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The Business Daily of the Global Scheduled Airline Industry Since 1939

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Inside:

AIRFRAMERS

777X Program Sees Leadership Shuffle As Teal Leaves Boeing

GUY NORRIS, guy.norris@aviationweek.com

Boeing is appointing David Loffing as the new VP and chief project engineer of the 777X following the decision of company veteran Michael Teal to retire.

Loffing, who was previously VP and chief project engineer on the 777, will be succeeded in that role by the current 777/777X director of engineering Ben Linder. Prior to his role on the 777, Loffing has held senior roles in the 747, 737 and New Midsize Airplane (NMA) programs.

Teal, whose departure was revealed in an internal engineering organization memorandum from Howard McKenzie, the recently appointed VP and chief engineer for Boeing Commercial Airplanes, began work at the company in 1986 as a stress engineer on the 757. In later years he rose through the ranks to become chief structures engineer for the 747—a responsibility that eventually expanded to include the 767 and 777.

Teal was also VP and chief project engineer for the 747-8 program before being appointed in August 2011 as VP, chief project engineer and deputy program manager for the 737 MAX. He then moved to the 777X program in November 2017.

Due to his senior role in the formative years of the 737 MAX, Teal was asked to testify

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The Daily Memo

Asia's International Traffic Rebound Moving At A Snail's Pace

ADRIAN SCHOFIELD, adrian.schofield@informa.com

Asia-Pacific airlines are lagging those from other regions in terms of international traffic recovery, and the spread of the omicron coronavirus variant appears to be further stalling their progress.

The pandemic has not altered the fact that Asia-Pacific domestic routes are the busiest in the world. However, the opposite is true for international routes as non-domestic city-pairs from the region have disappeared from the higher echelons of the global rankings.

The international slide is mainly due to Asia-Pacific governments taking a relatively cautious approach to reopening their borders compared with those in other regions. This was starting to change in late 2021 as key Asian markets took steps to ease border restrictions, but in many cases these efforts have been reversed or delayed as omicron began its worldwide spread.

Examining global rankings tables gives a good illustration of the dramatic contrast in fortunes between domestic and international services.

The Asia-Pacific region accounts for 17 out of the world's top-20 domestic routes, according to data from CAPA and OAG. The highest non-Asian route is 10th. This domestic dominance has not changed significantly from before the pandemic.

However, there is only one route to, from or within the Asia-Pacific region in the top-20 list of international city pairs. The Dubai-Karachi route just makes the list at 20th, with Shanghai-Taipei next at 24th.

The situation was quite different two years ago. For the week of Jan. 13, 2020, there were 14 Asia-Pacific international routes in the top 20, including the first three. Featuring prominently on the list were Asian destinations such as Hong Kong, Singapore, Tokyo and Bangkok.

The rankings trends are supported by capacity data from CAPA and OAG. International capacity—as measured by weekly

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AIRLINES

Korean Air Inspects Aircraft Using Drone Swarm

GRAHAM WARWICK, graham.warwick@aviationweek.com

Korean Air has demonstrated the visual inspection of an aircraft using multiple drones simultaneously.

A demo event was held in a hangar in Seoul in December 2021 and the company plans to launch the inspection drones commercially in 2022.

Airlines globally are introducing drones to improve workplace safety by eliminating manual checks for visible damage while increasing the accuracy and speed of fuselage inspections. Korean Air says it is the first to develop technology to inspect aircraft using drone swarms. Korean Air is a developer of unmanned aircraft as well as an airline and has developed a multicopter inspection drone that is 1 m (3.3 ft.) in width and height and weighs 5.5 kg (12.1 lb.). The aircraft fuselage can be inspected using four of these drones simultaneously.

Operations software allows the four drones to be programmed to image preplanned areas of the aircraft. This reduces the typical visual inspection time to 4 hr. from about 10 hr., Korean Air said. And if one of the drones fails, the system automatically completes the mission using the remaining drones.

Geofencing and a collision-avoidance system keep the drones a safe distance from surrounding structures and prevent breakaways from the mission area, said Korean Air, which has modified its inspection procedures to require the presence of safety personnel as well as pilots and engineers.

The drones' high-resolution cameras are able to identify micro-defects down to 1 mm in size, and the inspection data is uploaded to the cloud, enabling maintenance specialists to check the results from anywhere at any time, Korean Air said.

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in the 2020 Congressional hearings into the fatal accidents that led to the grounding of the aircraft in 2019. More recently, in November 2021, Teal's testimony was also noted by Democrats on the U.S. House Transportation Committee chaired by Rep. Peter DeFazio (D-Oregon) who are pushing for more individual accountability at the company.

Boeing says Teal's decision to retire is "long planned" and comes after 35 years of service to the company.

Holiday Note:

In observance of the Martin Luther King, Jr. U.S. federal holiday, Aviation Daily issue will not publish a Jan. 18 issue. The next issue will be dated Jan. 19.

DAILY MEMO, From P. 1

seats—is at 24% of pre-pandemic levels for Asia-Pacific airlines during the week of Jan. 10. In contrast, international capacity has recovered to 74.5% for North American carriers, and 60.2% for those in Europe.

Meanwhile, domestic capacity has returned to 87.8% of pre-pandemic levels in the Asia-Pacific region. This has obviously been a big boost to carriers with extensive domestic networks, but the predicament of those relying on international connecting traffic is more dire.

A few governments in the region have been active in trying to restore international flows, most notably Singapore, and more recently Australia.

This situation appeared to be improving late in 2021 as more countries revealed plans to reopen or expand international travel.

The brightening outlook at that time was reflected in the Association of Asia Pacific Airlines' (AAPA) traffic statistics for November 2021, the most recent month available.

According to AAPA, Asia-Pacific airline international passenger numbers rose to 5.2% of pre-pandemic levels in November. Capacity, as measured in available seat kilometers, increased to 16.6%. While these are still very low levels, they did climb steadily through most of 2021.

Asia-Pacific airlines carried 1.6 million international passengers in November 2021, which was the highest monthly total since March 2020.

AAPA said the November figures indicated "notable improvement" as governments began to relax border restrictions. However, the group cautioned that the emergence of omicron in late November "has since raised uncertainty over recovery prospects" in Asia-Pacific.

"The abrupt re-imposition of travel restrictions by many governments in the face of the rising spread of the omicron variant threatens to hold back the long-awaited revival of Asia's travel and tourism industry," AAPA Director General Subhas Menon said.

AIRLINES

South African Airways Board Vows To Root Out Corruption

ALAN DRON, alandron@adepteditorial.com

South African Airways' (SAA) interim board has pledged to take whatever action is necessary to rid the airline of corrupt staff from what it described as its "shameful past" and to work toward recovering misappropriated funds.

The interim board—whose members have been specifically chosen on the basis of having no connection with the airline's recent corrupt past—said it welcomed the Jan. 4 publication of the initial report of South Africa's Judicial Commission of Inquiry into Allegations of State Capture, Corruption and Fraud in the Public Sector.

Headed by South Africa's acting chief justice, Raymond Zondo, the inquiry into corruption at the country's state-owned companies including SAA produced a scathing report into the behavior of the airline's former chairperson Dudu Myeni and her boardroom allies. The commission painted a picture of incompetence, greed and bullying under Myeni, a close confidant of the country's then-president Jacob Zuma. The former president is himself facing charges including fraud, racketeering and money laundering during his tenure in office.

The four-year commission found there were patterns of abuse at every stage of public procurement and that governance had collapsed at state-owned companies, including SAA and its two subsidiaries, South African Airways Technical and regional carrier, SA Express.

Honest board members and company officials were allegedly hounded out of their posts, to clear the way for allies of Myeni.

SAA said Jan. 10 that board members "are currently reviewing the report systematically ... the board will cooperate with, and support law enforcement agencies in their pursuit of prosecutions, and where necessary, will institute internal investigations and disciplinary processes with the aim of cleaning the company of all vestiges of its shameful past as exposed in the Commission Report."

Additionally, the board said it "will take whatever actions required to recover any assets lost or monies misappropriated from SAA," with the commission's findings and recommendations being immediately implemented throughout all levels of the company. "This, it is believed, will foster a culture of transparency, accountability and ethical conduct within the SAA group," the SAA interim board said.

SAA resumed operations in September 2021 after 21 months in business rescue, the South African equivalent of administration, as well as pandemic-related closedowns.

The private Takatso consortium, a joint venture between local infrastructure investment firm Harith and South Africa's Global Aviation, operator of local LCC LIFT, is scheduled to complete its deal to take over 51% of the airline imminently.

SAFETY

Pandemic Delays Final Report On Sriwijaya SJ182 Crash To 2023

CHEN CHUANREN, chuanren@purplelightvisuals.com

SINGAPORE—The Indonesian National Transportation Safety Committee (KNKT) said it needs another year before it can deliver the final report on the ill-fated Sriwijaya Air Flight SJ182.

The 26-year-old Boeing 737-500 crashed into the Java Sea minutes after taking off from Jakarta on Jan. 9, 2021, killing all 62 people onboard.

A final report is usually submitted a year after an air accident under industry norms, but the KNKT said the pandemic has slowed the process. Investigators have been prevented from traveling freely between Indonesia and the U.S. by COVID-19-related travel rules, the KNKT said. Those attempting to visit Indonesia from supporting agencies in Singapore and the UK have also been affected by the restrictions.

The KNKT presented a preliminary report on Feb. 10, 2021, suggesting a faulty autothrottle had reduced left engine lever, while the right lever maintained its position, leading to a sharp left bank that resulted in an uncontrollable descent.

In its latest update on the investigation published Jan. 13, KNKT officials flagged that the pilot in command's voice had not been recorded by the Cockpit Voice Recorder (CVR) and could only be picked up from the co-pilot's headset recordings. Channel 4, which was the cockpit area microphone, was unintelligible as a prominent tone masked all recordings in that channel.

KNKT officials also disclosed that the autothrottle computer and server had been sent to Oakenhurst Aircraft Services in Essex, England, for testing. Meanwhile, the flight control computer was sent to the Honeywell Deer Valley facility in Phoenix, Arizona, for examination. The spoiler wheel was also examined.

Two flight simulator examinations have taken place in Nevada and Jakarta in attempt to recreate the flight.

KNKT said investigations will continue focusing on the root cause of the split thrust levers, the history of the autothrottle and its serviceability. Attention is also concentrated on pilot performance and their training on upset prevention and recovery as well as other human factors and any organizational issues within Sriwijaya Air.

Staff

EDITORIAL
2121 K Street, NW, Suite 210, Washington, DC 20037
+1-202-517-1100 awin.aviationweek.com

EDITORIAL STAFF
Managing Editor Mark Nensel
Executive Editor Jens Flottau
Contributing Editors Sean Broderick, Michael Bruno, Bill Carey, Chen Chuanren, Alan Dron, Thierry Dubois, Ben Goldstein, Kurt Hofmann, Helen Massy-Beresford, Polina Montag-Girmes, Victoria Moores, Guy Norris, Tony Osborne, Adrian Schofield, Graham Warwick
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Email: tech_assistance@aviationweek.com

INTELLIGENCE AND DATA SERVICES
Senior VP, Intelligence, Data and Media Anne McMahon
Tel: +1-646-469-1564, anne.mcmahon@aviationweek.com
Senior Director, Business Development Thom Clayton
Tel: +44 (0) 7771 808142, thom.clayton@aviationweek.com

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User Engagement Melissa Crum, Tel: +1-913-284-2951
melissa.crum@aviationweek.com

Online access to Aviation Daily is available at awin.aviationweek.com

ADVERTISING
Sales Director Tom Davis
Tel: +1-469-854-6717, tom.davis@aviationweek.com

REPRINTS
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REGULATORY/LEGISLATIVE

French Lawmakers Call For ICAO-Level Environmental Rules

THIERRY DUBOIS, thierry.dubois@aviationweek.com

LYON—Environmental regulations for aviation, such as mandates to use sustainable aviation fuel (SAF) mandates and hydrogen technology certification, should be backed by an international framework set out by ICAO, a French parliamentary report says.

That would create a level playing field, as opposed to creating burdens for those OEMs that are based in countries or regions where rules are more demanding, according to authors Jean-Luc Lagleize and Sylvia Pinel, both French legislators. They are calling for French and European authorities to lobby ICAO on the issue.

Lagleize and Pinel presented the report Jan. 12 at the French National Assembly. Lagleize belongs to the Modem party, part of the government's majority, while Pinel is part of the opposition center-left party PRG. Both represent departments in the southwest of the country where the aerospace industry has numerous facilities and employees.

On hydrogen, EASA should also be involved in the effort, they suggest. "Solid preparatory work should be conducted with EASA on hydrogen regulation to guarantee good support for hydrogen aircraft at ICAO level," one of the report's recommendations says. Airbus has been at the forefront of hydrogen technology as a way to decarbonize air transport.

Meanwhile, SAF is more expensive than existing jet fuel. Should SAF use become mandatory in a region, some carriers could be tempted to refuel further afield to circumvent the regulations, creating a so-called carbon leakage. The two members of parliament recommend that incorporation mandates, which set a minimum percentage of SAF in aviation fuel, should be defined by ICAO.

For a more efficient transportation infrastructure in France, a law was passed in 2021 that essentially prohibits domestic flights where a rail alternative lasting 2.5 hours or less exists. The aerospace industry protested, arguing that the ban would prevent electric aircraft from operating on the short routes which the technology is expected to be suitable for at first. Lagleize and Pinel support that objection, noting the rule could impede electric aircraft projects in France.

The report on the future of the aerospace sector in France is seen by its authors as addressing a key manufacturing industry in the country. They say the industry employed 691,000 people nationwide as of the end of 2020, a number slightly below the estimate of aerospace lobbying group GIFAS. The industry suffered an 8% drop in employment that year, making it four times more severely hit than the national average, according to Lagleize.

While the authors are encouraging research and development (R&D) work to decarbonize aviation, they are facing opposition from members of parliament in green parties, some of whom are calling for the elimination of domestic flights altogether. Lagleize and Pinel instead see a need for town and country planning, which electric aircraft could improve.

But decarbonization technologies will come too late to avoid a drastic reduction in domestic air traffic, according to Delphine Batho, the spokesperson for green presidential candidate Yannick Jadot. "We are in an absolute climate emergency; what counts is cutting greenhouse gas emissions between now and 2030," she says. "After 2030, we could start betting on R&D and potential new advancements ... This is the harsh reality."

REGULATORY/LEGISLATIVE

U.S.-China Row Over Forced Route Suspensions Escalates

AARON KARP, karpatw@yahoo.com

The U.S. Transportation Department (DOT) is not ruling out countermeasures following the Civil Aviation Administration of China (CAAC) forcing the temporary suspension of a number of routes to China operated by major U.S. airlines—an action DOT says runs afoul of the bilateral air transport agreement between the two countries.

The forced flight cancellations stem from a 2020 CAAC rule that requires the suspension of a route for two weeks if 5-9 arriving passengers test positive for COVID-19 "after arrival," or for four weeks if more than 10 passengers test positive. U.S.-China flights also must be limited to a 75% load factor.

Citing the rule, CAAC forced the grounding of both of Delta Air Lines' routes to China. Its weekly Detroit (DTW)-Seoul (ICN)-Shanghai (PVG) route has been grounded for four weeks, while its Seattle (SEA)-ICN-PVG route has also been temporarily suspended.

"I can confirm that six of our flights between Dallas/Fort Worth (DFW) and Shanghai have been canceled," an American Airlines spokesperson told Aviation Week Network.

United Airlines confirmed it was forced by the CAAC to cancel flights on its San Francisco (SFO)-PVG route scheduled for Jan. 15, 19, 21, 22, 26 and 28.

"China's actions are inconsistent with its obligations under the U.S.-China Air Transport Agreement," a DOT spokesperson told Aviation Week Network. "We are engaging with the [Chinese government] on this and we retain the right to take regulatory measures as appropriate."

DOT has previously complained that the CAAC rule places "undue culpability" on airlines, which follow protocol prior to departure to China—when all passengers are required to submit negative COVID-19 tests—and have no way of verifying the Chinese government's claims of positive tests or when passengers may have contracted COVID-19. Delta was informed by the CAAC that one of its flights had seven passengers who tested positive within eight days of arriving in China, meaning it is possible some or all of those passengers contracted COVID-19 after arriving in China.

"U.S. airlines are concerned about the implications of a disruption and are continuing to assess the impact to operations," an Airlines for America (A4A) spokesperson said. "We are in communication with the U.S. and Chinese governments to identify a path forward that minimizes impact to travelers."

AIRLINES

Finnair Struggles To Staff Flights As Crew Call In Sick

KURT HOFMANN, hofmann.aviation@netway.at

Finnair has cut its already reduced February flying program by 20% in an attempt to manage the operational challenges caused by high numbers of staff absences.

A combination of the omicron coronavirus variant and the annual flu season has led to a particularly acute level of sick leave among staff at Finnair and its partners, the airline says.

In addition to scrapping flights, the Oneworld alliance member has delayed the start of its service from Helsinki Vantaa International (HEL) to Dallas (DFW). A planned upgauging of frequencies on existing long-haul routes has also been postponed.

The flight cancellations should enable Finnair to operate a more flexible schedule and adapt to continued high levels of staff absences, which are expected to continue at both the airline and at companies that are crucial to its operations.

"Staff sick leave is now significantly impacting Finnair and airports in Finland as well as throughout the world," CCO Ole Orver said. "We aim to meet these resourcing challenges through the cancellation of flights, to avoid last-minute changes and better manage our customers' expectations."

The majority of the canceled flights are on routes where Finnair operates multiple daily services, such as Copenhagen, Oslo, Paris, Rome and Stockholm.

On the long-haul side, launch of the Dallas service will move to March 27. The start of flights to Nagoya (NGO), Japan, and additional frequencies to Osaka (KIX) are being pushed back to the summer. Weekly frequencies to Singapore (SIN) will fall to twice a week and to Hong Kong (HKG) down to three times a week.

Despite these proactive steps, last minute changes to flights are still possible due to staff shortages or weather-related disruption, Finnair warns.

A strike announced by Finnish labor union Pro for Jan. 17 would add to the disruption. Finnair said it was not a party in the dispute but that any strike action would still affect its aircraft maintenance. As a contingency, Finnair has made special arrangements to secure the continued maintenance of its aircraft should the strike go ahead.

AIRPORTS

Grant Scheme Opens For Small U.S. Airports

DAVID CASEY, david.casey@informa.com

The latest round of applications has opened for the U.S. government's Small Community Air Service Development Program (SCASDP), a scheme designed to help small communities address air service and airfare issues.

The U.S. Transportation Department (DOT) has up to $17 million in available funding during the current fiscal year. Grant sizes in the past have ranged from $20,000 to almost $1.6 million.

The scheme can involve revenue guarantees and financial assistance for marketing programs, as well as start-up costs and studies.

In addition, the DOT can award U.S. carriers grants in order to subsidize service to and from an underserved airport for up to three years.

Priority will be given to projects that help to restore scheduled passenger air service that has been terminated, as well as ones that provide "material benefits to a broad segment of the traveling public," including businesses and educational institutions whose access to the national air transportation system is limited.

Communities with air fares that are "significantly higher" than the national average in similar markets will also receive priority consideration. Applications for the latest SCASDP funding round are open until March 15.

TECHNOLOGY

Dassault Systemes Boosts Hydrogen-Transport Airship Startup

GRAHAM WARWICK, graham.warwick@aviationweek.com

A U.S. startup that plans to use airships to transport green hydrogen and air cargo has been selected for a business accelerator program run by Dassault Systemes.

H2 Clipper plans to begin releasing drawings in April for a subscale prototype it expects to fly in 2024.

The program will provide Santa Barbara, California-based H2 Clipper with full access to Dassault Systems' 3DExperience design, engineering, simulation and data management platform, as well as its network of customers, partners and technology collaborators.

Using hydrogen both as its lifting gas and the fuel for propulsion, H2 Clipper's airship is designed to carry liquid hydrogen (LH2) from locations in the world where renewable energy is plentiful, such as the Middle East, to regions where demand for green hydrogen will be highest, such as Europe.

On the return journey, the airship would carry air freight. The piloted vehicle is designed to carry a payload exceeding 340,000 lb. more than 6,000 mi. at speeds up to 175 mph. The target operating cost of $0.177-0.247 per ton-mi. is less than a quarter that of a conventional air freighter, the company said.

H2 Clipper plans to fly its first full-size airship in 2027 and aims to have a fleet of 100 vehicles by the beginning of the 2030s. They would be able to provide point-to-point hydrogen transport between any two locations within two days at or below the cost per kilogram of pipeline delivery.

Founder and Chairman Rinaldo Brutoco outlined one potential operational scenario at the International Hydrogen Aviation Conference in September. This involved transporting green hydrogen from a $5 billion production facility that Saudi Arabia intends to build at the Neom smart city on the Red Sea.

The Helios plant is planned to produce 650 metric tons of hydrogen a day using 4 gigawatts of wind and solar energy. Production is scheduled to begin in 2025 and reach the target $1.50/kg cost of hydrogen by 2030. The hydrogen is to be converted to ammonia for transport by ship to markets such as Europe.

H2 Clipper expects delivery by ship to Rotterdam will take 10 days, after which the ammonia will be transported by truck or pipeline to the ultimate market in Germany, where it will have to be converted back to the ultra-pure hydrogen required for use in fuel-cell vehicles. The ships will return empty.

The startup calculates this will increase the cost of hydrogen from $1.50/kg at the point of production to $5.37/kg at the point of delivery—$5.99/kg if the fuel is transported as LH2 rather than ammonia.

Using its airship to transport liquid hydrogen, H2 Clipper projects the flight from Neom direct to cities in Saudi Arabia will take 17 hr. and result in a cost of $4.11/kg, a 23% saving over transporting LH2 by ship.

The green hydrogen as delivered will be suitable for immediate use in fuel cells without purification and the airships will return with cargo, avoiding the cost of deadheading, Brutoco told the conference.

For hydrogen delivered from Neom to Germany, this will save $300 million a year over ammonia and $450 million a year over LH2 transported by sea, H2 Clipper projected. In addition to being cost-effective, the startup said, airship delivery is scalable and flexible as demand for hydrogen grows.

Departures

Opinions On Current Issues In Aviation

It's Broken ... This Time It Would Be A Failure Not To Fix It

WILLIAM SWELBAR

There are many reasons why the regional airline industry and small community air service are at a crossroads.

Fundamental to it all is the number of airports within each carrier's respective network. The business is changing. Major airlines' pre-COVID networks were expensive to operate. Redundancies need to be eliminated, and there are not enough pilots to fly the 2019 network anyway.

As aircraft size grows, not all airports can economically be served. Commercial entities seek to best match supply and demand. Why not size the airport infrastructure to better match today's aircraft technology by consolidating it?

Pilot Supply In The Pandemic Era

The air service promise to small markets necessary to get the Airline Deregulation Act passed has run its cycle. There are no more CARES Act protections on the way.

This time the confluence of events is totally different when it comes to providing commercial air service to all airports. Historically, pilot shortages timed with the end of an economic cycle and were dampened in the downturn.

Not this time.

Prior to 2017, regional carriers were used as an arbitrage tool to average down total network pilot labor costs. That's over, too. Recently, pilots at regional carrier PSA were offered up to $187,500 in bonuses. This industry is a pattern bargainer despite what the economics might say.

A Jan. 12 Aviation Daily article quoted Mesa CEO Jonathan Ornstein as seeing the shortage of certified commercial pilots as "the overarching issue" facing the industry today, adding that "it jeopardizes all of the plans" that carriers are making to grow their businesses. Ornstein all but placed the current situation facing his company and the industry squarely at the feet of the 1500-hr. rule passed in 2013.

The 1500-hr. rule is here to stay; union support and lawmakers' trepidation at anti-safety headlines will see to that.

Pilot unions do not care about small community air service. Negotiating scope language has been the cause of outsized consternation for mainline pilots since the small RJ came on the scene. Today, the cost of further scope relief for the network carriers is simply too costly for management to "buy" from labor.

The good news: a new regionalized airport infrastructure helps solve both issues.

Need For Infrastructure Consolidation

In the lower 48 states, there are 296 airports with service categorized as Nonhub primary, nonprimary, or Essential Air Service (EAS). Among the 105 EAS points, 82 lie within 180 mi. of at least one larger airport—the average is three.

Of the remaining 191 Nonhub primary and nonprimary airports, 178 of are within 180 mi. of at least one larger airport; the average is five.

> "A region with one right-sized commercial airport would better match available seats with demand than three airports with a few daily frequencies."
>
> —William Swelbar

Customers want larger (read: two-class) aircraft. They don't mind driving to get them. A region with one right-sized commercial airport would better match available seats with demand than three airports with a few daily frequencies.

What about airports that lose commercial service? Some can serve as training grounds for pilots needed to fly electric taxis, like the 100 Mesa and United plan to buy from Archer Aviation. Airports get used, albeit differently, and pilots get to build the time needed to fly for commercial airlines.

For pilot unions, scope language carve-outs for smaller aircraft will become less of an issue. Some of these newly created regional airports will support some mainline service, but not multiple daily frequencies. More large regional jet flying will likely be needed.

So, ALPA: as a key player in the network rebuild, how about backing a plan that preserves safety yet keeps the pilot pipeline full in return for more large regional jet flying not tied to constraining scope formulas?

What was deemed "essential" in 1978 is not today's essential. Back then, the interstate highway system was 15 years from completion.

Today, revamping networks to better reflect demand and ensuring there are enough pilots in the pipeline is far more essential than ensuring 500 communities have at least one flight to a hub.

William Swelbar is the chief industry analyst at The Swelbar-Zhong Consultancy and MIT Research Engineer who specializes in commercial air transport economics. These opinions are his alone.

Aviation Daily welcomes Op-Eds. Bylined submissions should be sent to mark.nensel@aviationweek.com. They should be exclusive to Aviation Daily and no longer than 700 words. The author's title, affiliation and contacts must be supplied. Aviation Daily reserves the right to edit for space and house style.

Industry Data

SpeedNews Commercial Aircraft & Engines Marketplace

COMPANY	COMMERCIAL AIRCRAFT FOR SALE OR LEASE	PHONE	E-MAIL	CONTACT
ALTAVAIR LTD	1- 777-300ER (GE90-115B), DOM 2006, MSN 34597, 28J/384Y CONFIG, FOR SALE OR LEASE, AVAILABLE 1Q22 1- 777-300ER (GE90-115B), DOM 2013, MSN 39686, 3-CLASS PAX CONFIG, FOR SALE OR LEASE, AVAIL 1Q22 9- A330-200 (TRENT 772-60/16), DOM 2005-2007, 22C/240Y, FOR SALE OR LEASE	(44)7899-892493	clive.bowen@altavair.com	CLIVE BOWEN
BOEING CAPITAL CORPORATION	5- 777: TWO -200ER (TRENT 884/892B) & THREE -300ER (GE90-115B), DOM 2001-2006, AVAILABLE NOW 13- 717-200 (BR715A1-30), 125Y PAX, DOM 2003-2006, AVAILABLE NOW	(1)206-390-6376 (1)425-336-9837	laurent.lanoiselet@boeing.com martin.d.eckart@boeing.com	LAURENT LANOISELET MARTIN ECKART
BRISTOL ASSOCIATES, INC.	7- ERJ 145LR, DOM 2001-2002, EX-UNITED EXPRESS, 50Y (C&D ZODIAC), AVAILABLE NOW	(1)202-682-4000	bristol@bristolassociates.com	PETE SEIDLITZ
C&L AEROSPACE	1- E190-100LR, MSN 19000435, DOM 2011, AVAILABLE NOW 5- SAAB 340B+, FLEET OPPORTUNITY, FOR SALE STARTING AT $1M, AVAILABLE NOW AS CARGO OR PAX	(61)404-855-991 (1)207-217-6149	jameel.w@cla.aero everette.m@cla.aero	JAMEEL WAZIR EVERETTE MASH
DORIC	1- A330-200 (TRENT 772-60/16), MSN 1407, DOM 2013, AVAILABLE 2Q22	(49)69-247559931	maurick.groeneveld@doric.com	MAURICK GROENEVELD
FPG AMENTUM	1- A319-100 (V2527M-A5), MSN 3705, DOM 2008, 144Y/C, AVAILABLE NOW	(353)86-041-9902	rupert.leggett@fpg-amentum.aero	RUPERT LEGGETT
JET MIDWEST	2- 777-200ER (TRENT 800), DOM 2003, MSN 32318/29065, FOR SALE/LEASE, AS IS/WHERE IS CONDITION	(1)913-706-2517	aircraft@jetmidwest.com	MARIZA BROWNING
COMPANY	**ENGINES FOR SALE OR LEASE**	**PHONE**	**E-MAIL**	**CONTACT**
AERODIRECT, INC.	1- CFM56-5B4/P, ESN 779502, SERVICEABLE, FULL QEC, FOR LEASE/EXCHANGE, AVAILABLE NOW 1- CFM56-7B26, ESN 894436, SERVICEABLE, FULL QEC, FOR LEASE/EXCHANGE, AVAILABLE NOW	(1)224-588-4132	jeffalesia@aerodirect.com	JEFF ALESIA
ALPHA AVIATION PARTNERS	1- CF34-8E5, ESN 193551, SERVICEABLE, FOR SALE OR LEASE, AVAILABLE NOW	(1)601-421-7844	mark.walenczyk@alphaaviationpartners.com	MARK WALENCZYK
ALTAVAIR LTD	1- CF6-80E1A4B, ESN 811498, FOR SALE/LEASE/EXCHANGE, AVAILABLE NOW	(44)7899-892493	clive.bowen@altavair.com	CLIVE BOWEN
BRICKELL ASSET MANAGEMENT	2- V2500: ONE EACH V2533 (S/N V11632) & V2527 (S/N V11590), FULL QEC, FOR SALE/LEASE/EXCHANGE	(1)954-762-9214	tjensen@brickellam.com	TODD JENSEN
CONTRAIL AVIATION SUPPORT	CFM56-5 / CFM56-7B / V2500, ALL THRUST LEVELS, SERVICEABLE, FOR SALE OR LEASE	(1)720-276-5966	steve@contrail.com	STEVE WILLIAMSON
EURAM AIR LEASES IRELAND LTD.	1- CFM56-7B24, ESN 894225, SERVICEABLE, W/ QEC, FOR SALE/LEASE/EXCHANGE, AVAILABLE NOW	(353)5-7860-6970	john@euram.ie	JOHN ODLUM
GE AVIATION MATERIALS	CF6 (TRUENGINE™): -80C2BxF/-80E1 FOR SALE/LEASE/EXCHANGE GE90 (TRUENGINE™): -94B/-115B FOR SALE/LEASE/EXCHANGE CF34 (TRUENGINE™): -10E/-8E/-3x1, FOR SALE/LEASE/EXCHANGE	(1)214-801-8967	sandy1.duncan@ge.com	SANDY DUNCAN
GLOBAL ENGINE MAINTENANCE, LLC	1- CFM56-7B26/27, AVAILABLE MARCH 2022	(1)305-717-0951	jamie.d@global-engine.com	JAMIE DEVIN
JETRAN	V2500-A5 / RB211-535E4B / CF6-80C2B6, SERVICEABLE, FOR SALE OR LEASE, AVAILABLE NOW	(1)210-269-3471	blowers@jetran.aero	NICK BLOWERS
SKY LEASING	1- V2527-A5, SERVICEABLE, FOR LEASE ONLY, AVAILABLE NOW	(1)415-860-9390	twiley@skyleasing.com	TRAVIS WILEY
WILLIS LEASE	GEnx / LEAP / CFM56 / IAE / GE / P&W ENGINES AND APUS FOR LEASE, PLUS ENGINE STANDS	(1)415-408-4742	leasing@willislease.com	JENNIFER MERRIAM
COMPANY	**ENGINE STANDS AVAILABLE**	**PHONE**	**E-MAIL/WEB ADDRESS**	**CONTACT**
GLOBAL ENGINE STANDS, INC.	ENGINE STANDS FOR LEASE: PW4000, CFM56, CF34, CF6, V2500, RB211, AE3007, TRENT 700 & APUs. REFURBS AVAIL.	(1)305-978-0898	yperez@globalenginestands.com	YEXCELD PEREZ
NATIONAL AERO STANDS	ALL PURPOSE STANDS FOR LEASE: AE3007; CFM56; CF34; CF6-80; GE90; GEnx; LEAP-1A/B; PW1100/2000/4000 RB211-535; TRENT 500/700/800/1000/7000; V2500. BOOTSTRAP KITS: CFM56-3/-7; CF6-80; RB211-535; TRENT 1000.	(1)512-296-9502	support@stands.aero www.stands.aero	GAIL HOLGUIN

Calendar

To list an event, send information in calendar format to Michael Johnson at michael.johnson@aviationweek.com. For a complete list of Aviation Week Network's upcoming events, and to register, visit www.aviationweek.com/events (Bold type indicates new calendar listing.)

Jan. 17-19—ACI North America, AirCargo 2022, Hilton New Orleans Riverside, New Orleans, LA, https://airportscouncil.org/conference/2022-air-cargo-meeting/

Jan. 18-21—Schedulers & Dispatchers Conference, San Diego, CA, https://nbaa.org/events/2022-schedulers-dispatchers-conference

Jan. 26-28—AeroEngines Americas, JW Marriott Turnberry, Miami, FL, https://www.aeroenginesusa.com/en/home.html

Feb. 1—16th Annual Aviation Symposium, The Ritz-Carlton, Pentagon City, Arlington, VA, https://www.foxrothschild.com/events/16th-annual-aviation-symposium

Feb. 2—2022 NBAA Miami-Opa locka Regional Forum, Opa-locka, FL, https://nbaa.org/upcoming-events/

Feb. 7-9—ATCA Annual Conference, Walter E. Washington Convention Center, Washington, DC, https://nbaa.org/events/2022-leadership-conference/

Feb. 7-9—2022 NBAA Leadership Conference, The Omni Fort Worth, Fort Worth, TX, https://nbaa.org/events/2022-leadership-conference/

Feb. 9-10—Aviation Week's MRO Latin America, Mexico City, Mexico, https://mrolatinamerica.aviationweek.com/en/home.html

Feb. 15-17—Aviation Week's Routes Americas 2022, San Antonio, Texas , https://www.routesonline.com/events/235/routes-americas-2022/l

Feb. 14-18—Singapore Airshow 2022, Changi Exhibition Centre, Singapore , https://www.singaporeairshow.com/l

Feb. 22-23—Aviation Week's MRO MIddle East, Dubai, UAE, https://mromiddleeast.aviationweek.com/en/home.html

March 1—Aerospace Raw Materials & Manufacturers Supply Chain Conference, Beverly Wilshire, Beverly Hills, CA, https://rmc.speednews.com/en/home.html

March 1-2—Air Charter Safety Symposium, NTSB Training Center, Ashburn, VA, https://10times.com/air-charter-safety-symposium

March 1—12th Annual Aerospace Raw Materials & Manufacturers Supply Chain, Beverly Hills, CA, https://rmc.speednews.com/en/home.html

March 1—12th Annual Aerospace Raw Materials & Manufacturers Supply Chain, Beverly Hills, CA, https://rmc.speednews.com/en/home.html

March 2-3—36th Annual Commerical Aviation Suppliers Conference, Beverly Hills, CA, https://asc.speednews.com/en/home.html

March 3-4—ACI North America ACI-NA/AAAE Washington Legislative Conference, Hyatt Regency Washington, Washington, DC, https://airportscouncil.org/conference/2022-aci-na-aaae-washington-legislative-conference/

March 14-16—2022 NBAA International Operators Conference (IOC2022), Los Angeles, CA, https://nbaa.org/upcoming-events/

March 28-31—The 65th Annual AEA International Convention & Trade Show, Ernest N. Morial Convention Center, New Orleans, Louisiana, https://aea.net/convention/2022/Default.asp

Apr. 5-7—2022 Asian Business Aviation Conference & Exhibition (ABACE2022), Shanghai, China, https://abace.aero/2022/

Apr. 12-14—2022 Asian Business Aviation Conference & Exhibition (ABACE2022), Shanghai, China, https://abace.aero/2022/

Apr. 26-28—MRO Americas, Dallas TX, https://mroamericas.aviationweek.com/en/home.html

May 3-5—2022 NBAA Maintenance Conference, San Antonio, TX, https://nbaa.org/events/2022-maintenance-conference/

May 18-20—Routes Europe 2022, Bergen Norway, https://www.routesonline.com/events/209/routes-europe-2022/

May 18-20—Routes Asia 2022, Da Nang, Vietnam, https://www.routesonline.com/events/211/routes-asia-2022/