



WORKING PAPER

**SEVENTH WORLDWIDE AIR TRANSPORT CONFERENCE
(ATCONF/7)**

Montréal, HQ, 16 to 20 November 2026

Agenda Item 2: Fostering aviation growth and air connectivity through investments in infrastructure, human capital and partnerships

2.2: Investment for the development and modernization of civil aviation infrastructure

**ENABLING AVIATION GROWTH THROUGH COORDINATED AND
ECONOMICALLY SUSTAINABLE ATM MODERNISATION**

(Presented by Brazil, Airports Council International (ACI), Aviation Services Association (ASA World), Civil Air Navigation Services Organisation (CANSO), International Coordinating Council of Aerospace Industries Associations (ICCAIA), International Federation of Air Line Pilots' Associations (IFALPA) and International Federation of Air Traffic Controllers' Associations (IFATCA))

EXECUTIVE SUMMARY

This paper presents an industry perspective developed by the Complete Air Traffic System (CATS) Global Council on the importance of globally coordinated and economically sustainable air traffic management (ATM) modernisation as a strategic enabler of future aviation growth. It highlights the need for sustained investment in modern ATM and airspace infrastructure, global interoperability and harmonisation, coordinated implementation through the Global Air Navigation Plan (GANP) and the development of the Minimum Implementation Path (MIP), closer coordination between ATM and airport infrastructure planning, and stronger international collaboration to reduce fragmentation, improve the affordability of modernisation, strengthen investment confidence, and support the safe, scalable and sustainable growth of international aviation.

Action: The conference is invited to:

- a) recognise that sustained investment in modern ATM and airspace infrastructure is essential to support the growth, resilience, sustainability and competitiveness of international air transport;
- b) urge States to recognise ATM as strategic national infrastructure and integrate its modernisation into national infrastructure and economic development strategies;
- c) encourage States, international financial institutions and development partners to promote transparent and economically sustainable investment and financing approaches that support ATM modernisation and take account of beneficiaries and system-wide benefits; and
- d) support ICAO's efforts to strengthen globally coordinated and interoperable implementation, including through the evolution of the GANP and the development of the MIP, recognising that greater implementation coherence and interoperability can improve affordability, reduce duplication and maximise the return on ATM investments.

¹ English, Arabic, Chinese, French, Russian and Spanish versions provided by CANSO.

<i>Strategic Goal:</i>	This working paper relates to the 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>	Greater global coordination of implementation can improve the affordability and cost-effectiveness of ATM modernisation.
<i>References:</i>	ICAO Global Air Navigation Plan (GANP, Doc 9750). CATS Concept of Operations (CONOPS) for Future Skies.

1. INTRODUCTION

1.1 The Seventh Worldwide Air Transport Conference (ATConf/7) is taking place at a defining moment for international aviation. Air transport continues to be a key enabler of global connectivity, economic development, trade, tourism and societal well-being. At the same time, the aviation sector faces increasing operational complexity, sustainability pressures, geopolitical uncertainty, infrastructure constraints, workforce challenges and rapid technological change.

1.2 Future aviation growth will increasingly depend on modern, interoperable, resilient and digitally enabled air traffic management (ATM) systems, supported by a skilled and future-ready workforce. ATM and airspace infrastructure should be recognised as strategic infrastructure at national and international levels. They enable global connectivity, operational resilience, environmental sustainability and the safe integration of emerging aviation ecosystems, including Unmanned Aircraft Systems (UAS), Advanced Air Mobility (AAM), Higher Airspace Operations (HAO) and commercial space transportation operations (STO).

1.3 In this context, the Complete Air Traffic System (CATS) Global Council, a coalition of more than 80 organisations across the aviation ecosystem, developed the CATS Concept of Operations (CONOPS) for Future Skies. Presented by CANSO and several co-sponsors to the 42nd ICAO Assembly, the CATS CONOPS was recognised by the Assembly as a valuable, coordinated industry vision, recommending that ICAO consider it as an input to the continued evolution of the Global Air Navigation Plan (GANP) and other relevant ICAO strategic frameworks.

1.4 Continued air transport growth will place increasing demands on airspace capacity, resilience and infrastructure. Meeting this demand safely, efficiently and sustainably will require sustained investment in digitally enabled ATM systems and globally coordinated, interoperable capabilities. This paper highlights how coordinated implementation and sustainable investment can reduce fragmentation, improve affordability, strengthen investment confidence and support future aviation growth.

2. AVIATION GROWTH REQUIRES ATM TRANSFORMATION AND INVESTMENT

2.1 Future aviation growth, resilience and sustainability will depend on continued transformation of ATM and airspace infrastructure, enabling greater capacity, operational resilience, environmental performance and the integration of emerging aviation ecosystems. The effectiveness of this transformation will increasingly depend on the seamless exchange of operational information between air navigation services providers (ANSPs), airports and aircraft operators.

2.2 Meeting future demand will require sustained investment in modern, cyber-resilient, interoperable and digitally enabled ATM capabilities, including digital information-sharing capabilities such as System Wide Information Management (SWIM) and Flight and Flow Information for a Collaborative Environment (FF-ICE). These capabilities should support a globally interoperable

information environment that enables timely operational information exchange across ANSPs, airports and aircraft operators and supports collaborative and network-wide decision-making. Together, they form part of the digital foundation for the future aviation system.

2.3 Like airports, ports, telecommunications and energy networks, ATM infrastructure should be recognised as critical strategic infrastructure at national and international levels, supporting economic development, global connectivity, trade, tourism, resilience and sustainable aviation growth. Recognising ATM within national infrastructure and economic development strategies is essential to strengthening resilience, improving investment confidence, supporting sustainable financing models and enabling long-term modernisation.

2.4 The global air navigation service (ANS) sector represents an estimated USD 45 billion annual market (see Figure 1), illustrating the economic scale and strategic importance of the infrastructure, technology and services which underpin global aviation. While this figure does not represent infrastructure value or future investment requirements, maintaining and transforming this system as aviation demand grows will require sustained investment, coordinated implementation and stable policy and financing frameworks.

2.5 While no consolidated global estimate of ATM investment needs currently exists, major modernisation programmes provide an indication of the scale of investment required. The United States has committed an initial USD 12.5 billion to modernise its air traffic control system. Meanwhile, the European ATM Master Plan estimates EUR 11.4 billion in investment needs between 2025 and 2035 to implement its strategic deployment objectives. As ATM transformation accelerates, investment will extend beyond physical infrastructure to digital services, cybersecurity, automation and information-sharing capabilities.

Global ANS market, 2024: \$45 billion

Market size by region (USD)

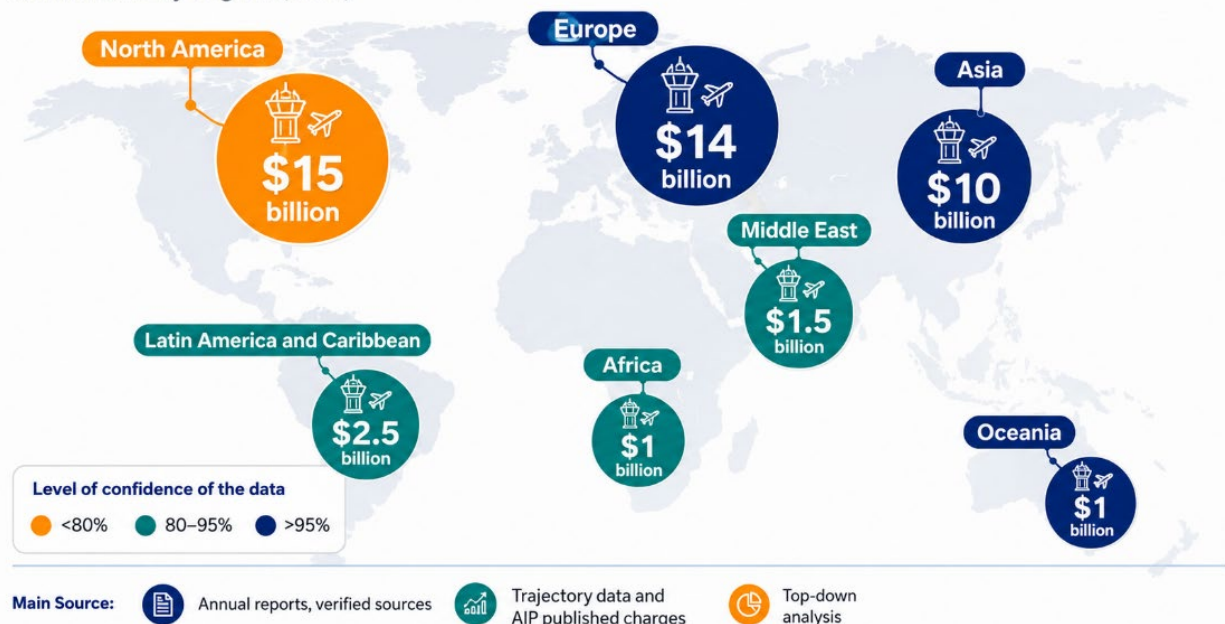


Figure 1. Estimated Global ANS Market by Region, 2024 (USD billions)

Note: Estimates primarily reflect annual ANS revenues; for the United States, FAA budget appropriations are used as a proxy. Confidence levels reflect the quality of the underlying data sources.

2.6 Fragmented modernisation approaches increase costs, reduce interoperability, create investment uncertainty and limit the economic and societal benefits of aviation connectivity. Fragmentation can arise not only between ANSPs, but across the wider aviation system when operational information

cannot be exchanged or integrated effectively across ANSPs, airports and aircraft operators. Greater coordination through common technical standards, harmonised implementation strategies and shared regional services can improve affordability, accelerate deployment and maximise the return on modernisation investments.

2.7 ICAO's development of the Minimum Implementation Path (MIP) should also recognise the need for economically sustainable service provision. As the MIP is developed to support a globally coordinated baseline of essential ATM capabilities, States should consider, as appropriate to their national circumstances, financing approaches that ensure their long-term availability and resilience. This will help maintain ATM as strategic infrastructure supporting connectivity, safety, operational resilience and economic continuity, including during periods when traffic demand alone may not provide a sufficient basis for investment. Financing approaches should be transparent and economically efficient, taking account of beneficiaries and system-wide benefits.

3. REDUCING FRAGMENTATION AND ENABLING SUSTAINABLE MODERNISATION

3.1 One of the greatest risks to future ATM modernisation is increasing fragmentation. Divergent implementation approaches, inconsistent capability development and limited interoperability increase costs, reduce economies of scale, create investment uncertainty, and limit the benefits of global aviation connectivity.

3.2 The global ATM community recognises the importance of ICAO's efforts to strengthen global implementation through the evolution of the GANP and the development of the Minimum Implementation Path (MIP). Building on the outcomes of the 42nd ICAO Assembly, the MIP is being developed to establish a globally coordinated baseline of essential ATM capabilities supporting worldwide interoperability. Drawing on a prioritised set of ICAO Aviation System Block Upgrades (ASBUs), it is intended to provide clearer global priorities and sequencing while recognising different regional and national starting points and implementation circumstances.

3.3 Beyond improving interoperability, the MIP can strengthen implementation certainty through common priorities that support national planning, regional cooperation and industry investment. A globally coordinated baseline can promote economies of scale, reduce duplication and costs, and strengthen investment confidence. Open standards and modular architectures can further support interoperability, reduce vendor lock-in and enable a more competitive and innovative supplier ecosystem. These foundational capabilities should support interoperability across the wider aviation system, including timely information exchange among ANSPs, airports and aircraft operators.

4. ENABLING INNOVATION AND EMERGING AVIATION ECOSYSTEMS

4.1 Aviation is entering a period of accelerated technological transformation. Emerging operational models, including UAS, AAM, HAO, increasingly autonomous operations and commercial STO, will require more agile, interoperable and digitally enabled ATM systems capable of supporting a broader range of users and operational models.

4.2 The successful integration of these emerging users will depend on common digital foundations, trusted, interoperable and cybersecure information-sharing environments that appropriately address data sovereignty and governance requirements, timely data exchange and collaborative operational processes. Innovation should therefore be supported through coordinated policy, governance, financing and

globally harmonised implementation. The evolution of the GANP and MIP can help establish common priorities and accelerate deployment of the interoperable capabilities needed to support future aviation ecosystems.

5. STRENGTHENING INSTITUTIONAL AND HUMAN CAPACITY

5.1 Successful ATM modernisation depends not only on technology, but also on institutional capacity, effective governance and a skilled, future-ready workforce. Investment in digital competencies, cybersecurity, collaborative operational models and human-centred transformation will be essential. Organisations must manage their capacity to absorb concurrent changes while maintaining safe, resilient and continuous operations.

5.2 International cooperation, knowledge sharing and coordinated implementation support will be critical, particularly for States with different levels of institutional maturity and implementation capability. Strengthening collaboration between States, ICAO, industry, regional organisations, financial institutions and implementation partners will enhance capacity-building, reduce fragmentation, accelerate implementation and support economically sustainable ATM transformation.

6. CONCLUSION

6.1 Air transport growth, resilience and sustainability will increasingly depend on sustained investment in modern, interoperable and digitally enabled ATM and airspace infrastructure.

6.2 ATM should be recognised as strategic infrastructure, with investment and financing approaches reflecting its contribution to economic development, global connectivity, operational resilience and environmental sustainability.

6.3 The challenge is no longer defining the future vision for ATM, but implementing it consistently, affordably and at a global scale. Globally coordinated implementation, supported by the evolution of the GANP and development of the MIP, will provide an opportunity to reduce fragmentation, improve affordability, strengthen investment confidence and maximise the return on ATM investments.

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