

MARKET OUTLOOK 2020



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The Start of a New Cycle	3
Executive Summary	4
Global Trends	7
Africa	11
China & Asia Pacific	15
CIS	23
Europe	26
Latin America	30
Middle East	34
North America	38

MESSAGE FROM ARJAN MEIJER

THE START OF A NEW CYCLE

“WHEN WILL WE GET BACK TO 2019 DEMAND LEVELS?”

Today, that’s probably the most-asked question in our industry. As with many coronavirus crisis-related discussions, it’s tempting to focus on getting back to how things were. A bigger consideration may be how things might change for the better.

We believe that the fallout from the pandemic signals the beginning of a new industry cycle, with many unique aspects. Unlike the previous one which was guided by a massive supply of capacity and a focus on lowest cost-per-

seat, we foresee a cycle characterized by versatility, operating efficiency, and profitability. Marketing guru Peter Drucker said that “the greatest danger in times of turbulence is not the turbulence - it is to act with yesterday’s logic.”

The air travel market will be smaller for years to come. Consequently, the airline capacity plans of the past will no longer fit. During the past few months, the up to 150-seat aircraft category played a key role in the recovery of the airline industry.

Around the world, that segment proved its versatility in maintaining network connectivity and ramping up schedules.

The up to 100-seat jet segment is well established. The next cycle will showcase the importance of the 100 to 150-seat category.

New trends, market conditions, and the advent of new state-of-the-art aircraft with excellent cost economics will be the cycle’s hallmarks.

This is a historic moment. The entire airline industry is being reshaped, and with it, there are huge opportunities to reorganize our businesses so we can emerge stronger and better prepared for the cycles to come.

Our Market Outlook 2020 details the main indicators of an emerging right-sizing cycle. Despite all of the challenges and volatility today, we believe the up to 150-seat aircraft segment will lead us to better times.



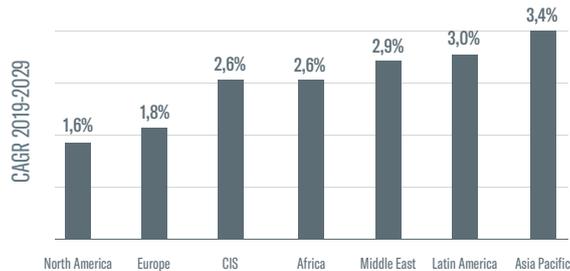
Arjan Meijer
President & CEO
Embraer Commercial Aviation

EXECUTIVE SUMMARY

AIR TRANSPORT DEMAND FORECAST: RPK GROWTH RATES BY REGION

We expect world passenger traffic to have a compound growth rate of 2.6% a year over the next decade. This significant deceleration mirrors the GDP decline and the extended recovery period from the COVID-19 crisis. We anticipate that global RPKs will return to 2019 levels in 2024.

Through the decade, Asia Pacific (including China) and Latin America will have the strongest growth, with annual RPK expansion of 3.4% and 3.0%, respectively. This will be followed by the Middle East with 2.9%, Africa and the CIS with 2.6%, Europe with 1.8%, and North America with 1.6%.

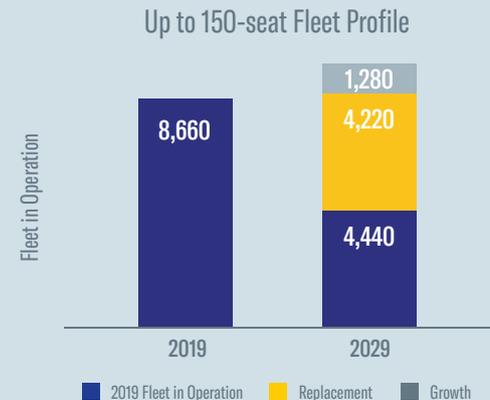


Source: Embraer

World RPKs will reach 11 trillion by 2029. This represents a 19% reduction compared to last year's projection. Asia Pacific will be the largest market in 2029, accounting for 37% of the global traffic. Combined, Europe and North America will generate 40% of total air transport demand.

THE UP TO 150-SEATS MARKET

Embraer foresees world demand for 5,500 new aircraft with up to 150-seats over the next 10 years representing a total market value of US\$ 350 billion. Replacement of ageing aircraft will account for over 75% of all new deliveries while 25% will be used to grow markets.



Source: Embraer

THE JET SEGMENT

Overall lower demand, traffic patterns favoring short-haul versus long-haul, and an increasing need for connectivity and efficiency will drive worldwide demand for 4,420 jets with up to 150 seats. Of these, 30% will support market growth and the remaining 70% will replace ageing aircraft.

Jets up to 150 Seats	
Africa	100
China & Asia Pacific	1,220
CIS	300
Europe	780
Latin America	380
Middle East	120
North America	1,520
Total	4,420

THE TURBOPROP SEGMENT

Short-haul operations will drive worldwide demand for 1,080 turboprops, mostly focused in Asia Pacific and Europe.

Turboprops	
Africa	80
China & Asia Pacific	490
CIS	80
Europe	190
Latin America	130
Middle East	30
North America	80
Total	1,080



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GLOBAL TRENDS

Nagoya, Japan

The COVID-19 crisis has shattered all long-term expectations for the aviation industry. While airlines struggle to survive, they must also think about building a solid foundation to be able to thrive in the coming years. This crisis will show, once again, that companies that adapt will be the most likely to prosper. There are structural changes under way which are already affecting virtually every airline in the world. These are:

1) Right-Sizing

We expect RPKs to return to 2019 levels only in 2024. Domestic traffic will recover around 12 months earlier than international traffic. RPKs will grow 2.6% per year on average over the next decade, a decline resulting in a cumulative loss of 19% in total volume by the end of the period.



Source: Embraer

Since 2019 traffic projections are no longer accurate, airlines will need to adjust their plans accordingly and reposition themselves to grow from a smaller demand base.

Companies will seek to be better prepared for any volatility in demand and, perhaps, another crisis in the future. A more versatile fleet with aircraft of different capacities will help mitigate slower traffic growth. We expect a movement to across-the-board right-sizing.

2) New Passenger Behavior

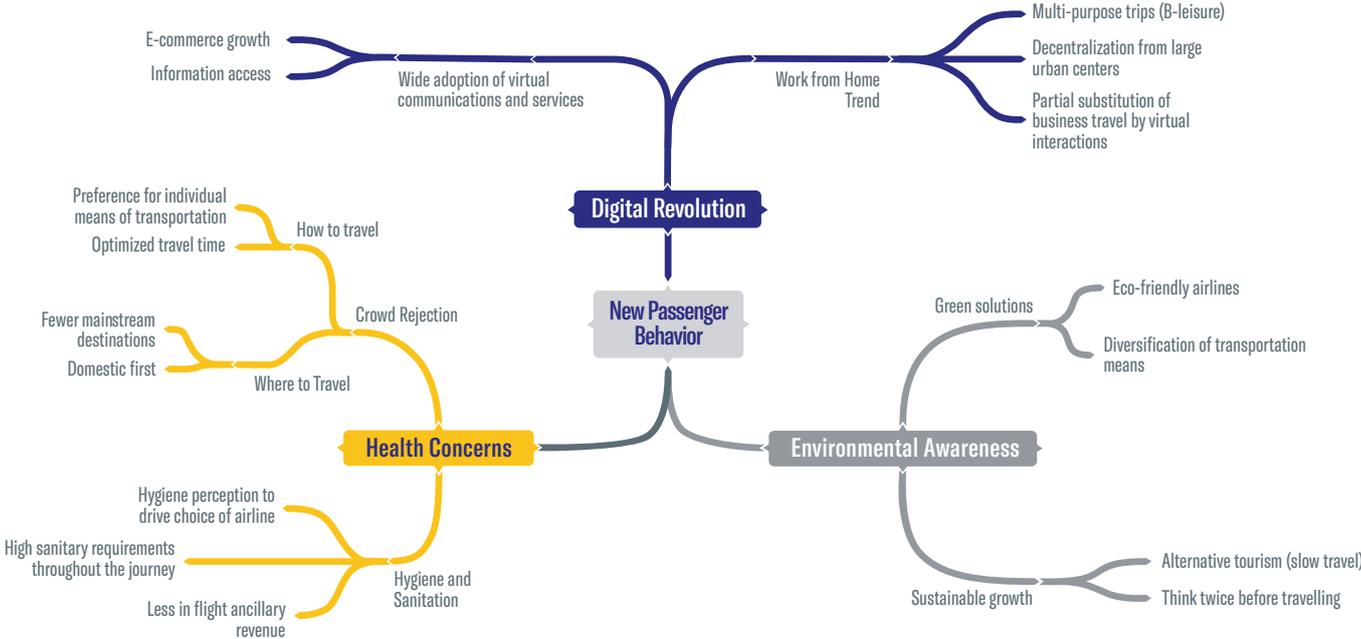
We're already seeing pronounced shifts in passenger behavior and their consumption of air travel. Temporary behavior becomes permanent the longer people endure a particular set of circumstances. This applies to both business and leisure travelers.

Our contact with technology increased during the pandemic by working from home. Consequently, a small portion of corporate travel may be replaced by virtual interactions. On the other hand, the pandemic may also lead companies to move away from large urban centers since talent is not bound to a specific geography anymore. In any case, these changing patterns in business demand will be handled by airlines through increased connectivity, right-sized aircraft and improved revenue management.

We expect that some of the current-generation leisure passengers will prefer shorter-haul trips. Their choices will reflect the realities of new travel procedures, their perception of personal safety while in transit, and the expected quality of experience at their destination.

Overall, new travelers will be more conscious of their choices which, in turn, will reshape the current demand profile. Airlines will need to review their networks, assess their fleets, offer new solutions, communicate efficiently, and provide freedom of choice to attract passengers.

Factors Influencing Passenger Behavior



3) Environmental Awareness

Many airlines and OEMs that received government aid will encounter growing political influence in the form of greater pressure to adopt more environmentally-friendly technologies.

Additionally, sustainability is becoming more important in financing with an increasing number of lines of credit linked to a company's environmental performance. Businesses focused on ESGs (Environment, Social, Governance) achieve better results in the market.

For airlines, this leads to an intense drive to acquire aircraft with higher fuel efficiency. When the industry recovers, we will see significant waves of orders for state-of-the-art aircraft to replace inefficient fleet types.

CEOs RECOGNIZE THE GROWING RELEVANCE OF THE AGENDA

1# | Climate change and environmental risks considered by global CEOs number one risk factor for their companies.

76% | Of global CEOs say that their organization's growth will depend on their ability to navigate the shift to a low-carbon, clean technology economy.

Sustainable investments are already on the rise...

34% | Growth in Environmental, Social and Corporate Governance (ESG) and impact investing assets under management across all regions from 2016-2019.

200% | Growth of ESG assets in the US over the last 10 years.

49% | Proportion of sustainable investments in Europe relative to total managed assets.

...these assets perform better

63% | Of sustainable funds performed in the top half of their respective categories in 2018, according to Morningstar

And will keep growing

\$400bn | Estimated growth in ESG ETFs over the next decade

Source: NPMG LLP Report "The numbers that are changing the world", 2019

4) Regionalization

Many countries realized their vulnerability through their overdependence on international supply chains during the crisis. To avoid repeating that exposure in the future, businesses will tend to turn inward to mitigate risk.

This will inevitably create new flows of commerce and, consequently, impact the way people will travel and the types of aircraft airlines will need.

Carriers fortunate enough to serve large domestic or continental markets with few border restrictions are likely to emerge from the crisis much stronger than those that rely on open international borders.

Bottom Line

More than just returning to 2019 demand and revenue levels, airlines will need to focus on returning to profitability. Retained earnings will ensure their survival and their ability to rebuild.

When traffic volume eventually returns to its pre-pandemic height, it will flow differently. Expect demand to be less for long-haul travel and stronger for regional travel. That dynamic will create new interest in secondary, less-populated destinations which, in turn, will open new opportunities for air service with smaller-capacity aircraft.



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AFRICA



Johannesburg, South Africa

/KEY MESSAGES

- / The need to overcome operational inefficiencies will lead to opportunities to rethink strategies and build a stronger foundation with up to 150-seat jets.
- / Greater collaboration between airlines and countries will be key to unlocking intra-regional market potential and increasing carrier competitiveness.

ANNUAL ECONOMIC & TRAFFIC GROWTH

GDP	RPKs
2.2%	2.6%

NEW DELIVERIES

Jets up to 150 Seats	TPs	Narrowbodies
100	80	110

FLEET IN SERVICE - UP TO 150 SEATS

2019	2029
570	650

OPPORTUNITY TO OVERCOME PRE-PANDEMIC CHALLENGES

Africa was the last world region where coronavirus infections peaked in 2020. Yet, profitability has been elusive for the region's airlines even before the pandemic. IATA estimates African airlines will post a US\$2 billion net loss in 2020, which represents a negative net margin of 30.5%.



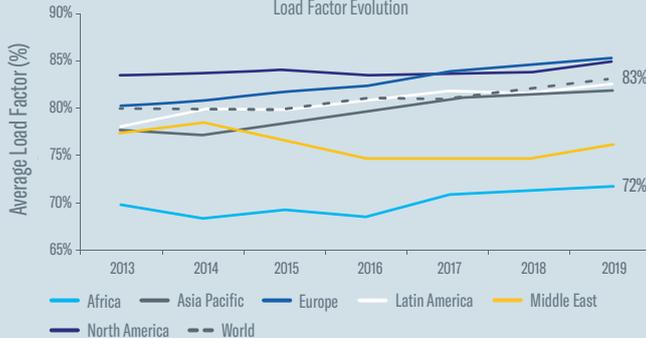
Source: IATA Economics - Economic Performance of the Airline Industry

OPPORTUNITY TO OVERCOME PRE-PANDEMIC CHALLENGES

Airlines now face some degree of resizing and restructuring. There is a new opportunity to address the persistent problems of low load factors due to overcapacity, poor connectivity stemming from few frequencies, the absence of nonstop flights to many markets, and operating inefficiencies from regulatory restrictions.

Low Load Factors over Past Decade

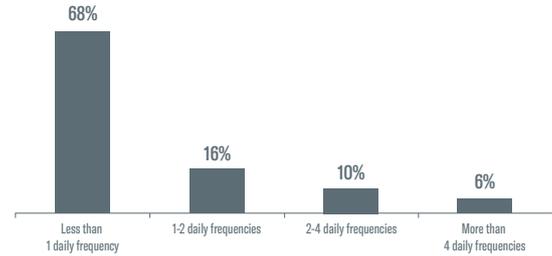
Load Factor Evolution



Source: IATA Economics

Underserved Domestic and Intra-Regional Markets

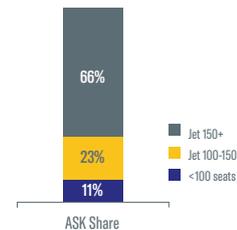
Daily Flight Frequencies – Domestic and Intra-Regional Markets



Source: Sabre

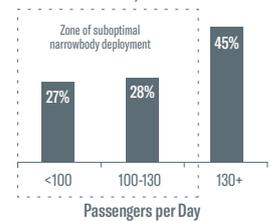
The up to 150-seat jet segment can address most of these issues.

Unbalanced Fleet Driving Inefficiency and Losses



~66% of total ASKs from 150+ seat NB jets...

% Markets vs. Passengers per Departure
Routes Dominated by 150+ Seat NB Aircraft



...yet 55% of markets dominated by 150+ seat NBs have fewer than 130 PPD

Source: Sabre, Embraer. excludes widebodies

BUILDING A PATH AHEAD

Aviation can play a fundamental role in the drive for long-term African economic and social prosperity. In most countries, air travel is an essential service and a catalyst for promoting tourism and fostering trade and regional development. Post-pandemic rebuilding presents opportunities for the aviation industry. The relatively small order backlog for new aircraft gives airlines a chance to adapt their fleet plans to the new landscape and remedy current inefficiencies.

Some initiatives that could help build a stronger foundation for the aviation sector include a push for a more collaborative environment and targeting better cooperation between African airlines. This would support the development of intra-regional markets and increase local carrier competitiveness against the bigger airlines from Europe and the Middle East.



Nairobi, Kenya



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CHINA & ASIA PACIFIC

Guangzhou, China

/KEY MESSAGES

- The repositioning of the world supply chains will promote economic development in the region and require a new degree of air transport connectivity.
- As the main driver of growth, airlines will need to establish new schedule and network strategies for better access to underserved low and medium-density markets.
- Secondary airports will be the key component of this new strategy, avoiding the constraints currently prevalent at large, saturated airports.
- Hub and spoke operations will be needed to build a higher degree of connectivity to support the repositioning of the region in the new world economy.

ANNUAL ECONOMIC & TRAFFIC GROWTH

GDP	RPKs
3.8%	3.4%

NEW DELIVERIES

Jets up to 150 Seats	TPs	Narrowbodies
1,220	490	3,100

FLEET IN SERVICE - UP TO 150 SEATS

2019	2029
800	2,020

CYCLICAL AND STRUCTURAL CHANGES AHEAD

China and Asia have led global growth in air passenger traffic for years. Now, as growth slows following travel restrictions precipitated by the coronavirus, there are fundamental changes that will shape future air travel demand in the region.

SUPPLY CHAIN REALIGNMENT

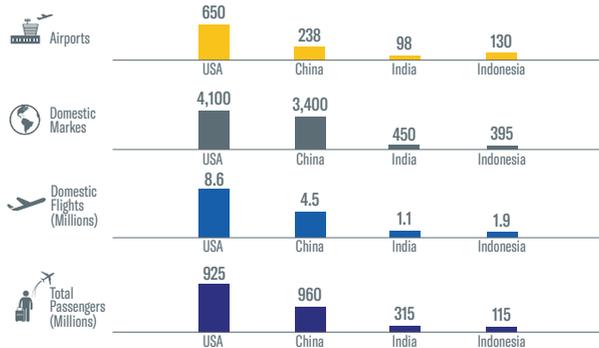
The fallout from protracted USA-China trade tensions has forced businesses to modify or duplicate their supply chains to mitigate risk. Disruptions to labour and air freight capacity during the pandemic further emphasized how supply chains are vulnerable to uncontrollable global forces.

As companies look to insulate themselves from future shocks, ASEAN and SAARC countries, with their lower labour and production costs, will be well-positioned to redirect future growth. Air transport is key to realizing growth and attracting new investments. It will require greater connectivity among existing airports and upgrades to access and infrastructure. New supply chains in these countries will create new flows of business passengers in domestic networks.

TREMENDOUS POTENTIAL FOR NEW AIR LINKS

To understand the magnitude of domestic air connectivity that the main countries in Asia can achieve, we compare it with the North American environment. They share much in common, all having large populations distributed across expansive geography with a range of small, medium, and mega cities.

Air Transport Snapshot: Mature vs. Emerging

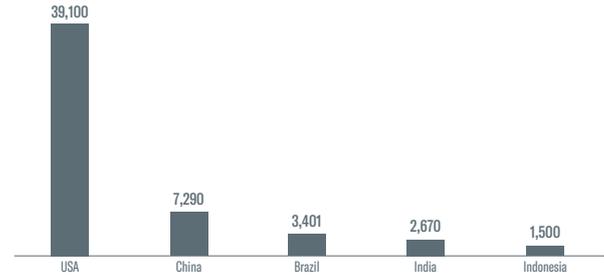


Source: Sabre, national websites

NUMBER OF ORIGIN-DESTINATION CITY PAIRS

The USA has five times more domestic origin-destination city pairs yet only one third of China's population. City pairs with 10 or fewer passengers per day each way (PDEW) account for 85% of U.S. domestic origin-destination demand. Travelers can access a network that links almost any city to any other city frequently and conveniently.

Number of Origin-Destination City Pairs

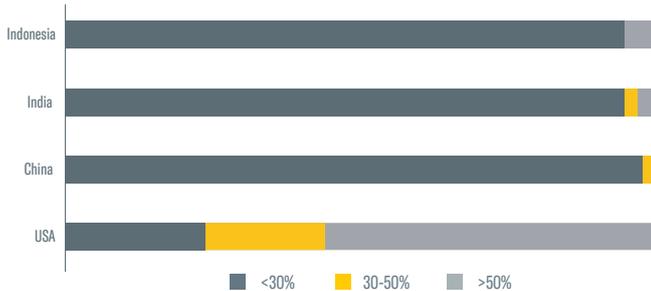


Source: Sabre

NUMBER OF ORIGIN-DESTINATION CITY PAIRS

Unlike in China, India, and Indonesia, U.S. airports and airlines are extremely efficient in flowing connecting traffic. At 56% of U.S. airports, more than half of the passenger throughput is connections. The percentage of connecting traffic is comparatively tiny, almost negligible, for the three big domestic Asian countries.

Percentage of Connecting PAX at Airports



Source: Sabre

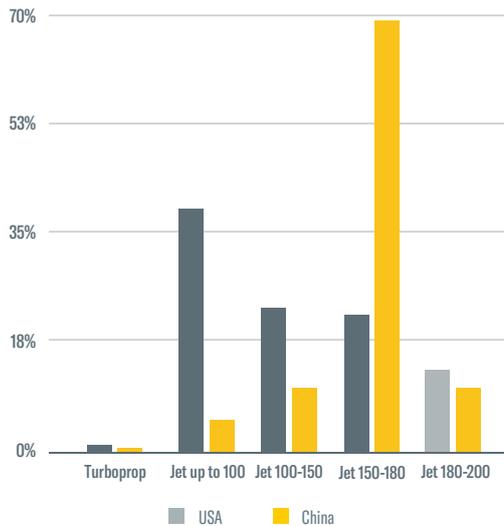
Airlines in the USA tap into smaller markets with regional aircraft that serve hubs with multiple daily frequencies. That same opportunity exists in Asian countries with small cities spread across expansive geography.



CHINA'S DIVERSIFICATION STRATEGY

Large jets dominate China's commercial airline fleet – 79% of all flights are operated by 150 to 210-seat aircraft. As China transitions to greater connectivity and a more efficient air transport system, airlines will need more jets in the up to 150-seat category than the current 15% in order to offer high-frequency, economical flights. Aircraft currently serving medium and small markets in China are considerably bigger than those serving similar markets in the USA where capacity is proportional to demand and connectivity is higher.

Domestic Fleet Profile



Source: Sabre

China's Current Airport Infrastructure



Source: Sabre

Mid to Long-Term Plan for China's High-Speed Rail Network

The strategic importance of China's western regions became more visible after COVID-19. As part of its new plan, the government has announced a series of infrastructure developments – the Go West Plan – that includes around 200 new airports to encourage and promote industrial relocation. Twelve provinces and regions – covering three quarters of China's territory but home to only a quarter of the country's population – are part of the plan. The low and medium density demand of these cities is ideal for 80-seat jets to play a key role in turning these new airports into efficient hub & spoke operations.

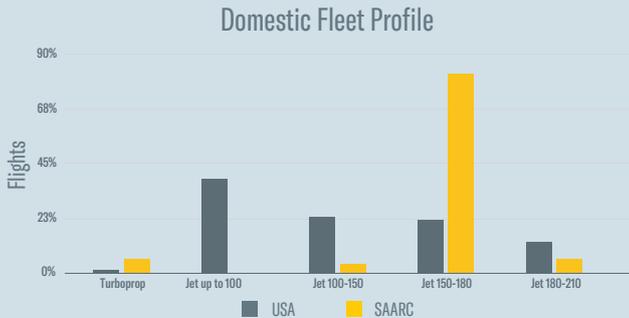


Source: MDPI, Potential Impacts of China 2030 High-Speed Rail Network on Ground Transportation Accessibility
 - Lvhua Wang, Yongxue Liu, Liang Mao, Chao Sun (April 2018)

OPPORTUNITIES FOR SAARC

Airlines in India focus their business on mega-cities. Only 6% of domestic markets are classified as large-to-large yet they account for 32% of all flights. Conversely, 20% of all markets are large-small yet only 6% of all flights serve those city pairs.

India's focus on serving large markets with large aircraft is replicated by airlines in other SAARC countries although none share India's population or domestic network scale. They do, however, share a need for greater connectivity. Jets in the 70 to 150-seat category will be needed to build connectivity without inefficient and costly excess capacity. Airport infrastructure is an additional limitation for big jets at secondary airports. Development will come through smaller jets or turboprops.



Source: Sabre

ASEAN CALLS FOR SECONDARY HUBS

Indonesia's seventeen thousand islands, 1.9 million square kilometers, four time zones, and 273 million people illustrate the importance of air travel and network connectivity in the ASEAN region.

The majority of routes link small to large, saturated airports. This imposes severe limitations to growth. Airport slot constraints in Jakarta, Kuala Lumpur, and Manila limit the growth in smaller markets that require smaller aircraft capacity. Secondary hubs are then a latent need in the ASEAN region to further develop tourism and the economy. Turboprops and jets up to 150-seats will be required to expand networks from these airports and build connectivity through the next decade.

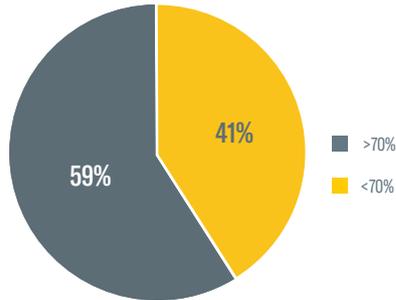


Source: Sabre

NE ASIA - DRIVE FOR RIGHTSIZING

The rightsizing concept is expected to become more relevant in the region in the post-pandemic period. Overcapacity was already an issue before the spread of the coronavirus. 57% of narrowbody flights in Japan operate with loads more appropriate for a smaller-capacity aircraft. This issue was evidenced by the collapse of Vanilla Air and the closure of Air Asia Japan.

Load Factors
Domestic Japan NB Flights



41% of NB flights depart with loads appropriate for smaller capacity aircraft.

Source: Sabre



Tokyo, Japan



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CIS

Astana, Kazakhstan

/KEY MESSAGES

- / Air travel expected to recover quickly.
- / Regional segment - served by up to 150-seat aircraft - has proven to be the most resilient.
- / Considerable potential for developing the regional segment further with connectivity beyond main hubs.

ANNUAL ECONOMIC & TRAFFIC GROWTH

GDP	RPKs
1.7%	2.6%

NEW DELIVERIES

Jets up to 150 Seats	TJs	Narrowbodies
300	80	370

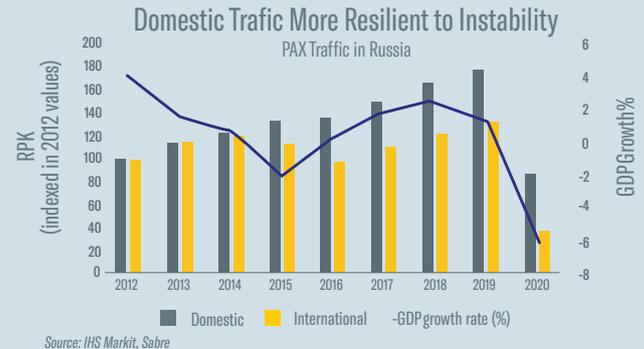
FLEET IN SERVICE - UP TO 150 SEATS

2019	2029
530	650

REGIONAL RESILIENCE

Regional aviation has proven to be resilient through this and past crises compared to international, long-haul traffic. Russian domestic capacity had the smallest year-to-date decline (IATA) compared to other large domestic markets such as China, Brazil, and the USA. Aviation is essential in the CIS because of the long distances between cities and the lack of overland transportation infrastructure. Maintaining a healthy airline industry is in the national interest.

Aircraft in the up to 150-seat segment are more versatile during economic downturns. The CIS fleet in this capacity category has been gaining prominence since 2010 and was not adversely impacted during the peak of the pandemic.



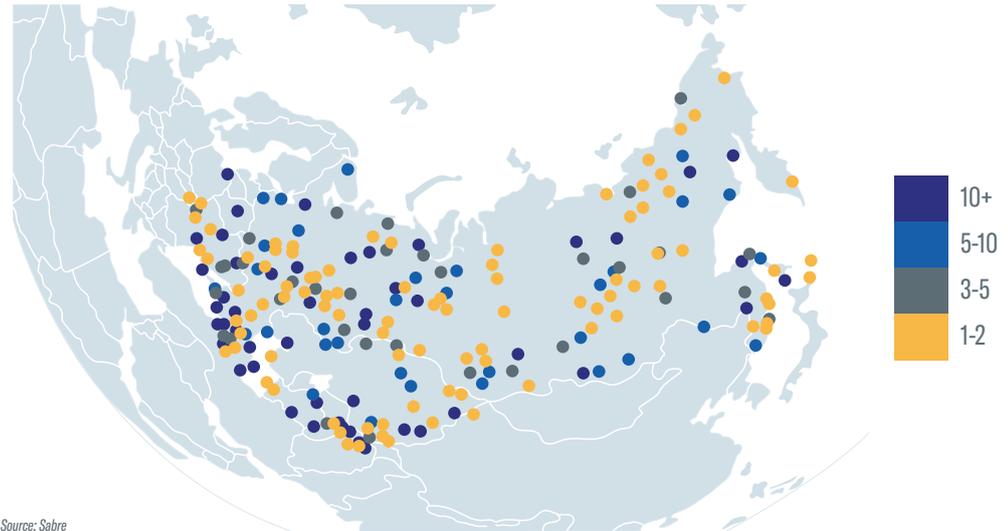
NETWORK DECENTRALIZATION

International demand will be weaker for several years stemming from the economic fallout of the pandemic. Businesses will look for stability and opportunities internally. Fortunately, there is considerable potential for developing the regional aviation segment further.

Over half of all seats provided by Russian carriers flow through either Moscow or Saint Petesburg. Almaty accounts for 55% of all seats flown by Kazakh airlines – when combined with Astana, the proportion reaches 90%. Kyiv accounts for 75% of the seating capacity offered by Ukrainian carriers.

This degree of network centralization around country capitals keeps connectivity and traffic from realizing their full potential. Lower-density markets are expected to flourish post-pandemic, and 70 to 150-seat jets are best suited to connect these markets through the right mix of capacity and frequency.

Number of Available Destinations



Source: Sabre



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EUROPE



Vienna, Austria

/KEY MESSAGES

- / Re-establishing connectivity will be essential for European carriers in a highly-competitive, low-demand environment.
- / Accelerated market expansion by LCCs will be tougher in a low-growth scenario.
- / Green concerns become a permanent priority - European airlines to lead the demand for new-generation aircraft.

ANNUAL ECONOMIC & TRAFFIC GROWTH

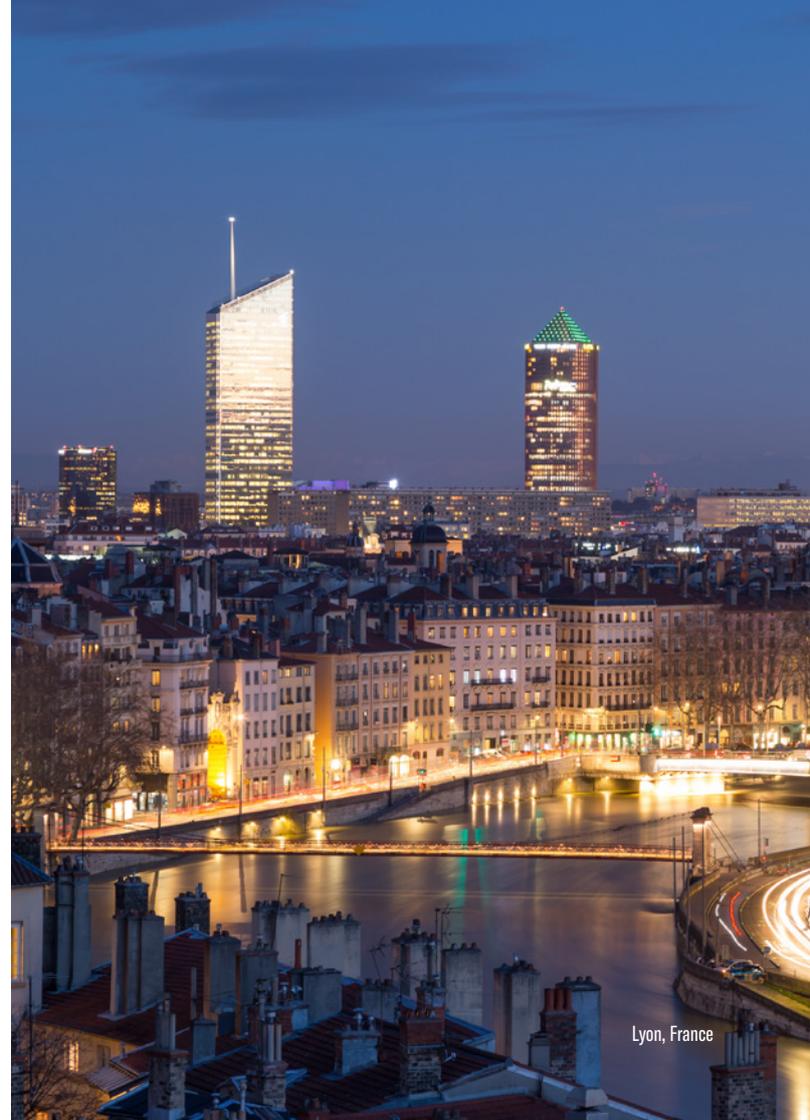
GDP	RPKs
1.0%	1.8%

NEW DELIVERIES

Jets up to 150 Seats	TPs	Narrowbodies
780	190	1,410

FLEET IN SERVICE - UP TO 150 SEATS

2019	2029
1,600	1,680



Lyon, France

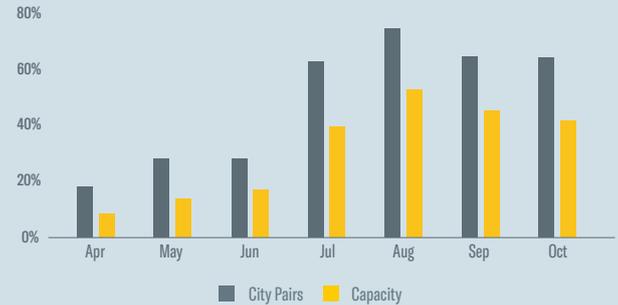
RE-ESTABLISHING CONNECTIVITY

Re-establishing intra-regional networks will be essential for European mainline carriers in the new, low-demand environment. Constructing efficient connection banks at the main hubs will optimize the number of passengers on long-haul flights. Additionally, high flight frequency at key airports will shield home carriers from intense LCC competition.

In the restoration phase, airlines will not simply add capacity to the main routes, they will regain capillarity by resuming service on as many city pairs as possible.

Up to 150-seat aircraft are ideal for this strategy since they offer the right mix of capacity and frequency. These aircraft have been pivotal in re-establishing air service after the shutdown from the first wave of the coronavirus. We expect this right-sizing trend to strengthen and continue over the next few years as airlines rebuild from a lower demand base.

Maintaining Connectivity as Priority over Adding Capacity



Source: Sabre

Growing Relevance of the up to 150-Seat Segment

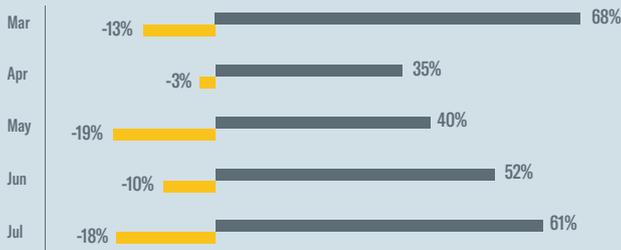


Source: Sabre (considers April-Oct)

ADDITIONAL METRICS FOR MARKET EXPANSION

2020 load factors dropped to all-time lows despite aggressive price discounting by airlines. This shift in price elasticity, combined with overall lower demand, makes the development of new routes increasingly risky. To mitigate these risks, cost-per-trip becomes an essential metric in addition to cost-per-seat for airlines (especially low cost carriers) that wish to keep creating value through geographic expansion.

Yield (YoY Change) Passenger Load Factor



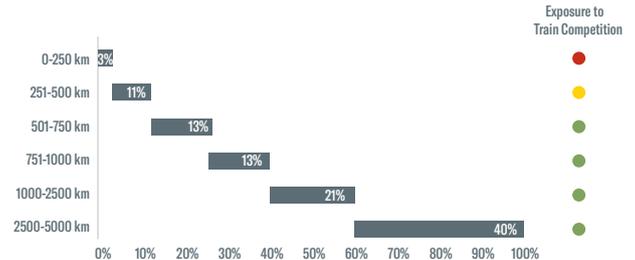
Source: IATA, Sep. 2020

Fortunately, new-generation crossover narrow-body jets (such as Embraer's E-Jet E2s) make this problem equitable since they offer much lower trip cost and a comparable CASK.

THE ENVIRONMENT - A PERMANENT PRIORITY

The pandemic raised the awareness of aviation and its impact on the environment among European citizens. Governments implemented new policies and rules which may result in some degree of replacement of short-haul air service by train. We estimate that ASKs directly impacted by train competition represent around 3.2% of the short-haul segment (up to 5,000 km).

ASK Distribution by Distance Segment



Source: Sabre, Embraer

The regional aviation sector, in the mid to long term, has the potential to be an ally of the environmental movement. It is an early adopter of alternative technologies that include biofuels, hybrid-electricity, and hydrogen to power aircraft. Airlines will be able to acquire more fuel-efficient aircraft in the short term. State-of-the-art technology is featured on new, next-generation airplanes which are 15%-20% more efficient to operate. European airlines have historically led the drive to greater environmental responsibility and are ideally positioned to lead the demand for new-generation aircraft.



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LATIN AMERICA

Buenos Aires, Argentina

/KEY MESSAGES

- / Airlines will need to adjust the current fleet and network to maintain connectivity in the post-pandemic recovery phase.
- / Latin America will benefit from new trade agreements redirecting supply chains from North America.
- / New infrastructure development will demand hub and spoke systems to include more cities in the network and drive future growth.

ANNUAL ECONOMIC & TRAFFIC GROWTH

GDP	RPKs
1.8%	3.0%

NEW DELIVERIES

Jets up to 150 Seats	TPs	Narrowbodies
380	130	710

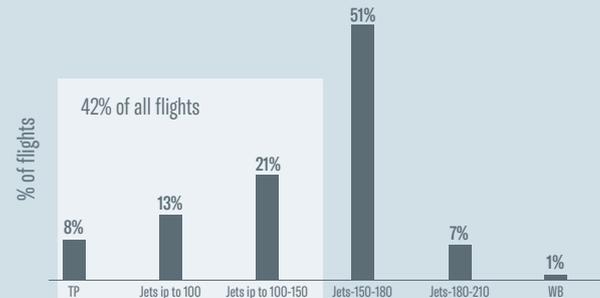
FLEET IN SERVICE - UP TO 150 SEATS

2019	2029
430	810

THE NEED FOR BALANCED FLEETS

The Latin American fleet was well positioned to match market demand in 2019. Flights operated by aircraft in the up to 150-seat category represented 42% of all departures. In the near future, however, the large narrowbody order backlog and a fleet of rapidly-ageing regional aircraft will generate a mismatch between capacity and demand.

Domestic & Intra-Regional Flight Profile

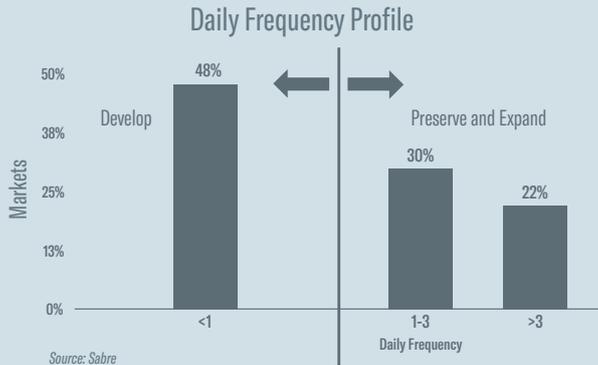


Source: Sabre

The effects of the coronavirus on air travel present an opportunity for airlines to make adjustments as they confront new challenges and opportunities. Revising business strategies and seeking more balanced fleets will be essential during the recovery phase.

THE NEED FOR BALANCED FLEETS

A large portion of Latin American markets have less than one daily flight. With lower post-pandemic demand, those markets would be best served by right-sized aircraft better suited to fewer expected passengers. This would prevent route cancellations due to poor economic performance from operating aircraft that are too large. Route withdrawals and suspensions would permanently weaken network connectivity.

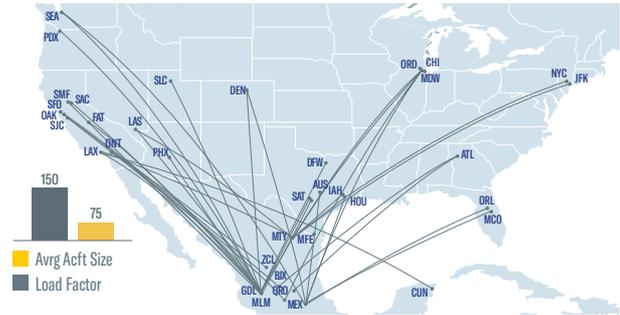


STRENGTHENING RELATIONS WITH NORTH AMERICA

Global supply chains were disrupted during the pandemic which exposed the vulnerability of manufacturers to their dependence on overseas producers and reliable long-haul air links. We expect Latin American companies will prefer to establish new supply lines with U.S. and U.S.- oriented entities to reduce the risk of future interruptions.

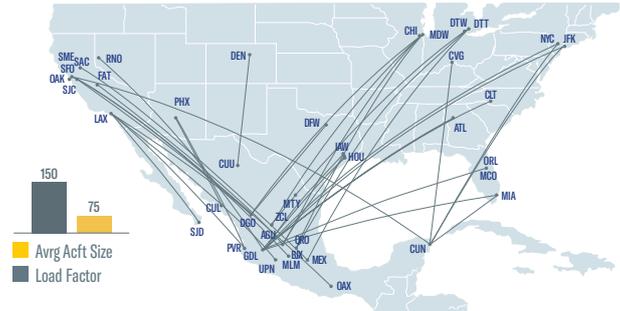
Mexico is already the largest trading partner of the U.S.A. It would be a logical choice for redirecting these business flows. However, current aircraft deployed in these markets are sub-optimal and probably not sustainable. Right-sizing is required even in markets that already have more than one daily frequency.

Markets with 1-3 Daily Frequencies



Source: Sabre

Markets with Less than 1 Daily Frequency



Source: Sabre

INFRASTRUCTURE REVOLUTION ON THE WAY

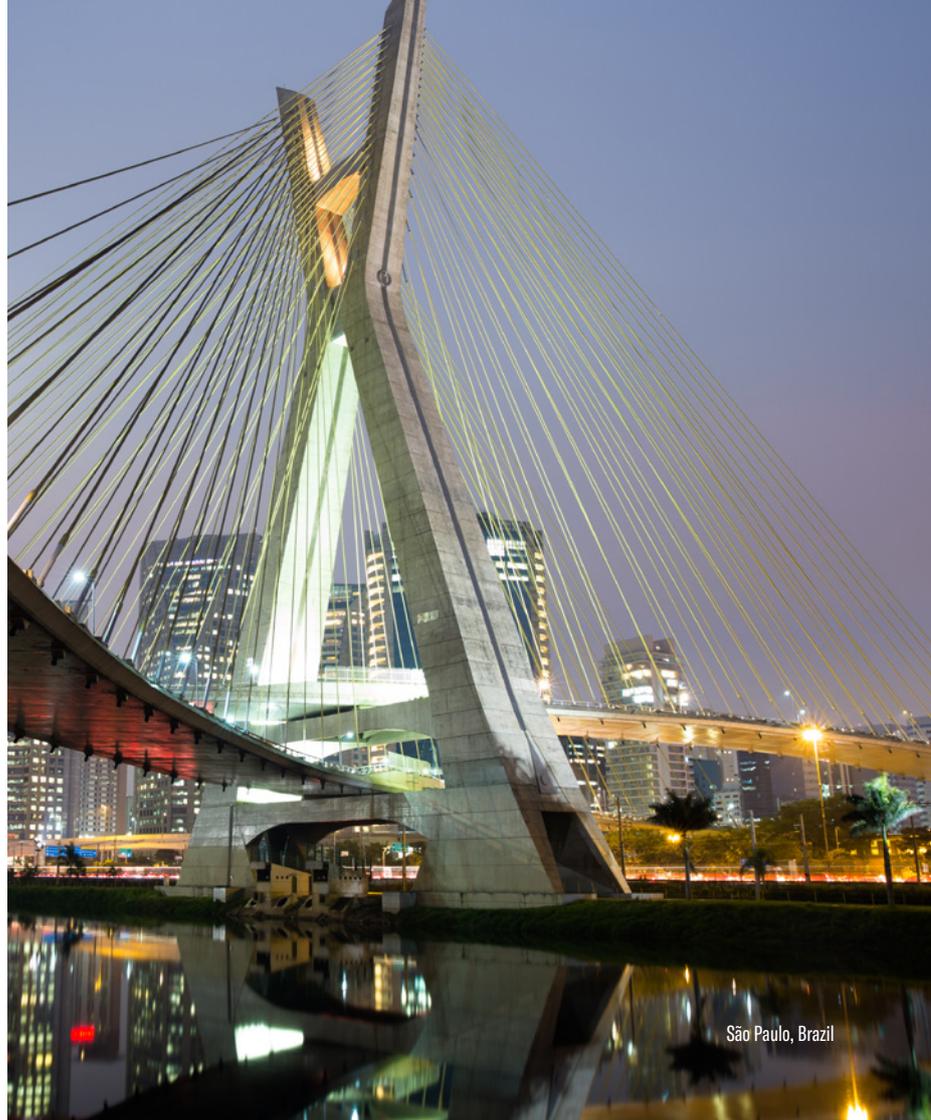
Brazil, as one of the largest air transport markets in the world, will play an important role in Latin American economic development. Brazil's airport privatization plan is due to be finalized in 2022. It is intended to boost air travel access to smaller cities. Sixty-six new airports will be built which will help spur economic growth. The work is expected to be completed by 2026.

A hub and spoke airline network using regional capitals will be the best way to connect these smaller cities. An up to 150-seat fleet is ideal to add frequencies, open new routes, build networks, and improve connectivity.

66 Airports in the 2026 Privatization Plan



Source: Sabre



São Paulo, Brazil



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MIDDLE EAST



Abu Dhabi, United Arab Emirates

/KEY MESSAGES

- / Pre-pandemic slowdown of global hub strategy continues
 - demand to recover with right-sized aircraft.
- / Underserved short to medium-haul markets will become more important for international traffic feed.
- / Oil price decline accelerating the need for new revenue sources and economic diversification through tourism, including regional destinations.

ANNUAL ECONOMIC & TRAFFIC GROWTH

GDP	RPKs
1.9%	2.9%

NEW DELIVERIES

Jets up to 150 Seats	TPs	Narrowbodies
120	30	700

FLEET IN SERVICE - UP TO 150 SEATS

2019	2029
190	220

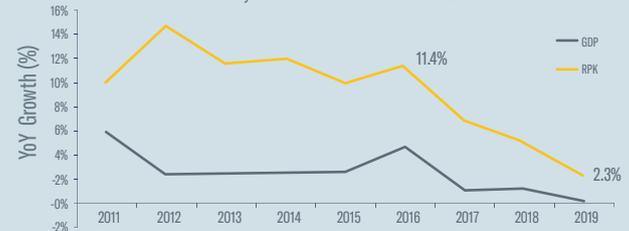
In addition to the impact of the pandemic, air transport in the Middle East was also hit by a sharp decline in the price of oil and slowing traffic growth from a saturated global hub strategy.

GROWTH RATES WERE ALREADY ON THE DECLINE

The Dubai, Abu Dhabi and Doha mega-hubs helped Middle Eastern air carriers record years of double-digit traffic growth. Their strategic geographic location facilitated intercontinental east-west and north-south transit with throughput increasing faster than national economies in the region. Yet, RPK growth has been steadily declining for years.

Ongoing Slowdown in Demand Growth

Steady Decrease in RPK Growth Since 2016

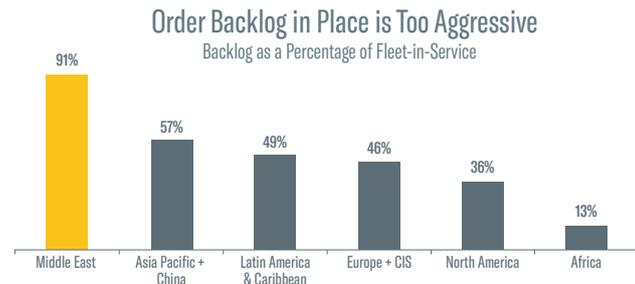


Source: IATA, IHS Markit

The slowdown will continue and worsen with the fallout from the coronavirus since international markets will take longer to recover. Traditionally, the region has been the domain of large and ultra-large jets. Smaller, right-sized aircraft will become more important in any recovery.

GROWTH RATES WERE ALREADY ON THE DECLINE

Previous long-term traffic forecasts, including those for this decade, and actual reported numbers are at odds. Today, the backlog of aircraft orders by carriers in the region is essentially comprised of widebodies and large narrowbodies. This large supply of capacity does not reflect the anticipated weaker growth in demand. Consequently, expect airlines in the Middle East to postpone or cancel future deliveries, or convert orders to smaller aircraft.

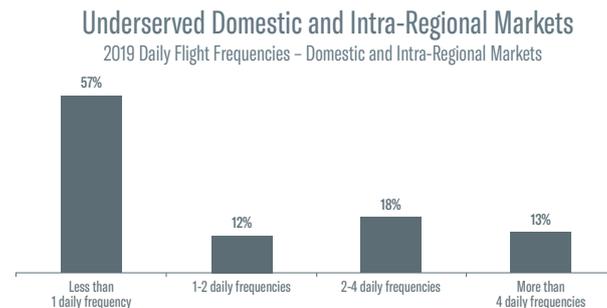


Source: Cirium Fleet Analyzer – January 1, 2020

LOOKING AHEAD: OPPORTUNITIES WITHIN

To counter the continuing decline in long-haul growth and offset weaker demand from the pandemic, airlines could focus on developing intra-regional, short to medium-haul markets which, today, are few and have limited flight frequency.

The big-jet fleet strategy could be supplemented with jets in the up to 150-seat category which would be the right size to feed the mega-hubs and their international networks. Smaller aircraft would help develop secondary markets, open new nonstop routes, and spur economic development.



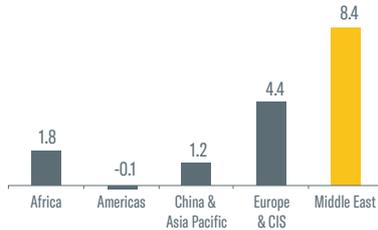
Source: Sabre

Countries are expected to further diversify their petroleum-dependent economies, diminish their exposure to oil price volatility, and promote more tourism to generate new revenue. For several years, the Middle East has recorded the highest year-over-year growth rates for tourism in the world.

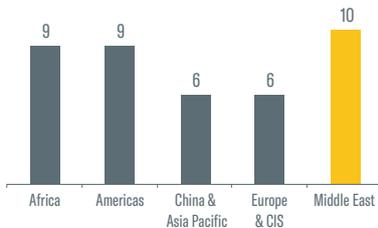
LOOKING AHEAD: OPPORTUNITIES WITHIN

If the influence of mega-hubs is waning, the rise of regional tourism could be a real game-changer for commercial aviation. The impact of the pandemic may cause governments and airlines in the Middle East to redraft their future plans to include new secondary destinations. Those new markets would likely require right-sized aircraft to connect to global networks.

International Tourism Receipts – Percent Growth (2018-2019)



Tourism as Percentage of Total Exports (2019)



Source: UNWTO Global and Regional Tourism Performance





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NORTH AMERICA



Toronto, Canada

/ KEY MESSAGES

/ Connectivity will continue to be the most valuable asset in the North America airline industry, reaffirming the relevance of regional jets.

/ Demand volatility, slower growth, and the availability of new, more efficient state-of-the-art aircraft put the 100 to 150-seat jet segment in the spotlight.

ANNUAL ECONOMIC & TRAFFIC GROWTH

GDP	RPKs
2.0%	1.6%

NEW DELIVERIES

Jets up to 150 Seats	TPs	Narrowbodies
1,520	80	1,290

FLEET IN SERVICE - UP TO 150 SEATS

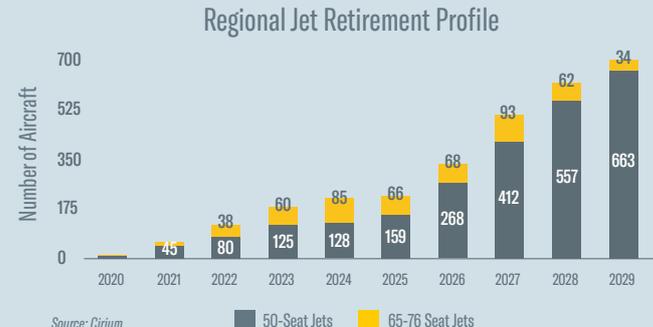
2019	2029
3,630	3,370

REAFFIRMATION OF THE REGIONAL SEGMENT

Connectivity is the most important, most valuable characteristic of the North American market and one of the reasons why the region has recorded the highest profit margins in the world over the years.

In 2019, regional carriers were present at 65% of all U.S. airports and accounted for nearly half of all departures in the country. Those figures reinforce how vital regional aircraft, and the cities they serve, are to the restoration of national connectivity.

We expect that the growing pressure to return to profitability, a rapidly ageing regional fleet (50 to 76-seat jets), and the arrival of new, more efficient aircraft in the segment (specifically, the E175-E2) will drive scope clause relaxation. This will allow more 70 to 76-seat jets to fly in the USA.



SMALL NARROWBODIES IN THE SPOTLIGHT

Expect demand volatility and slower growth through the next decade. Airlines will therefore need to consider the importance of having the ideal aircraft serving each market. One size will not fit all.

A fleet of versatile, small narrowbody jets is an optimal solution. The aircraft have attractive, competitive operating costs that generate higher profits yet have the flexibility to serve mainline, regional, long and short-haul missions.

New Market Conditions

- Demand disruption requiring capacity adjustments
- Slower growth through the decade
- Connectivity as a major asset

New Product Conditions



Source: Embraer Analysis

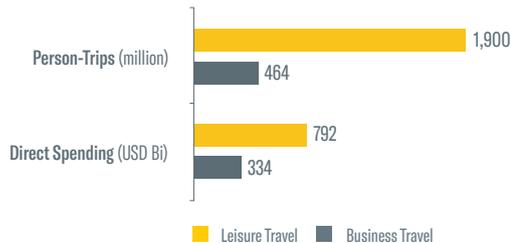
Additionally, new-generation small narrowbodies are more fuel-efficient than current alternatives. Crew costs on new 120-seat jets are 10% to 35% lower than 160-seat jets. Their significantly lower trip costs makes them ideal on shuttle markets, on routes requiring high daily frequencies, and for connecting cities with hubs.

SHIFTS IN BUSINESS PASSENGER BEHAVIOR

Perhaps one of the most anticipated aspects of post-pandemic travel in the USA is a shift in business passenger behavior. The U.S. Travel Association cites that business passengers represented around 20% of all person-trips in 2019, and accounted for 30% of direct travel expenditures.

The number of business travelers is expected to drop by a single digit due to increasing use of virtual communication tools in the workplace. It is an important change but it will not cause any disruption considering the magnitude of the U.S. domestic air travel market.

US Traffic Composition



Source: US Travel Association



St Louis, USA

DATA SOURCES

ALL ANALYSIS DEVELOPED USING DATA FROM:

- / Global Insight
- / The Economist, OECD, World Bank, IMF, McKinsey Global Institute
- / OAG
- / ICAO, IATA
- / A4A, A4E, CAAs, AEA, ALTA, CAPA, AFRAA
- / CAAC (Civil Aviation Administration of China)
- / Sabre
- / Cirium Fleet Analyzer
- / Embraer Market Intelligence
- / Airlines

For more information, please visit:
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REGIONAL DEFINITIONS

- / North America
- / Latin America (includes Mexico & Caribbean)
- / Europe (includes Israel)
- / Russia/CIS
- / Africa
- / Middle East (includes Egypt & Turkey)
- / Asia-Pacific (includes China)