

AIRLINE ECONOMIC ANALYSIS

2022–2023

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FOREWORD

Pandemic-driven disruption in the aviation industry gave way not only to recovery for many airlines over the past year, but also permanent, structural change. Oliver Wyman's *Airline Economic Analysis* reveals significant transformation of airlines to make networks more efficient and adapt to new travel norms.

Profits returned for most US airlines, even as the long-term displacement of some business travel by technology and societal workplace changes became evident. Yields moved sharply higher in the second half of the year as demand for travel showed remarkable resilience despite the highest inflation in a generation plus a war in Europe. US airlines generated record revenue from domestic flying — surpassing pre-pandemic levels — in the second and third quarters of 2022. Labor shortages and ongoing delays in aircraft deliveries constrained capacity, as did continued travel restrictions in Asia.

The regional partner framework is changing for full-service carriers, and the *Airline Economic Analysis* models the industry's optimum level of regional jet aircraft reduction in favor of mainline aircraft flying. Still, a large number of regional jet aircraft will remain economically viable.

Airline networks are creating almost as many possible itineraries for customers as before the pandemic, but with fewer flights — a key measure of improved efficiency. Increasingly carriers are using larger aircraft but offering less frequent flights in many cities. And the growing mix of leisure passengers means everything from more checked baggage per passenger to a snowballing focus on premium economy products and sales upgrades.

Over two and a half years, COVID-19 resulted in operating losses of \$57 billion for 11 US carriers. Serious challenges remain, including possible recession, higher labor costs, an increasing number of severe weather disruptions, and heightened political and corporate focus on carbon emissions. But long-term changes — some driven by the pandemic and some in spite of the pandemic — have set the industry up for greater efficiency and perhaps profitability going forward.

The *Airline Economic Analysis*, which maintains a heavy focus on the US, is our effort to provide the aviation industry with data and commentary that will help it with unfolding market challenges. We welcome your questions about our analysis and look forward to discussing it with you.

Very best,

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METHODOLOGY

Our report divides passenger airlines into three categories: full-service carriers, value carriers, and ultra-low-cost carriers. The categories reflect similar business models based on financial and operational characteristics. For example, the carriers in the full-service group have the highest unit revenue as well as the highest cost structure, while ultra-low-cost carriers (ULCC) have the lowest unit revenue and cost structures. The metrics used to determine the categories include domestic revenue per available seat mile (RASM) and cost per available seat mile (CASM).

On an operational basis, the full-service group is made up of only those carriers with a large international presence in the three major world regions: Atlantic, Latin, and Pacific.

The list below shows the US passenger airlines by category; each carrier’s placement is based on the data tracked and analyzed in the report.

Exhibit 1: Our economic report reflects data collected from 11 airlines

Full Service Carriers	Value Carriers	Ultra-low-cost Carriers
American	Alaska	Allegiant
Delta	Hawaiian	Frontier
United	JetBlue	Spirit
	Southwest	Sun Country

A substantial part of our financial analysis is based on US Department of Transportation Form 41 data. The data include transport-related revenue and expenses, a somewhat confusing moniker that seems quite broad but is mainly related to, but not limited to, regional partners and, to a smaller degree, code-shares. When analyzing absolute costs, we typically include transport-related costs to create better comparisons to US Securities and Exchange Commission data. However, when providing unit results, transport-related costs are removed as Form 41 does not provide complete partner capacity to accurately make comparisons.

Beyond individual US carriers, the report looks at global and regional demand and capacity trends in major world markets. As we did this analysis, we relied on a variety of official sources for data, including the Airlines Reporting Corp., the Official Airline Guide, and the International Air Transport Association as well as our own calculations.

Demand and capacity analysis throughout the report is done in both miles and kilometers, based on source data. For the most part, the demand portion uses kilometers (revenue passenger kilometers, or RPKs) while the capacity section is largely based on miles (available seat miles or ASMs). Most of our analysis uses percentage change, making distance units irrelevant. Lastly, totals between charts and text throughout the report may vary slightly because of rounding used in the text.

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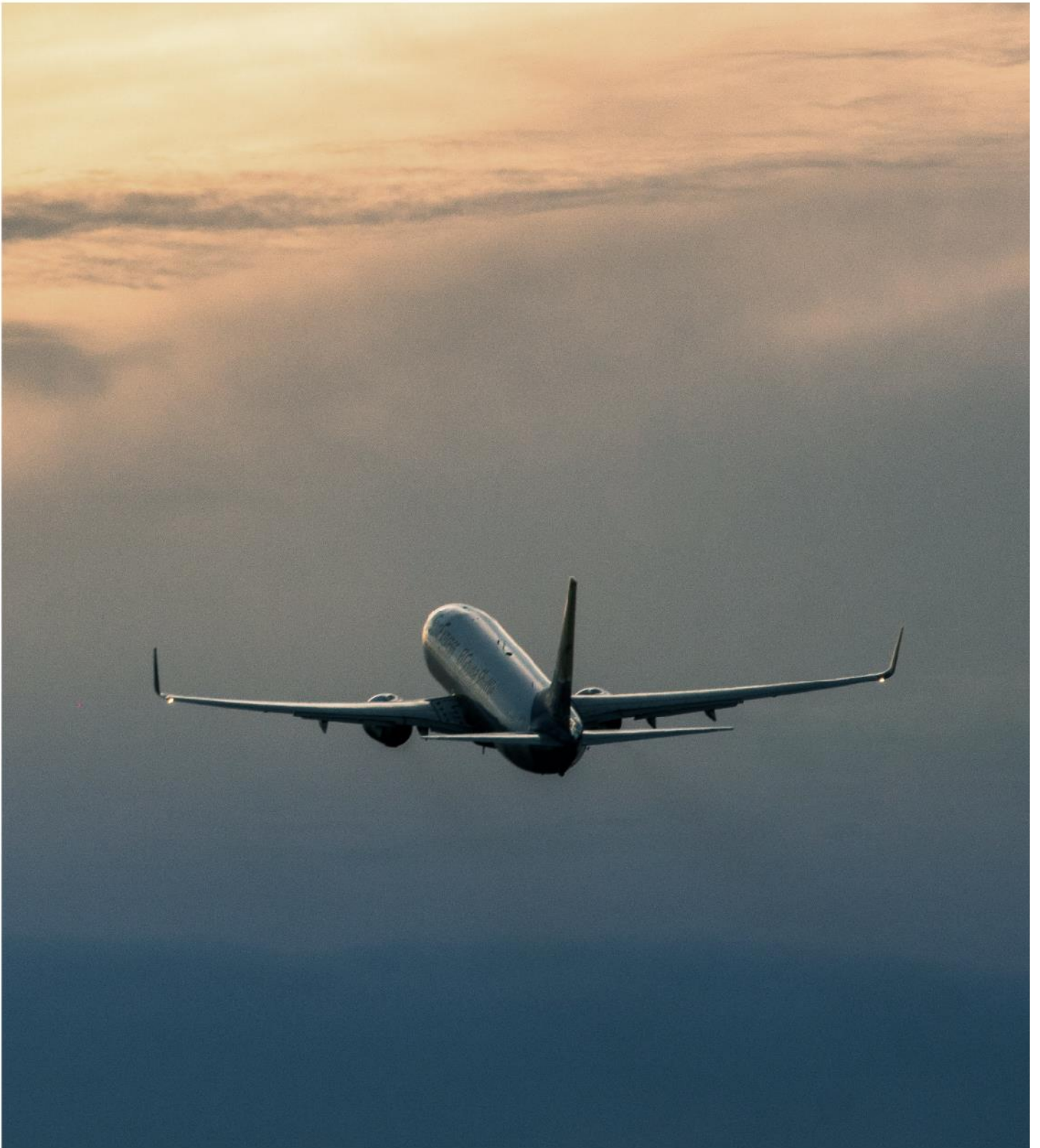
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EXECUTIVE SUMMARY

A PATCH OF SMOOTH AIR AMID TURBULENCE

Since the start of the COVID-19 pandemic, airlines have undergone three years of non-stop change and adaptation to survive. Labor costs have been rising dramatically. Business travel has recalibrated to a post-COVID-19 world of videoconferencing and concerns about recession, prompting a significant alteration in the passenger mix. Airline networks have transitioned to achieve more efficient operations, while accommodating a post-pandemic resurgence of leisure travel.

In short, the airline industry, particularly in the United States, has adapted swiftly and smartly to constant and unrelenting pressure. It wasn't painless, but over the last 12 months airline agility has begun to pay off.

The name of the game for airlines in 2022 was once again transition. New chief executives took over at American and Southwest Airlines. Value carrier JetBlue agreed to acquire the largest ultra-low-cost carrier (ULCC), Spirit, although that merger is now being challenged in court by the US Justice Department. Airline fees and operational performance became political targets, and US airlines may face increased regulation as a result.

As airport crowds multiplied, [labor in the cockpit](#), cabin, and on the [ground remained in short supply](#) — continuing to pressure on-time performance and schedules. Labor shortages also plagued air-traffic control, prompting the Federal Aviation Administration to encourage airlines to limit the number of flights at peak periods in congested airports like those in New York and Washington DC.

Demand recovery and profit recovery have been uneven globally, but more steadily trending up in the US. How well individual carriers can continue to adapt to the transition will determine their success for the next year and likely beyond.

BACK TO THE BLACK FOR THE THREE FULL-SERVICE CARRIERS

The three US full-service carriers returned to profitability in 2022, collectively netting more than \$2 billion for the full year. The turnaround took hold in the second quarter, with \$4 billion in cumulative operating profits for that three-month period. These carriers repeated that performance in both the third and fourth quarters.

Delta has had the strongest recovery so far, with net earnings of \$1.3 billion in 2022, compared with \$737 million at United and \$127 million at American. Still, even Delta's earnings are a long way from the \$4.8 billion the carrier earned in 2019.

International traffic has been a sore spot. For full-service airlines, international capacity was still down 37% from 2019 at the end of 2022. But 2023 summer schedules for international routes are building back with major increases in the number of flights available.

VALUE AND ULCC FINANCIAL PERFORMANCE

Results were mixed for both value carriers and ULCCs. Like the full-service group, value airlines generated profitable operating results during the second and third quarters of 2022. For the year, Southwest and Alaska were profitable but JetBlue and Hawaiian posted net losses.

ULCCs as a group continued to post losses in 2022, with net losses at Spirit and Frontier overwhelming small annual profits at Sun Country and Allegiant. ULCCs have continued to expand capacity, despite the red ink, leveraging their cost advantage to capture additional market share.

But operating costs have been skyrocketing for ULCCs. In the third quarter of 2022, for example, ULCC carriers' unit cost increased more than 41% compared with the same three months of 2019, even though they had added 10% more available seat miles (ASMs) during the period. While every cost category increased during that quarter, fuel took the biggest hit, rising 77% versus the same period in 2019.

It's worth noting that the two US airlines with the largest 2022 losses — JetBlue, with a net loss of \$362 million, and Spirit, with a net loss of \$554 million — are looking to merge.

HUB EFFICIENCY FIRST

Airlines have reset their networks quickly to put seats where passengers want to go. But they have done more than that. Oliver Wyman's proprietary network forecast modeling, [NetPlan](#), reveals that carriers are laser-focused on the efficiency of their hubs as they battle to grab more market share despite labor and aircraft shortages and reduced business travel.

Carriers are creating more itineraries per flight, while average journey times are declining. Instead of smoothing out schedules at hub airports, peaks have become more pronounced, increasing connecting opportunities even with fewer total flights.

Worldwide, the number of flights per route has declined 11%, while the number of seats per departure has increased four percent. That's in part because airlines are providing more capacity by opting to fly larger aircraft on some routes. In 2022, total global flight volume was 18% below 2019 levels. Yet connecting demand opportunity — an indicator of how well a network generates demand for its individual flights — only dipped four percent, as measured by the number of itineraries created by the schedule per flight.

Scheduled journey time declined by five percent. Planes didn't move faster: The dip was because passengers were able to connect more quickly to their next flight or took advantage of more non-stop service. Even while some airports have lost service altogether, the majority of airports, on average, now have more destinations with non-stop service.

ROAD WARRIORS STILL MIA

One of the biggest changes is the growing acceptance that business travel has changed significantly, and perhaps permanently. The rebound in corporate travel plateaued at about 70% to 80% of 2019 levels, and even airline executives who had bullishly forecast a full recovery now say that may be as good as it gets for some time to come.

The reasons are many. Lifestyles have changed with workers desiring less time away from home. Office routines have changed, with more people continuing to work from home more often. Improvements in video conferencing technology have increased the preference to conduct routine meetings virtually to save time.

A sampling of leisure-oriented airports and select business-heavy airports in Europe and North America, using Oliver Wyman's [PlaneStats](#) data, confirms the change in the travel mix. In 2022, European leisure airports returned to the same levels of seats available in 2019 where business airports only brought back 80% of the 2019 seats. The North American leisure airports had about 10% more seats than they had in 2019 while business-heavy airports only had 90% of the 2019 seat capacity.

THE TREND TOWARD FLYING IN COMFORT

Premium economy seats are playing a larger role in airline offerings and seating layouts, with rising numbers of high-end leisure traveler and former road warriors opting for seat choices with more amenities. While business travel was down, the willingness to pay for more amenities allowed airlines to replace some of the revenue lost from corporate purchases of high-fare tickets.

The willingness to pay more for airfare, whether for upgrades or because of the rising cost of travel, has paid off in better yields. In the second and third quarters of 2022, the yield of full-service carriers increased more than 20% over the same 2019 quarters. Value carriers and ULCCs also saw similar double-digit yield increases in those periods.

THE PERSISTENCE OF REGIONAL JETS

The three largest US carriers — which employ approximately 45% of the global regional jet fleet — have significantly reduced regional jet capacity. The cutback is sometimes triggered by regional airline decisions to make routes more efficient and profitable by cutting flights and substituting larger aircraft so the remaining flights will have more seats to fill. More often, it is linked to the industry-wide shortage of pilots and the hiring away of regional pilots by larger carriers.

High fuel costs make regional service more costly, too, on a per-seat basis. When demand is high, larger airplanes become more economical. In 2022, [the regional jet fleet in the US stood at 1,396 planes, down 14% from 2019](#).

But cutbacks to the regional jet fleet are nothing new. As far back as 2010, large airlines started reducing the share of regional capacity in favor of mainline capacity. Analysis and modeling using Oliver Wyman's [NetPlan](#) support an additional cutback of 7% in regional jet capacity from 2022 levels, or another 104 aircraft, for airlines to hit the optimal profit level. If a shortage of pilots or increasing pilot costs drive even further regional jet fleet reductions, airlines could potentially tolerate a 22% decline before the loss of regional capacity begins eroding airline profits. That would take the fleet down to 1,087 aircraft.

The [NetPlan](#) modeling suggests that a drop of between 7% and 22% in regional jet capacity is likely. Further reduction would depress profitability. Current order books suggest carriers could reach that level in one to four years. While this portends continued contraction, it also supports the notion that a large number of regional jets — more than 1,000 in the US — will remain economically viable for the foreseeable future.

THE AIRPORT SQUEEZE

Strain on capacity is not only being felt by airlines. Crowds of travelers have descended on many airports before they were fully staffed and prepared to handle the masses post-COVID-19. That's put a strain on airport services — from food operations to maintenance staff as low unemployment, especially in the US, has made it hard to find workers.

It also hurt airport on-time performance, as measured by flights departing within 15 minutes of scheduled gate departure time. In 2022, on-time performance at Hartsfield-Jackson Atlanta International Airport — the world's busiest — was 78% versus 83% in 2019. Meanwhile, Toronto Pearson Airport dropped to 55% in 2022 from 71% in 2019; London Heathrow fell to 55% from 75%; and Singapore dropped to 77% from 86%.

Contributing to those declining on-time numbers has been a widespread shortage of baggage handlers and other ground personnel at airports. Bottlenecks such as delays in employee screening and badging and challenges in training have exacerbated frontline worker shortages. Further aggravating operations has been the shift to a greater mix of leisure passengers and those who fly less frequently. Generally, they require more processing time by airline personnel because, for example, they have more baggage to check.

LONG LINES TO THE LOUNGE

Another post-pandemic trend at airports: increased use of high-end credit cards with lounge perks, driven by bank partnerships that sustained many airlines financially through the pandemic. The rush to gain access to lounges has created long lines and a spate of social media outrage over wait time.

Airports and airlines are addressing the staffing challenges by offering higher pay and wage supplements, working with government to fast-track work permits, visas, and background checks, and even sending office personnel to the front lines. Some airports even capped the number of passengers at times because of labor shortages, forcing airlines to cancel flights.

Increased collaboration between airports, airlines, and key third-party suppliers can help lessen the impact of the labor struggles. Increased data sharing and planning for travel peaks can also reduce disruptions. In addition, identifying best practices and sharing them across airports can improve efficiency and ease the transition.



ROUTE NETWORK EFFICIENCY

Necessity has mothered substantial change in airline route networks, which have become more efficient as the industry builds back from the COVID-19 pandemic. Globally, key indicators suggest that carriers are leveraging the opportunity to reset their route networks to capture and carry demand more effectively. Analysis of industry schedules from 2019 and 2022 using [NetPlan](#), reveals that these schedules are creating more itineraries per flight while average journey times are declining.

These are important metrics as they indicate how efficiently the networks are at collecting and carrying demand. In 2022, global flight volume was 18% below 2019 levels. Yet connecting demand opportunity — an indicator of how well a network generates demand for its individual flights — declined only four percent (measured by the number of itineraries created by the schedule per flight).

Similarly, scheduled journey time — the amount of time it takes an airline to transport a passenger from trip origin to the final destination — declined five percent. Yet flight block time, or the speed at which individual flights within an itinerary are scheduled to operate, was largely unchanged. The decrease in journey time indicates that itineraries became less circuitous and/or required less layover time in airports during connections. The net outcome is time savings for travelers.

As networks have become more efficient, they have also increased their breadth. Much of the industry, especially in the Americas and Europe, has seen an increase in the number of routes served per city — despite a three percent drop in the number of airports served. A key finding is that while some airports have lost service, the majority, on average, have more destinations connected to them with nonstop service.

Exhibit 2: 2022 Key Airline Network Dynamics

	2022 versus 2019
Flight volume	-18%
Itineraries per flight	-4%
Flights per route	-11%
Scheduled journey time	-5%
Airports served	-3%
Seats per departure	+4%

These outcomes required some trade-offs. Broadly, carriers are now using larger aircraft to operate less frequently. Across regions, the number of flights per route has fallen 11%. Meanwhile, the number of seats per departure, or gauge, has increased four percent. The shift between frequency and gauge has had two noticeable effects: Traditionally high frequency markets, often supported by robust business travel, remain at reduced levels, and a number of hubs now have fewer banks. This means that travelers now have fewer choices when building their itineraries.

It is also notable that these outcomes vary by region. Latin America and Oceania were the most efficient in creating flight-level demand (measured by itineraries per flight), while North America and Europe were the least. However, Europe saw one of the largest declines in journey time, along with Asia. The Americas, meanwhile, had the smallest declines.

These changes have been influenced by several emerging trends. Notably, the nature of demand remains changed from the pre-pandemic era. While business travel has been recovering, it is still 30% or more below 2019 levels in some regions. The nature of business travel is changing, too, as remote work and corporate travel policies continue to adapt, and as business travel increasingly blends with leisure. Pure leisure travel, meanwhile, has grown past 2019 levels in many regions.

Airline labor and supply shortages continue to challenge the industry. Like many businesses, airlines continue to struggle with securing adequate staffing and resources to support growth. At the industry level, shortages exist across virtually all functions, from pilots to airport ground workers to mechanics. As a result, some carriers are placing increasing emphasis on metrics like headcount per seat. Offering fewer flights with larger aircraft helps alleviate the impact of these constraints but also results in a less robust service offering.

Underscoring all of this is that industry capacity has yet to fully recover to, let alone grow beyond, pre-pandemic levels. At the end of 2022, global capacity was 17% below that in 2019, though some regions, such as the Americas and Europe, closed to within 10%. Whether today's efficiencies are sustainable as part of a platform for future growth remains an open question.



BUSINESS TRAVEL MALAISE

Business travel clearly lost some pounds during the pandemic. And it looks like corporations might keep some of those pounds off airlines.

While leisure travel came roaring back in 2022, business travel returned at a subdued pace. Data from Airlines Reporting Corp (ARC) show that based on a four-week moving average of tickets booked for domestic and international travel, leisure reached its 2019 level in May 2022 and has remained above 2019 levels since. Business tickets, on the other hand, have stubbornly been at least 25%-30% below comparable 2019 levels, according to ARC, which processes tickets sold through travel agencies. That 25%-30% shortfall is better than the 50% deficit to 2019 numbers that still persisted at the end of 2021. But business travel recovery clearly stalled by May 2022 and has consistently run ~30% behind 2019 levels since.

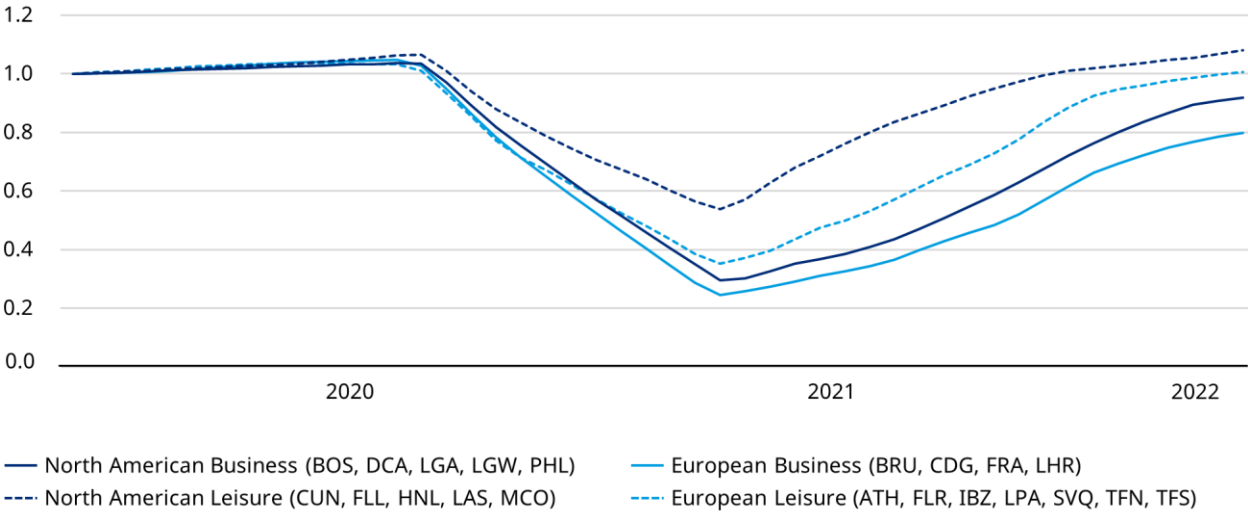
Delta Air Lines, heavily reliant on business travel, has seen a different plateau, but a plateau nonetheless. In January 2023, Delta President Glen Hauenstein said business bookings were holding steady, with domestic corporate sales hitting about 80% of 2019 levels in the final quarter of 2022. "We're counting on it to stay in that roughly 80%," he said.

Similarly, Vasu Raja, American Airlines chief commercial officer, also said in January 2023 that contracted corporate travel seemed permanently impaired at about 75% of its pre-pandemic level.

A comparison of primarily leisure airports to leading business centers, done through Oliver Wyman's [PlaneStats.com](https://www.planstats.com), illustrates how leisure travel in Europe and the US has exceeded pre-pandemic levels, while business travel in those regions remains below 2019 levels.

Exhibit 3: Sampled leisure airports in Europe and North America have recovered faster

Rolling 12-month seat totals, indexed to January 2019



Business travel will remain a significant — and for some, the most significant — driver of airline profitability for full-service and value carriers. At the same time, airlines have adroitly adapted to this new reality. Though high-fare business travelers have traditionally been the biggest driver of airline profits for full-service carriers, both full-service and value airlines dramatically increased yield in second and third quarters of 2022 compared with the very strong pre-pandemic year of 2019. They have expanded in markets where demand for leisure travel was strong enough to support higher fares. Full-service airlines, too, are selling a higher percentage of premium seats rather than giving them away in upgrades. Capacity discipline, aided by aircraft delivery issues and worker shortages, also spurred yield increases.

In the second and third quarters of 2022, airlines generally saw strong yield increases over the same periods of 2019. Domestic yield for full-service carriers increased more than 25%, and international yield grew 18.7% in the second quarter and nearly 30% in the third quarter. Value carriers also saw double-digit yield increases for both domestic and international service. While ULCCs had the most dramatic domestic yield increases — up 31.3% in the second quarter and 28.6% in the third quarter — the group also saw a decline, with its international yield falling.

Bottom line: Travelers were willing to pay more for air travel even when household budgets took inflationary hits for energy, food, and other core items. That strong demand showed new resilience for an industry typically slowed by economic headwinds and demonstrated how airlines, despite significant declines in business travel, can boost overall yield.

Daily routines suggest some of that business travel displacement is lasting. Videoconferencing technology, now easy to use and available on every smartphone and computer, has clearly replaced some business trips. While sales calls are widely expected to return to full strength, many in-house meetings and trainings, tech support functions, and routine check-ins will continue to be conducted virtually. People prefer the speed and convenience; companies prefer smaller more targeted travel budgets.

In addition, changing work habits have left fewer people in the office, making it harder to schedule in-person meetings. A hybrid workplace has become the norm for millions, who spend some days in the office but work from home on others. Office square footage is going underutilized, with *The Wall Street Journal* reporting in January that top commercial real estate companies were pivoting into the residential sector and even a casino. The US office vacancy rate was 12.3% at the end of the third quarter — about where it stood at the peak of the global financial crisis, according to CoStar Group. Corporate tenants have flooded the sublease market, with the square footage of subleased space available in January doubling, compared with the end of 2019.

In January, New York subway weekday ridership remained less than 65% of what it was on comparable pre-pandemic days, according to the Metropolitan Transportation Authority. Ridership on both the Long Island Railroad and Metro-North Railroad remained under 70% of comparable pre-pandemic days.

Travelers have learned to consolidate multiple client visits or employee check-ins with each trip. Many report they no longer cross oceans for a single meeting or dinner. The pandemic scratched away some of the gloss of road warrior ventures and made time at home more prized. Now realizing they don't have to be on the road all the time, many corporate travelers aren't venturing out as frequently.

Companies are also under pressure to significantly reduce their carbon footprint, and an increasing number are required to publish annual environmental impact reports. For intellectual property companies, which don't have factory emissions to reduce, that often means cutting portions of business travel in the coming years. Many have committed to significantly reduce their emissions and purchasing carbon offsets has already raised the cost of business travel for companies.

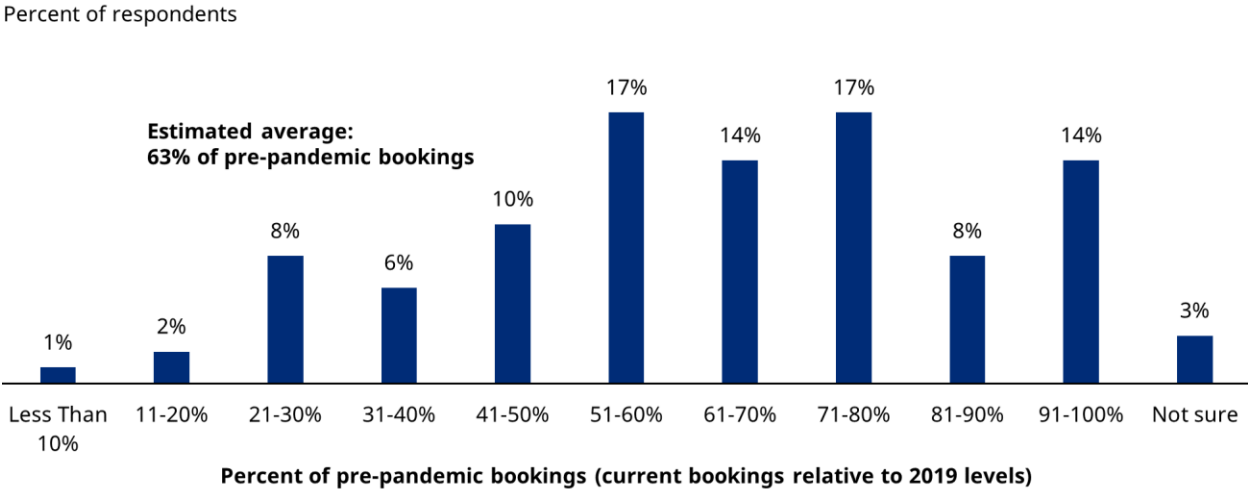
Airline executives often note that sales calls need to happen in person to land business and predict that business travel will return in force lest companies lose deals to competitors who do travel. Yet sales and securing clients account for only 25% of all business travel, according to research by IdeaWorks, which dug into business travel surveys and government reports in the US, Europe, Canada, and Asia. About 65% of all business travel relates directly to customers, including conventions and trade shows, customer support, and professional services. The other 35% is for internal functions such as tech support, company meetings, and commuting by air.

Applying likely reductions in travel to each category, the research found a probable 19% to 36% loss of business travel post-pandemic. So far the projection has been on target.

An October 2022 poll of corporate travel managers by the Global Business Travel Association (GBTA) supports the likelihood of prolonged displacement of trips. Asked how current bookings for domestic business travel compared with pre-pandemic bookings, the managers reported an average of 63% of pre-pandemic bookings. On international travel, the managers said bookings amounted to only 50% of the pre-pandemic number.

Looking ahead, two-thirds of the respondents expected budget tightening in 2023 to reduce or limit growth of employee travel at their companies.

Exhibit 4: GBTA Travel Survey: Percentage of 2022 bookings versus 2019 levels



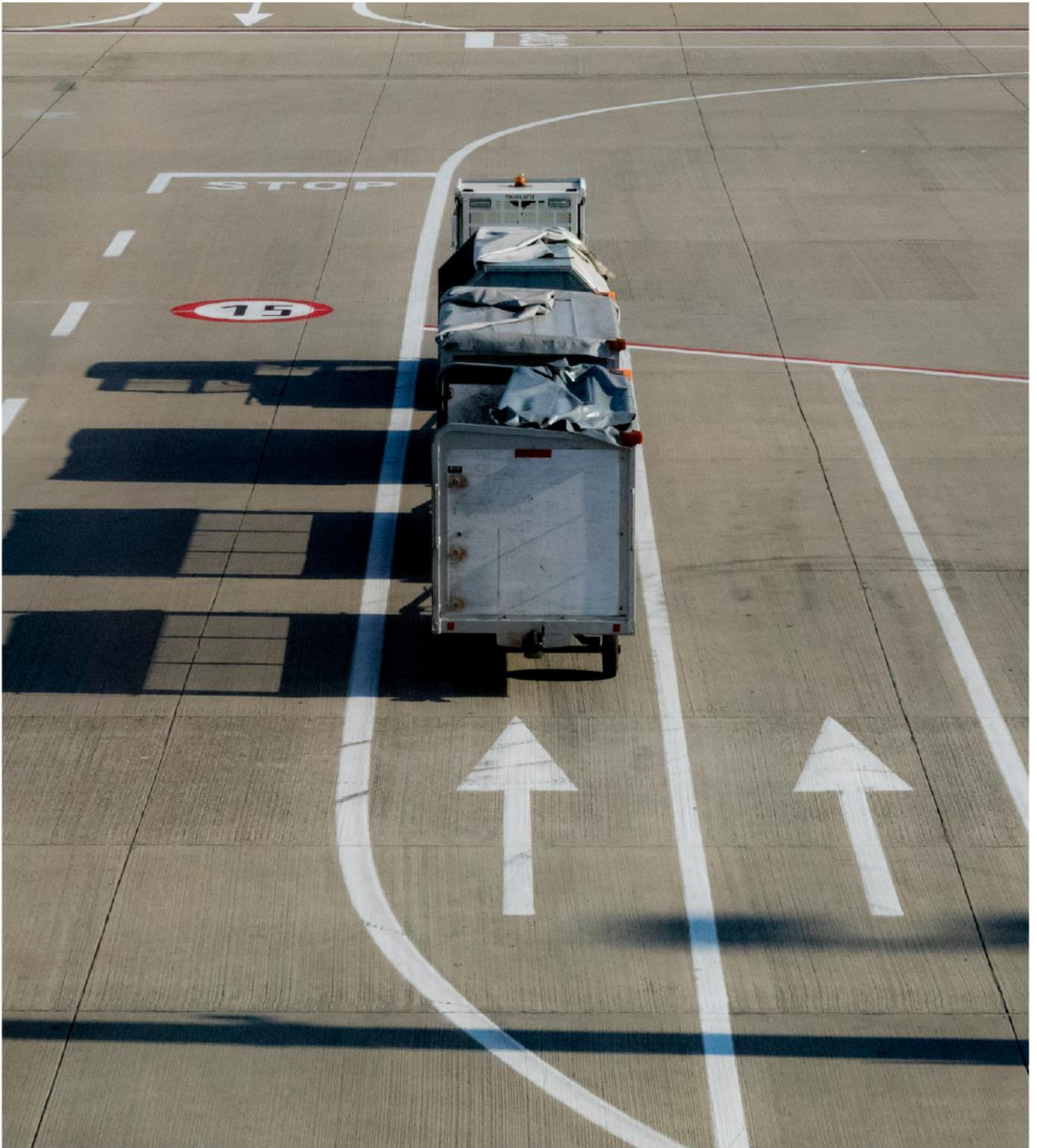
Note: Answers could be based on best estimate
 Source: Global Business Travel Association October 2022 Survey

The GBTA survey also found that 41% of corporate travel managers have seen an increase in employees asking for blended travel — adding leisure onto a business trip. Greater flexibility in work schedules and location has fueled a “bleisure” movement.

The bleisure trend has implications for airlines if work and vacation are combined, reducing the total number of trips. Networks have evolved to support increased interest in leisure destinations. And bleisure-oriented products might open up new growth for airlines through incentives for taking family along on corporate-booked trips or extending corporate benefits and discounts to loved ones who might fly in for a weekend to join a top-tier loyalty plan member.

Beyond bleisure, the shift in passenger composition will push other changes for airlines. Loyalty programs, for example, are built around rewards for business travelers. Reduced corporate travel may mean reducing the spend and travel requirements for elite tiers of reward programs to maintain the same number of members in those highest elite-qualification categories. Already, airlines are moving programs from loyalty generators to revenue producers, thanks to credit card spend. American Express, for example, paid Delta \$5.5 billion to buy SkyMiles to give to customers in 2022, the airline’s filings show.

The recalibration for airlines has already begun. Changes across networks, pricing, and loyalty programs are all moving airlines to focus more on the premium leisure traveler willing to pay higher fares. It’s that type of traveler who will replace some of the missing high-fare business passengers.



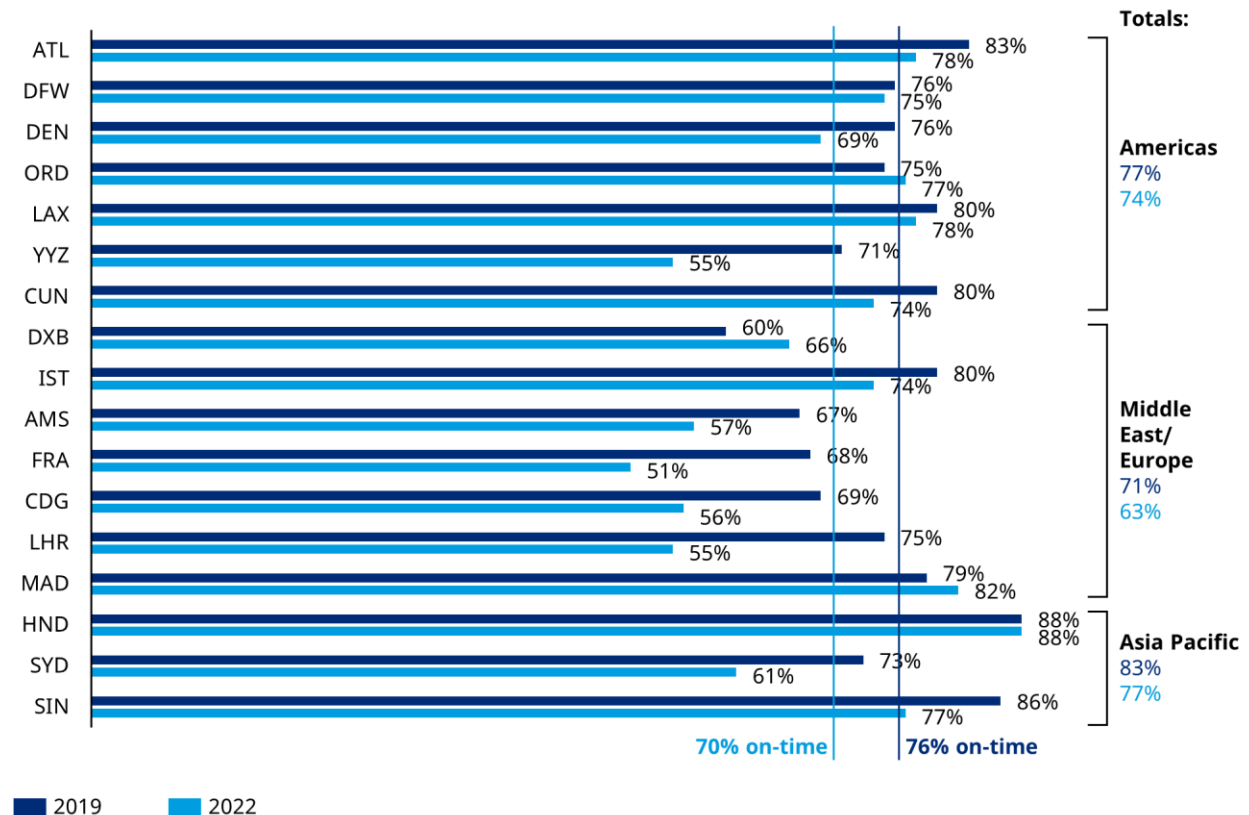
THE SQUEEZE AT AIRPORTS

Suddenly overcrowded and understaffed, airports faced new pressures and significant strain — and made headlines in 2022.

Airports have contended with the return of flight schedule peaks similar to those in 2019, as well as more hold baggage per passenger, thanks to an increased portion of leisure travelers. Yet many airports, still short-staffed on baggage handlers and other ground personnel, have struggled to hire and train new workers quickly. Airports also faced on-airport system strains such as bottlenecks in employee security screening and badging as well as airline operational challenges. Performance suffered.

Exhibit 5: Airport on-time performance (D15) 2022 vs. 2019

Airport on-time performance, measured by D15



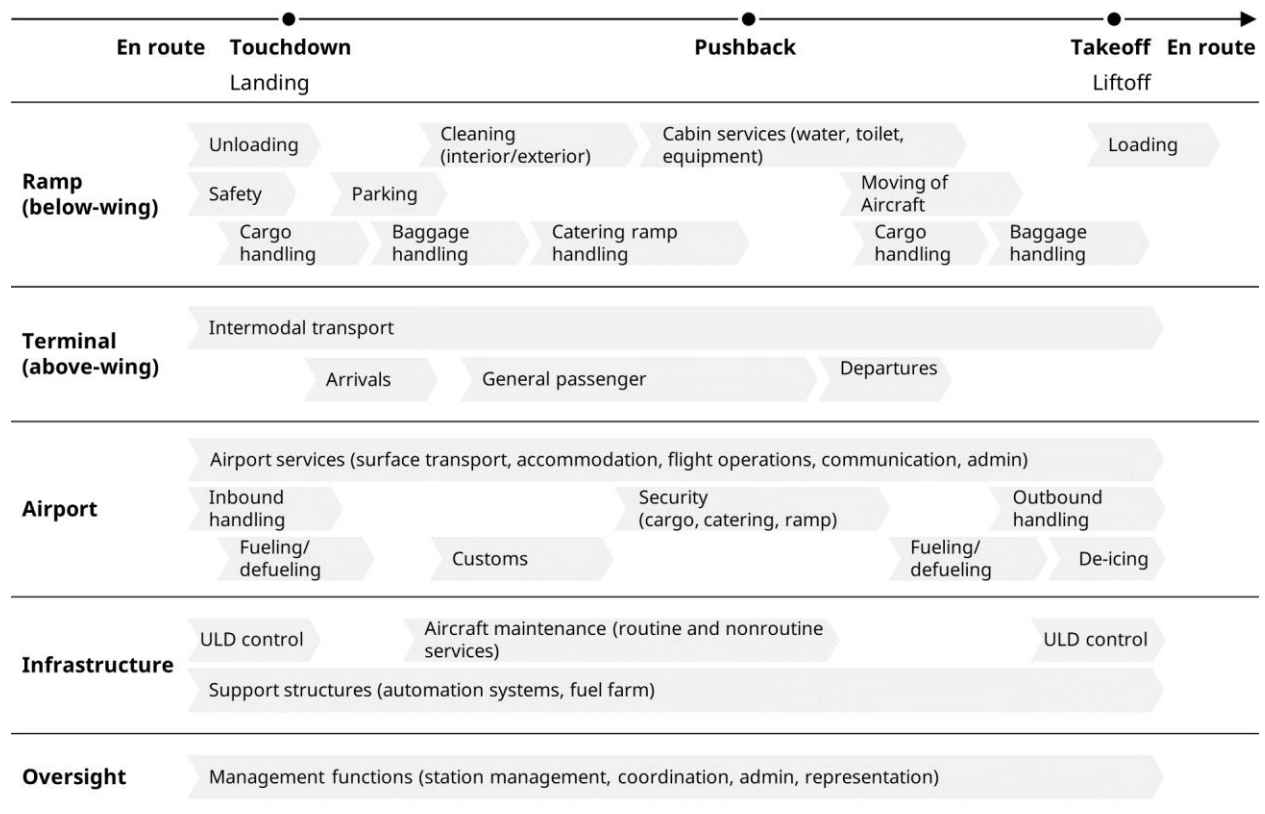
Note: Based on actual gate departure times within 15 minutes of schedule. Cancellations included and recorded as not on-time. Weighted by number of monthly operations
 Source: OAG monthly on-time performance reports, Planestats.com, Oliver Wyman analysis

In a sample of 20 large airports across regions where demand has recovered, on-time gate departure, measured as within 15 minutes of schedule, fell six percentage points for 2022 compared with 2019. This decline occurred despite a 19% reduction in overall flight volume from 2019 to 2022. The decrease in on-time performance was most pronounced at European hubs,

Toronto Pearson (YYZ), Sydney Kingsford Smith (SYD), and Singapore Changi (SIN). Despite operational challenges in the US in 2022, on-time performance for major hubs was similar to that for 2019.

Ground handling, including above the wing and below the wing functions, and security screening have drawn widespread attention for airport operational challenges. At some airports, the ground handling ecosystem can be quite fragmented, with multiple principal handlers providing below-wing and above-wing services along with more than 100 potential suppliers involved in aircraft turns. As the airport operating model exhibit shows, there is significant complexity across airport suppliers that goes into a single, on-time aircraft turn in addition to airline-specific factors such as crew and aircraft maintenance.

Exhibit 6: Airport operating model for an aircraft turn



Airports and their suppliers have faced labor supply constraints during the recovery, including more recruitment and retention challenges and poaching between suppliers rather than focusing on overall airport labor pool growth, long and cumbersome employee badging processes, inexperienced and less productive employees, higher sick rates, and increased attrition after the

mass 2022 recruitment efforts. The supply constraints are exacerbated by greater demand on ground handling and security screening from an influx of leisure travelers who take along more bags per passenger and are less efficient at navigating airport check-in and security screening procedures.

Airport stakeholders have worked hard to address these ramp-up operational challenges as quickly and efficiently as possible. Airlines and airports have offered wage supplements, increased sick pay, sign-on bonuses, and shift completion bonuses. To increase workforce staffing, some airports, governments, and airlines fast-tracked work permits and visas to hire or transfer foreign workers, provided temporary alleviation of background checks for some positions, and asked head office staff to work as baggage handlers, check-in agents, and way-finding aides. To influence passenger behavior, some airports and airlines limited arrival and check-in time to three or four hours before flights. Additionally, some instituted temporary baggage restrictions to reduce the strain on the baggage system and minimize handling challenges.

In the US, some lawmakers called on the Department of Transportation to fine airlines for canceling flights that they knew they couldn't fully staff over summer 2022. Many airlines across regions reduced summer 2022 flying due to staffing challenges, aircraft shortages, and flight caps instituted by some airports. In Europe, flight and passenger caps were put into place, with London Heathrow capping departing passengers at 100,000 per day, London Gatwick capping daily flights to between 825 and 850, and Amsterdam Schiphol capping passengers at 67,500 per day in July and 72,500 per day in August. While some flight caps remain in place, schedule interventions have stabilized.

With the recovery in travel, the operating pressures at airports have revived interest in airport, airline, and supplier operating models as well as airport modernization. Although operating and regulatory environments may differ, airports, airlines, and suppliers can improve their collaboration to better prepare for changes in demand and to cope with travel peaks. Recommendations include:

1. **Focusing on collaboration:** Airports can create specific roles with responsibilities to engage with the broader airport community, especially third-party suppliers that contract directly with airlines. Airports should use this as an opportunity to review governance and communication effectiveness.
2. **Increasing data sharing and planning:** Sharing operational data is critical for airports to prepare for travel peaks. For example, collaborating with airlines on planned schedules and passenger forecasts in advance can help airports and suppliers ensure appropriate staffing and resilience. In turn, airports can aggregate data across the airlines and work with suppliers to ensure suppliers are prepared, identify problem areas, and craft playbooks to handle disruption during peaks. With an eye on improving resilience during peak travel, more airports are using predictive analytics to forecast and plan resourcing for operational needs.

3. **Embedding best practice standards:** At airports with multiple suppliers for key activities such as ground handling and security, implementing best practice standards and rewarding suppliers for high-quality service — especially when an operating license is at stake — can improve performance and control costs. Developing and publishing performance scorecards with controllable metrics can identify top performers and the laggards. For both above the wing and below the wing, investments in automation — such as baggage systems and self-service for passengers to check in, check bags, and go through immigration — can improve the customer experience and reduce labor needs. It is critical that all parts of the airport ecosystem are strong to ensure the service that passengers expect.
4. **Strengthening the airport employment value proposition:** Many airport jobs come with unsociable hours, physically demanding labor, and lower pay. Airports can work with local communities and transit authorities to provide reduced-cost airport access for employees and support recruitment with expansive job postings and marketing. Restructuring rosters and shifts to accommodate employee preferences can help with retention and resilience for peaks.
5. **Streamlining the employee airport ID process:** The travel recovery in 2022 brought record numbers of new employees to airports. But strict security protocols made obtaining an airport badge a months-long endeavor for job seekers, causing many to drop out of the candidate pool. Airports should review their job application processes to find ways to speed up the hiring timeline, reduce first-time rejections, and provide more transparency to suppliers. They also can explore biometrics to increase security and enable more cross-airport employment potential.



REGIONAL JET TRENDS AND OUTLOOK

THE REGIONAL JET IS DEAD. LONG LIVE THE REGIONAL JET.

As broader recovery continues, the role of regional jets in mainline networks continues to decline. The three largest US carriers — American, Delta, and United — use approximately 45% of the global regional jet fleet through wholly owned regional subsidiaries or capacity purchase agreements with independent regional operators. From 2019 to 2022, they lowered the regional jet capacity in their networks by 28% while simultaneously increasing small-gauge (e.g., A220, A320, and Boeing 737) mainline fleet capacity by one percent. As a result, the share of regional jet-produced capacity in these carriers' networks collectively dropped two percentage points.

But this is not the start of a trend, as regional capacity share in the broader US market has been declining since 2010 in favor of mainline growth.

Declines in regional jet use are driven by several longer-term, structural changes, all favoring the use of larger aircraft, also known as upgauging. As the industry has consolidated and becomes healthier financially, the environment has become more favorable for using larger aircraft. For example, load factor and margin were materially higher in the years leading up to the pandemic than when regional jets were reaching their peak use in the early 2000s. Meanwhile, airports and air space have become more congested. Many large airports with high levels of regional jet service experienced heavy increases in air traffic delays. Further, the industry's demand for pilots continues to outpace supply. The resulting shortage is felt most acutely by regional carriers.

Despite these headwinds, Oliver Wyman analyses and modeling of industry results indicate that regional jet operations still drive significant value as part of mainline carrier route networks.

Network modeling indicates that removing regional jets from networks and not backfilling them with other aircraft would result in significant earnings loss across the three carriers. Approximately 20% of the loss would be from regional jet operations directly, while the remaining 80% would be from the worsening of mainline economics without the regional jet feed (after accounting for the ability to backfill lost traffic from other sources, such as spill and recapture). Further, the lower cost of ownership for the existing regional jets, as they age, will also support continued use.

On the other end of the spectrum, wholesale replacement of regional jet fleets with smaller mainline aircraft produces an even worse outcome. Upgauging all regional jets to small mainline aircraft, while remaining roughly capacity neutral, destroys more value than simply removing them from the network. This is true even when including the rising cost of regional pilots, due to the shortage.

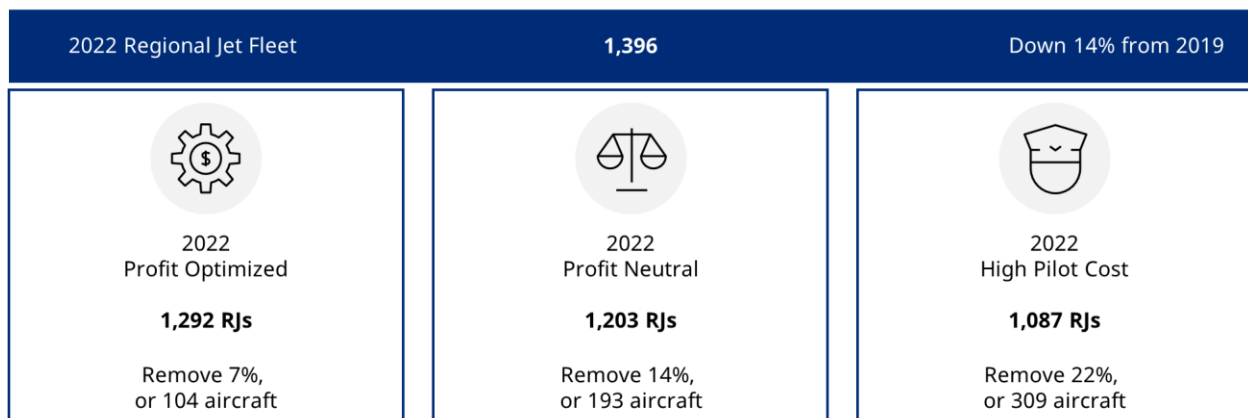
Part of the problem is that cost and capacity between mainline and regional fleet categories don't scale one-for-one. Compounding the situation is the need to reduce frequency to remain capacity-neutral with larger aircraft. For hub-and-spoke carriers, which are the heaviest users of regional jets, frequency reduction on this scale undermines the integrity of connecting banks within their hub systems. As connectivity within the hub systems unwinds, so too does revenue production.

If economics suggest that regional jets should not be eliminated, what is the optimum outcome? Tactically targeting low-performing or unprofitable regional jet routes, with marginal incremental system feed, leads to more favorable outcomes. These outcomes can be measured on both a profit optimal and profit neutral outcome.

Across our three study carriers, the optimal profit level was achieved with a regional jet fleet reduction of seven percent versus 2022. If further fleet reductions were warranted (for example, due to rising pilot shortages), the regional jet fleets could be reduced another seven percent while remaining profit neutral to the baseline. However, if pilot shortages persist and costs continue to escalate, the 14% fleet reduction increases to 22%. In short, with all else equal, this means that a further regional jet fleet reduction of seven percent is likely the floor, with the ceiling being up to 22% if pilot costs continue climbing and carriers seek to preserve their baseline earnings levels.

Exhibit 7: Potential regional jet fleets based on economic outcomes

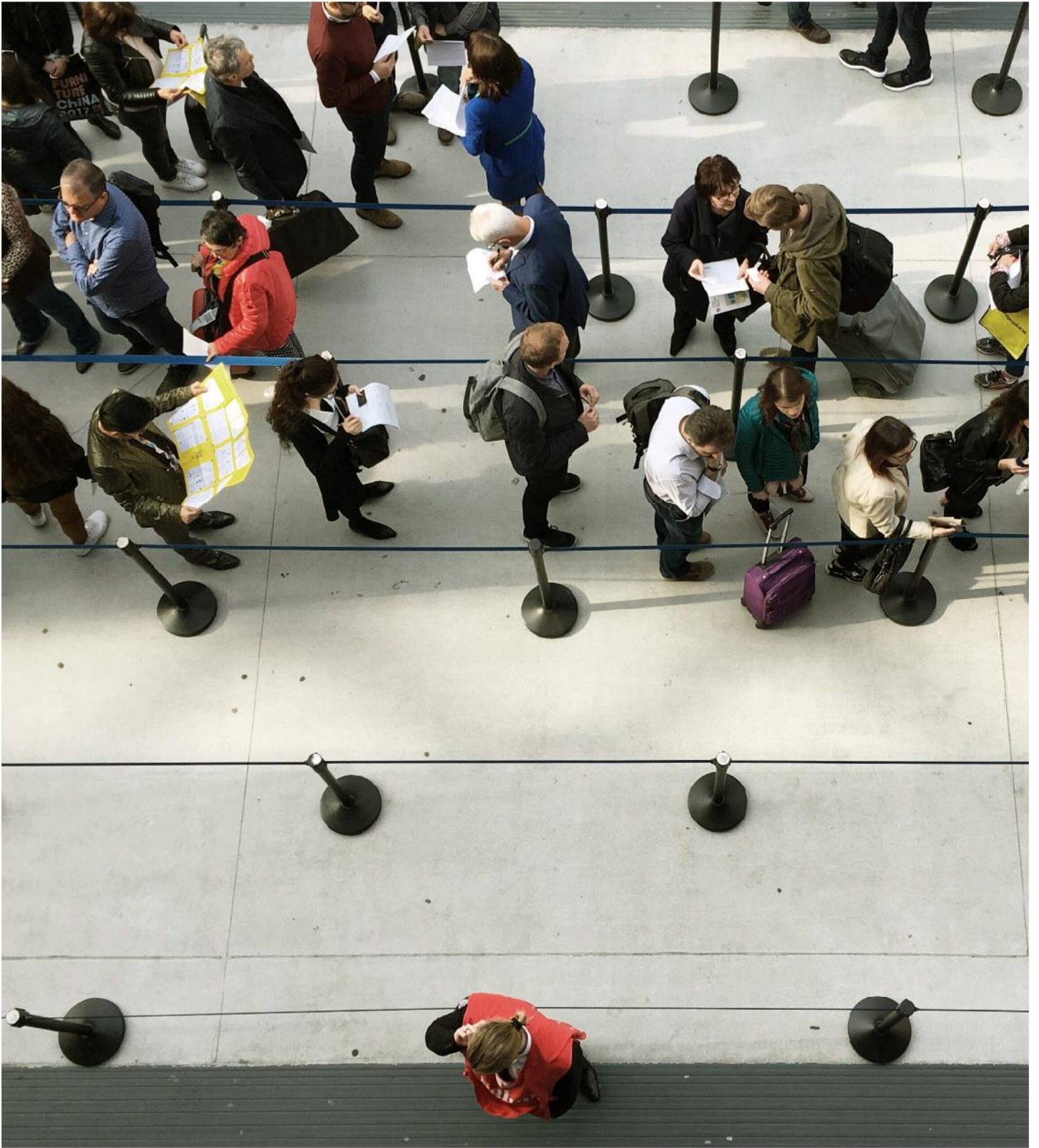
2022 regional jet fleet scenarios



Note: Estimated based on published schedules for August to December 2022 as of July 27, 2022; Includes additional shells to account for differences between owned and operating fleet — 25 for already removed, 11 for Profit max, 21 for earnings neutral and 33 for high-pilot cost
 Source: Planestats.com/OAG, Form 41, T100, O&D Survey, Oliver Wyman analysis

Current order books suggest that carriers could achieve these replacement scenarios within the next one to two years. This assumes, however, that all deliveries fund regional jet replacement. More likely, deliveries will fund a variety of needs beyond just regional jets. More conservative assumptions add two to four years, pushing timing into the second half of the decade.

The implications are varied. For the regional industry, this means continued contraction. But this also suggests that a large number of regional jets will remain economically viable for the foreseeable future.



DEMAND AND CAPACITY

AIR PASSENGER DEMAND

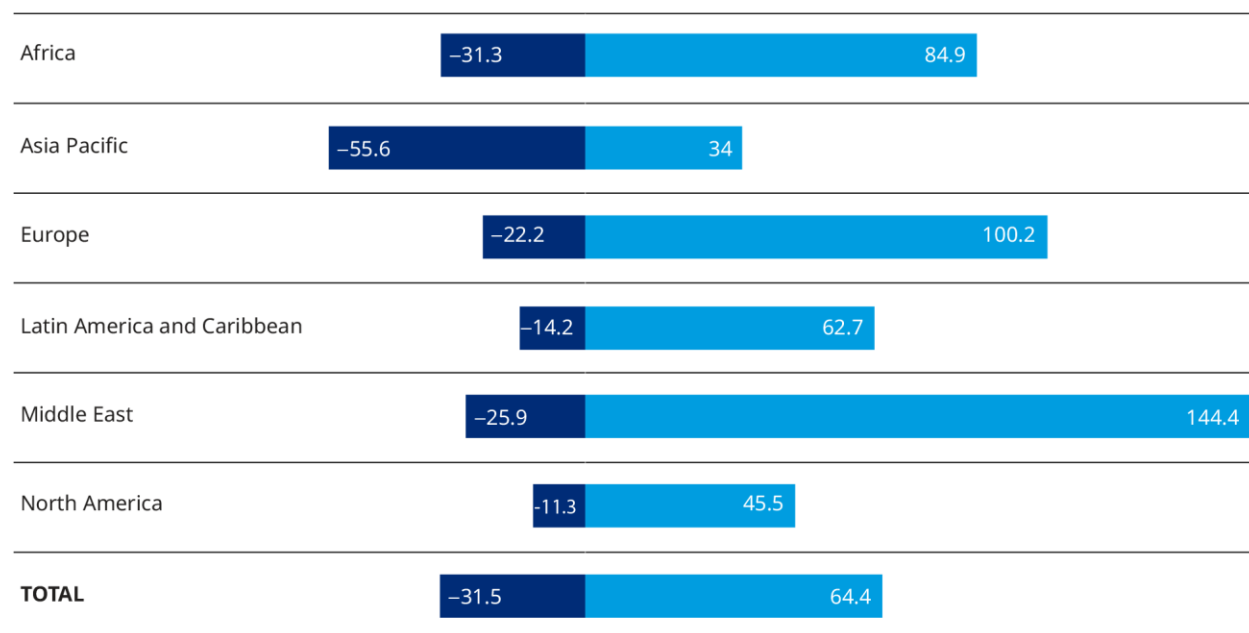
Airline passengers continued to return to the skies during 2022, increasing worldwide revenue passenger kilometers (RPKs) by 64% during 2022 compared with 2021 figures. Even with the strong growth, worldwide air passenger demand was still 32% below 2019 levels.

Demand recovery has not been equal throughout the world, with deficits ranging from 11% to 55% for the full year 2022 compared with 2019 figures. RPKs for North American airlines were 11% below 2019 levels and improved to eight percent during December 2022. From 2021 to 2022, North American airlines increased RPKs by 45%.

Latin American airlines have recovered to 14% below 2019 levels. The group's initial recovery was somewhat slower than for North American carriers, but strong growth of 63% for 2022 over 2021 has lifted regional results.

Exhibit 8: Worldwide air passenger demand, full year 2022

Percent change



■ 2022 versus 2019 ■ 2022 versus 2021

Note: Demand measured in revenue passenger kilometers (RPKs); traffic allocated to region where providing carrier is registered; Mexico is included in Latin America

Source: International Air Transport Association (IATA)

European air passenger demand was 22% below that in full year 2019, followed by the Middle East (down 26%) and Africa (down 31%). Middle East airlines reported the largest increase in demand, 144%, during 2022 compared with December 2021 figures.

Airlines in the Asia Pacific region continue to report significantly depressed demand levels. During 2022, the group was still 56% below full year 2019 RPKs even after jumping 63% during December 2022 over December 2021. The monthly increase is a good sign for the struggling region.

Demand in China's domestic market continues to drive the region's slow recovery. Air passenger travel within China remains 70% below 2019. Although some of China's COVID-19 restriction policies are easing, there is still a long road to full normalization and recovery for air travel.

During 2019, the Asia Pacific region represented 35% of worldwide RPKs, making the region the largest air travel market in the world. Asia Pacific's world share has since dropped to 22% of the world's RPKs as of December 2022. European airlines have taken the top spot, based on 30% share of world RPKs, up from 27% during 2019.

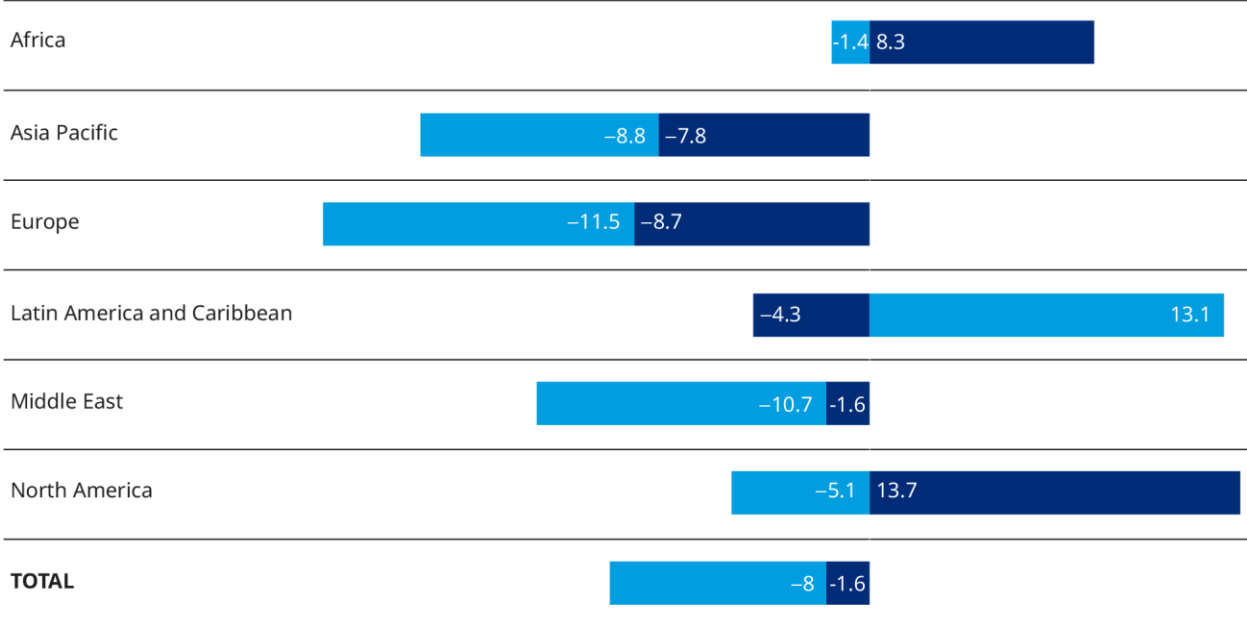
AIR CARGO DEMAND

After most of 2021 saw double-digit growth in air cargo demand, 2022 proved a challenging year with the geopolitical issues in Europe and lockdowns in Asia. However, the sector still performed well, thanks to air cargo rates remaining at historic highs set during 2021.

Worldwide air cargo demand, as measured by cargo tonne kilometers (CTKs), decreased eight percent during the full year 2022 compared with 2021 figures. During 2022, air cargo demand was 1.6% below that of 2019. Air cargo volume during 2021 was eight percent higher than in 2019.

Exhibit 9: Worldwide air cargo demand, full year 2022

Percent change



■ 2022 versus 2019 ■ 2022 versus 2021

Note: Demand measured in cargo tonne kilometers (CTKs); traffic allocated to region where providing carrier is registered; Mexico included in Latin America

Source: International Air Transport Association (IATA)

North America and Africa were the only regions to remain above 2019 in tonnage carried. Demand for North American air cargo was almost 14% above 2019 figures even after falling five percent year over year. Europe remains nearly nine percent below 2019 air cargo demand transport levels.

Latin America represented the only bright spot for air cargo during 2022, with demand registering 13% higher than in 2021. However, the positive result is likely driven by the fact that Latin America was the only world region that didn't participate in the strong growth in 2021.

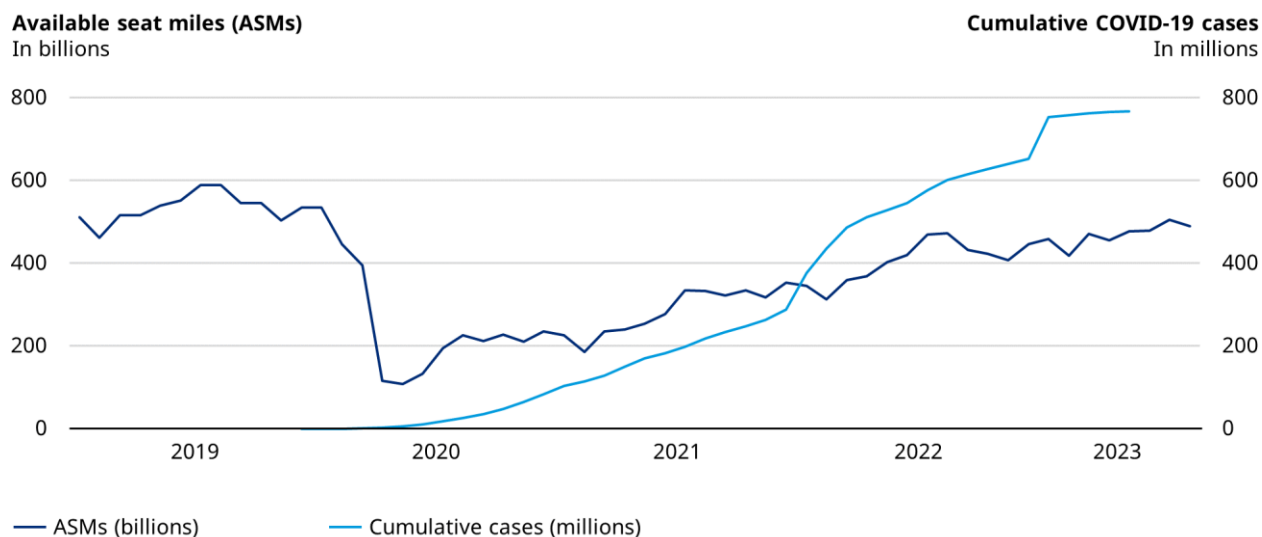
AIRLINE CAPACITY

According to the World Health Organization data, cases of COVID-19, including variants, continued to increase and even accelerated during 2022. According to the data, cumulative cases nearly doubled, rising from 377 million during January 2022 to 652 million cumulative cases by the end of December 2022, showing the majority of tracked COVID-19 case counts occurred in 2022. In fact, the case counts could be even higher, given that a large portion of new COVID-19 cases have not been reported.

Despite the continued increase in case rates, worldwide airline capacity rose steadily during 2022 because the cases were much less severe. Worldwide available seat miles dropped to 108 billion during May 2020 (down 78% over May 2019) following the onset of the pandemic. By the end of 2022, ASMs increased to 446 billion, 17% percent below the December 2019 numbers.

The following section analyzes the details of the recovery through the end of 2022. For the most part, this section uses capacity analysis of scheduled ASMs to determine how the airline recovery has taken place to date. We use airline schedule data (capacity) instead of demand measures (passengers flown) because demand is not available in all regions.

Exhibit 10: Worldwide cumulative COVID-19 cases and monthly available seat miles



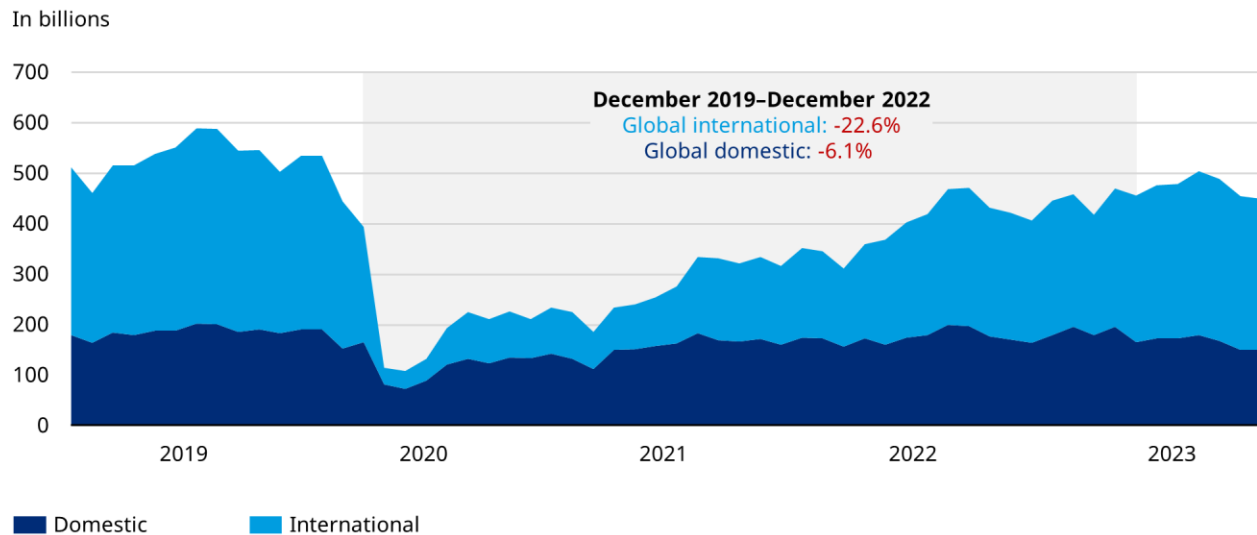
Note: 2023 ASMs based on forward looking schedules. COVID-19 case data not estimated for 2023
 Source: World Health Organization, OAG schedule capacity via PlaneStats.com

As of December 2022, worldwide ASMs were 16.7% below those in December 2019, with ASMs expected to reach 470 billion during March 2023, based on forward-looking scheduled capacity. Domestic capacity was only six percent below that of December 2019 despite the downward drag of the domestic China market. Without China, worldwide domestic ASMs are only three percent below December 2019.

At the end of 2022, total international ASMs were 22.6% below those in December 2019. As noted in past editions of this report, domestic travel has recovered more quickly than international travel. At the end of 2021, international capacity was still 48% below that in 2019, while domestic was down only nine percent over the same period.

Like the domestic market, China has a large impact on international capacity. Without China, international capacity would be only 15% below December 2019.

Exhibit 11: Scheduled available seat miles worldwide, 2019-2023



Note: Domestic = capacity within individual countries
Source: OAG schedule capacity via PlaneStats.com

Airline capacity recovery, compared with 2019, continues to vary greatly by major world region. For the full year 2022, capacity was 76% of 2019 full year results. For comparison, 2021 figures were 53% below those in 2019.

Of the five major world regions, Latin America took the top spot during 2022 by restoring 92% of ASMs that were generated during 2019. The region takes over the top spot from North America, which led the recovery during 2021 with 69% of ASMs generated during 2019.

All three subregions within Latin America — Central America, South America, and the Caribbean — were significantly above world recovery averages. Latin America represented nine percent of world capacity during 2022. Central America, which is largely Mexico, exceeded 2019 capacity levels by 7% during the year. Central America was the only world region to exceed 2019 figures for the full year 2022. The Caribbean ranked third during 2022 in capacity recovery.

North America, with 28% of world capacity, fell to second among the five largest world regions during 2022, recording 87% of 2019 ASMs. The US was second among subregions, behind Central America in 2022 capacity recovery. Canada, while still among the slowest to recover capacity,

improved from 34% of 2019 ASMs during 2021 to 76% during 2022. Canadians enjoyed the largest capacity increase among the world regions and subregions during 2022.

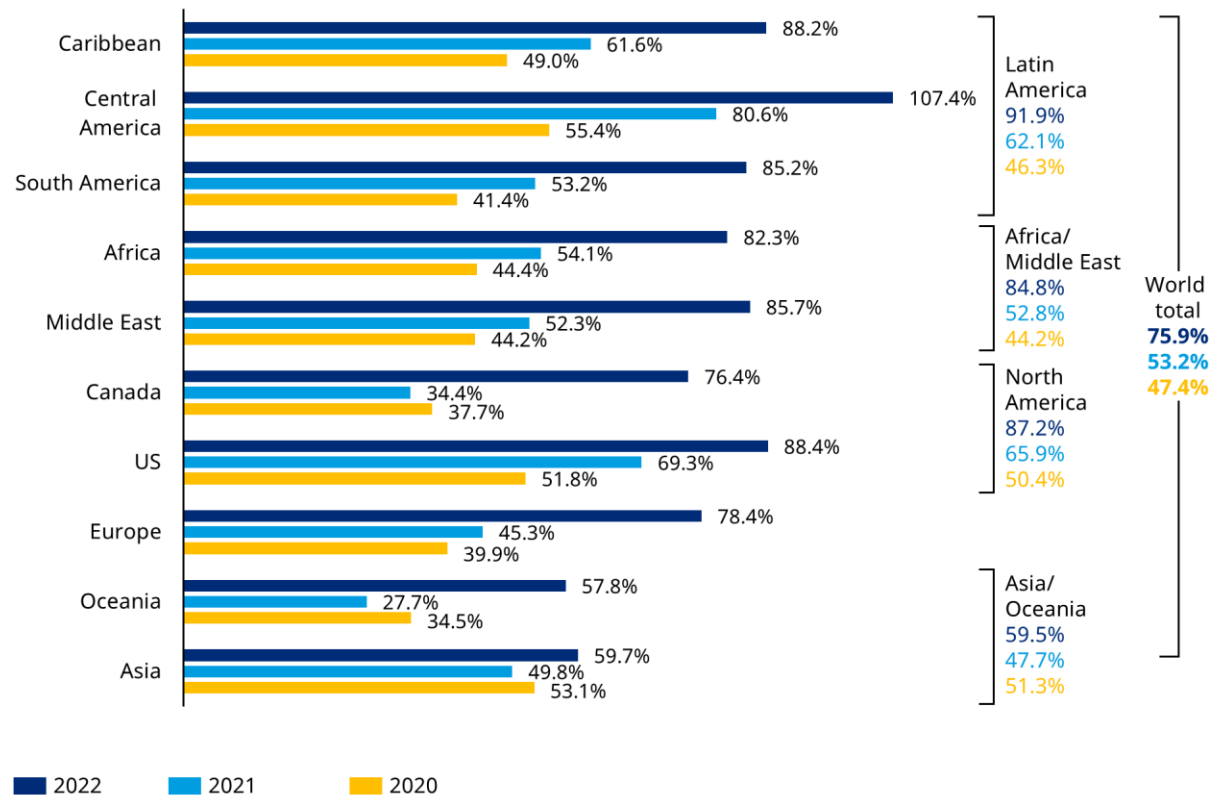
Africa and the Middle East, together making up 13% of world capacity, rose to 85% of ASMs restored in 2022 compared with 2019 figures. The two subregions have had nearly identical recovery rates over the past three years.

Capacity in Europe (23% of world capacity) reached 78% of the 2019 figures during 2022, up from 45% during 2021. European results in 2022 were impacted by the war between Russia and Ukraine and the prohibition of flying over Russian airspace.

As noted in the demand section, Asia/Oceania (28% of world capacity) remains well behind other global regions for capacity recovery. The region had only 60% of capacity relative to 2019 during 2022, again largely due to China’s continuing struggle with COVID-19 lockdowns. As a bright spot for the region in 2022, Oceania improved to 58% of 2019’s capacity, gaining ground from its 28% recovery in 2021.

Exhibit 12: Percent of systemwide in-service global capacity versus 2019

Based on available seat miles



Note: Systemwide = domestic + international, domestic capacity = capacity within individual countries
 Source: OAG schedule capacity via PlaneStats.com

Regionally, domestic results were generally in line with systemwide results with a few notable differences. As mentioned earlier, worldwide domestic capacity recovery has been more robust than for international. This has also been true for every world region (including subregions), except the Caribbean, where domestic traffic represents less than one percent of the region’s traffic.

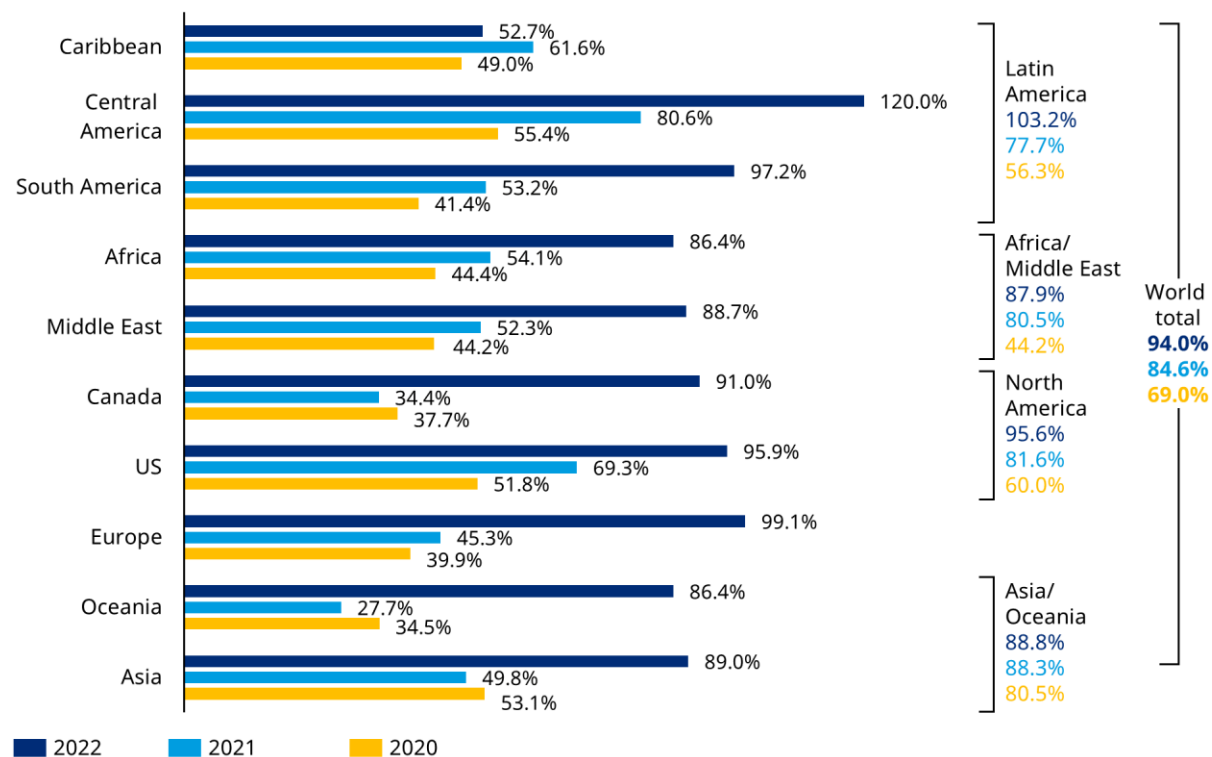
Globally, domestic capacity reached 94% of 2019’s figures during the full year 2022, a nearly 10-point improvement over 2021 capacity recovery.

Europe’s domestic capacity for 2022 pulled almost even with its 2019 numbers, at 99% recovered. That placed it second to Central America’s recovery. But for European carriers, domestic travel represents only 12% of the region’s total capacity.

As noted earlier, Asia’s capacity results are significantly impacted by lockdowns in China. Despite this hindrance, 2022’s domestic capacity in Asia was at 89% recovery from 2019 figures.

Exhibit 13: Percent of domestic in-service capacity versus 2019

Based on available seat miles



Note: Domestic reflects in-service capacity within individual countries
 Source: OAG schedule capacity via PlaneStats.com

The dynamic between domestic and international capacities is best displayed in Exhibit 14 (below). During 2019, domestic capacity represented 35% of total scheduled capacity. Border closures and international travel restrictions tied to COVID-19 led to domestic airline capacity increasing to 51% of total scheduled ASMs worldwide in 2020.

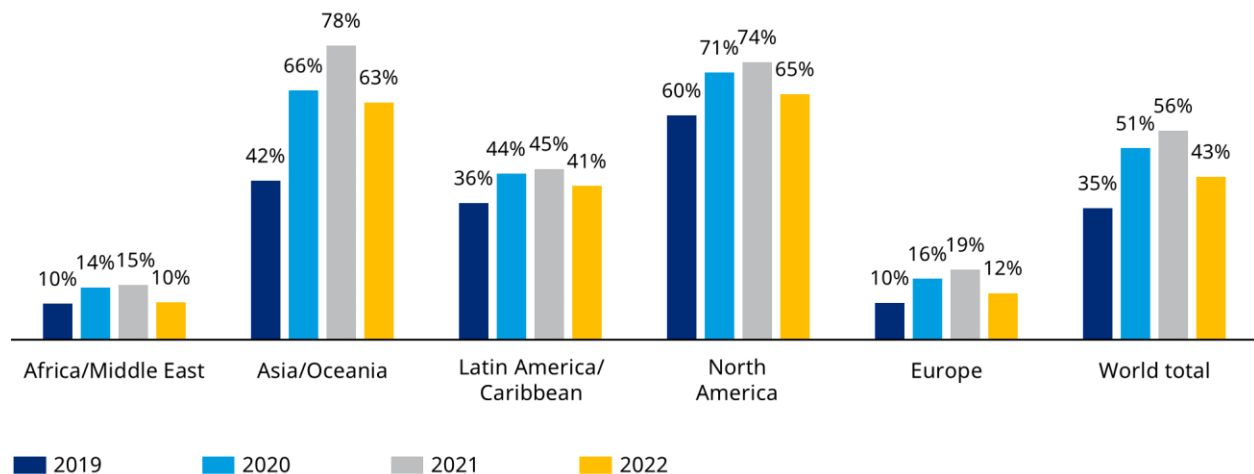
Many of the international travel restrictions and border closures were lifted during 2021. However, the demand for domestic travel returned at a much quicker rate during 2021, further increasing the domestic share of capacity to 56% worldwide.

While domestic capacity continued to make gains during 2022, international capacity growth outpaced it, shifting the domestic share to 43% of total ASMs. It is important to note that international capacity increases based on ASMs are skewed because of the differences in average stage length. However, Exhibit 14 effectively demonstrates the relationship between domestic and international travel as the industry returns to what most would consider normal.

Asia/Oceania is the only major region to have a significantly distorted domestic to international relationship during 2022. All other regions have returned to within five percent of 2019 balances.

Exhibit 14: Domestic service as a percent of total capacity

Based on available seat miles



Note: Domestic reflects in-service capacity within individual countries
 Source: OAG schedule capacity via PlaneStats.com

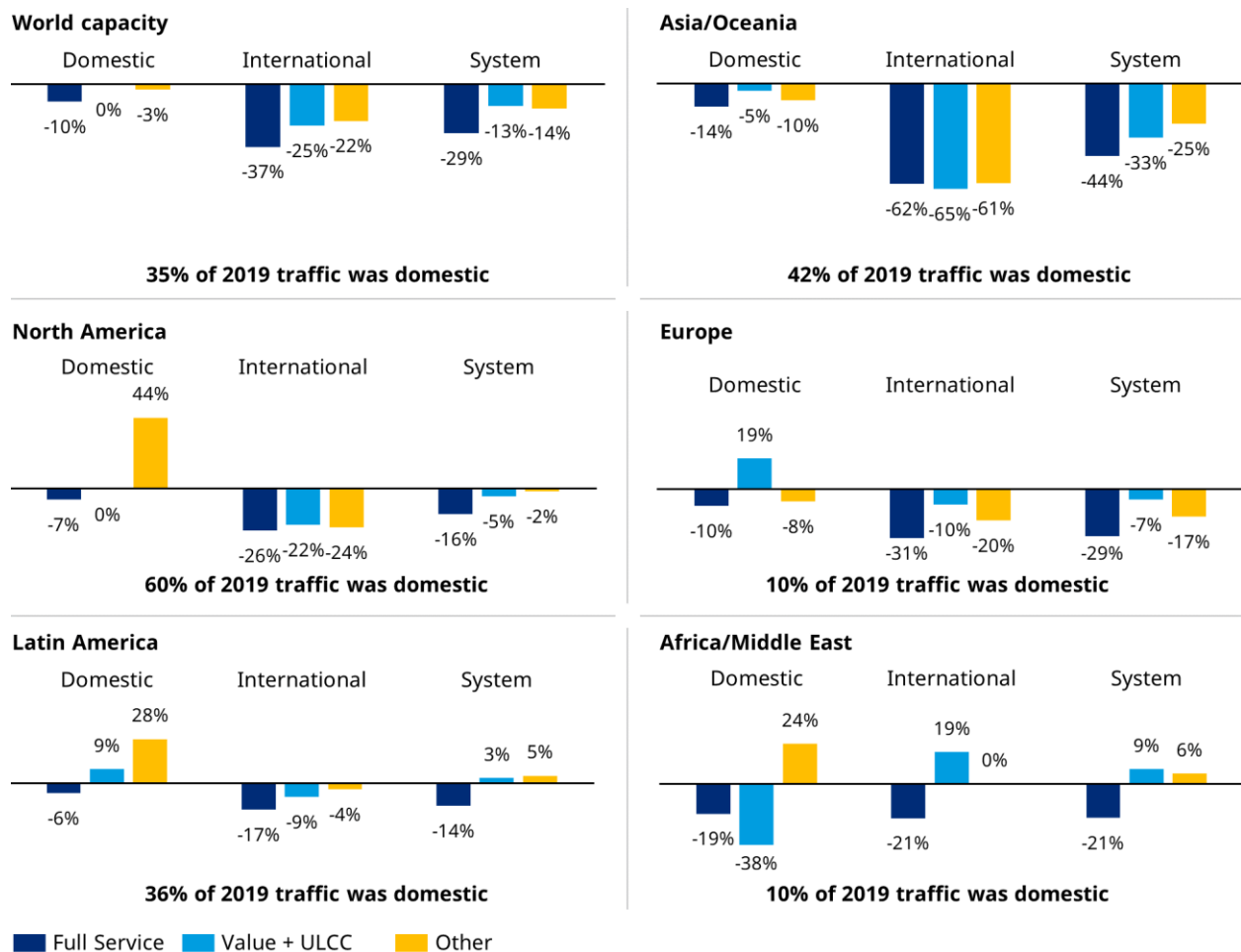
The pandemic continues to affect airline categories differently. Full-service carriers, which are typically more reliant on connecting international markets and serving business travelers, have felt the greatest impact. Worldwide, full-service carriers are 29% below full year 2019 capacity levels. The group's international capacity remains 37% under 2019 figures.

Full-service carrier results are relatively consistent throughout the world's regions. The glaring exception is the Asia/Oceania region, where international capacity is still 61% below 2019.

LCC and ULCC carriers have done considerably better than their full-service counterparts. Overall, the group provided 13% less total capacity during 2022 than in 2019. Worldwide, the group provided virtually the same domestic capacity as it did during 2019. It was again lagging international results that slowed the group's overall growth.

The Other group is difficult to analyze on a worldwide basis as the group represents less than 10% of total capacity. The rise of Breeze and Avelo in the US has increased domestic capacity in the North American region. The two airlines remain in our Other category for 2022 but will likely be reclassified in 2023.

Exhibit 15: Available seat mile reductions by carrier type, 2022 versus 2019



Note: Latin America includes Mexico

Other = all other scheduled airlines such as scheduled charter, independent regionals, and small operators. Domestic reflects in-service capacity within individual countries

Source: OAG schedule capacity via PlaneStats.com

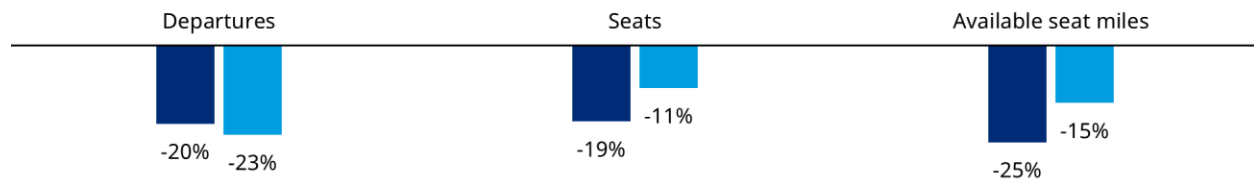
In 2022, departures for commuter/regional partner airlines were 23% below 2019 levels, while their mainline partners had 20% fewer departures over the same period. Regional carrier total seats declined 11% during the period, indicating the use of larger regional jets.

Regional partner capacity is typically measured by departures as the number of seats and the stage lengths are substantially below those of the carriers' mainline partner counterparts. As seen in Exhibit 16, mainline partners cut departures at a slightly higher rate than the regional partners (-37% versus -36%) in 2021. However, in 2022 that dynamic changed when mainline departures fell 20% and regional partners slid 23%, both from 2019 levels.

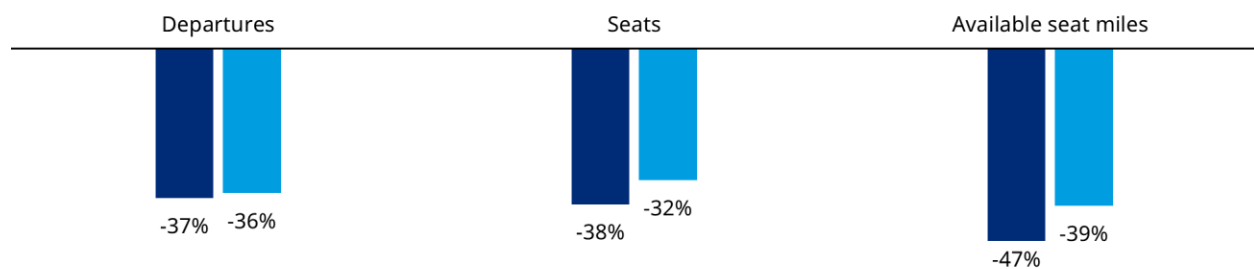
Exhibit 16: Comparison of capacity reductions between mainline operations and partner operators, 2022 and 2021 versus 2019

Domestic and international

2022 versus 2019



2021 versus 2019



■ Mainline ■ Partner operator

Note: Mainline represents flights operated by a primary carrier; partner operator represents flights operated by regional partners and capacity purchase agreements

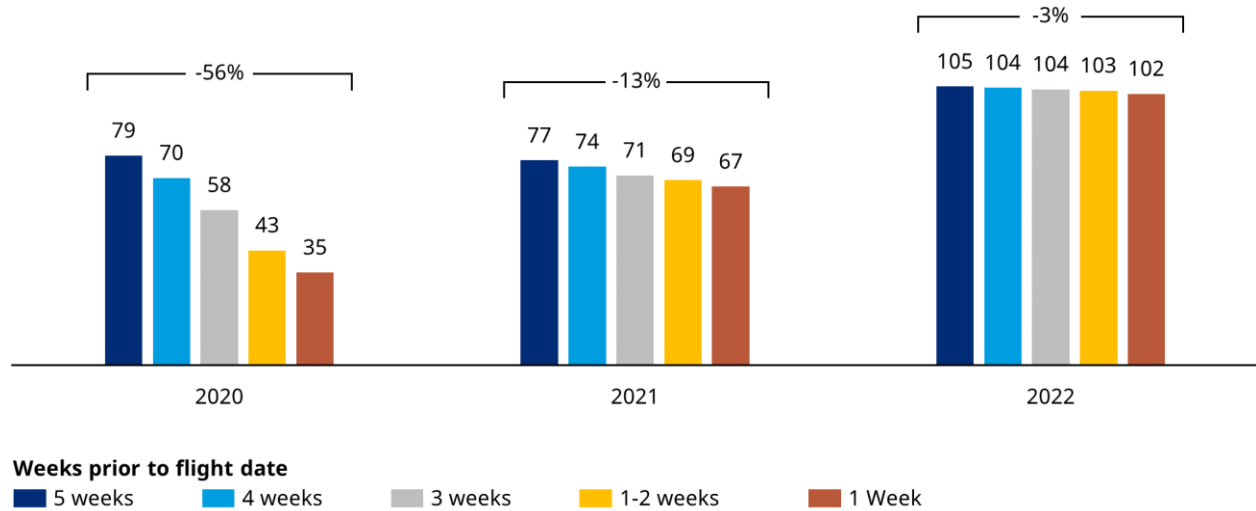
Source: OAG schedule capacity via PlaneStats.com

Scheduling of airline capacity was much more consistent during 2022, with airline schedules settling earlier compared with the previous two years. In 2020, airlines had 79 billion ASMs scheduled for the week of June 15-21 five weeks before the flight dates. As the June flight dates approached, worldwide airlines rapidly reduced capacity. One week before the June 15-21, 2020, flight dates, airlines had reduced scheduled capacity to 35 billion ASMs, or 44% of what was scheduled just four weeks earlier.

During June 2021, schedules were reduced 13% between five weeks prior and one week prior. However, it appears that airline scheduling during 2022 was considerably more settled, with schedules contracting only three percent between five weeks prior and one week prior.

Exhibit 17: June airline schedules were settled earlier during 2022

In billions of available seat miles



Source: OAG schedule capacity via PlaneStats.com



US CARRIER FINANCIAL PERFORMANCE

PROFIT AND LOSS

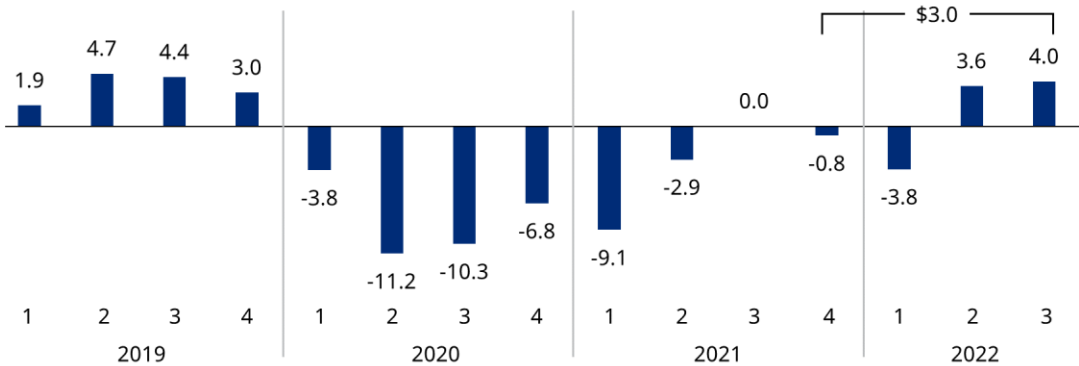
The 11 airlines surveyed in our study (see Methodology for carriers) had combined operating losses of \$37 billion from the start of 2019 through third quarter 2022. Excluding the strong operating profits of \$20 billion in 2019, the combined group has lost more than \$57 billion.

Since the beginning of 2019, US full-service carriers have collectively lost \$27 billion, or nearly 75%, of the US passenger carrier losses. The group accounted for 71% of revenue during the same period beginning 2019. Combined, the second and third quarters of 2020 produced \$22 billion in losses. Excluding profits from 2019, the full-service group lost \$41 billion from first quarter 2020 through third quarter 2022.

The good news for the group is that the second and third quarters of 2022 produced healthy operating profits rounding to \$4 billion each quarter. While the operating margins did not quite equal 2019 same-quarter results, margins of nine percent and 10% are certainly respectable for the second and third quarters of 2022.

Exhibit 18: Operating profit for US full-service carriers, by quarter

US\$ in billions



Operating profit

Cumulative	1.9	6.5	10.9	13.9	10.1	-1.1	-11.5	-18.2	-27.4	-30.3	-30.2	-31.0	-34.8	-31.2	-27.2
Last 12 months												-0.8	-4.5	-1.0	3.0

Operating margin

Total	6%	13%	12%	9%	-15%	-245%	-119%	-59%	-80%	-14%	0%	-3%	-15%	9%	10%
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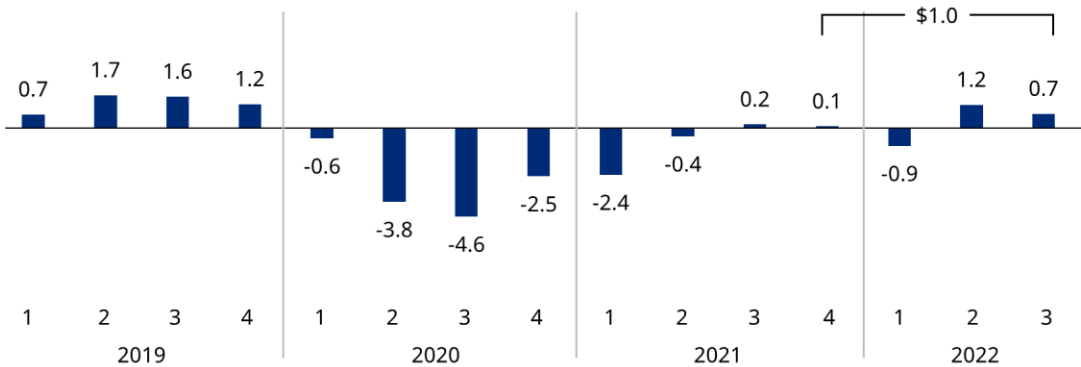
Source: US Department of Transportation P 1.2 Income Statement via Planestats.com

US value carriers have reported operating losses of \$8 billion since the start of 2019 through third quarter 2022. Excluding 2019, the group has lost \$13 billion. The second and third quarters of 2020 alone combined for more than \$8 billion in losses.

Like the full-service group, value airlines were able to produce profitable operating results during the second and third quarters of 2022, with operating margins of nine and six percent, respectively. During 2019, the group had operating margins of 15% for both quarters, boosted by summer travel.

Exhibit 19: Operating profit for US value airlines, by quarter

US\$ in billions



Operating profit															
Cumulative	0.7	2.3	3.9	5.1	4.6	0.8	-3.8	-6.3	-8.7	-9.2	-9.0	-9.0	-9.9	-8.7	-8.0
Last 12 months												0.1	-0.9	0.3	1.0

Operating margin															
Total	7%	15%	15%	11%	-7%	-224%	-150%	-69%	-65%	-6%	2%	1%	-11%	9%	6%

Source: US Department of Transportation P 1.2 Income Statement via Planestats.com

US ULCC carriers in our study lost almost \$2 billion since the start of 2019 through third quarter 2022. Excluding 2019, the group has lost nearly \$3 billion. Like the other two groups, the ULCC carriers had significant losses during the quarters encompassing the 2020 summer travel season.

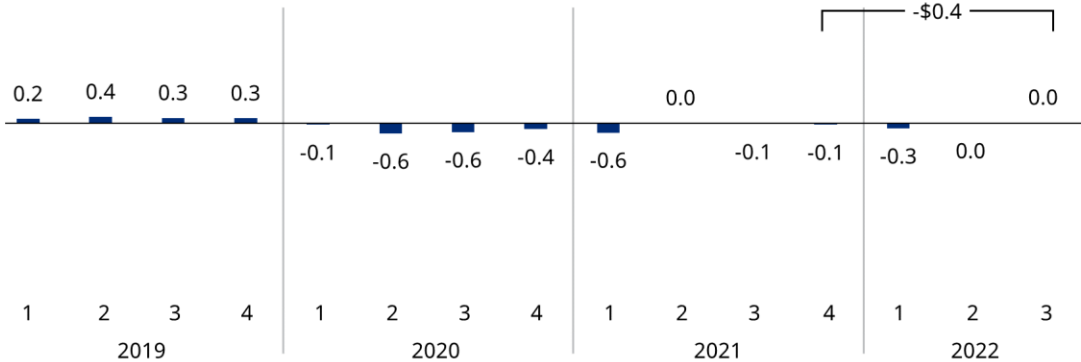
The ULCC group lost \$400 million for the year ending third quarter 2022. During the same period, the full-service carriers had an operating profit of \$3 billion and the value carriers reported a \$1 billion operating profit.

The ULCC carriers’ additional losses during fourth quarter 2020, and losses over the latest 12 months, are the direct result of decisions to expand capacity during a period that was not profitable. By the end of 2020, the ULCC group had reduced capacity only 26%, a relatively low amount compared with the full-service carriers (down 48%) and the value carriers (down 40%).

The ULCC group has continued to expand capacity despite continuing losses. ULCC capacity exceeded 2019 levels by 11% at the end of 2021 and by 18% at the end of 2022. Throughout recent US airline history, lower-cost producers have typically expanded capacity during difficult operating environments, leveraging their cost advantage to capture additional market share. ULCC carriers increased domestic share of ASMs to 12% during third quarter 2022, up one point since third quarter 2019.

Exhibit 20: Operating profit for US ULCC airlines, by quarter

US\$ in billions



Operating profit															
Cumulative	0.7	2.3	3.9	5.1	4.6	0.8	-3.8	-6.3	-8.7	-9.2	-9.0	-9.0	-9.9	-8.7	-8.0
Last 12 months												0.1	-0.9	0.3	1.0

Operating margin															
Total	12%	16%	14%	13%	-5%	-131%	-61%	-34%	-52%	0%	-3%	-4%	-14%	0%	1%

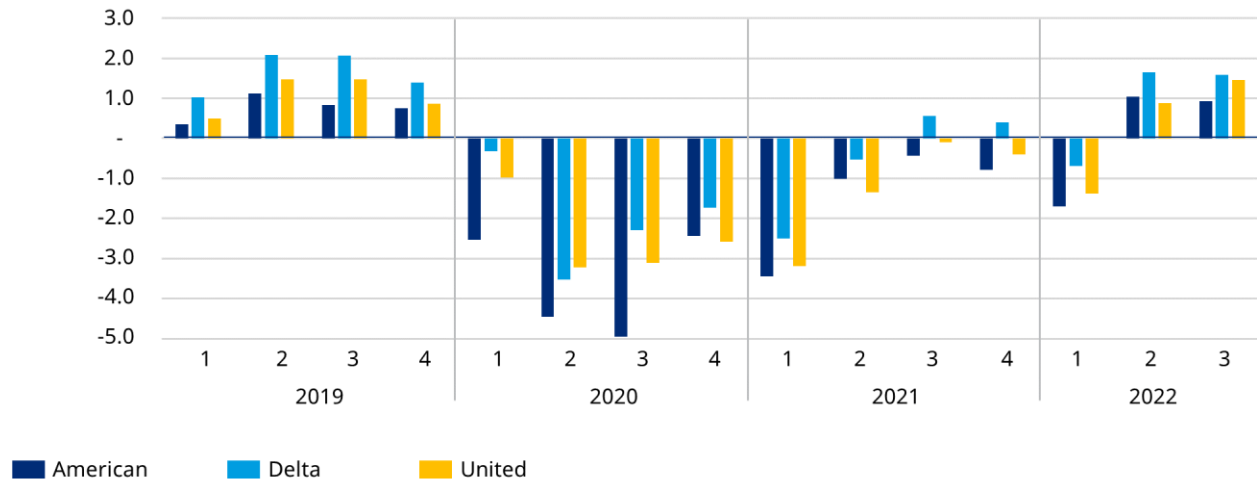
Source: US Department of Transportation P 1.2 Income Statement via Planestats.com

Of the US full-service carriers, Delta has compiled the most successful results since the start of 2019. Since 2019, Delta has lost only \$800 million and produced a \$3 billion operating profit over the four quarters ending third quarter 2022. Delta produced operating profits during the third and fourth quarters of 2021 as well as the second and third quarters of 2022.

Since the start of 2019, United has lost nearly \$10 billion and American has lost almost \$17 billion. United was able to produce a \$600 million operating profit for the year ending third quarter 2022. Although American was profitable during the second and third quarters of 2022, the carrier still reported an operating loss of \$500 million for the year ending third quarter 2022.

Exhibit 21: Operating profit by US full-service carrier, by quarter

US\$ in billions



Cumulative

American	0.3	1.5	2.3	3.0	0.5	-3.9	-8.9	-11.3	-14.8	-15.8	-16.2	-17.0	-18.7	-17.7	-16.7
Delta	1.0	3.1	5.2	6.6	6.2	2.7	0.4	-1.3	-3.8	-4.3	-3.8	-3.4	-4.1	-2.4	-0.8
United	0.5	2.0	3.4	4.3	3.3	0.1	3.0	-5.6	-8.8	-10.1	-10.2	-10.6	-12.0	-11.1	-9.7

Last 12 months

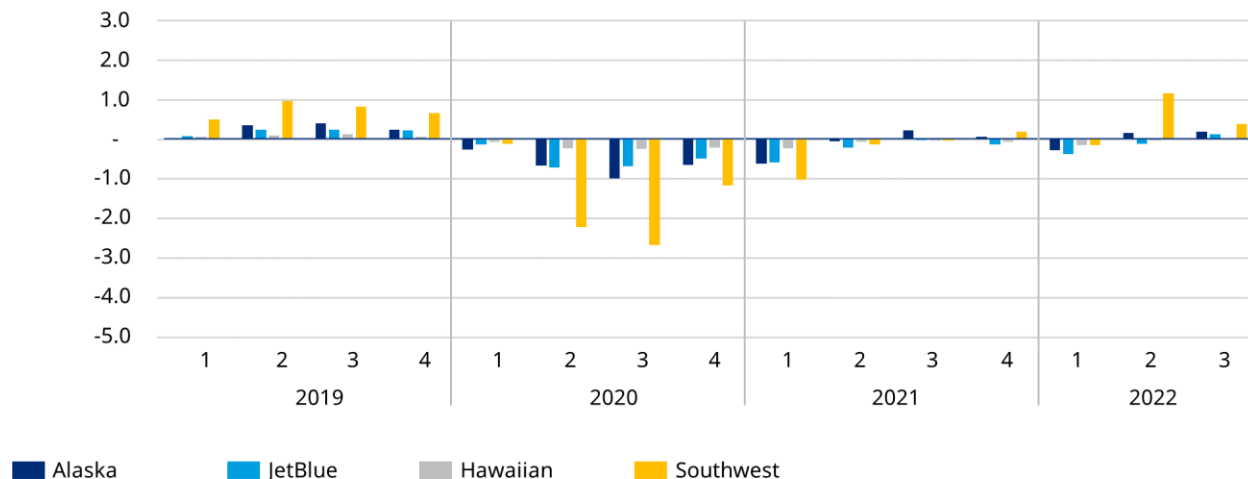
American	-0.8	-2.5	-1.4
Delta	0.4	-0.3	1.4
United	-0.4	-1.8	-0.9

Source: Planestats.com; Form 41 Financials; P 1.2 Income Statement

All four value airlines recorded operating profits during the third quarter 2022. Since 2019, Southwest has lost just under \$3 billion but posted a \$1.6 billion profit for the year ending third quarter 2022. Alaska also produced a profit over the four quarters ending third quarter 2022. However, both Hawaiian and JetBlue reported losses for the four quarters ending third quarter 2022.

Exhibit 22: Operating profit by US value airline, by quarter

US\$ in billions



Cumulative

Alaska	0.0	0.4	0.8	1.0	0.8	0.1	-0.9	-1.5	-2.1	-2.2	-1.9	-1.9	-2.2	-2.0	-1.8
JetBlue	0.1	0.3	0.6	0.8	0.7	-0.0	-0.7	-1.2	-1.8	-2.0	-2.0	-2.1	-2.5	-2.6	-2.5
Hawaiian	0.1	0.1	0.3	0.3	0.3	0.1	-0.2	-0.4	-0.6	-0.7	-0.7	-0.8	-0.9	-1.0	-0.9
Southwest	0.5	1.5	2.3	3.0	2.8	0.6	-2.0	-3.2	-4.2	-4.3	-4.4	-4.2	-4.3	-3.2	-2.8

Last 12 months

Alaska	0.1	-0.2	-0.1	0.1
JetBlue	-0.1	-0.5	-0.6	-0.5
Hawaiian	-0.1	-0.2	-0.2	-0.2
Southwest	0.2	0.0	1.2	1.6

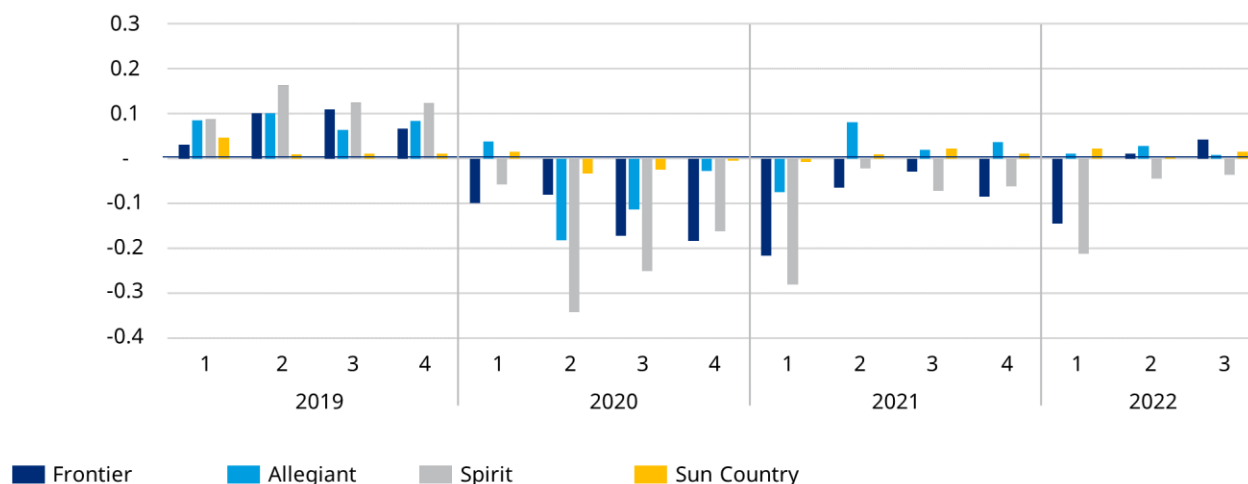
Note: Margins include transport-related revenue

Source: Planestats.com; Form 41 Financials; P 1.2 Income Statement

Allegiant and Sun Country are the only two US airlines to report cumulative operating profits since the start of 2019, with results of \$200 million and \$100 million respectively. Both Frontier and Spirit continue to report losses, combining for \$600 million in red ink over the 12 months ending September 2022. Frontier and Spirit make up more than 75% of the capacity provided by the group.

Exhibit 23: Operating profit by US ULCC airline, by quarter

US\$ in billions



Cumulative

Frontier	0.0	0.1	0.2	0.3	0.2	0.1	-0.0	-0.2	-0.4	-0.5	-0.5	-0.6	-0.8	-0.8	-0.7
Allegiant	0.1	0.2	0.2	0.3	0.4	0.2	0.1	0.0	-0.0	0.1	0.1	0.1	0.1	0.2	0.2
Spirit	0.1	0.3	0.4	0.5	0.4	0.1	-0.1	-0.3	-0.6	-0.6	-0.7	-0.7	-1.0	-1.0	-1.0
Sun Country	0.0	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1

Last 12 months

Frontier	-0.1	-0.2	-0.2	-0.2
Allegiant	0.0	0.0	0.1	0.1
Spirit	-0.1	-0.3	-0.3	-0.4
Sun Country	0.0	0.0	0.0	0.1

Note: Margins include transport-related revenue

Source: Planestats.com; Form 41 Financials; P 1.2 Income Statement

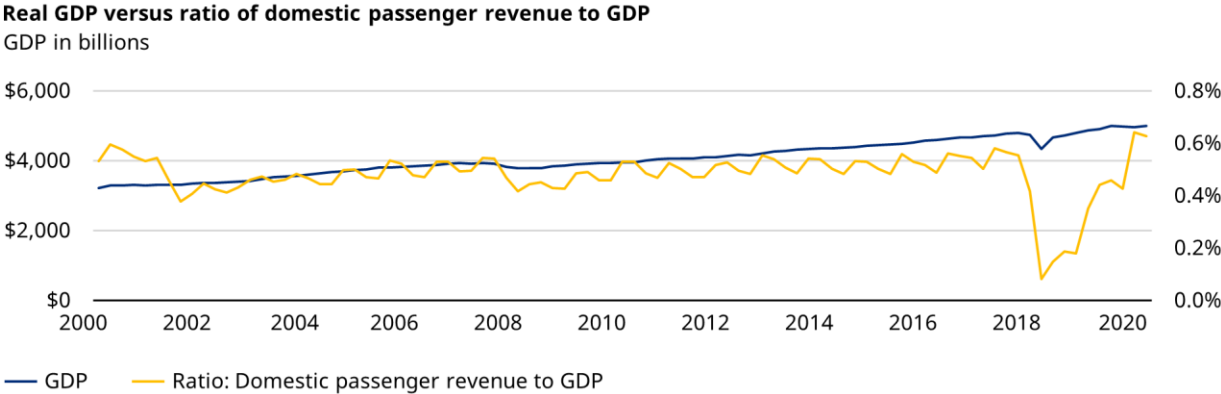
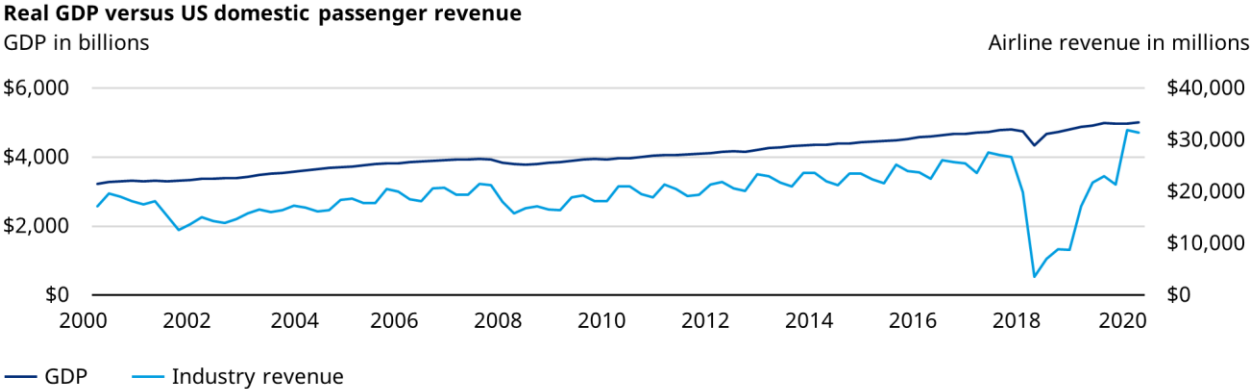
REVENUE

US reporting airlines (not just those in our study) combined to produce \$32 billion in passenger revenue for third quarter 2022. The quarterly result was 16% higher than the domestic revenue recorded during third quarter 2019. Surprising to most, the second and third quarters of 2022 represented record totals for US domestic passenger revenue.

US domestic passenger revenue dropped to only \$4 billion during the second quarter of 2020 as the COVID-19 pandemic began. Even though real US GDP dropped more than eight percent during the same period, domestic passenger revenue fell to 0.1% of GDP. For comparison, US domestic passenger revenue was between 0.4% and 0.6% of US GDP between the 2000 and 2019.

Since the dramatic drop in 2020, US domestic passenger revenue as a percent of GDP rose to 0.6% during the second and third quarters of 2022. US airlines were able to produce this record revenue despite six percent fewer passenger miles.

Exhibit 24: Domestic US airline passenger revenue versus real US GDP, Q1 2000 – Q3 2022



Note: Real gross domestic product chained to 2012 US dollars
 Source: US Department of Transportation P 1.2 Income Statement via Planestats.com, Federal Reserve Economic Data

Total revenue for US full-service carriers increased to \$40 billion during third quarter 2022, 12% higher than what the group reported during the same quarter in 2019. The group also recorded 10% more total revenue during second quarter 2022 compared with 2019.

Like the domestic passenger revenue trend noted earlier, US full-service carriers reported more passenger revenue compared with 2019 during the second (eight percent) and third (15%) quarters of 2022. Transport revenue, which for full-service carriers is mostly regional partner operations, was also up during the second and third quarters of 2022.

Cargo revenue began double-digit growth over 2019 beginning with third quarter 2020. During third quarter 2022, cargo was 158% higher than for the same quarter in 2019. Cargo revenue was more than double that of 2019 during fourth quarter 2021.

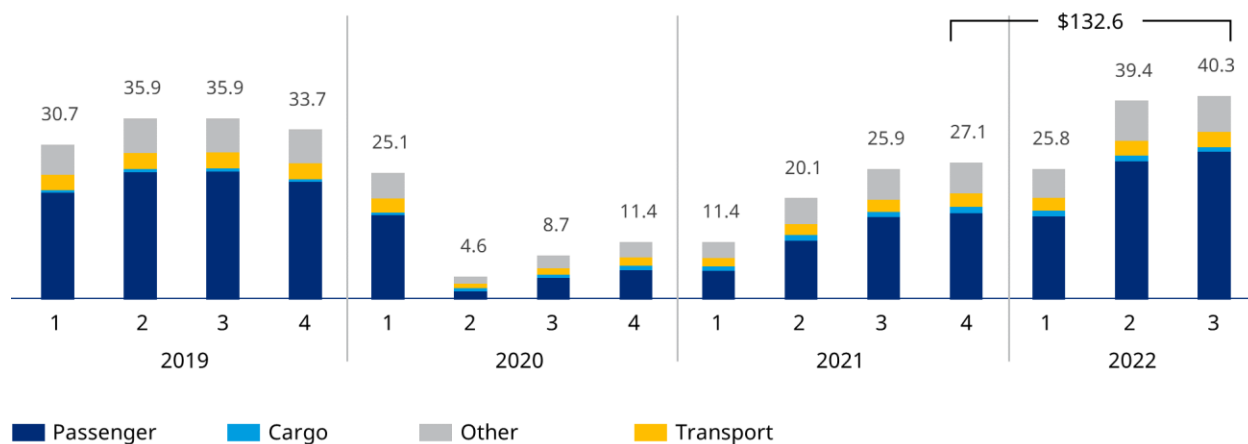
Cargo revenue represented two percent of total revenue during the third quarter of 2022, up 0.3 point from the same quarter in 2019.

The only category still below 2019 levels is “other revenue,” a catch-all category that includes ancillary revenue. Compared with third quarter 2019, the full-service carriers reported a 19% rise in miscellaneous revenue — where ancillary revenue is largely reported — in third quarter 2022. Excess baggage was nearly equal to 2019 (-0.3%) during the quarter. The significant decline in the Other category is attributable to reservation cancellation fees.

Full-service carriers reported \$597 million in revenue related to reservation cancellation fees during the third quarter 2019. During the third quarter 2022, full-service carriers reported only \$56 million in the fees, a 91% drop in revenue. Much of the decline in cancellation fees can be attributed to fee waivers implemented during the pandemic. Eliminating change fees has continued for domestic travel at most US carriers. Reservation cancellation fees at the full-service carriers dropped immediately after the onset of the pandemic and have not exceeded \$56 million since.

Exhibit 25: Systemwide operating revenue for US full-service carriers, quarterly

US\$ in billions



Percent of 2019 revenue

	2019 Q1	2019 Q2	2019 Q3	2019 Q4	2020 Q1	2020 Q2	2020 Q3	2020 Q4	2021 Q1	2021 Q2	2021 Q3	2021 Q4	2022 Q1	2022 Q2	2022 Q3
Passenger	79%	6%	17%	25%	27%	46%	64%	74%	78%	108%	115%				
Cargo	79%	94%	114%	153%	154%	178%	172%	207%	198%	178%	158%				
Other	92%	29%	41%	53%	55%	68%	78%	81%	84%	95%	93%				
Transport	86%	21%	37%	46%	53%	75%	91%	92%	95%	115%	107%				
Total	82%	13%	24%	34%	37%	56%	72%	81%	84%	110%	112%				

Source: US Department of Transportation P 1.2 Income Statement via Planestats.com

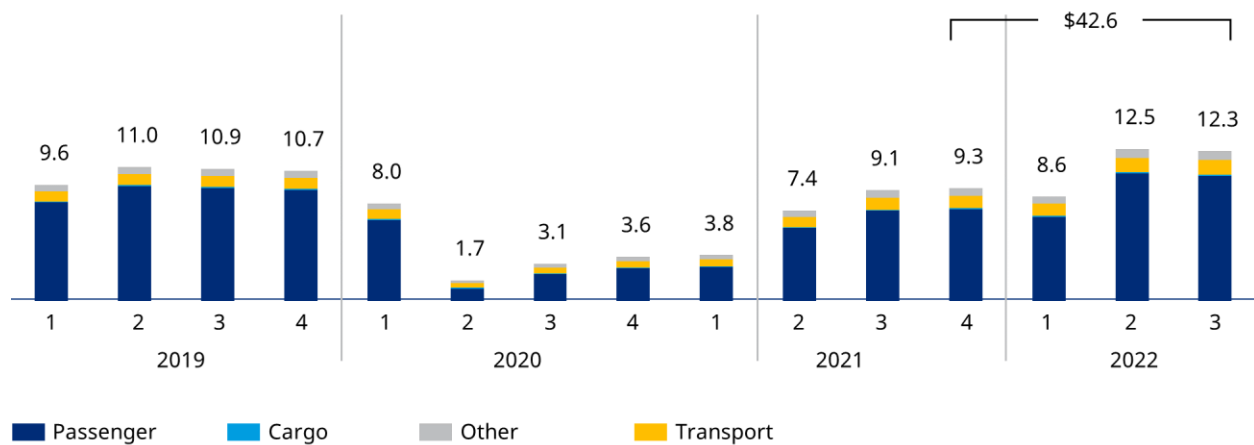
Total revenue for the value carriers increased 13% during the third quarter of 2022 over third quarter 2019. Passenger revenue increased 11% during third quarter 2022 and represented 84% of total revenue, down from 85% in 2019.

Other revenue, representing 10% of total revenue, jumped 30% during third quarter 2022. Reservation cancellation fees at the value carriers dropped 24% from 2019 — similar to the full-service group, but to a lesser degree. Excess baggage and miscellaneous revenue boosted other revenue, increasing 32% and 38% respectively.

While cargo and transports increased during the period, the two combined made up less than five percent of total revenue for value carriers.

Exhibit 26: Systemwide operating revenue for US value airlines, quarterly

US\$ in billions



Percent of 2019 revenue

Passenger	82%	11%	24%	29%	34%	63%	80%	83%	86%	111%	111%
Cargo	91%	73%	88%	98%	95%	103%	99%	106%	108%	108%	110%
Other	95%	43%	53%	60%	69%	91%	108%	111%	116%	126%	130%
Transport	92%	38%	53%	60%	63%	92%	102%	106%	107%	130%	122%
Total	84%	15%	28%	34%	39%	68%	84%	87%	90%	113%	113%

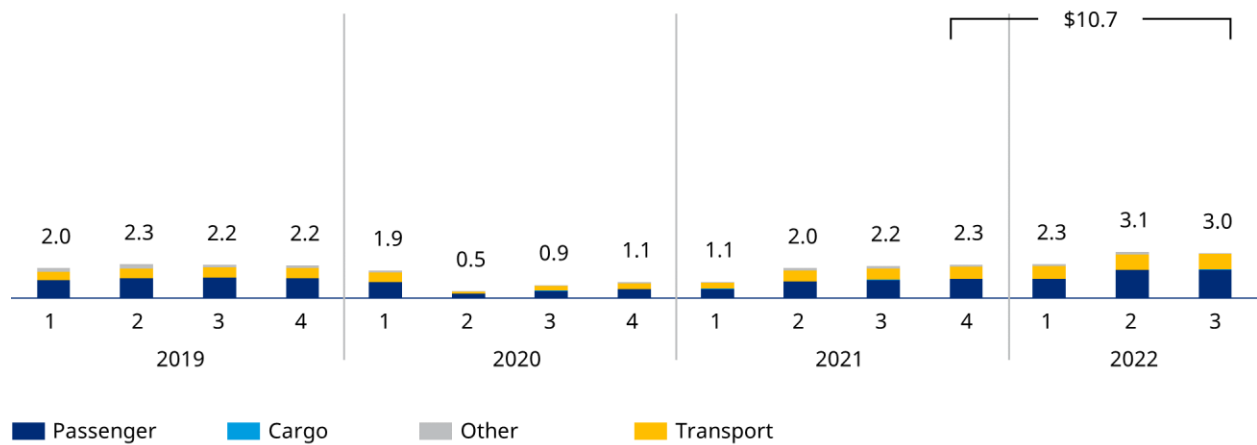
Source: US Department of Transportation P 1.2 Income Statement via Planestats.com

ULCC carriers increased total operating revenue by 35% during third quarter 2022 over the same quarter in 2019. Passenger revenue increased 37% over third quarter 2019 and represented 63% of total operating revenue. Historically, some ancillary revenue has been reported as transport revenue for the ULCC group, which is why Oliver Wyman combines transport with other revenue. Together, transport and other revenue increased 27% for the ULCC group over 2019 and represented 36% of revenue.

Even after such tremendous growth, cargo revenue represents less than one percent of ULCC total revenue.

Exhibit 27: Systemwide operating revenue for US ULCC airlines, quarterly

US\$ in billions



Percent of 2019 revenue

Passenger	90%	24%	37%	46%	52%	84%	88%	96%	107%	139%	137%
Cargo	113%	1,673%	7,309%	23,981%	46,097%	11,351%	12,476%	28,985%	45,016%	10,910%	13,083%
Other	112%	20%	47%	55%	68%	110%	112%	114%	144%	155%	154%
Transport	59%	13%	41%	47%	33%	53%	101%	88%	62%	70%	22%
Total	93%	21%	41%	50%	55%	89%	97%	102%	113%	137%	135%

Source: US Department of Transportation P 1.2 Income Statement via Planestats.com

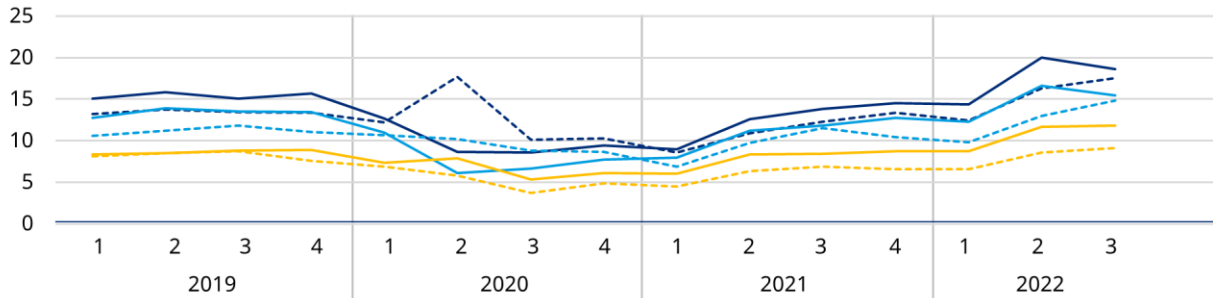
Since reaching a low during the first quarter of 2021, revenue per available seat mile (RASM) has been steadily increasing for all airlines in our study for both domestic and international operations. Increases during the second and third quarters of 2022 have pushed RASM past 2019 levels. First quarter 2022 results were slightly below 2019 levels.

Full-service carriers increased domestic RASM by 23% over the same quarter in 2019, and international RASM grew 31% during the same period. Value carriers saw third quarter 2022 domestic revenue rise 14% over 2019, while international RASM grew 25% over the same period. ULCC carrier RASM was up 34% for domestic operations and five percent for international operations.

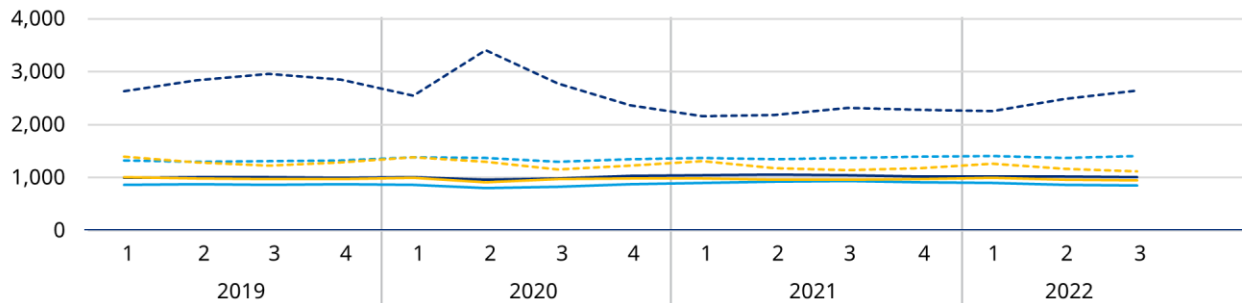
Exhibit 28: Trends in revenue per available seat mile, Q1 2019-Q3 2022

RASM

US\$ in cents



Stage length in miles



— Full-service (Domestic) — Value (Domestic) — ULCC (Domestic)
 - - - Full-service (International) - - - Value (International) - - - ULCC (International)

Note: RASM in this case counts only revenue from mainline operations and excludes transport-related revenue
 Source: US Department of Transportation P 1.2 Income Statement via Planestats.com

RASM calculations depend on yield, stage length, and load factor. For the most part, the RASM increases detailed earlier resulted from passenger yield increases as changes in both stage length and load factor were either minimal or, in some cases, a negative impact to RASM.

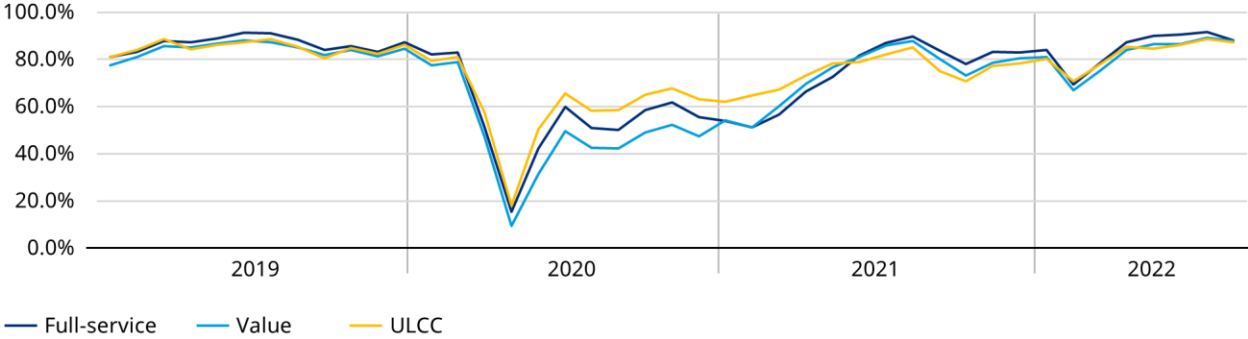
Domestic stage lengths were virtually equal during the third quarters of 2022 and 2019, with full-service carriers having no change in stage length, while value and ULCC stage length decreased only two percent. Stage length decreased 11% for full-service carriers' international operations, driving international RASM higher by about six percent toward the 31% increase. Similarly, stage length decreased nine percent for ULCC international operations.

Load factor also had minimal impact on the increase in RASM during third quarter 2022. Except for the ULCCs' international operations, load factors during third quarter 2022 were within one percentage point of the same quarter in 2019.

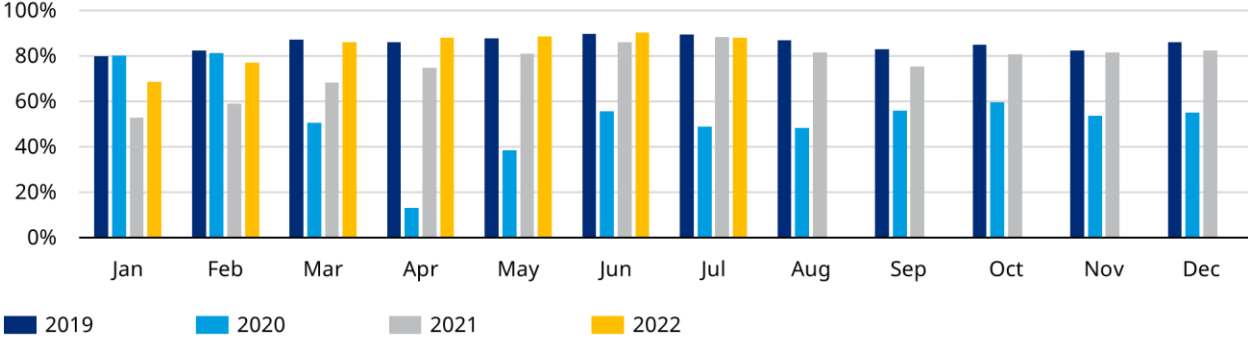
Load factors dropped dramatically during the onset of the pandemic, and airline managers tried to shrink capacity to match the disappearing demand. Load factors returned to 2019 levels during the summer months of 2021, then dropped sharply in first quarter 2022. When demand returned in the second and third quarters of 2022, load factors returned to 2019 levels.

Exhibit 29: Monthly domestic load factors for US carriers

January 2019 through July 2022



Combined monthly load factors

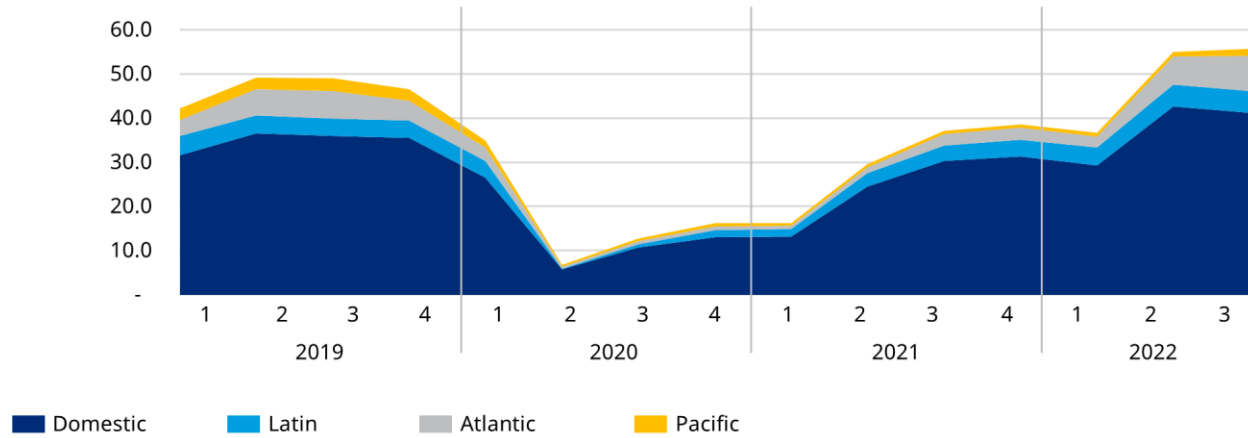


Note: Mainline operations only
 Source: Planestats.com; Form 41; T100 Traffic

Perhaps the biggest shift in operating revenue during the second and third quarters of 2022 is the continued absence of Pacific revenues. The Pacific region generated six percent of revenue for the airlines in our survey during third quarter 2019. During 2021, domestic revenue growth remained strong, and both the Latin and Atlantic regions began to rebound. As a result, Pacific revenue dropped to two percent of total revenue by second quarter 2021. Pacific revenue began to recover slowly during third quarter 2022, increasing to three percent of total revenue.

Exhibit 30: Total operating revenue for US airlines, quarterly by region

US\$ in millions



Domestic	75%	74%	73%	76%	76%	84%	84%	80%	81%	83%	81%	81%	80%	78%	74%
Latin	10%	8%	8%	8%	11%	3%	6%	10%	11%	10%	9%	10%	11%	9%	9%
Atlantic	9%	12%	13%	10%	8%	7%	6%	5%	5%	4%	7%	7%	7%	12%	15%
Pacific	6%	6%	6%	6%	5%	6%	4%	4%	4%	2%	2%	2%	2%	2%	3%

Note: Revenue includes transport-related revenue

Source: US Department of Transportation Form 41 via PlaneStats.com

The pandemic has had an impact on individual carrier domestic and international revenue mix. For third quarter 2022, both Delta and American experienced a slight decrease in international revenue compared with 2019, while United had an increase in international revenue percentage.

Hawaiian underwent the largest shift, with international revenue falling from 29% during 2019 to 14% during third quarter 2022. The shift is the result of restrictions in the Pacific region, the only international region that the airline serves.

Exhibit 31: Domestic and international revenue by quarter

US\$ in millions

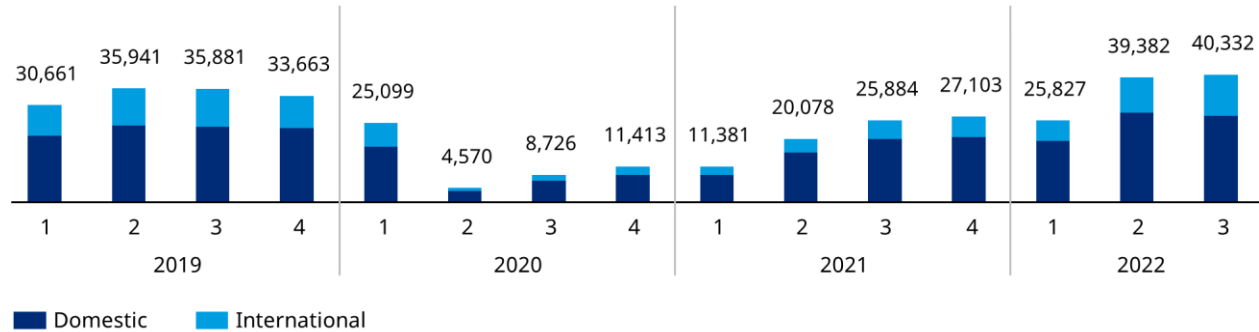
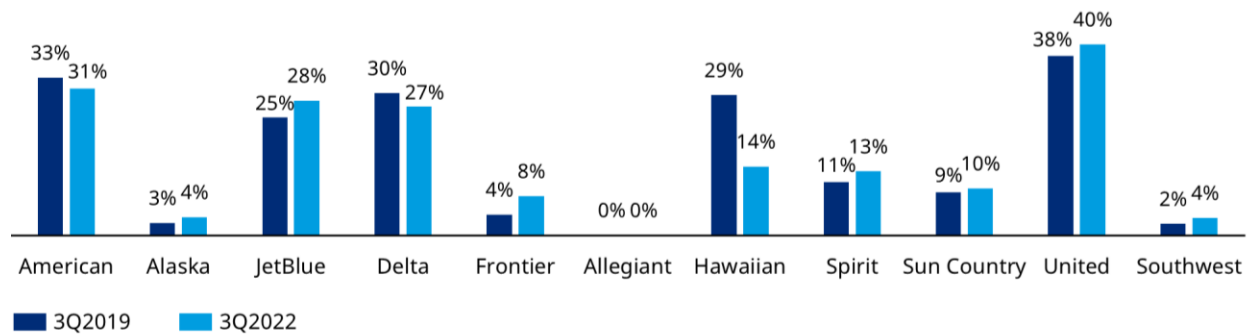


Exhibit 32: Domestic and international revenue by carrier

Percent



Note: Revenue includes transport-related revenue
 Source: US Department of Transportation Form 41 via PlaneStats.com

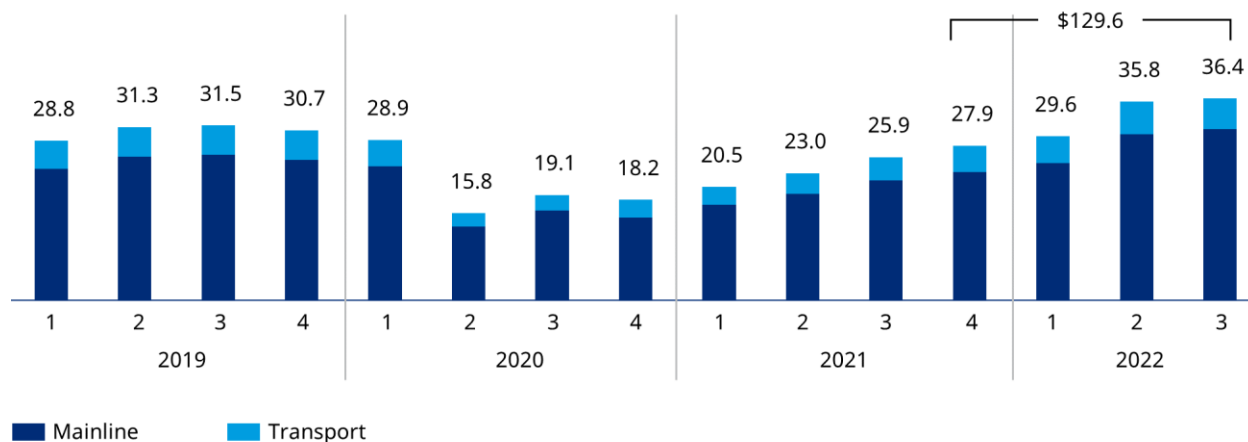
COSTS

Operating costs for all three groups in our survey increased when comparing third quarter 2022 to third quarter 2019. For the full-service and value carriers, the jump in operating costs is attributable to increases in absolute costs as capacity remains below 2019 levels. However, costs at the ULCC group increased due to increased flying as well as the increase in absolute cost.

Operating costs at the US full-service carriers increased 15% during the third quarter 2022 compared with the same period of 2019. Operating costs were also up 15% during second quarter 2022. Mainline costs (no transport/regional) were up 15% and 18% for the second and third quarters of 2022 compared with the same periods of 2019.

Exhibit 33: Systemwide operating expense for US full-service carriers, quarterly

US\$ in billions



Percent of 2019 cost

	2019 Q1	2019 Q2	2019 Q3	2019 Q4	2020 Q1	2020 Q2	2020 Q3	2020 Q4	2021 Q1	2021 Q2	2021 Q3	2021 Q4	2022 Q1	2022 Q2	2022 Q3
Mainline	102%	51%	62%	59%	73%	74%	83%	91%	104%	115%	118%				
Transport	93%	46%	54%	61%	62%	70%	79%	89%	96%	112%	103%				
Total	100%	50%	61%	59%	71%	74%	82%	91%	103%	115%	115%				

Source: US Department of Transportation P 1.2 Income Statement via Planestats.com

US full-service carriers' unit cost (cost per ASM) was 31% higher during third quarter 2022 compared with third quarter 2019. The largest driver of unit cost growth was a 79% jump in fuel cost. Full-service carriers paid an average of \$1.96 per gallon of fuel during the third quarter. Fuel cost per gallon had remained relatively constant during 2018 and 2019. After a dramatic drop in cost per gallon during 2020, fuel cost per gallon returned to the \$2.00 mark during September 2021. Russia's invasion of Ukraine and increased demand rapidly pushed up fuel cost per gallon. The cost per gallon for full-service carriers peaked at \$3.87 per gallon during second quarter 2022 and inched down to \$3.64 per gallon by third quarter 2022. Fuel represented 30% of total operating costs during third quarter 2022, up from 22% during 2019.

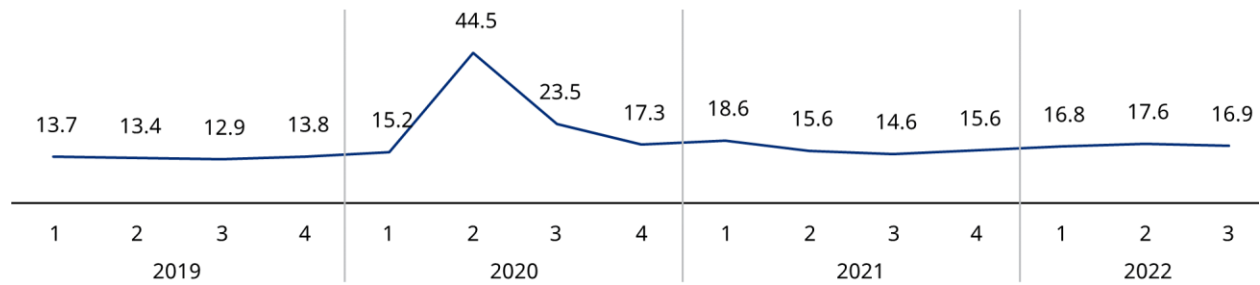
Labor unit cost increased nine percent over third quarter 2019. Labor represents 31% of full-service carriers' costs, down from 38% during 2019. Full-service carriers employed 286,600 full-time equivalent (FTE) workers during September 2022, a decrease of 0.4% from third quarter 2019. For third quarter 2022, full-service carriers produced 10% fewer ASMs compared with third quarter 2019.

Aircraft maintenance unit costs increased 41% between third quarter 2019 and third quarter 2022, and aircraft ownership rose 7% during the same period. Full-service carriers operated almost three percent more aircraft during the same period (based on Form 41 aircraft days; operated, not owned) and produced 10% fewer ASMs.

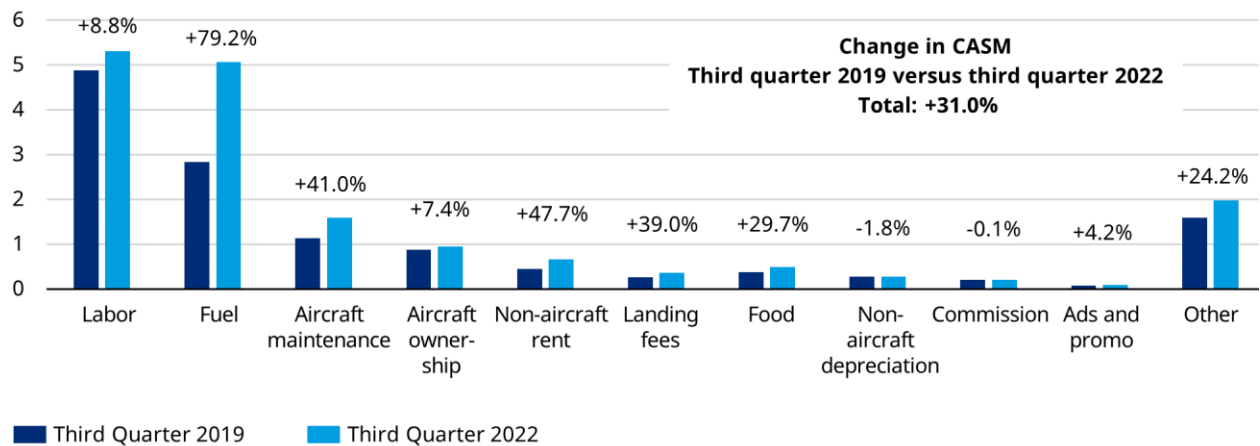
All other costs increased during the period except for non-aircraft depreciation and commissions.

Exhibit 34: Systemwide unit costs for US full-service carriers, by quarter

Cost per available seat mile (CASM)
US\$ in cents



Cost per available seat mile (CASM)
US\$ in cents

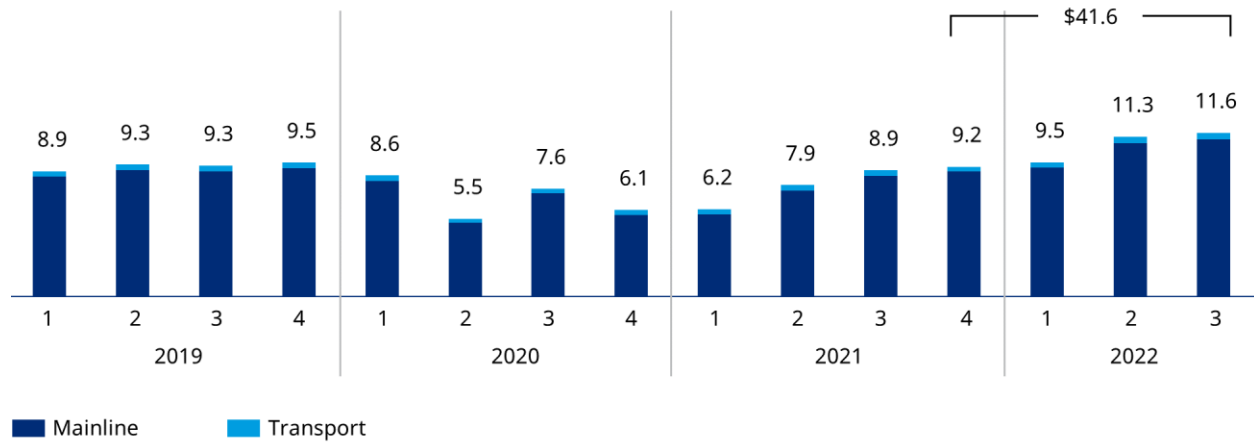


Note: Mainline operations only; excludes transport-related expense; rent and commissions do not include aircraft-related expenses, which are included in aircraft ownership
Source: US Department of Transportation Form 41 via PlaneStats.com

The value carrier group experienced larger increases in absolute operating cost. Operating costs during the second and third quarters of 2022 increased 21% and 25% respectively compared with the same quarters in 2019.

Exhibit 35: Systemwide operating expense for US value airlines, quarterly

US\$ in billions



Percent of 2019 revenue

Mainline	97%	59%	82%	64%	69%	84%	96%	97%	108%	121%	125%
Transport	98%	68%	81%	84%	92%	101%	102%	87%	96%	115%	115%
Total	97%	59%	82%	65%	70%	84%	96%	97%	107%	121%	125%

Source: US Department of Transportation P 1.2 Income Statement via Planestats.com

Value carrier unit cost increased 28% from third quarter 2019 to third quarter 2022. The group produced only two percent fewer ASMs, keeping the rise in unit cost in line with absolute cost increases.

Fuel cost was again the largest driver of the increase, with unit cost increasing 69%. Fuel cost per gallon was \$3.43 during third quarter 2022, 74% higher than 2019.

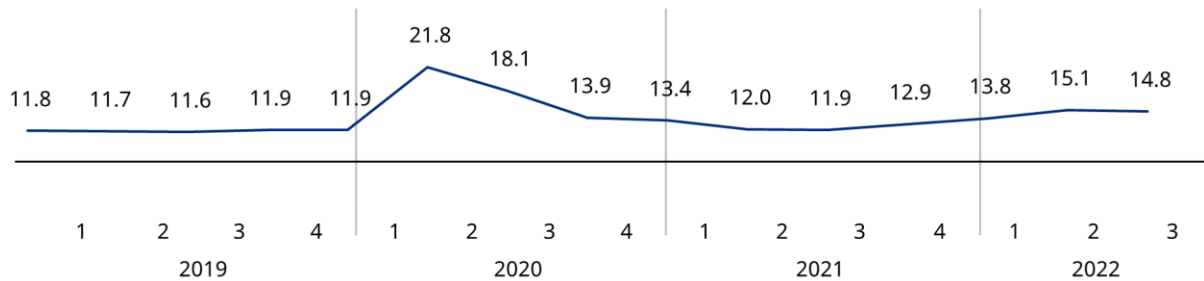
Labor unit cost grew 17% over third quarter 2019. Value carriers employed 114,617 FTEs during September 2022, nearly six percent more than in September 2019.

Aircraft maintenance unit cost decreased 7%, while aircraft ownership increased 13%. The group operated three percent more aircraft during third quarter 2022.

Exhibit 36: Systemwide costs for US value airlines, by quarter

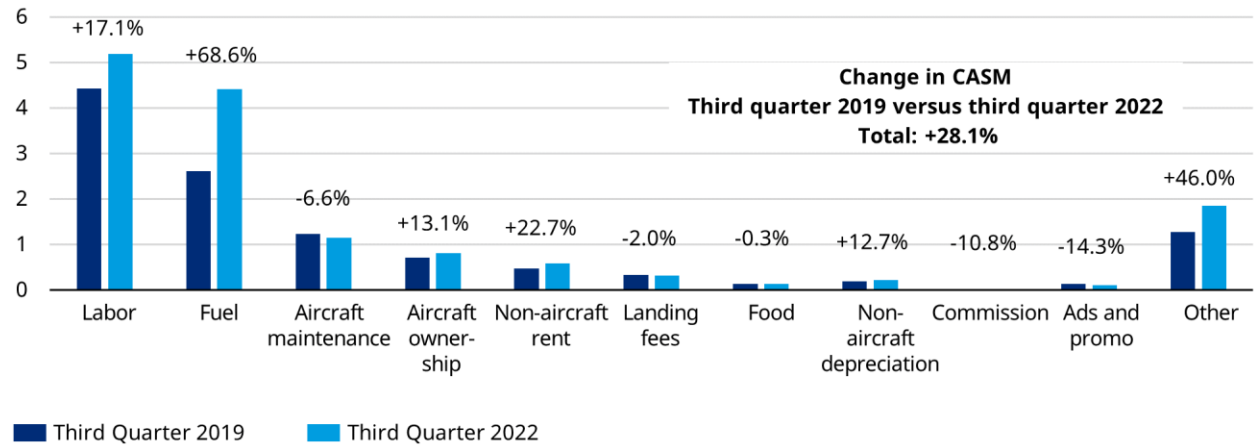
Cost per available seat mile (CASM)

US\$ in cents



Cost per available seat mile (CASM)

US\$ in cents



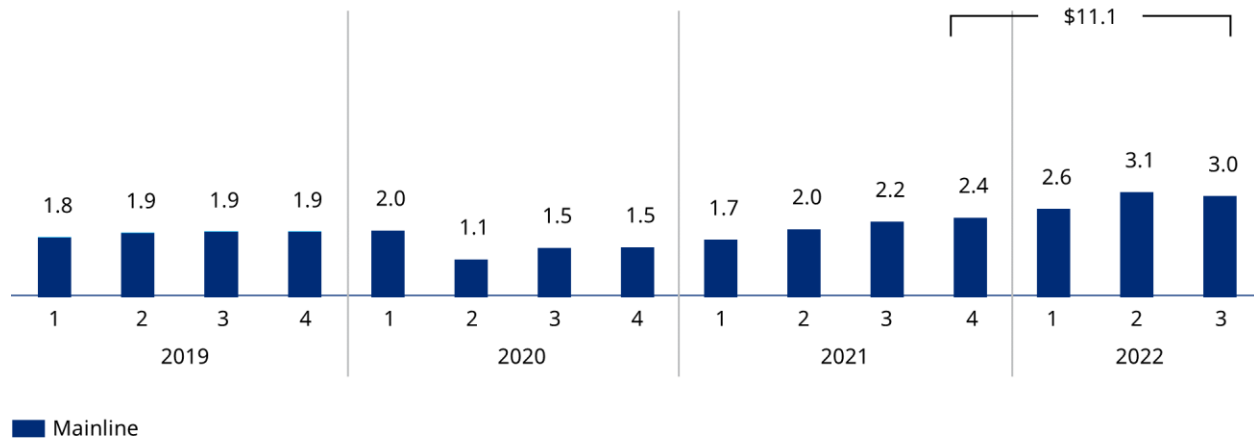
Note: Mainline operations only; excludes transport-related expense; rent and commissions do not include aircraft-related expenses, which are included in aircraft ownership

Source: US Department of Transportation Form 41 via PlaneStats.com

As mentioned earlier, the ULCC group has increased capacity beyond 2019 levels, driving cost changes by both volume and absolute cost. ULCC cost increased by 64% and 55% for the second and third quarters of 2022 compared with those in 2019.

Exhibit 37: Systemwide operating expense for US ULCC airlines, quarterly

US\$ in billions



Percent of 2019 cost

Mainline	112%	59%	76%	77%	96%	106%	116%	122%	148%	164%	155%
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Source: US Department of Transportation P 1.2 Income Statement via Planestats.com

ULCC carriers' unit cost rose more than 41% during the third quarter 2022, compared with the same quarter of 2019, even while adding 10% more ASMs during the period. Every cost category increased during the quarter.

Again, fuel was the largest driver of the unit cost increases. During third quarter 2022, ULCC carriers paid \$3.65 per gallon, 77% higher than during third quarter 2019.

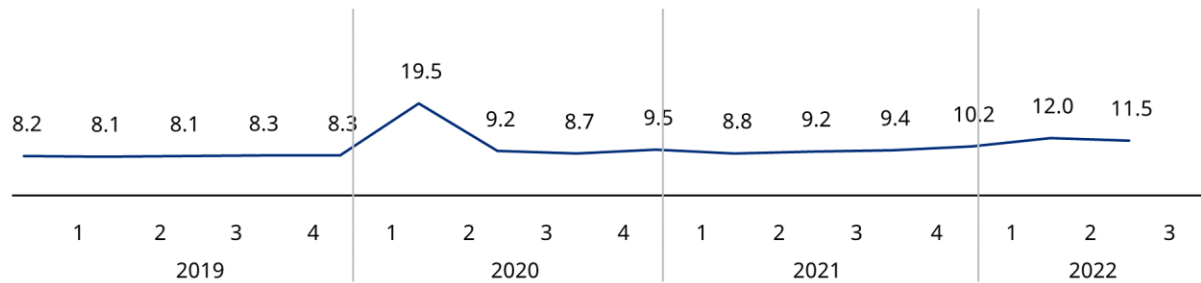
Labor cost per ASM increased nearly 32% over third quarter 2019, the largest labor cost increase for all three groups. ULCC carriers hired 35% more FTEs during third quarter 2022.

ULCC aircraft maintenance unit cost jumped 29%, and aircraft ownership increased over 32% during third quarter 2022. The group operated 33% more aircraft during the period.

Exhibit 38: Systemwide costs for US ULCC airlines, by quarter

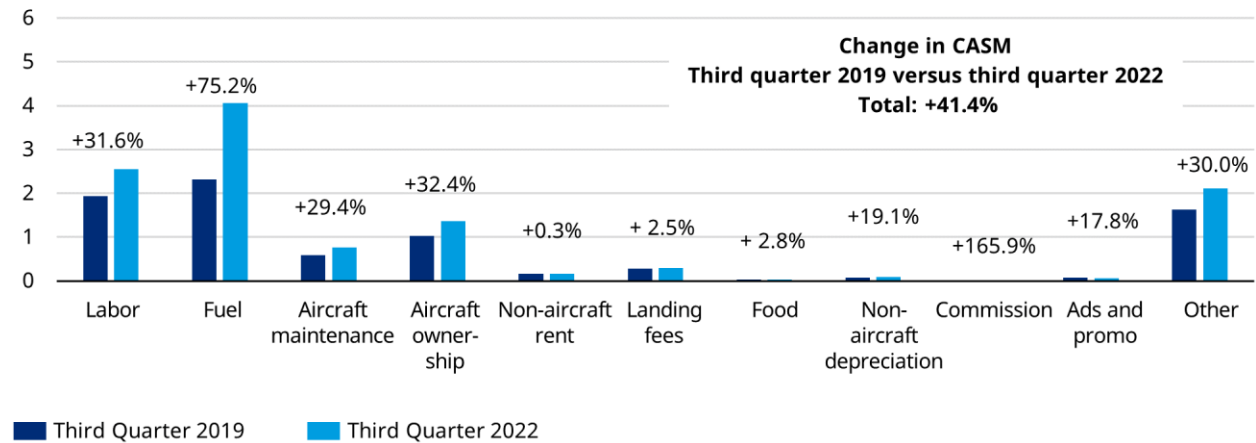
Cost per available seat mile (CASM)

US\$ in cents



Cost per available seat mile (CASM)

US\$ in cents

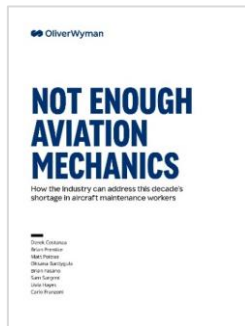


Note: Mainline operations only; excludes transport-related expense; rent and commissions do not include aircraft-related expenses which are included in aircraft ownership

Source: US Department of Transportation Form 41 via PlaneStats.com

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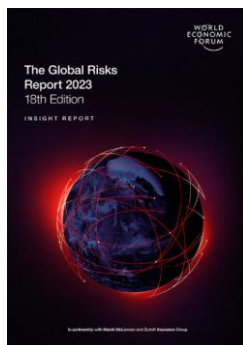
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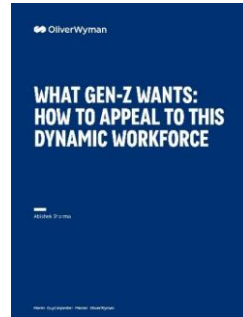
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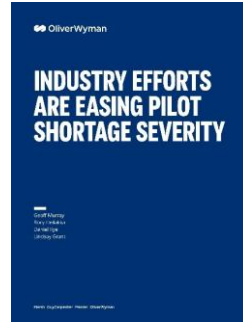
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Profiles of the 21st century consumers businesses will be serving in the coming decade, based on extensive research conducted by the Oliver Wyman Forum.



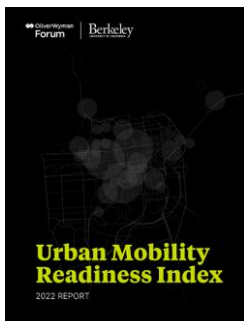
Diversity and Inclusion in Aviation

This year's World Aviation Festival explored the latest innovations and strategies driving the industry forward.



The SAF Flight Path To Decarbonization

Many airlines have come to understand the pivotal role sustainable aviation fuel must play if aviation is to cut emissions between now and 2030. The problem: not enough SAF to let airlines live up to pledges.



Urban Mobility Readiness Index

This year's World Aviation Festival explored the latest innovations and strategies driving the industry forward.



Exploring Space With Garrett Reisman

Oliver Wyman sits down with former NASA astronaut Garrett Reisman to discuss how the next great business opportunities may be waiting for companies in space.

ABOUT OLIVER WYMAN

Oliver Wyman is a global leader in management consulting that combines deep industry knowledge with specialized expertise in strategy, operations, risk management, and organization transformation.

Our aviation, aerospace, and defense experts advise global, regional, and cargo carriers; aerospace and defense manufacturers and suppliers; airports; maintenance, repair, and overhaul companies; and other service providers in the transport and travel sector. We grow shareholder and stakeholder value, optimize operations, and maximize commercial and organizational effectiveness. A recent acquisition of Avascent has significantly expanded our team coverage and expertise across the aerospace, defense, and related private capital investment sectors.

The full team's capabilities also include: CAVOK, technical consulting on safety and compliance, maintenance programs, and certification (www.cavok.oliverwyman.com); analytical data tools at PlaneStats.com; and strategies and modeling for market share, network, and fleet planning analyses via our Network Simulation Center and [NetPlan](#) modeling tool. This deep industry expertise and our specialized capabilities make us a leader in serving the needs of the sector.

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