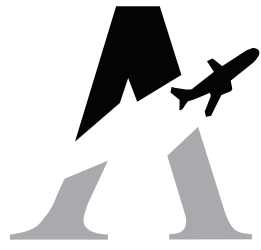


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JUNE 2022

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AFRICA

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Nigeria President affirms commitment to ICAO objectives



President of Federal Republic of Nigeria H.E Muhammadu Buhari

The President gave the Secretary General the assurance of Nigeria's support to the activities of ICAO particularly in relation to the achievement of ICAO's strategic objectives, highlighting that Nigeria will ensure the provision of a safe, secure and sustainable civil aviation infrastructure.

The Minister highlighted Nigeria's desire to support the sustainable development of air transport in the region and ICAO's efforts in facilitating the recovery process of the industry from the unprecedented impacts of the COVID-19 pandemic and expressed reassurance of Nigeria's future continued support for ICAO's initiatives and collaboration with Member States and development partners.

The Secretary General commended Nigeria for the leadership role it plays in civil aviation in Africa, highlighting the doubling of its number of airports, and achievement of growing air passenger numbers despite the impacts of the COVID-19 pandemic. He recognized the excellent work by the government of Nigeria to maintain high standards in aviation, in line with international best practices. He assured the President of the Republic for the continuous support of ICAO through its Regional Office.

Nigeria became a member of ICAO Council in 1962, and since then, it has continued to make valuable contributions to the Council's work and its activities "It is pertinent to also mention that Nigeria has been playing a key role in supporting the implementation of ICAO Policies and Programmes internationally, and particularly in the African region.

The President told the ICAO delegation that he has approved the establishment of Aerospace University in Abuja to cater for research and development as well as provide manpower for the industry. He also noted that the Nigerian Government has established independent agencies in order to enhance aviation safety and security, while ensuring effective and efficient provision and management of infrastructure in all aspects of the industry.

IN THE NEWS

AFRAA and AviaPro Consulting Inc. sign MoU on the provision of Aviation Consulting Services



Nairobi, Kenya, and Toronto, Canada – 12 May 2022: The African Airlines Association (AFRAA) has signed a memorandum of understanding (MoU) with AviaPro Consulting Inc. The MoU will provide a framework of cooperation between AFRAA and AviaPro Consulting to support the provision of aviation consulting services in the following areas:

- Airline network and fleet planning,
- Sales, pricing and revenue management,
- Airline operations planning and audit services,
- Airline start-up consulting services,
- Airline financial planning,

- Manpower sourcing for specialised airline resource requirements,
- Airline IT,
- Cargo consulting,
- Air service development,
- Aviation legal support consulting.

The MoU was signed by Abdérahmane Berthé, AFRAA's Secretary-General and Kevin Clarke, AviaPro Consulting Inc.'s Head of Consulting Services. Under the terms of the agreement, both parties will cooperate closely and complement each other's aviation consulting services offering to African airlines to enable them respond to evolving market dynamics.

Mr. Abdérahmane Berthé stated: "AFRAA Aviation Consultancy Unit which was set up in 2019, provides a wide scope of in-depth air transport industry experience to African aviation stakeholders. We are backed by expert consultants specialized in the air transport sector and we are pleased to add AviaPro Consulting's expertise to enrich our capabilities. This collaboration will enhance AFRAA Consultancy services capability to meet the needs of aviation sector in Africa."

Mr. Kevin Clarke added: "We are very pleased to be collaborating with AFRAA. This mutually beneficial relationship allows our company to leverage its global aviation experts with years of expertise in the aviation industry, to consult and recommend optimal ways to develop network and fleet planning, enhance all aspects of flight and ground operations, and maximize revenue opportunities. Our objectives are fully aligned to those of AFRAA, which is to maximize AFRAA members' success during these challenging post-pandemic times."

Mr. Clarke added: "We look forward to a long and fruitful cooperation between our two organizations. This MOU will reinforce the aviation consulting work already being offered by AFRAA to its members, and will complement it with state-of-the-art methods and ideas to support the growth and development of AFRAA members."

AFRAA Aviation Consultancy Unit has successfully carried out various consultancy projects in Africa. The main objective of the Unit is to provide consultancy support to African stakeholders and provide data-driven studies that are aimed to build winning strategies for a sustainable air transport sector in the African continent.

Rwanda and New Zealand Sign Bilateral Air Services Agreement

On Saturday April 23rd 2022, the government of Rwanda and that of New Zealand signed Bilateral Air Services Agreement (BASA) to create a basis in which the Airlines from both countries can operate on air transport services. The agreement is aimed at enabling the two countries to be connected by direct flights.

The Agreement was signed by Madam Patrice Uwase the Rwandan minister of state in charge of Infrastructure (MININFRA) and Michael Ian Upton the New Zealand Ambassador to Rwanda. The signed agreement provides for all air traffic required under a liberalized framework for the conduct of International Air transport services by the airlines of the two countries as part of the strengthening of commercial ties.

Rwandair, the Rwandan National carrier, and Air New Zealand, the New Zealand public flagship, can now claim the opening of air routes between the two countries. Better, they can consider commercial partnerships via code sharing agreements or interline agreements.



Rwandan Minister of state for Infrastructure Ms Patrice Uwase(R) and Michael Ian Upton the New Zealand Ambassador to Rwanda

Reacting to signing of this Bilateral Air Services Agreement, the New Zealand Ambassador thanked the government of Rwanda for allowing this outcome, after multiple negotiations undertaken between the two parties regarding the signing of the agreement. Mr. Upton further commends the two countries for the newly established connection, in addition to other already existing ties between the two countries.

Airbus appoints Olivier Michalon Senior vice President



Olivier Michalon Executive Vice President Global Business for Airbus Helicopters

Olivier Michalon is the Executive Vice President Global Business for Airbus Helicopters. Previously he was Senior Vice President – Head of Europe Region, since 2014, and chairman of the Board of Airbus Helicopters in the UK as well as director of Airbus Helicopters in Spain.

Michalon joined Airbus Helicopters (then Eurocopter) in 2002 from Bombardier where he held international positions in customer support and global network development based in France and Canada.

Michalon began his professional career in 1990 in a Los Angeles based consulting firm specialising in the semi-conductors and energy industries, supporting multinational companies in their international expansion in Eastern Europe. He continued his career as a commercial aircraft trader.

Married and father of two daughters, Michalon is an alumnus of Northwood University and the Harvard Business School Executive Program.

Boeing and Ethiopian Airlines announce order for five 777 Freighters

Boeing and Ethiopian Airlines announced the carrier is further expanding its all-Boeing freighter fleet with an order for five 777 Freighters. The order is currently unidentified on Boeing's orders and deliveries website.

"The addition of these five 777 Freighters into our cargo fleet will enable us to meet the growing demand in our cargo operation. While cementing our partnership with Boeing with new orders, the growth of our freighter fleet takes the capacity and efficiency of our shipment service to the next

level," said Ethiopian Airlines Group CEO Mr. Mesfin Tasew. "We always strive to serve our customers with the latest technology aircraft the aviation industry could offer.

Our cargo terminal is Africa's largest, coupled with fuel-efficient freighters and well-trained cargo handling professionals will enable our customers get the best quality shipment service. Customers can rely on Ethiopian for wide-ranging cargo services across five continents."

Boeing's market-leading 777 Freighter is the world's largest,

longest-range and most capable twin-engine freighter flying with 17% lower fuel use and emissions to prior airplanes. Ethiopian Airlines operates a fleet of nine 777 Freighters, utilizing the model's range of 4,970 nautical miles (9,200 km) and maximum structural payload of 107 tonnes (235,900 lb) to connect Africa with 66 dedicated cargo centers throughout Asia, Europe, the Middle East and the Americas.

"Ethiopian Airlines' all-Boeing freighter fleet provides them with unrivalled capability and flexibility as Africa's largest cargo operator," said Ihssane Mounir, Boeing's senior vice president of Commercial Sales and Marketing. "These additional 777 Freighters will enable Ethiopian to capitalize on near-term cargo demand, while positioning the airline for further expansion in the future."



In early March 2022, Boeing and Ethiopian Airlines also announced the signing of a Memorandum of Understanding for the carrier's intent to purchase five 777-8 Freighters, the industry's newest, most capable and most fuel-efficient twin-engine freighter. Ethiopian Airlines also operates three 737-800 converted freighters, as well as a combined passenger fleet of more than 80 Boeing jets, including 737s, 767s, 777s and 787s.

Ethiopian
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Launches a Flight Connecting Lomé and Washington DC

Ethiopian airlines commenced new flights between its hub, Addis Ababa, and Washington D.C with a stop in Lomé on 1ST June. The route is set to increase the frequency between Addis Ababa and Washington DC to 10x a week. Lomé is set to benefit from its 3rd US connection by the airline, as it currently serves Newark (4x weekly) and New York JFK (3x weekly). The airline also serves Chicago. The route shall

be served by a Boeing 787-8 Dreamliner 3x a week

Ethiopian Airlines Group CEO Mr. MefsinTasew regarded the launch as crucial due to the large community of Africans living in the country as well as the growing ties between the US and Africa. He further emphasized the role of flights in enhancing economic, trade, tourism, and diplomatic ties between the two regions.

Bombardier unveiled the newest member of its industry-leading business jet portfolio with the introduction of the Global 8000 aircraft, the world's fastest and longest-range purpose-built business jet, innovatively crafted with the industry's healthiest cabin for safety, comfort and performance beyond compromise.

With an industry-leading range of 8,000 nautical miles and an unbeatable top speed of Mach 0.94, the Global 8000 aircraft is the ultimate all-in-one business aircraft, offering customers a unique blend of outstanding performance married with the smoothest ride and an uncompromising passenger experience – the absolute leader in the long-range class.

"Today, Bombardier solidifies once more its position as the leader in business aviation with the newest member of the industry-leading Global family," said Éric Martel, Bombardier's President and Chief Executive Officer. "The Global 8000 aircraft leverages the outstanding attributes of the Global 7500 aircraft, providing our customers with a flagship aircraft of a new era. We remain unmatched, which for an innovation-focused

Bombardier Introduces Global 8000 Aircraft



Comair suspends flights, seeks additional funding



Comair (South Africa) has suspended all British Airways (operated by Comair) and kulula.com flights from Tuesday evening 31 May 2022 pending successfully securing additional funding, the Aviator Africa has learnt.

Comair Limited is an airline based in South Africa that operates scheduled services on domestic routes as a British Airways franchisee (and an affiliate member of the Oneworld airline alliance). It also operates as a low-cost carrier under its own kulula.com brand.

The company's business rescue practitioners (BRPs) have advised that the process to raise the necessary capital is in progress and that there is reason to believe such funding may be secured. Once received, the airline will be able to recommence operations, but regrettably under these circumstances, the practitioners have no choice but to voluntarily suspend all scheduled flights until the funding is confirmed.



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By **Katatumba Tyson Tommy**
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Qn: Briefly explain Boeing's presence on the African Market and why you think Boeing equipment is suitable for Africa.

Ans: Boeing's history in Africa dates back over 75 years. Since the introduction of the jet airplane, Boeing aircraft have formed the backbone of the continent's commercial fleet. We have more than 60 airline customers operating around 500 Boeing airplanes throughout Africa, and Boeing represents nearly 70% of the airplane market across the continent. Currently, we have an office in Johannesburg, South Africa, in addition to field service representatives co-located with commercial customers across the continent.

Our Boeing Commercial Market 20 year outlook, shows that airline growth in Africa, in terms of fleet growth and air traffic growth will exceed the global average:

- Airline traffic growth - RPK in Africa (5.4%) above global average (2.7%).
 - Airline fleet growth in Africa (3.4%) is also above global average (3.1%).
- Intra-Africa traffic will be the highest growth African market over the next 20 years, due to an increasing middle class demographic, increased

cooperation between African states, and a growing domestic network.

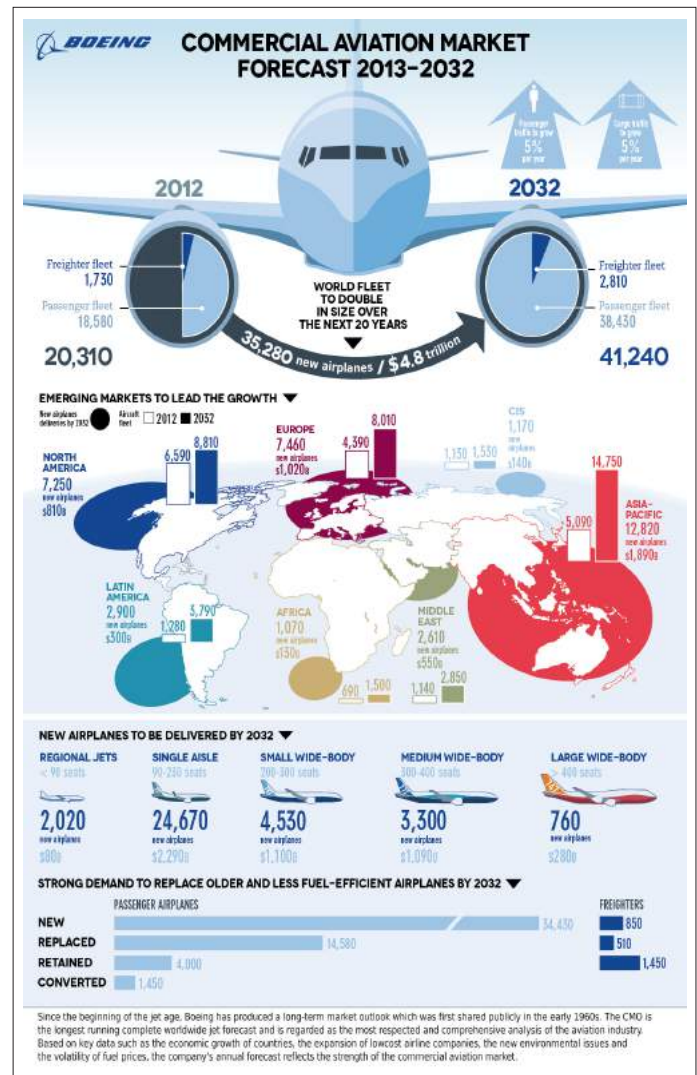
Over the next 20 years, Africa will need over 1,000 new airplanes valued at \$160 billion. Boeing is committed to further strengthening its role and to continue supporting the development of the continent's aviation sector. The Boeing fleet offers the versatility, modernity and efficiency to meet the needs of Africa's commercial aviation sector.

- 72% (740 airplanes) of the new deliveries are expected to be single aisle aircraft, such as our 737 MAX family, which the most efficient in its class in the industry now. It provides superior economic performance with 20% reduction in fuel consumption.
- 23% (240 airplanes) for widebody, such as our 787 family of aircraft.
- Nearly all of the demand (~95%) will be for small to mid-size widebodies like the Boeing 787-8 and -9 Dreamliner. The Dreamliner family offers 25% reduction in fuel consumption, 50% smaller noise footprint, and more comfortable travel experience for passengers. Economics and versatility of the 787 Dreamliner is important for African carriers as they compete with Middle Eastern & European airlines.

Qn: Boeing has been under scrutiny in recent years with concerns on safety. How has this affected the business in general and what plans do you have to ensure passenger safety and also to reassure the public that your planes are safe?

Boeing remains focused on driving meaningful changes designed to strengthen the safety practices and culture of our company. We're making progress towards the establishment of an enterprise safety management system, with an initial focus on our commercial airplanes business, and expanded safety resources for our team, including a confidential employee safety reporting system.

Engineering excellence is core to Boeing's culture. We have methodically strengthened our engineering function, including establishing a unified enterprise-wide engineering organization of 50,000 encompassing our programs, products and services. We appointed world-class engineers to key leadership roles, including a chief aerospace safety officer and a leader of our software engineering organization. We also separated engineering from our production function, which further empowers our teams to drive innovation.



As we look ahead, Boeing must anticipate and respond to the needs of our customers and shifts in the markets we serve. We must pursue, develop and retain top talent as we keep innovating for safety, sustainability and success. Continuing to invest in our people and areas critical to our business will strategically position us for future growth.

-How much did you lose as a result of the groundings of the 737 Max and how easy or tough has it been to redeem your image after that?
We will always remember those whose lives were lost on Lion Air Flight 610 and Ethiopian Airlines Flight 302. Since the accidents, Boeing has made significant changes as a company, and to the design of the 737 MAX, to ensure that accidents like those never happen again.



Safety is fundamental to the success of our industry, and the industry takes steps after every accident and incident to further improve safety for the flying public. Over the past 50 years, this journey of continuous improvement has made commercial aviation the world's safest form of transportation.

We continue to work with regulators and our customers to ensure the continued safe return of the 737 MAX to service worldwide. Since December 2020, nearly 190 out of 195 countries have approved a return to service. More than 40 operators have more than 600 737 MAX in revenue service. Since the FAA's ungrounding in Nov. 2020, airlines have safely flown more than 500,000 revenue flights, totaling more than 1.2 million flight hours with schedule reliability above 99 percent. (Data as of early May 2022.)

Qn: Boeing reported a wider-than-expected loss and weaker revenue for the first quarter of this year. To those asking, is Boeing on the decline, what would say to them?

While the first quarter of 2022 brought new challenges for our world, industry and business, we remain proud of our

team and the steady progress we're making toward our key commitments. We increased 737 MAX production and deliveries and made important progress on the 787 by submitting our certification plan to the FAA. Despite the pressures on our defense and commercial development programs, we remain on track to generate positive cash flow for 2022, and we're focused on our performance as we work through certification requirements and mature several key programs to production. Leading with safety and quality, we're taking the right actions to drive stability throughout our operations, deliver on our commitments to customers and position Boeing for a sustainable future.

Qn: With the air cargo boom, reports indicate that competition is doing better than Boeing cargo line. Are these reports true? If not, what sets you apart?

Ans: With the standout performance of air cargo, the industry is reminded again how important that segment of the market is, and we have the track record of delivering on the needs of customers. Freighters have been part of our DNA since before the jet age began and we feel we

have a great lineup from 20 tons up to 130 tons. Boeing currently supplies more than 90% of freighter airplane capacity as measured in available metric tons per kilometers flown (ATKs). We're not resting on that.

Air cargo remains a crucial piece of the global trade infrastructure, from manufacturing supply chains to e-commerce. According to IATA estimates, 2021 was the best year ever for air cargo revenue, up 95% through for full year 2021 vs. 2019.

The freighter market continues to be strong with 2021 cargo traffic 8% higher than 2019. Limited belly-cargo capacity from passenger airplanes has resulted in more freighters flying with high load factors. Air cargo capacity on dedicated freighters is up more than 30% vs. 2019. This demand is evidenced by record orders in 2021 for Boeing freighters, including new production models and converted freighters. In 2021, we had 84 gross orders for new production freighters (747-8F, 767F and 777F), outpacing the previous record of 83 in 2019. Also last year, we had more than 100 orders and commitments for Boeing Converted Freighters (737-800BCF and 767-300BCF, more than double the previous high mark. Most recently, our longstanding customer, Ethiopian Airlines, expanded its all-Boeing freighter fleet with an order for five 777 freighters which will enable the airline to capitalize on near-term cargo demand, while positioning it for further expansion in the future. In addition to this order, Ethiopian also signed a Memorandum of Understanding (MoU) in March of this year, with the intent to purchase five 777-8 Freighters, the industry's newest, most capable

and most fuel-efficient twin-engine freighter to help position the carrier for long-term sustainable growth.

Ethiopian Airlines currently operates nine 777 Freighters, connecting Africa with more than 40 cargo centers throughout Asia, Europe, the Middle East and Americas. The carrier's fleet also includes three 737-800 Boeing Converted Freighters and a combined commercial fleet of more than 80 Boeing jets including 737s, 767s, 787s and 777s.

Boeing launched the new 777-8 Freighter in January 2022 and has already booked 34 firm orders for the model, which features the advanced technology from the new 777X family and proven performance of the market-leading 777 Freighter. With payload capacity nearly identical to the 747-400 Freighter and a 30% improvement in fuel efficiency, emissions and operating costs, the 777-8 Freighter will enable a more sustainable and profitable business for operators.

Qn You have predicted considerable demand for new aircraft in Africa over the next 20 years. Is this still possible even with the safety concerns? What is the company doing to make this a reality?

Ans: As mentioned, Boeing shares a 75 year history in Africa. With more than 60 airline customers operating about 500 Boeing airplanes; representing nearly 70% of the airplane market across the continent. Our 20 year Commercial Market Outlook shows that, Africa will need





over 1,000 new airplanes valued at \$160 billion.

Boeing is committed to further strengthening its role and to continue supporting the development of the continent's aviation sector. We don't only sell aircraft, we are deeply invested in working with our key stakeholders in Africa to help overcome certain structural challenges in order to maximize their growth:

- Talent Pipeline: Developing and retaining skilled pilots, maintainers, and managers
- Financing: Reducing risk perception and sharing the African growth story with investors.
- Competitiveness: Achieving market liberalization and expanding business-friendly policies and programs.
- Safety: Implementing and upholding equivalent safety standards in Africa as the rest of the world.
- Operational Efficiency: Reducing operating costs, enhancing service quality, and strengthening profitability.

I'll give you two examples of where Boeing is trying to have an impact.

1. When it comes to Competitiveness in African aviation, it has long been a goal of the African aerospace community to see the full implementation of the 1999 Yamoussoukro Decision and the realization of a Single African Air Transport Market (SAATM).

Boeing continues to support advocacy efforts for market liberalization through our participation in the African Aviation Industry Group which aligns itself closely to the African Airlines Association (AFRAA).

2. When it comes to operating efficiencies, we know the challenges for African carriers selling into economies where domestic flights can cost upwards of three-quarters of average income whereas in for example, Thailand or the UK, a ticket might cost less than 10% of average income.

Through leveraging data, engineering innovations, and sustainability technology, Boeing is looking at ways for airline operators to lower costs, similar to what AFRAA achieved with its innovative Joint Fuel Purchase project.

Furthermore, we are committed to support the growth of the industry in Africa through our presence, industrial partnerships & community engagement activities through industrial partnerships.

Our investments in Africa have helped grow the local aerospace sector, creating jobs and driving innovation for mutual benefit. We work with eight suppliers across Africa, with partnerships valued at approximately \$41 million. I'll give a few examples:

- Over the past several years in Ethiopia, Boeing has expanded its manufacturing footprint and attracted overseas suppliers to the region as joint venture partners to local industry in the area of aircraft fuselage insulation blankets. Boeing has also deepened our commitment to growing the next generation of African engineers through university research collaboration.
- In 2016 Boeing launched an innovative project with the Kingdom of Morocco to design investment incentive programs to attract Boeing suppliers to local manufacturing clusters with the aim of creating as many as 8,700 new jobs by 2028.
- In 2021, Boeing invested in Kenya's aerospace ecosystem through a partnership to develop an innovation hub that will encourage entrepreneurship and new ideas for sustainable development.

We are also heavily focused on providing systemic improvements in education and economic empowerment



for those in poverty, to develop 21st-century skills such as digital employability, entrepreneurship and STEM. A few examples from just this year:

- Think Young Coding Schools in Kenya, Rwanda and Ethiopia. Girls are particularly encouraged to apply for the schools.
- Partnership with Digital Divide in Kenya. The partnership goes back 12 years and supports the online delivery of DDD's core Work-Study Program, which provides participants with training in business English, soft skills, and technology (BEST), in addition to tertiary education support and employment.
- Partnership with Hand in Hand in Tanzania: training farmers in the Kilimanjaro region on regenerative agriculture techniques. 90% of the participants are women.
- Expanding our successful partnership with Injaz-Junior Achievement into Africa. 'Our Future - Tomorrow Innovators' program. First stop will be Ghana in June 2022.

- Other examples include our partnership Leo Lagrange in Ivory Coast; and Ubuntu Pathways in South Africa – supporting the most vulnerable groups in society.

Qn Being that the aviation industry is still recovering from the effects of covid-19, how have you or will you assist African Airlines?

Ans: The global economy has bounced back from the COVID-19 recession and Africa is projected to grow above world average in 2022 and 2023. Africa's GDP is projected to grow at 3.86% & 3.72% in 2022 and 2023 vs World 3.15% and 3.28%.

Africa's aviation market is recovering in line with global trends. Similar to what we observed in the early phase of recovery in other regions, African airlines are predominately returning their smaller gauge aircraft to service first (widebodies are primarily used for long haul services, and the slowest markets to recover).

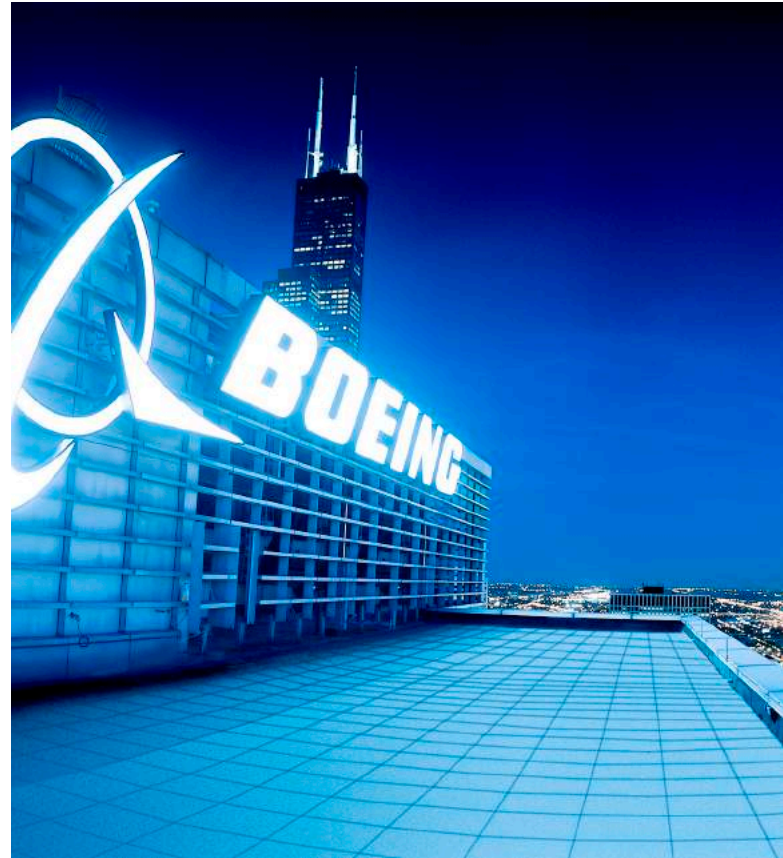
In terms of support, Boeing is connecting suppliers to available resources, sharing best practices, and in certain circumstances, providing direct support as we navigate this uncertain time, together.

Through the Confident Travel Initiative, Boeing has been working with airlines, industry organizations, infectious disease experts and behavioral specialists around the world to enhance health safeguards and develop new solutions. Our partners include the Air Transport Action Group, IATA, the Airports Council International, ICAO (International Civil Aviation Organization, a specialized agency of the United Nations), International Coordinating Council of Aerospace Industries Associations (ICCAIA) and others.

Qn: You are backing up Africa's first aviation hub by Kenya Airways. What inspired you to back it up and what impact will this hub have in terms of aviation in Africa? What will it be comprised of?

Ans: Our support of KQ's aviation hub is a manifestation of our commitment to, and our steadfast belief in, the role of Africa's aviation sector in the continent's economic potential.

Launched in July 2021, the Kenya Airways' Fahari Innovation Hub is a platform that brings together entrepreneurs and innovators to help accelerate the development of the aviation industry and tackle some of



its current and future challenges.

We are very proud of our partnership with Kenya Airways to support their new startup hub. We share a common objective to discover and empower new talent that will accelerate the growth of our industry. The industry has been through a tough two years, but it is resilient and promises to become even more competitive and complex. We have the opportunity to enable new entrants that think outside of our norm and consider new approaches to our business.

The Fahari Innovation Hub is an autonomous and agile business unit, created within Kenya Airways. Boeing will support the hub through equipping the center with software, hardware, furnishing, and other essential requirements.

Focused on being an epicenter for strategic innovation management, the center will offer opportunities for co-creation, collaboration, networking, research, and learning. It aims to stimulate innovation by providing expertise, resources, services, mediation, and support to other business functions and partner organizations.



Qn 8. With the emphasis currently being on reduction on carbon emissions, how is Boeing committed to assisting the aviation industry implement this?

Ans: On the sustainability front, Boeing supports and aligns with the aviation industry goals for carbon neutral growth from 2020 going forward and commitment to achieve net zero carbon emissions by 2050.

Boeing has a multi-faceted strategy that allows our industry to decarbonize aerospace while ensuring the connectivity, societal and economic benefits that come from air travel are available to people everywhere:

- Fleet renewal
- Network Operational Efficiency (including air traffic management)
- Sustainable Aviation Fuels (SAF)
- Fleet renewal
- New airplanes provide significant efficiency gains, and the airplanes that we deliver this year will be as much as 25- 40% more fuel-efficient than the airplanes they're replacing. Now, the 737 MAX is the most

efficient single aisle airplane, with 21% less carbon emissions than the similar sized 737NG.

- Fully deploying the latest generation airplanes is the most significant contribution to carbon emissions reduction available over the next decade.

Network Operational Efficiency (including air traffic management)

- The aviation industry continues to collaborate on how to operate and fly more efficiently, which collectively can reduce emissions by ~12%
- Boeing works with airlines, government customers, air navigation service providers and airports on efficiency improvements. These include procedures such as continuous descent approaches and equipment upgrades such as GPS-based navigation for more direct routings. We also develop services to leverage data for fuel efficiency, help customers optimize flight planning, and provide pilots with real-time weather and traffic information.

Sustainable Aviation Fuels (SAF)

- Sustainable fuels are key to long-term, large-scale CO2 emissions reductions that airplane technology cannot achieve, and offer the best potential to significantly reduce emissions on larger, longer-range airplanes for the next several decades. Sustainably produced jet fuel reduces CO2 emissions by as much as 80% on a gallon for gallon basis.
- For 15 years, Boeing has collaborated globally with airlines, governments, research institutions, SAF companies and other stakeholders to develop and approve SAF pathways.
- Last fall, Boeing partnered with the NASA Langley Research Center to test the emissions of SAF on the 2021 ecoDemonstrator
- In 2021, we have committed that our commercial airplanes will be capable and certified to fly on 100% SAF by 2030.
- Most recently in 2022, Boeing announced a supply agreement for two million gallons (7.5 million liters) of blended sustainable aviation fuel with EPIC Fuels to power its Commercial Airplanes operations in Washington state and South Carolina through 2022. The agreement is the largest announced SAF procurement by an airframer and further demonstrates Boeing's commitment to decarbonizing aviation.

Qn: How easy or tough is it being in your shoes? What are some of the plans that you have for African aviation? How will Africa benefit from your presidency?

Ans: I am truly honored to be in the position that I am in, leading Boeing's enterprise initiatives and presence in

some of our key growth markets, which includes Africa. I have a very personal interest in growth of aviation in Africa as I was born in Uganda and have deep family routes in Kenya and Uganda going back around a century, when my grandparents moved from British India to British East Africa. My family contributed significantly to building the foundations of these nations as they emerged from the colonial era and I am very proud to be playing a part in continuing that family tradition, albeit in the aviation sector.

I've been with Boeing for over a decade, and I was fortunate to have worked as its legal counsel across several key areas of the business and in several markets across the globe. In my last role, I served as vice president and assistant general counsel for Boeing Global Services, from its inception in 2017 based in Plano, Texas. Before that, I held roles as the regional counsel for Europe, Russia and Israel, based in London, and was regional counsel for India, Middle East, Turkey and Africa based in Dubai.

All this helped me foster a strong understanding of our industry, our value proposition and the markets we operate in as well as an appreciation of the depth of our engagement with the countries that we operate in.

The opportunity for growth of the African aerospace industry is remarkable. My focus now is on government affairs, new business and industrial partnership opportunities, corporate citizenship projects, expanding the Boeing presence and strengthening our relationships with customers and other stakeholders. It's a challenge that I am truly relishing and as I said before it is an honor and a privilege to be in this role.



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Pilots Retirement Age Legislation

Legislation to raise pilot retirement age in offing



By Vincent M. Mupenzi
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The movement among airline pilots to increase the retirement age has been gaining momentum for several years. Airline financial difficulty and employee pension issues have impacted the earning ability of commercial airline pilots, and led to calls to increase the artificial mandatory retirement age of 60 set by the Federal Aviation Administration (FAA) in 1959.

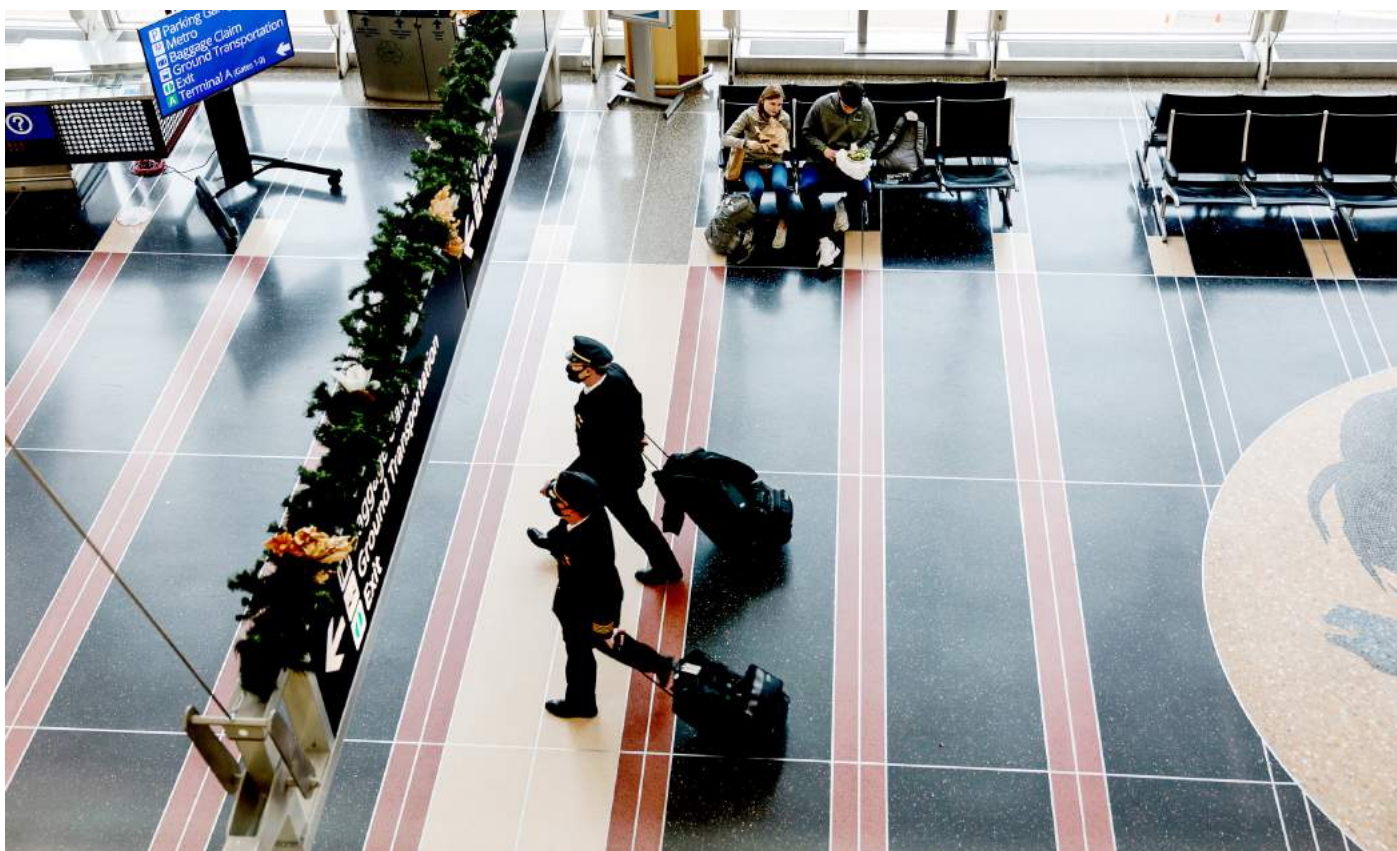
For decades, both airlines and pilots unions have fought attempts to raise the retirement age, but

momentum has shifted in recent years and leading pilots unions have softened their stance on the issue. To solve the pilots' shortage impasse, Sen. Lindsey Graham (R-S.C.) is said to be preparing to introduce legislation that would raise the retirement age for commercial airline pilots in the U.S. by at least two years, to 67. Graham is said to be in the process of building support among his colleagues in Congress before introducing the bill.

According to the current legislation, Airline pilots must retire at 65 years, an age that was set in 2007 from the initial retirement age of 60 years. Following a spike in early retirements at major carriers and a slowdown in the issuance of new airline transport pilot (ATP) certificates by the Federal Aviation Administration (FAA) during the pandemic, the industry is facing a shortage of thousands of pilots that is not expected to ease until at least 2023.

The shortage is forcing regional airlines, including Mesa Airlines and SkyWest Airlines, to ground planes and cancel flights. Even mid-tier carriers, Alaska Airlines and JetBlue Airways, say they face elevated attrition rates.

However, raising the retirement age does not address the industry's need for more new pilots, something that takes years and can cost hundreds of thousands of dollars due to the government's requirement for 1,500 hours at the controls of a plane



for ATP certification as a first officer, or 2,500 hours as a captain.

The Southwest Airlines Pilots Association (SWAPA), which represents pilots at Southwest, asked pilots on May 12 to vote in a poll on whether they supported raising the mandatory retirement age. “The SWAPA government affairs committee is closely monitoring the issue and working closely with our industry partners to determine the road ahead,” the union told members in a notice.

“There won’t be a quick fix but we’ve got to work on shoring up that domestic aviation workforce,” Transportation Secretary Pete Buttigieg told the Senate Commerce, Science, and Transportation Committee on May 3. He said the FAA was preparing to award \$5 million in workforce development grants to help boost pilot supply but did not provide specifics for easing the immediate shortage.

Cowen & Co. analyst Helene Becker wrote in April that the U.S. government needed to take a three-pronged approach to easing the pilot shortage. Those prongs included lowering the hour requirement for new ATPs,

allowing consolidation to reduce duplicate flights, and temporarily raising the pilot retirement age to 67.

“We expect this pilot issue to persist for the foreseeable future as airlines seek to replace retirements that occurred during the pandemic, retirements that continue and won’t peak until later in the decade, and growth,” she wrote. Outgoing Allegiant Air CEO Maurice Gallagher commented on the pilot situation in a letter to shareholders on May 12.

“We are facing a chronic scarcity that will last for years given the known retirements and the projected numbers of new pilots entering the system. The numbers suggest by 2030 the industry could have a deficit of almost 30,000 pilots. At 16 pilots per aircraft this will correspond to 1,800 aircraft that will be parked or the equivalent of two US legacy carriers such as [American] and [United],” he said.

Sen. Kyrsten Sinema (D-Ariz.) will lead a Senate Commerce Committee field hearing outside of Phoenix on May 13 centered on developing the aviation workforce.

Credit: Edward Russell

Sustainability and growth compatibility in air travel today

By Yann Cabaret, CEO of SITA for Aircraft



The current turbulent economic environment is undoubtedly adding fresh challenges for aviation, an industry still recovering from the devastating impacts of COVID-19. Operating on reduced margins and with an ambitious carbon net-zero goal by 2050 to achieve, can the industry feasibly ensure its success and long-term growth post-pandemic?

We believe that growth and an environmentally sustainable industry are not mutually exclusive, but to achieve both, we need to start now.

Aviation's recovery and the benefits to the global economy

SITA data shows that the industry's recovery in 2022 is underway: in 2021, global air traffic was at 64% of pre-COVID levels for 2019, but still up 18% on figures for 2020. The signs are encouraging for 2022 and beyond. But what is also clear is that airlines face another year of dealing with adverse economic shocks, placing increasing pressures on their costs and activities. In 2021, the pandemic's impact resulted in losses of over \$51.8 billion for airlines, though significantly less than in 2020 when the pandemic first swept the world.

In particular, we have seen a significant surge in fuel prices, one of an airline's biggest costs. The average price of jet fuel in April 2022 is 118.5% higher year on year, an additional \$108.4 billion burden on our industry.

Given aviation's contribution to the global economy – contributing some \$3.5 trillion to the world's global domestic product (GDP) – the industry

must still plan its recovery and growth without negatively impacting the environment.

Sustainability is not new or prohibitive for aviation. The industry's carbon net-zero by 2050 commitment (made in 2021) is challenging but inevitable to address climate change at the pace and scale required by climate science and to counteract any growth in the industry's emissions in the future.

Reducing environmental impacts is not new for aviation or prohibitive to the success or growth of the industry. For many years, aviation has addressed its environmental impacts, including air quality, noise, and emissions.

IT is enabling sustainability and recovery

We see an industry now looking to use technology to build back better and greener following the pandemic. SITA's latest Air Transport IT Insights study reveals that the industry is planning for its future by investing in technology to support both its recovery and sustainability efforts. Some of the investment drivers will respond to rapid shifts in passenger traffic and travel regulations, the anticipated rise in demand for travel, increasing operational efficiencies to make cost savings, and reducing carbon footprint.

Airports' and airlines' IT spending priorities are focused on improving the passenger experience with more digitally enabled journeys and more sustainable operations with energy efficiencies, smarter infrastructure, and solutions such as data-driven flight path optimization to enhance route efficiencies and reduce fuel burn and carbon.

To simultaneously boost post-pandemic economic recovery and sustainability, many governments provide economic green stimulus programs such as private sector investments to develop a new green technology market. The growth opportunities for airports and airlines today. The rising fuel price is likely to be a catalyst to drive a

faster move to more sustainable fuel sources. Though sustainable aviation fuels (SAF) and new energy-efficient aircraft and engines are two primary ways for the industry to cut carbon emissions and its reliance on fossil fuels, they cannot be widely achieved today given availability and affordability issues.

Operational improvements are a primary measure to enable the industry to directly and more immediately reduce their emissions by up to 10% - efficiencies that can be achieved through today's technology. For example, airports can process their passengers swiftly, even enabling remote check-in before arrival, by deploying passenger processing and self-service technology. This enables airports to maximize their existing investment without having to invest to expand their physical footprint.

Using technology to leverage data for greater situational awareness and more informed decision-making is key to realizing efficiencies and emission reductions. For example, SITA is trialling a new emission management capability, leveraging our Airport Management solution, to enable Palermo Airport to improve the measurement and optimization of emissions in and around the airport.

We are also helping airlines improve situational awareness and reduce fuel burn, emissions, and costs while building climate resilience by integrating our eWAS Pilot and OptiFlight applications. The results are immediate and concrete. Climb fuel savings of 5% are possible for each flight without affecting passenger safety or comfort. The financial pressure on the industry may just be the catalyst to making lasting changes for a more environmentally-conscious industry without losing the economic benefits of a strong airline sector.

Credit: Yann Cabaret, CEO of SITA for Aircraft, SITA

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Kenya Airways' long journey to recovery

By Evans Kimani
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Kenya Airways is the national carrier of Kenya and has been in operation for 45 years. The airline, based at the Jomo Kenyatta International Airport, has an active fleet of 32 aircraft consisting of; 9 Boeing 787-8 Dreamliners, 5 Boeing 737-8NG, 15 Embraer E-190 as well as 2 Boeing 737-3F, serving 51 destinations globally.

Covid-19 Pandemic: Impact & Recovery Phase

Kenya Airways recorded its worst loss since its inception of ksh.36billion in 2020. This was directly attributed to the covid-19 pandemic.

As Alan Kilavuka took over Kenya Airways as CEO on April 2020, it was clear that the airline's main priority was damage control from the sudden halt of passenger movement and service provisions by the airline.

As a trend that was witnessed by various airlines in the world, Kenya Airways quickly turned to cargo operations, an area that previously accounted for only 10% before the pandemic. The cargo sector, which was highly essential due to the transportation of key medical equipment, KQ was able to centralize its operations in this business.

The airline focused on the transportation of agricultural and horticultural products to various parts of the continent, Europe, and China in a bid to sustain the airline as well as protect the local farmers. The key global achievement of the airline, was the renovation of two of their Boeing 787-8 Dreamliners to a full-scale Freighter, which certified the aircraft to carry more than 16 tons of cargo, enabling it to reach its maximum payload of 46 tons.

The project, coordinated by KQ and Avianor, was the first of its kind for the Dreamliner aircraft and through the Freighter project, the airline believes that it will serve as a model for developing their cargo business, which they hope to increase by 20% in the next 3 years.



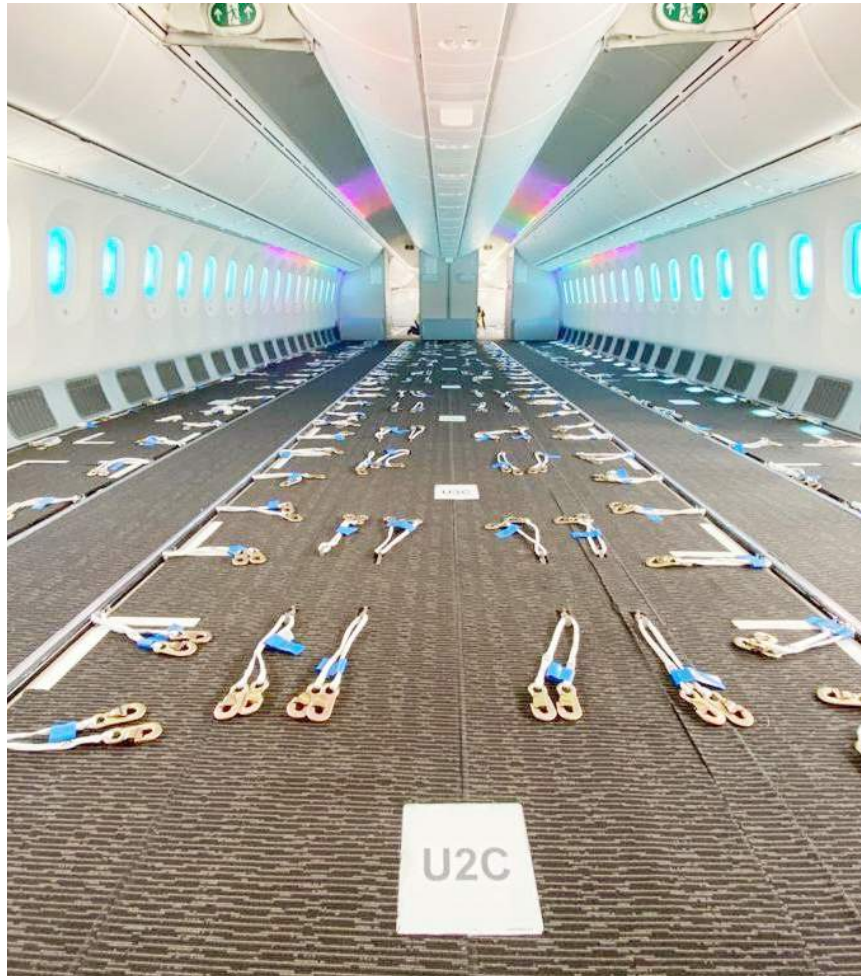
The AFCFTA Factor in KQ's Business Model. The African Continental Free Trade Area (AFCFTA) is a free trade area that was founded in 2018 to boost trade in Africa by enabling a single market of goods and services. The agreement forms a crucial factor for Kenya Airways' growth. This is as nearly 60% of the airline's network is in Africa with various destinations in all parts of the continent.

During the 10th African Airline's Association's (AFRAA) 10th Aviation Stakeholder's Conference that was held in Nairobi in May, the CEO of Kenya Airways lamented the challenges faced by Africans traveling within the continent. According to AFRAA, 75% of African countries require other Africans to be given a contemporary visa, while another 40% of African countries require other Africans to apply for a traditional visa.

The documentation hurdles, and the high fares of flights within Africa, has hindered the airline's growth plans in the continent. The airline believes that the ratification and commencement of the AFCFTA deal shall increase regional trade hence increasing travel within the region through initiatives such as 5th freedom rights in the continent along with creating more capacity for the region which would enable more people to travel.

For this to be fully achieved, Alan Kilavuka believes that through inter-government coordination, the elimination of costs and taxes that are incurred directly to the airline, would encourage more people to travel. Furthermore, stakeholders such as airlines and governments are encouraged to have more dialogue to create solutions to mitigate the stringent visa measures that are imposed on Africans.

This is as the national carrier of Kenya's post covid recovery has been facilitated by its intra-African routes that it operates, as many of the African countries were able to open



up quickly as compared to the other regions. The airline currently serves 31 destinations in Africa.

KQ's Approach on Cost-Saving, & Post COVID Strategies.

During FY2021, KQ saw a reduction of losses to 15bn KSh, which signified a 56% reduction from its 36billion loss experienced in 2020. This was attributed to the introduction of cost-cutting measures, mainly from its operations sector where the airline reduced its fleet ownership costs as well as the renegotiation of some of its leasing agreements, which saw the airline save 26.7% of its fixed costs. This was done by changing the lease agreements from the traditional fixed costs to hourly rates to ensure that the aircraft were used according to the demand required.

As sighted by the key account holders of the airline, KQ adopted a strategy where slots were created on a demand basis rather than on a scheduled basis. It enabled the airline to reduce some of its crucial operation costs such as fuel, which accounts for 30% of its total operating costs. As the airline anticipates the fuel costs to rise, the dispatch of

aircraft on a demand basis has proved to be effective for the airline's recovery.

Conclusion and way forward

The role of the stakeholders in the recovery of Kenya Airways cannot be ignored. They all have a role in the growth of the airline. Furthermore, the government of Kenya, as well as the other governments that the airline serves, plays an important role in enabling aviation to be more accessible to all people.

Through the reduction of taxes and fuel, the airline does


have the potential to expand its operations and be able to connect millions of Africans. This can be achieved through collaborations with other airlines to ensure seamless connectivity within the continent to other parts of the world in line with the AFCFTA agreement. The recently published intention of Kenya Airways and South African Airways to form a Pan-African Alliance serves as a crucial component in enhancing connectivity in the continent. Through this, Kenya Airways will maintain its position as the Pride of Africa.

KENYA AIRWAYS


FY2021

Ksh.15bn

The FY 2021 Losses were Recorded by the airline. This was a 56% reduction from FY 2020 when the airline lost Ksh. 36Bn, the highest loss recorded in the airline's history.



Fixed costs saved after fleet adjustments and modifications of leasing agreements




Fuel accounts for a third of the airline's operational costs


Source: Kenya Airways

KENYA AIRWAYS

CARGO OPERATION FACTS




KQ Cargo's contribution to the airline's revenue stream.



KQ Cargo's expected growth in the next 2-3 years

Kenya Airways became the first airline in the world to successfully convert a Boeing 787-8 into a cargo aircraft, gaining the name "Preighter"



KQ Cargo operates 2 Boeing 787-8 Preighters and 2 Boeing 737-3CF

Source: Kenya Airways

KENYA AIRWAYS QUICK FACTS

IATA CODE: KQ

1977

Year the airline was founded after the breakaway of the East African Airways

NBO


The hub of Kenya Airways, the Jomo Kenyatta International Airport

32

Active fleet currently operating for Kenya Airways

51

Destinations operated by Kenya Airways, 31 of them being in Africa



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Issues affecting connectivity and market access in Africa

By Harriet James
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Simon Netwon Smith interim Executive Commercial SA Airlines

Africa is the world's second largest and second most populous continent in the world, with a land area of 30.4 mn sq. km, is a market of 1.2 billion people and an estimated GDP of US\$ 2 trillion in 2017. While this at a glance seems like an opportunity for the continent to thrive, connectivity still remains a key challenge that hinders this development from taking place.

At the recent Africa's Travel Indaba that took place in Durban South Africa, various players in the aviation industry discussed on the pertinent issues affecting connectivity and how the continent can move forward when it comes to this. According to Shingai George, a Data analyst and insights expert at Forward Keys, connectivity should mean easy access from one point to another in a hustle free as well as cost effective way.

He adds that for this to take place, governments must learn how to work with private organizations to harness data that will enable them make informed choices. "When it comes to data, we are not just talking about historical data which is hugely accessible, we need to look at how what is happening now will also impact the future. Data is a critical component in route and air connectivity.

For instance, when we look at search data or where people are searching to go, that's where we can know where people are travelling and where the opportunities are and where the destination can market its products," he notes.

According to Foreward Keys research, when it comes to intra-African travel, the average consumer has two airlines options as opposed to intra-European travel which have airlines at their disposal. There are also low cost and legacy carriers in the European continent which is a sign of a healthy market. In intra-Africa travel, 95 per cent of traffic is dominated by legacy carriers.

"Low cost and legacy in Africa can only survive in the same market provided that there are regulations that allow them to do so. The low cost carriers enable air transport to be more accessible to the general public," continues Shingai.

He adds that secondary airports must also be developed as a supplement to the international airports for connectivity to thrive.

"When developed, we must also develop intermodal connectivity and transportation links between the secondary airports to the populations that they serve.



From the research, hubs are still a critical component for air transport connectivity. There will be route for new entrance in the shape of low cost carriers and secondary airport. Lastly, data is a key component in the process of route development and air connectivity.

The regulatory environment needs to be more enabling in order for more airlines to emerge. At the same time, we need to bring investment or access to funding for startup airlines to grow and develop," he says. Another frustration that Shingai notes is the disconnect between public and private sector in that there lacks much investment in new technology and data in particular.

"All decisions that involve connectivity need data. By the end of the day there is a need for that investment and willingness to leverage on the information not just data for the sake of numbers but to actually understand what the date is saying, the insights and gems in the data," he



was launched in January 2018, it was enthusiastically embraced as the key that would unlock air travel in Africa.

Although 33 countries in the continent are signatories to the project, industry observers are not optimistic that many countries in Africa would open their airspace for a single air market in the continent.

“We have 55 countries and we need to ensure that all of them sign the Single African air transport since its just 35 that have signed. Most are still stuck on the bilateral agreements and are not implementing the agreement. Some have not yet developed direct routes and you have to go through Europe to reach their countries before you come into Africa,” observes Dr. Gainmore Zanamwe, Senior manager Intra-Africa trade initiative for Africa export and import bank.

Zanamwe adds that while opportunities to advance are there, African countries must shift from just talk to action which will in turn create employment opportunities for the millions of youths in Africa. To solve the issue of connectivity, the bank has created a facility for financing aircraft through debt, risk sharing.

“We also provide leasing and we are working on ensuring that the leasing arrangement we can support those who are trying to get into the industry. We also want to have an African leasing platform to try and address the issue on

continues.

For South African Airways, connectivity means looking at the underlying market demands between multiple points and creating them to develop a market.

“We also look at whether there’s enough low traffic on either ends to then build the route. Where frequency comes in, is where there is a big opportunity for Africa to create simplicity for people to travel.

If you only can connect to a destination only twice a week that creates restrictions and it doesn’t make thing easy for people to travel. Our goal as an airline is to build enough frequency for daily service and additional frequency. Connectivity also means opportunity to work with partners to grow the market and the demand,” said Simon Newton Smith, the interim executive commercial South African airlines.

When the Single African Air Transport Market (SAATM)



the declining African ownership of the aviation sector," he says

Another thing that the bank has noted is the rise of medical tourism which is an opportunity for benefit if the continent solves its connectivity issues.

"We are losing billions when people are traveling to India to be treated yet in Africa we have doctors and specialists but no infrastructure to connect the countries. We need to build the proper infrastructure and give doctors salaries to lure them to come and work with us. We have put in place construction medical tourism relay facility which is helping medical tourism infrastructure. For instance, in Nigeria, they are already building the African medical center of excellence which will deal with all the diseases and the key issues that make people travel abroad," he continues.

For connectivity to be there, there has to be money and this is why the bank is engaging AFTRA to support the African aviation industry.



DID YOU KNOW!

Interesting aviation facts



- Auckland to Doha on Qatar Airways is the world's longest flight by distance at 14,525 kilometers.
- Singapore Airlines spends approximately \$700 million on food every year and \$16 million on wine.
- In 1987 American Airlines saved \$40,000 by removing one olive from each salad served in first class.
- An aircraft takes off or lands every 37 seconds at Chicago O'Hare's International Airport.
- The Boeing 747 wing-span (195 feet) is longer than the Wright Brothers first flight of 120ft.
- The 747 family has flown more than 5.6 billion people - equivalent to 80% of the world's population.
- The longest flight in the world takes 18 hours 38 minutes
- The largest building in the world is an aircraft-production factory
- Aeroplanes are lightning resistant
- Flying changes your taste buds
- Over 1.5 litres of your body's water is lost each long-haul flight



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5G

and Aviation Safety

5G is the 5th Generation Mobile Network technology succeeding 4G-LTE that is being designed by the International Telecommunication Union (ITU-R) and 3rd Generation Partnership Project (3GPP)

**By Maximillial Philberth
Kalukamisa**

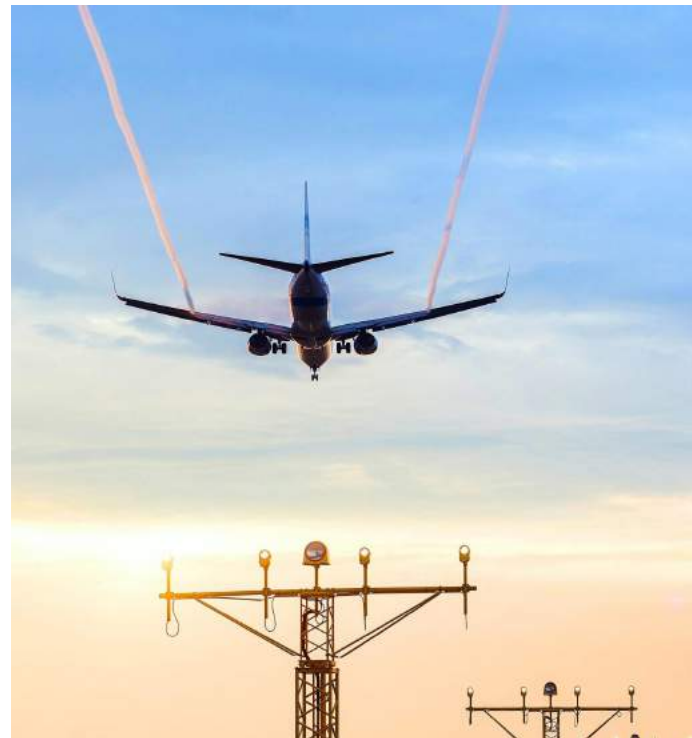
What is 5G?

5G is the 5th Generation Mobile Network technology succeeding 4G-LTE that is being designed by the International Telecommunication Union (ITU-R) and 3rd Generation Partnership Project (3GPP) to virtually connect everyone, and everything, including machines, objects, and devices, together on the internet to provide an immersive experience, telepresence, and massive connectivity as well as promoting internet of things (IoT) at the faster data rate. 5G can reach a data rate of up to 20 Gbps and a user experience of up to 100 Mbps, low latency compared to 4G, support device density of 1 million devices per 1 Km², and the mobility of 500 Km/hr. which can support high-speed railways and flying drones.

5G technology services are delivered using the upper band of UHF (Ultra high frequency), SHF (Super High Frequency), and the lower band of EHF (Extremely High Frequency), of the radio frequency spectrum. The 5G frequency ranges are 1 to 4 GHz, 6 to 24 GHz, 30 GHz, and 40 GHz ranges.

5G Deployment in different countries.

Since the commercialization of 5G in April 2019, more than 88 countries have invested in, tested, deployed, and launched 5G network services in different radio frequency ranges. For instance,





the European Union and South Korea use 3.4 to 3.8 GHz and 3.42 to 3.7 GHz bands respectively, while the USA uses 3.7 to 4.2 GHz bands.

Risk of Interference of Aircraft's Radar Altimeter from 5G Radio Frequencies

The Radar Altimeter, also known as a Radio Altimeter or, a low range radar, is a critical instrument that enables and enhances several different safety and navigation functions in civil, commercial, and military aircraft by determining and showing height above the ground level. It provides situational awareness to the crew during different phases of flight and instrument approaches.

The Radar Altimeter operates in an Aeronautical Radio Navigation Service (ARNS) spectrum allocation, in the 4.2 to 4.4 GHz band, and its information forms a part of the Terrain Awareness and Warning System (TAWS), Traffic Alert and Collision Avoidance System (TCAS), wind shear detection system, Flight control system, Auto land systems (including auto throttle and automated landing flare and roll out), Automatic Flight Guidance and Control System (AFGCS), as well as Electronic Centralized Aircraft Monitoring (ECAM) system.

A study conducted by Radio Technical Commission for Aeronautics (RTCA) in 2020 found that both 5G base stations and user equipment on board an aircraft operating in the 3.7 to 4.2 GHz frequency band (currently deployed in the USA) presented a risk of harmful interference to Radar Altimeters (these operate in the 4.2 to 4.4 GHz range) across all aircraft types with far-reaching safety consequences and impacts to aviation operation. Radar Altimeter interference from 5G radio signals can cause loss of radar altitude information or, worse, incorrect radar altitude information unknowingly being generated.

Impacts on the USA Aviation Sector

The Federal Communication Commission (FCC) auctioned a frequency band from 3.7 to 3.98 GHz of the allocated 3.7 to 4.2 GHz frequency band to telecommunications companies AT&T and Verizon and some regional airports were included in the network deployment.

Because this frequency band sits close to the radio altimeter operation frequency of 4.2 to 4.4 GHz, the interference could lead to safety consequences in the aviation industry. As a result, the Federal Aviation Administration (FAA) imposed restrictions on aircraft operation which led to airliners delaying, diverting, or cancelling their flights in airports installed with 5G and during poor weather.

Turkish Flight 1951 Crash Due to Fault Radar Altimeter
On 25th February 2009, The Turkish Airlines Flight 1951 operating a Boeing 737-800 from Istanbul, Turkey and carrying 135 souls crashed at Amsterdam Schiphol Airport, the Netherlands after stalling while landing at 400 ft. due to faulty radar altimeter and pilot error.

The faulty radar altimeter caused the automatic throttle control system to decrease power to idle during the approach. The crew noticed this too late to take appropriate action to increase the thrust and recover the aircraft before it stalled and crashed. The airliner broke into three pieces on impact resulting in the deaths of 9 passengers and crew, including all 3 pilots.

The Likelihood of the Co-existence of 5G and the Radar Altimeter

Aviation safety and 5G can co-exist, but stakeholders must collaborate to find and lay permanent solutions. Some of the implementable solutions could include:

Updates to Radar Altimeter

Future radar altimeter designs should be improved to become resilient to radio frequency interference in the 3.7



to 3.98 GHz band by updating the Minimum Operational Performance Standards (MOPS). The Altimeters should then be certified with additional performance requirements for the RF interference rejection. In the step to solve the problem, the FAA has approved new and more robust and reliable radar altimeters which are resistant and eliminate 5G C- Band radio signals interference with unique digital signal processing (DSP) technology.

Reducing 5G Power Levels and Antenna Heights

Every country deploying 5G could impose some level of restrictions on its use to protect radar altimeters against harmful interference. These may include reducing both power levels of 5G transmissions and antenna heights near airports, and along approach and landing paths. Also, 5G transmissions could be limited to antennas pointing skyward and at the locations near public helipads. These measures will ensure that 5G operates at a farther distance from the aviation environment and limit the directional tilt of the 5G antennas.

Sufficient Spacing for 5G Frequency Bands from the Radar Altimeter

ITU standards specify an adequate margin of a 6dB requirement from a Radio Altimeter's operating frequency limits to eliminate the possibility of radio interference by other radio frequency services. Countries, when choosing and managing frequency spectrum for 5G, should ensure required spacing between frequency usages to eliminate interference possibility. For instance, the European Union and South Korea chose 5G frequency bands far from Radio Altimeter frequency limits and did not experience cases of interference with their operations.

Restricting 5G in the Airport Vicinity

I advise countries to restrict the deployment of 5G in the airport vicinity unless viable solutions are in place to mitigate interference of radar altimeters from 5G signals. When Canada approved 5G in the frequency band of 3.45 to 3.65 GHz restrictions against it in the vicinity of 26 airports to ensure aviation safety were placed.

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AFRAA 10TH AVIATION STAKEHOLDER'S CONVENTION

By Vincent M. Mupenzi
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The 10th Aviation Stakeholders Convention hosted by the African Airlines Association (AFRAA) and Kenya Airways kicked off on the 8th of May 22, 2022 in Nairobi, Kenya at the Emara Ole-Sereni hotel. The two-day convention provided a platform for showcasing new developments and innovations in aviation, discussing industry business trends, networking and forging new partnerships.

The Convention organized under the theme: "Beyond the crisis", brought together over 500 delegates from 47 countries across the globe who

attended both physically and virtually. The Convention is one of Africa's major forums for air transport industry stakeholders to dialogue, exchange knowledge and experiences for the development of the travel ecosystem. A total of 34 African airlines were represented at the event, with 12 airline CEOs in attendance.

Speaking at the convention on the importance of establishing lasting relationships and partnerships between aviation stakeholders for the benefit of African Aviation, Mr. Abdérahmane

Berthé emphasized the need to draw out-of-the box solutions and regional initiatives for Africa: “AFRAA, in coordination with African Union Commission (AUC), African Civil Aviation Commission (AFCAC), and African Aviation Industry Group (AAIG), will convene the first lab meeting to be held from 27 June to 01 July 2022. “I call upon stakeholders to join this noble initiative which will bring experts from various sectors to craft solutions to transform business in the region and ensure the efficient development of intra-Africa air transport.”

Dr. Eng. Joseph K. Njoroge, CBS, the Principal Secretary, State Department for Transport Government of Kenya commended the various actions taken by aviation industry players such as ICAO, AFRAA, IATA and the AUC to mitigate the impact of COVID-19 on civil aviation as a whole and the strategies crafted to sustainably recover. He called upon continued cooperation for a resilient recovery and growth of the industry noting: “Among the industry actions for recovery by airlines is the enhanced cooperation and collaboration.

This will establish stronger and more efficient airlines with business models that will allow them compete internationally and improve Africa's air traffic market share which is currently very low.”

Mr. Allan Kilavuka, CEO – Kenya Airways emphasized on the importance of exchanging knowledge and experiences to inspire a sustainable and resilient aviation. “COVID-19 posed the greatest risk to the aviation sector but we remained resilient as an industry and Carried on. Planes continued to fly, delivering tons of freight, bringing our people home from overseas, and keeping people connected with their families across the continent. As we fly towards a better future, sustainability will be a key priority for Africa's aviation sector.

Our current ecosystem provides us with the necessary ingredients to maximize our efficiencies and productivity by evaluating strategic areas of synergies that can demonstrate effective ways of doing business



and this can only be achieved through shared experiences and learnings that will ensure business continuity as we are doing today.”

Event Highlights

Aviation ecosystem stakeholders at the Convention deliberated between 09th – 10th May 2022, on the various on-going and expected actions towards the revamping of the air transport industry in the context of the African continent. The Convention marked the return to AFRAA's in-person events after a two year period of lockdowns and travel restrictions. The presence of several African airline CEOs was a true testament of the leaders' readiness and dedication to support aviation recovery and rebuild a sustainable resilient future.

CSR event for youth development in aviation.

On 7th May, the Convention activities commenced with a CSR activity aimed at empowering the next generation of aviators at the Kenya Airways Pride Center. The event was sponsored by Collins Aerospace and staged in collaboration with AFRAA and Kenya Airways. A total of 132 High School students from 7 schools in Kenya benefited from the session aimed at supporting youth development in aviation.



Conference sessions

Over the 2 day Conference program, delegates had the opportunity to network and discuss developments in the industry and forge business partnerships. In addition to the conference plenary sessions, the programme was structured to incorporate scheduled one-to-one appointments where delegates could have exclusive meetings with airlines, selected airports, CAAs, IATA, ICAO and AFRAA. There was also a master classes where cutting edge ideas, industry best practices, new opportunities and practical solutions were presented and discussed. The following masterclasses also took place:

- Class 1: Aircraft configuration and fleet decisions for recovery by Embraer.
- Class 2: Showcase of selected AFRAA Projects.
- Class 3 Regional Operators' Opportunities for Route and Network Planning by De Havilland Aircraft of Canada.

Exhibition

There were 25 exhibitors at the Convention displaying their products and interacting with delegates at the conference. The exhibitors included: AFRAA, African Civil Aviation Commission (AFCAC), AMREF Flying Doctors, AMST Aviation, Astral Aviation, AVIACO, Avmax Spares, Boeing, Collins Aerospace, DPO Group, Flightline Training, Global Load Control, Kenya Airports Authority, Kenya Airways, Kenya Civil Aviation Authority, Lufthansa Systems, National Aviation Services, Pratt & Whitney, RwandAir, SatNav AFRICA JPO, SITA, South African Airways Technical, South African Airways Technical, Star Navigation Systems Group Ltd., Swissport Kenya and The Aviator Africa.

Sponsors

The Stakeholders Convention was proudly sponsored by: Collins Aerospace, Kenya Airports Authority, Kenya Airways, Kenya Civil Aviation Authority, ASECNA, Airbus, Astral Aviation, Boeing, Kenya Tourism Board and NAS Servair.



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An outlook of the African aviation industry

Challenges and Opportunities in the African Aviation Sector

By Vincent M. Mupenzi
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African Aviation Industry has faced many challenges over the past decade and still lags behind the rest of the world. With its strong population and economic growth coupled with a significant tourism potential, Africa's Aviation Industry is set to grow in spite of a cocktail of challenges facing the Industry.

The United Nations Forecasts Africa's population growth to reach 1.63 billion in the year 2030. Africa will be the third fastest growing region in the world in terms of international traffic with an average growth rate of 6.1% compared to the global average of 5.8%, and 7.9% and 6.9% for the Middle

East and Asia Pacific, respectively, while Europe, Latin America and North America are projected to record lower international passenger growth of 5.0%, 5.8% and 4.9%, respectively.

This growth trend is expected to continue in the coming years due to a number of factors, notably robust economic growth, demographic boom, increasing urbanization, and emergence of the middle class. Air transportation plays a vital role in the country's growth process by accelerating convergence of goods and persons. The contribution of air transport far exceeds that of road transportation sevenfold.

Growth in air transportation has directly mapped into economic growth due to spillover effects through creation of direct and indirect jobs in the industry and other auxiliary sectors such as tourism and other service sectors. Expansion in air transportation creates market opportunities for local entrepreneurs by creating regional and global economic centers.

Market overview

Africa's Aviation Market is characterized by both concentration and fragmentation. The top 5 countries in Africa account for 69% of total traffic,





while the bottom 43 countries account for only 31% of total traffic, resulting in an individual markets size of less than 1 million passengers per year. According to the ACI Statistics and traffic forecast report, passengers are expected to grow to 400 million passengers by the year 2027 with South Africa and Egypt taking the lion's share of those passengers at 28% and 24 % respectively.

Traffic Patterns

The market is still dominated by old colonial trade ties, south and northern Africa economic poles with low connectivity between African countries with market segmentation by travel destination as measured in non-stop daily seats at 22% for Intra Africa, 36% for Domestic and 42% for Inter-continental. When looking at Market Segmentation by region according to OAG (2010) Central Africa accounts for 6%, Eastern Africa 16%, Western Africa 19% Northern Africa at 25% and Southern Africa at 34%.

Challenges to the African Aviation industry

The growth of the African aviation sector is hampered by a number of factors notably; Poor record of safety and security, lack of adequate

resources and infrastructure, distance and limited connectivity, lack of regulation, cost of operations and market protectionism among others.

Safety and security challenges;

Safety is the most pressing challenge facing the aviation industry in Africa. The frequency of accidents stems largely from inconsistency in the implementation and enforcement of internationally accepted safety standards and practices. The International Air Transport Association (IATA) jointly with the International Civil Aviation Organization (ICAO) and other organizations have committed to supporting the Africa Strategic Improvement Action Plan of the African Union.

Cost of Operations

African air fares are among the highest in the world which stems from lack of market scale, highly fragmented markets, Poor safety records as well as high airport and air fees. Inadequate infrastructure:

The air transport industry faces various challenges including poor airport infrastructures, lack of physical and human resources, limited connectivity, and lack of transit facilities. Although substantial progress has been made during the past decade, Africa still lags behind other regions in terms of "soft" and "hard" infrastructure. It is therefore critical that African countries invest in the soft as well as hard infrastructure to support the industry.

Poor government regulation and actions: Despite increased liberalization of the African aviation industry and the growing presence of foreign companies, some African governments are still reluctant to open their skies fearing foreign competition could undercut national airlines, some of which are short of commercial viability besides being just symbols of sovereignty. These challenges require governments to enhance regulation of aerospace management, consumer protection and safety of airlines. Lack of aviation experts and skills, high airport taxes and fees, the weak connectivity



and restrictions on transit visas and facilities add to the menu of impediments affecting Africa's aviation industry.

Market Protectionism

Twenty five African countries have weak private or small state-owned carriers i.e. Algeria, Angola, Burkina Faso, Botswana, Cape Verde, Chad, Comoros, Djibouti, DRC, Libya, Madagascar, Malawi, Mali, Mauritania, Mozambique, Namibia, Rwanda, Seychelles, Senegal, Sudan, Tanzania, Tunisia, Uganda, Zambia, and Zimbabwe. While these countries have signed the Yamoussoukro Accord, their management of bilateral accords reflects clear patterns of protectionism of home based airlines as they account for nearly 40% of total African demands, their protectionism policies impact the entire African market.

Opportunities to the African Aviation Industry

Africa can capitalize on her growing population and vast land mass to foster the Aviation sector. Better connected African countries and regions through a viable air transport industry could be the catalyst that can boost intra-African business, trade, tourism as well as cultural exchange. Well-crafted open sky policies will help increase air market growth but only in a sustainable manner in countries where safety oversight is good.

Africa will also need to adopt a market consolidation policy. Market consolidation will encourage a market services specialization among airlines operators; large airlines will focus on international and intra-African markets using a hub/spoke system with worldwide alliances; LCCs will focus on point-to-point, no-frill services.

South Africa, Egypt, Morocco and now Kenya have pioneered this well-known hybrid model successfully in Africa. As long as markets are fully liberalized, the resulting lower barriers of entry will allow new airlines to enter over profitable markets.

SAATM is key to shaping aviation in Africa

By Evans Kimani
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Aviation in Africa has significantly developed in the last 50 years. As more countries began to develop their economies, more trade developed within the continent and beyond. This, therefore, increased travel in the continent, giving rise to iconic airlines the continent has seen such as Zambian Airways, Kenya Airways, South African Airways, and Ethiopian Airlines.

Some of these airlines were able to cater to the rising demand that was seen by the continent, with many of them scheduling flights to cities in Europe and Asia. However, it was evident that the rate of intra-African travel continued to stagnate into the 21st century and led to many of these carriers ending operations or suffering financial losses as a result of the low demand within the continent.

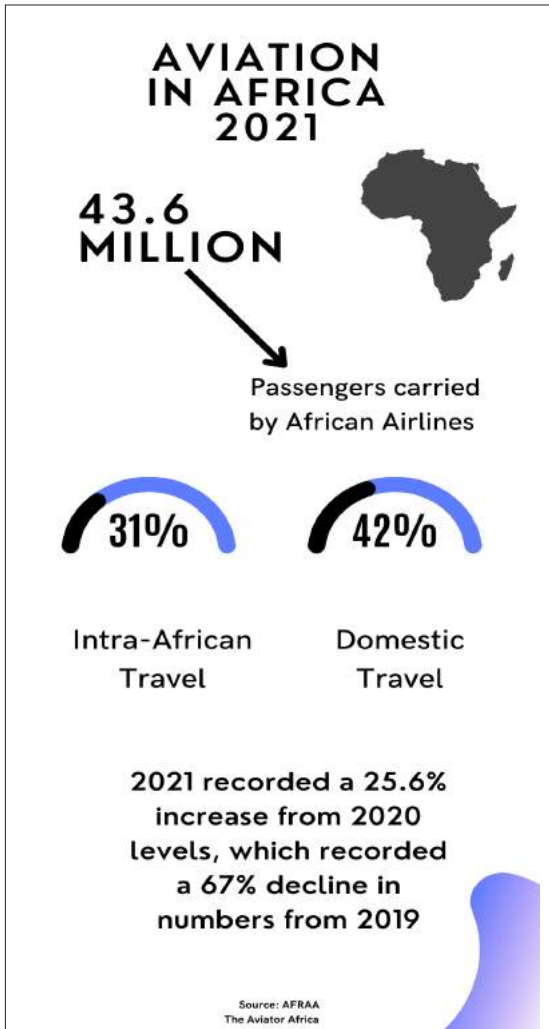
This being a major concern for the African Union and the African Airlines Association (AFRAA), steps were made to understand the reasons for the low demand and as they spanned from issues of infrastructure to the high fares and the stringent visa regimes, it became evident that there was a lot of work needed to be done by the stakeholders.

A series of negotiations, carried out by the African Union and member states, led to the signing of the continent's first Air Transport Agreement, known as the Yamoussoukro



Declaration (YD) of 1999, which formed the framework for the liberalization of air transport services in Africa. The agreement also focused on key issues in the industry such as the provision of reliable, safe air transport that would be highly essential for the free movement of people, goods, and services.

When YD was fully ratified in 2002, it facilitated the growth of the air transport industry in the world, with 2019 being the most successful year with over 95 million passengers carried by African Airlines with intra-African travel accounting for 27% of the share while domestic travel was 22.41%. The COVID-19 Pandemic proved to hit hard in the aviation



4th & 5th freedoms, frequencies, fares as well as capacity. These restrictions were believed to hinder the growth of several airlines in the continent, due to the protective measures that were set by governments whose intentions were to protect their local airlines.

Furthermore, the protection measures set resulted in limited frequencies that hindered the environment that which many of these African airlines operated. This, therefore, led to passengers traveling within Africa, to travel through other continents such as Europe and the Middle East to be able to access their final destination; a practice that is not only expensive but also damaging to the environment.

According to the AFRAA, countries with better connectivity tend to trade more. This is as a country that has a 1% advantage in its air cargo operations, can generate at least 6% more trade. This is because, with a comprehensive and well-structured air cargo system, more cargo can be transported to various parts of the world within a shorter time, which in turn increased the potential volume of trade in the region thus directly contributing to the economy of the state.

The continent, which has 35% of routes operated daily while another 13% of routes are operated on a twice or higher basis, shows adequate potential for growth. However, the growth remains to be affected by challenges such as fuel prices, inadequate infrastructure, and ground support equipment which are key factors in boosting operational efficiency. This together with a stringent visa policy, where over 50% of African countries need Africans to have a visa to enter their countries, presents the crucial areas that SAATM intends to deal with.

industry, where a 67% drop was recorded during that year. However, 2021 was a 25.6% increase from 2020, as 43.6 million people traveled during that year with 31% of the share being Intra-African travel while 42% was domestic, signifying the rising importance of both sectors in the African aviation.

In a bid to boost African travel, the Single African Air Transport Market (SAATM) was launched in 2018 as part of the African Union Agenda 2063 to fully implement the YD, thus enabling all the signatories of the previous agreement to lift market access restrictions imposed on airlines.

Among these restrictions focused on were the traffic rights which contained the 3rd,



With 35 signatories, representing 64% of the African Union members and 70% of the African population, the agreement is estimated to improve intra-African volumes by nearly 51%, and to have a decline in average fuel levels by 26% due to increased operational efficiencies. Furthermore, with the enhanced connectivity; SAATM is expected to have more than 145 country pairs with direct frequencies and have the existing route's frequencies increased by more than 27%.

The road to SAATM's achievement appears to be very promising, with an additional 20 countries signing a Memorandum of Implementation that seeks to eliminate Bilateral Air Services Agreements (BASA) which have been a factor challenging the growth of aviation. This agreement, allows states to develop their national air transport system, and an extensive chance to introduce new trends such as Low-Cost Carriers (LCC) which are believed to aid in the increased volumes of passengers on the continent.


Therefore, all countries, their governments, and airlines are encouraged to embrace SAATM to facilitate the development of the industry.

SINGLE AFRICAN AIR TRANSPORT MARKET BUILDING BLOCKS

- 1** **TRAFFIC RIGHTS**
The increasing of 3rd, 4th and 5th freedom traffic rights in the continent.
- 2** **CAPACITY**
The agreement seeks to increase the capacity of seats offered in the continent by airlines.
- 3** **TARIFFS**
The eradication of tariffs so as to make air transport more liberal in the continent.
- 4** **CARGO OPERATIONS**
Enhancing cargo transport in the continent to increase trade in the continent and beyond.

Source: AFRAA

INTRA-AFRICAN TRAVEL



40%

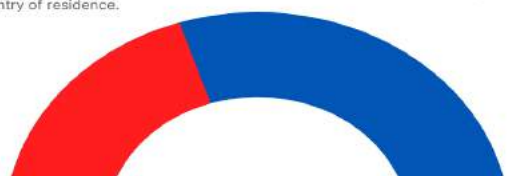
Traditional Visas

African countries require Africans to have a traditional visa when entering their borders, obtained through an embassy appointment at their country of residence.

75%

Contemporary Visas

African countries require Africans to have a visa, apply through online means (e-visa), or on arrival at the port of entry.



BENEFITS OF THE SINGLE AFRICAN AIR TRANSPORT MARKET (SAATM)

- 51%

Increase in intra-African volumes, achieved by addressing visa policies, infrastructure etc.
- 26%

Average decline of average fare levels, accounting to \$1.46Billion in fare savings.
- 145+

More than 145 country pairings with direct service, and an additional 27% frequency in existing routes, enhancing connectivity.

Interview with Aaron Munetsi

C.E.O Airlines Association of Southern Africa

By Harriet James
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but now we have come to the point where everything is automated but this is just the beginning since the end game is when we start implementing artificial intelligence into our business and digitalization and then we'll say that we are getting into where we need to be.

The second thing that has changed is the aircraft itself have so much technology on board which increase the economic as well as the actual physical operation of the aircraft. Airline operations are very expensive piece of equipment that we have to maximize or optimize the use of equipment, because aircrafts make money when they are flying. This is what I used to say back in the day.

Presently what is said is that airlines make money when they fly more often. When on the ground, the aircraft is losing you money. If it's not optimized and it's flying, you might be able to cover your cost but you are not making money but when flown more often, it means more frequencies, more trips, more passengers and carrying more cargo and then things will begin to change.

Qn: What is ailing the African state airlines?

The unfortunate statistics that I want to share is that in the 1980s, there were quite a number of African airlines, and our share of the global travel market was about 14 percent, but fast forward in 2022, there are very few African airlines that are running. Even the ones running are struggling. Even though the number of aircraft has changed, the saddest thing for me is to note that the percentage of African airlines has changed now to 2 percent. This means that other continents are eating our lunch and taking our market away from us.

This is why we need to be united and we must acknowledge that we can't do it alone. The Single African Air Transport Market (SAATM) is the only thing that can help us to become more competent and productive. Airlines are a business just like any other. If you don't

Qn: How did your journey in the airline industry begin?

I have worked in almost all departments in the aviation industry starting from ticketing, reservations, sales and marketing. I have lived in 11 different countries on the African continent. I lived in Dubai in the early 90s where I was representing South African Airways. I have done a lot of work in terms of understanding the aviation sector on the African continent and the ultimate situation for me was when I was based in Nairobi with the African Airlines Association where I was the director for government industry and legal affairs.

I was primarily looking after the interest of the African airlines to implement the single African air transport market, one of the flagship projects of the African union which was actually supporting my own vision because in my 36 years in the industry, I have desired to see a united aviation industry in Africa. I also want to see a prosperous aviation industry in Africa and the third thing I want to see is the development of the young Africans to become aviation professionals.

Qn: How has the evolution been like in the 36 years of being in the aviation industry?

Everything was manual and there was no automation to talk about



generate positive cash flow, you are heading for trouble.

You must be able to cover your operative costs and plan forward in terms of the ups and downs because if you don't, you are going to find yourself in a situation where you have your aircraft, no passengers, no cargo and no cash flow and you are dead in the water. No airline has ever gone bankrupt because they don't have an aircraft or airport, but they run out of cash. The revenue generated from sales is vanity but profit gives you a sense of sanity as it begins to cover your operating costs but the ultimate goal is having positive cash flow which is key.

Qn: Why are our airlines not getting to this stage of positive cash flow?

This is because we start the airlines on the wrong business model. Most of the countries just start an airline because they want to have a national carrier instead of thinking about positive cash flow. To get to this place we must have solid business model, with a solid plan and we have got to have specific objectives that are well spelt out. The other thing is that governments are not best at managing businesses especially airlines. Governments can own the airline but must be able to find ways of ensuring that they are managed professionally. Look at Ethiopian airlines for example, it's 100 percent owned by the government but it is professionally managed without any interference from the government and that's why they are making profits.

Qn: How have your efforts to unite airlines been like and

how can African airlines both compete and cooperate at the same time?

I always say that there are three Cs that we need to focus on. The first one is cooperation meaning that there are certain things that we can do together. We don't have to do it for each other but we can do it together. For instance, Kenya Airways and South African Airways are cooperating, they are not doing it for each other but they are doing it together. The second stage is collaboration where we need to collaborate in our joint purchases of spare parts because the aircrafts are the same and manufactured by the same manufacturers.

So why would the airlines buy them individually at a premium instead of having a spare parts pool that we are all going to work with. That would be collaboration. The third element is commitment to the agreements that we make. We have known each other for many years, why are we still signing MOUs? We need to assess what has been implemented and learn from them who are succeeding while assisting those still lagging behind.

African airlines open up the skies based on their governments signing up the single African air transport market agreement which is a flagship agreement of the African union. So far they're 35 countries that have signed up and 20 countries haven't. My role is to approach the countries that haven't signed and address the issues as to what makes them not want to sign.



World's fastest passenger jet tested

By Vincent M. Mupenzi
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Canadian business jet manufacturer, Bombardier Inc. has commenced the race to resume supersonic passenger flights nearly two decades after the retirement of Concorde. Bombardier, based in Quebec, has claimed that the Global 8000 which is still in development will beat any other business jet in range and speed. The Global 8000 is slated to have a range of 8,000NM and can carry 19 passengers at a speed of Mach 0.94. The Canadian company said the in-development Global 8000 will be "the world's fastest and longest-range purpose-built business jet."

With a capacity for up to 19 passengers, a range of 8,000 nautical miles (14,800 kilometers) and a top speed of Mach 0.94, the upcoming plane is expected to enter service in 2025, according to a statement from Bombardier. The news comes after a Global 7500 test vehicle broke the sound barrier during a demonstration flight last May, achieving speeds of more than Mach 1.015.

The aircraft, accompanied by a NASA F/A-18 chase plane, also became the first Transport Category airplane to fly supersonic with sustainable aviation fuel





(SAF) as a result of the flight, says Bombardier.

"The Global 8000 aircraft leverages the outstanding attributes of the Global 7500 aircraft, providing our customers with a flagship aircraft of a new era," Eric Martel, president and CEO for Bombardier, said in a statement released on Monday 23rd May 2022. Flight testing for the Global 8000 has already begun on Global 7500 flight-test vehicles. Bombardier says the upcoming aircraft will also have a cabin altitude equivalent to 2,900 feet.

Global 8000 is just one of many developments in the numerous efforts to raise the speed of passenger aircraft more than two decades after Concorde retired.

Last year, United Airlines announced it could be offering supersonic routes as early as 2029 after striking a deal to buy 15 supersonic jets.

Understanding supersonic flights

Supersonic flight is when an aircraft travels faster than the local velocity of sound. At an altitude of 60,000ft (18,300m), that means flying faster than 660mph (1,060km/h). A typical passenger jet may cruise at about 560mph (900km/h).

The speed of sound (Mach 1) varies with atmospheric pressure and temperature: in air at a temperature of 15 °C

(59 °F) and sea-level pressure, sound travels at about 1,225 km (760 miles) per hour.

Some of the challenges with supersonic passenger travel There are two major concerns with supersonic passenger travel: noise and pollution. Travelling faster than the speed of sound causes a sonic boom, which can be heard on the ground as a loud thunderclap or explosion. The boom limits where the planes can fly. Typically they must lower their speed until they are out over the ocean, away from citizens who may be disturbed by the loud bang.

The other big issue is fuel consumption. In order to fly supersonic, you will need more power, and more fuel, according to Kathy Savitt, Boom's chief commercial officer.

Is supersonic travel demanded?

Despite the enormous cost of Concorde's development more than 50 years ago, it is thought to have been profitable for British Airways in its final years of operation. Concorde was seen as a luxurious way to travel with tickets costing more than a first class seat on a regular jet. Research suggested passengers want speed and that faster planes could deepen human connections and make better business relationships.

Credit: CNN



CHINA'S FUTURE STEALTH BOMBER THE JH-XX

By Oscar Ssemawere
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China's strategic bomber, a long range and fast stealth bomber would be a game changer. In January 2018, two sentences in an annual report by the DIA on Chinese military power sent a minor shockwave rippling across the defense-related internet. The PLAAF is developing new medium and long-range stealth bombers to strike regional and global targets.

Stealth technology continues to play a key role in the development of these which

will probably reach initial operational capability no sooner than 2025. In a separate chart, an undesignated next generation tactical bomber is listed denoted as being equipped with a high resolution active electronically scanned array radar precision guided bombs and long-range air-to-air missiles.

About the JH-XX

Not much is known about the Chinese bomber. It is believed to be stealthy and supersonic. The Chinese envision it to



bomb targets within the Indo-Pacific region and even around the world (of course depending on range), according to a military power report on China from the U.S. Department of Defense presented to Congress in 2019. The report said the JH-XX could be ready for flight by 2025. The JH-XX would bring a different mix of capabilities and might be better for penetrating certain very dense air defense networks where evading detection may not be possible even for a stealth H20.

Grow Stealth Characteristics from Existing Fighters

The JH-XX would borrow from the current stealth technologies in fighter planes the Chinese are flying such as the Chengdu J-20 Mighty Dragon that is already patrolling the East and South China Seas. The DOD said in its Congressional report that the JH-XX would be between 60 to 100 tons



and almost 100-feet long.

It would also fire long-range air-to-air missiles from a ventral weapons bay. The range would be in the neighborhood of 1,000 to 2,000-miles. That would allow it to threaten American bases on Japan and Guam. The bomber could easily attack Taiwan. It's not clear if the JH-XX would be nuclear-capable.

Similarity with the FB-22

Long-range, stealthy, and fast – sounds like the ideas behind the FB-22. The FB-22 bomber was inspired by the F-22 Raptor fighter. Could the Raptor's enviable characteristics be transferred into a new American bomber program? This was going to be a departure, maybe even a bridge too far. The F-22 does not have long-range bomber characteristics. Its operational range is only 600-miles. Plus, the F-22 internal payload is not large enough to handle much beyond four GPS-guided 250-pound Small Diameter bombs.

FB-22 Would Have Delta-Wings to Handle Larger Payload

The FB-22 would need a longer fuselage. If that didn't work, it could use a delta-wing design with a much larger surface area than the F-22. The concept would allow for a back-seat Weapons Systems Officer. The idea was an airframe that could carry 15,000 pounds of weapons. This included not only larger bombs but medium-range air-to-air missiles to protect them from enemy fighters.

High Speed with More Fuel

New engines borrowed from the F-35 Lightning II would give the bomber a top speed of MACH 1.9. The bigger airplane would carry almost double the amount of fuel than the F-22 with 300-percent more range (2,000 miles) than the stealth fighter.

It stands to reason that the Chinese would want to copy aspects of American warplanes. They are believed to have stolen plans for the F-35 and are keen to match conceptual abilities of existing or planned airplanes from the United States. The JH-XX is also likely to take inspiration from the B-21 Raider, a next-generation stealth bomber that the United States is building now. China is like a chess player that studies moves in books and seeks to emulate existing strategies instead of formulating its own. It appears these gambits echo what it wants to achieve with next-generation airplane design.

The JH-XX's high speed would make it viable for carrying air-to-air missiles not only for self-defense but for hit and run attacks on vulnerable support planes or to rapidly intercept incoming bombers. While the JH-XX likely wouldn't be optimized for short-range aerial dog fights against highly maneuverable fighters, its stealth, speed and large payload could still make it a deadly delivery platform for beyond visual range air-to-air missiles.

Additional content provided by: Brent M. Eastwood

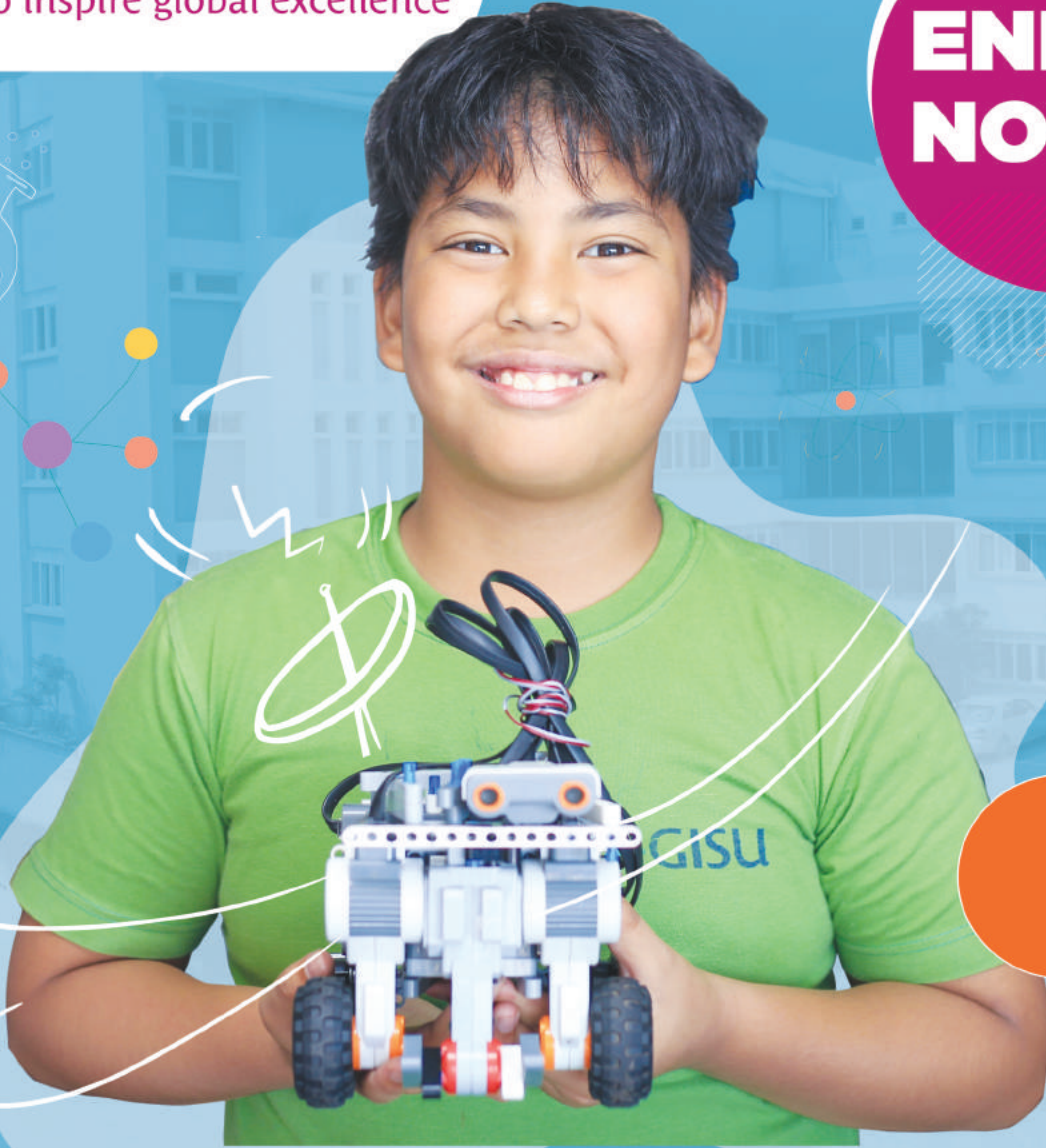




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