



ASSEMBLY — 42ND SESSION

TECHNICAL COMMISSION

Agenda Item 24: Aviation Safety and Air Navigation Priority Initiatives

GOVERNMENT-LED DEVELOPMENT OF TECHNICAL STANDARDS AND OPERATIONAL
GUIDANCE TO FACILITATE TOTAL AIRPORT MANAGEMENT (TAM)
IMPLEMENTATION

(Presented by China)

EXECUTIVE SUMMARY

Total airport management (TAM) is an extension and evolution of airport collaborative decision-making (A-CDM). It takes a holistic approach to airport performance management by integrating operational processes across the airfield, terminal area and ground transportation centre, consolidating data on flights, passengers and baggage, and involving stakeholders in a coherent planning and collaborative decision-making process. Compared to A-CDM, TAM covers a broader scope of operations, larger physical areas, and extended timeframes, requiring government agencies and industry stakeholders to jointly develop technical standards and operational guidelines for TAM to ensure the effectiveness and consistency of its implementation.

Action: The Assembly is invited to:

- a) urge ICAO to create the necessary enabling conditions for developing a feasible TAM implementation plan in a globally coordinated manner; and
- b) urge ICAO to encourage Member States, in advancing TAM implementation, to proactively adopt artificial intelligence (AI) technologies to enhance A-CDM capacities.

<i>Strategic Goals:</i>	This working paper relates to <i>Every Flight is Safe and Secure</i> , and <i>Aviation Delivers Seamless, Accessible, and Reliable Mobility for All</i> .
<i>Financial implications:</i>	The activities referred to in this paper are expected to be undertaken with the resources available in the 2026-2028 Regular Budget and/or from extra-budgetary contributions as guided by the ICAO Business Plan 2026-2028.
<i>References:</i>	ICAO <i>Strategic Plan 2026-2050</i> ICAO <i>Business Plan 2026-2028</i> Doc 9750, <i>Global Air Navigation Plan (GANP)</i>

¹ English and Chinese versions provided by China.

1. INTRODUCTION

1.1 The Global Air Navigation Plan (GANP, Doc 9750) specifies three airport collaborative decision making (A-CDM) tasks for the B2 phase under Performance Improvement Area 1 (Airport Operations) of the Aviation System Block Upgrades (ASBU) framework: A-CDM-B2/1 (Airport Operation Planning (AOP)), A-CDM-B2/2 (Airport Partnership Operations Centre (APOC)) and A-CDM-B2/3 (Total Airport Management (TAM)).

1.2 To achieve progress in the development of the aviation industry, it is necessary to further enhance the efficiency of airport operation and the utilization of relevant resources and facilities to accommodate sustained growth in air traffic volume. In addition, airports are evolving from standalone air transport nodes into integrated urban transportation hubs, calling for enhanced TAM capabilities.

1.3 Since 2017, the Civil Aviation Administration of China (CAAC) has been advancing the development of A-CDM systems across the industry. To date, 41 major international airports have successfully implemented A-CDM operations. During implementation, these airports have established collaborative operational mechanism, involving air traffic control, airlines, airport operators, and ground handlers. By employing video analysis and other technologies to automatically capture ground handling operational data, they have achieved dynamic allocation of ground support resources and pre-departure sequencing capabilities. Furthermore, standardized interaction protocols have been developed for key operational parameters including target off-block time (TOBT), target start-up approval time (TSAT), and calculated take-off time (CTOT), enabling effective integration between A-CDM and air traffic flow management (ATFM) systems. Through years of operational practice, substantial implementation experience has been accumulated, and a robust technical foundation has been established for future adoption of TAM systems.

2. DISCUSSION

2.1 According to ASBU framework, TAM involves comprehensive management of flights, passengers, baggage and ground transportation across airside, landside and the integrated ground transportation centre. This is achieved through upgrading Airport Partnership Operations Centers (APOC) to integrate landside management, developing and implementing Airport Operations Plans (AOP), and integrating the entire airport into a coherent collaborative decision-making process that supports all flight operation phases (strategic, pre-tactical, tactical stages and post-operational analysis). Comparing with A-CDM, TAM covers a broader scope of operations, larger physical areas, and extended timeframes, requiring government agencies and industry stakeholders to jointly develop technical standards and operational guidelines for TAM to enhance the effectiveness and consistency of its implementation.

2.2 CAAC has developed a five-year work plan (2025-2029) to promote TAM implementation, with key tasks including working group formation, technical standard development, pilot program implementation and industry-wide implementation.

2.2.1 In April 2025, the CAAC, in collaboration with industry stakeholders, set up a Working Group on TAM Implementation to advance various implementation tasks.

2.2.2 CAAC, following extensive discussions with industry stakeholders, issued the *Provisional Technical Guidelines for Total Airport Management* in July 2025, providing technical direction for airport operators to develop the TAM system.

2.2.3 By the end of 2025, three major international airports will be selected for TAM pilot programs, which will commence in January 2026 and are expected to take more than 18 months to complete.

2.2.4 Based on experiences from pilot programs, it is expected that the TAM technical standards will be developed and issued by 2028, followed by gradual application at eligible airports.

2.3 The technical guidelines for TAM primarily covers terminology definitions, responsibilities, operational modes, operation processes, and system architecture.

2.3.1 Terminology definitions and responsibilities. The technical guidelines define key concepts including TAM, APOC and AOP, while delineating the responsibilities of airport operators and other airport stakeholders.

2.3.2 Operational mode. The management mode has shifted from traditional siloed management for airfield, terminal area and ground transportation to centralized management by a large operation control centre. Airport operators are tasked with establishing an APOC to provide a shared workplace and system platform for stakeholders. All stakeholders, who share the same workplace, collaboratively develop and update when necessary the AOP, which defines performance targets, resource allocation and support programs, and assume supervision and management role.

2.3.3 Operation process. To achieve TAM performance targets, the APOC is required to carry out data governance and data integration, optimize flight operation workflows, establish end-to-end passenger service processes, and redesign performance metrics and evaluation methods.

2.3.4 System architecture. TAM platform consists of a perception layer, decision-making layer and execution layer. Utilizing big data, artificial intelligence and other technologies, it builds algorithmic models with self-adaptive learning and autonomous optimization capabilities to drive the operational support systems of all stakeholders, thereby achieving airport-wide collaboration and intelligent empowerment. Specifically:

- a) the perception layer collects real-time data from both local and external resources by using a variety of smart devices and technologies, providing TAM platform with real-time data support and precise situational awareness;
- b) the decision-making layer, based on the operational data from the perception layer and operation rules, analyzes complex scenarios using AI technologies such as large-scale models and intelligent agents. By evaluating multiple objectives including safety, efficiency and service quality, it generates decision-support plans and operational directives; and
- c) the execution layer deeply integrates TAM platform with stakeholders' operational supporting systems, establishing an intelligent execution system with automatic recognition and decision-support capabilities, which enables cross-system collaboration, dynamic resource allocation, and monitoring of the entire execution process.

2.4 In the future, CAAC will advance all TAM implementation tasks according to the work plan, with a focus on deepening the integration of AI technologies with airport operations. By leveraging flight operational data to train specialized large-scale models for the aviation sector, and through continuous application, retraining and optimization across various operation scenarios, gradual improvement will be

made in generative AI capabilities, thus enhancing on an on-going basis airport operational efficiency and passenger travel experience. Furthermore, CAAC stands ready to share relevant practical experiences at future ICAO technical meetings, contributing China's wisdom to the global civil aviation governance.

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