



International Civil Aviation Organization

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## WORKING PAPER

### ASSEMBLY — 41ST SESSION

#### EXECUTIVE COMMITTEE

#### Agenda Item 23: Innovation in Aviation

#### INDUSTRY ROADMAP FOR FUTURE SKIES

(Presented by the Civil Air Navigation Services Organization (CANSO), ACI, IATA, IBAC, ICCAIA and IFALPA)

#### EXECUTIVE SUMMARY

The Complete Air Traffic Services (CATS) Global Council is a unique industry forum which brings together leaders from across the manned and unmanned aviation industries together with service and technology providers. The CATS Global Council works under the strong belief that as a sector we need to act collectively and with a sense of urgency in order to mobilise and build the future complete air transport system together to meet evolving and future industry needs.

The first action of the CATS Global Council was to create a collaborative vision of the future skies of 2045, which is described in information paper “CATS Global Council Vision” from CANSO. The CATS Global Council then undertook the critical task of developing a roadmap, laying out the key activities on the pathway to turning the vision into reality. The CATS vision roadmap includes technological and regulatory developments as well as political, economic, social and environmental aspects.

While much of the activity needed to build the future air transport system will be undertaken by industry, this working paper highlights some activities for which ICAO has a critical role to play and makes suggestions for additions of actions to the ICAO work programme.

**Action:** The Assembly is invited to:

- a) note the development by a broad coalition of industry of a 2045 Future Sky Vision and detailed roadmap outlining the milestones and activities necessary to achieve it;
- b) request that ICAO continue to prioritize existing activities identified in the roadmap as important milestones to future capabilities; and
- c) request that ICAO examine the activities identified in section 2.2 to determine where they best fit and how they can be advanced within the relevant work plans.

<i>Strategic Objectives:</i>	This working paper relates to Strategic Objectives: Safety; Air Navigation Capacity and Efficiency; Security and Facilitation; Economic Development of Air Transport; and Environmental Protection.
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<sup>1</sup> English, Arabic, Chinese, French, Russian and Spanish versions provided by CANSO.

<i>Financial implications:</i>	The activities referred to in this paper will be subject to the resources available in the Regular Programme Budget and/or from extra budgetary contributions. The financial implication to ICAO can be reduced through the advancements of studies and draft provisions prepared by the industry.
<i>References:</i>	Doc 10118, <i>Global Aviation Security Plan</i> Doc 10004, <i>Global Aviation Safety Plan</i> Doc 9750, <i>Global Air Navigation Plan</i> <a href="http://futureskyvision.com">futureskyvision.com</a> <a href="http://CATS-Global-Council_Vision.pdf">CATS-Global-Council_Vision.pdf</a> ( <a href="http://canso.fra1.digitaloceanspaces.com">canso.fra1.digitaloceanspaces.com</a> )

## 1. INTRODUCTION

1.1 The roadmap for future skies, developed by the CATS Global Council, provides a logical and ambitious pathway toward the CATS vision to *create global airspace that is safe, fair, intelligent and interoperable, leveraging revolutionised design, technology and services to power sustainable global mobility and prosperity.*

1.2 The roadmap is a living document for which industry holds itself accountable for progress, with direct engagement with ICAO and States. It will be used to galvanize the industry and to enlist and engage stakeholders in the CATS vision for our future skies and the necessary activities to get there. The roadmap not only focuses on technical developments but also addresses the political, economic, legal, social, operational and environmental aspects, which are all critical to progress.

1.3 The roadmap, built on seven core building blocks, is composed of three layers: long-term goals, intermediate milestones and finally actions. For each of the seven building blocks that underpin the vision, two long-term goals have been identified:

Building Block 1 - Services and Service Delivery Goals:

- Improved performance through automation
- Harmonised service delivery

Building Block 2 - Technology and Digitisation Goals:

- Harmonised, efficient and flexible systems
- Digital Collaboration

Building Block 3 - Safety and Regulation Goals:

- Predictive approach to risk management
- Strong safety and quality culture

Building Block 4 - Environmental Sustainability and Social Impact Goals:

- Towards Net Zero carbon
- Environmental sustainability and social impact management

Building Block 5 - Airspace Design and Classification Goals:

- Integrated airspace
- Integrated and connected multimodal transportation network and infrastructures

Building Block 6 - Data and Security Goals:

- Data-powered ecosystem
- Safety and Security by design

Building Block 7 - People, Organisation and Talent Goals:

- Thriving airspace management community
- High performing teams

For each long-term goal, the roadmap identifies the key milestones and actions that need to occur to achieve it. Over 70 milestones and 100 actions have been identified.

## 2. OWNERSHIP OF KEY ACTIVITIES

2.1 The CATS Global Council accepts that it is the custodian of its own vision and therefore it is the responsibility of the industry to deliver the vision and to own most of the actions and activities identified in the roadmap. However, ICAO is solely and uniquely positioned to contribute to important elements and to drive the global harmonisation that is a key pillar of the CATS vision.

2.2 For that reason, while industry is prepared to contribute with technical expertise, the CATS Global Council believes that ICAO is best positioned to lead actions related to the following activities identified as part of the roadmap:

- The development of a framework for the decentralised management of sovereign airspace, addressing liability, security, regulatory, political and financial aspects.
- The development of a global service model in high altitude airspace that enables full integration and a review of existing airspace classes to ensure they remain fit for purpose for a future reality in which airspace will necessarily become a more unified, flexible and dynamic environment.
- The advancement of global electronic conspicuity standards guidance aimed at air to air and air to ground conspicuity.
- The integration into the GASP of practices encouraging proactive risk management for new models of strategic and tactical service delivery.
- The evolution of the existing competency models to the changing roles and new positions our future industry will need, enabling the delivery of performance-based training programmes, and unlocking opportunities to use objective data and improve monitoring and evaluation.
- The integration into or alignment with the Global Air Navigation Plan of the relevant core goals and key milestones identified within the roadmap.

2.3 In addition to the items identified in 2.2, ICAO plays an important role supporting the delivery of the Future Skies Vision through the ongoing work aimed at: encouraging harmonization and performance based regulatory approaches, enabling the establishment of a globally harmonized international aviation trust framework that will enable higher levels of digitization in a secure manner, and its ongoing support for deployment activities related to Flight and Flow — Information for a Collaborative Environment (FF-ICE).

2.4 The broad industry coalition that is represented by the CATS Global Council is well positioned to advance other key actions in the vision roadmap and will undertake the development of a new

Global Concept of Operations (CONOPS) designed for the next era of traffic management, an ATM-UTM integration roadmap, (including a CONOPS for mixed mode ATM and UTM), to plot a course toward full convergence.

2.5 The Global Air Navigation Plan provides an important vehicle for harmonized advancement of key enabling capabilities. However, in its current state it may not go far enough in key areas, or provide for the level of airspace integration or automation now envisaged as necessary for the future sky vision. Industry will undertake the development of a technology roadmap to support the new Global CONOPS. The outcome of that activity will be coordinated with the ICAO GANP Study Group to support relevant updates and evolutions to the Global Air Navigation Plan.

### 3. CONCLUSION

3.1 While the past two years have presented unprecedented challenges for industry, the next period presents unprecedented opportunities if action is taken to advance a comprehensive future sky vision that achieves scalability, interoperability, adaptability and sustainability. In order to meet future needs, it is critical to progress with urgency on the changes identified through this vision, for which there is already broad consensus.

3.2 The Assembly is invited to accept the actions in the Executive Summary.

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