



WORKING PAPER

ASSEMBLY — 40TH SESSION

TECHNICAL COMMISSION

Agenda Item 30: Other Issues to be considered by the Technical Commission

UAS TRAFFIC MANAGEMENT

(Presented by International Coordinating Council of Aerospace Industries Associations (ICCAIA), Airports Council International (ACI), International Federation of Air Line Pilots' Associations (IFALPA) and International Federation of Air Traffic Controllers' Associations (IFATCA))

EXECUTIVE SUMMARY

Fundamental principles of aviation are being challenged by new entrants into aviation. In particular, unmanned aircraft systems (UAS) including small commercial drones, urban air mobility (UAM) and high-altitude pseudo-satellites (HAPS). UAS traffic management (UTM) is the enabler for new operations ranging from very low to very high altitude. This working paper outlines key considerations for States, relating to UAS and UTM operations, whilst identifying actions for ICAO building upon their “*UTM – A Common Framework with Core Principles for Global Harmonization*” document that was released in early 2019.

Action: The Assembly is invited to:

- a) request the Council to urge States to establish a framework for UTM operations based on the ICAO document “*UTM – A Common Framework with Core Principles for Global Harmonization*” and further updates to that document;
- b) request the Council to urge States to implement authoritative and validated digital data sources for UTM providers and UAS operators;
- c) request the Council to urge States to ensure alignment of risk profiles between manned and unmanned aircraft operating in shared airspace and use a common risk assessment methodology for UAS operations and UTM operations within their airspace;
- d) instruct the Secretary General to identify which panels and/or groups are tasked with addressing integrated operations in all airspace classes and strata (low/medium/high). This should include a focus on the ‘trust’ requirements for increasing levels of autonomy; and
- e) instruct the Secretary General to identify appropriate industry standards that States should apply with regards to UAS and UTM software and hardware.

<i>Strategic Objectives:</i>	This working paper relates to all Strategic Objectives.
<i>Financial implications:</i>	The activities referred to in this paper will be subject to the resources available in the 2020-2022 Regular Programme Budget and/or from extra budgetary contributions.

¹ Arabic, Chinese, English, French, Russian and Spanish versions provided by ICCAIA.

<i>References:</i>	Doc 10115, <i>Report of the Thirteenth Air Navigation Conference (AN-Conf/13)</i> , Corrigenda Nos. 1 and 2, and Supplement No. 1 Doc 10075, <i>Assembly Resolutions in Force (as of 6 October 2016)</i>
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1. INTRODUCTION

1.1 The concept of UTM is evolving at a fast pace. It is the enabler for all UAS operations from very low to very high altitude. Through UTM, it is envisaged that civil aviation authorities (CAAs) and air navigation service providers (ANSPs), to the extent that they are involved, will be able to make real-time information regarding airspace constraints and flight intents available to UAS operators directly or through a UTM service provider.

1.2 As the concepts of UTM mature, systems providing initial levels of capability start emerging, and the demand for airspace access continues to grow at all flight levels. ANSPs anticipate that UAS operations will include those that are fully contained in either controlled or uncontrolled airspace, and those that transit across these boundaries.

2. DISCUSSION

2.1 ICAO has developed a document titled “*UTM – A Common Framework with Core Principles for Global Harmonization*”. The document, developed by the UAS Advisory Group and primarily focusing on very low-level operations, provides States with a framework and core capabilities of a “typical” UTM system. It includes a list of key UTM services and technical requirements. As ICAO continues its work, and States start to focus on implementation, the following areas are identified as being important and requiring action from industry.

2.2 The long-term goal should be flexible accommodation of manned and unmanned operations at all altitudes rather than an approach that links a fixed volume of airspace to a particular type of system (ATM, UTM, STM, etc.) and particular class of vehicle operation (manned, unmanned, autonomous, etc.) as is implied by many of the ongoing efforts. ICAO should identify which panels, and groups should propose how to address this goal.

2.3 In some States, multiple UTM providers may offer services in the same airspace. Additionally, UTM will interface and integrate with traditional ATM. It is therefore essential that UTM systems, and UAS operations, utilize common datum. Data sources should be authoritative and validated to ensure common references.

2.4 UAS bring new and novel operating methods to aviation. This diverse mix of new operations places additional importance on the ability to effectively calculate and manage risk. Risk assessment models therefore must be quantifiable, consistent and comparable. In particular, States should ensure alignment of risk profiles between manned and unmanned aircraft operating in shared airspace. Additionally, there is a need for common real-time risk assessment methodology with a quantitative basis for UAS operations and UTM operations within their airspace. Transparency of models will be key to validate applicably, interoperability and compatibility.

2.5 As the number of UAS operations increase, and different Concept of Operations (CONOPs) are introduced (including increasing levels of autonomy), it is essential that this be done on

the basis of trust for both the operators and their operations. The ICAO Trust Framework Study Group has been established to ensure data integrity and security for evolving digital systems. It is essential that this work feeds into UTM development with specific focus on cybersecurity, trust and identity management. This may impact the scope of and capabilities associated with UAS registries.

2.6 Standards for UAS and UTM software and hardware development are being developed within industry. Different functional allocations between the UAS or UTM system may emerge in different applications or locations. These standards will cover a variety of applications including those related to safety of life services. It should be expected therefore that certain aviation standards in use today will be applied. These should be identified by ICAO.

3. CONCLUSION

3.1 UTM and UAS operations are evolving at a fast pace. It is incumbent on the aviation industry and the States to establish and implement international and national regulations enabling safe and secure operations. ICAO recognized the importance of UTM and its document “*UTM – A Common Framework with Core Principles for Global Harmonization*” provides a UTM reference framework for States. Further follow on work is required by ICAO to ensure UAS and UTM operations at all altitudes evolve safely, securely and expeditiously.

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