



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

**SUSTAINABLE FINANCING AND MEASUREMENT FOR AIR CONNECTIVITY IN
ARCHIPELAGIC AND GEOGRAPHICALLY ISOLATED STATES**

(Presented by Indonesia)

EXECUTIVE SUMMARY

This paper highlights the unique connectivity challenges faced by archipelagic and geographically isolated States, where air transport is an essential lifeline for tourism, trade, healthcare, education, disaster response, and socio-economic development, yet sustainable connectivity is constrained by limited traffic volumes, high infrastructure costs, climate vulnerability, and operational sustainability challenges. Addressing these challenges requires sustainable financing mechanisms, innovative infrastructure investment, and strengthened regional cooperation, while better connectivity measurement is essential to support evidence-based financing and investment decisions. Current national-level connectivity measurement approaches may not fully capture disparities within large archipelagic States, limiting the ability of policymakers to identify underserved areas and prioritize investment. Drawing on Indonesia's experience, this paper presents Indonesia's perspective and proposes that the International Civil Aviation Organization (ICAO) consider developing guidance to support States in assessing and managing these interconnected challenges through a holistic, investment-focused framework, including the feasibility of enabling sub-national connectivity analysis.

Action: The Conference is invited to:

- a) review the information and assessment presented in this paper; and
- b) consider the recommendations set out in paragraph 4 of this paper.

<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>	None to ICAO at this stage. Any future development of guidance or analytical approaches would draw, as appropriate, on existing ICAO technical resources and voluntary contributions from interested Member States.
<i>References:</i>	Doc 9082, <i>ICAO's Policies on Charges for Airports and Air Navigation Services</i> Doc 9587, <i>Policy and Guidance Material on the Economic Regulation of International Air Transport</i> Doc 9980, <i>Manual on Privatization in the Provision of Airports and Air Navigation Services</i> ICAO Global Aviation Competitiveness Index (GACI) methodological framework ICAO Assembly 42nd Session Working Paper A42-WP/113 Revision No.1 (Brazil)

	IATA (2022) <i>"Air Connectivity: Measuring the connections that drive economic growth"</i> United Nations Sustainable Development Goal (SDG) Indicator 9.1.2 <i>Passenger and freight volumes, by mode of transport.</i> Indonesia Ministry of Transportation, 2026 pioneer and PSO subsidy data; ATR (2026) market analysis
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1. INTRODUCTION

1.1 Air transport plays an essential role in connecting island and geographically remote communities. For archipelagic States such as Indonesia, which comprises more than 17,000 islands, aviation provides an important means of connecting communities to essential services, markets, and economic opportunities. Reliable air services support tourism, trade, healthcare, education, and disaster response, while contributing to national integration and regional economic development.

1.2 The importance of air connectivity is firmly rooted in the Convention on International Civil Aviation (Chicago Convention), which establishes the framework for international civil aviation and recognizes the importance of safe, regular, and efficient air transport. This paper aligns with the International Civil Aviation Organization (ICAO) Strategic Plan 2026-2050, particularly its emphasis on the economic development of air transport, and with the *No Country Left Behind* (NCLB) strategic goal, which calls for tailored assistance to States with specific connectivity challenges.

1.3 Archipelagic States face distinct structural barriers to sustainable connectivity. These barriers, together with the financing and connectivity measurement approaches needed to address them, are examined in this paper, which proposes that ICAO consider developing guidance to support States in assessing and managing these interconnected challenges.

2. DISCUSSION

2.1 The Connectivity Challenge

2.1.1 Archipelagic States face a distinctive set of interconnected challenges in sustaining air connectivity. The most fundamental is limited traffic volumes: many routes serving island communities operate with low passenger and cargo volumes, making it difficult to achieve commercial viability. Thin demand limits the frequency and size of aircraft that can be profitably deployed, which in turn constrains the connectivity available to those communities. Compounding this is the high cost of infrastructure: building and maintaining airports, runways, and navigation systems across dispersed island geographies is significantly more expensive than in contiguous landmasses, and small islands often require short runways, specialized equipment, and resilient infrastructure to withstand climate impacts. Climate vulnerability further exacerbates these costs, as archipelagic States are disproportionately exposed to sea-level rise, extreme weather events, and coastal erosion, all of which threaten aviation infrastructure and disrupt operations. Finally, airlines serving thin routes face operational sustainability challenges, including high operating costs, limited economies of scale, and difficulty attracting and retaining skilled personnel, creating barriers to entry and, in some cases, resulting in limited competition or single-operator dependency.

2.1.2 Indonesia's experience illustrates these challenges. The Papua region accounts for approximately 310 airports and airstrips, more than any other island group, yet many of these facilities have no scheduled air service, and connectivity varies significantly across regions and provinces. Of

Indonesia's 180 paved-runway airports, 70 (39 percent) have no scheduled passenger service. Industry analysis has identified 209 new domestic routes that could be economically viable, representing an untapped market of approximately 16 million passengers per year. While this paper presents Indonesia's experience, the challenges described are shared by many archipelagic and geographically isolated States.

2.1.3 The economic and social importance of overcoming these challenges is significant. Air connectivity contributes to the integration of archipelagic States by enabling the movement of people, goods, and services across dispersed territories. It supports tourism, trade, agriculture, fisheries, and manufacturing, while facilitating access to markets and contributing to regional economic development. In times of natural disaster or public health emergency, air transport can also provide an important means of delivering humanitarian assistance, evacuating affected populations, and restoring essential services. Reliable connectivity is therefore an important component of resilience and socio-economic development in geographically dispersed territories.

2.2 Financing the Connectivity Gap

2.2.1 Addressing these connectivity challenges requires significant and sustained investment. Yet archipelagic States face structural financing difficulties. Low traffic volumes on thin routes make it difficult to recover infrastructure costs through user charges alone, and airports serving remote communities often operate at a loss and depend on public subsidies. At the same time, many archipelagic and developing States face constrained public budgets, limiting their ability to fund aviation infrastructure amid competing priorities for health, education, and other essential services. Private investors, meanwhile, may be deterred by the perceived risks of thin routes, high capital costs, long payback periods, and uncertain demand. Without de-risking mechanisms, private capital may remain limited.

2.2.2 ICAO Doc 9082 (*ICAO's Policies on Charges for Airports and Air Navigation Services*) and ICAO Doc 9980 (*Manual on Privatization in the Provision of Airports and Air Navigation Services*) provide relevant guidance, but do not fully address the specific challenges faced by archipelagic States. In response, Indonesia and other States have begun to explore innovative financing solutions. Public-Private Partnerships can mobilize private capital and expertise, sharing risks and rewards between public and private partners, as illustrated by Indonesia's North Bali International Airport, a National Priority Project estimated at approximately Indonesian rupiah (Rp)50 trillion (US\$2.8 billion) and developed through private investment. Blended finance combines public and philanthropic capital with private investment to reduce risk and attract commercial funding and can be particularly relevant for projects with strong social returns but limited commercial viability. Development banks can provide long-term, low-cost financing with technical assistance, while climate and sustainability funds can support resilient infrastructure aligned with environmental objectives. Regional infrastructure financing arrangements offer another avenue, pooling resources and sharing risks across neighbouring States. Indonesia's own experience reflects this diversity: the Maleo Airport development was funded through an Rp177.99 billion grant, while the Rendani Airport expansion has attracted international interest.

2.2.3 Despite these financing avenues, there remains a need for further ICAO guidance. In particular, guidance on financing small island airports, including cost recovery, subsidy design, and private-sector engagement, could support States in developing sustainable financing models. Methodologies for evaluating the socio-economic benefits of aviation infrastructure in archipelagic contexts could support evidence-based investment decisions. Facilitating the exchange of best practices among archipelagic States could also enable successful financing models and lessons learned to be shared more widely.

2.3 Measurement as an Enabler of Better Financing Decisions

2.3.1 A critical enabler of effective financing is better measurement. ICAO's connectivity measurement tools, including the Global Aviation Competitiveness Index (GACI) and the country-level connectivity framework, currently provide national-level results for cross-country benchmarking. While valuable for international comparison, these tools do not capture sub-national disparities within large archipelagic States. A small number of well-connected trunk routes between major hubs may improve the national aggregate score, while significant regions may remain underserved or functionally disconnected.

2.3.2 As illustrated by Indonesia's experience in Section 2.1.2, internal connectivity disparities within archipelagic States can be substantial, yet may not be reflected in national aggregate scores. Without granular, sub-national data, policymakers may face challenges in identifying which regions most require investment, which routes may require public support, or where financing could have the greatest impact. Sub-national connectivity measurement could provide an evidence base for targeting available resources more effectively.

2.3.3 This proposal is consistent with the broader direction of ICAO discussions on aviation benchmarking. At the 42nd Session of the ICAO Assembly (2025), Brazil proposed (A42-WP/113) moving the GACI from a single unified index towards a more flexible "collaborative benchmarking dashboard" that would take into account national specificities. Indonesia's proposal for sub-national measurement could complement this direction by extending the principle of contextual sensitivity from inter-State comparison to intra-State policy prioritization. Indonesia considers that ICAO could examine the feasibility of extending its connectivity measurement tools to enable sub-national analysis, providing States with a more actionable basis for targeting financing and investment.

3. CONCLUSION

3.1 Achieving the vision of the Seventh Worldwide Air Transport Conference (ATConf/7), where air transport supports global connectivity, economic development, and resilience, requires a strategic and coordinated approach to financing aviation infrastructure in archipelagic and geographically isolated States. Indonesia's experience demonstrates that connectivity challenges need to be addressed holistically. By integrating aviation investment into national development plans, embracing innovative financing mechanisms, fostering regional cooperation and enabling sub-national connectivity measurement to better target financing, States can unlock the full economic potential of their aviation sectors.

4. RECOMMENDATION

4.1 The Conference is invited to:

- a) encourage States to exchange best practices related to financing aviation infrastructure serving archipelagic and geographically isolated communities;
- b) invite ICAO to compile case studies and guidance on sustainable infrastructure financing models;
- c) invite ICAO to explore innovative financing mechanisms to enhance connectivity in remote and island regions;
- d) encourage States to consider socio-economic and connectivity benefits when assessing aviation infrastructure investments; and

- e) invite ICAO, as it continues to develop and finalize its connectivity measurement methodologies, to examine the feasibility of enabling sub-national analysis, in consultation with interested Member States.

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