

First Experience with UTM and Proposed Way Forward

1st Swiss UTM Forum
ZHAW, 23 OCT 2017

Jürg Hänni, Head Operational Relations and Special Tasks

with you, all the way.



Corporate IT Service Desk
German & English +41 43 931 65 65
French +41 22 417 47 47
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Who am I?

...as a person

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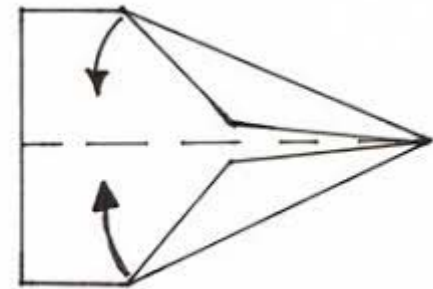
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...in relation to
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It is all a matter of the perspective



My perspective

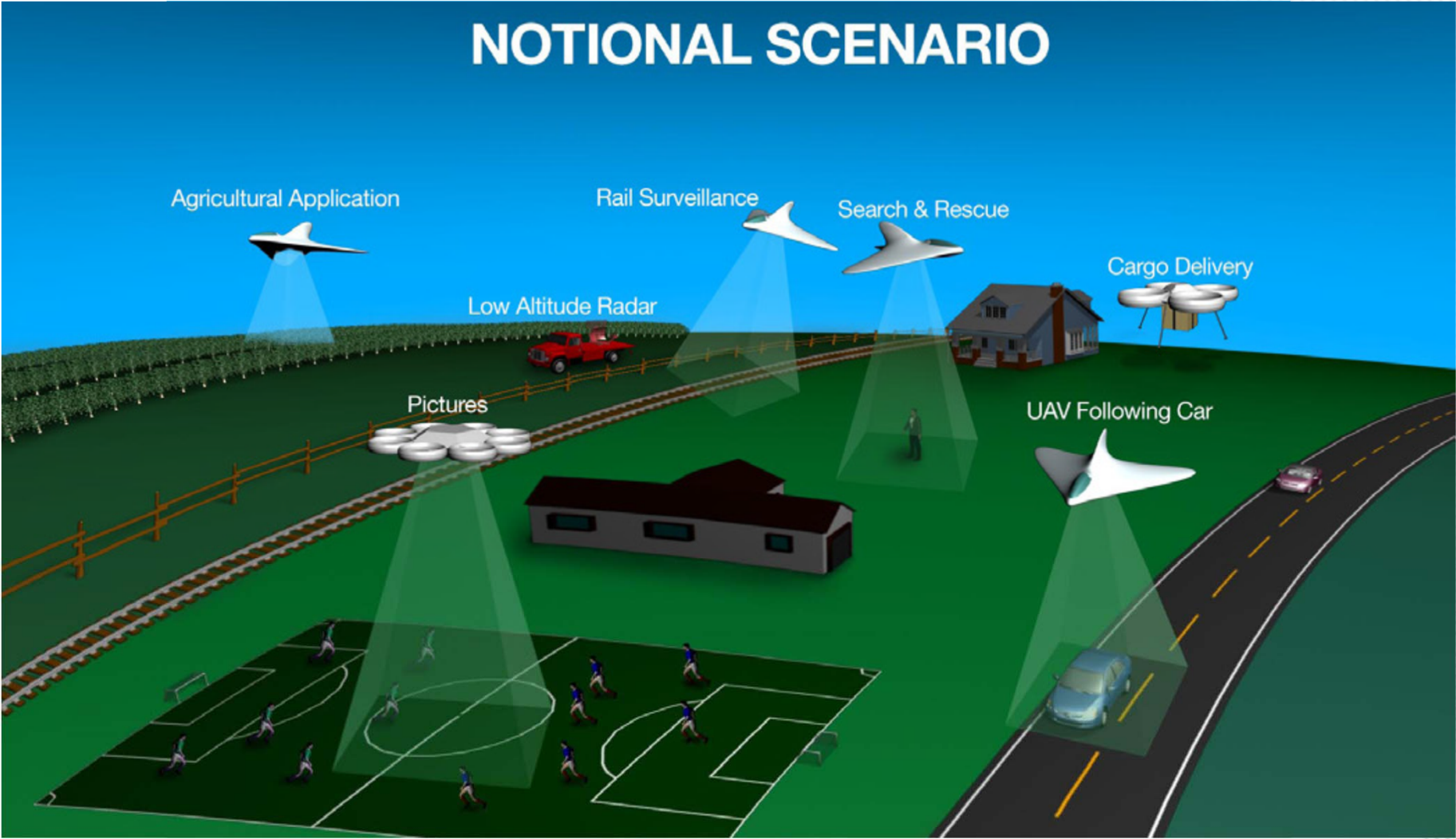


Disposition

1. Focus UTM and SESAR
2. U-space demonstrator 14 SEP 2017, Geneva
3. Swiss UTM concept
4. Lessons learned
5. Challenge with innovations
6. Proposed way forward
7. Q & A



1. Focus UTM



1. Focus UTM

SESAR U-Space Blueprint 2017



U-space

- › will enable complex drone operations with a high degree of automation to take place **in all types of operational environments**, including urban areas
- › is a set of new services and specific procedures designed to support safe, efficient and secure **access to airspace for large numbers of drones**
- › provides an enabling framework to support routine drone operations, as well as a clear and effective **interface to manned aviation**, ATM/ANS service providers and authorities
- › is capable of ensuring the smooth operation of drones in all operating environments, and **in all types of airspace**, in particular but not limited to very low level airspace



1. Focus UTM

SESAR U-Space Blueprint 2017

- › Progressive deployment
- › Blocks of services and enabling technologies
- › U-Space services evolve with automation
- › Interaction with environment through digital information and data exchange
- › U1: e-registration, e-identification geofencing
- › U2: flight planning, approval, tracking airspace dynamic information etc
- › U3: capacity management, assistance to conflict detection etc
- › U4: full services, integrated interfaces

SESAR

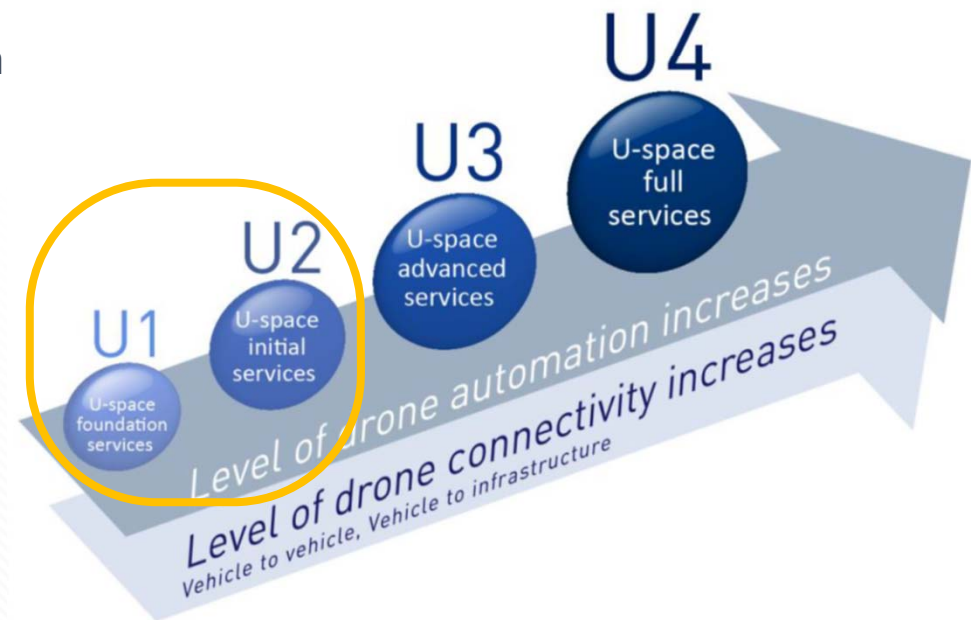
U-space
Blueprint

The demand for drone services is steadily increasing, with the potential to generate significant economic growth and societal benefits, as recognised in the 2012 EU Aviation Strategy, and more recently in the 2015 SESAR Drone Outlook Study and Warsaw Declaration on drones. In order to realise this potential, the declaration calls for "urgent action on the airspace dimension, in particular the development of the concept of U-space". Ultimately, U-space will enable complex drone operations with a high degree of automation to take place in all types of operational environments, including urban areas. U-space must be flexible enough to encourage innovation, support the development of new business models and facilitate the overall growth of the European drone services market while properly addressing all safety and security issues, respecting the privacy of citizens and minimising the environmental impact. This document outlines the proposed vision for U-space and how it could be rolled out. Rather than providing a definitive roadmap, this blueprint provides the basis to better define the way drones will operate in Europe in the future.

What is U-space?

U-space is a set of new services and specific procedures designed to support safe, efficient and secure access to airspace for large numbers of drones. These services rely on a high level of digitalisation and automation of functions, whether they are on board the drone itself or are part of the ground-based user and effective interface to managed entities (ATIS/ADS) service providers and authorities, as well as a therefore not be considered as a defined volume of airspace, which is segregated and designated for the sole use of drones. U-space is capable of ensuring the smooth operation of drones in all operating environments, and in all types of airspace for particular but not limited to very low level (or "near") U-space. The delivery of U-space adapts the following key principles:

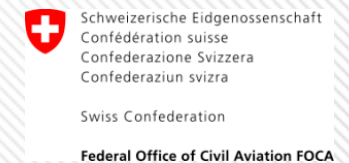
- To ensure the safety of all airspace users operating in the U-space framework as well as people on the ground.



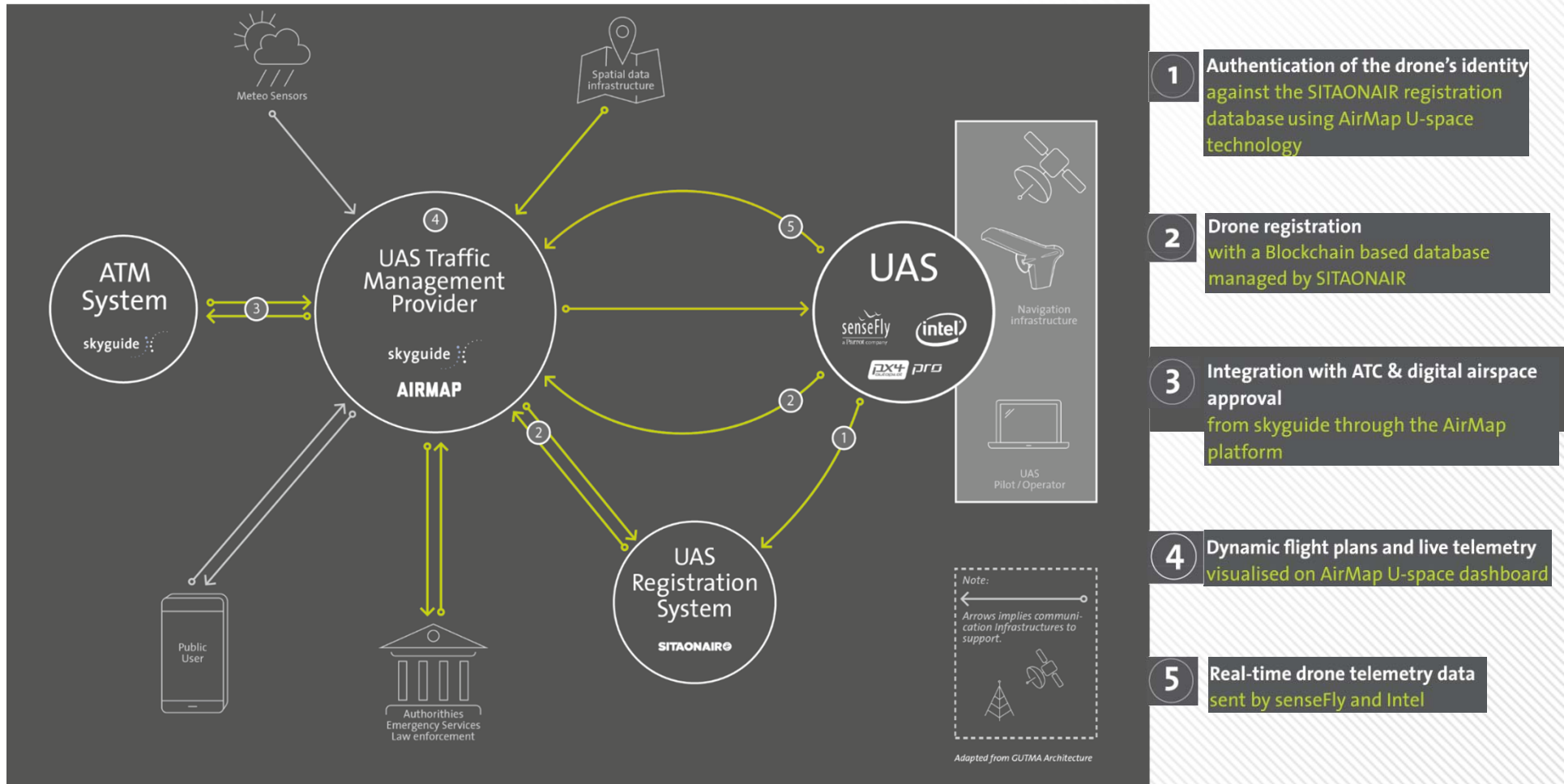
2. U-space demonstrator 14 SEP 2017, Geneva

Intention, Objectives and Outcome

- › Provide an effective answer to all the questions related to UTM and U-space
 - › Validate the conceptual model of the U-Space developed by skyguide in collaboration with GUTMA, FOCA and partners
 - › Proof of capabilities
 - Registration service with SITAONAIR blockchain technology
 - Identification of drone and operator – 2 unique codes
 - Live traffic situation about unmanned *and* manned aviation with AIRMAP
 - Flight planning and dynamic situational awareness
 - Access to geo-information and geofencing before and during flight
 - Digital airspace approval and flight management
- › All the planned functionalities performed as planned in a real time environment

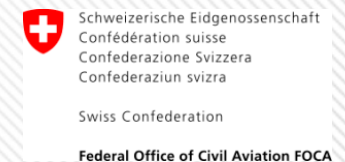


3. Swiss UTM concept skyguide proposition

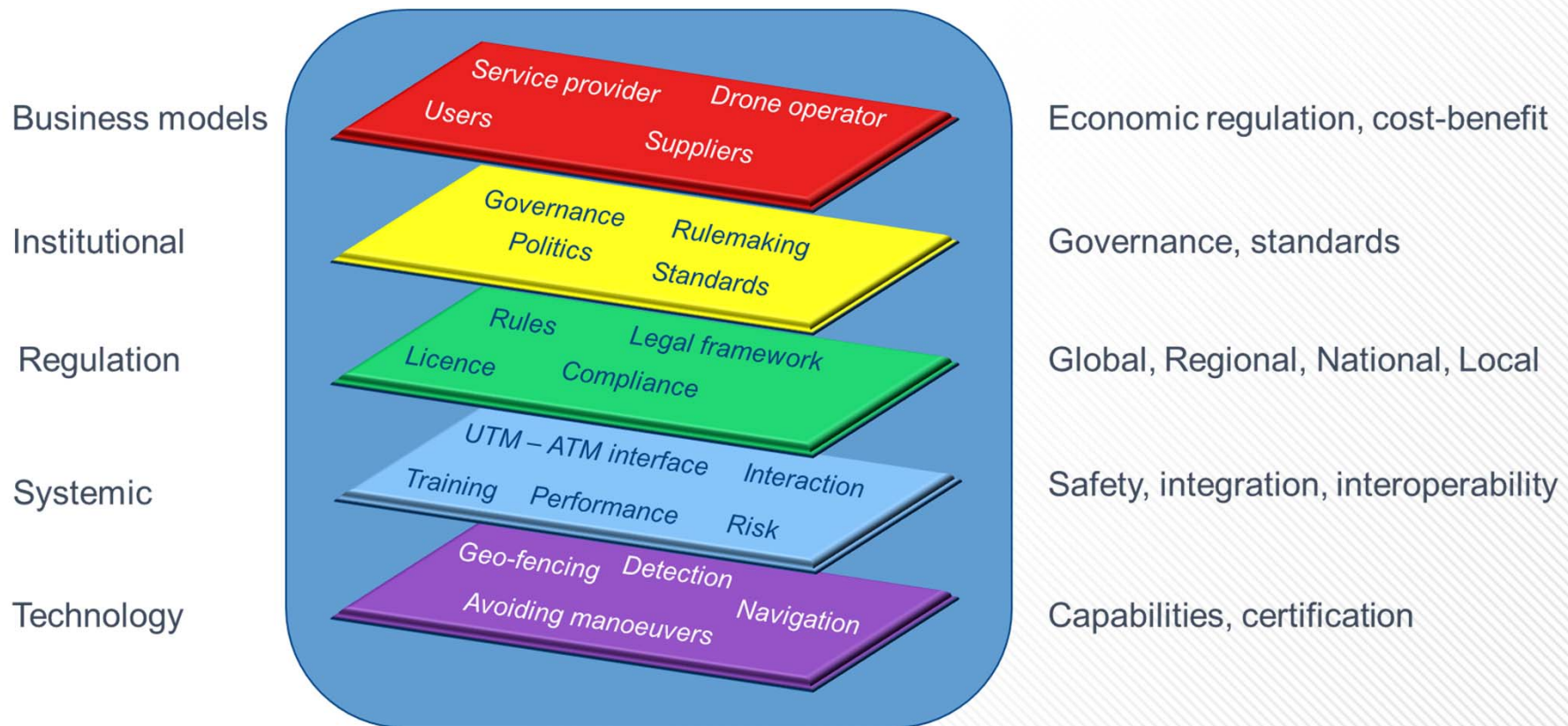


4. Lessons learned from the U-Space demonstrator

- 🔑 Innovation needs **cooperation**
- 🔑 Know-how is available but **dispersed** over a variety of organizations
- 🔑 UTM is the new twin-brother to ATM - needs a great variety of all kind of answers
- 🔑 UTM is a positive disruptive technology – **think different** to ATM
- 🔑 From feasibility to **sustainability**
- 🔑 Develop adequate **standards** and a legal framework for both UTM & ATM
- 🔑 UTM **interface to ATM** is the main challenge
- 🔑 The disruption and innovative elements will extend to conventional aviation



5. Innovation – 5 layers of interdependencies



6. Proposed way forward

1. Global/European level – align regulation
 - Continue with international cooperation with GUTMA
 - Continue to support the **development of a regulation** at European level
2. Swiss level – structure the development
 - Create a multi-corporate **Think-tank** to design the Swiss UTM concept
 - Create and maintain a **national UTM coordination platform**
 - Define a **governance structure** to decide on fundamental questions
 - Develop a **roadmap** for a national infrastructure and local projects
 - Align to a common **vision, mission and strategy** to address national and local needs
3. Operational level - improve quality
 - Comprehensive **risk assessment** and mitigation
 - Substitute 5km-rule
4. Include Swiss academic institutions / ARCS for fundamental **research support**

We strongly believe in innovations



“We see ourselves as forward-looking partners of the drone industry. The U-space can only develop successfully if the **different players collaborate efficiently together** and embrace innovation. The demonstrator shows that this is possible. I look forward to us taking the next steps **together with our partners** as soon as possible.”

Alex Bristol, CEO

skyguide

skyguide

Thank you for your attention
May I answer your questions?

with you, all the way.

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Swiss U-space Demonstrator in line with GUTMA = Global UTM Association

Featured Members

The featured members include:

- aerial innovation
- AERIALTRONICS
- AERONYDE
- AGI
- AG FLY
- AIRMAP**
- AIRBÖTICS
- ALTITUDE
- ANRA TECHNOLOGIES
- ACSL
- AZIMUT
- Blue Innovation
- Colibrex
- Connect Robotics
- 天合国际
- Dedrone
- delair.tech
- DPS Deutsche Flugsicherung
- dji
- DRONE ALLIANCE EUROPE
- DRONE COMPLIANT
- DroneLogbook
- enav
- everis
- gemalto
- Ge=Network
- GLONASS UNION
- GLVI
- GRYPHON SENSORS
- Hionos
- HITACHI Inspire the Next
- IDS
- JTM JAPAN UTM Consortium
- MATTERNET
- NATS
- robotics
- NOKIA
- NQUAV
- NITTDATA
- ONEKY
- Parrot
- PRECISIONAVIX
- PRODRONE
- QUALCOMM
- Rakuten AIRMAP
- SITA** Create success. Together
- skyguide
- senseFly** a Parrot company
- skysoft
- Skyward
- SONY
- TERRA DRONE
- THALES
- Ublox
- UNIFLY
- UPC
- VAISALA
- ViaSat

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SESAR U-Space Blueprint 2017



› Key principles

- **safety** of all airspace users operating in the U-space framework as well as people on the ground
- scalable, flexible and adaptable system that can respond to changes in demand, volume, technology, business models and applications, while **managing the interface with manned aviation**
- high-density operations with **multiple** automated drones
- equitable and fair **access** to airspace for all users
- competitive and **cost-effective service** provision at all times
- minimize deployment and operating costs by leveraging existing aeronautical services and infrastructure
- adopt technologies and standards from other sectors when meeting the needs of U-space
- **risk-based** and performance-driven approach for safety, cyber- and security and resilience