الهيئة العامة للطيران المدني
CIVIL AVIATION AUTHORITY
QATAR قطر

ICAO

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Implementation of the National UTM System in Qatar

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Presentation Overview

01

Introduction

- National UTM implementation project: cornerstone for managing Qatar’s evolving drone ecosystem
- Strategic enabler of Smart Nation ambitions and aerial digital infrastructure
- Supports safety, innovation, and international regulatory alignment
- Part of QCAA’s broader airspace modernization strategy
- Reinforces ICAO-driven harmonization and UAS integration
- Presentation goals: share implementation progress, challenges, and next steps

02

What is UTM?

- A digital framework for safe integration of UAVs into low-altitude airspace
- Provides services:
  - UAS operator and drone registration
  - flight planning and authorization
  - real-time tracking and monitoring
  - dynamic airspace management
  - strategic and tactical deconfliction
  - remote identification
  - situational awareness and alerts
  - compliance monitoring and enforcement support
- Ensures safety, security, efficiency, and scalability of drone operations
- Key enabler of Drones-as-a-Service in public and private sectors
- Harmonized with ICAO UTM Framework and Doc 10019 Manual on RPAS

03

UAS Operations Evolution in Qatar

- Steady and substantial growth since 2014 across sectors
- Major use cases:
  - video and photography
  - surveys and mapping
  - agriculture
  - logistics and delivery
  - public safety and emergency response
  - construction and infrastructure development
- Drone innovation tied to Qatar's national development agenda
- Drones-as-a-Service gaining momentum in both civilian and governmental use
- Increasing demand for scalable regulatory and operational frameworks
- UTM seen as critical for future-proofing low-altitude operations

03

UAS Operations Evolution in Qatar

Year	Number of RPAS Operation requests	Number of issued RPAS LOAs
2017	No records	34
2018	54	151
2019	252	343
2020	601	347
2021	956	421
2022	**1589**	442
2023	951	408
2024	608	430
until end of April **2025**	450	236

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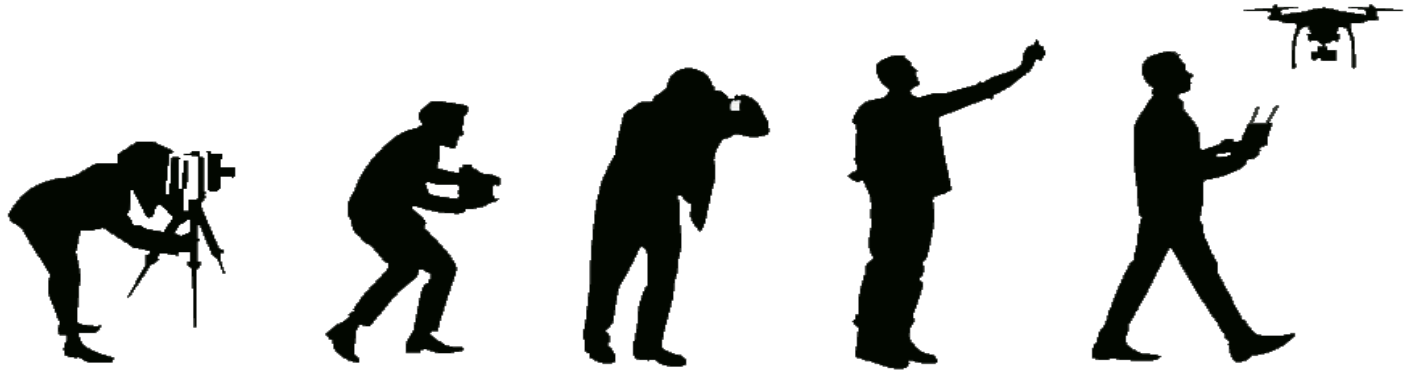
Regulatory Foundations

- FIFA World Cup 2022: catalyst for UAV operational readiness
- Enhanced regulatory framework:
  - Risk-based approach (VLOS, BVLOS, altitude, zones)
  - Licensing, training, and safety enforcement
  - Weather/time-based operational constraints
- Evolving to support emerging trends: drone swarms, urban mobility, autonomous operations
- ICAO alignment through adoption of Model Regulations and RPAS guidance
- Foundation for future services like U-Space (UAS airspace) and Advanced Air Mobility



05

Stakeholder Identification and Engagement

- Multi-agency involvement:
  - QCAA (ANS & ASD)
  - Ministry of Defense
  - Ministry of Interior
  - Qatar R/C Sport Center
  - Qatar Airlines Group
  - General Authority of Customs
- Emphasis on shared vision and transparency
- Early engagement increases acceptance and system adaptability
- Coordination mechanisms inspired by regional and global best practices
- UTM Task Force was formed to support the preparation of the ConOps and address operational, regulatory, and technical requirements for the UTM implementation

06

Stakeholder Workshops & ConOps Development

- Stakeholder workshops and consultations (from the beginning of 2025) for inclusive governance
- Workshops have been held with potential international suppliers as well and will continue to be held in the following months
- Collaborative development of Qatar’s UTM Concept of Operations (post stakeholder feedback, 150+ pages)
- Defined service layers, roles, and stakeholder responsibilities
- Comprehensive ConOps structured around real-world operational scenarios
- Addressed safety, redundancy, and data-sharing protocols
- Output: common reference model for deployment and testing
- Buy-in from all actors crucial for successful national rollout

07

Supplier Selection & Tender Process

- Pre-qualification and transparent selection of the national UTM technology provider
- Technical and operational requirements tailored to Qatar's needs based on the ICAO guidelines and national / regional experiences and implementations
- The criteria include a scalable, modular architecture and interoperability with existing ATM systems
- Compliance – among others – with:
  - ICAO Annex 6 - Part IV - RPAS
  - ICAO RPAS CONOPS
  - ICAO UTM Framework Edition 4
  - U-space Regulation (EU) 2021/664
  - EASA standards
- Vendor expected to deliver secure and customizable countrywide UTM system
- Process ensures alignment with long-term national goals and stakeholder expectations
- The future vendor should have experience in implementing a nationwide UTM system

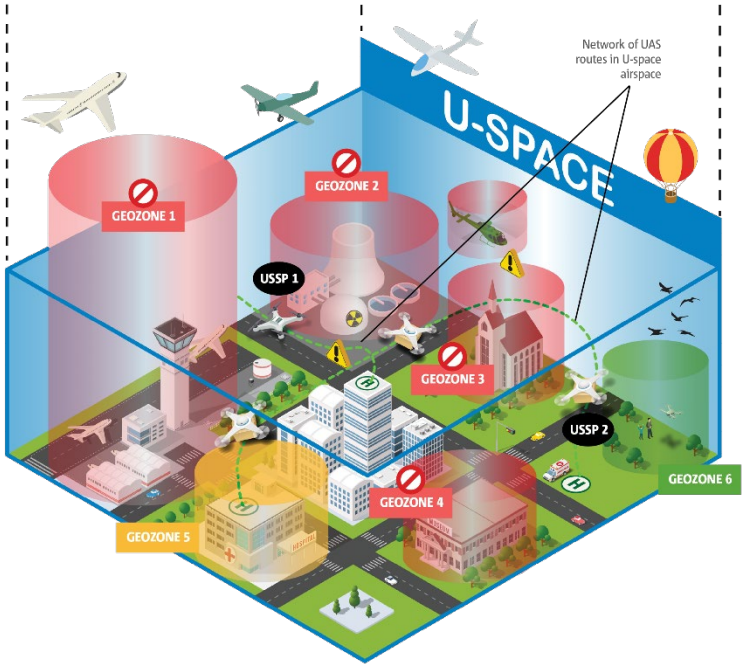
08
Challenges

- Choosing the correct supplier for a long-term strategic partnership
- The implementation of the system is fundamentally different from that of traditional ATM systems.
- Cybersecurity must conform to national guidelines
- Determining and agreeing to flight approval workflows with various involved stakeholders
- Training, licensing and insurance (operator and UAS) requirements
- Future cross border operations (interoperability with external UTM / ATM systems)

09

Future Outlook

- Phased deployment of National UTM System underway
- Upcoming capabilities:
  - Dynamic airspace management
  - U-Space
  - Remote ID
  - Advanced Air Mobility
  - Integration with Smart City and GIS platforms



- Roadmap for UTM–ATM systems integration in progress
- Qatar's vision: a regional center for safe, scalable unmanned aviation
- Continued investment in innovation, R&D, and international collaboration

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Conclusion

- Qatar has taken decisive steps in establishing their UTM infrastructure and governance
- Stakeholder engagement and involvement has been secured
- Strong legal foundation, inclusive engagement, forward-looking strategy
- Positioned to lead in regional drone integration and airspace innovation
- National UTM System aligns with ICAO vision for harmonized global standards

Thank You