



WORKING PAPER

**SEVENTH WORLDWIDE AIR TRANSPORT CONFERENCE
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**Agenda Item 4: Emerging technologies, new business models and other associated aspects
4.1: Economic regulatory frameworks on emerging technologies**

DIGITAL TRANSFORMATION AND ARTIFICIAL INTELLIGENCE IN AIR TRANSPORT

(Presented by Kenya on behalf of 54 Member States of the African Civil Aviation Commission²)

EXECUTIVE SUMMARY

This working paper presents Africa's position on digital transformation, emerging technologies and artificial intelligence (AI) in air transport. These technologies are already reshaping aviation efficiency, security, resilience and competitiveness, offering Africa an opportunity to adopt modern, interoperable systems while avoiding legacy infrastructure. However, gaps in digital infrastructure, cybersecurity, specialized skills, data protection and AI governance risk widening existing inequalities. The paper highlights the African Civil Aviation Commission's (AFCAC) central role in coordinating shared solutions, common governance and capacity-building, and calls for ICAO's support for affordable and interoperable frameworks, cybersecurity cooperation, financing and technology transfer to ensure an inclusive and responsible digital transition.

Action: The conference is invited to:

- a) recognize the strategic importance of an inclusive, interoperable, secure and affordable digital transformation, including the responsible adoption of AI and emerging technologies, while ensuring that developing States are not left behind;
- b) request ICAO to develop coherent, technology-neutral, interoperable and secure global guidance and practical frameworks for responsible aviation digital transformation and the application of AI, addressing cybersecurity, data governance and protection, ethical AI use and regulatory oversight, and to support developing States through capacity-building, technology transfer and access to appropriate solutions;
- c) encourage ICAO, in cooperation with regional organizations, including AFCAC, industry, development partners and financial institutions, to support regionally led shared platforms, common governance arrangements, cybersecurity cooperation and pilot initiatives, and to mobilize the necessary financing; and
- d) invite international financial institutions, development banks, donors and other partners to increase technical and financial support for digital aviation initiatives in developing States and, in Africa, support AFCAC, Regional Economic Communities (RECs) and Member States in coordinating and implementing the continent's digital aviation transition.

¹ English and French versions provided by AFCAC.

² Algeria, Angola, Benin, Botswana, Burkina Faso, Burundi, Cameroon, Cabo Verde, Central African Republic, Chad, Comoros, Congo, Côte d'Ivoire, Democratic Republic of the Congo, Djibouti, Egypt, Equatorial Guinea, Eritrea, Eswatini, Ethiopia, Gabon, Gambia, Ghana, Guinea, Guinea-Bissau, Kenya, Lesotho, Liberia, Libya, Madagascar, Malawi, Mali, Mauritania, Mauritius, Morocco, Mozambique, Namibia, Niger, Nigeria, Rwanda, Sao Tome and Principe, Senegal, Seychelles, Sierra Leone, Somalia, South Africa, South Sudan, Sudan, Togo, Tunisia, Uganda, United Republic of Tanzania, Zambia, Zimbabwe.

<i>Strategic Goal:</i>	This working paper relates to Strategic Goal: <i>The Economic Development of Air Transport Assures the Delivery of Economic Prosperity and Societal Well-Being for All.</i>
<i>Financial implications:</i>	The proposed actions are expected to be pursued within ICAO's existing work programme and available resources.
<i>References:</i>	Lomé Declaration on the Single African Air Transport Market and its Implementation Matrix, 2026 African Union, Digital Transformation Strategy for Africa (2020–2030) African Union, AU Data Policy Framework, 2022 ICAO, International Aviation Trust Framework; ICAO Aviation Cybersecurity Strategy and Action Plan ICAO Long-Term Vision for International Air Transport Liberalization African Union, Continental Artificial Intelligence Strategy, 2024

1. INTRODUCTION

1.1 Air transport is in the midst of a technological transformation as far-reaching as any in its history. Digital identity and biometrics, system-wide information management, cloud computing, big-data analytics, automation and — increasingly — artificial intelligence (AI) are moving from pilot projects to the everyday machinery of how aircraft are operated, borders are crossed, markets are regulated and decisions are made. What was until recently described as the future of aviation is now its present: the capacity to digitalize, connect and apply intelligent tools to data has become a determinant of efficiency, safety, security and competitiveness rather than an optional enhancement.

1.2 For Africa, the stakes of this transformation are particularly high. As the continent continues to develop and modernize its aviation system, it has a unique opportunity to leapfrog legacy technologies and adopt modern, interoperable and intelligent solutions from the outset. At the same time, there is a risk that existing disparities in global aviation could be reinforced if the digital and AI transition does not adequately reflect the realities, capacities and development needs of African and other developing States. Ensuring that digitalization and AI become drivers of greater connectivity, efficiency and inclusion will therefore depend on adequate infrastructure, access to technology, skilled human resources, robust cybersecurity frameworks and, above all, effective international cooperation, capacity-building and implementation support for States. In June 2026, African Ministers meeting at the African Air Transport Convention and Expo in Lomé reaffirmed, through the Lomé Declaration and its Implementation Matrix, the importance of digital transformation, innovation and technology as enablers of a more connected, competitive and resilient air transport system.

2. DISCUSSION

2.1 Emerging technologies and artificial intelligence offer major opportunities for air transport

2.1.1. Emerging technologies, like digital identity and biometrics, the ICAO Digital Travel Credential (DTC) and One ID, system-wide information management, cloud computing, big-data analytics, automation and artificial intelligence, offer significant gains in efficiency, transparency, safety, security, facilitation and economic oversight.

2.1.2. These technologies also carry economic-regulatory implications. New business models, digital platforms and artificial-intelligence applications call for adapted, technology-neutral and pro-competitive regulatory frameworks that protect consumers and enable innovation, without fragmenting markets or imposing disproportionate compliance burdens on developing States and their operators.

2.1.3. Artificial intelligence is becoming a practical tool across the aviation value chain and for aviation administrations themselves. AI and machine learning already support demand forecasting and market-trend analysis, predictive maintenance and safety-risk detection, optimization of capacity and connectivity, the automated processing of statistical and regulatory information, and improved services to operators and passengers, including through conversational tools. For civil aviation authorities and regional bodies operating with limited staff, such tools can multiply analytical capacity, turning scarce data and expertise into faster, evidence-based decisions, provided they are deployed responsibly and on sound data

2.2 Africa faces a digital-infrastructure gap and a wide digital divide

2.2.1. The underlying digital and communications infrastructure for aviation remains uneven. Regional analysis of the African region shows that key information-management and data-link systems are only partially deployed, air-ground and inter-facility data-link and message-handling systems are implemented at low levels, while the transition from paper-based aeronautical information to digital aeronautical information management is incomplete. These deficits constrain the adoption of data-intensive capabilities such as System Wide Information Management (SWIM), digital facilitation and analytics.

2.2.2. The broader digital divide compounds these constraints. Across sub-Saharan Africa the mobile-internet usage gap is estimated at around 59 per cent and only about a quarter of the population uses mobile internet, while power, connectivity and skills remain unevenly distributed. Without deliberate measures, the global digital transition risks widening rather than narrowing these gaps.

2.3 Digital transformation must be secure and trustworthy

2.3.1. As aviation becomes more interconnected and data-driven, cybersecurity is a precondition for digitalization, not an optional add-on. The ICAO International Aviation Trust Framework and the ICAO Aviation Cybersecurity Strategy provide the global architecture, but African States need capacity, resources and cooperation to implement them, given their limited resources and potentially disproportionate exposure within an increasingly interconnected system.

2.3.2. At the ecosystem level, digital facilitation solutions, including digital identity and Advance Passenger Information and Passenger Name Record (API/PNR) systems, must be interoperable and affordable. The aviation industry has cautioned that such systems should follow ICAO standards and be funded by governments rather than passed on to airlines and passengers, since additional charges undermine connectivity and affordability. The operational aspects of facilitation are addressed in the companion paper on seamless mobility; the concern here is that the cost and design of digital compliance must not become a barrier to affordable connectivity.

2.3.3. The same conditions that make AI valuable also make governance essential. The benefits of AI and advanced analytics depend on trustworthy data, protection of personal information and clear safeguards against bias, opacity and misuse, together with meaningful human oversight of automated decisions. Yet a substantial share of African States is still developing data-protection legislation, and few as yet have dedicated frameworks for the governance of AI. Practical, proportionate guidance on data governance, AI ethics and human oversight, aligned with global and continental norms but suited to developing-State capacity, is therefore a precondition for adopting these technologies with confidence.

2.4 Africa's continental digital agenda

2.4.1. Africa's aviation digital transformation does not take place in isolation. It should be aligned with the African Union's (AU) Digital Transformation Strategy for Africa (2020–2030), the AU Data Policy Framework and the AfCFTA Protocol on Digital Trade, which shape the continent's approach to data governance, cross-border data flows, digital identity and cybersecurity. Coherence between aviation digital systems and these frameworks would reinforce both Single African Air Transport Market (SAATM)

and the AfCFTA, while respecting data-protection and sovereignty considerations, noting that a substantial share of African States is still developing data-protection legislation.

2.4.2. This alignment calls for whole-of-government and multi-stakeholder coordination among civil aviation authorities, immigration, customs, security and health agencies, airports, airlines, air navigation service providers and regional bodies, so that digital systems are interoperable, cost-effective and mutually reinforcing.

2.5 AFCAC Support to States on Digital and AI Transition

2.5.1. Africa's response to the digital and AI transition is being organized at the continental level, with AFCAC at its center. As the African Union's specialized agency for civil aviation and the Executing Agency of the YD and SAATM, AFCAC is mandated to coordinate, monitor and harmonize aviation policy across its Member States, a mandate that extends naturally to digitalization and the responsible use of technology. AFCAC has itself embarked on a digital transformation and artificial-intelligence project to modernize its operations and analytical capacity, and the approach it is developing can be extended outward to support States.

2.5.2. AFCAC's supporting role is practical. Rather than each of 54 States acquiring digital and AI capabilities on its own, AFCAC can pool scarce expertise and offer shared, continentally coordinated tools, including common data and monitoring platforms such as the African Programme on Aviation Data (APAD) and SAATM implementation dashboards, giving smaller and resource-constrained States access to capabilities they could not build alone. It can promote common governance for cybersecurity, data protection and AI ethics, harmonize standards to ensure interoperability, train national focal points and digital champions, and act as a bridge between States and international, technical and financial partners. Approached in this way, digital transformation becomes a driver of continental integration rather than a new source of fragmentation.

2.6 An inclusive global framework

2.6.1. Global digital-transformation frameworks should be practical, interoperable, technology-neutral, cost-effective and explicitly designed for the circumstances of developing States, and they should be accompanied by financing, technology transfer and capacity-building. Without such support, the digital transition risks entrenching, rather than reducing, existing inequalities.

2.6.2. ICAO, regional institutions, partners and financial institutions have complementary roles in supporting African Digitalization and AI Programme. ICAO provides global standards, guidance, frameworks and capacity-building; regional institutions translate these into implementation arrangements suited to regional circumstances, and partners and financial institutions can support in knowledge transfer and financial support to AFCAC and Member States. ICAO support should complement and reinforce African-led efforts coordinated by AFCAC and mobilize international cooperation, so that global action and continental action pull in the same direction.

3. CONCLUSION

3.1 Digital transformation, emerging technologies and artificial intelligence are decisive for the efficiency, safety, security, resilience and competitiveness of African air transport, and they are a present reality rather than a distant prospect. The opportunity is substantial, but so too are the continent's infrastructure, skills, cybersecurity and governance gaps, which must be addressed for that opportunity to be realized. Africa supports a global aviation digital ecosystem that is secure, interoperable, inclusive and trustworthy. It seeks practical and affordable frameworks for digital transformation, emerging technologies and the responsible use of AI suited to developing States, alignment with the continental digital agenda,

and financing and technology transfer so that the transition narrows the divide. With AFCAC coordinating and supporting its Member States, pooling expertise, operating shared platforms and promoting common governance, a stronger global framework would enable Africa to participate fully in, and benefit from, the digital transformation of air transport.

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