The Daily Double

TWICE-A-DAY FLIGHT CLUSTERS AT CVG ENHANCE AMAZON AIR'S CAPABILITY AS RECESSION FEARS LOOM

Chaddick Amazon Air Brief No. 8 | March 7, 2023

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Our analysis of Amazon Air's moves since September 2022 shows that the carrier has:

- Boosted Cincinnati-N. Kentucky (CVG) daily flights from 44 to 58 while also expanding "partner flights" using non-Amazon planes.
- Organized departures into two 90-minute clusters ("banks"), spaced roughly 12 hours apart, a pivot from the more dispersed schedule patterns that greatly abet plane-to-plane transfers.
- Achieved systemwide expansion of 5.8%, despite a rollback of warehouse additions. Domestic flying rose just 2.8%, while domestic activity not involving CVG *dropped* 1.5%.
- Expanded carrying capacity, measured in cubic feet of cargo space, making it 14% and 23% as large as FedEx and UPS, respectively.
- Launched intra-India, Boise, ID, Manchester, NH, Mobile, AL, and San José, CA services, despite keeping its fleet largely constant. Europe's service is more focused on DHL rather than UPS hubs.

Amazon Air is strategically reallocating flight capacity as the U.S. economy teeters on the edge of recession and doubling down on expansion at Cincinnati-Northern Kentucky International Airport (CVG). Its domestic network is acquiring a more classic air cargo structure, with a "superhub" (CVG) supplemented by three smaller but expanding regional hubs. This independently produced brief reviews Amazon Air's initiatives between September 2022 and March 2023 and builds upon our previous bi-annual Amazon Air Brief, released in September.[1] For a primer on Amazon Air, see the sidebar on page 4.

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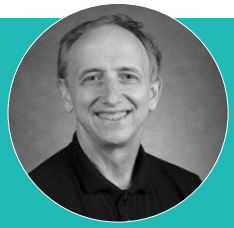
PHOTO (ABOVE): BOEING 737 AT ONTARIO (CA) INTERNATIONAL AIRPORT ON FEBRUARY 6, 2023 (PEIWEN CHEN)



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MAJOR FINDINGS FROM OUR ANALYSIS

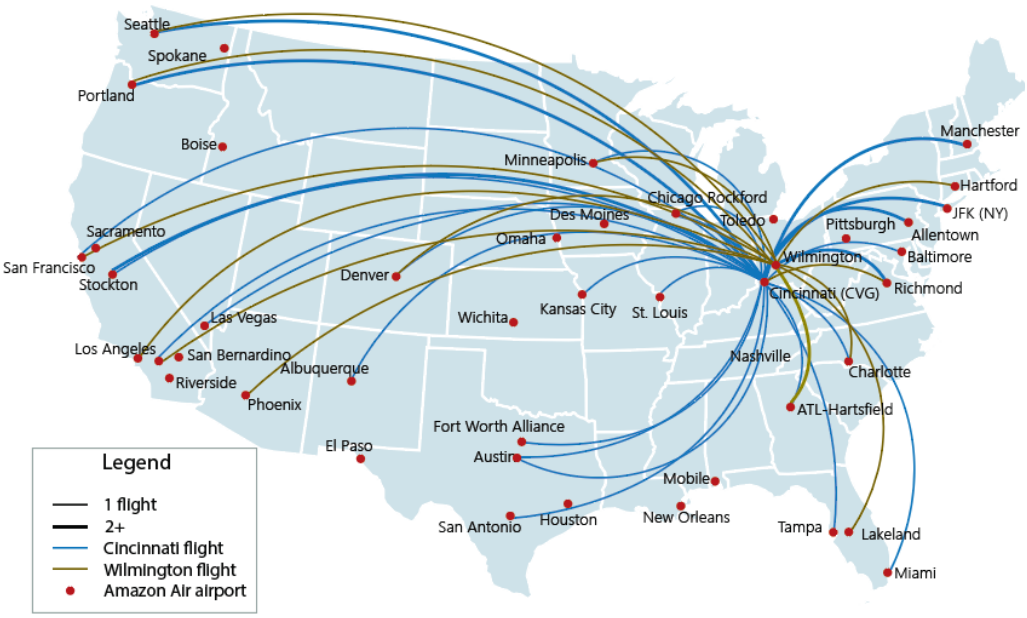
The analysis draws on publicly available sources of information, including:

- Flight data on 7,600 Amazon Air takeoffs and landings from flightaware.com and flightradar24.com since 2020, including analysis of activity from February 13–March 1, 2023.[2] We define the term "flights" as the sum of takeoffs and landings at an airport;
- Geographic analysis of Amazon flights using ArcGIS Pro software and U.S. Census data; and
- Information on fleet registration from the FAA and other sources, including planespotters.net.

FINDING 1. Amazon Air activity at Cincinnati/N. Kentucky (CVG) is rapidly expanding, having grown from 44 to 58 daily flights since September. Flight scheduling is becoming increasingly similar to FedEx's and UPS's largest hub-based operations, with nearly all departures tightly clustered in two intervals: 12:30–2 pm and 2:30–4 am. Such tight departure banks set the stage for a large expansion in plane-to-plane transfers to support next-day delivery.

The number of flights on Amazon Air-branded planes has increased by about a third (31.5%), from 43.9 to 57.7 daily, between September 2022 and February 2023, resulting in a roughly 125% increase over the past year. In addition, partner flights involving planes not branded as part of Amazon Air but appearing to be on missions for the retailer have grown more pervasive, pushing total daily flight activity at CVG into the 70–74 range (Table 1) (See page 12 for a discussion of partner flights). Amazon Air has adopted much tighter flight scheduling at CVG, particularly for departures. A large set of arrivals, including several partner flights, occur between 5:30 am and 8:30 am. After spending the morning in CVG, this

FIGURE 1: Amazon Air Flights at Cincinnati (CVG) & Wilmington (ILN)
March 1, 2023, with partner flights shown



Note: not all routes served in both directions on sample day. Partner flights, which add roughly 10% to flight activity, are not shown.

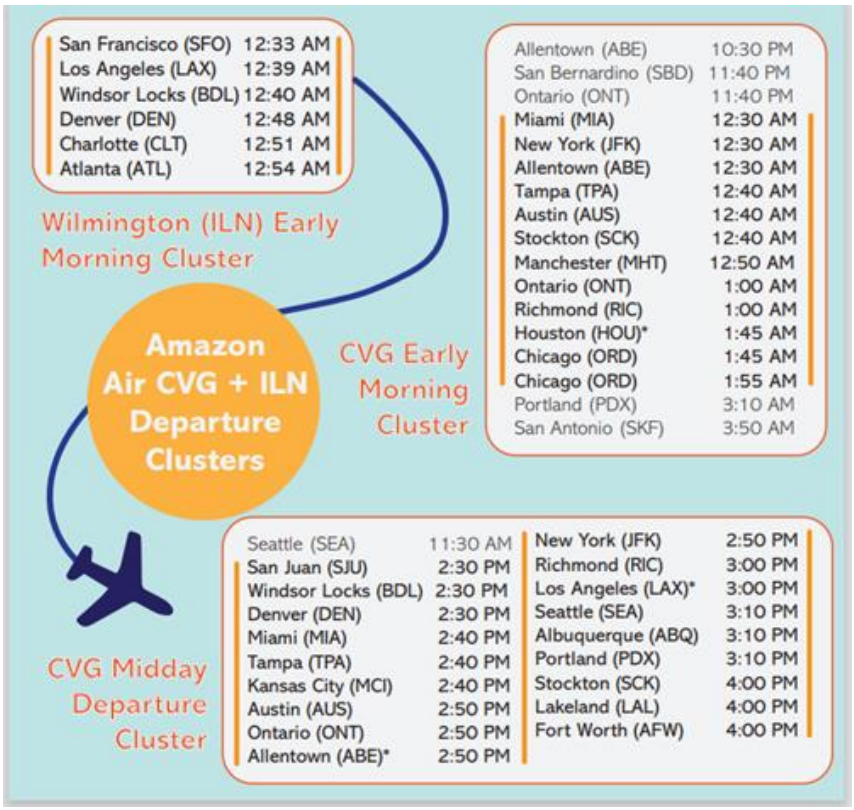
Amazon Air freighters await their mid-afternoon departure window at Cincinnati CVG last month. Most will depart in quick succession, some only minutes apart.

set, often 17-18 jets, depart in quick succession from 2:30–4 pm. The second cluster arrives from 4:30–8:30 pm. Most depart from CVG from 12:30–2 am. This cluster, often 12–13 planes, is typically complemented by six jets taking off from Wilmington (OH) Air Park during almost the exact same time interval.

These changes have pushed the CVG hub in new directions (Figure 1 and Table). As recently as early 2022, most departures occurred during the mid-day hours and were not tightly clustered into such narrow bands but were more spread out across the day, making them less conducive to next-day parcel shipments. Another relatively new feature is highly consistent daily flight itineraries. Flight patterns are quite predictable across the week, which likely helps simplify the retailer's famously complex supply chain.

Much similarity has emerged between CVG and UPS's Louisville and FedEx's Memphis hubs, which, too, have both late-afternoon and middle-of-the-night departure banks (FedEx's Indianapolis hub, which is smaller, has only one major bank per day). Among the notable differences (apart from Amazon's hub still being much smaller) is that its planes have longer dwell times than those at the two air-cargo integrator hubs.

TABLE 1: Twice-Daily Clustering for Amazon Air's Departures at Cincinnati CVG and Wilmington ILN March 1, 2023 | Including partner flights



This table shows Amazon Air's tightly woven departure clusters at Cincinnati (CVG) and Wilmington (ILN) on March 1, 2022. The clusters account for more than 80% of hub departures.
* denotes apparent partner flights using non-Amazon Air planes.

Why is Amazon Air's expansion so significant?

Amazon Air's expansion is one of the most notable developments in the air-cargo industry in recent years, constituting the most ambitious effort by a global retailer to date to bring airborne freight shipments "in-house." Its network has continuously expanded even as activity at many players in this sector has plateaued or even diminished. Although its 91+ planes are registered to Amazon Air and bear its logo, Amazon Air does not have an airline operating certificate. Amazon Air relies on contractors to do all its **freighter flying**, an approach different from that of FedEx and UPS. Whereas Amazon Air was once **primarily designed to support inventory movement** between its warehouses and fulfillment centers, this appears to be changing, as is made evident by its emerging CVG "superhub." This hub facilitates its effort to expand "third-party" shipping (i.e., shipping for customers outside of the Amazon supply chain). Our September brief outlined how **Amazon has been more aggressively entering the third-party shipping business** in direct competition with FedEx and UPS, although its airline remains too small to provide the "everywhere to everywhere" domestic overnight shipping associated with the above "air cargo integrators."

Amazon's expanded capacity at CVG makes next-day delivery possible for items stocked on the other side of the country. For example, an online consumer in Concord, NH, who makes a purchase at 1 pm ET could have the product delivered the next morning, even if it must be shipped from California. The product could be on a plane leaving San Francisco at 4 pm ET and transferred to a CVG-to-Manchester, NH flight that arrives at 3 am, where it could be transported by truck to a local fulfillment center for a late-morning delivery. Both the afternoon and early-morning clusters allow for package transfers between more than 125 combinations of flights (Figure 1 and Table 1).

Wilmington Air Park (ILN), which is just 60 miles by highway from CVG, has a complementary role. Although its daily flight activity fell from 24.2 in March 2021 to 15.3 at present, its flights generally depart for airports not served by CVG, with particular emphasis on California and the West. Moreover, on some days, a short-hop flight leaves CVG for ILN in the late evening, arriving at ILN in time to catch its early-morning departure cluster, typically having six flights. The percentage of its domestic flights accounted for by either CVG or ILN grew from approximately 30.4% in March 2022 to 42.6% in February 2023.

FINDING 2. Amazon Air is gradually consolidating US activity at four hubs: CVG, Fort Worth Alliance, San Bernardino International, CA, and Lakeland, FL. The impressive recent growth at these airports suggests the company is gradually moving toward a more hub-centric model with less point-to-point flying. Still, outside of the Ohio Valley, all Amazon Air hubs have a daytime flight orientation, suggesting they are less critical to overnight package delivery than the CVG/ILN hub complex.

Flight activity at all four of Amazon's largest US hubs grew between September and February, while that at most less-heavily served facilities plateaued or diminished. Activity at Fort Worth Alliance (AFW)

increased from 29.9 to 34.1 daily flights, while Lakeland (LAL) increased from 17.9 to 20.3, and San Bernardino (SNB) grew from 10.3 to 17.1. CVG's growth was even more significant, as discussed in the previous section. Meanwhile, activity diminished at many smaller hubs, including at airports in Baltimore, MD, Portland, OR, and Riverside, CA. Many non-hub airports also saw declines. Such changes contrast sharply with patterns observed a year ago, when it appeared Amazon sought to create a large set of mini-hubs, almost all of which seemed poised to grow.

Flight departures from Amazon Air's hubs outside the Ohio Valley tend to be spread out between 7 am and 5 p.m. rather than being tightly clustered, which suggests they are not oriented toward plane-to-plane transfers. Except for these hubs' overnight flights to Cincinnati and Wilmington, many flights leave too early to be of much value for handling parcels needing next-morning delivery.

Amazon planes are parked in wingtip-to-wingtip at the CVG hub on the morning of February 26, 2023. Note the plane not branded as Amazon Air, likely making a "partner flight."

The emerging schedule patterns suggest that Amazon Air's secondary hubs are less oriented toward next-day parcel shipment than they are toward inventory movements and second- and third-day delivery. Having a daytime orientation has several notable advantages at a time of heightened cost containment. It minimizes the number of employees working late-night or early-morning shifts. Such workers are more difficult to recruit, are usually paid a premium, and are subject to higher absenteeism and turnover. Daytime flights complement Amazon's massive trucking operation, which can move merchandise more cheaply than flights and has long had a night-time scheduling orientation.

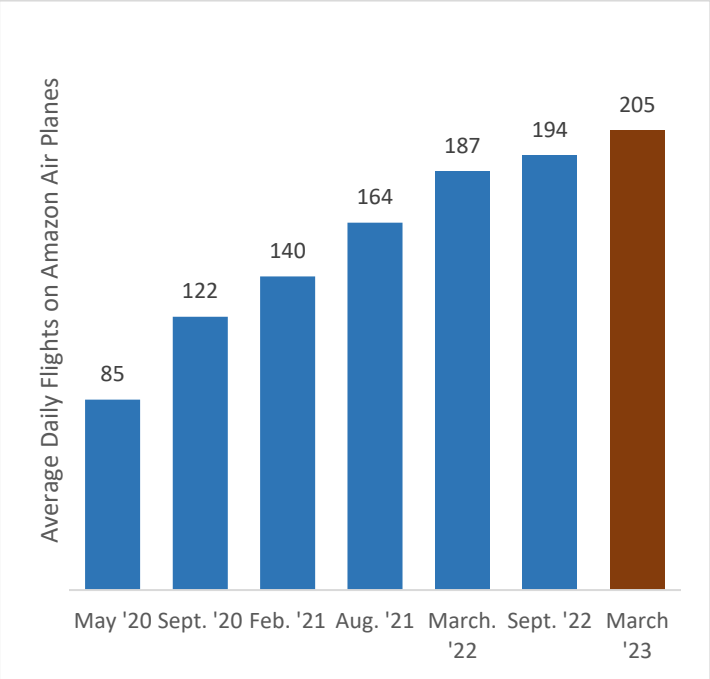
FINDING 3. Flight activity on Amazon Air grew by 5.8% between August 2022 and March 2023, a modest increase from the 3.8% increase in the previous six months. Although expansion at CVG and other notable hubs accounted for most of the growth, adding Boise, ID, Mobile, AL, Manchester, NH, San Jose, CA, and new intra-India flying broadened its geographic scope. Domestic takeoffs and landings not involving the CVG hub, however, fell 1.5%.

Amazon Air grew from 194.1 flights per day in September 2022 to 205.3 flights in February, or 5.8% (Figure 2). Cumulatively, its growth over the past year has been around 9.8%. By comparison, during the 12 months leading up to March 2022, Amazon Air activity surged 34%. Domestic flying, however, rose only by around 2.8%, while US takeoffs and landings not involving CVG *diminished* by 1.5%. Between September and February, the number of airplanes reported as part of its fleet remained steady, in the 89–92 range.[3] We estimate, therefore, that Amazon Air makes 2–3% more flights per airplane than six months ago. Partner flights across the system also grew, although modestly. These planes contribute

perhaps 15–20% to Amazon's overall air capacity, we estimate, although the uncertainty about the likely range must be acknowledged (see page 12).

An important conclusion for our analysis is that Amazon Air is *not* scaling back flights in response to the retail-sales growth slowdown, although its *growth rate* has clearly diminished and domestic growth is small. Its systemwide growth is noteworthy, considering that reports by MWPVL International Inc. indicate that Amazon has dropped dozens of existing and planned facilities around the United States.[4] Several developments during the past six months warrant mention:

FIGURE 2: Growth in Daily Amazon Air Flight Activity
September 2022



- New service to Mobile, AL, reinforces our belief that the ATR-72 will be used to tap into small markets, like FedEx's feeder fleet. Amazon Air now has five of these turboprops, which primarily operate from AFW.

- The addition of Manchester-Boston Regional Airport closes a large geographic gap in its access to northern New England. This addition appears to have led to diminished activity at its airports at Windsor Locks (Hartford), CT, which fell from 10.0 to 4.3 daily flights, and apparently at Baltimore, MD (which fell from 18.0 to 14.6 flights) as well. Unlike in other US regions, Amazon is becoming more decentralized in the congested Northeastern US.

- With the addition of Manchester, less than an hour's drive from Boston, MA, Amazon Air now has airports within 60 miles by truck of the geographic centers of 29 of the 30 largest metropolitan

How does the Economic Slowdown affecting Amazon Air?

Several prominent players in the air-cargo industry, including FedEx and ATSG Group (an Amazon Air contractor), have recently warned that their flying will likely diminish due to a recent sharp downturn in demand. Our analysis, however, suggests that Amazon Air's growth is driven primarily by a desire to accelerate its delivery options and protect market share amid mounting competition from both other online platforms and brick-and-mortar stores rolling out new conveniences. Although a recession could result in strategic shifts and a markedly reduced growth rate, we believe Amazon continues to have compelling reasons to expand its airline. See page 11 for our projection for the rest of 2023.

areas in the contiguous United States. The largest metro region not served is San Diego, CA, which is about 100 miles from Riverside, CA.

- The addition of Boise, ID, fills a void in the Amazon Air network between Denver, CO, and Spokane, WA. Salt Lake City, UT, and Montana flights could be coming. Amazon Air now serves airports within 100 miles of approximately 75% of the U.S. mainland's population, up from 60% two years ago.

- Amazon Air's European and Canadian operations have largely remained the same since our September report. The discontinuance of Cologne, DE flights suggests it favors DHL hubs over those of UPS. Its intra-European traffic grew from roughly 22 to 24 flights daily between September and last month, not including partner flights. Canadian activity has held steady, at around five daily flights. Although flights to Cologne, a UPS hub, ended, Amazon Air retains a strong presence at Leipzig, which is a major DHL hub connecting complex. It has shifted since early 2021 away from Ontario International and Chicago Rockford, other UPS.

See Page 12 for maps and discussion of Europe and India service, including partner flights in those regions.

- A new intra-India service by Quikjet Airlines, which links Delhi to Bengaluru (Bangalore) and Hyderabad, began in January. The new contractor operates two Boeing 737s, each typically making

FIGURE 3: Amazon Air's Domestic U.S Flight Network, February 19, 2023

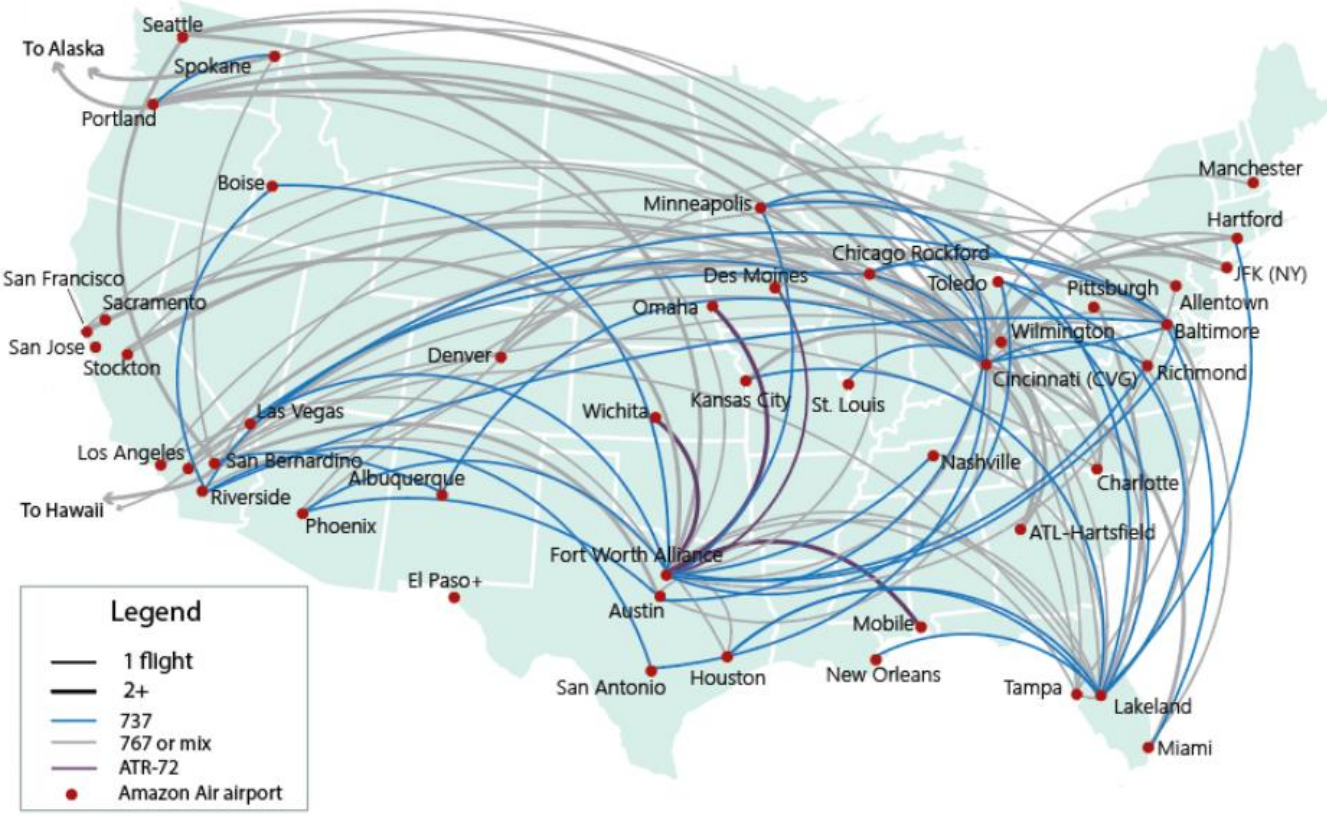
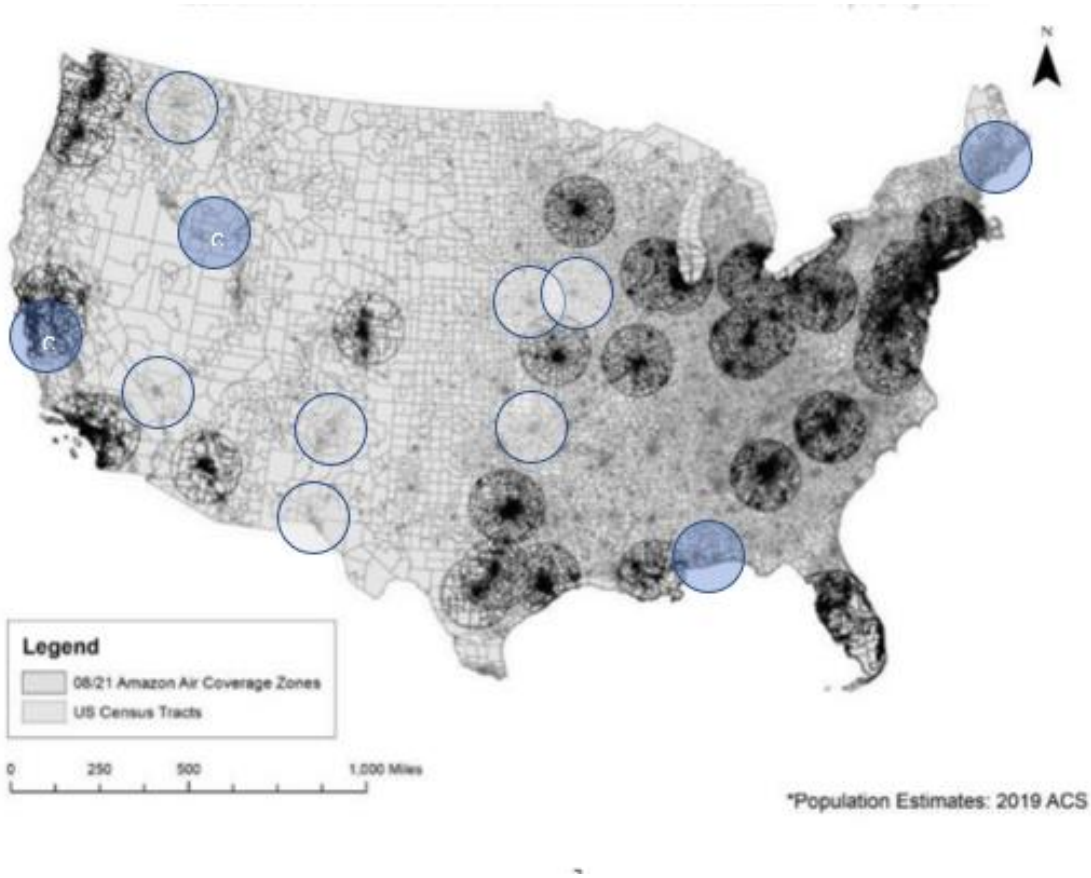


TABLE 2: Trends in Daily Takeoffs & Landings at Airports Served by Amazon Air

Airport		April 2020	August 2020*	February 2021*	August 2021	March 2022	September 2022	February 2023
Albuquerque International Sunport (ABQ)						4.8	1.9	2
Allentown Lehigh Valley Int'l (ABE)	*See Pg. 12*	6	5.0	4.3	0.0	1.4	2.3	4.6
Anchorage Ted Stevens Int'l (ANC)		4	2.0	2.0	1.8	2	2	2.0
Atlanta Hartsfield-Jackson Int'l (ATL)		0	2.0	2.5	2.3	3.2	4	4.9
Austin-Bergstrom International (AUS)		0	4.0	4.2	3.7	5.8	6.1	5.9
Baltimore-Washington Marshall Int'l (BWI)	*Hub*	6	9.0	10.5	19.5	19.2	18	14.6
Boise (BOI)	*New*							2.0
Charlotte Douglas Int'l (CLT)					1.7	5	3.7	4.3
Chicago O'Hare International (ORD)		0	2.7	3.5	7.5	7.2	6	4.6
Chicago Rockford International (RFD)	*Hub*	15	16.5	15.8	10.2	9.2	11.7	12.0
Cincinnati/Northern Kentucky Int'l (CVG)	*Superhub*	24	25.7	27.8	21.5	25.6	43.9	57.7
Denver International (DEN)		4	3.7	4.2	1.0	2.2	3.9	6.0
Des Moines International (DSM)	*New*					1.6	2	1.9
El Paso (ELP)							1.7	
Fairbanks Int'l (FAI)					2.0	1.8	1.7	1.7
Fort Worth Alliance (AFW)	*Hub*	8	16.7	17.2	26.3	36.6	29.9	34.1
Honolulu Daniel K. Inouye Int'l (HNL)		4	4.3	3.8	5.2	5.6	3.1	4.0
Houston G. Bush Intercontinental (IAH)	*Hub*	9	10.2	10.0	7.3	3.2	3.6	3.3
Kahului (OGG)		2	2.2	1.8	2.2	2	1.7	2.0
Kailua-Kona/Kona International (KOA)		0	1.7	2.0	2.5	2	1.7	2.0
Kansas City International (MCI)					3.7	2.2	6.1	4.9
Lakeland Linder International (LAL)	*Hub*	0	11.5	11.5	21.2	16.2	17.9	20.3
Las Vegas (LAS)							2.6	4.0
Liuhe (LIH)							2	2.0
Los Angeles International (LAX)		0	0.0	2.0	3.8	6	3.7	2.0
Manchester-Boston Regional (MHT)	*New*							3.3
Miami International (MIA)		6	7.3	6.7	5.7	6.8	8.1	4.7
Minneapolis-Saint Paul International (MSP)		2	3.7	2.0	6.3	6	4.4	6.0
Mobile Regional Airport (BFM)	*New*							1.9
Nashville International (BNA)						3.8	4	2.0
New Orleans, Louis Armstrong Int'l (MSY)		0	0.0	2.0	2.0	2	2	2.0
New York John F. Kennedy Int'l (JFK)		0	8.0	8.8	10.0	8.2	4	6.0
Omaha Ebbly (OMA)						2.4	2	1.4
Ontario International (ONT)		13	21.5	20.5	12.8	12	12.4	9.3
Phoenix Sky Harbor International (PHX)		4	6.5	9.5	9.5	6.2	4	4.0
Pittsburgh International (PIT)					3.8	6.2	2	2.0
Portland International (PDX)		6	8.2	10.5	15.3	13.8	12.4	9.3
Richmond International (RIC)		0	5.0	4.0	3.7	2	3.7	5.9
Riverside March Air Reserve Base (RIV)		4	5.7	6.5	9.3	9.2	5.4	4.1
Sacramento International (SMF)		4	6.2	4.5	6.0	2	2	0.6
San Antonio/Kelly Field (SKF)		2	3.2	2.0	2.0	2	4.1	1.7
San Bernardino International (SBD)	*Hub*				8.0	11	10.3	17.1
San Francisco International (SFO)		2	2.8	7.0	4.0	3.8	5.7	4.3
San Jose (Mineta) International (SJU)	*New*							2.9
San Juan Luis Muñoz Marin Int'l (SJU)		0	2.7	2.0	2.0	1.8	1.7	0.1
Seattle-Tacoma International (SEA)	*Hub*	9	9.3	11.2	11.3	16	10.3	10.0
Spokane International (GEG)						1.8	2	4.0
St. Louis Lambert International (STL)					3.6	1.8	4.3	1.9
Stockton Metropolitan (SCK)		4	4.0	6.2	5.3	4.8	4	4.0
Tampa International (TPA)		16	11.3	13.2	7.7	6	8.1	4.7
Toledo Express (TOL)					3.7	4	4	4.0
Wichita (Eisenhower National) (ICT)						1.2	1.4	4.0
Wilmington Air Park (ILN)	*Hub*	13	13.7	14.8	20.5	24.2	20.4	15.3
Windsor Locks Bradley (Hartford) (BDL)		2	6.8	8.0	4.2	5.6	10	4.3
Outside United States								
Canadian Airports					10.2	10.2	10.0	10.3
Asia Pacific Airports	New, see pg. 12	1						9.1
Western Europe Airports	New, see pg. 12	0	0.7	16.8	16.3	36.4	44.3	48.0
Total takeoffs & landings		170.0	243.5	279.3	326.5	374.0	388.2	410.7
Total flights		85.0	121.8	139.7	163.3	187.0	194.1	205.3

FIGURE 4: Amazon Air Airports on U.S. Mainland with 100-Mile Buffer
With airports added since September 2022 shown in blue.



The **dark gray** circles represent airports added through August 2021, while light gray circles denote those added from September 2021–August 2022. More recent additions are in **blue.**

two or three flights daily. Some depart Delhi at around 2 am, which suggests a role in overnight parcel delivery.[5] Delhi is the chief city in India's most populous metropolitan region, while Bengaluru and Hyderabad rank third and sixth, respectively, with the latter being a vital highway hub.

FINDING 4. Amazon Air's cubic volume of available cargo space is now between one-fourth and one-fifth the size of UPS and approximately one-seventh the size of FedEx. Its capacity as a share of that of these air-cargo integrators has more than doubled since March 2020. Its average payload per airplane remains substantially greater than FedEx's but smaller than UPS's, mainly due to Amazon Air's avoidance of planes larger than Boeing 767s. Its average payload, however, will rise once ten Airbus 330-300s enter service.

We measured the cumulative airborne carrying capacity of Amazon Air, FedEx Express (the airline of FedEx Corporation), and United Parcel Service (UPS) by reviewing the performance characteristics of each of the 22 different types of aircraft that these carriers possess. The payload and volume limits for each

aircraft type were obtained predominantly from the official specifications published on the websites of airframe manufacturers. In the few cases where the data from the manufacturer was unavailable, aircraft charter websites were consulted, which had the necessary data available. Details of our methods are available on request.

Our results show that between March 2020 and March 2023,

- Amazon Air expanded its fleet from 33 to 91 planes, a 175.8% increase. FedEx and UPS, conversely, expanded by just 5.7% and 9.5%, respectively.

- The maximum weight of the cargo (payload) that Amazon Air planes can carry increased in absolute terms by 111.4%. Amazon Air went from 7.5% to 14.5% of FedEx's capacity, and from 11.2% to 20.5% of UPS's capacity over the period. With this increase, the tonnage capacity of Amazon Air's fleet is about one-fifth that of UPS and about one-ninth that of FedEx.

- Amazon Air's total cubic feet of air cargo space increased by 110.8%, from 8.2% to 15.8% of FedEx's volume capacity, and from 12.3% to 22.8% of UPS's volume capacity, making it between one-fourth and one-fifth as large as UPS.

- The average payload of Amazon Air planes (89,088 pounds) exceeds that of FedEx (77,839) by a considerable margin due to the latter's heavy reliance on small turboprop "feeder" planes, which account for almost one-third of its total fleet. UPS's average payload is much higher at 137,034 lbs.

A FedEx Express plane departs Ontario (CA) International Airport on February 6, 2023 (Peiwen Chen)

Amazon Air's announced plans to use Hawaiian Airlines as a contractor for ten Airbus 330 freighters along with more Boeing 767s will make possible another notable leap in its capacity as early as late 2023. While reportedly slated for domestic use, the A330s are better suited for bulk transoceanic shipments than any of its current models and will have 15–20% more payload capacity than its 767s. These ten A330s alone will boost the payload capacity of the current fleet by 1,366,870 lbs. (or 16.9%) and the total cubic volume by 164,920 ft.^{3} (or 15.3%). Additional 767s coming online will further boost capacity.

SHORT-TERM OUTLOOK AND PREDICTIONS

Amazon Air is a much different airline than a year ago due to its hub-centric growth strategy and twice-daily clustering of departures at Cincinnati CVG. This airline has become far more than a conduit to

support rapid inventory movements across its vast warehouse system. Not only is the long-anticipated CVG "superhub" taking shape, but Amazon Air is investing in three smaller US hubs while de-emphasizing point-to-point flying. CVG remains only a fraction of the size of the largest FedEx and UPS hubs. Even so, the increasing "economies of scope" Amazon enjoys allow faster connections between hundreds of flight combinations while also providing great synergy with its trucking network.

We expect that by early 2024:

- Expansion on the U.S. mainland will remain relatively slow, at an annualized rate of below 10%. Yet, there will be much additional expansion at CVG, pushing daily flights, including partner activity, to 90, up from 70–74. The number of departing flights in its early-morning cluster will likely expand from 13–14 today to around 20, thereby filling more gaps in its US coverage. Wilmington (ILN) service will continue to reduce congestion, provide operational backup when problems occur at CVG, and support airplane maintenance.

- Arrivals at CVG will become more tightly clustered to reduce dwell times and increase fleet utilization. This will result in CVG having even more similarity to the largest FedEx and UPS hubs and providing later "cut-off" times for shipments at distant airports, facilitating Amazon's efforts to move more extensively into third-party shipping.

- A continued buildup of activity at Fort Worth Alliance, Lakeland-Linder, and San Bernardino will result from Amazon's efforts to "do more with less" in difficult economic times. Creating a more hub-centric system will expand the utilization of its fleet and the use of its available payload capacity while also facilitating third-party shipping. A gradual decline in flights at non-hub airports will accompany this. We do not expect, however, that Amazon will commence extensive middle-of-the-night flying from hubs other than CVG and ILN this year.

- Amazon Air will significantly expand long-haul flights through Hawaiian Air's deployment of the A330-300F. We anticipate that these planes will ultimately result in a resumption of transoceanic flying from Asia, which has been largely absent since 2020. We also predict that Amazon Air's reported fleet will reach 100 planes by mid-summer 2023.

- Efforts to expand flying within Europe and India, which has been relatively slow in the former and still consists of two planes in the latter, will accelerate. The intra-India network seems poised to grow akin to that in Europe, which now sees around 22 daily flights. Amazon will increasingly make Leipzig a focal point of European expansion, considering its status as a significant hub for DHL, a critical Amazon partner.

APPENDIX: AMAZON AIR'S EUROPEAN AND INDIA SERVICE

Europe Network, February 18, 2023, excluding Partner Flights

All routes are Boeing 737s. Those with more than one flight shown are in bold.

India Network, January 31, 2023

In addition to the Europe network on the map (top left), Amazon Air apparently has extensive partner-flight activity using planes operated by ASL Ireland Airlines but not branded as Amazon Air. To estimate this activity, we reviewed ASL flights that: i) involve planes not reported as being operated for other cargo airlines; ii) link existing Amazon Air airports; and iii) have flight times suggesting they are not serving other airlines' hubs. For example, DHL or FedEx flights at their hubs tend to arrive and depart during specific intervals. Partner flights, we estimate, add perhaps 20–25% to Amazon Air's Europe capacity, although there is much uncertainty about the range.

Our estimates of Amazon Air activity in India (lower left) encompass both 737s operated by Quikjet, even though only one is reported as being part of Amazon Air. The other (VT-BAZ) is included on account of media reports indicating that it was obtained specifically for Amazon Air. This plane entered the Quikjet fleet in December, just before Amazon Air's India startup.

Our estimates of Europe and North America activity exclude partner flights. We estimate that, systemwide, these flights add perhaps 15–20% to Amazon Air's capacity, based on the criteria mentioned in the Europe section above. Non-Amazon planes operated by contractors are regularly parked alongside branded Amazon Air jets at CVG. Some airports, such as **Allentown, PA**, apparently see more partner flights than others, which could result in significant undercounts of Amazon activity at these locations.

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TECHNICAL SUPPORT: ALLISON WOODWARD

Please click here for our five earlier Amazon Air Briefs and our March 2021 brief on expanding activity at cargo-only airports during the pandemic year 2020.

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Issues in Aviation Law and Policy

Volume 21 Spring 2022 Number 2

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[1] This brief is prepared as an extension of the Chaddick Institute's mission to promote public understanding of the evolution of transportation systems. The findings are based entirely on the Chaddick Institute's independent analysis of publicly available data. Any opinions expressed are those of the authors.
[2] The estimates in Table 3 and used to compute the growth rate are based on flights from February 13–19, 2023.
[3] This estimate excludes partner flights except for one Quikjet Airlines Boeing 737 (VT-BAZ), which is included for reasons discussed on page 12.
[4] For a good discussion of this issue, *see* Spencer Soper, *Amazon Sellers See 'Scary' Holiday Season as Consumers Pull Back*, SEATTLE TIMES (Sept. 9, 2022, 2:57 PM), https://www.seattletimes.com/business/amazon-sellers-see-scary-holiday-season-as-consumers-pull-back.
[5] *See* Endnote 3 above.