



WORKING PAPER

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

Montréal, HQ, 16 to 20 November 2026

Agenda Item 1: Overview of developments in the field of air transport

**1.2: Air transport in ICAO's long term strategic plan: Accelerating aviation
towards 2050**

**STRENGTHENING GLOBAL AIR CONNECTIVITY: AN APPROACH TO INTERNATIONAL
ROUTE NETWORK NODES SELECTION FOR DEVELOPING COUNTRIES**

(Presented by China)

EXECUTIVE SUMMARY

Strengthening global air connectivity is intended to promote a more balanced and inclusive global air transport system and is consistent with the goals of the International Civil Aviation Organization (ICAO) Strategic Plan. This working paper proposes an approach to international route network nodes selection for developing countries. The new idea put forward will help developing countries optimize their route networks and better integrate into the global route network system.

Action: The Conference is invited to:

- a) recognize the importance of strengthening global air connectivity in promoting the socio-economic development of all countries and improving societal well-being for all, in implementing the *No Country Left Behind* (NCLB) initiative, and in achieving the goals of the ICAO Strategic Plan;
- b) call upon Member States to enhance the connectivity of developing countries and promote a more balanced and inclusive global air transport network; and
- c) request ICAO to task relevant expert panels to conduct research on the approach set out in this paper, and encourage willing Member States to share nodes or connecting points selection practices with airlines, airports and relevant regional organizations, and to carry out voluntary case studies to assess the impact of the relevant approach on accessibility, commercial sustainability and network resilience.

<i>Strategic Goals:</i>	This working paper relates to the Strategic Goals: <i>The Economic Development of Air Transport Assures the Delivery of Economic Prosperity and Societal Well-Being for All; and No Country Left Behind.</i>
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<i>Financial implications:</i>	No additional resources required.
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<i>References:</i>	Assembly Resolution A39-25, <i>Aviation's contribution towards the United Nations 2030 Agenda for Sustainable Development</i> Assembly Resolution A39-23, <i>No Country Left Behind (NCLB) Initiative</i>
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¹ English and Chinese versions provided by China.

	Resolution A42-26, <i>Consolidated statement of continuing ICAO policies in the air transport field</i> ICAO Strategic Plan 2026-2050
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1. INTRODUCTION

1.1 The value and significance of strengthening global air connectivity

1.1.1 Civil aviation, with its unique advantages in terms of speed, coverage and connectivity, is the only networked mode of transport capable of reaching the entire globe. It plays an irreplaceable role in cross-border and trans-oceanic transport and is the most efficient vehicle for connectivity between countries.

1.1.2 At its 39th Session, the International Civil Aviation Organization (ICAO) Assembly adopted Resolution A39-23 on the *No Country Left Behind* (NCLB) initiative, which advocates for inclusive and equitable development, places high priority on developing countries, particularly the Least Developed Countries (LDCs), Landlocked Developing Countries (LLDCs) and Small Island Developing States (SIDS), and supports capacity-building in developing countries. The 42nd Session of the ICAO Assembly adopted Resolution A42-26, recognizing that “regular and reliable air transport services is of fundamental importance to the development of the economies of States, especially the developing States, including those dependent on tourism.”.

1.1.3 Strengthening global air connectivity is consistent with the core objectives of the ICAO Strategic Plan 2026-2050. The integration of States into a prosperous, connected, accessible, inclusive and affordable integrated passenger-and-cargo transport system can drive socio-economic development and enhance societal well-being for all, a vision that remains steadfastly anchored in the *No Country Left Behind* principle.

1.2 Major challenges to global air connectivity

1.2.1 **Insufficient demand to support direct routes in certain markets.** Although global air transport demand continues to grow, a significant number of city pairs with potential economic or social value cannot support the launch or sustained operation of direct flights due to insufficient passenger traffic and low yields. This not only hampers global and regional economic integration, but also excludes many travellers who rely on air transport from the global air network.

1.2.2 **Connectivity gaps persist for developing countries.** Air carriers make capacity and network decisions driven by demand levels, cost structures and expected returns. Some developing countries are characterized by low aggregate demand, fragmented markets and long flight distances. Air services tend to be deployed in high demand markets, with limited attention paid particularly to emerging market economies. This results in inconvenient travel conditions for passengers travelling to and from developing countries.

1.2.3 **Developing States face notable internal capacity constraints.** Some developing countries exhibit significant deficiencies in fleet capacity, aviation infrastructure, regulatory frameworks, human resources and technology. These constraints not only limit their capacity to integrate into the global air transport network, but also create a Matthew effect in the development of air transport, exacerbating imbalances in global connectivity.

1.2.4 In addition, factors such as geopolitical conflicts and high jet fuel costs further increase the difficulty for airlines of all countries in sustaining international route operations.

2. DISCUSSION

2.1 An Approach to International Route Network Nodes Selection for Developing Countries

2.1.1 **Overall Approach.** Nodes form the foundation of a route network and play an indispensable role in forming transport corridors. A node can serve as a transit hub for a country or a region, as well as a gateway airport. To enhance the international connectivity of developing countries, it is essential to objectively and accurately identify international air route network corridor nodes for respective countries and regions. A node evaluation indicator system can be built that takes into account multiple factors, including air connectivity, hub characteristics, market potential, economic and trade ties, and business environment. The entropy-weighted Technique for Order Preference by Similarity to Ideal Solution (TOPSIS) method (a multi-index comprehensive evaluation method that first uses the entropy weight method to calculate index weights and then uses the TOPSIS method to score and rank samples) can then be used to conduct a comprehensive assessment of aviation hubs in the countries of the target region. Finally, node selection proposals are put forward in accordance with the actual development status and strategic plans of national civil aviation.

2.1.2 Specific Steps

- Step 1: Select the target regional market.
- Step 2: Construct an evaluation system for nodes in the target regional market from dimensions such as aviation links (X1), hub characteristics (X2), market potential (X3), economic and trade links (X4), and business environment (X5).
- Step 3: Based on data availability, refine the specific indicators of each dimension. For instance, passenger traffic volume (X_{1-1}), flight frequency (X_{1-2}) and number of connected airports (X_{1-3}) may represent the level of air links between Country A and Country B₁.
- Step 4: Data preparation.
- Step 5: Use the entropy weight method to determine the weight (W) of each dimension indicator.
- Step 6: Use the TOPSIS method to calculate the comprehensive score of each airport in the region.
- Step 7: Carry out cluster analysis. On the basis of comprehensive scores, classify hubs in the target regional market into different tiers.
- Step 8: Put forward suggestions for hub nodes in the target regional market. In light of national civil aviation development conditions and strategic plans, several hub or gateway airports are identified as international network nodes. By prioritizing the launch or frequency enhancement of air routes to selected nodes and strengthening commercial cooperation among air carriers, the network coverage and radiation capacity toward the target region can be effectively improved.

2.1.3 **Conclusion.** For countries and regions with insufficient aviation services, the data-driven air route network nodes selection methodology proposed in this report can provide supportive reference for connectivity improvement, including enhanced connectivity from all countries to developing countries and improved outbound connectivity of developing countries to other countries worldwide.

2.2 **Other Ways to Support Developing Countries in Integrating into the Global Route Network System**

2.2.1 **Strengthening infrastructure cooperation.** Support developing countries in advancing the construction of airports, air traffic management systems, logistics parks and other aviation infrastructure, and better serve local economic development and employment growth.

2.2.2 **Deepening civil aviation cooperation in various fields.** Promote the liberalization of market access among Member States, encourage business cooperation between airlines, and expand the coverage of route networks.

2.2.3 **Assisting capacity-building.** Make full use of existing resources, platforms and mechanisms, take individual and joint actions to share development experience, deliver technical assistance, and provide feasible support for building civil aviation professional talent teams in developing countries.

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