



ICAO

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Fourteenth Meeting of the Air Traffic Management Sub-Group (ATM/SG/14) of APANPIRG

Bangkok, Thailand, 3 – 7 August 2026

Agenda Item 6: ATM Coordination and Implementation

6.4: ATS Route Development

OUTCOME OF DATA-DRIVEN AIRSPACE EFFICIENCY STUDY ON ATS ROUTE PROPOSALS AT EUROPE-ASIA INTERFACE

(Presented by IATA)

SUMMARY

The paper presents the outcome of the *Data-driven Airspace Efficiency Study* completed by IATA and industry stakeholders, and its white paper delivered by IATA in Q1 2026, which is in response to the operational challenges at Europe-Asia interface affected by airspace disruptions and traffic shift. The case study aims to explore and validate the data-driven and performance-based approach for improving airspace efficiency by multi-faceted assessment on proposed route optimizations and potential solutions.

1. INTRODUCTION

1.1 Affected by geopolitical conflicts and airspace disruptions, the Europe-Asia air corridor and corresponding Flight Information Regions (FIRs) at the interface of APAC and EUR/NAT regions are experiencing traffic shifts and spillovers from other FIRs. Directly or indirectly, this has led to serious challenges in airspace capacity and operational efficiency within this area.

1.2 In response, IATA carried out a case study in 2025 titled *Data-driven Airspace Efficiency Study*, in collaboration with the airlines, ANSPs and industry stakeholders concerned. During the study, data-driven and performance-based methodologies along with digital tools have been developed and validated to analyze and measure the risks, costs and benefits of the proposed route optimizations and potential solutions.

1.3 At the Thirteenth Meeting of the Air Traffic Management Sub-Group (ATM/SG/13) of APANPIRG, the following Working Paper was presented by IATA: [Data-driven and Performance-based Case Study on Improving Airspace Efficiency and Capacity \(WP/32\)](#), which provided a briefing on the ATS route proposals and case study led by IATA. With the completion of the tasks and release of the White Paper in Q1 2026, this paper is to provide a summary of the outcomes and conclusions from the case study.

2. DISCUSSION

Case Study and Data-driven Approach

2.1 The study was focused on the FIRs at Europe-Asia interface (e.g. Urumqi, Lanzhou, Ulaanbaatar and Almaty FIRs), which were significantly impacted by traffic growth and airspace constraints (e.g. frequent airspace restrictions and closures). To address the operational challenges in this area, IATA collaborated with a number of industry stakeholders and came up with a proposal of new and potentially more efficient ATS routes crossing Urumqi FIR and Ulaanbaatar FIR as an alternate option for the operators (refer to **Figure 1** below).

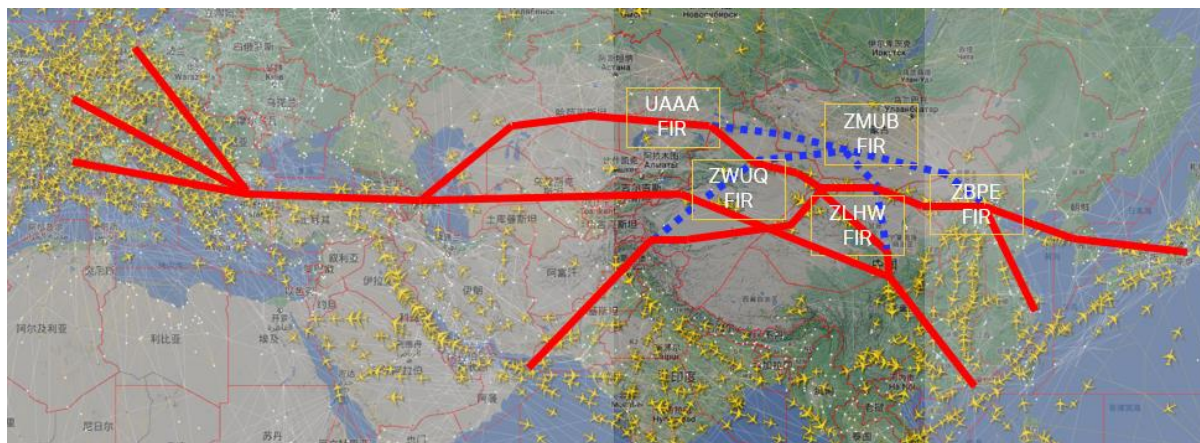


Figure 1. Proposed New ATS Routes as Alternate Option for Operators

2.2 To complete the cost-benefit analysis of the potential solutions, the following approach and steps were implemented by the project team:

- a) Real Data Collection and Analysis: the historical flight and NOTAM data collection and analysis covered two flight seasons (from March 2024 to March 2025), during which the real flight plan and schedule data were provided by 22 airlines with the highest frequency of operations;
- b) Statistical Modelling: a statistic model was developed in collaboration with industry partners utilizing modeled digital platform (the modernized flight planning system with enhanced tools on airspace capacity, aircraft performance and weather information) to conduct the simulation and evaluation on the existing routes and “What-if” scenarios;
- c) Interviews with Key Stakeholders: the interviews were conducted with the key personnel and experts from airspace users, ANSPs, airport operators, CAAs, etc., to validate the pain points and adapt solution concept to actual operational requirements;
- d) Technical Visits to Key Facilities: technical visits were organized to the ACCs and airports concerned and joined by industry advisors, to validate the infrastructure and direct/indirect costs needed to fulfil future operational needs; and
- e) Performance Assessment and Desk Research: a multi-dimensional KPI framework was developed to evaluate airspace efficiency improvements from the simulated data, and a multi-faceted assessment approach was implemented for all the stakeholders involved; and

- f) Industry Review and Validation: an industry review workshop was hosted on 25-27 November 2025 in Xi'an, China in collaboration with Air Traffic Management Bureau of Civil Aviation Administration of China (CAAC/ATMB), attended by 103 participants from 9 States/ANSPs, 20 airlines and seven international organizations and institutes. The methodologies were discussed and endorsed by the participants and further improvements were made based on industry feedback.

Overall Results of Performance Assessment

2.3 The simulations were conducted for a total of 68,256 flights over the one-year period from March 2024 to March 2025. For each flight, operations on the originally planned route and diversion to the proposed alternative route were simulated.

2.4 Analysis of original route operations revealed that 6,664 flights (14.4%) were affected by NOTAM-induced airspace restrictions, resulting in an average delay of 140.3 minutes per affected flight, with a median of 114.3 minutes. To assess the overall potential of the new routes, different assumptions based on the change in route distance following diversion were applied.

2.5 Assuming full diversion for flights with shorter alternative distances, annual total flight time could be reduced by 4,968 hours, fuel consumption by 33,530 tons, and CO2 emissions by 105,623 tons. Route charges would decrease by approximately USD 2.04 million, while delay time attributable to NOTAM restrictions would be reduced by 13,084 hours. The total controller service time would be reduced by 4,968 sector hours.

Key Takeaways and Recommendations

2.6 In summary, the proposed new ATS routes through Urumqi FIR and Ulaanbaatar FIR offer significant strategic value in alleviating operational pressure on the Europe-Asia interface and enhancing regional airspace resilience. Meanwhile, recommendations for future research and proposed short-, medium- and long-term actions for the industry stakeholders are provided.

2.7 In the short term, strengthened civil-military, cross-region and cross-border cooperation, informed decision-making and immediate mitigation measures are required to address the operational challenges and improve overall airspace resilience, especially during the era of uncertainty with increasing conflict risks and emerging impact from new entrants to the civil aviation and current airspace systems.

2.8 In medium-to-long term, cultivating a more robust and resilient industry framework for airspace efficiency management, with development of modernized and digitalized solutions powered by data and emerging technologies such as Artificial Intelligence, is greatly recommended as a strategic enabler to improve and upgrade operational intelligence, agility, sustainability and overall maturity of the airspace systems in APAC Region.

2.9 Further details of the case study and relevant data can be found in the White Paper: [Data-driven Airspace Efficiency Study](#).

2.10 As the follow-up, ATS route proposals (refer to **Appendix A**) are submitted to the *Asia/Pacific Region ATS Route Catalogue* for further review by the stakeholders.

3. ACTION BY THE MEETING

3.1 The meeting is invited to:

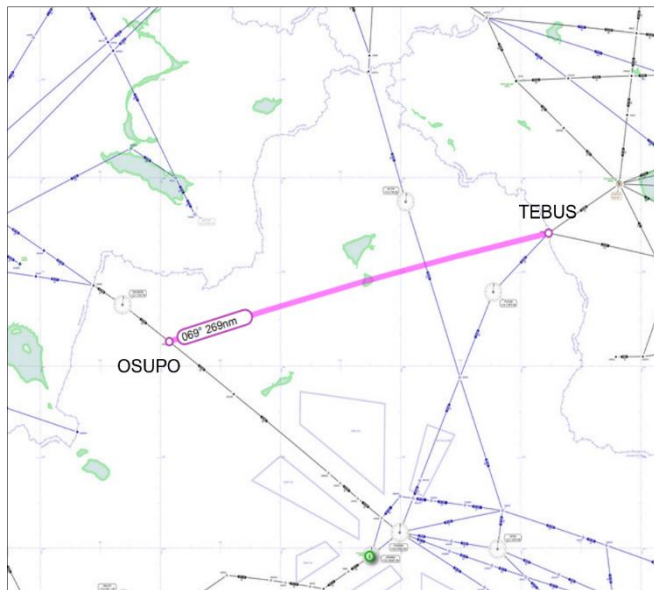
- a) note the information contained in this paper;

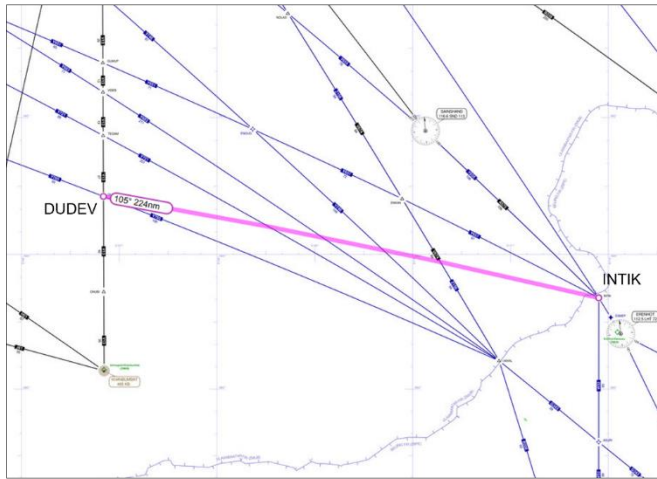
- b) note the information and findings in the IATA White Paper, discuss the strategies and consider the solutions proposed for the relevant airspace; and
- c) discuss any relevant matters as appropriate.

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APPENDIX A

ATS ROUTE PROPOSALS

ATS Route Name	IATA 03
State Priority	A/B/C/D
IATA Priority	HIGH
Requested by (when)	IATA
States/Administrations Involved	China, Mongolia (Urumqi, Ulaanbaatar FIRs)
Route Description	Implementation of new bi-directional ATS route: OSUPO – TEBUS
Flight Level Band	28,000 – 46,000 ft
Benefit (fuel, environmental)	Assuming full diversion for flights with shorter alternative distances, annual total flight time could be reduced by 4,968 hours, fuel consumption by 33,530 tons, and CO ₂ emissions by 105,623 tons. Route charges would decrease by approximately USD 2.04 million, while delay time attributable to NOTAM restrictions would be reduced by 13,084 hours. The total controller service time would be reduced by 4,968 sector hours. (further details can be found in IATA White Paper: Data-driven Airspace Efficiency Study)
Operational Information (potential airlines, flight frequency, potential city pairs)	Operators from Asia/Pacific, Europe, Middle East regions (more than 68,000 flights annually)
Remarks:	

ATS Route Name	IATA 04
State Priority	A/B/C/D
IATA Priority	HIGH
Requested by (when)	IATA
States/Administrations Involved	Mongolia, China (Ulaanbaatar, Beijing FIRs)
Route Description	Implementation of new bi-directional ATS route: DUDEV – INTIK
Flight Level Band	28,000 – 46,000 ft
Benefit (fuel, environmental)	Assuming full diversion for flights with shorter alternative distances, annual total flight time could be reduced by 4,968 hours, fuel consumption by 33,530 tons, and CO2 emissions by 105,623 tons. Route charges would decrease by approximately USD 2.04 million, while delay time attributable to NOTAM restrictions would be reduced by 13,084 hours. The total controller service time would be reduced by 4,968 sector hours. (further details can be found in IATA White Paper: Data-driven Airspace Efficiency Study)
Operational Information (potential airlines, flight frequency)	Operators from Asia Pacific, Europe, Middle East regions (more than 68,000 flights annually)
Remarks:	

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