

CORUS-XUAM

CONCEPT OF OPERATIONS FOR EUROPEAN U-SPACE SERVICES - EXTENSION FOR URBAN AIR MOBILITY

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ICAS ETF FORUM 2023, Kyoto, Japan

11. September 2023

FOUNDING MEMBER
sesar
JOINT UNDERTAKING

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AT-One



Agenda



DLR
Institute of Flight Guidance

A graphic for the DLR Institute of Flight Guidance. It features a dark blue background with a repeating pattern of the DLR logo and the text 'DLR.de'. In the foreground, there is a circular inset showing a white commercial airplane flying over a blue sky, with a smaller white drone flying below it. To the left of the inset is a white air traffic control tower.

CORUS-XUAM

A two-year project encompassing very large-scale Europe-wide urban air mobility demonstrations and the definition of the concept of operations

A 3D isometric diagram of an urban air mobility system. It shows a city with various buildings, roads, and a body of water. Several drones are shown in flight, connected by colored lines to specific locations marked with labels: WP6, WP7, WP8, WP9, WP10, and WP11. The diagram illustrates the integration of urban air mobility into a city's infrastructure.

DLR INSTITUTE OF FLIGHT GUIDANCE



DLR is the Federal Republic of Germany's research centre for aeronautics and space. We conduct research and development activities in the fields of aeronautics, space, energy, transport, security and digitalization.

The DLR Institute of Flight Guidance in Braunschweig, Germany, is working on the development and application of future processes and technologies for the integrated airborne and ground-based guidance of aircraft, including unmanned aircraft.

Divisions (each ranging from 25 to 50 persons):



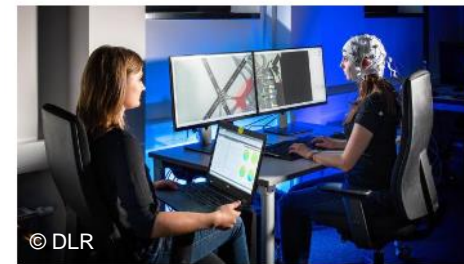
Controller Assistance



Pilot Assistance



ATM-Simulation



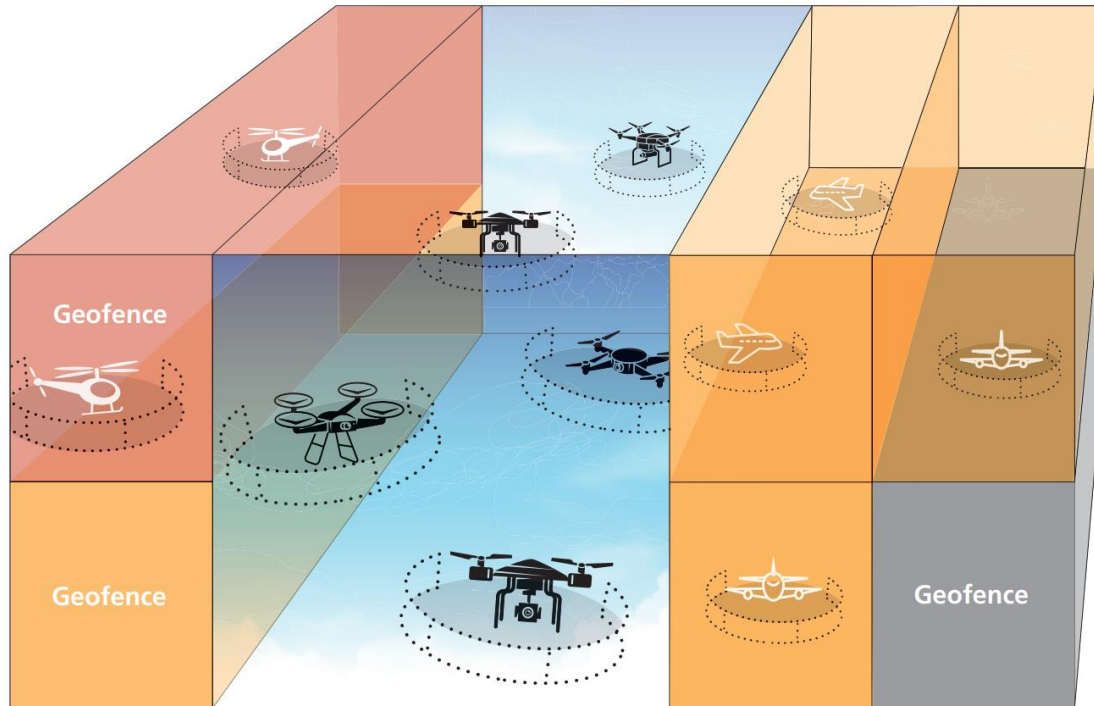
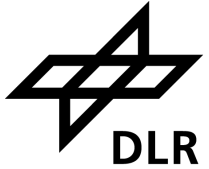
Human Factors



Unmanned Aircraft Systems

Unmanned Aircraft Systems and Urban Air Mobility

Optimised use of airspace for all users



Integration of UAS into controlled airspace

Optimised mission planning and execution

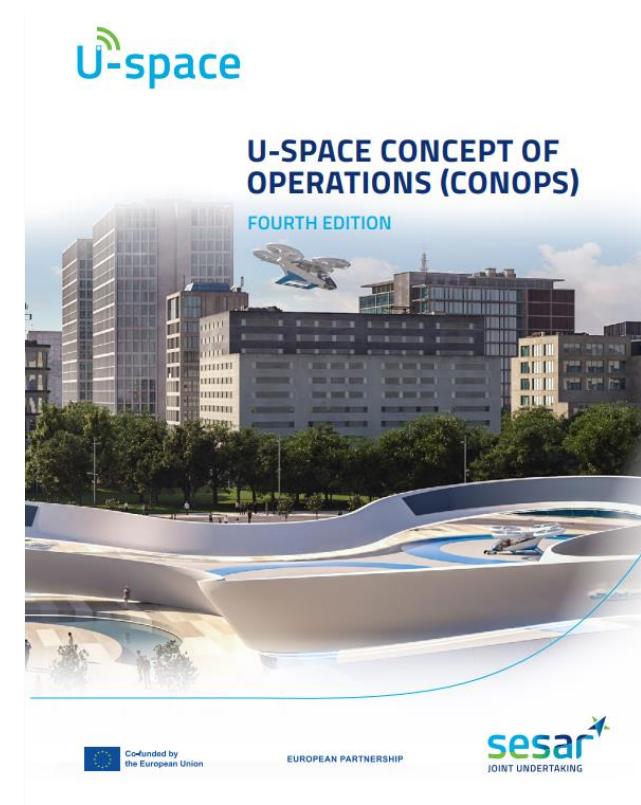
Testing new procedure and concepts

- Current U-space projects: AREA U-space, EUREKA, SAFIR-Ready, etc.
- [Institute of Flight Guidance - Unmanned Aircraft Systems \(dlr.de\)](https://www.dlr.de/IFG)



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Progress from U-space Blueprint to ConOps Edition 3 to 4





Update of the U-space concept of operations

addressing the integration of UAM/UAS operations into the airspace



Six large-scale live demonstrations

in Belgium, France, Germany and the UK, Italy, Spain and Sweden



Focus on different types of mission

such as passenger transport, delivery, emergency response and surveillance



Consider coordination between ATC and U-space

including interaction with air traffic controllers and pilots



Combine flights by eVTOLs with other traffic

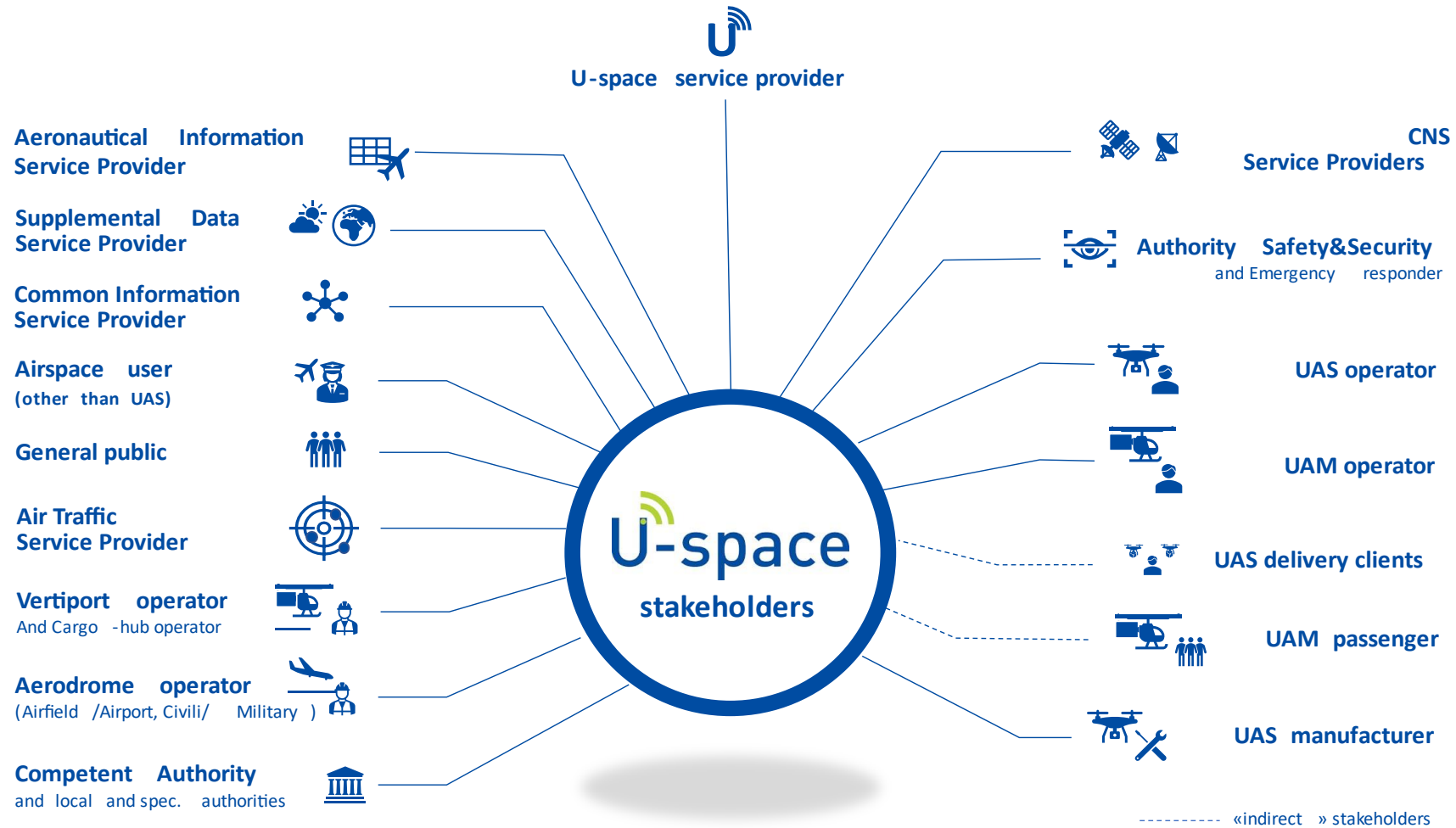
and operations in the CTRs of major airports



Demonstrate vertiport procedures

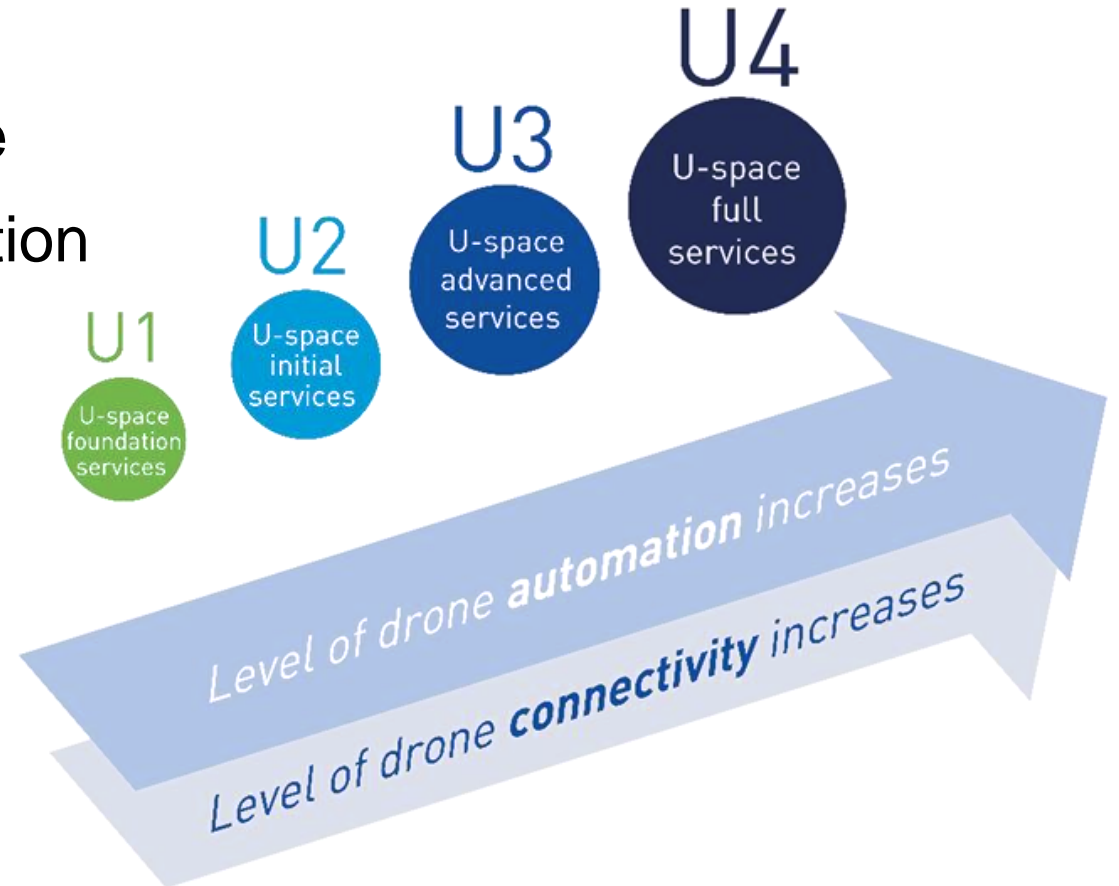
as well as separation, and data services

Who and What is U-space?

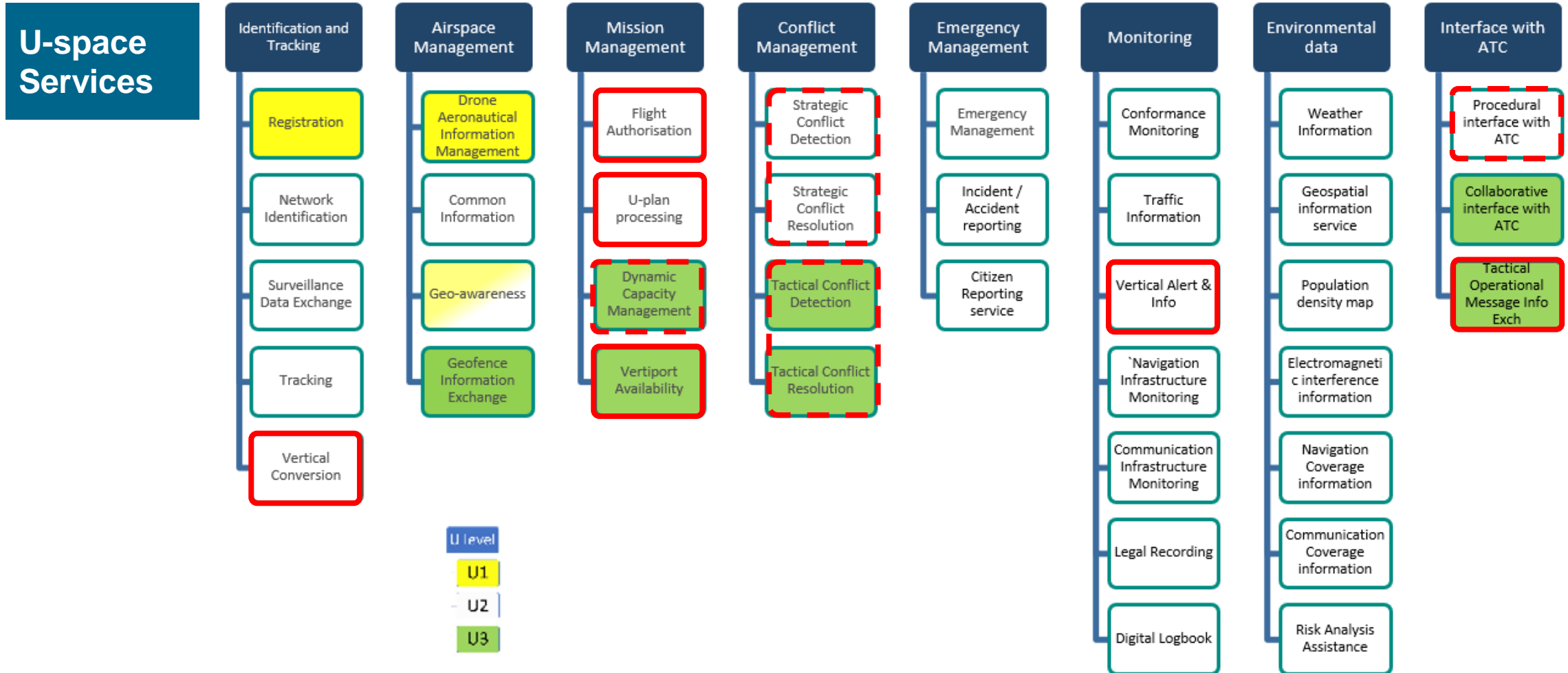


U-space evolution eras

- Before 2023: the foundation of U-space
- 2023-2030: Initial U-space implementation
- From 2030: General U-space
- Advanced U-space
- Full U-space Integration



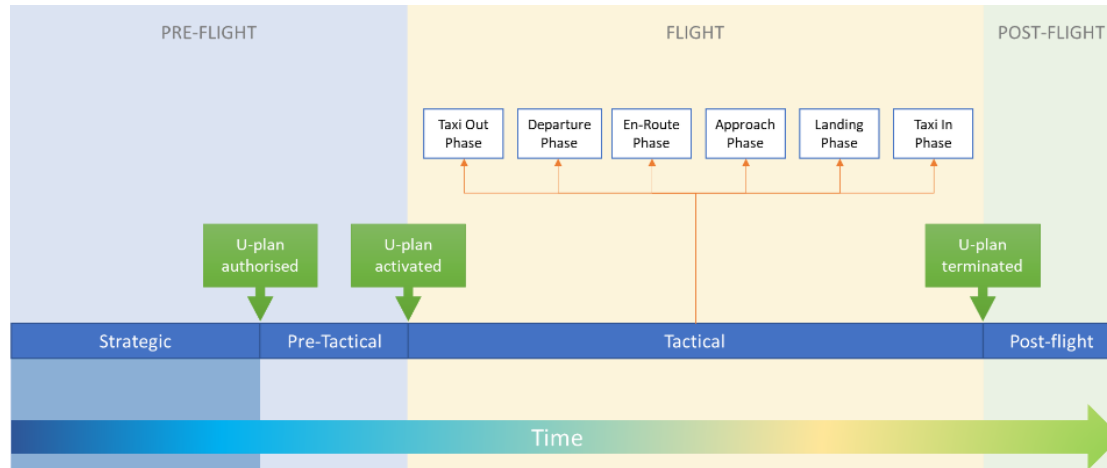
What's new?



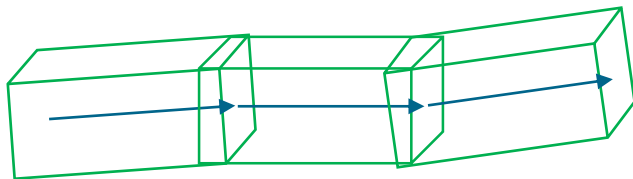
What's new?

U-plan

- Different tasks in different phases



- 4D Trajectories/Volumes



- Pre-defined U-plan states: authorisation, activation, termination
- Strategic and tactical conflict detection, prediction and resolution
- Vertiports play important part in U-plan

What's new?

Vertiports

- Important part of the U-plan and its lifecycle
- Real-time tracking of vertiport availability and capacity constraints
- Selection of alternate vertiports
- Vertiport Traffic Zone (V-TZ)



What's new?

UFR: U-space Flight Rules*

- Proposal of a dedicated set of flight rules uniquely applicable for users of U-space services in U-space airspace
- „The principle behind UFR is to enable aircraft operations that cannot conform to VFR, SVFR or IFR in all operational conditions”
- Standardized U-space equipment, interfaces and protocols
- Aircraft operating under UFR are not expected to receive voice communications from ATS units

*Low maturity

Open Questions at ConOps Level



- Fairness in conflict resolution & demand capacity balancing
 - What does fair mean?
 - Can cost be part of a fairness mechanism?
 - Where else should cost be discussed?
- Human factors
 - Crewed vs. uncrewed operations
 - How does that impact the design of tactical processes?
- Flight rules
- Responsibilities
- Detect and Avoid
 - Independent safety net or part of U-space
- How does weather impact strategic and tactical decision making processes

Points of Contact



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U-space ConOps Ed. 4

SCAN ME



THANK YOU!