ICAO UTM FRAMEWORK

Core Principles for Global Harmonization

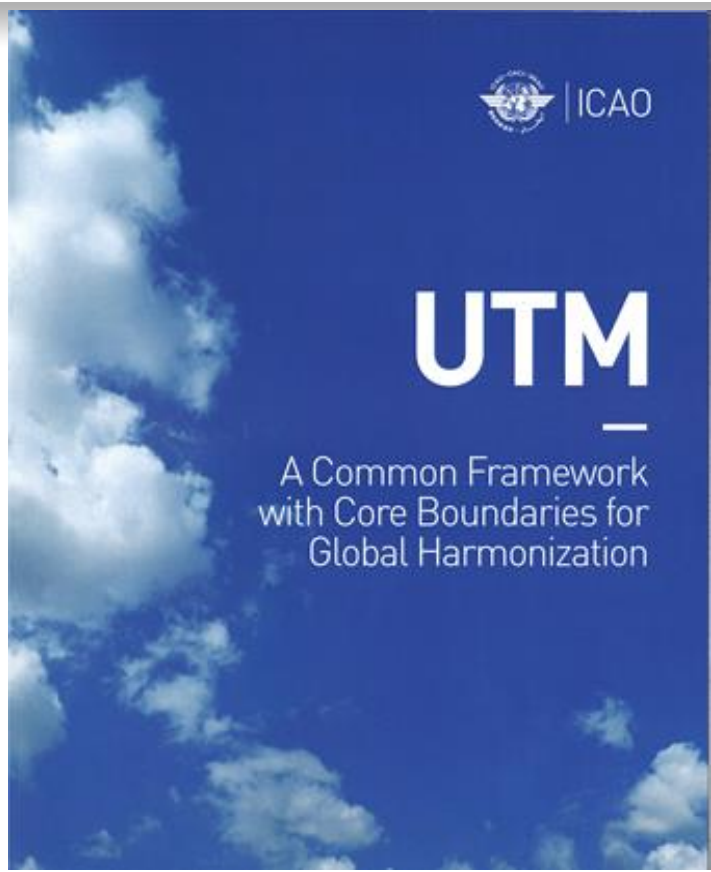
17 NOVEMBER 2020

BACKGROUND

- 2015 – States started requesting that ICAO address UAS issues
  - Since then, formal requests were raised during several key events
- Recognized that existing ICAO processes could not keep up with the pace of technology
- UAS-AG formed to address these challenges
- Initial UAS-AG work included the development of ICAO UAS Toolkit
- Once Toolkit completed, UAS-AG moved onto UTM activities
- Several innovative approaches were adopted
  - UTM RFI Process
  - DRONE ENABLE Symposia

ICAO's UTM FRAMEWORK

- A framework and core capabilities of a "typical" UTM system
- Need to interact/integrate with ATM systems
- High level UTM requirements/considerations
- Not a technical solutions document
- Developed in collaboration with industry/academia



UTM FRAMEWORK - OBJECTIVES

- Foster common framework and harmonization of core UTM principles
- Maintain safety and minimize disruption to existing aviation system
- Support technological developments in UTM and UAS
- Provide safety-focused recommendations for UTM system development
- Address security and environmental risks
- Enable stakeholders to grow safely and efficiently

UTM FRAMEWORK – MAIN DOCUMENT

Provide key principles, scope and building blocks

ICAO UTM Framework

PRINCIPLES AND SCOPE

- Oversight is the responsibility of the regulator.
- Existing aircraft prioritization policies should be applicable, and practices unique to UTM should be compatible.
- Access to airspace should remain equitable.
- Key personnel should be trained and qualified.
- States should have unrestricted, on-demand access to critical UTM system data.
- The creation, adoption and maintenance of safety culture among the UTM community is essential.
- Free and open reporting of accidents and incidents should be facilitated for all stakeholders.

UTM FRAMEWORK – MAIN DOCUMENT

Provide key principles, scope and building blocks

Define/describe the various services to be provided

SERVICES

- Activity reporting service
- Aeronautical Information Management
- Airspace authorization
- Discovery service
- Mapping service
- Registration service
- Restriction management service
- Flight planning service
- Identification service
- Tracking and location service
- Meteorological service

- Conflict management and separation service
  - Strategic deconfliction service
  - Tactical separation with manned aircraft service
  - Conflict advisory and alert service
  - Conformance monitoring service.
  - Dynamic reroute service

UTM FRAMEWORK – MAIN DOCUMENT

Provide key principles, scope and building blocks

Define/describe the various services to be provided

Identify complementary concurrent activities

CONCURRENT/ENABLING ACTIVITIES

- Develop a regulatory approach that is performance- and risk-based
- Development of and compliance with standards data management
- Optimization of common and shared airspace
- Optimization of frequency spectrum
- Application of appropriate assurance standards (e.g. cybersecurity or software assurance level)
- Prescribe/promote appropriate education, guidance and usage standards
- Ensure AIS or GIS data is trusted, accurate and timely
- Develop common horizontal, vertical and temporal reference sources

UTM FRAMEWORK – MAIN DOCUMENT

Provide key principles, scope and building blocks

Define/describe the various services to be provided

Identify complementary concurrent activities

Identify gaps/issues/challenges

GAPS/ISSUES/CHALLENGES

GAPS

- Airspace classification
- Rules of the Air
- Airspace access
- Operational procedures
- Liability determination
- UTM system certification
- Data standards
- Contingency management

GAPS/ISSUES/CHALLENGES

ISSUES

- Airspace/procedure design
- Frequency spectrum availability and supportability
- Provision of service may change airspace classification
- UTM and ATM interface
- Data exchange and privacy protocols

GAPS/ISSUES/CHALLENGES

CHALLENGES

- Capability to identify/detect and avoid conflicting aircraft
- Enhanced detectability/conspicuity of UA by manned aviation
- Development of separation standards within the UTM
- Policies to address means of compliance or system approval
- Implementation/maintenance of a safety management system
- Forecasting and dissemination of micro-weather

UTM FRAMEWORK – MAIN DOCUMENT

- Provide key principles, scope and building blocks
- Define/describe the various services to be provided
- Identify complementary concurrent activities
- Identify gaps/issues/challenges
- Appendices address specific topics or problem areas

UTM FRAMEWORK – RFI BASED CONTENT

EDITION 1

- Registration, identification and tracking
- Communications systems
- Geofencing-like systems
- Potential architectures

UTM FRAMEWORK – RFI BASED CONTENT

EDITION 2

- UTM-ATM boundaries and transitions
- Information exchange between ATM and UTM

UTM FRAMEWORK – RFI BASED CONTENT

EDITION 3

- Structure and approval processes for UTM service providers
- Separation and deconfliction in UTM
- UTM risk assessment/contingency procedures

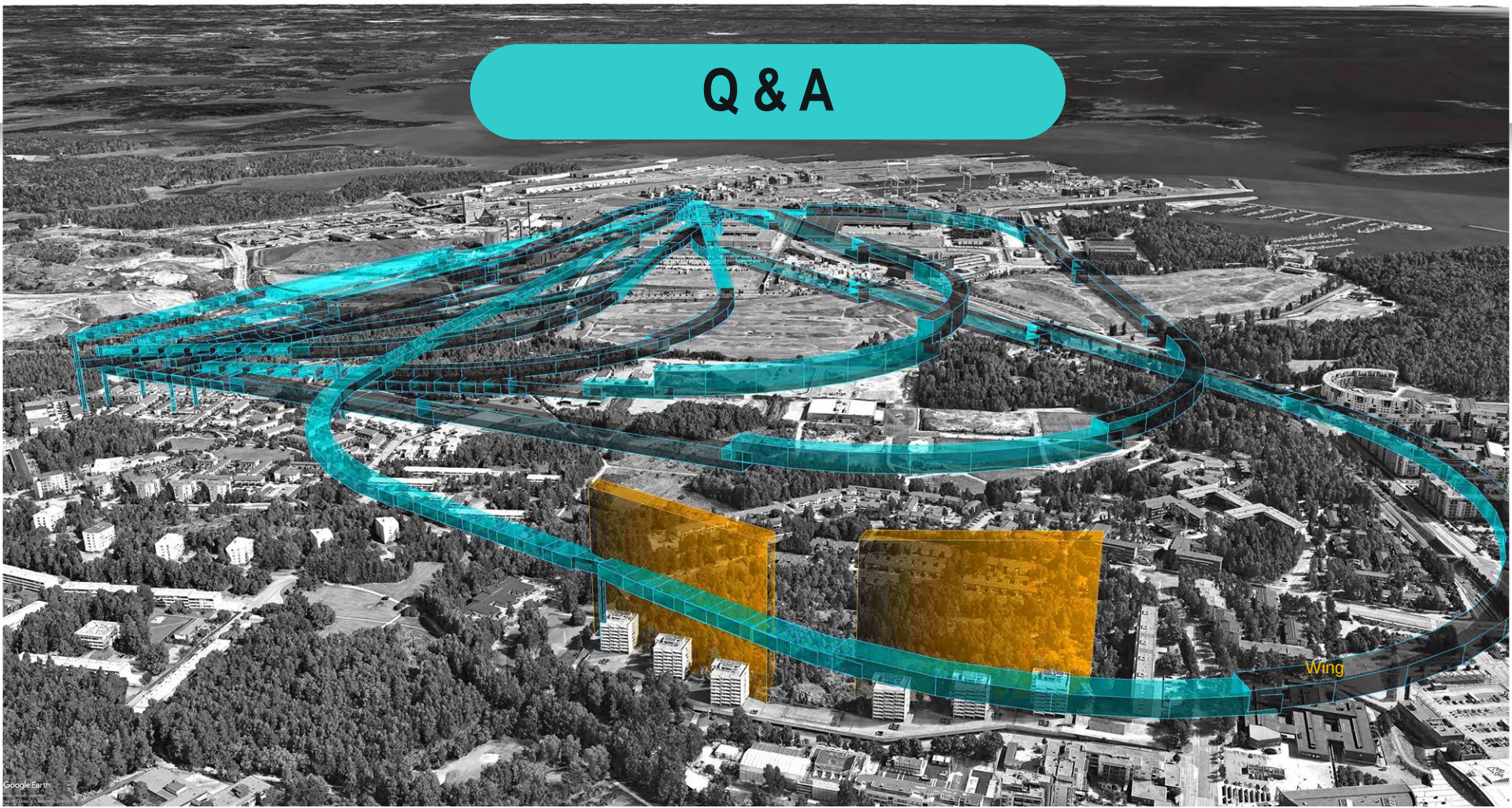
UTM FRAMEWORK – RFI BASED CONTENT

EDITION 4 (RFI STAGE)

- UA performance requirements in a UTM environment
- UTM system certification requirements
- UTM integration into aerodrome environments/activities
- Update to earlier Appendices

RFI available on ICAO's Unmanned Aviation page
https://www.icao.int/safety/UA/Pages/default.aspx

Q & A



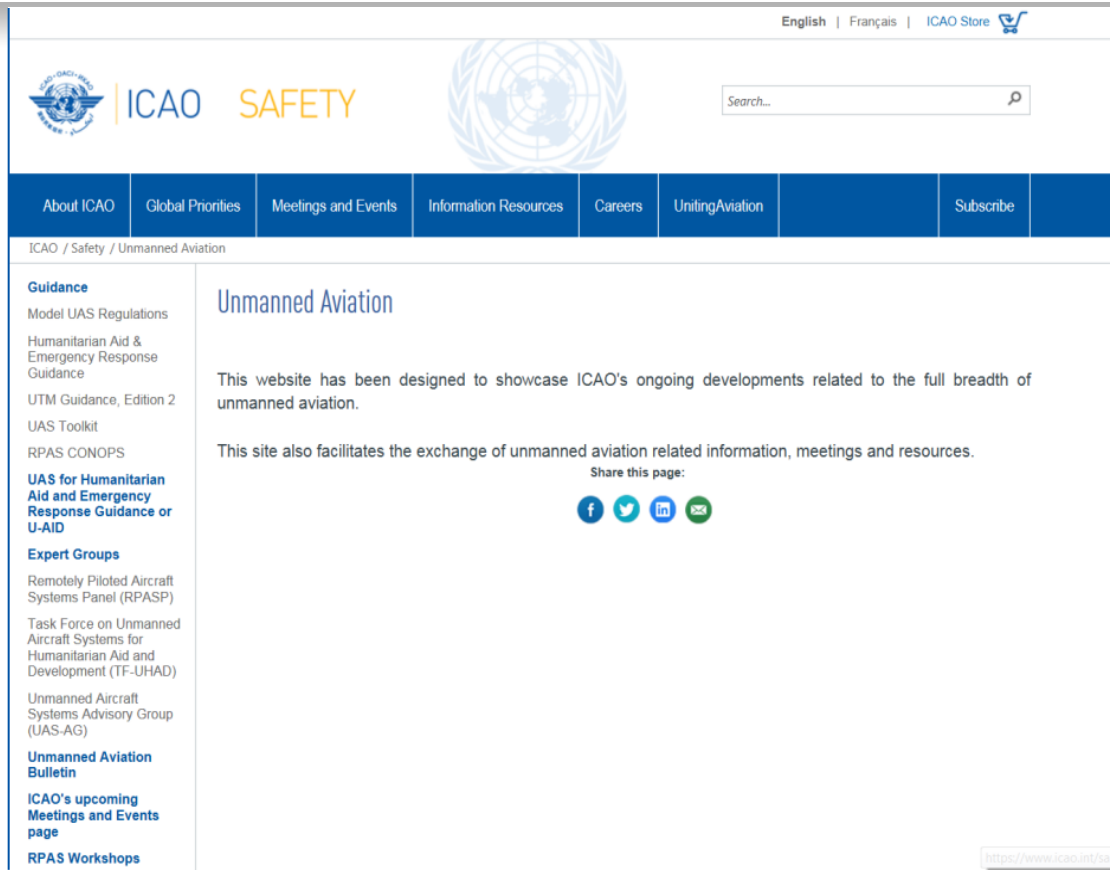
www.icao.int/safety/UA

Model UAS Regulations

Humanitarian Aid & Emergency Response Guidance

UTM Guidance Edition 2

UAS Toolkit



DRONE ENABLE 2021 (Virtual)

13, 14, 15, 20, 21 April 2021

www.icao.int/Meetings/DRONEENABLE4

THANK YOU FOR YOUR PARTICIPATION