



# Higher Airspace Operations – SESAR perspective

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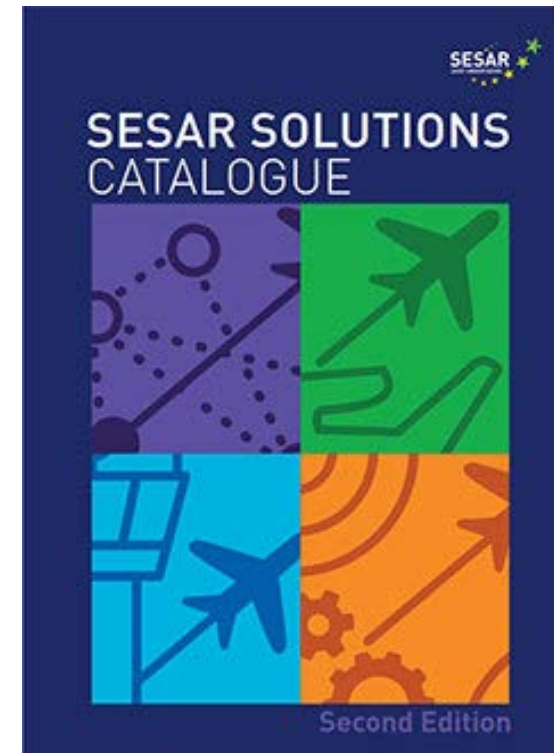
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# Agenda

- Setting the scene
- Why research?
- Designing the future
- Conclusion

# Setting the scene

- SESAR overwhelmingly addresses ‘conventional’ ATM
  - No current research on Higher Airspace Operations
- But we do cover part of ‘New Entrants’:
  - U-space
  - RPAS integration
- Do we actually *need* to research anything else ... ?



# Why research?

- New stakeholders / operators
- New vehicle types
- Hugely varied vehicle performance
- Unknown network impact
- New services
- New airspace division/classification/concept?
- New flight rules?
- High degrees of digitalization and automation

# Why research?

- New stakeholders / operators
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- High degrees of digitalization and automation

In fact ...

- Everything is new!

But wait ...

- Have we seen this before anywhere?



# Lessons (1)

- New stakeholders / operators
- New vehicle types
- Hugely varied vehicle performance
- Unknown network impact
- New services
- New airspace division/classification/concept?
- New flight rules?
- High degrees of digitalization and automation



# Lessons 1 (U-Space)

- A set of **new services** relying on a high level of **digitalisation and automation** of functions and specific procedures designed to support safe, efficient and secure access to airspace for **large numbers of drones**.
- An **enabling framework to facilitate any kind of routine mission**, from the inspection of infrastructure or delivery of goods to more complex future applications such as **urban air mobility**.



Source : Airbus

# Lessons 1 (RPAS)

- Allowing RPAS to fly safely among manned aircraft will not be achieved in a 'Big Bang'
- An iterative approach is being adopted:
  - Accommodation
  - Integration
- In order to truly 'integrate' we need a step-wise approach, understanding and addressing the needs of many new vehicle types with potentially very different needs
- This will require 'accommodating' new users until the whole ATM system is ready to evolve as one environment
- This may need something like the U-space service levels (U1, U2, U3, U4)



## Lessons (2)

- New stakeholders / operators
- New vehicle types
- Hugely varied vehicle performance
- **Unknown network impact**
- **New services**
- **New airspace division/classification/concept?**
- New flight rules?
- **High degrees of digitalization and automation**



# Lessons 2 (AAS - Current Architecture)

Infrastructure...)

Limited capacity  
Poor scalability  
Fixed routes  
Fixed national airspace  
structures

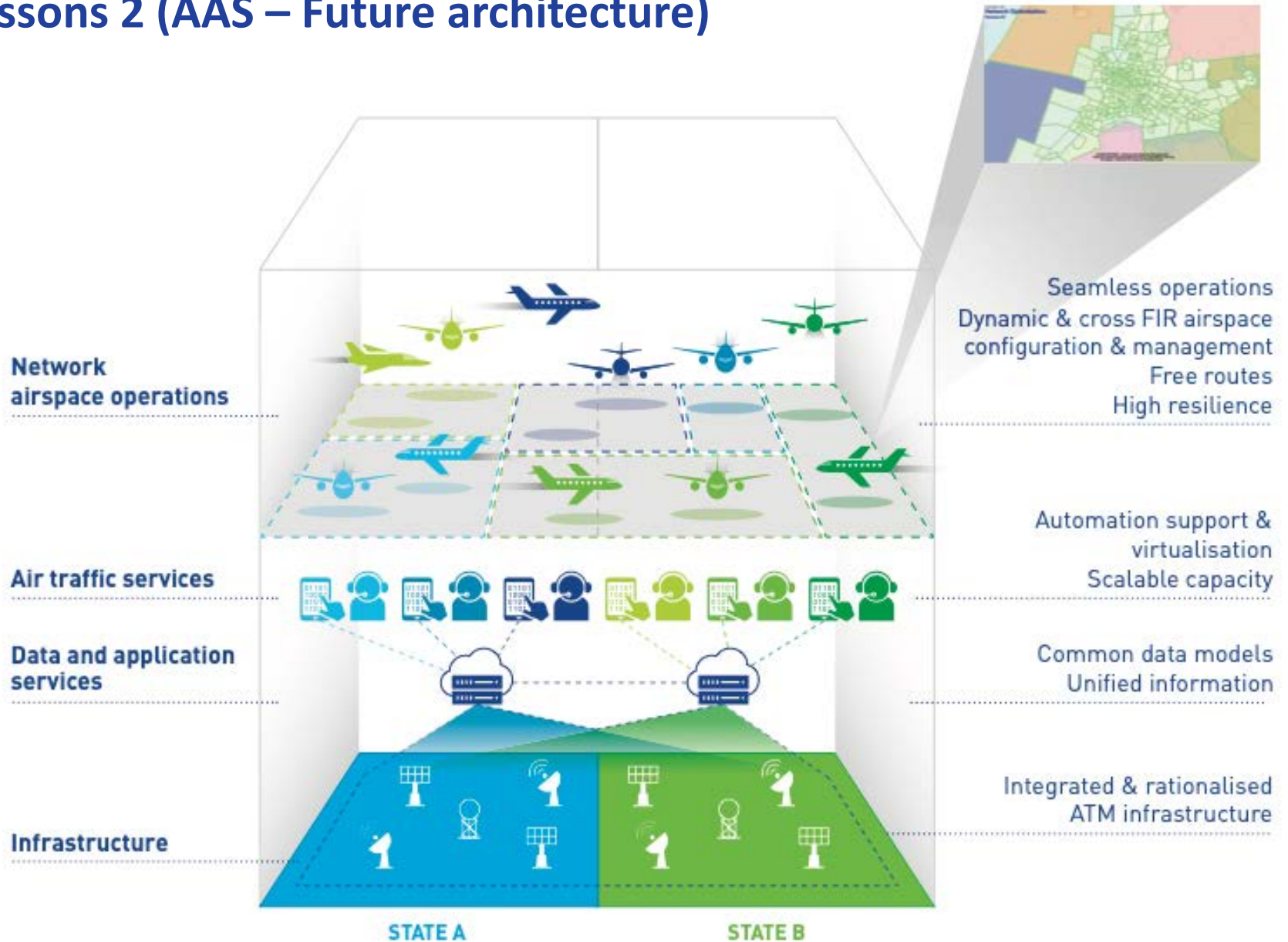
Limited automation

Low level of  
information sharing

Fragmented ATM  
infrastructure



# Lessons 2 (AAS – Future architecture)



# Conclusion

- Higher airspace operations are coming
- The variety of new users is staggering, which introduces significant challenges
- Research is needed to devise solutions, and SESAR is well placed to undertake it
- Introducing such new stakeholders mirrors the U-space revolution, and lessons can be learned and applied from that experience
- All new stakeholders must be involved, including those new to aviation, in order to achieve a consensual solution
- An iterative approach, as adopted for RPAS integration, allows for accommodating new users while work continues on defining the model for full integration
- A pan-European approach is needed to avoid fragmentation, maximise efficiency and, above all, maintain the safety of all airspace users



**Thank you**

Any questions?

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