CORUS five

Introduction

Khushboo, Andrew, Karolin, et al

CORUS five Second Workshop

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Welcome!

CORUS five has received funding from the European Union under grant agreement 101166763

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Agenda

- Welcome – Khushboo
  - Safety & Practical
  - Local info
- ConOps – Andrew
  - CORUS five, where we are in the project
  - Purpose of the meeting & method
  - Structure and assumptions of the ConOps
- Hello from the topic presenters
- Plan for the next 48 hours – Andrew
  - Discussion rooms & Your personal agenda
- Social event - Karolin

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Welcome

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Collins Aerospace
An RTX Business

Collins welcomes you to the CORUS V Concept Development Workshop

ÉALÚ-AER SPATIO

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An RTX Business

ENSURE U-AGREE

*As a technology provider, **Collins Aerospace** is focused driving the development of next-generation airspace management solutions.*

Khushboo Wadhwani
Principal Engineer

Stefano Riverso
Associate Director + SESAR3 Contribution Manager

Javier Camacho Font
Principal Engineer

Craig Wilson
Associate Director

Daniel Mobsby
Program Manager

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Practical

Room	Purpose	Where
Douglas Vance	Plenary	Here!
Beckett Suite	AOM AO	Right from hotel entrance, up the stairs by the flower shop. All rooms together on same floor.
Joyce Suite	AUO	
Mary Elmes Suite	CM DCB	
O'Casey Suite	SDM	
Wilde Suite	S + E	
Yeats Suite	TS	

Wifi – Guest@Metropole (no password)

Taxi – Uber, Freenow, Frontdesk at the hotel

We need to eat

- Tea/Coffee Break – *always* at Douglas Vance (here)
- Social Dinner today at Franciscan Well Brewery (self-pay) from 1900 onwards
  - Good Pizza, Great Beer
  - 15 mins walk from Metropole hotel
- Lunch on Thursday at the Metropole Hotel – Merchant Restaurant (self-pay)
- Social event + Dinner at Deep South (self-pay) from 1830 onwards
  - Lively atmosphere, great food
  - 10 mins walk from Metropole Hotel

Franciscan Well Brewery

Deep South

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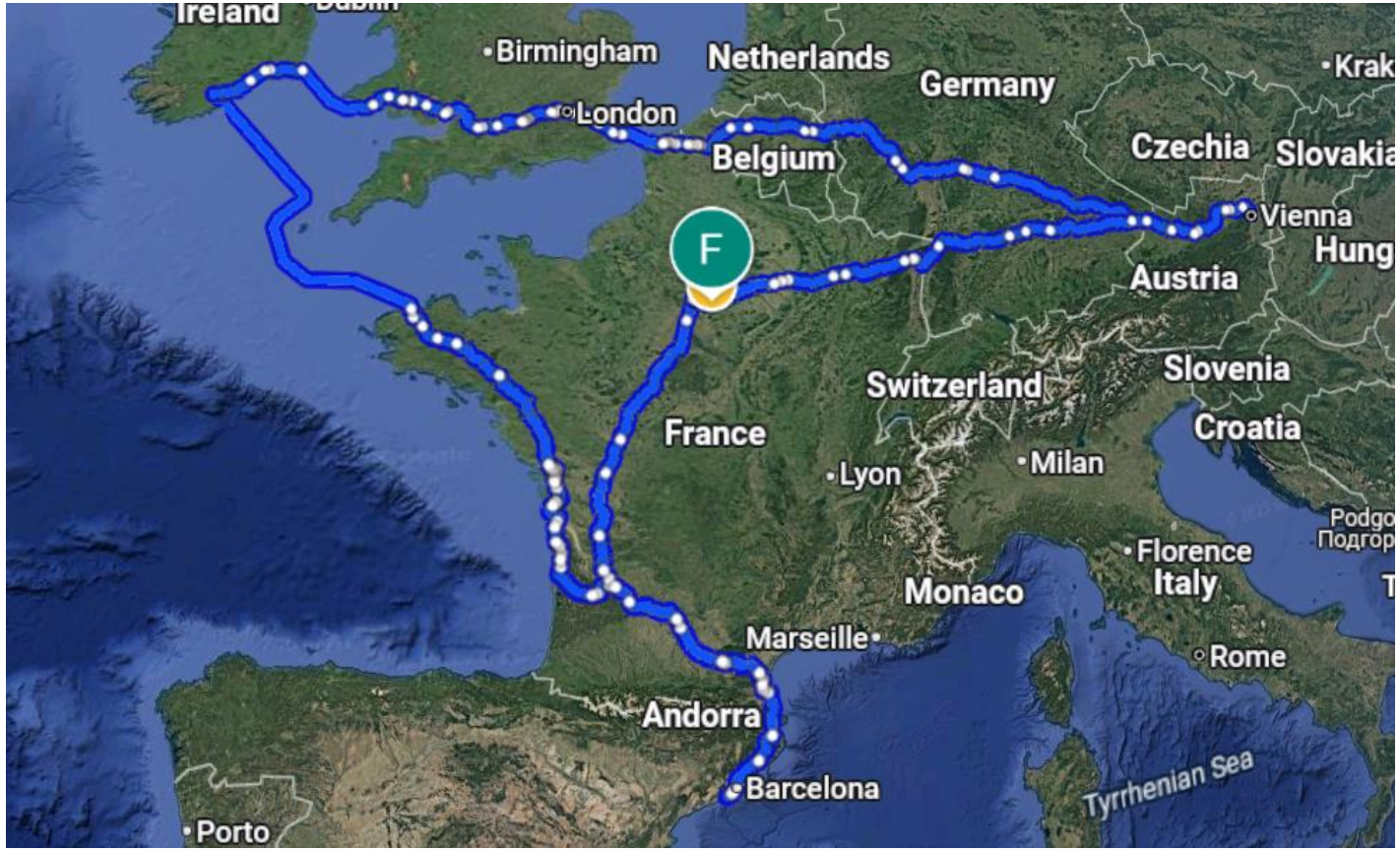
- Funded by the SESAR Joint Undertaking as an Exploratory Research project (HORIZON-SESAR-2023-DES-ER2; Grant 101166763)
- September 2024 – August 2026 (plus 6 months CDE)
- Led by EUROCONTROL with 13 consortium members
- Based on stakeholder consultation with three Concept Workshops



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Concept Exploration Workshop
January 2025
- Defined ConOps scope

Concept Definition Workshop
September 2025
- We are here today

Concept Validation Workshop
February 2026
- Refine and validate ConOps

Final Dissemination Event
late 2026
- Roll-out ConOps

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What is the U-space ConOps?

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CORUS project: Sept 2017 – Oct 2019

- Developed SESAR U-space ConOps editions 1,2,3
- Described how U-space worked
  - From the point of view of different users
- Built in consensus with a large stakeholder community.
- Provided framework for
  - Understanding U-space
  - Discussing details of U-space
- Supported the development of the EU regulations

CORUS-XUAM, Sept 2020 – Aug 2023

- Performed flight trials in seven countries
- Developed ConOps Edition 4
  - Updates
  - Extensions to support passenger carrying operations

Why update the ConOps?

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EU regulations
Acceptable means of compliance,
Emerging standards

Research results

Experience from implementation
Best & common practice worldwide

Adding the IAM view
needed by ongoing projects

EU U-space 2.0 strategy

SESAR Master Plan update

Comments on previous editions

Open questions & U4

A little bit of history…

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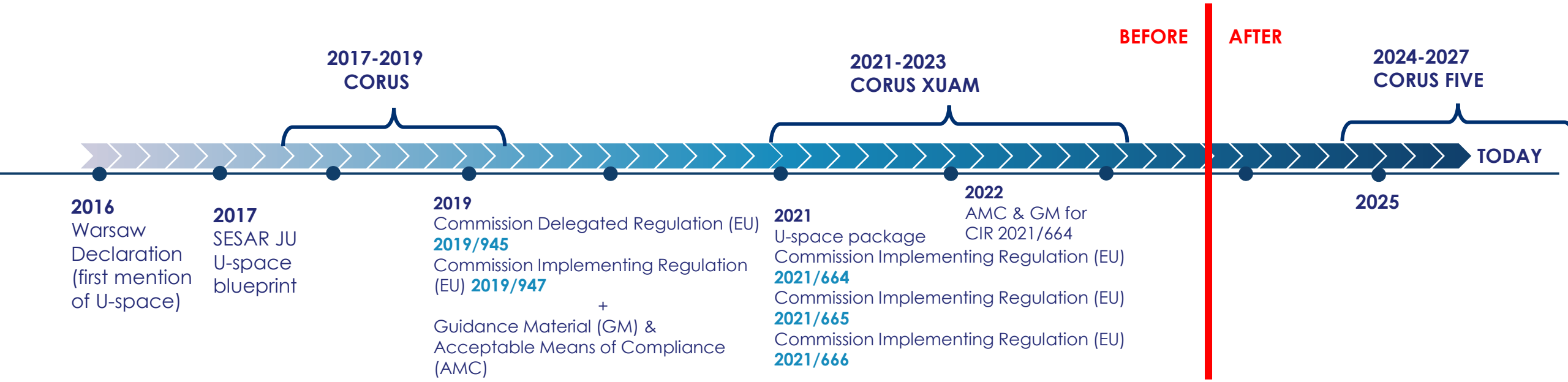

Major EU regulation on UAS in 2019

- CDR 2019/945 UAS & third-country UAS operators
- CIR 2019/947 rules & procedures for UAS operations
- CDR 2019/945 refers to CIR 2019/947

U-space package in 2021

- CIR 2021/664 regulatory framework for the U-space
- CIR 2021/665 U-space airspace in controlled airspace
- CIR 2021/666 manned aviation in U-space

UAS Operations — **U-space**

Temporal Horizons

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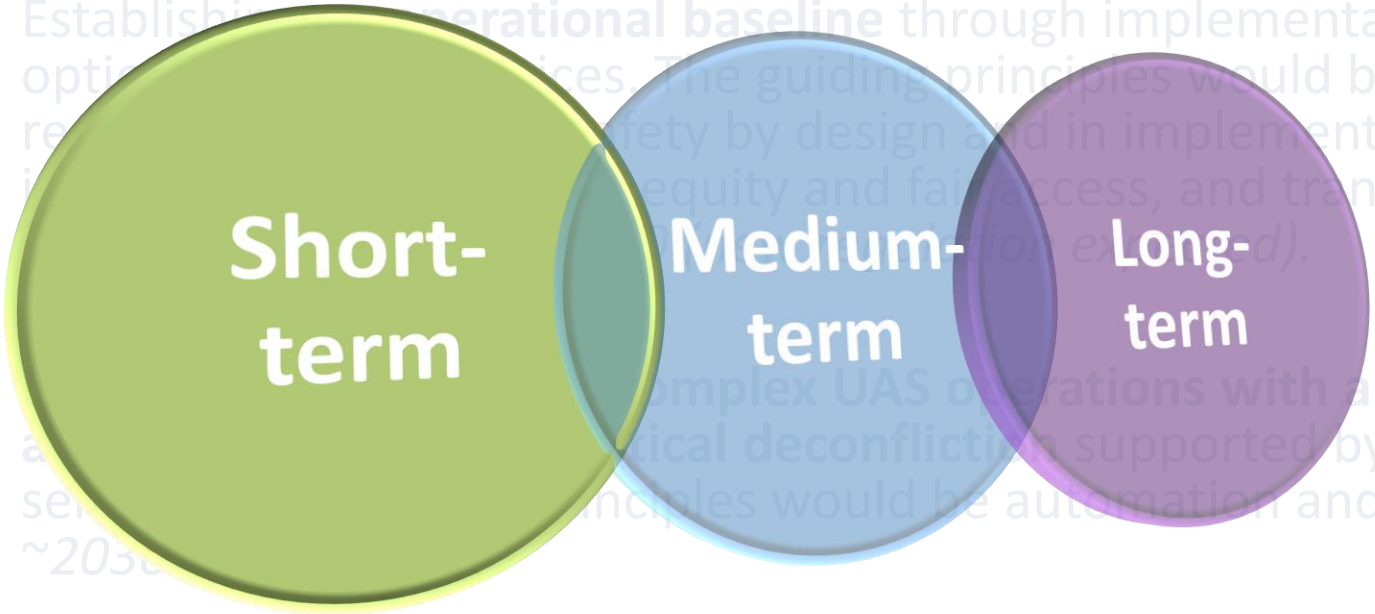
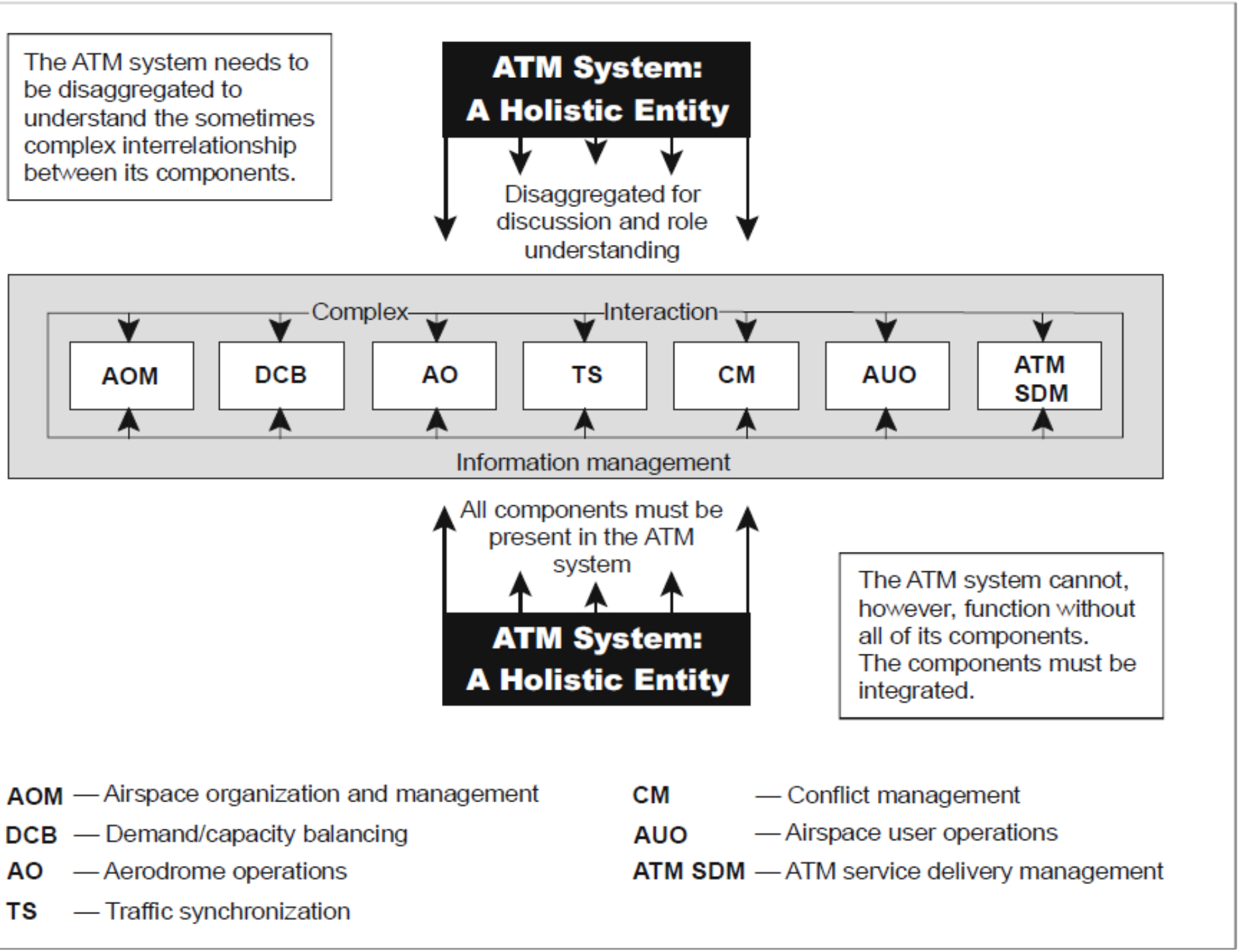


Temporal horizons may overlap

GATMOC

- The 5th ConOps is inspired by the Global ATM Operational Concept
- ICAO Doc 9854



Doc 9854
AN/458 – Figure 2-1

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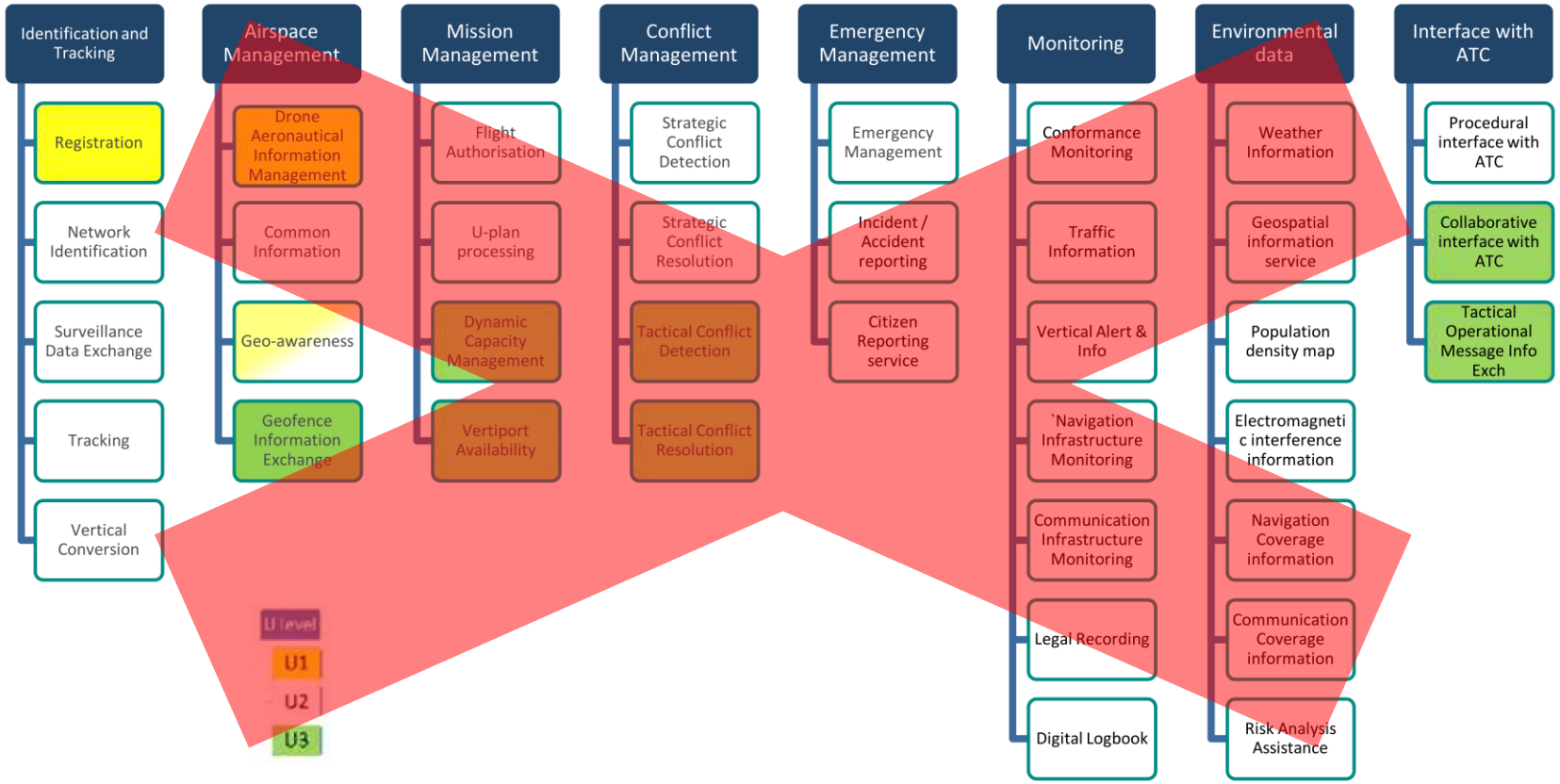
Assumptions

- Short term is based on the U-space Regulation
- The regulated services are precisely defined. Other services may exist



Assumptions

- Short term is based on the U-space Regulation
- The regulated services are precisely defined. Other services may exist
- U-space Airspace flavours X,Y,Z
  - Y = strategic (plan) deconfliction – as U-space airspace today
  - Z = tactical conflict detection & resolution service
  - X = no deconfliction service
- U-space can support all sorts of aircraft
  - Open, Specific, Certified UAS
  - Passenger carrying operations – with a suitably qualified service provider
  - POBA if they conform to U-space processes & data exchanges

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Your personal program

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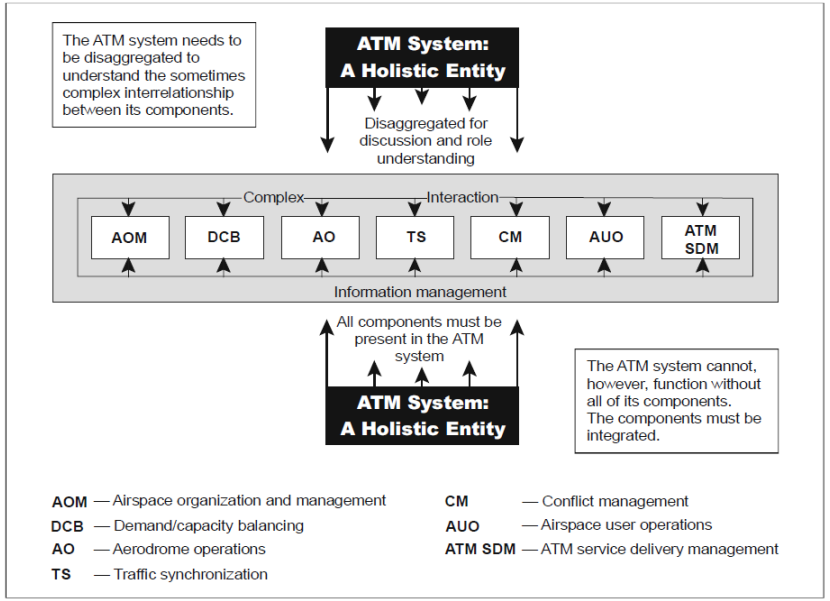
- There are six break-out sessions and six topics
- You are scheduled to visit every topic over the six sessions
- On the back of your badge is your personal program
- Beware! almost everyone has a different program. Look at your badge

Wednesday		Thursday		Friday – all plenary	
13:00	Registration	09:00	**3rd Break-out session**	09:00	Intro (10")
13:30	Welcome	10:30	Coffee	09:10	Quick Report plus Q&A: AOM AO
13:45	Introduction	11:00	**4th Break-out session**	09:30	Quick Report plus Q&A: AUO
14:45	**1st Break-out session**	12:30	Lunch	09:50	Quick Report plus Q&A: CM DCB
16:15	Coffee	13:30	**5th Break-out session**	10:10	Quick Report plus Q&A: SDM
16:30	**2nd Break-out session**	15:00	Coffee	10:30	Coffee
18:00	End of Day 1	15:30	**6th Break-out session**	11:00	Quick Report plus Q&A: S + E
19:00	Dinner	17:00	End of Day 2	11:20	Quick Report plus Q&A: TS
		18:30	Social event	11:40	Q&A
				12:20	Close-out
				12:30	End

What we will talk about at this workshop CORUS five

- **Airspace Organisation and Management (AOM) + Aerodrome (and Vertiports) Operations (AO)**
  - Marta Sanchez
  - Andra Mohan
- **Airspace User Operations (AUO)**
  - Enric Pastor
  - Stian W Helgesen / Patrica Garcia Pastor
- **Conflict Management (CM) and Demand Capacity Balancing (DCB)**
  - Cecilia Claramunt
  - Andrew Hately
- **Service Delivery Management (SDM)**
  - Thomas Lutz
  - Vadim Kramar
- **Social and Economic** – *not in GATMOC*
  - Cristina Barrado
  - Patrica Garcia Pastor / Stian W Helgesen
- **Traffic Synchronisation (TS)**
  - Norberto Vera Velez
  - Jose Luis Muñoz Gamarra



An example

- Khushboo's badge is shown
- Her first session is *Airspace Organisation and Management (AOM) + Aerodrome (and Vertiports) Operations (AO)*
- Her second is *Service Delivery Management (SDM)*
- …
- Khushboo's last session is *Conflict Management (CM) and Demand Capacity Balancing (DCB)*
- Friday we are all back in here.

CORUS five
U-space

Khushboo Haresh Wadhwani

Collins Aerospace

	Wednesday 1st October	
13:30	Plenary	Douglas Vance
14:45	AOM AO	Beckett Suite
16:30	SDM	O'Casey Suite
	Thursday 2nd October	
09:00	TS	Yeats Suite
11:00	AUO	Joyce Suite
13:30	S + E	Wilde Suite
15:30	CM DCB	Mary Elmes Suite
	Friday 3rd October	
09:00	Plenary	Douglas Vance

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And now

- The topics….

AOM & Aerodromes/ Vertiports

Marta Sánchez (CRIDA) & Andra Mohan (Austro Control)

AOM

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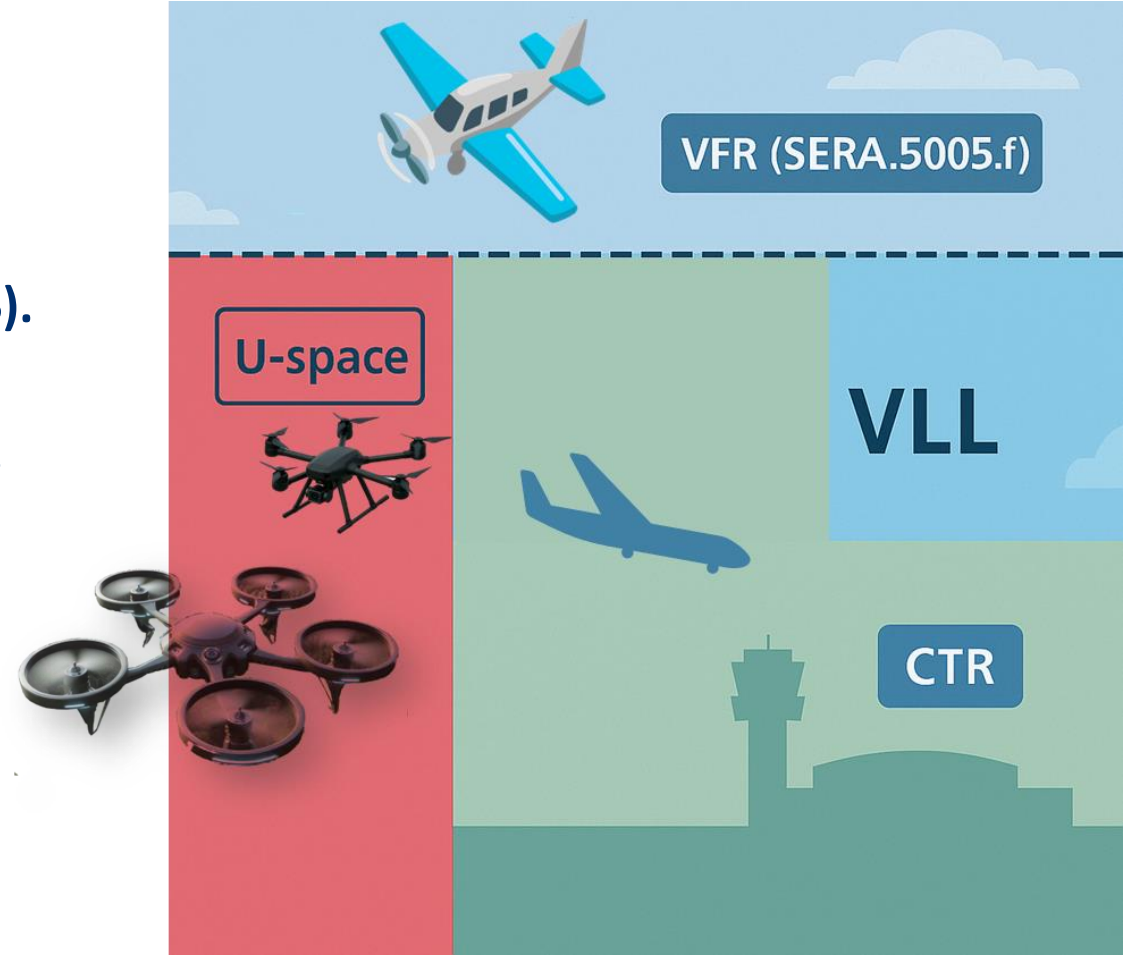
Short-term

Key Features:

- **Single class** of U-space airspace.
- **Mandatory services**:
  - **U2 baseline** (Network Identification, Geo-awareness, Flight Authorisation, Traffic Information).
  - Additional service: **Common Information Service (CIS).**
- **Located** (mainly) **at Very Low Level (VLL)** (<minimum heights for VFR flights, SERA 5005.f).
- May exist within **controlled airspace (CTR)**, but separated from aerodrome traffic flows to limit DAR activation.
- **Designated only in high-demand areas**, not generally adjacent.



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AOM & Aerodromes/ Vertiports

Marta Sánchez (CRIDA) & Andra Mohan (Austro Control)

Aerodrome/ Vertiports Operations

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Short-term

- Aerodromes (incl. vertiports/ heliports) defined as ICAO/EASA facilities, but in STH they play a **limited role for UAS**.
- Most UAS ops **do not depend on dedicated infrastructure**, operating from flexible locations.
- Some early cargo/logistics ops may use ground facilities (charging, loading/ unloading).

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AOM & Aerodromes/ Vertiports

Marta Sánchez (CRIDA) & Andra Mohan (Austro Control)

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Two Axis

Guiding Questions/ Principles	AOM	Aerodrome/ Vertiports Operations	
	• What **changes** are needed/ feasible in short-term **to current status quo**?	• What **changes** are needed/ feasible in short-term **to current status quo**?	**Short-term**
	• Should **traffic** be arranged (e.g. in vertical layers) **according to the aircraft performances**? ➢ C5 preliminary answer	• What are the **UAM management tasks** at **vertiports** and which of them could be **automated**? ➢ C5 preliminary answer	**Medium-term**
	• What **services** will have to be enabled for the **coexistence of GA / VCA and UAS**? • (open answer)	• How to **adapt A-CDM** for **drones and U-space**? • (open answer)	**Long-term**

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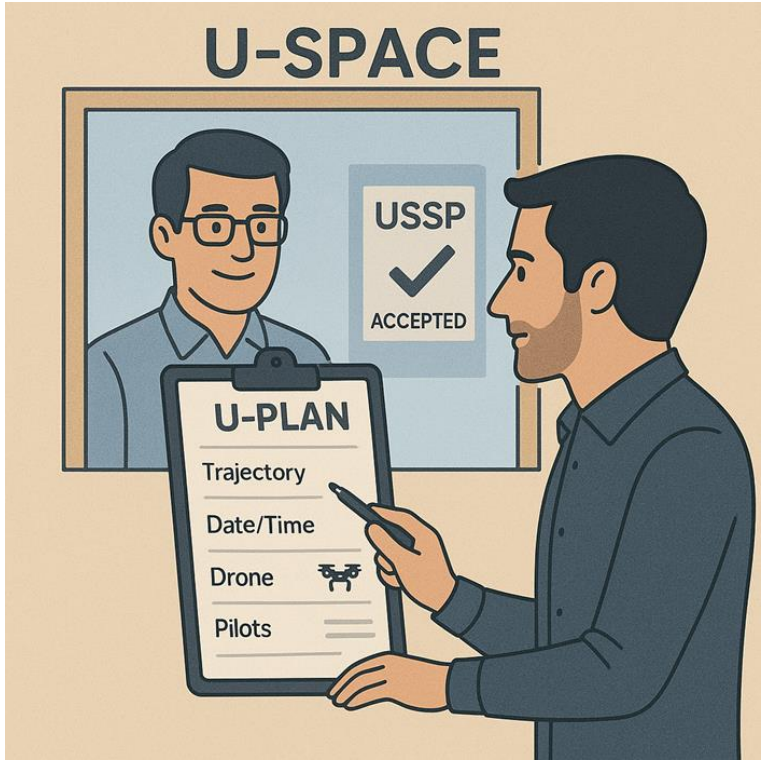
Airspace User Operations (AUO)

Enric Pastor (UPC), Stian W. Helgesen(Aviant) & Patricia Garcia Pastor (ANRA)

- Interactions between UAS Operators and U-space:
  - Focused on aspects associated with the **request** of the intended operation (U-plan), which becomes an actual **authorization**.
    - Which elements are contained in the U-plan request.
    - Definition of 4D volumes and its implications for UAS operators
    - Implications in terms of airspace sharing between UAS operators
    - Other aspects like conformance, contingencies, etc.



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Conflict Management (CM) and Demand Capacity Balancing (DCB)

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Two axes

Three horizons	Conflict Management	DCB
Short-term	• Strategic vs tactical • Uncertainty • CA (UAS vs manned) • Electronic conspicuity	• Capacity • DCB initial measures • FC-FS
Medium-term	• U-plans overlap • DAR • Fairness	• Advanced DCB
Long-term	• Flight rules	• Only DCB + tactical

Cecilia Claramunt &
Andrew Hately
(EUROCONTROL)

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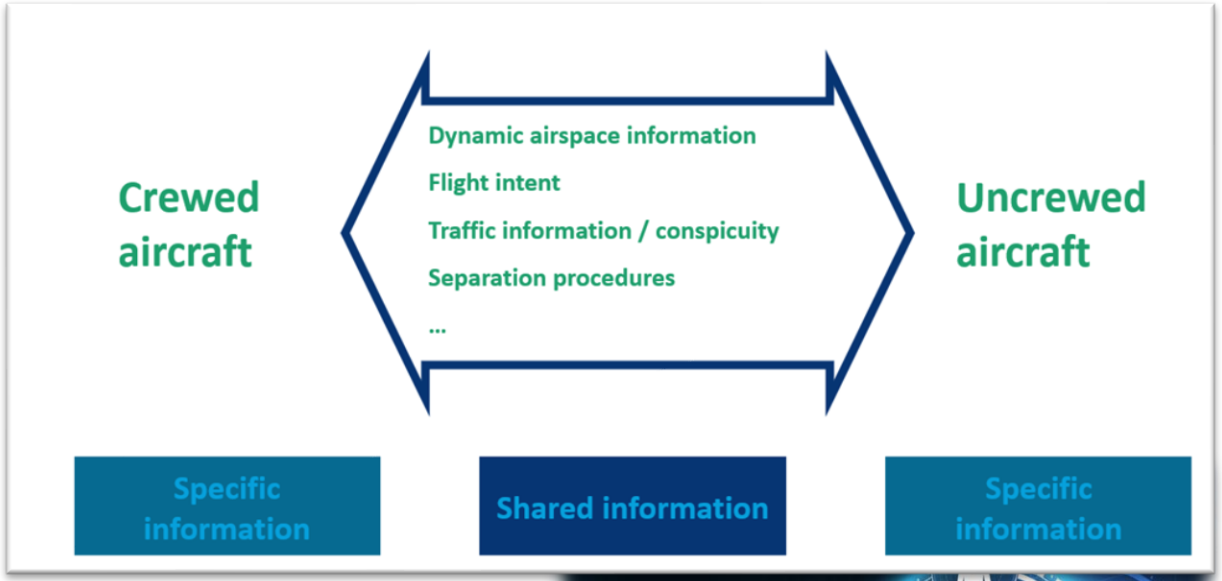
Service Delivery Model

Vadim, Stefan & Tom

Explore the magic off complex interaction



Distributed Systems & Information Management

… setting up a social event at a conference

Aiming for Collaborative Decision Making

Social and Ecomonic aspects of U-Space

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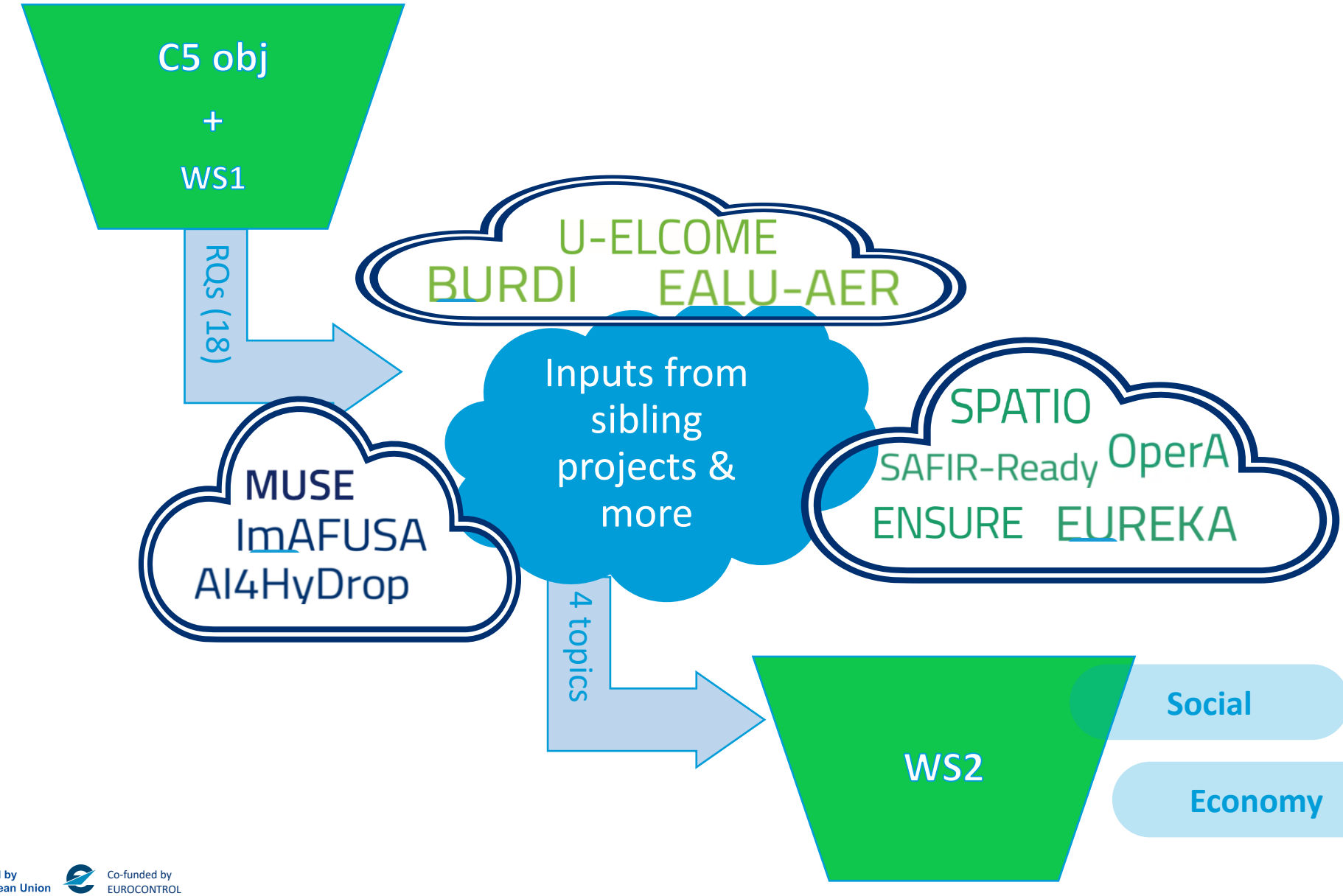

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Traffic Synchronization is like solving a packing puzzle CORUS five

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Strategic deconfliction in the STH

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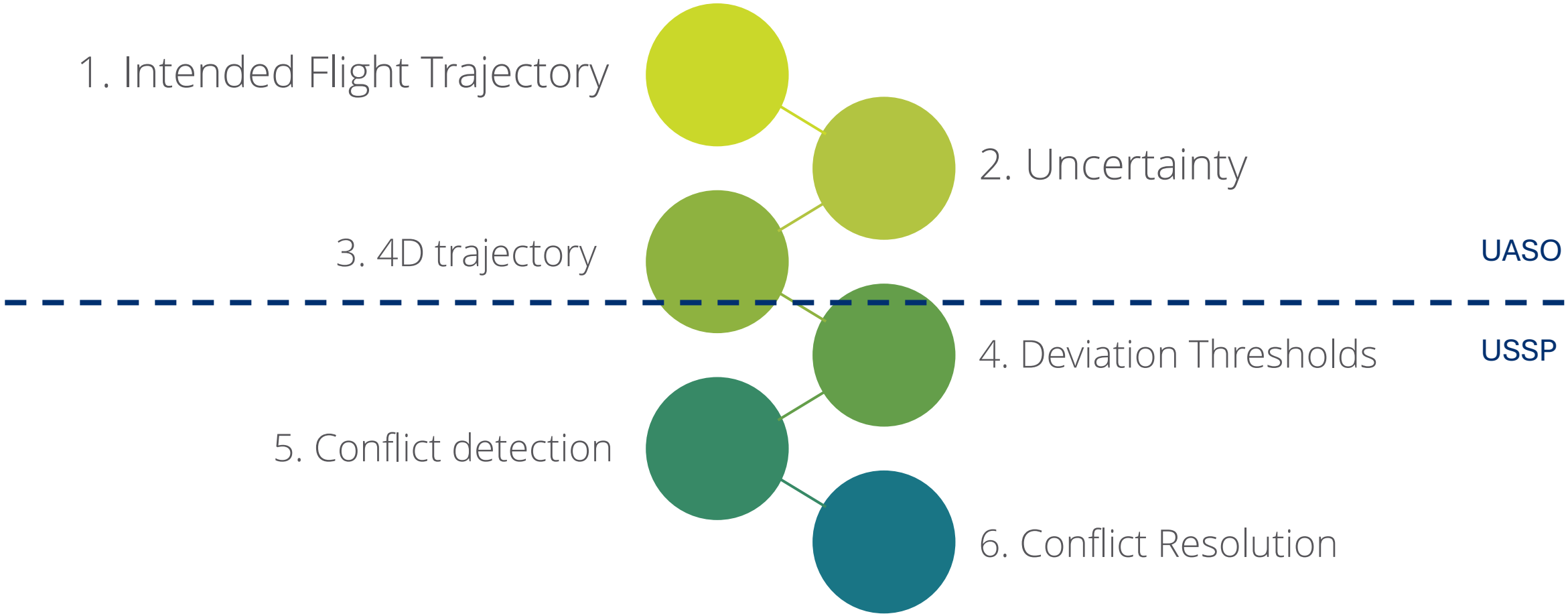

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MTH – Possible ideas about TS

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The MTH is characterised by more complex scenarios and much higher demand than in the STH. In the MTH, Traffic Synchronisation must evolve to tackle these challenges, ensuring safety and efficiency.

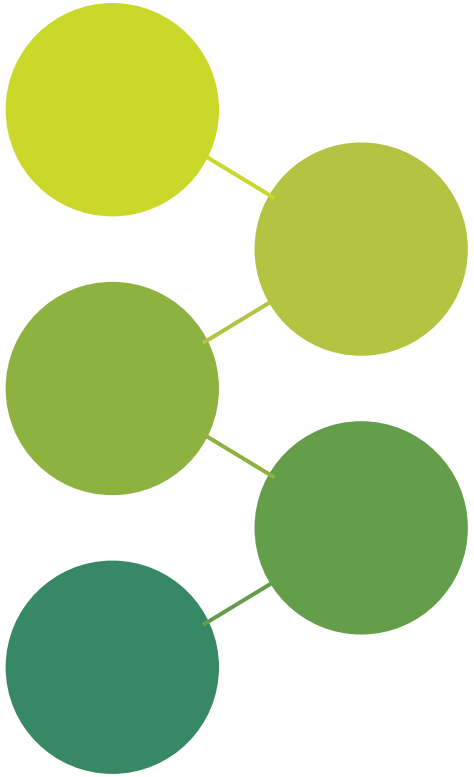
1. Single vs Batch

2. Dynamic Uncertainty

3. RTTA

4. Allow overlap (strategic)

5. TS in aerodrome operations



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Topics and rooms

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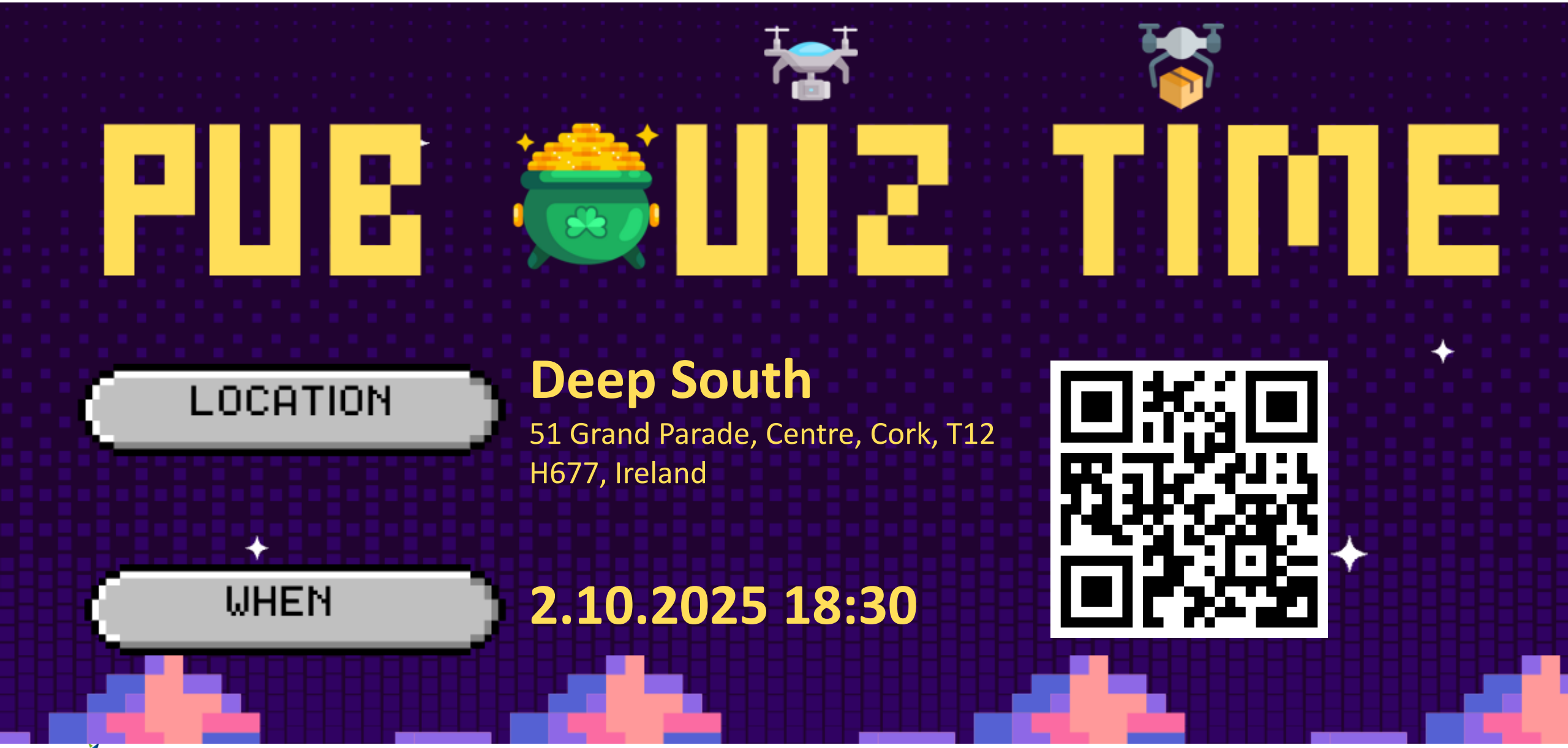
Room	Topic	Longer name
Beckett Suite	AOM AO	Airspace Organisation and Management (AOM) + Aerodrome (and Vertiports) Operations (AO)
Joyce Suite	AUO	Airspace User Operations (AUO)
Mary Elmes Suite	CM DCB	Conflict Management (CM) and Demand Capcacity Balancing (DCB)
O'Casey Suite	SDM	Service Delivery Management (SDM)
Wilde Suite	S + E	Social and Economic
Yeats Suite	TS	Traffic Synchronisation (TS)

- Today we start here and spread out.
- Tomorrow in the break-out sessions all day
  - Coffee is always here (Douglas Vance)
  - Lunch is …
- Friday back in here.


PUB QUIZ TIME
LOCATION
Deep South
51 Grand Parade, Centre, Cork, T12
H677, Ireland
WHEN
2.10.2025 18:30

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No grand idea was ever born in a conference,
but a lot of foolish ideas have died there.

F. Scott Fitzgerald

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