travelers whose final destination was Virginia. Passengers in transit or on a layover were excluded from this analysis. Further clarification on how out-of-state visitors were calculated can be found in **Chapter 5 – Methodology.**

3.3.2.2. GA Visitors

A GA visitor is an out-of-state individual traveling on business or leisure who arrives in Virginia using non-commercial aviation services. This includes individuals arriving via recreational aircraft, air taxis, or charter flights rather than scheduled commercial airlines. GA passengers were considered across all 65 airports in the VAS, including the nine commercial service airports. This approach differs from the treatment of commercial service passengers, whose activity is limited to just the nine designated commercial service airports in the State.

[3] FAA. "Passenger Boarding (Enplanement) and All-Cargo Data for U.S. Airports." Last modified June 11, 2025. https://www.faa.gov/airports/planning_capacity/passenger_allcargo_stats/passenger.

3.3.3. Industry Reliance

Airports in Virginia support a wide range of industry sectors, including education (e.g., universities and research institutions), tourism, and corporate enterprises. With Virginia ranking fifth nationally in the number of Fortune 500 company headquarters, the state's airports play a critical role in supporting corporate operations and connectivity.[4] As referenced in **Figure 3.6**, industry reliance impacts reflect the extent to which off-airport businesses across Virginia depend on the state's airport network for supply chains, workforce mobility, and customer access. These businesses may base aircraft or frequently use Virginia's airports to access broader markets. While their corporate activities contribute to the state's economy and are captured as industry reliance, they are not classified as business tenants, as they do not solely operate from leased on-airport facilities.

Additionally, industry reliance is not easily attributed to a single airport. For example, a business in Northern Virginia may depend on both Leesburg Executive (JYO) and Manassas Regional (HEF), making it difficult to assign a precise percentage of reliance to each facility. Accordingly, this report does not present industry reliance impacts at the individual airport level. Instead, this study calculates industry reliance at the statewide level to avoid overlapping impacts.

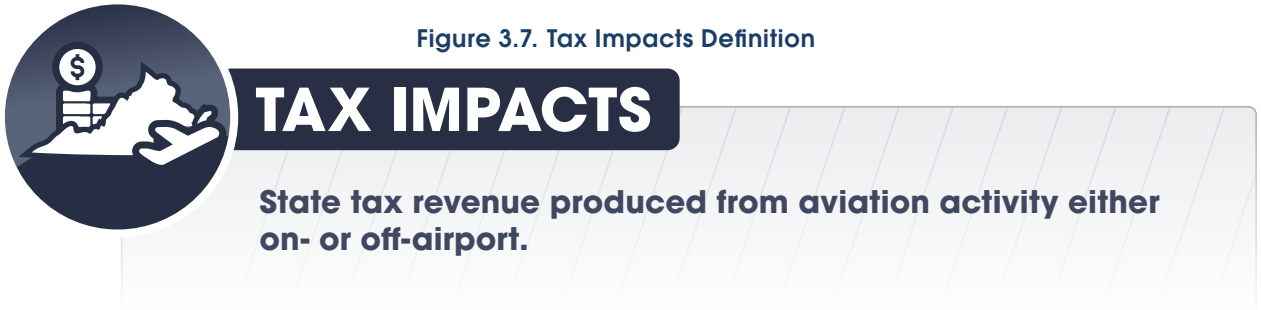
Figure 3.6. Industry Reliance Definition

Source: Kimley-Horn, 2025

3.3.4. Taxes

In Virginia, taxes are levied on nearly all sales, including fuel, food and beverage, and lodging, as well as on personal income. These taxes generate essential revenue for state and local governments and play a vital role in supporting the Commonwealth's economy. This study quantifies the tax contributions associated with aviation-related spending—covering on-airport operations and employment, as well as off-airport visitor spending, as noted in **Figure 3.7.** Like industry reliance, tax impacts are only calculated at a statewide level to avoid overlapping impacts.

Figure 3.7. Tax Impacts Definition



Source: Kimley-Horn, 2025

[4] Virginia Economic Development Partnership. "Headquarters." Accessed June 3, 2025. https://www.vedp.org/industry/headquarters.

Chapter 4. Data Collection Process

A robust data collection program is essential to conducting an economic impact study, as the quality and reliability of the results are directly dependent on the accuracy of the data gathered. Data collection is a multi-step process that lays the foundation for estimating direct impacts. The data collection process for this study includes:

- Host introductory webinars to explain the data collection process and intent to the airports.
- Development of the surveys to collect airport, business tenant, and visitor data.
- Conduct outreach and meet individually with 65 airports.
- Survey airport managers, airport tenants, and out-of-state visitors.
- Confirmation and validation of airport, business tenant, and visitor data.

The data collection process for the Virginia Airport System Economic Impact Study was conducted between November 2024 and June 2025. The results of this economic impact study are based on calendar year (CY) 2024 data. The primary steps in the data collection process are described in detail throughout this chapter.

4.1. Surveys

Five surveys were developed to collect information from airport managers, businesses, and visitors to measure the economic impact of the airports in the Commonwealth of Virginia.

- Airport Manager Survey (AMS)
- Airport Business Tenant Survey
- Commercial Passenger Survey
- GA Pilot and Passenger Survey
- Off-Airport Business Reliance Survey

These survey instruments were administered through multiple methods including airport site visits, in-person passenger surveying, passive surveying through Wi-Fi portals, and email outreach. Each survey is described in greater detail below.

4.1.1. On-Airport Data

On-airport data was retrieved via two surveys: the AMS and airport business tenant survey.

4.1.1.1. AMS

The AMS was the primary tool used to collect data and relied on a two-pronged process. The first part of the process was to identify airport employment, both full-time and part-time, total payroll, operating expenses (OPEX), and capital expenditures[5] (CAPEX). The AMS also collected information on GA operations including total operations, percent of operations originating out-of-state, and the average number of people per flight. Operational data is important as it informs the visitor profile developed for each airport. The second part of the process was for the airport sponsor to identify their business tenants and estimate employment levels for each. Additionally, the airport sponsor was asked to identify businesses off-airport that are reliant on the airport. Data collected from the airport representative is shown in **Table 4.1** below. It was provided to the airport representative in a fillable PDF with a printable version if needed.

[5] To account for the year-to-year fluctuations in capital projects that occur at an airport, the survey collected CAPEX data for the past four years to calculate an average.

Table 4.1. AMS

Categories	Data Points
Airport Contact Information	▶ On-Site Airport Manager ▶ Survey Respondent ▶ Other Airport Contact
Airport Employment	▶ Full-Time Employment by Function ▶ Part-Time Employment by Function
Expenditures	▶ Payroll ▶ CAPEX (CY 2021-2024) ▶ Operating Expenditures
Airport Activity	▶ Total Operations (Commercial Service, GA, Military, Cargo) ▶ Out-of-State Operations ▶ Average Number of Passengers for Out-of-State GA Operations ▶ Average Number of Nights for Out-of-State GA Visitors ▶ Purpose of Visit for Out-of-State GA Visitors
Feedback	▶ Airport Manager Feedback for DOAV
Airport Tenants	▶ Contact Information ▶ Type of Business ▶ Employment Estimates (Full and Part-Time)
Off-Airport Business Reliance	▶ Contact Information ▶ Type of Business

Source: Kimley Horn, 2025

4.1.1.2. Airport Business Tenant Survey

The airport business tenant survey was distributed to all Virginia airport businesses, which is defined as a business enterprise with employees. The airport business tenant survey was distributed to tenants via email based on contact information provided by the airport sponsor. In addition, it obtained information on employment and CAPEX over the past four years. The airport business tenant survey was distributed either through in-person visits at the time of the airport site visit or via email for them to complete online using SurveyMonkey. The data collected from the airport tenants was aggregated to the airport level. The data collected is shown in **Table 4.2.**

Table 4.2. Airport Business Tenant Survey

Categories	Data Points
Business Information	▶ Business Name ▶ Business Contact Information ▶ Type of Business
Employment on Airport	▶ Full-Time Employment ▶ Part-Time Employment
Expenditures	▶ Capital Improvements On-Airport from CY 2021–CY 2024 ▶ Additional Economic Benefits to Local Community

Source: Kimley Horn, 2025

4.1.2. Off-Airport Visitor Spending Data

Off-Airport visitor spending data was obtained using two surveys: the commercial passenger survey and the GA pilot and passenger survey.

4.1.2.1. Commercial Passenger Survey

Commercial Service airports welcome millions of passengers every year to the Commonwealth of Virginia. Whether they are visiting for business, leisure, or a combination of both, visitors spend money in the local and/or regional community on lodging, food and beverage, transportation, entertainment, and retail. The commercial passenger survey was deployed to gather spending profiles to ultimately quantify the average spend per visitor using air transportation via a scheduled air carrier. Responses were collected either through in-person surveying or through a SurveyMonkey link on the airport's Wi-Fi portal. **Table 4.3** shows the data points that were collected.

Table 4.3. Commercial Passenger Survey

Categories	Data Points
General Trip Information	▶ Traveling from Out-of-State ▶ Purpose of Trip ▶ Virginia Airport Visited ▶ Number of People in Party ▶ Number of Nights Spent in Virginia
Expenditures	▶ Lodging ▶ Food and Beverage ▶ Entertainment ▶ Recreation (Outdoor Activities) ▶ Local Transportation (Uber, Lyft, Rental Car) ▶ Retail ▶ Other

Source: Kimley Horn, 2025

CHO, ORF, RIC, IAD, and DCA were surveyed in-person during the Spring and Summer of 2025. During in-person surveying, hard copy surveys with International Civil Aviation Organization (ICAO) translations for Chinese, French, Hindi, Russian, Spanish, and Arabic were provided. At the other four airports, the project team requested to upload the commercial passenger survey on the Wi-Fi portal for guests to take as they accessed the airport's Wi-Fi. In addition to in-person surveying, RIC and CHO uploaded the survey to their airport's Wi-Fi portal.

4.1.2.2. GA Pilot and Passenger Survey

Virginia's GA airports welcome out-of-state visitors who also spend money on lodging, entertainment, food and beverage, and ground transportation. Like the commercial passenger survey, the GA pilot and passenger survey was implemented to collect trip information and spending activity from out-of-state visitors traveling using GA. Surveys were made available via QR codes and posted on signs and cards near high-traffic areas around GA terminal and private FBOs. The QR code directed the individual to an online survey via SurveyMonkey. The GA Pilot and Passenger Surveys were available for the duration of the data collection period, from November 2024 through June 2025. The data points in the GA Pilot and Passenger Survey are provided in **Table 4.4.**

Table 4.4. GA Pilot and Passenger Survey

Categories	Data Points
General Trip Information	▶ Traveling from Out-of-State ▶ Purpose of Trip ▶ Virginia Airport Visited ▶ Number of People in Party ▶ Number of Nights Spent in Virginia
Expenditures	▶ Lodging ▶ Food and Beverage ▶ Entertainment ▶ Recreation (Outdoor Activities) ▶ Local Transportation (Uber, Lyft, Rental Car) ▶ Retail ▶ Other

Source: Kimley Horn, 2025

4.1.3. Industry Reliance

4.1.3.1. Off-Airport Business Reliance Survey

The 65 Virginia airports support the needs of businesses in the Commonwealth even though they may not be located on the airport's property. Off-airport businesses may rely on the airport for cargo related transport of goods or the transport of employees. The off-airport business reliance survey collected the data points needed to measure the dependence of the business on the local airport. **Table 4.5** lists the data points collected in the off-airport business reliance survey.

Table 4.5. Off-Airport Business Reliance Survey

Table 1.2 Categories	Data Points
Business Information	▶ Contact Information ▶ Primary Product or Service
Employment In Virginia	▶ Full-Time Employees ▶ Part-Time Employees
Reliance on Airport	▶ Use of Virginia Airports ▶ Reliance on Virginia Airports to Conduct Business

Source: Kimley Horn, 2025

4.1.4. Tax Data

The airports did not provide any information on taxes, No tax data was collected by any survey. Tax impacts are based on calculated data derived from the IMPLAN model. For more context on how the tax impacts were calculated, refer to **Chapter 7**.

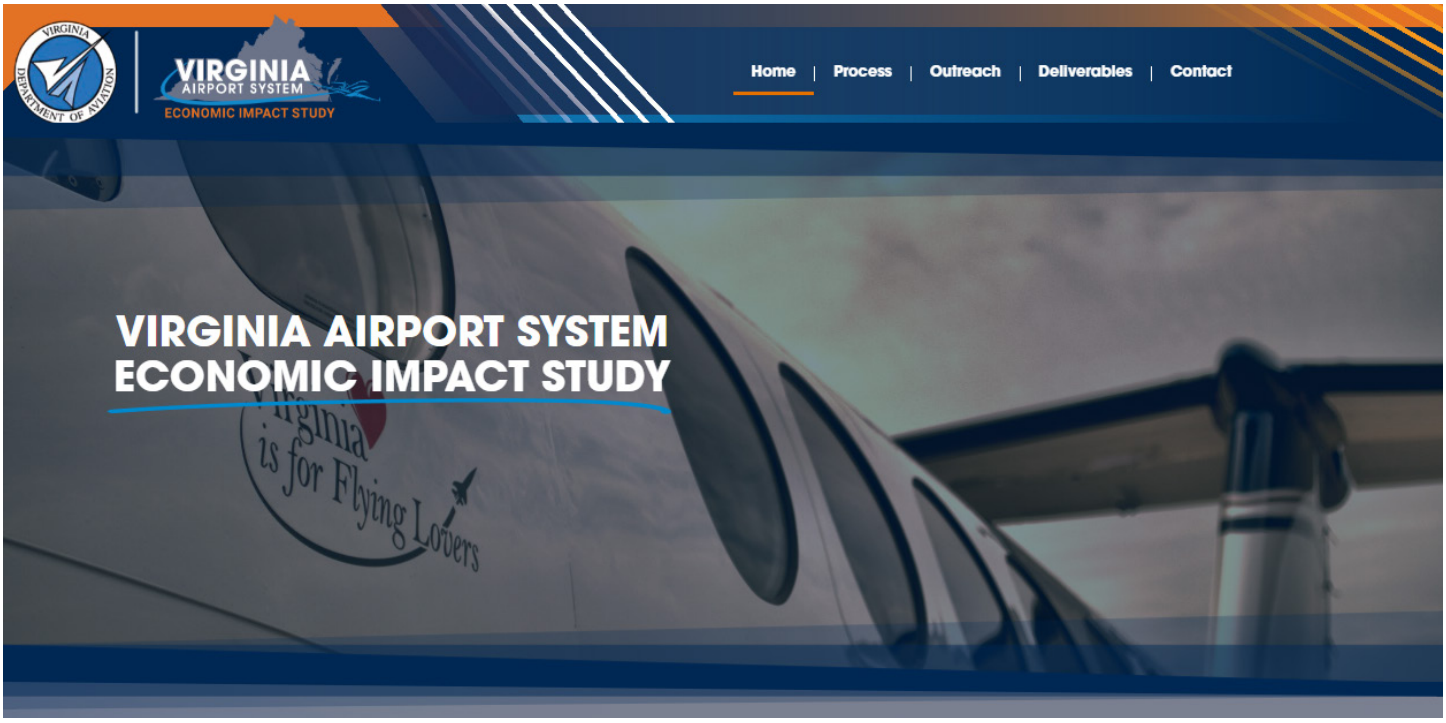
4.2. Airport Outreach and Data Collection Methods

Effective outreach to the airport sponsor and airport tenants was essential to the success of the data collection effort. Clear communication helped reinforce the important role each participant plays in the study and ensured broad understanding of how their input shapes the results. To support this, the study team implemented a comprehensive outreach strategy anchored by a dedicated VAS Economic Impact Study website, which served as the central hub for project information, materials, webinars, scheduling site visits, and both in-person and passive passenger surveys. The full outreach approach is summarized below.

4.2.1. Project Website

The first step in the airport outreach strategy was the development of a study website (airporteconimpactva.com). The website was a central place for all documents to be stored for airports and community stakeholders. The website, shown in **Figure 4.1**, was also a place where airports could upload pictures of their airports to be used in the final report, but largely it was a resource allowing people to access webinars, presentations, surveys, and recordings of previously held meetings.

Figure 4.1. Project Website



Source: Kimley-Horn, 2025

4.2.2. Webinars

Active participation from airports was critical to achieving efficient and accurate data collection. To help ensure this, the study team conducted three webinars:

- Airport Manager Webinar
- Airport Tenant Webinar
- Airport Training Webinar

4.2.2.1. Airport Manager Webinar

All 65 airports in the system were invited to attend an airport manager webinar on November 18, 2024. The goal of the airport manager webinar was to inform airport representatives about the study and convey the importance of the airport's participation. The presentation covered the study's purpose, process, and deliverables, with emphasis was made on data collection needs from the airports.

4.2.2.2. Airport Tenant Webinar

In addition to the airport manager webinar, the study team hosted an airport tenant webinar on December 13, 2024. To maximize participation, the airports extended an invitation to their tenants while the Virginia Aviation Business Association (VABA) helped with the outreach to their members. The objective of the webinar was to educate the airport tenants on their role in the data collection effort and the importance their data plays in developing the airport's results. Similar to the airport manager webinar, the presentation covered the study's purpose, process, and deliverables, with emphasis on data needs from the tenants.

4.2.2.3. Impact Roll-Out Webinar

The Impact Roll-Out Webinar was held at the conclusion of the study to provide one last review to the airports on the data collection process, economic modeling methodology, and deliverables. Additionally, the presentation focused on the nuances of the economy since the previous study and encouraged airports to communicate their updated impacts to local legislators and stakeholders.

4.2.3. Site Visits

Airport site visits were an integral part of the data collection effort where the study team aimed to meet with all 65 airports either in-person or virtually. The site visits offered designated time to review the AMS, Business Tenant Spreadsheet, discuss further surveying needs, and airport operations.

4.2.3.1. Scheduling and Coordination

The study team reached out to each airport to introduce the study and explain the data required to complete the surveys. The initial outreach to the airports was used to schedule a time to meet either in-person or virtually. Scheduling and coordination began in December 2024 with site visits commencing in early 2025. Following the scheduling of the site visits, the study team sent confirmation emails with site visit details. Each email included the AMS and business tenant spreadsheet for the airport representative to complete prior to meeting the study team. Virtual meetings were scheduled for 2-hours, while in-person meetings were scheduled for 4-hours.

4.2.3.2. Test Site Visit

The study team conducted a test site visit at a representative airport, to ensure the study team was prepared to provide standard site visits across the 65 airports in Virginia. The study team conducted a test site visit at Winchester Regional Airport (OKV) on January 22, 2025. A key part of the test site visit was to gather feedback from DOAV, the study team, and the test site airport, OKV, on areas needing improvement or needed further explanation to ensure that the airport site visits were standardized. The study team reviewed OKV's completed AMS and the business tenant spreadsheet. The site visit included a discussion of the airport operation and a tour of the airport. In addition, the study team met with the on-airport tenants to explain the purpose of the airport tenant survey and provide each tenant with a hard copy. The study team placed the GA pilot and passenger survey posters and postcards in the terminal for visitors to complete.

4.2.3.3. Airport Site Visits

The airport site visits at the 64 remaining airports in Virginia took place from early February 2025 through the end of May 2025. The goal of the site visit was to have completed and validated surveys, gain insight into the airport's operation, and if in-person, tour the airport and meet with airport tenants. The site visits were segmented into the following parts:

- General discussion related to the purpose of the study and meeting agenda
- Review and complete the AMS and business tenant spreadsheet
- If in person, attend an airport tour
- If in person, meet with on-airport business tenants
- If in person, distribute of the GA pilot and passenger survey posters and postcards

The virtual site visits were limited to the review and confirmation of the AMS and the business tenant spreadsheet. In addition, the study team reviewed the two other surveys, the airport tenant survey and the GA pilot and passenger survey, which required support from the airport representative for implementation at their airport. The distribution of the airport tenant survey and the GA pilot and passenger survey was completed over email.

The AMS and the business tenant spreadsheet were completed before the site visit to help expedite the survey process and to use the site visit as another point of validation. Many of the site visits included multiple airport employees to help verify the data. Each line in the survey and the business tenant spreadsheet was reviewed during the site visit. Data validity was crucial to the economic impact effort, and the study team was committed to ensuring that the data collected was accurate.

Following the review of the survey and spreadsheet, the airport representative hosted a tour of the airport where the study team was able to take pictures and distribute the airport tenant survey to the tenants that were available. The airport tenants that were not available received a follow-up email with the survey attached. The study team displayed the GA pilot and passenger survey posters in the terminal or FBO and placed the postcards in high-traffic areas.

Following completion of the site visit, the study team emailed the airport representative with a copy of the updated AMS and business tenant spreadsheet. The study team asked the airport representative to review the survey and spreadsheet again and provide any incomplete data or revisions within the two weeks following the visit. In addition, the study team reached out to the airport tenants with a link to the Airport Tenant Survey requesting their participation. The study team sent data confirmation emails throughout the summer of 2025, which allowed airports to confirm the data they provided for CY 2024 earlier in the year.

4.2.4. Visitor Surveying

Obtaining information on airport visitors is a key component to an airport's economic impact. While all passengers are important to an airport's vitality and impact on the local community, it is expected that out-of-state visitors that utilize a Virginia airport spend money on lodging, food, and entertainment among other things. This visitor spending is indirectly attributed to the airport as it is the visitors access point to the Commonwealth.

Two visitor surveys were developed, implemented, and analyzed as part of the data collection process. The surveys are described in detail below.

4.2.4.1. Commercial Service Visitor Spending

Commercial service visitor spending was captured through a combination of in-person surveying and if available, passive surveying through the airport's Wi-Fi portal. The commercial passenger survey focused on the out-of-state visitor that departed from a Virginia airport. The commercial service airports that were surveyed in person were CHO, ORF, RIC, IAD, and DCA. The study team was able to survey passengers at peak travel times at both pre-security and post-security locations.[6,7] CHO, RIC, and DCA passenger surveys were conducted post security, while ORF and IAD were pre-security. The survey took two minutes or less to complete and was conducted on an iPad with the results remaining anonymous.

4.2.4.2. GA Visitor Spending

In addition, an online survey was conducted for pilots and passengers traveling through a GA airport in Virginia. It was a passive survey that was conducted at the Virginia airports and communicated to the pilots and passengers through posters displayed in the terminal or a postcard in high traffic areas (shown in **Figure 4.2**). The poster and postcards had a QR code that, when scanned, brought the recipient to the online survey.

Figure 4.2. GA Pilot and Passenger Survey Postcard

Source: Kimley Horn, 2025

The survey was coordinated and implemented by the FBOs at each of the airports. The importance of the survey results was discussed with the FBOs at the time of the site visit. The study team encouraged the FBOs to recommend people take the survey to bolster the survey results. The posters and postcards were either distributed during the in-person site visits or in the case of virtual site visits, were emailed to the airport for printing.

[6] Peak times were based on flight data and then confirmed with the airport.

[7] If passengers were surveyed post-security, the study team typically had an airport personnel guide. With the airports that allowed for survey pre-security, the study team aimed to survey at high traffic areas including prior to security gates and ticketing.

4.3. Data Validation and Results

The study team implemented multiple steps to ensure that the input data for the economic impact modeling was accurate and consistent. The validation process is discussed in further detail below.

4.3.1. Validation Process

4.3.1.1. Steps

All data from the completed survey forms were consolidated, analyzed by survey type, and forensically reviewed for accuracy and consistency. Any data points that were questionable, missing, and/or outlier were flagged for follow-up with the airport representative.

4.3.1.2. Final Opportunity for Validation

Before beginning the economic impact modeling process, the 65 Virginia airports were provided with the opportunity to review and if necessary, revise the data points before it was finalized. This information was emailed to each airport starting in June of 2025. The airports were given two weeks to review and finalize data. On July 11th, the data points were reviewed with the Virginia DOAV to act as a final quality check. The final data points were used to calculate the total economic impact of the VAS.

4.4. Summary

The data collection effort for the Virginia Airport System Economic Impact Study provided all the important data points required for developing an updated economic impact of the 65 Virginia airports. The five surveys implemented at the airports support the measurement of economic impact that will be detailed in subsequent chapters. The data collection process was comprehensive, accurate and efficiently executed.

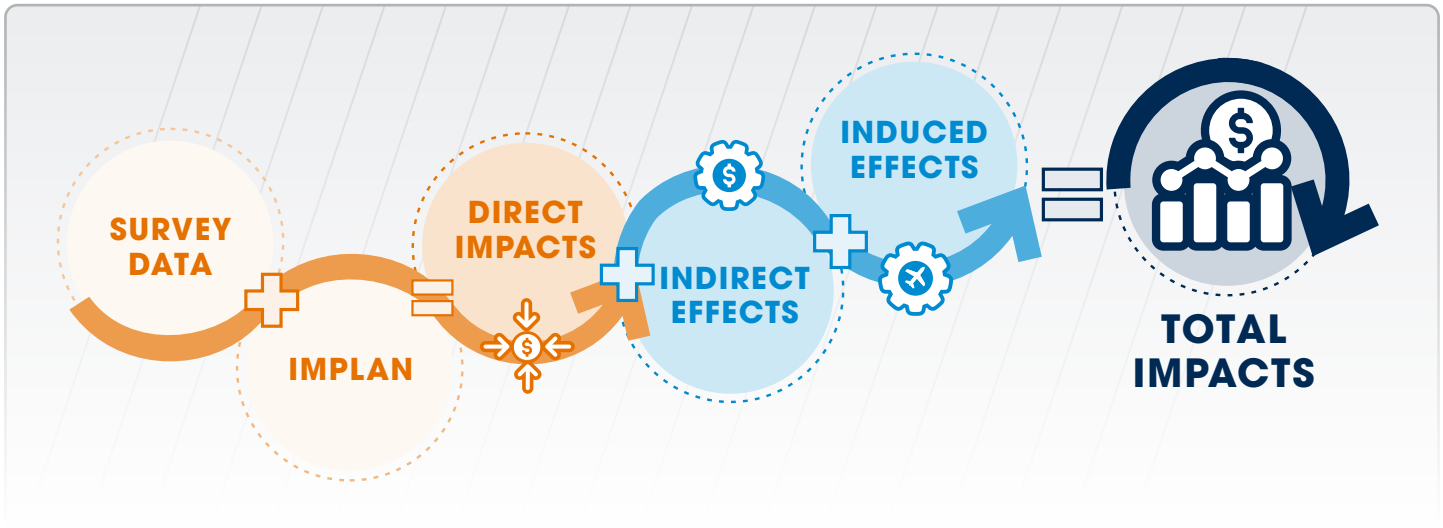
Chapter 5. Methodology

This chapter provides details on the methodology used to quantify the economic impact of Virginia's airports in terms of jobs, wages, GSP, and total economic impact (output). Definitions of these terms can be found in **Chapter 3 – Economic Impact Definitions**. This chapter also details the modeling framework and use of the IMPLAN software application. All final impacts are presented in **Chapter 6 – Economic Impact Findings.**

5.1. Economic Modeling Overview

The economic impacts presented in this chapter are reported as the combined total of direct, indirect, and induced impacts, expressed in terms of jobs, wages, GSP, and output. These totals are developed through a structured process. First, survey data from airport management, tenants, and visitors, together with IMPLAN's industrystandard assumptions, are used to estimate the direct impacts. IMPLAN then models how this direct activity generates additional indirect impacts related to supplier purchases and induced impacts resulting from household spending within Virginia's economy. The sum of these components represents the total economic impact of Virginia's airport system. An overview of the economic modeling process is shown in **Figure 5.1.**

Figure 5.1. Economic Modeling Process Overview



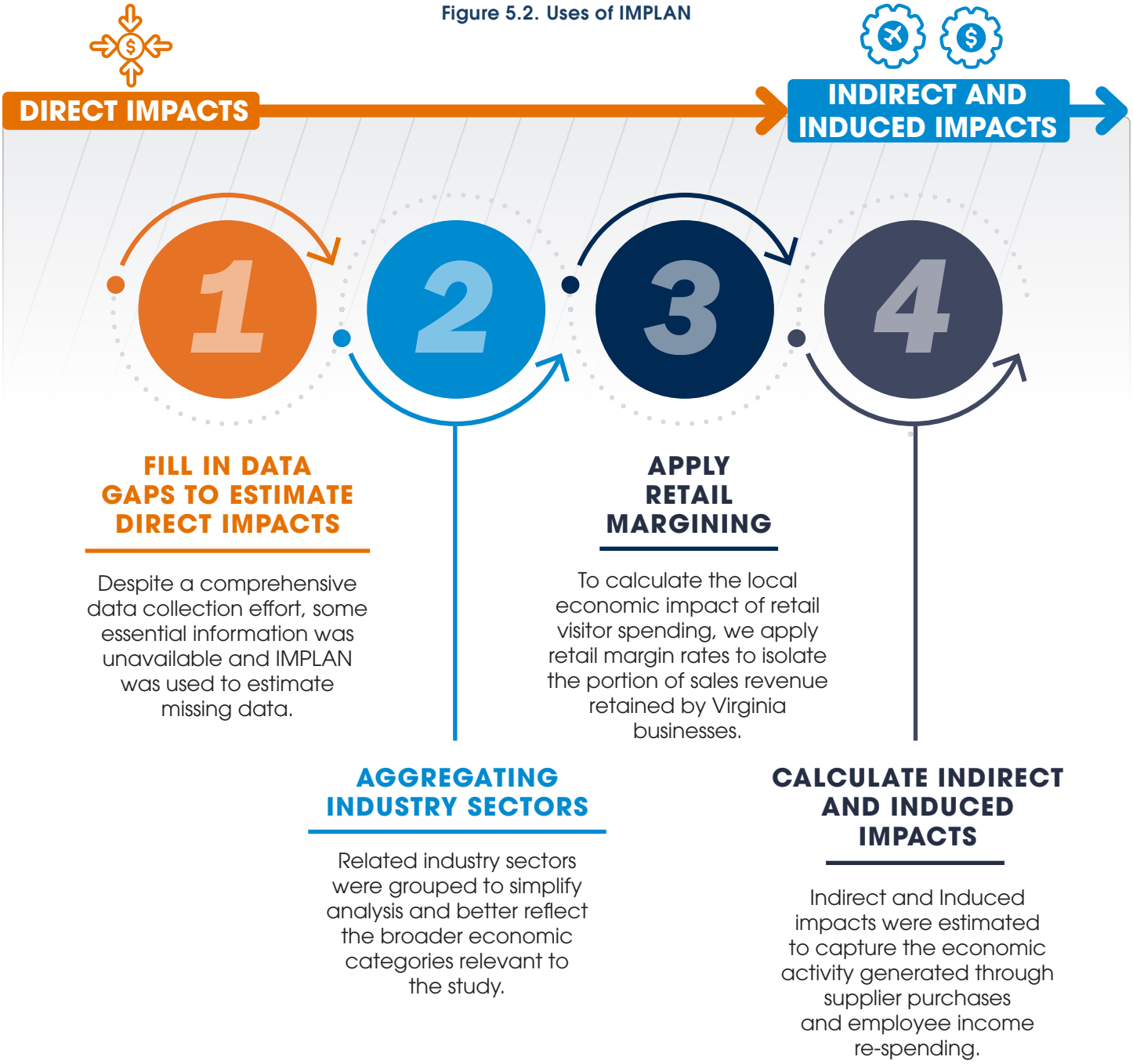
Source: Kimley-Horn, 2025

5.2. Use of IMPLAN

IMPLAN is one of the most widely used input-output (I/O) models in the United States, with data sourced from several agencies, including the Bureau of Economic Analysis (BEA), Bureau of Labor Statistics (BLS), U.S. Census Bureau, and the U.S. Department of Commerce. When given an input, the model examines and calculates economic indicators, such as jobs, wages, GSP, and output, across 528 industry sectors, which closely align with the two- to six-digit codes defined by the North American Industry Classification System (NAICS).[8] The most recent version of IMPAN (2023) was used to help quantify the impact of each airport in the Virginia Aviation System (VAS). IMPLAN fulfilled four main roles in this study, as described in **Figure 5.2.** These roles are explained further in the following sections.

[8] NAICS codes associate industries that produce similar products in similar ways for the use of statistical programs and economic comparison purposes. (https://www.bls.gov/bls/naics.htm)

Figure 5.2. Uses of IMPLAN



Source: Kimley-Horn, 2025

5.2.1. Direct Impacts

IMPLAN was used to supplement data obtained via the data collection process by translating reported activity levels into complete direct economic impact measures, aggregating industries, and apply retail margining to the visitor spending industries. The overall methodology was designed to rely on surveys to collect the most reliable, readily reportable inputs from airports, on-airport businesses, and visitors, and to use IMPLAN's region-specific economic relationships to estimate associated economic measures not directly requested in surveys. The steps used to estimate direct impacts using IMPLAN are outlined in the following sections.

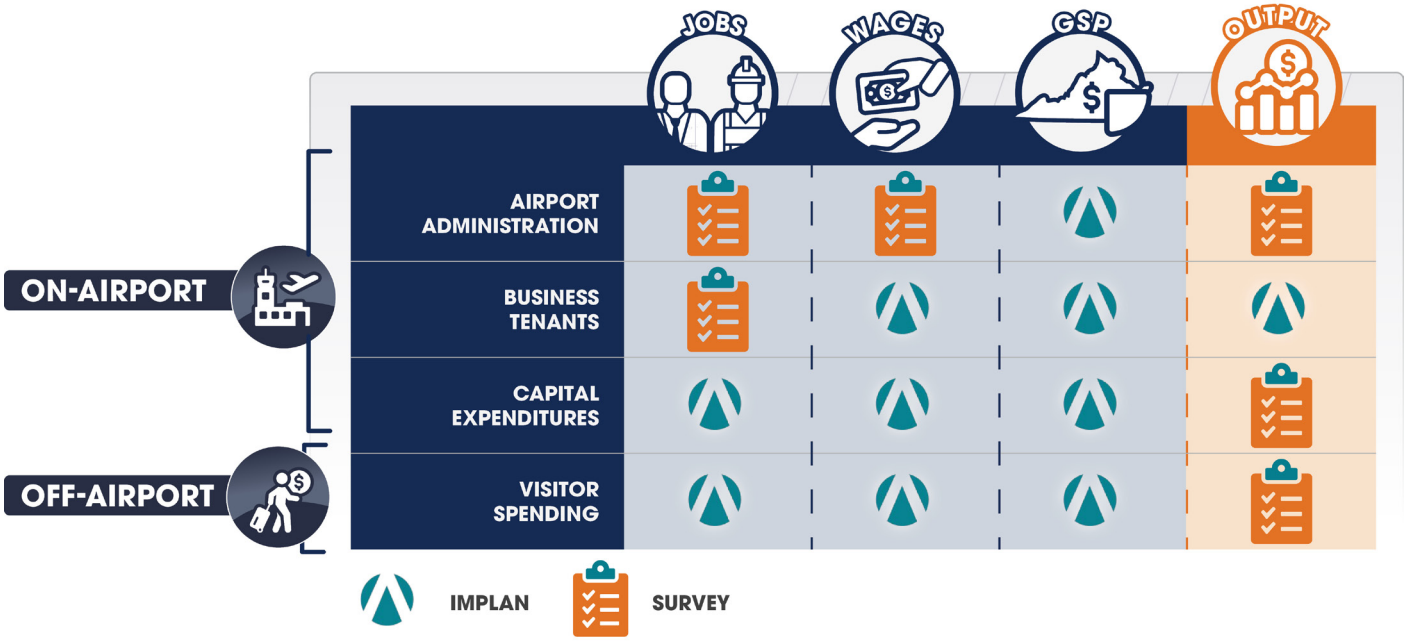
5.2.1.1. Filling in Direct Data Inputs

IMPLAN was used to estimate direct economic impact measures, including jobs, wages, GSP, and output, by converting reported activity data into complete economic estimates using region-specific industry relationships. This approach reflects a deliberate methodological choice to limit survey requests to information respondents could reasonably and consistently provide, while relying on IMPLAN to estimate related economic measures using standardized, defensible assumptions.

- **Jobs:** On-airport job figures were primarily obtained directly from airport management and on-site tenants. These data represent reported headcounts and do not include all contract or construction-related employment. Capital expenditure data was obtained as an output, and the output was used as inputs to IMPLAN to estimate construction-related jobs associated with on-airport activity. Similarly, employment associated with visitor spending was estimated in IMPLAN based on reported visitor spending output levels.
- **Wages:** Wage data were collected directly only for administrative functions. For all other employment categories, including airport tenants, construction-related jobs, contract workers, and visitor-supported jobs, IMPLAN was used to estimate labor income based on regional, industry-specific wage relationships. This approach avoids relying on self-reported payroll estimates while maintaining consistency across airports and business types.
- **GSP:** GSP was not requested directly as part of the data collection process and was estimated in all cases using IMPLAN's value-added-to-output relationships. These ratios reflect region- and industry-specific production structures and are a standard component of IMPLAN-based economic impact analysis.
- **Output:** Output estimates were developed using a combination of reported and modeled inputs. Airport administrative operating expenses (including payroll) and capital expenditures were provided directly by airports. Visitor spending output was obtained via survey responses. For on-airport business tenants, output was estimated by IMPLAN based on reported employment levels and associated industry production relationships.

Figure 5.3 illustrated the relationship between survey data and IMPLAN.

Figure 5.3. Survey Data and IMPLAN Relationship



Source: Kimley-Horn; IMPLAN, 2025

Virginia Economic Development Partnership (VEDP) Regions

All IMPLAN estimates were developed using region-specific models aligned with VEDP regions. VEDP regions are used throughout the study to group economic activity that follows similar trends across the state. These regional bounds are created and referenced in IMPLAN and help to identify industry patterns specific to each area.

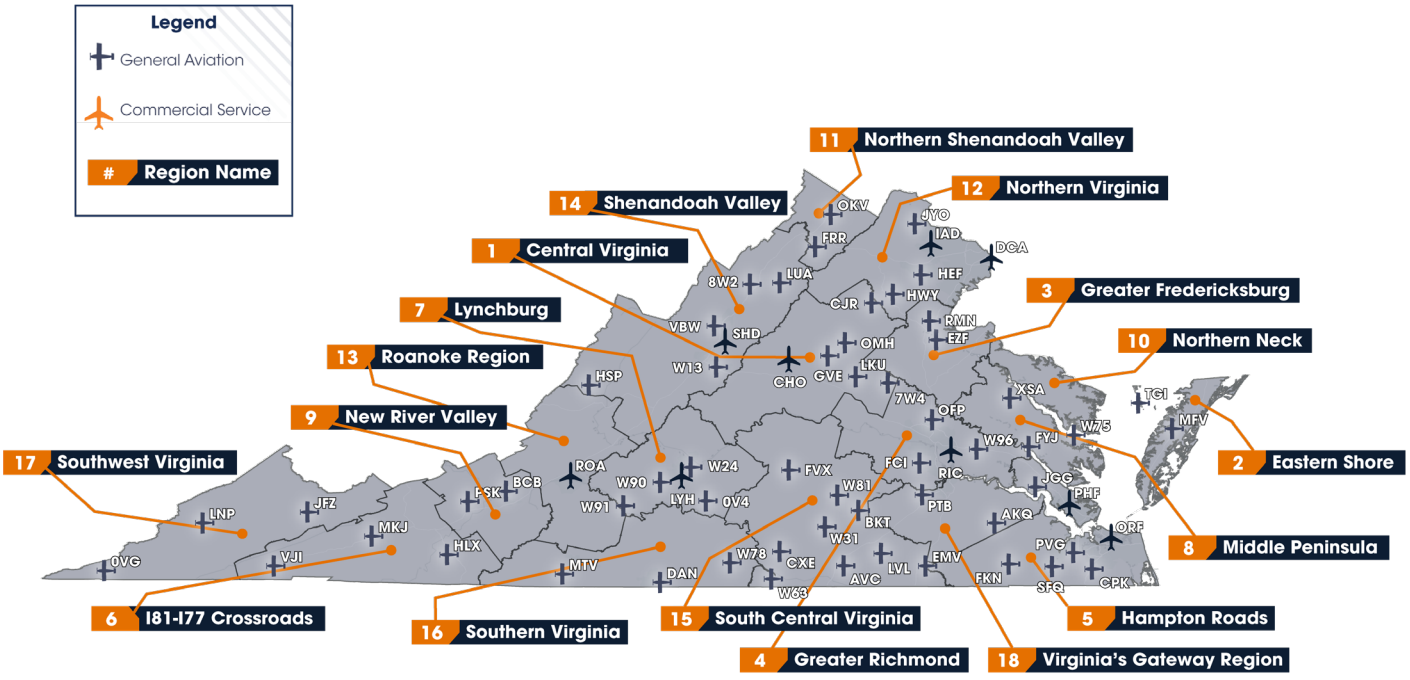
The approach for estimating direct data within these regions varies slightly between on-airport and off-airport visitor spending impacts. The following sections detail the methodology and differences for each category.

On-Airport: To account for economic variation in businesses on-airport across the state, the IMPLAN model was calibrated for 528 IMPLAN industries at the VEDP regional level.[9] This process provided an estimated number of jobs, wages, GSP, and output for each airport when data could not be collected through surveys. This approach ensures that regional differences—such as labor costs, industry composition, and economic output—are reflected in the direct impact estimates.

For example, an FBO located in the Northern Virginia region likely generates a higher output than an FBO in the Eastern Shore region, primarily due to higher labor costs and greater economic activity in Northern Virginia. Since individual business revenue data was not collected via survey, IMPLAN was used to estimate these values. By aligning estimates with VEDP regions, the model accounts for regional cost structures and promotes an accurate representation of local business-level impacts.

Each airport is depicted in its associated VEDP region in **Figure 5.4.**

Figure 5.4. VEDP Regions



Source: Kimley-Horn; VEDP, 2025

[9] Additional information regarding the 528 IMPLAN industries is available at: https://support.implan.com/hc/en-us/articles/115009674428-IMPLAN-Industry-Schemes

Off-Airport Visitor Spending: VEDP regions were also used to estimate visitor spending and cost differences across Virginia. The study team used IMPLAN to compare labor costs of 26 tourism-related industries to the statewide average labor cost for those same industries at the statewide level. This analysis produced VEDP region-specific ratios, which were applied to the spend per visitor at each airport. This analysis assumes that visitor spending is positively correlated with labor costs across the state.

It's important to note that these ratios are specific to the 26 tourism industries and do not reflect all 528 industries included in the IMPLAN model for on-airport estimates. The visitor spending ratios for each VEDP region are presented in **Table 5.1.** For more information on how VEDP regional ratios were used in calculating GA and commercial service visitor spending, refer to **Section 5.3.2.**

Figure 5.5. VEDP Regional Spending Ratio Calculation

Region Name	VS Industry Payroll Per Employee	Percentage of Statewide Average	Spending Ratio (Rounded)
Statewide	$33,580	100.0%	1.0
Central Virginia	$37,189	110.7%	1.1
Eastern Shore	$28,104	83.7%	.84
Greater Fredericksburg	$26,477	78.8%	.79
Greater Richmond	$32,961	98.2%	.98
Hampton Roads	$28,485	84.8%	.85
I81-I77 Crossroads	$28,998	86.4%	.86
Lynchburg Region	$27,199	81.0%	.81
Middle Peninsula	$27,528	82.0%	.82
New River Valley	$29,014	86.4%	.86
Northern Neck	$28,735	85.6%	.86
Northern Shenandoah Valley	$31,547	93.9%	.94
Northern Virginia	$41,834	124.6%	1.2
Roanoke Region	$28,756	85.6%	.86
Shenandoah Valley	$29,929	89.1%	.89
South Central Virginia	$25,482	75.9%	.76
Southern Virginia	$26,994	80.4%	.80
Southwest Virginia	$29,478	87.8%	.88
Virginia's Gateway Region	$32,717	97.4%	.97

Source: IMPLAN, 2025

5.2.1.2. Aggregating Industry Sectors

Aggregating industry data refers to the process of combining closely related industry sectors to reflect broader economic activity. This approach is particularly useful in models like IMPLAN, which include hundreds of detailed sectors. Aggregation simplifies the modeling process, especially when granular data are unavailable and when the goal is to present findings at a statewide level. This study aggregated commonly reported on-airport industries such as construction, state and local government, federal government, retail, and food and beverage services.

- **Example:** An on-airport restaurant may offer both sit-down dining (full-service) and carry-out options (limited-service), which are categorized separately in IMPLAN. To accurately reflect these mixed operations, the study team aggregated and averaged impact measures across relevant sectors into a general "Food and Beverage" industry.

It is important to note that not all on-airport activities were combined into broader aggregations. Many on-airport activities are specific enough to be represented by individual industry sectors. Industry assignments were based on the business descriptions provided by either the airport or the business itself.

26 off-airport visitor spending sectors including entertainment, retail, local transportation, food and beverage, and lodging were also aggregated throughout this process. Gathering visitor spending data presents challenges such as limited participation and reduced transparency. It is also impractical to collect data for each individual tourism-related industry, so the study team aggregated these sectors into broader categories that visitors could more easily report.

- **Example:** A visitor reports spending $150 on concert tickets, $80 on museum admission, and $40 on a guided tour. These activities span multiple IMPLAN sectors, but because each activity falls under the broader category of entertainment, the spending is aggregated into a single entertainment industry. Impact measures such as jobs, wages, GSP, and output are averaged across the relevant IMPLAN sectors and applied to the total reported spending to estimate economic impact.

5.2.1.3. Applying Retail Margining

Retail spending reflects gross sales. However, only the retail margin, or the portion covering operating costs and profits, generates local economic activity. To accurately quantify the impact of visitor retail purchases, IMPLAN applies margin rates to isolate the share of revenue retained by Virginia retailers, ensuring that only locally generated value is used in estimating employment and labor income. Most retail margining occurs in the retail industries, where finished goods are sold to consumers.

- **Example:** A visitor from another state purchases a pair of headphones for their flight home. The headphones cost the visitor $200. However, the store bought those headphones from their supplier for $140. The $60 difference would be the retail margin. When using IMPLAN, only that $60 margin is counted as local economic activity. This method ensures that only the value added by the local business is used to estimate economic impacts like employment and wages.

5.3. Estimating Direct Impacts Using Survey Data

Direct impacts refer to initial economic effects such as off-airport spending from out-of-state visitors, as well as companies contributing to jobs and payroll that are based at the airport. Data to support the estimation of these impacts are primarily sourced through the data collection process using surveys. The methodology used to quantify direct impacts, both on- and off-airport, is detailed in the following sections.

5.3.1. On-Airport

On-airport impacts reflect the combined impacts of airport administration, on-airport business tenants, and capital expenditures. Direct on-airport data were collected via surveys distributed to airport sponsors and tenants. IMPLAN was used to fill in gaps where direct on-airport data were unavailable. This process is further discussed in **Section 5.3.1.1.** These data were validated through close coordination with the airport sponsors and the DOAV.

5.3.2. Off-Airport Visitor Spending

Off-airport visitor spending reflects the economic contribution of travelers who arrive in Virginia via commercial service or GA airports and spend money within the Commonwealth. For this analysis, out-of-state travelers are defined as true visitors because they reside outside Virginia and represent new spending within the state economy.

Estimating visitor impacts at each airport requires two inputs: (1) the number of true visitors and (2) the average spending per true visitor per trip. Multiplying these inputs produces the direct visitor spending estimate for each airport. The following sections describe the methods used to estimate direct spending for commercial service and GA visitors.

5.3.2.1. Commercial Service

Estimating Number of Visitors

The number of true commercial service visitors at each commercial service airport was obtained from Airline Data Inc., which reports origin-and-destination passengers based on airline ticketing information. For most Virginia commercial service airports, these true visitor counts were used directly in the analysis. However, Virginia's two large hub facilities—DCA and IAD—serve expansive multi-state market areas and are located adjacent to Maryland and Washington, DC. As a result, a portion of travelers using these airports conduct most trip-related activities outside Virginia, creating out-of-state spending leakage that must be addressed when estimating statewide impacts. To ensure that statewide off-airport visitor spending reflects economic activity occurring within Virginia, airport-specific Virginia visitor share adjustments were applied to DCA and IAD. These adjustments reflect differences in airport location, traveler behavior, and regional spending patterns that influence where visitors conduct the majority of their trip-related activities.

A 50 percent Virginia visitor share was applied at DCA due to its immediate proximity to downtown Washington, DC, and its role as a primary airport for short-haul, government, and business travel oriented toward the District. Many travelers using DCA select lodging, dining, and ground transportation options in Washington, DC, rather than in Virginia, particularly for short stays and business trips. As a result, a substantial portion of visitor spending associated with DCA occurs outside Virginia and is appropriately excluded from the statewide analysis.

In contrast, a 75 percent Virginia visitor share was applied at IAD. The airport is in Loudoun County and is surrounded by substantial Virginia-based hotel inventory, employment centers, conference facilities, and commercial development. IAD serves a higher share of long-haul and international flights, which are more likely to involve longer stays and overnight lodging within Virginia, particularly in Fairfax and Loudoun counties. In addition, more

limited direct transit connectivity to downtown Washington, DC, relative to DCA, increases the likelihood that visitors using IAD select Virginia-based accommodations and ground transportation options. These factors support the application of a higher Virginia visitor share at IAD. **Table 5.2** summarizes the true visitor share adjustment for IAD and DCA.

Table 5.2. Large Hub Airport True Virginia Visitor Adjustment

Airport	FAA ID	Total True Visitors	Total True Virginia Visitor Share (%)	Total True Virginia Visitors (#)
Ronald Reagan Washington National	DCA	5,445,827	50%	2,722,914
Washington Dulles International	IAD	3,866,555	75%	2,899,916

Sources: Kimley-Horn, 2025; Airline Data Inc., 2024

Only MWAA airports received an adjustment. It should also be noted that this adjustment is only appropriate for a statewide study such as this. If IAD and DCA were to complete their own, MWAA-sponsored economic impact study, their true visitor numbers should not be reduced. Therefore, their own economic impact study may report higher visitor spending impacts since their study is not as catchment area constrained. **Table 5.3** shows the total true visitors used for each commercial service airport.

Table 5.3. Total True Visitors at Commercial Service Airports

Airport	FAA ID	Total True Visitors
Charlottesville Albemarle	CHO	138,603
Lynchburg Regional	LYH	31,843
Newport News International	PHF	30,174
Norfolk International	ORF	1,034,089
Richmond International	RIC	931,913
Roanoke–Blacksburg Regional	ROA	141,765
Shenandoah Valley Regional	SHD	2,411
Ronald Reagan Washington National	DCA	2,722,914
Washington Dulles International	IAD	2,899,916

Source: Kimley-Horn, 2025; Airline Data Inc. 2025

Estimating Spending Per Visitor Per Trip

To estimate average spending per visitor per trip, the study team deployed the commercial service passenger survey. This survey was offered to all nine commercial service airports via Wi-Fi, and in-person surveying was conducted at five Virginia commercial service airports: IAD, DCA, RIC, ORF, and CHO.[10] Survey responses from these airports were used to directly calculate airport-specific average spending per visitor values. These five airports were prioritized because they serve the majority of the Commonwealth's commercial service passengers.

[10] Survey results achieved a statistically valid sample size sufficient to support a 95 percent confidence level for average spending estimates at all surveyed commercial service airports, with the exception of Norfolk International Airport (ORF), where results support a 90 percent confidence level.

In-person commercial service surveying was not conducted at LYH, ROA, SHD, and PHF. For these four airports, average spending per visitor was estimated rather than directly observed using the following two-step process:

1. Statewide baseline: A statewide average spending per visitor was calculated from the commercial service passenger survey results collected at the five airports surveyed and applied to non-surveyed airports as an initial estimate.

2. Regional adjustment: The statewide baseline was then adjusted using VEDP regional spending ratios to reflect differences in costs and spending patterns across Virginia's economic regions.

For surveyed airports, spending per visitor reflects observed survey results; for non-surveyed airports, spending per visitor reflects a regionalized estimate based on the statewide average and VEDP regional ratios.

Table 5.4. Estimated Spend Per Visitor

Airport	FAA ID	Base Spend Per Visitor	VEDP Regional Ratio	Spend Per Visitor
Charlottesville Albemarle	CHO	$802	N/A	$802
Lynchburg Regional	LYH	$732	.81	$593
Newport News International	PHF	$732	.85	$620
Norfolk International	ORF	$892	N/A	$892
Richmond International	RIC	$720	N/A	$720
Roanoke–Blacksburg Regional	ROA	$732	.86	$626
Shenandoah Valley Regional	SHD	$732	.89	$652
Ronald Reagan Washington National	DCA	$1,049	N/A	$1,049
Washington Dulles International	IAD	$962	N/A	$962

Sources: Kimley-Horn, 2025; Airline Data Inc., 2024

5.3.2.2. General Aviation

Estimating Number of Visitors

Just as commercial service visitors contribute to Virginia's economy, GA visitors also generate economic benefits, often at a more localized level. GA visitor spending was estimated using the same fundamental approach as commercial service visitors, by multiplying the number of true visitors by the average spend per visitor per trip.

The estimation of GA visitors began with the development of total annual GA operations at each airport. Because the availability and reliability of operations data vary by airport type, the study team applied a prioritized, hierarchical approach to establish GA operations, selecting the most reliable data source available for each airport.

For airports with an operating air traffic control (ATC) tower, annual GA operations were derived directly from ATC movement counts. These data represent the most accurate and consistent record of aircraft arrivals and departures and were used as the sole source for all towered airports.

For non-towered airports, annual GA operations were based primarily on airport-reported estimates provided during site visits. To ensure reasonableness and consistency at the statewide level, these reported figures were reviewed and compared against FAA Terminal Area Forecast (TAF) data, where available. This comparison was used as a quality-control check to identify values that appeared inconsistent with airport role, activity levels, or regional trends. In most cases, airport-reported estimates aligned with TAF benchmarks and were retained for use in the analysis.

In instances where an airport did not provide an operations estimate, FAA TAF data were used directly. Because TAF data are reported only for NPIAS airports, a limited number of non-NPIAS airports lacked both airport-reported estimates and TAF records. For these airports, the study team coordinated with the Virginia DOAV to establish reasonable and conservative operations estimates based on airport classification and observed activity levels. These airports were assigned relatively low annual operations totals consistent with their limited scale and role within the statewide airport system.

Once total annual GA operations were established for each airport, operations were divided by two to isolate arrivals for the purpose of visitor estimation.

Determining the share of GA operations associated with out-of-state visitors represents the most assumption-driven component of the visitor analysis due to well-documented, industry-wide limitations in tracking GA passenger origins and loads at non-towered airports. Unlike commercial service, GA activity is privately conducted and is not comprehensively captured through standardized passenger or origin-destination datasets. Although ADS-B-based flight tracking systems are increasingly being deployed nationwide, their availability and consistency varied across airports at the time of this study.

As part of the data collection effort, airport managers were asked to estimate both the percentage of GA operations originating from out-of-state and the average number of passengers per GA operation. However, responses varied significantly across airports, including among those with similar operational roles, reflecting differences in interpretation, tracking practices, and familiarity with GA activity levels. Reliance on airport-specific responses would risk introducing extreme values and inconsistencies into the statewide analysis.

To address these limitations and promote consistency, the study team—working in coordination with DOAV—adopted a standardized, classification-based approach. Assumptions for both average passengers per GA arrival and the percentage of out-of-state operations were developed based on observed similarities across airports with comparable roles, professional judgment, and common practices used in statewide GA planning studies. While this approach does not capture all airport-specific variation, it provides a consistent, reasonable, and defensible framework for statewide analysis.

Using this standardized framework, the number of true GA visitors was estimated in two steps. First, the average number of passengers per GA arrival was multiplied by the total number of arrivals at each airport to estimate total GA passengers. Second, the standardized out-of-state percentage was applied to identify true visitors. Through this approach, all 65 airports in the Commonwealth's aviation system were attributed a total number of true GA visitors for 2024. Airport classifications and corresponding standardized assumptions are presented in **Table 5.5.**

Table 5.5. GA True Visitor Standardizations

State Classification	Average of % True Visitors	Average Number of Pax / GA Arrival
Commercial Service	85%	5
Regional Business	65%	4
Community Business	40%	3
Local Service	30%	2

Source: Kimley-Horn, 2025

Estimating Spending Per Visitor Per Trip

After establishing the number of true GA visitors at each airport, the study team estimated average spending per visitor per trip. As mentioned in **Chapter 4**, a GA passenger survey was deployed to collect information on visitor

expenditures across multiple spending categories. The survey yielded 325 valid responses statewide.[11,12] However, sample sizes at individual airports were insufficient to calculate reliable airport-specific spending averages.

As a result, survey responses were used to calculate a statewide average spend per GA visitor per trip of $488, which served as the baseline spending estimate applied across the airport system.

This baseline value alone does not fully reflect differences in airport role or operating environment. Airport classification is an important consideration when estimating GA visitor spending, as airports supporting higher levels of activity or accommodating larger and more complex aircraft tend to serve visitors with different travel characteristics and spending profiles. To account for these differences—and to maintain consistency with the methodology used to estimate commercial service visitor spending—the study team applied an airport classification spending ratio to adjust the statewide average GA spending value.

Classification-based spending ratios were developed to reflect typical differences in GA visitor spending associated with airport role and function. These ratios were applied uniformly to all airports within each classification and are presented in **Table 5.6.**

Figure 5.6. GA Spend per Visitor Classification Ratio

State Classification	Statewide Spend/Visitor/Trip	Spending Ratio	Spend/Visitor/Trip
Commercial Service	$488	100%	$488
Regional Business	$488	90%	$439
Community Business	$488	80%	$390
Local Service	$488	70%	$342

Source: Kimley-Horn, 2025

After applying the airport classification spending ratios, regional economic variation was incorporated using the VEDP regional spending ratios described in **Table 5.1.** These ratios were applied to each airport based on location. Incorporating both airport classification and regional adjustments ensures that GA visitor spending estimates reflect consistent spending patterns across similarly sized airports while accounting for geographic cost and price differences across the Commonwealth.

Following review and approval by DOAV, the number of true GA visitors at each airport was multiplied by the adjusted spending per GA visitor to estimate total direct GA visitor spending. These direct spending estimates were then used as inputs to the economic impact model to calculate indirect and induced impacts associated with GA visitor activity.

11 The GA passenger survey was not deployed at DCA or IAD.
12 22 of the 63 airports had at least one valid survey response.

5.4. Estimating Indirect and Induced Impacts

As mentioned previously, IMPLAN is an I/O economic modeling tool that tracks the flow of money through an economy based on specific data inputs and industry relationships. Direct measures, such as jobs, wages, and output, served as inputs to the IMPLAN model. The model generated indirect (supplier sales) and induced (income re-spending) impacts to capture broad economic activity resulting from direct impacts. Indirect and Induced impacts were calculated using IMPLAN at the airport level using statewide ratios, as the direct data already incorporates regional characteristics. For a detailed breakdown of these impacts by airport, see **Appendix B and Appendix C.**

- **Example of Indirect Impacts:** A janitorial company contracted by an airport generates direct economic activity through its operations. Indirect impacts arise as the company purchases supplies from regional distributors, such as mops, cleaning supplies, and toiletries.
- **Example of Induced Impacts:** A visitor arriving via a Commonwealth airport generates direct economic activity by spending on lodging. Induced impacts arise as the hotel employees (paid via the revenue of the visitors' stay) spend their wages within the community (groceries, dining, and housing).

It is important to note that when businesses purchase goods or services from out-of-state vendors or pay employees who do not reside or spend their income in Virginia, those dollars are considered lost to the Commonwealth's economy and are excluded from the indirect and induced impact calculations. This includes spending that occurs in neighboring areas such as Washington, DC, or Maryland.

5.5. Summary

The study relied on a series of surveys to gather data from various airport sponsors and users. These data served as the direct inputs for the IMPAN I/O modeling software. When data were not collected through the survey effort, IMPLAN estimated values using regional ratios aligned with the VEDP regions. To account for businesses operating across multiple sectors, industry aggregation was applied, while retail margining techniques were used to isolate the local value-added portion of visitor retail spending. IMPLAN then calculated indirect and induced impacts, capturing the broader economic activity generated through supply chain purchases and the re-spending of employee income. Direct, indirect, and induced impacts are summed to produce the total economic impact figures presented in **Chapter 6 – Economic Impact Findings.**

Chapter 6. Statewide Economic Impact Findings

This chapter presents the combined economic impacts found at the Commonwealth's 65 airports in 2024. Individual airport impacts can be found in the **Appendix**. Statewide impacts illustrate the breadth of aviation's role in supporting employment, income, and economic activity across Virginia. Impacts are presented in measures of jobs, wages, GSP and total economic impact (output), and are separated into two categories: on-airport impacts and off-airport visitor spending impacts. These two categories of impacts are aggregated to estimate the total economic impact of the VAS, as presented in **Section 6.3.**

Inflation considerations are discussed in **Section 6.4** Understanding the influence of inflation is critical to interpreting the results presented throughout the chapter, especially in terms of comparison to the previous study.

6.1. On-Airport Impacts

On-airport impacts encompass the economic activity generated by airport administration, on-airport business tenants, and capital improvement projects. In 2024, these activities represented the largest driver of economic impact, accounting for 70 percent of the statewide output. On-airport impacts are further detailed in the sections that follow, which display direct impacts, as well as indirect and induced effects. The totals presented in each section below represent the sum of the direct impacts and the indirect and induced effects.

6.1.1. Airport Administration

Airport administration impacts include personnel responsible for the daytoday administrative functions of each airport, such as airport managers, line service staff, accountants, and other staff included in airport payroll. The Commonwealth's airports employed 2,442 direct airport administration workers who collectively generated more than $900 million in economic output in 2024. These direct employees account for roughly 35 percent of total airport administration impacts. In addition, their spending and support of airport-related activity, through indirect and induced effects, added an additional 4,521 jobs across Virginia.

Airport administration activities in the Commonwealth supported a total of 6,963 jobs associated with $490 million in wages, contributed nearly $1.3 billion to the GSP, and nearly $1.8 billion in total economic output. Airport administration impacts are presented in **Table 6.1** by direct, indirect, and induced impact type.

Table 6.1. Statewide Airport Administration Impacts

Impact Type	Jobs	Wages	GSP	Output
Direct	2,442	$203,507,000	$759,848,000	$936,010,000
Indirect	1,123	$87,082,000	$117,263,000	$195,128,000
Induced	3,398	$199,860,000	$397,550,000	$620,000,000
Total	**6,963**	**$490,449,000**	**$1,274,662,000**	**$1,750,727,000**

Note: Totals may not sum due to rounding
Source: Kimley-Horn, 2025

6.1.2. On-Airport Business Tenant

On-airport businesses are defined as entities that conduct operations and employ staff directly on airport property. These businesses are not exclusively aviationrelated; for example, both a concessionaire and a flight school are classified as on-airport business tenants.

On-airport business tenants were the largest contributor to Virginia's on-airport impacts in 2024. Across the Commonwealth, more than 500 businesses supported 62,522 direct jobs at Virginia's airports. The activities of these employees, in turn, supported an additional 57,558 jobs statewide through indirect and induced effects. On-airport

business tenant activity supported 120,080 jobs, $10.1 billion in wages, generated over $16.3 billion in GSP, and $26.9 billion in total economic output in 2024.

Statewide economic impacts attributable to on-airport business tenants are presented in **Table 6.2.**

Table 6.2. Statewide On-Airport Business Tenant Impacts

Impact Type	Jobs	Wages	GSP	Output
Direct	62,522	$6,135,640,000	$9,520,532,000	$15,843,611,000
Indirect	28,257	$2,242,156,000	$3,379,555,000	$5,686,835,000
Induced	29,301	$1,723,479,000	$3,429,766,000	$5,345,025,000
Total	**120,080**	**$10,101,275,000**	**$16,329,852,000**	**$26,875,471,000**

Note: Totals may not sum due to rounding
Source: Kimley-Horn, 2025

6.1.3. Capital Expenditure

Capital expenditure impacts are generated by construction activity occurring on airport property. This construction may be undertaken by the airport sponsor or by on-airport tenants and includes employment, wages, revenue, and costs associated with constructionrelated activities.

In 2024, airports across the Commonwealth reported spending an average of $493 million on CAPEX, which directly supported 2,369 constructionrelated jobs.13 These expenditures also supported an additional 1,372 jobs statewide through indirect and induced effects.

As shown in **Table 6.3**, CAPEX supported a total of 3,741 jobs, $266 million in wages, contributed $460 million to the GSP, and nearly $789 million in total economic output.

Table 6.3. Statewide CAPEX Impacts

Impact Type	Jobs	Wages	GSP	Output
Direct	2,369	$174,330,000	$283,172,000	$493,292,000
Indirect	603	$46,553,000	$87,079,000	$154,964,000
Induced	769	$45,227,000	$89,989,000	$140,244,000
Total	**3,741**	**$266,111,000**	**$460,240,000**	**$788,501,000**

Note: Totals may not sum due to rounding
Source: Kimley-Horn, 2025

6.1.4. On-Airport Summary

Together, airport administration, on-airport business tenants, and CAPEX form the total on-airport economic footprint of Virginia's airport system. On-airport business tenants were the primary driver of these impacts, accounting for more than 120,000 jobs statewide. Business tenants generated 91 percent of the on-airport output, underscoring that Virginia's airports serve not only as transportation facilities but as major economic hubs where businesses can thrive. Airport administration accounted for an additional six percent of on-airport impacts, and CAPEX for the remaining three percent.

These three activities supported 130,784 jobs, $10.9 billion in wages, contributed $18.1 billion to the Commonwealth's GSP, and $29.4 billion in total economic output in 2024. **Table 6.4** summarizes the statewide on-airport impacts.

[13] Capital expenditures were averaged over four years (2021-2024) to capture typical spending profiles for each airport.

Table 6.4. Statewide On-Airport Impacts Summary

Impact Type	Jobs	Wages	GSP	Output
Airport Administration	6,963	$490,449,000	$1,274,662,000	$1,750,727,000
On-Airport Business Tenants	120,080	$10,101,275,000	$16,329,852,000	$26,875,471,000
CAPEX	3,741	$266,111,000	$460,240,000	$788,501,000
Total	**130,784**	**$10,857,835,000**	**$18,064,754,000**	**$29,414,700,000**

Note: Totals may not sum due to rounding
Source: Kimley-Horn, 2025

6.2. Off-Airport Visitor Spending Impacts

In addition to on-airport activity, Virginia's airports generate substantial economic impacts through their visitors, specifically offairport visitor spending. Offairport visitor spending impacts represent the economic activity generated by outofstate visitors, who travel via the Commonwealth's airports and spend money within the state, referred to as "true visitors." These impacts capture expenditures made by visitors offairport, across a range of visitororiented sectors including entertainment, retail, local transportation, food and beverage, and lodging.

In 2024, Virginia's estimated 9.4 million true visitors spent nearly $7.5 billion in the visitor spending sectors across the Commonwealth. Offairport visitor spending impacts are presented in the sections that follow and are reported separately for commercial service and GA visitor spending.

6.2.1. Commercial Service

In 2024, nearly eight million true visitors traveled through Virginia's commercial service airports, generating an estimated $6.9 billion in direct visitor spending statewide. This spending supported 56,541 jobs across the visitororiented industries listed above. Indirect and induced effects associated with commercial service visitor activity supported over 24,000 additional jobs and generated $4.7 billion in output statewide.

As shown in **Table 6.5**, commercial service visitor spending supported a total of 80,550 jobs, $4.0 billion in wages, generated $7.1 billion in GSP, and more than $11.5 billion in total economic output in 2024, underscoring the significant role commercial service airports play in supporting Virginia's visitor economy.

Table 6.5. Statewide Commercial Service Visitor Spending Impacts

Impact Type	Jobs	Wages	GSP	Output
Direct	56,541	$2,415,425,000	$4,352,066,000	$6,864,669,000
Indirect	12,877	$901,366,000	$1,494,265,000	$2,631,922,000
Induced	11,132	$654,966,000	$1,303,446,000	$2,031,310,000
Total	**80,550**	**$3,971,756,000**	**$7,149,778,000**	**$11,527,901,000**

Note: Totals may not sum due to rounding
Source: Kimley-Horn, 2025

6.2.2. GA

Visitors traveling via GA aircraft spent an estimated $612 million statewide in 2024. This spending supported 5,618 jobs across the same visitororiented industries as commercial service visitors (entertainment, retail, local transportation, food and beverage, and lodging).

The economic activity generated by GA visitors also produced additional indirect and induced effects, supporting 2,454 additional jobs and contributing $457 million in output through supplychain purchases and household spending by employees.

In total, GA visitor spending supported 8,072 jobs, $362 million in wages, contributed nearly $629 million to the GSP, and nearly $1.1 billion in total economic output across the Commonwealth. These impacts are presented in **Table 6.6.**

Table 6.6. Statewide GA Visitor Spending Impacts

Impact Type	Jobs	Wages	GSP	Output
Direct	5,618	$207,686,000	$356,000,000	$611,867,000
Indirect	1,376	$90,519,000	$146,346,000	$260,385,000
Induced	1,078	$63,443,000	$126,230,000	$196,724,000
Total	**8,072**	**$361,648,000**	**$628,577,000**	**$1,068,977,000**

Note: Totals may not sum due to rounding
Source: Kimley-Horn, 2025

6.2.3. Visitor Spending Summary

The figures presented above highlight the critical role that both commercial service and GA visitors play in supporting Virginia's broader visitor economy. Commercial service visitors were the primary driver of these impacts, accounting for more than 90 percent of total visitor spending output, while GA visitors contributed the remaining ten percent.

In 2024, visitor spending associated with commercial service and GA activity supported 88,621 jobs, $4.6 billion in wages, contributed $7.8 billion to the Commonwealth's GSP, and produced nearly $12.6 billion in total economic output. **Table 6.7** summarizes the statewide off-airport visitor spending impacts.

Table 6.7. Statewide Off-Airport Visitor Spending Impacts

Impact Type	Jobs	Wages	GSP	Output
Commercial Service	80,550	$3,971,756,000	$7,149,778,000	$11,527,901,000
GA	8,072	$361,648,000	$628,577,000	$1,068,977,000
Total	**88,621**	**$4,333,404,000**	**$7,778,355,000**	**$12,596,878,000**

Note: Totals may not sum due to rounding
Source: Kimley-Horn, 2025

6.3. Total Statewide Economic Impact Summary

The total economic impact of the Commonwealth's airports reflects the combined effects of on-airport activity and offairport visitor spending. While individual airport impacts vary widely based on activity type and scale, statewide results reflect the combined performance of Virginia's commercial service hubs and GA system as an integrated economic network.

On-airport activity accounted for the largest share of statewide impacts, representing approximately 70 percent of total economic output due to the concentration of employment and business activity located directly on airport property. On-airport business tenants account for roughly 64 percent of the total statewide impact. Offairport visitor spending accounted for the remaining 30 percent of the statewide total impacts.

Together, these findings underscore the critical role Virginia's airports play, not only as transportation assets, but as key economic engines supporting businesses, employment, and communities across the Commonwealth. **Table 6.8** summarizes the statewide economic impacts by category.

Table 6.8. Total Statewide Impacts

Impact Category	Jobs	Wages	GSP	Output
On-Airport	130,784	$10,857,835,000	$18,064,754,000	$29,414,700,000
Off-Airport Visitor Spending	88,621	$4,333,404,000	$7,778,355,000	$12,596,878,000
Total	**219,405**	**$15,191,240,000**	**$25,843,109,000**	**$42,011,577,000**

Note: Totals may not sum due to rounding
Source: Kimley-Horn, 2025

6.4. Inflationary Considerations

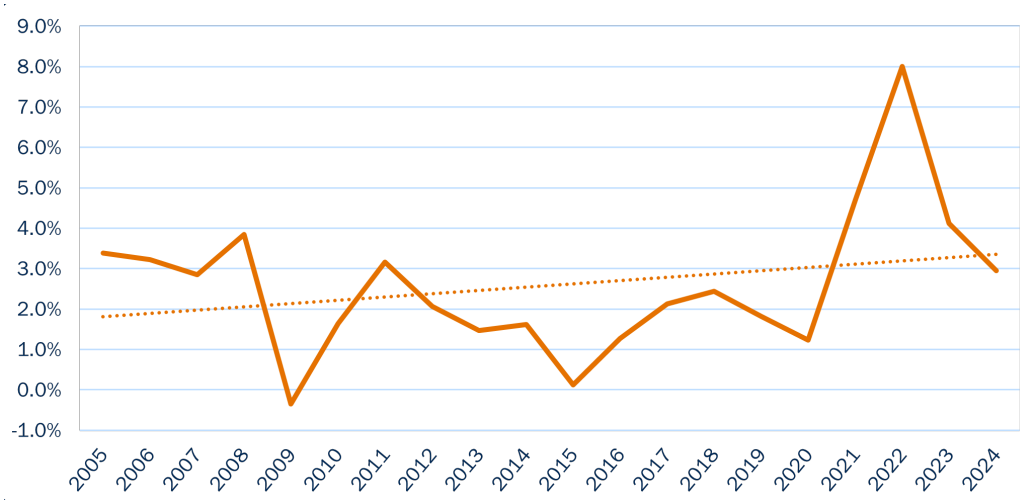
Inflation is a key consideration in economic impact studies, as considering inflation often allows for more meaningful yeartoyear comparisons across study periods. Accordingly, understanding the role of inflation is essential to accurately interpret the study results presented in this chapter. The following sections provide economic context for interpreting the impacts presented in this report by summarizing key inflation and aviation related labor market trends observed since the previous study, specifically related to the COVID-19 pandemic recovery period.

6.4.1. COVID-19 Recovery

Inflation is often examined in conjunction with labor market conditions. Defined as the rate of increase in the price of goods and services over a given period, inflation may result from increased demand, constrained supply, or a combination of both. In the United States, inflation is typically measured using the consumer price index (CPI), which tracks changes in prices for a representative "basket" of goods and services.

Beginning in 2021, consumer demand rebounded sharply following the COVID-19 pandemic. This surge in demand, combined with ongoing supplychain constraints, resulted in elevated inflationary pressures. As illustrated in **Figure 6.1**, from 2021 through 2023, inflation remained above the longterm average, coinciding with a strong labor market that placed upward pressure on wages. Although unemployment rates were returning to prepandemic levels during this period, labor availability remained constrained, contributing to ongoing supply chain disruptions.

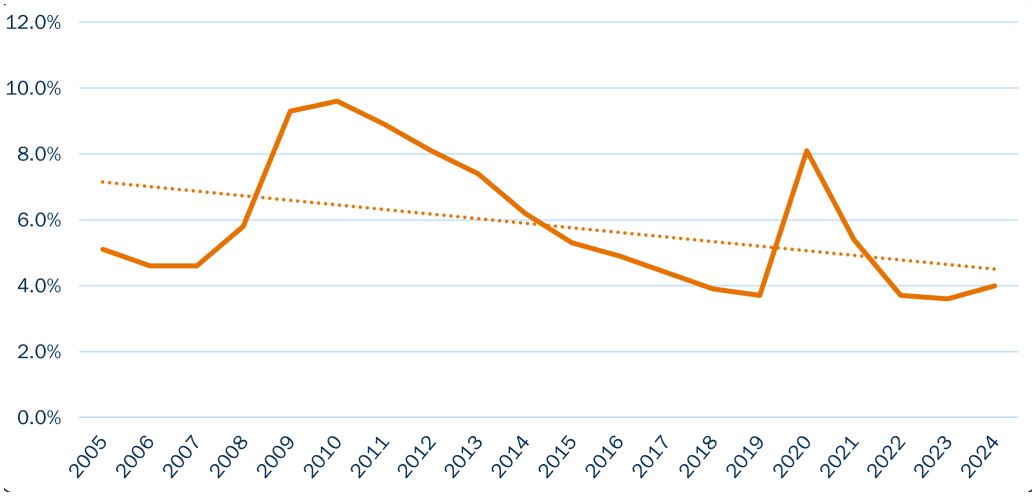
Figure 6.1. Inflation Rate (Consumer Price All Goods) (2005-2024)



Source: US Bureau of Labor Statistics. Indexed to 1982-1984

During this inflationary period, consumers experienced higher costs for essential goods and services, including food, housing, construction services and material, and transportation. As depicted in **Figure 6.2**, labor market conditions began to ease by 2024 as workforce participation increased and labor supply more closely aligned with employer demand.

Figure 6.2. Unemployment Rate (2005-2024)



Source: US Bureau of Labor Statistics via FRED

The combined effects of labor constraints and elevated inflation continued to place pressure on operating costs, capital programs, and overall financial performance across the aviation industry. As daytoday operating costs increased, many industries—including aviation—sought alternative strategies to control expenses and maintain profitability. For example, some airlines have implemented selfservice kiosks and other automated technologies to reduce staffing needs at ticketing counters.

These economic shifts enabled the aviation industry to generate comparable levels of economic output with fewer employees when compared to pre-COVID-19 levels. This dynamic has contributed to trends such as stagnant employment alongside higher output, as output measures include rising costs associated with intermediate goods and services. These industrywide trends are reflected in the economic impact results presented in this report, where increases in output are not always accompanied by proportional growth in employment, highlighting the effects of rising costs, productivity gains, and automation across the aviation sector.

6.4.2. Inflationary Considerations Summary

Since the completion of the prior economic impact study, elevated inflation has materially affected wages, construction costs, OPEX, and overall output across the aviation industry. As a result, changes observed in employment, payroll, and total economic output reflect both shifts in aviation activity and broader inflation-driven increases in the cost of producing goods and services. Accordingly, the impacts presented in this chapter should not be interpreted as an inflation-adjusted comparison to the results of the previous economic impact study.

Chapter 7. Reliant Industries and Tax Benefits

This chapter outlines the value of industry reliance and the tax benefits driven by Virginia's aviation industry. These analyses provide additional insight into how aviation supports economic activity beyond airport boundaries and contributes to public revenue streams at multiple levels of government. Both measures are presented separately from the total impacts, and should not be summed, to avoid double counting activities that influence both direct airport impacts and these supplemental analyses. These impacts offer another lens on aviation's role as a critical economic engine for the Commonwealth.

7.1. Industry Reliance

Industry reliance describes the degree to which off-airport businesses across Virginia depend on the aviation industry. Industries are classified as fully reliant when all the business's output is tied to aviation and the business could not operate without it, or partially reliant when only a portion of the business's output depends on aviation. Partially reliant industries include sectors where aviation supports a meaningful share of business activity, though not all firms within these industries depend on aviation to the same degree.

The businesses included in this analysis differ from the on-airport business tenants discussed in **Chapter 6** because they do not have employees based at an airport, yet they still rely on airports to conduct business operations. These impacts cannot be combined with the total economic impact presented in **Chapter 6**, as this may result in double-counting certain on-airport and visitor spending impacts.

Reliant industries were identified through the AMS, off-airport business reliance survey, and ESRI Business Analyst. This process identified 12 fully reliant industries and 13 partially reliant industries, each associated with a North American Industry Classification System (NAICS) code translated to a related IMPLAN code, as shown in **Table 7.1.**

Table 7.1. Reliant Industries

NAICS Industry Description	NAICS Code	IMPLAN Code
Fully Reliant		
Aircraft Manufacturing	336411	337
Aircraft Engine and Engine Parts Manufacturing	336412	337
Other Aircraft Parts and Auxiliary Equipment Manufacturing	336413	339
Scheduled Passenger Air Transportation	481111	396
Scheduled Freight Air Transportation	481112	396
Nonscheduled Chartered Passenger Air Transportation	481211	396
Nonscheduled Chartered Freight Air Transportation	481212	396
Other Nonscheduled Air Transportation	481219	396
Air Traffic Control	488111	396
Other Airport Operations	488119	402
Other Support Activities for Air Transportation	488190	402
Flight Training	611512	464
Partially Reliant		
Colleges, Universities, and Professional Schools	611310	463
Engineering Services	541330	439
Technical Consulting Services	541690	445
National Security	927110	528
Transportation Regulation	926120	528
Wired Telecommunications Carriers	517111	415
Wireless Telecommunications Carriers	517112	451
Other Information Services	519190	419
Travel Arrangement Services	561599	456
Ground Passenger Transportation	485999	400
Hotels and Motels	721110	489

Source: Kimley-Horn, 2025

Using the NAICS code for each industry, ESRI identified off-airport businesses located more than one mile from airports to further avoid double counting on-airport tenants. ESRI provided employee counts associated with each NAICS code, which served as inputs to the IMPLAN model. IMPLAN then calculated corresponding Wages, GSP, and Total Economic Output, as shown in **Table 7.1.** The statewide industry reliance analysis identified 10,632 off-airport Jobs, associated with $1.1 billion in wages, contributing nearly $2.0 billion in GSP and nearly $3.3 billion in Output as reliant on the Commonwealth's aviation industry. These impacts reflect the value aviation provides to off-airport businesses across the state and the monetary value of their reliance.

Table 7.2. Industry Reliance Impacts

Impact Type	Jobs	Wages	GSP	Output
Direct	5,690	$758,476,000	$1,388,601,000	$2,286,932,000
Indirect	1,763	$155,558,000	$223,773,000	$371,203,000
Induced	3,178	$193,096,000	$386,384,000	$601,746,000
Total	**10,632**	**$1,107,130,000**	**$1,998,758,000**	**$3,259,881,000**

Note: Totals may not sum due to rounding.
Source: Kimley-Horn; ESRI; IMPLAN, 2025

7.2. Tax Impacts

Tax impacts represent the revenue generated at the local, state, and federal levels as a result of aviation-related activity. These activities include taxes paid by airports, tenants, construction companies, and their employees, as well as visitors traveling from out of state. The analysis accounts for federal social taxes such as Medicare and Social Security, personal income taxes at both state and federal levels, sales taxes at state and local levels, property taxes, and other taxes, including those on motor vehicles.

Data collected throughout the study was used to estimate taxes paid for each activity based on direct output. IMPLAN calculates the average tax amount paid by industry sector per $1 million in output. This ratio is then applied to the direct output of each industry sector. For example, if an airport reports $10 million in capital improvements, and the construction industry pays $100,000 in taxes per $1 million, the resulting tax impact is $1 million. Similarly, if the same airport generates $40 million in retail activity through visitor spending, and retail averages $255,000 in taxes per $1 million, the estimated tax impact is $10.2 million. This process is repeated for each airport's activity statewide.

On-airport business tenants are a major driver of tax revenue, accounting for approximately 60 percent of all taxes generated through aviation activity in Virginia and producing $4.1 billion in tax revenue. Airport administration, capital expenditures, and visitors contribute an additional $2.4 billion in tax revenue for a total of $6.5 billion in aviation related tax revenue across the state. Of this total, ~23 percent supports local governments, another ~23 percent benefits the Commonwealth, and ~54 percent supports federal programs. These figures underscore the significant role Virginia's aviation industry plays—not only in strengthening the commonwealth's economy but also in contributing to national fiscal health. **Table 7.3** summarizes statewide tax impacts by activity type.

Table 7.3. Statewide Tax Impacts

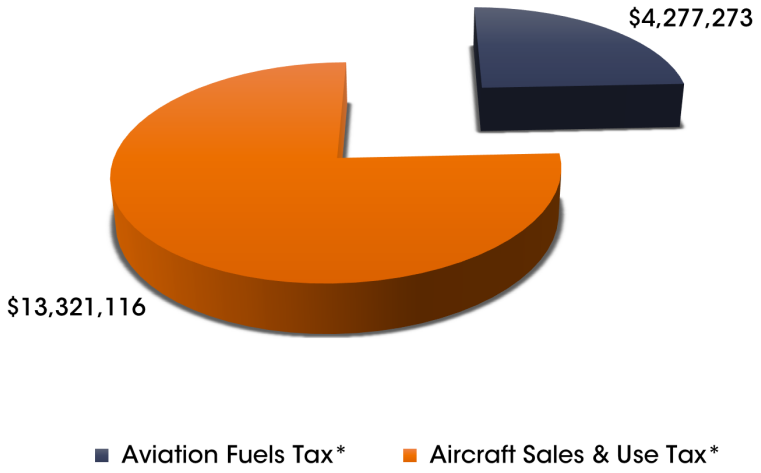
Tax Source	Federal Taxes	State Taxes	Local Taxes	Total Taxes
Airport	$230,772,000	$52,510,000	$33,466,000	$316,748,000
Capital Expenditures	$61,072,000	$18,673,000	$13,272,000	$93,017,000
Tenants	$2,244,089,000	$945,316,000	$938,185,000	$4,127,590,000
Commercial Service Visitors	$885,965,000	$457,571,000	$493,590,000	$1,837,126,000
GA Visitors	$84,076,000	$38,662,000	$39,419,000	$162,157,000
Total	**$3,505,974,000**	**$1,512,732,000**	**$1,517,932,000**	**$6,536,638.000**

Note: Totals may not sum due to rounding.
Source: Kimley-Horn; IMPLAN, 2025

In addition to the statewide tax impacts resulting from aviation activities, taxes are generated from aviation fuel sales and the imposed sales and use tax, which contributes to the Aviation Special Fund (ASF). Taxes on fuel and aircraft use cannot be estimated through IMPLAN because direct business revenues for fuel suppliers were not reported during data collection. Instead, these figures were provided directly by the Virginia DOAV) and are shown in **Figure 7.1.**

In 2024, the total revenue from aircraft sales and use tax and aviation fuels tax reached $17.6 million, with aviation fuels tax accounting for 24 percent and aircraft sales and use tax contributing the remaining 76 percent.

Figure 7.1. ASF Tax Revenue Breakdown



**Includes interest rated over individual revenue totals.*
Source: Kimley-Horn; DOAV, 2025

7.3. Summary

This chapter emphasizes the critical role of aviation in Virginia's economy through two key dimensions: industry reliance and tax impacts. Industry reliance illustrates how off-airport businesses depend on aviation services, with some sectors fully tied to aviation and others partially reliant for operations and growth. These connections extend beyond airport boundaries, reinforcing aviation as an essential driver of statewide economic activity. Tax impacts further demonstrate aviation's significance by highlighting the broad range of revenues generated at federal, state, and local levels through airport operations, capital projects, tenants, and visitor spending, as well as additional contributions from aviation fuel and aircraft sales. Together, these findings provide additional context to aviation's importance not only as a transportation system but as a dynamic business sector driving economic growth. Together, these findings reinforce that investments in Virginia's aviation system generate returns that extend well beyond airport boundaries, supporting diverse industries and meaningful public revenues statewide.

Appendix A. Total On-Airport Impacts

Associated City	Airport Name	FAA ID	Jobs	Wages	GSP	Output
Commercial Service						
Charlottesville	Charlottesville-Albemarle	CHO	806	$71,084,000	$122,967,000	$204,344,000
Lynchburg	Lynchburg Regional	LYH	590	$40,088,000	$60,741,000	$100,565,000
Newport News	Newport News–Williamsburg International	PHF	803	$56,796,000	$102,410,000	$191,217,000
Norfolk	Norfolk International	ORF	5,381	$409,274,000	$688,813,000	$1,181,541,000
Richmond	Richmond International	RIC	5,960	$479,726,000	$772,190,000	$1,272,935,000
Roanoke	Roanoke – Blacksburg	ROA	1,809	$138,425,000	$244,769,000	$438,379,000
Staunton/ Waynesboro/ Harrisonburg	Shenandoah Valley Regional	SHD	261	$23,845,000	$38,749,000	$58,467,000
Washington	Ronald Reagan Washington National	DCA	44,169	$3,643,314,000	$6,229,706,000	$10,096,269,000
Washington	Dulles International	IAD	64,541	$5,393,721,000	$8,938,480,000	$14,505,838,000
General Aviation						
Abingdon	Virginia Highlands	VJI	70	$3,319,000	$5,967,000	$10,309,000
Blacksburg	Virginia Tech–Montgomery Executive	BCB	84	$7,466,000	$12,974,000	$21,478,000
Blackstone	Allen C. Perkinson Municipal	BKT	181	$16,493,000	$31,699,000	$56,141,000
Bridgewater	Bridgewater Air Park	VBW	1,112	$131,698,000	$162,246,000	$241,267,000
Brookneal	Brookneal–Campbell County	0V4	0	$13,000	$43,000	$63,000
Bumpass	Lake Anna	7W4	1	$38,000	$98,000	$151,000
Chase City	Chase City Municipal	CXE	2	$92,000	$169,000	$318,000
Clarksville	Lake Country Regional	W63	4	$218,000	$414,000	$765,000
Crewe	Crewe Municipal	W81	0	$14,000	$42,000	$64,000
Culpeper	Culpeper Regional	CJR	87	$7,425,000	$13,522,000	$21,984,000
Danville	Danville Regional	DAN	89	$4,931,000	$7,630,000	$12,653,000

Associated City	Airport Name	FAA ID	Jobs	Wages	GSP	Output
Dublin	New River Valley	PSK	33	$1,976,000	$2,784,000	$4,331,000
Emporia	Emporia-Greensville Regional	EMV	24	$2,382,000	$3,094,000	$4,037,000
Farmville	Farmville Regional	FVX	12	$639,000	$1,153,000	$2,101,000
Forest	New London	W90	0	$29,000	$127,000	$178,000
Franklin	Franklin Regional	FKN	2	$111,000	$243,000	$346,000
Fredericksburg	Shannon	EZF	65	$5,051,000	$9,258,000	$16,260,000
Front Royal	Front Royal-Warren County	FRR	70	$6,028,000	$9,333,000	$16,054,000
Galax/Hillsville	Twin County	HLX	22	$1,299,000	$1,934,000	$2,937,000
Gordonsville	Gordonsville Municipal	GVE	12	$940,000	$1,268,000	$1,837,000
Hot Springs	Ingalls Field	HSP	7	$358,000	$837,000	$1,264,000
Jonesville	Lee County	0VG	-	$-	$-	$-
Kenbridge	Lunenburg County	W31	3	$137,000	$285,000	$495,000
Lawrenceville	Brunswick Municipal	LVL	2	$63,000	$106,000	$181,000
Leesburg	Leesburg Executive	JYO	414	$37,444,000	$50,493,000	$70,418,000
Louisa	Louisa County	LKU	20	$1,719,000	$2,477,000	$3,386,000
Luray	Luray Caverns	LUA	46	$4,252,000	$5,834,000	$8,560,000
Lynchburg	Falwell	W24	7	$312,000	$403,000	$563,000
Manassas	Manassas Regional	HEF	1,896	$184,125,000	$270,619,000	$453,110,000
Marion/Wytheville	Mountain Empire	MKJ	11	$566,000	$1,404,000	$2,050,000
Martinsville	Blue Ridge Regional	MTV	189	$27,974,000	$36,406,000	$56,352,000
Melfa	Accomack County	MFV	17	$895,000	$2,766,000	$4,001,000
Moneta	Smith Mountain Lake	W91	21	$974,000	$1,667,000	$2,712,000
New Market	New Market	8W2	29	$1,760,000	$2,382,000	$3,892,000
Norfolk	Chesapeake Regional	CPK	110	$8,677,000	$11,446,000	$15,641,000
Norfolk	Hampton Roads Executive	PVG	313	$21,542,000	$35,008,000	$60,117,000

Associated City	Airport Name	FAA ID	Jobs	Wages	GSP	Output
Orange	Orange County	OMH	83	$5,281,000	$7,323,000	$11,471,000
Petersburg	Dinwiddie County	PTB	33	$2,138,000	$3,211,000	$5,969,000
Quinton	New Kent County	W96	10	$463,000	$886,000	$1,385,000
Richlands	Tazewell County	JFZ	7	$295,000	$617,000	$942,000
Richmond	Richmond Executive – Chesterfield County	FCI	414	$36,243,000	$51,373,000	$69,685,000
Richmond/ Ashland	Hanover County Municipal	OFP	133	$11,475,000	$15,466,000	$22,640,000
South Boston	William M Tuck	W78	7	$155,000	$197,000	$268,000
South Hill	Mecklenburg–Brunswick Regional	AVC	13	$922,000	$1,315,000	$1,771,000
Stafford	Stafford Regional	RMN	180	$18,181,000	$25,385,000	$33,165,000
Suffolk	Suffolk Executive	SFQ	74	$4,212,000	$7,055,000	$10,979,000
Tangier	Tangier Island	TGI	0	$3,000	$13,000	$19,000
Tappahannock	Tappahannock–Essex County	XSA	11	$703,000	$1,049,000	$1,444,000
Topping	Hummel Field	W75	14	$594,000	$1,088,000	$1,897,000
Wakefield	Wakefield Municipal	AKQ	2	$132,000	$340,000	$560,000
Warrenton	Warrenton–Fauquier	HWY	83	$6,468,000	$8,637,000	$12,381,000
Waynesboro	Eagles Nest	W13	10	$1,300,000	$1,556,000	$1,972,000
West Point	Middle Peninsula Regional	FYJ	192	$17,064,000	$27,600,000	$51,217,000
Williamsburg	Williamsburg–Jamestown	JGG	18	$843,000	$1,601,000	$2,618,000
Winchester	Winchester Regional	OKV	176	$11,190,000	$16,835,000	$26,542,000
Wise	Lonesome Pine	LNP	47	$2,940,000	$8,253,000	$12,205,000

Appendix B. Total Visitor Spending Impacts

Associated City	Airport Name	FAA ID	Jobs	Wages	GSP	Output
Commercial Service						
Charlottesville	Charlottesville-Albemarle	CHO	2,051	$103,323,000	$182,299,000	$297,111,000
Lynchburg	Lynchburg Regional	LYH	345	$12,663,000	$23,283,000	$41,329,000
Newport News	Newport News–Williamsburg International	PHF	562	$22,590,000	$42,574,000	$72,880,000
Norfolk	Norfolk International	ORF	10,954	$446,788,000	$853,770,000	$1,442,274,000
Richmond	Richmond International	RIC	8,115	$355,226,000	$649,674,000	$1,086,899,000
Roanoke	Roanoke – Blacksburg	ROA	1,407	$55,173,000	$101,674,000	$174,680,000
Staunton/ Waynesboro/ Harrisonburg	Shenandoah Valley Regional	SHD	459	$17,407,000	$32,828,000	$59,696,000
Washington	Ronald Reagan Washington National	DCA	30,154	$1,564,637,000	$2,777,248,000	$4,423,354,000
Washington	Dulles International	IAD	30,042	$1,557,745,000	$2,770,177,000	$4,409,556,000
General Aviation						
Abingdon	Virginia Highlands	VJI	52	$2,166,000	$3,886,000	$6,576,000
Blacksburg	Virginia Tech–Montgomery Executive	BCB	119	$5,084,000	$8,842,000	$15,400,000
Blackstone	Allen C. Perkinson Municipal	BKT	22	$746,000	$1,331,000	$2,465,000
Bridgewater	Bridgewater Air Park	VBW	4	$144,000	$271,000	$494,000
Brookneal	Brookneal–Campbell County	0V4	8	$276,000	$477,000	$868,000
Bumpass	Lake Anna	7W4	4	$213,000	$361,000	$593,000
Chase City	Chase City Municipal	CXE	0	$8,000	$14,000	$26,000
Clarksville	Lake Country Regional	W63	8	$261,000	$465,000	$860,000
Crewe	Crewe Municipal	W81	5	$180,000	$320,000	$593,000
Culpeper	Culpeper Regional	CJR	323	$17,046,000	$28,928,000	$47,500,000
Danville	Danville Regional	DAN	147	$5,838,000	$10,263,000	$17,520,000
Dublin	New River Valley	PSK	9	$397,000	$690,000	$1,202,000

Associated City	Airport Name	FAA ID	Jobs	Wages	GSP	Output
Emporia	Emporia–Greensville Regional	EMV	7	$237,000	$422,000	$782,000
Farmville	Farmville Regional	FVX	38	$1,269,000	$2,262,000	$4,191,000
Forest	New London	W90	16	$572,000	$990,000	$1,801,000
Franklin	Franklin Regional	FKN	2	$93,000	$173,000	$299,000
Fredericksburg	Shannon	EZF	98	$3,329,000	$5,965,000	$10,837,000
Front Royal	Front Royal–Warren County	FRR	84	$3,374,000	$5,844,000	$10,496,000
Galax/Hillsville	Twin County	HLX	23	$956,000	$1,716,000	$2,904,000
Gordonsville	Gordonsville Municipal	GVE	5	$248,000	$421,000	$692,000
Hot Springs	Ingalls Field	HSP	9	$339,000	$638,000	$1,163,000
Jonesville	Lee County	0VG	10	$450,000	$710,000	$1,195,000
Kenbridge	Lunenburg County	W31	0	$2,000	$4,000	$7,000
Lawrenceville	Brunswick Municipal	LVL	0	$3,000	$6,000	$11,000
Leesburg	Leesburg Executive	JYO	66	$3,508,000	$5,811,000	$9,459,000
Louisa	Louisa County	LKU	155	$8,190,000	$13,898,000	$22,821,000
Luray	Luray Caverns	LUA	25	$959,000	$1,806,000	$3,293,000
Lynchburg	Falwell	W24	107	$3,889,000	$6,732,000	$12,247,000
Manassas	Manassas Regional	HEF	447	$23,795,000	$39,417,000	$64,165,000
Marion/Wytheville	Mountain Empire	MKJ	73	$3,030,000	$5,435,000	$9,199,000
Martinsville	Blue Ridge Regional	MTV	165	$6,536,000	$11,489,000	$19,614,000
Melfa	Accomack County	MFV	43	$1,684,000	$3,065,000	$5,293,000
Moneta	Smith Mountain Lake	W91	11	$388,000	$672,000	$1,222,000
New Market	New Market	8W2	10	$395,000	$744,000	$1,357,000
Norfolk	Chesapeake Regional	CPK	317	$12,607,000	$23,538,000	$40,658,000
Norfolk	Hampton Roads Executive	PVG	432	$17,198,000	$32,110,000	$55,463,000
Orange	Orange County	OMH	13	$683,000	$1,159,000	$1,902,000

Associated City	Airport Name	FAA ID	Jobs	Wages	GSP	Output
Petersburg	Dinwiddie County	PTB	71	$2,554,000	$4,764,000	$8,358,000
Quinton	New Kent County	W96	40	$1,742,000	$3,002,000	$5,184,000
Richlands	Tazewell County	JFZ	1	$57,000	$90,000	$151,000
Richmond	Richmond Executive – Chesterfield County	FCI	233	$10,051,000	$17,321,000	$29,910,000
Richmond/ Ashland	Hanover County Municipal	OFP	241	$10,432,000	$17,977,000	$31,044,000
South Boston	William M Tuck	W78	21	$840,000	$1,476,000	$2,519,000
South Hill	Mecklenburg–Brunswick Regional	AVC	63	$2,081,000	$3,709,000	$6,871,000
Stafford	Stafford Regional	RMN	158	$5,345,000	$9,576,000	$17,398,000
Suffolk	Suffolk Executive	SFQ	25	$1,003,000	$1,872,000	$3,234,000
Tangier	Tangier Island	TGI	3	$121,000	$221,000	$382,000
Tappahannock	Tappahannock–Essex County	XSA	23	$922,000	$1,582,000	$2,695,000
Topping	Hummel Field	W75	43	$1,723,000	$2,956,000	$5,036,000
Wakefield	Wakefield Municipal	AKQ	1	$49,000	$91,000	$160,000
Warrenton	Warrenton–Fauquier	HWY	331	$17,614,000	$29,177,000	$47,496,000
Waynesboro	Eagles Nest	W13	2	$89,000	$167,000	$305,000
West Point	Middle Peninsula Regional	FYJ	12	$486,000	$834,000	$1,421,000
Williamsburg	Williamsburg–Jamestown	JGG	66	$2,638,000	$4,926,000	$8,508,000
Winchester	Winchester Regional	OKV	434	$17,379,000	$30,101,000	$54,065,000
Wise	Lonesome Pine	LNP	10	$437,000	$689,000	$1,160,000

Appendix C. Total Impacts (On-Airport + Visitor Spending)

Associated City	Airport Name	FAA ID	Jobs	Wages	GSP	Output
Commercial Service						
Charlottesville	Charlottesville-Albemarle	CHO	2,857	$174,407,000	$305,266,000	$501,455,000
Lynchburg	Lynchburg Regional	LYH	935	$52,751,000	$84,024,000	$141,894,000
Newport News	Newport News–Williamsburg International	PHF	1,365	$79,386,000	$144,984,000	$264,097,000
Norfolk	Norfolk International	ORF	16,336	$856,062,000	$1,542,583,000	$2,623,815,000
Richmond	Richmond International	RIC	14,075	$834,952,000	$1,421,864,000	$2,359,834,000
Roanoke	Roanoke – Blacksburg	ROA	3,216	$193,599,000	$346,443,000	$613,059,000
Staunton/ Waynesboro/ Harrisonburg	Shenandoah Valley Regional	SHD	721	$41,252,000	$71,576,000	$118,163,000
Washington	Ronald Reagan Washington National	DCA	74,211	$5,201,059,000	$8,999,883,000	$14,505,825,000
Washington	Dulles International	IAD	94,695	$6,958,358,000	$11,715,727,000	$18,929,191,000
General Aviation						
Abingdon	Virginia Highlands	VJI	122	$5,485,000	$9,852,000	$16,886,000
Blacksburg	Virginia Tech–Montgomery Executive	BCB	203	$12,550,000	$21,816,000	$36,877,000
Blackstone	Allen C. Perkinson Municipal	BKT	204	$17,239,000	$33,030,000	$58,606,000
Bridgewater	Bridgewater Air Park	VBW	1,115	$131,842,000	$162,517,000	$241,761,000
Brookneal	Brookneal–Campbell County	0V4	8	$288,000	$520,000	$931,000
Bumpass	Lake Anna	7W4	5	$251,000	$459,000	$744,000
Chase City	Chase City Municipal	CXE	2	$100,000	$183,000	$344,000
Clarksville	Lake Country Regional	W63	12	$478,000	$879,000	$1,626,000
Crewe	Crewe Municipal	W81	6	$194,000	$362,000	$657,000
Culpeper	Culpeper Regional	CJR	410	$24,470,000	$42,449,000	$69,485,000
Danville	Danville Regional	DAN	236	$10,769,000	$17,892,000	$30,173,000
Dublin	New River Valley	PSK	42	$2,373,000	$3,474,000	$5,533,000

Associated City	Airport Name	FAA ID	Jobs	Wages	GSP	Output
Emporia	Emporia-Greensville Regional	EMV	32	$2,619,000	$3,516,000	$4,818,000
Farmville	Farmville Regional	FVX	50	$1,908,000	$3,416,000	$6,291,000
Forest	New London	W90	16	$601,000	$1,117,000	$1,979,000
Franklin	Franklin Regional	FKN	4	$203,000	$416,000	$644,000
Fredericksburg	Shannon	EZF	163	$8,380,000	$15,222,000	$27,097,000
Front Royal	Front Royal-Warren County	FRR	154	$9,402,000	$15,177,000	$26,551,000
Galax/Hillsville	Twin County	HLX	45	$2,255,000	$3,650,000	$5,841,000
Gordonsville	Gordonsville Municipal	GVE	16	$1,188,000	$1,689,000	$2,528,000
Hot Springs	Ingalls Field	HSP	16	$696,000	$1,475,000	$2,427,000
Jonesville	Lee County	0VG	10	$450,000	$710,000	$1,195,000
Kenbridge	Lunenburg County	W31	3	$140,000	$289,000	$502,000
Lawrenceville	Brunswick Municipal	LVL	2	$66,000	$112,000	$192,000
Leesburg	Leesburg Executive	JYO	480	$40,952,000	$56,303,000	$79,877,000
Louisa	Louisa County	LKU	175	$9,909,000	$16,376,000	$26,207,000
Luray	Luray Caverns	LUA	72	$5,210,000	$7,640,000	$11,854,000
Lynchburg	Falwell	W24	10	$400,000	$555,000	$840,000
Manassas	Manassas Regional	HEF	2,343	$207,920,000	$310,036,000	$517,274,000
Marion/Wytheville	Mountain Empire	MKJ	84	$3,596,000	$6,840,000	$11,249,000
Martinsville	Blue Ridge Regional	MTV	354	$34,510,000	$47,895,000	$75,966,000
Melfa	Accomack County	MFV	59	$2,579,000	$5,831,000	$9,294,000
Moneta	Smith Mountain Lake	W91	31	$1,362,000	$2,339,000	$3,935,000
New Market	New Market	8W2	40	$2,155,000	$3,127,000	$5,249,000
Norfolk	Chesapeake Regional	CPK	427	$21,285,000	$34,984,000	$56,299,000
Norfolk	Hampton Roads Executive	PVG	745	$38,741,000	$67,118,000	$115,580,000
Orange	Orange County	OMH	96	$5,964,000	$8,482,000	$13,373,000

Associated City	Airport Name	FAA ID	Jobs	Wages	GSP	Output
Petersburg	Dinwiddie County	PTB	104	$4,692,000	$7,975,000	$14,327,000
Quinton	New Kent County	W96	51	$2,205,000	$3,887,000	$6,569,000
Richlands	Tazewell County	JFZ	8	$352,000	$707,000	$1,093,000
Richmond	Richmond Executive – Chesterfield County	FCI	647	$46,293,000	$68,693,000	$99,595,000
Richmond/ Ashland	Hanover County Municipal	OFP	374	$21,907,000	$33,443,000	$53,684,000
South Boston	William M Tuck	W78	28	$995,000	$1,673,000	$2,787,000
South Hill	Mecklenburg–Brunswick Regional	AVC	76	$3,003,000	$5,024,000	$8,642,000
Stafford	Stafford Regional	RMN	338	$23,526,000	$34,961,000	$50,563,000
Suffolk	Suffolk Executive	SFQ	99	$5,215,000	$8,927,000	$14,213,000
Tangier	Tangier Island	TGI	3	$125,000	$234,000	$401,000
Tappahannock	Tappahannock–Essex County	XSA	34	$1,625,000	$2,631,000	$4,140,000
Topping	Hummel Field	W75	57	$2,317,000	$4,044,000	$6,933,000
Wakefield	Wakefield Municipal	AKQ	4	$181,000	$432,000	$720,000
Warrenton	Warrenton–Fauquier	HWY	414	$24,082,000	$37,814,000	$59,877,000
Waynesboro	Eagles Nest	W13	12	$1,388,000	$1,723,000	$2,277,000
West Point	Middle Peninsula Regional	FYJ	205	$17,551,000	$28,434,000	$52,638,000
Williamsburg	Williamsburg–Jamestown	JGG	84	$3,481,000	$6,526,000	$11,126,000
Winchester	Winchester Regional	OKV	610	$28,568,000	$46,936,000	$80,607,000
Wise	Lonesome Pine	LNP	57	$3,377,000	$8,943,000	$13,365,000

Appendix D. Total Direct Impacts (On-Airport + Visitor Spending)

Associated City	Airport Name	FAA ID	Jobs	Wages	GSP	Output
Commercial Service						
Charlottesville	Charlottesville-Albemarle	CHO	1,780	$103,482,000	$181,497,000	$298,063,000
Lynchburg	Lynchburg Regional	LYH	622	$31,932,000	$47,598,000	$82,654,000
Newport News	Newport News–Williamsburg International	PHF	807	$41,375,000	$80,978,000	$160,437,000
Norfolk	Norfolk International	ORF	10,902	$496,254,000	$906,879,000	$1,581,578,000
Richmond	Richmond International	RIC	9,107	$503,556,000	$843,422,000	$1,414,368,000
Roanoke	Roanoke – Blacksburg	ROA	1,941	$107,289,000	$198,587,000	$373,351,000
Staunton/ Waynesboro/ Harrisonburg	Shenandoah Valley Regional	SHD	457	$24,171,000	$41,595,000	$69,020,000
Washington	Ronald Reagan Washington National	DCA	43,080	$3,102,336,000	$5,335,646,000	$8,516,367,000
Washington	Dulles International	IAD	54,136	$4,213,240,000	$6,931,074,000	$11,122,983,000
General Aviation						
Abingdon	Virginia Highlands	VJI	86	$3,153,000	$5,593,000	$9,856,000
Blacksburg	Virginia Tech–Montgomery Executive	BCB	122	$7,176,000	$12,483,000	$21,636,000
Blackstone	Allen C. Perkinson Municipal	BKT	111	$10,796,000	$21,495,000	$40,001,000
Bridgewater	Bridgewater Air Park	VBW	533	$93,243,000	$93,898,000	$132,684,000
Brookneal	Brookneal–Campbell County	0V4	6	$153,000	$281,000	$532,000
Bumpass	Lake Anna	7W4	3	$144,000	$269,000	$428,000
Chase City	Chase City Municipal	CXE	1	$58,000	$103,000	$212,000
Clarksville	Lake Country Regional	W63	8	$261,000	$482,000	$964,000
Crewe	Crewe Municipal	W81	4	$99,000	$194,000	$376,000
Culpeper	Culpeper Regional	CJR	253	$14,372,000	$24,855,000	$40,455,000
Danville	Danville Regional	DAN	168	$6,427,000	$10,088,000	$17,250,000
Dublin	New River Valley	PSK	29	$1,531,000	$1,959,000	$3,064,000

Associated City	Airport Name	FAA ID	Jobs	Wages	GSP	Output
Emporia	Emporia–Greensville Regional	EMV	20	$1,860,000	$2,153,000	$2,635,000
Farmville	Farmville Regional	FVX	37	$1,046,000	$1,855,000	$3,686,000
Forest	New London	W90	12	$312,000	$606,000	$1,126,000
Franklin	Franklin Regional	FKN	3	$103,000	$238,000	$356,000
Fredericksburg	Shannon	EZF	104	$4,444,000	$8,523,000	$16,180,000
Front Royal	Front Royal–Warren County	FRR	97	$5,560,000	$8,682,000	$15,961,000
Galax/Hillsville	Twin County	HLX	32	$1,411,000	$2,130,000	$3,340,000
Gordonsville	Gordonsville Municipal	GVE	11	$823,000	$1,025,000	$1,446,000
Hot Springs	Ingalls Field	HSP	10	$350,000	$848,000	$1,396,000
Jonesville	Lee County	0VG	7	$278,000	$405,000	$684,000
Kenbridge	Lunenburg County	W31	2	$75,000	$167,000	$302,000
Lawrenceville	Brunswick Municipal	LVL	2	$41,000	$65,000	$115,000
Leesburg	Leesburg Executive	JYO	306	$29,717,000	$35,714,000	$46,648,000
Louisa	Louisa County	LKU	114	$6,078,000	$9,578,000	$14,887,000
Luray	Luray Caverns	LUA	45	$3,503,000	$4,532,000	$6,785,000
Lynchburg	Falwell	W24	8	$268,000	$319,000	$460,000
Manassas	Manassas Regional	HEF	1,185	$128,679,000	$170,684,000	$291,160,000
Marion/Wytheville	Mountain Empire	MKJ	57	$1,943,000	$3,902,000	$6,376,000
Martinsville	Blue Ridge Regional	MTV	198	$23,830,000	$30,021,000	$46,975,000
Melfa	Accomack County	MFV	37	$1,165,000	$3,311,000	$5,177,000
Moneta	Smith Mountain Lake	W91	22	$773,000	$1,285,000	$2,209,000
New Market	New Market	8W2	27	$1,343,000	$1,677,000	$2,867,000
Norfolk	Chesapeake Regional	CPK	296	$13,045,000	$20,281,000	$31,978,000
Norfolk	Hampton Roads Executive	PVG	487	$21,881,000	$37,873,000	$67,697,000
Orange	Orange County	OMH	64	$3,841,000	$4,694,000	$7,198,000

Associated City	Airport Name	FAA ID	Jobs	Wages	GSP	Output
Petersburg	Dinwiddie County	PTB	71	$2,590,000	$4,326,000	$8,336,000
Quinton	New Kent County	W96	36	$1,269,000	$2,214,000	$3,781,000
Richlands	Tazewell County	JFZ	5	$195,000	$419,000	$627,000
Richmond	Richmond Executive – Chesterfield County	FCI	431	$32,589,000	$43,747,000	$59,101,000
Richmond/ Ashland	Hanover County Municipal	OFP	250	$14,004,000	$19,426,000	$30,638,000
South Boston	William M Tuck	W78	22	$592,000	$958,000	$1,592,000
South Hill	Mecklenburg–Brunswick Regional	AVC	56	$1,736,000	$2,771,000	$4,905,000
Stafford	Stafford Regional	RMN	231	$16,884,000	$22,621,000	$30,541,000
Suffolk	Suffolk Executive	SFQ	67	$3,113,000	$5,151,000	$8,038,000
Tangier	Tangier Island	TGI	2	$66,000	$131,000	$229,000
Tappahannock	Tappahannock–Essex County	XSA	25	$1,010,000	$1,533,000	$2,334,000
Topping	Hummel Field	W75	42	$1,346,000	$2,298,000	$4,022,000
Wakefield	Wakefield Municipal	AKQ	2	$80,000	$246,000	$417,000
Warrenton	Warrenton–Fauquier	HWY	275	$15,254,000	$22,138,000	$33,840,000
Waynesboro	Eagles Nest	W13	7	$1,021,000	$1,066,000	$1,229,000
West Point	Middle Peninsula Regional	FYJ	118	$11,244,000	$17,970,000	$35,970,000
Williamsburg	Williamsburg–Jamestown	JGG	59	$1,875,000	$3,663,000	$6,357,000
Winchester	Winchester Regional	OKV	426	$16,899,000	$26,062,000	$46,018,000
Wise	Lonesome Pine	LNP	26	$1,400,000	$5,337,000	$7,555,000

Appendix E. Total Indirect Impacts (On-Airport + Visitor Spending)

Associated City	Airport Name	FAA ID	Jobs	Wages	GSP	Output
Commercial Service						
Charlottesville	Charlottesville-Albemarle	CHO	552	$40,030,000	$62,291,000	$107,583,000
Lynchburg	Lynchburg Regional	LYH	142	$10,757,000	$16,406,000	$28,038,000
Newport News	Newport News–Williamsburg International	PHF	288	$22,131,000	$32,406,000	$54,413,000
Norfolk	Norfolk International	ORF	2,670	$197,255,000	$312,223,000	$538,115,000
Richmond	Richmond International	RIC	2,438	$182,580,000	$282,293,000	$483,942,000
Roanoke	Roanoke – Blacksburg	ROA	633	$48,609,000	$72,830,000	$122,785,000
Staunton/ Waynesboro/ Harrisonburg	Shenandoah Valley Regional	SHD	127	$9,047,000	$13,997,000	$24,232,000
Washington	Ronald Reagan Washington National	DCA	15,478	$1,177,878,000	$1,831,762,000	$3,133,681,000
Washington	Dulles International	IAD	19,990	$1,535,140,000	$2,376,863,000	$4,053,832,000
General Aviation						
Abingdon	Virginia Highlands	VJI	16	$1,147,000	$1,903,000	$3,358,000
Blacksburg	Virginia Tech–Montgomery Executive	BCB	40	$2,938,000	$4,485,000	$7,687,000
Blackstone	Allen C. Perkinson Municipal	BKT	38	$3,200,000	$5,080,000	$8,546,000
Bridgewater	Bridgewater Air Park	VBW	176	$14,659,000	$20,993,000	$34,852,000
Brookneal	Brookneal–Campbell County	0V4	1	$77,000	$124,000	$220,000
Bumpass	Lake Anna	7W4	1	$58,000	$95,000	$168,000
Chase City	Chase City Municipal	CXE	0	$21,000	$38,000	$67,000
Clarksville	Lake Country Regional	W63	2	$117,000	$198,000	$353,000
Crewe	Crewe Municipal	W81	1	$54,000	$87,000	$154,000
Culpeper	Culpeper Regional	CJR	81	$5,670,000	$8,783,000	$15,298,000
Danville	Danville Regional	DAN	33	$2,269,000	$3,680,000	$6,494,000
Dublin	New River Valley	PSK	5	$386,000	$608,000	$1,055,000

Associated City	Airport Name	FAA ID	Jobs	Wages	GSP	Output
Emporia	Emporia–Greensville Regional	EMV	4	$270,000	$391,000	$668,000
Farmville	Farmville Regional	FVX	7	$476,000	$792,000	$1,408,000
Forest	New London	W90	2	$161,000	$259,000	$459,000
Franklin	Franklin Regional	FKN	1	$42,000	$64,000	$111,000
Fredericksburg	Shannon	EZF	30	$2,259,000	$3,362,000	$5,716,000
Front Royal	Front Royal–Warren County	FRR	30	$2,283,000	$3,394,000	$5,757,000
Galax/Hillsville	Twin County	HLX	6	$404,000	$646,000	$1,139,000
Gordonsville	Gordonsville Municipal	GVE	2	$157,000	$250,000	$437,000
Hot Springs	Ingalls Field	HSP	2	$167,000	$270,000	$475,000
Jonesville	Lee County	0VG	2	$101,000	$164,000	$291,000
Kenbridge	Lunenburg County	W31	0	$29,000	$50,000	$88,000
Lawrenceville	Brunswick Municipal	LVL	0	$11,000	$19,000	$34,000
Leesburg	Leesburg Executive	JYO	55	$4,257,000	$6,703,000	$11,589,000
Louisa	Louisa County	LKU	32	$2,122,000	$3,396,000	$6,019,000
Luray	Luray Caverns	LUA	10	$744,000	$1,192,000	$2,082,000
Lynchburg	Falwell	W24	1	$51,000	$76,000	$130,000
Manassas	Manassas Regional	HEF	564	$44,262,000	$69,743,000	$117,634,000
Marion/Wytheville	Mountain Empire	MKJ	13	$882,000	$1,404,000	$2,483,000
Martinsville	Blue Ridge Regional	MTV	84	$6,481,000	$9,516,000	$15,966,000
Melfa	Accomack County	MFV	9	$648,000	$997,000	$1,743,000
Moneta	Smith Mountain Lake	W91	4	$287,000	$454,000	$790,000
New Market	New Market	8W2	6	$419,000	$668,000	$1,163,000
Norfolk	Chesapeake Regional	CPK	63	$4,256,000	$6,778,000	$11,968,000
Norfolk	Hampton Roads Executive	PVG	129	$9,324,000	$14,250,000	$24,514,000
Orange	Orange County	OMH	13	$1,020,000	$1,592,000	$2,754,000

Associated City	Airport Name	FAA ID	Jobs	Wages	GSP	Output
Petersburg	Dinwiddie County	PTB	16	$1,164,000	$1,783,000	$3,082,000
Quinton	New Kent County	W96	8	$515,000	$837,000	$1,486,000
Richlands	Tazewell County	JFZ	1	$63,000	$101,000	$176,000
Richmond	Richmond Executive – Chesterfield County	FCI	77	$5,531,000	$8,682,000	$15,148,000
Richmond/ Ashland	Hanover County Municipal	OFP	57	$3,990,000	$6,232,000	$10,914,000
South Boston	William M Tuck	W78	3	$227,000	$366,000	$650,000
South Hill	Mecklenburg–Brunswick Regional	AVC	10	$672,000	$1,071,000	$1,894,000
Stafford	Stafford Regional	RMN	34	$2,399,000	$3,894,000	$6,862,000
Suffolk	Suffolk Executive	SFQ	14	$1,009,000	$1,600,000	$2,784,000
Tangier	Tangier Island	TGI	1	$33,000	$54,000	$95,000
Tappahannock	Tappahannock–Essex County	XSA	4	$302,000	$475,000	$835,000
Topping	Hummel Field	W75	8	$534,000	$876,000	$1,555,000
Wakefield	Wakefield Municipal	AKQ	1	$44,000	$72,000	$125,000
Warrenton	Warrenton–Fauquier	HWY	71	$4,805,000	$7,674,000	$13,566,000
Waynesboro	Eagles Nest	W13	2	$124,000	$174,000	$294,000
West Point	Middle Peninsula Regional	FYJ	37	$3,342,000	$4,563,000	$7,472,000
Williamsburg	Williamsburg–Jamestown	JGG	13	$892,000	$1,444,000	$2,557,000
Winchester	Winchester Regional	OKV	90	$6,147,000	$9,887,000	$17,467,000
Wise	Lonesome Pine	LNP	10	$743,000	$1,150,000	$1,984,000

Appendix F. Total Induced Impacts (On-Airport + Visitor Spending)

Associated City	Airport Name	FAA ID	Jobs	Wages	GSP	Output
Commercial Service						
Charlottesville	Charlottesville-Albemarle	CHO	525	$30,895,000	$61,478,000	$95,809,000
Lynchburg	Lynchburg Regional	LYH	171	$10,062,000	$20,021,000	$31,201,000
Newport News	Newport News–Williamsburg International	PHF	270	$15,880,000	$31,601,000	$49,248,000
Norfolk	Norfolk International	ORF	2,764	$162,553,000	$323,481,000	$504,122,000
Richmond	Richmond International	RIC	2,530	$148,815,000	$296,148,000	$461,523,000
Roanoke	Roanoke – Blacksburg	ROA	641	$37,700,000	$75,027,000	$116,923,000
Staunton/ Waynesboro/ Harrisonburg	Shenandoah Valley Regional	SHD	137	$8,034,000	$15,985,000	$24,912,000
Washington	Ronald Reagan Washington National	DCA	15,653	$920,845,000	$1,832,475,000	$2,855,777,000
Washington	Dulles International	IAD	20,569	$1,209,978,000	$2,407,791,000	$3,752,376,000
General Aviation						
Abingdon	Virginia Highlands	VJI	20	$1,184,000	$2,356,000	$3,672,000
Blacksburg	Virginia Tech–Montgomery Executive	BCB	41	$2,436,000	$4,848,000	$7,555,000
Blackstone	Allen C. Perkinson Municipal	BKT	55	$3,243,000	$6,455,000	$10,060,000
Bridgewater	Bridgewater Air Park	VBW	407	$23,940,000	$47,626,000	$74,224,000
Brookneal	Brookneal–Campbell County	0V4	1	$58,000	$115,000	$180,000
Bumpass	Lake Anna	7W4	1	$48,000	$95,000	$148,000
Chase City	Chase City Municipal	CXE	0	$21,000	$42,000	$65,000
Clarksville	Lake Country Regional	W63	2	$100,000	$199,000	$310,000
Crewe	Crewe Municipal	W81	1	$41,000	$81,000	$127,000
Culpeper	Culpeper Regional	CJR	75	$4,428,000	$8,811,000	$13,732,000
Danville	Danville Regional	DAN	35	$2,073,000	$4,125,000	$6,429,000
Dublin	New River Valley	PSK	8	$456,000	$907,000	$1,414,000

Associated City	Airport Name	FAA ID	Jobs	Wages	GSP	Output
Emporia	Emporia-Greensville Regional	EMV	8	$489,000	$972,000	$1,516,000
Farmville	Farmville Regional	FVX	7	$386,000	$768,000	$1,198,000
Forest	New London	W90	2	$127,000	$253,000	$394,000
Franklin	Franklin Regional	FKN	1	$57,000	$114,000	$177,000
Fredericksburg	Shannon	EZF	29	$1,677,000	$3,337,000	$5,201,000
Front Royal	Front Royal-Warren County	FRR	26	$1,558,000	$3,101,000	$4,832,000
Galax/Hillsville	Twin County	HLX	7	$440,000	$875,000	$1,363,000
Gordonsville	Gordonsville Municipal	GVE	4	$208,000	$414,000	$645,000
Hot Springs	Ingalls Field	HSP	3	$179,000	$357,000	$556,000
Jonesville	Lee County	0VG	1	$71,000	$141,000	$220,000
Kenbridge	Lunenburg County	W31	1	$36,000	$71,000	$111,000
Lawrenceville	Brunswick Municipal	LVL	0	$14,000	$28,000	$44,000
Leesburg	Leesburg Executive	JYO	119	$6,978,000	$13,886,000	$21,640,000
Louisa	Louisa County	LKU	29	$1,710,000	$3,402,000	$5,301,000
Luray	Luray Caverns	LUA	16	$964,000	$1,917,000	$2,987,000
Lynchburg	Falwell	W24	1	$81,000	$160,000	$250,000
Manassas	Manassas Regional	HEF	594	$34,979,000	$69,609,000	$108,481,000
Marion/Wytheville	Mountain Empire	MKJ	13	$771,000	$1,534,000	$2,391,000
Martinsville	Blue Ridge Regional	MTV	71	$4,200,000	$8,358,000	$13,025,000
Melfa	Accomack County	MFV	13	$765,000	$1,523,000	$2,373,000
Moneta	Smith Mountain Lake	W91	5	$302,000	$600,000	$935,000
New Market	New Market	8W2	7	$393,000	$782,000	$1,219,000
Norfolk	Chesapeake Regional	CPK	68	$3,984,000	$7,926,000	$12,352,000
Norfolk	Hampton Roads Executive	PVG	128	$7,536,000	$14,995,000	$23,369,000
Orange	Orange County	OMH	19	$1,103,000	$2,195,000	$3,421,000

Associated City	Airport Name	FAA ID	Jobs	Wages	GSP	Output
Petersburg	Dinwiddie County	PTB	16	$938,000	$1,866,000	$2,908,000
Quinton	New Kent County	W96	7	$420,000	$836,000	$1,302,000
Richlands	Tazewell County	JFZ	2	$94,000	$187,000	$291,000
Richmond	Richmond Executive – Chesterfield County	FCI	139	$8,173,000	$16,264,000	$25,346,000
Richmond/ Ashland	Hanover County Municipal	OFP	67	$3,913,000	$7,785,000	$12,133,000
South Boston	William M Tuck	W78	3	$176,000	$349,000	$544,000
South Hill	Mecklenburg–Brunswick Regional	AVC	10	$594,000	$1,183,000	$1,843,000
Stafford	Stafford Regional	RMN	72	$4,243,000	$8,445,000	$13,160,000
Suffolk	Suffolk Executive	SFQ	19	$1,094,000	$2,176,000	$3,391,000
Tangier	Tangier Island	TGI	0	$25,000	$49,000	$77,000
Tappahannock	Tappahannock–Essex County	XSA	5	$313,000	$623,000	$971,000
Topping	Hummel Field	W75	7	$437,000	$870,000	$1,356,000
Wakefield	Wakefield Municipal	AKQ	1	$57,000	$114,000	$178,000
Warrenton	Warrenton–Fauquier	HWY	68	$4,022,000	$8,002,000	$12,471,000
Waynesboro	Eagles Nest	W13	4	$243,000	$484,000	$754,000
West Point	Middle Peninsula Regional	FYJ	50	$2,965,000	$5,901,000	$9,196,000
Williamsburg	Williamsburg–Jamestown	JGG	12	$713,000	$1,420,000	$2,212,000
Winchester	Winchester Regional	OKV	94	$5,522,000	$10,987,000	$17,123,000
Wise	Lonesome Pine	LNP	21	$1,234,000	$2,455,000	$3,826,000

VIRGINIA AIRPORT SYSTEM

ECONOMIC IMPACT STUDY