



SWIM in Wave 2 & Wave 3

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February 18, 2020

PJ17-W1 Open Day, Rome



Founding Members



SESAR vision



SECURITY

- Ensuring high levels of security

COST EFFICIENCY

- Up to **40%** reduction in air navigation services costs per flight

CAPACITY

- Up to **30%** reduction in departure delays
- Up to **10%** additional flights landing at congested airports
- A system capable of handling up to **100%** more traffic

ENVIRONMENT

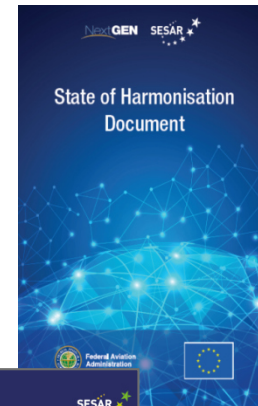
- Up to **10%** reduction in CO₂ emissions
- Positive impact on noise and air quality

SAFETY

- Improvement by up to a factor of **4**

OPERATIONAL EFFICIENCY

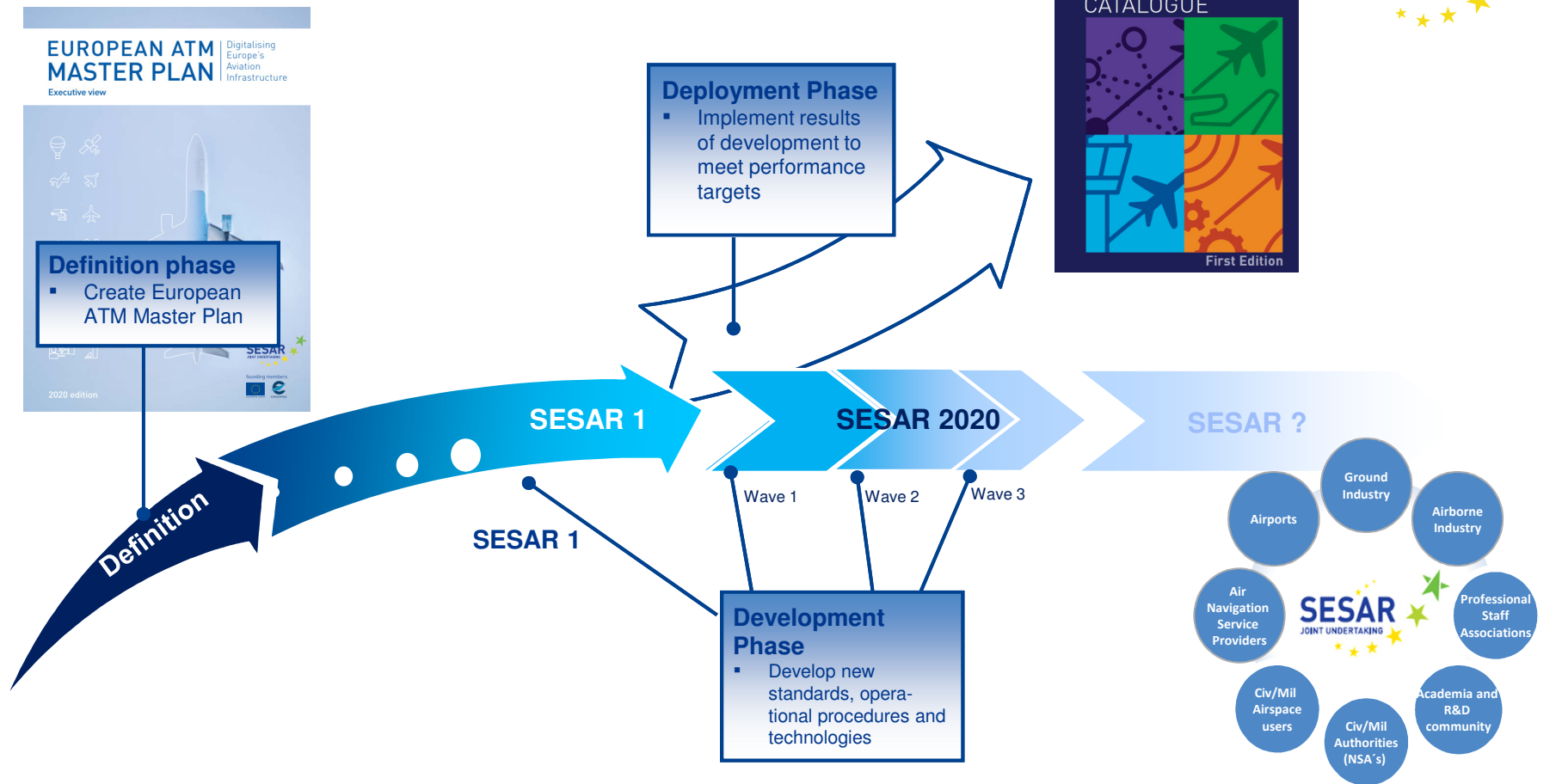
- Up to **6%** reduction in flight time
- Up to **10%** reduction in fuel burn



SESAR life cycle



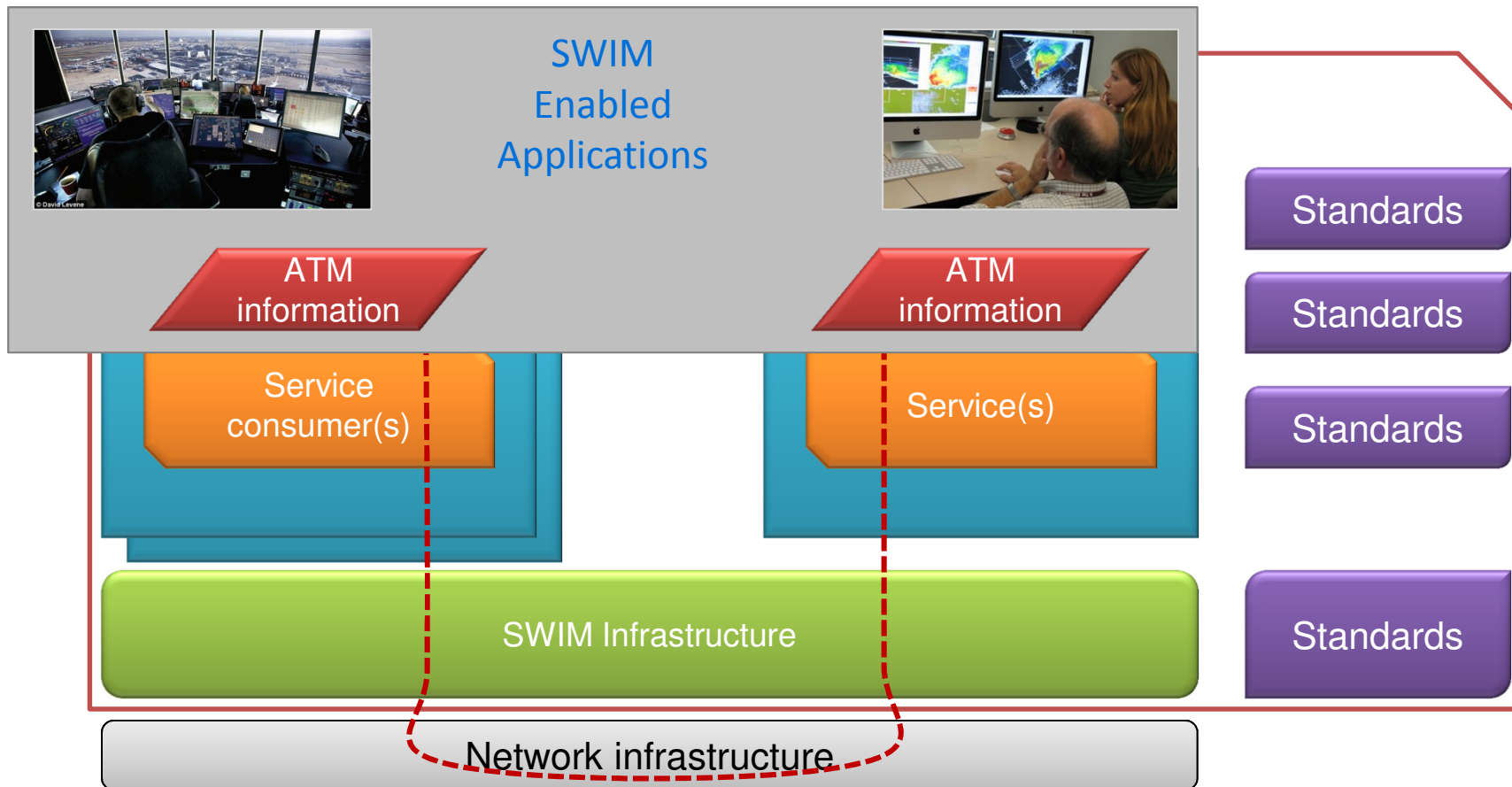
The SESAR project



SWIM definition

SWIM is not (just) a set of services, but rather the future way of service development

SWIM consists of *standards*, *infrastructure* and *governance* enabling the management of *ATM information* and its exchange between *qualified parties* via *interoperable services*.





Airspace architecture study



Airspace architecture study



Single European
Airspace System

Network
airspace operations

Air traffic services

Data and application
services

Infrastructure



Seamless operations
Dynamic & cross FIR airspace
configuration & management
Free routes
High resilience

Automation support &
virtualisation
Scalable capacity

Common data models
Unified information

Integrated & rationalised
ATM infrastructure

Airspace architecture study

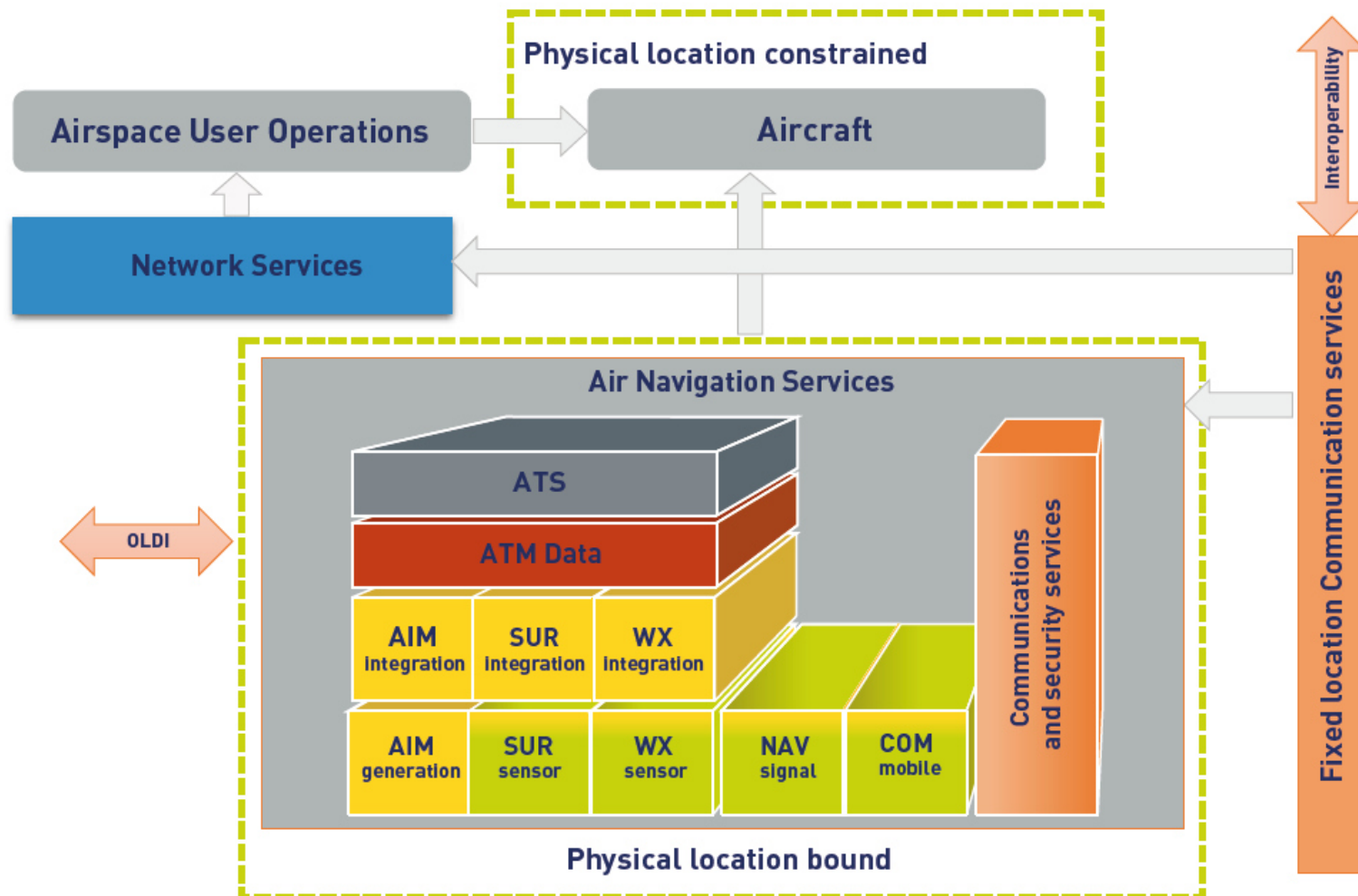


Figure 48. Traditional monolithic set-up, with all services integrally provided by one ANSP⁹⁵

Airspace architecture study

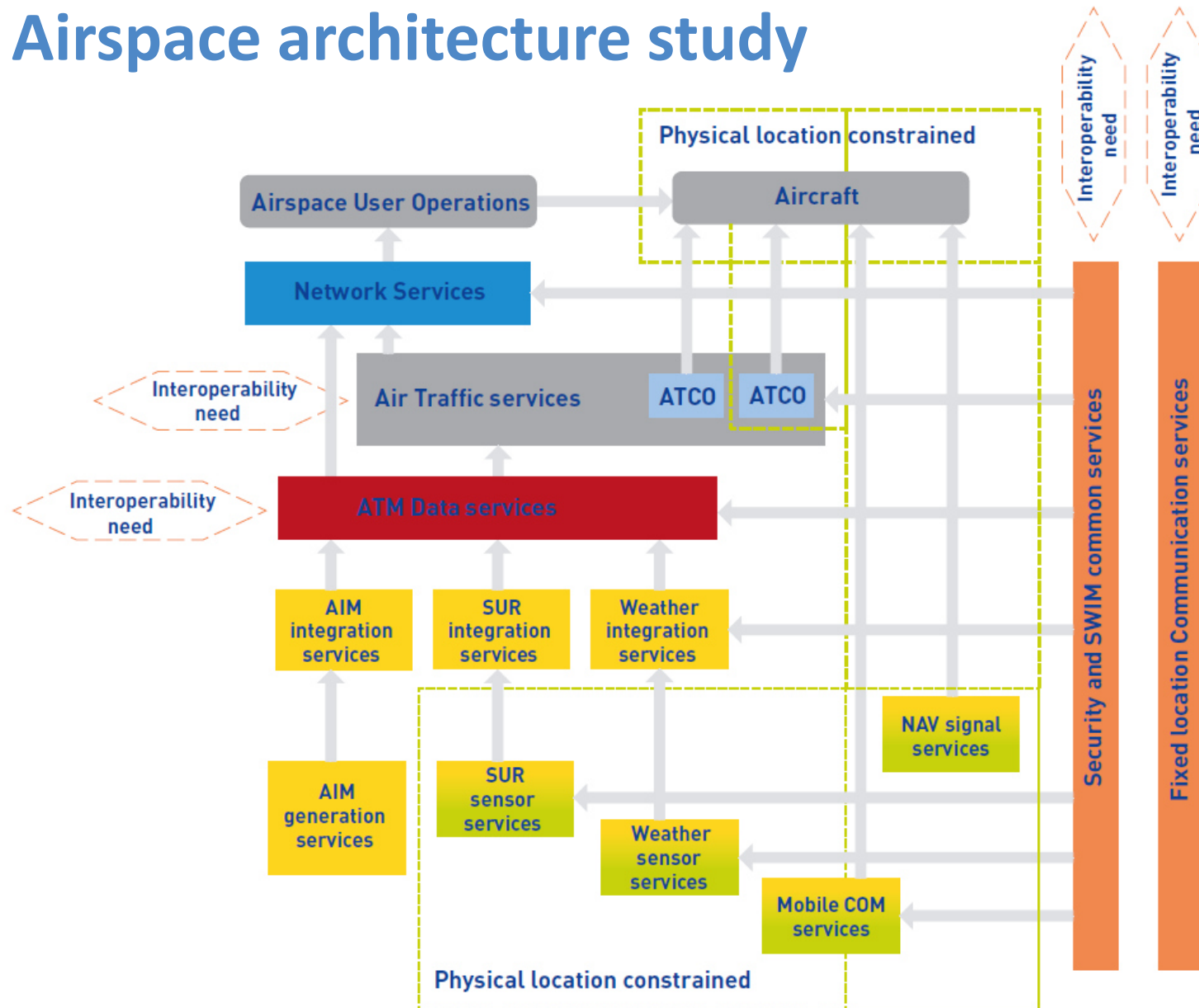


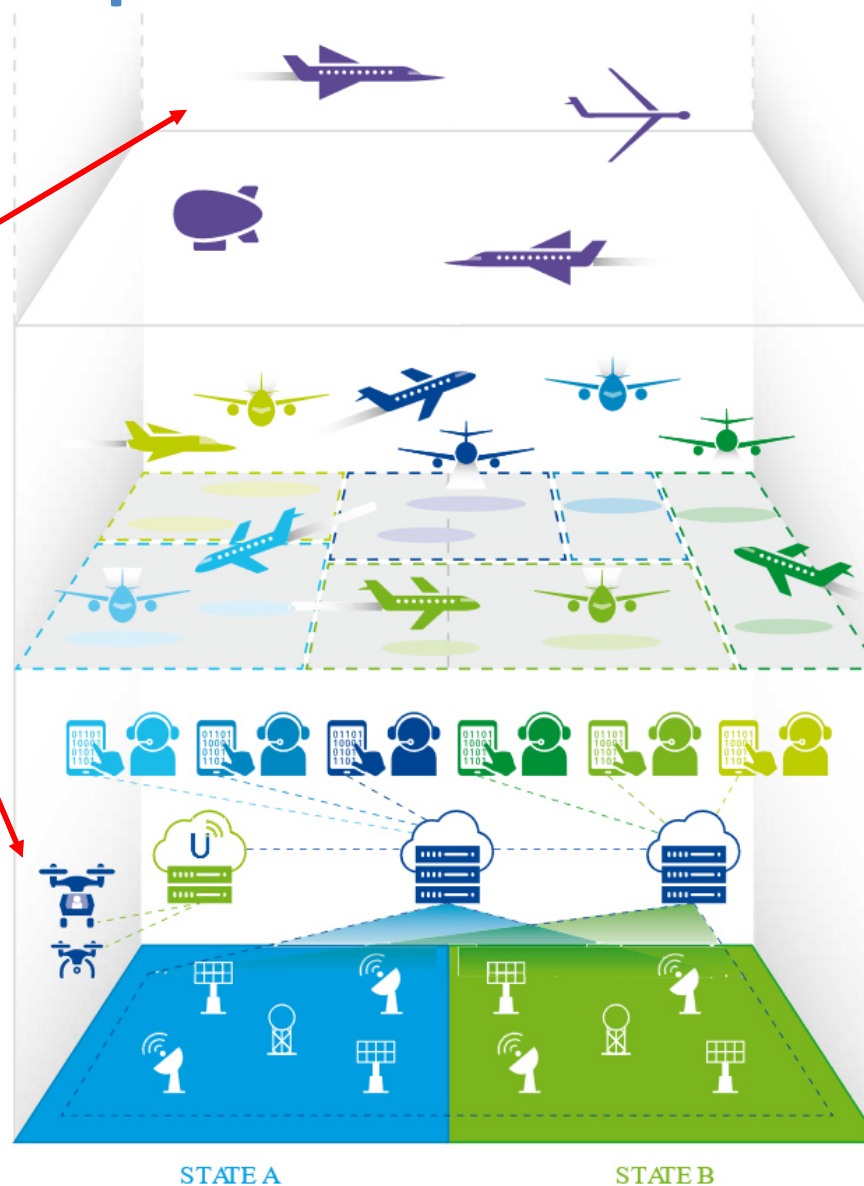
Figure 49. Proposed service-oriented architecture depicting service (not information exchange) flows⁹⁶

Beyond the Airspace architecture study

New entrants

Typically below 500 ft

- U-space / UTM
- Drones
- Air taxis
- ...



Typically above FL660

- Unmanned balloons
- Hypersonic passenger AC
- Sub-orbital flights
- ...

IFR integration

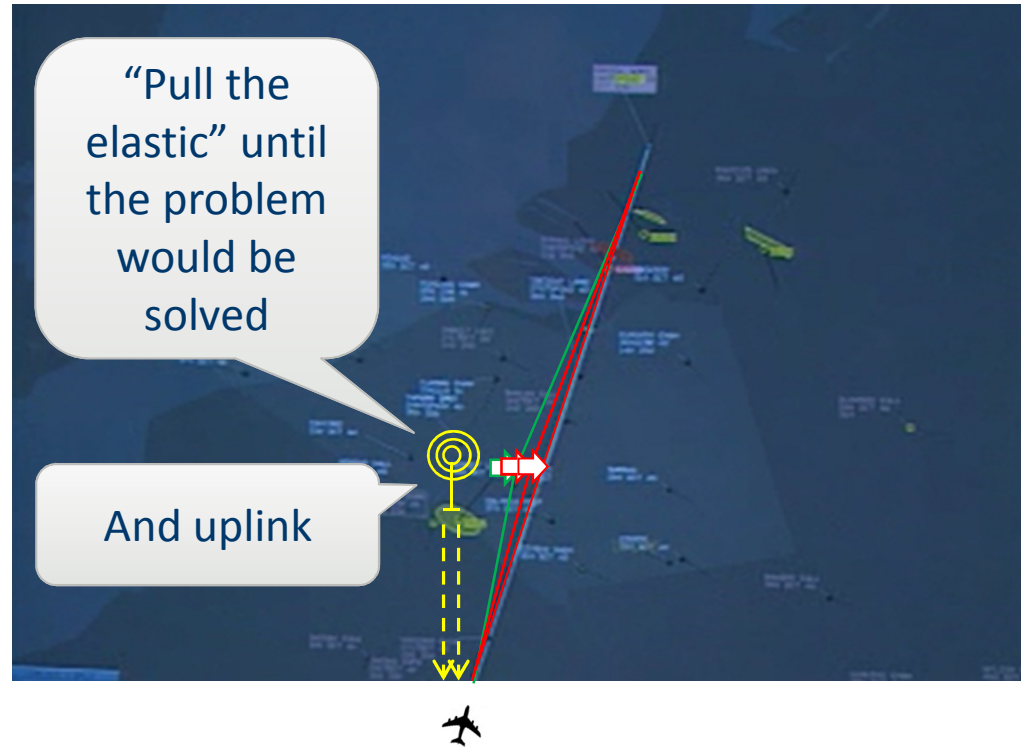
- RPAS

Complex clearances (example)



Beyond CPDLC/ADS-C:

Operational
requirements for
future DATACOM
(LDACS/SATCOM)



- Register ATCO intention in ground system... and share it
- Improve TP
- Uplink with or without clearance: FMS flight optimization
- Symmetric concept: crews initiate request to change RBT and/or clearance
- Lateral & Vertical...
- ...



SWIM in wave 2 & wave 3

Wave 2 – Kicking off

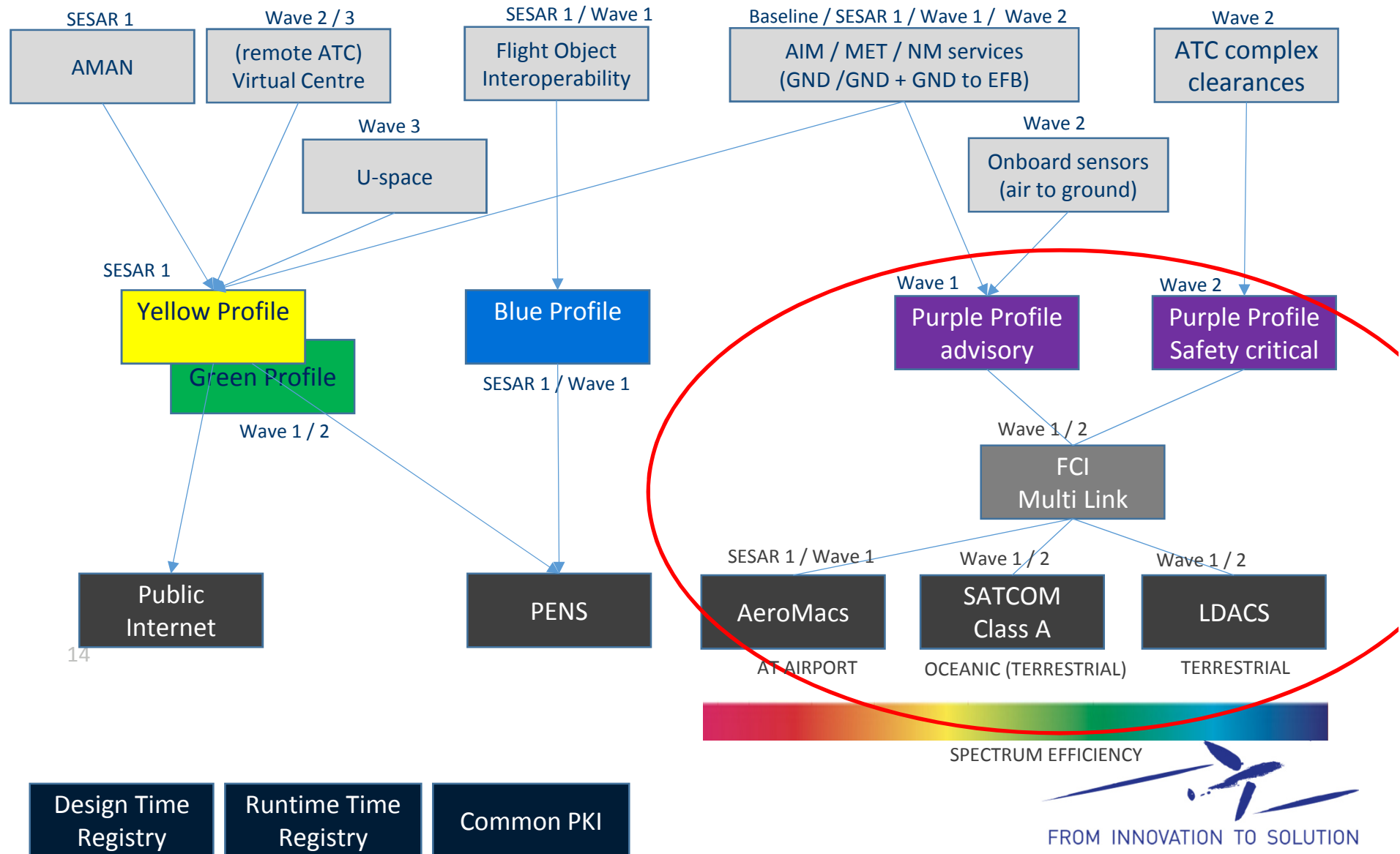
- SWIM TI Green Profile (continued)
- SWIM TI Purple Profile (safety critical)
- AIM/MET uplink services (PP - advisory)
- AC as a sensor downlink (PP - advisory)
- Complex clearances (PP - safety critical)
- Virtual Centre SWIM services (YP)

Wave 3 – Under definition

- Collaborative U-space-ATM interface (YP)

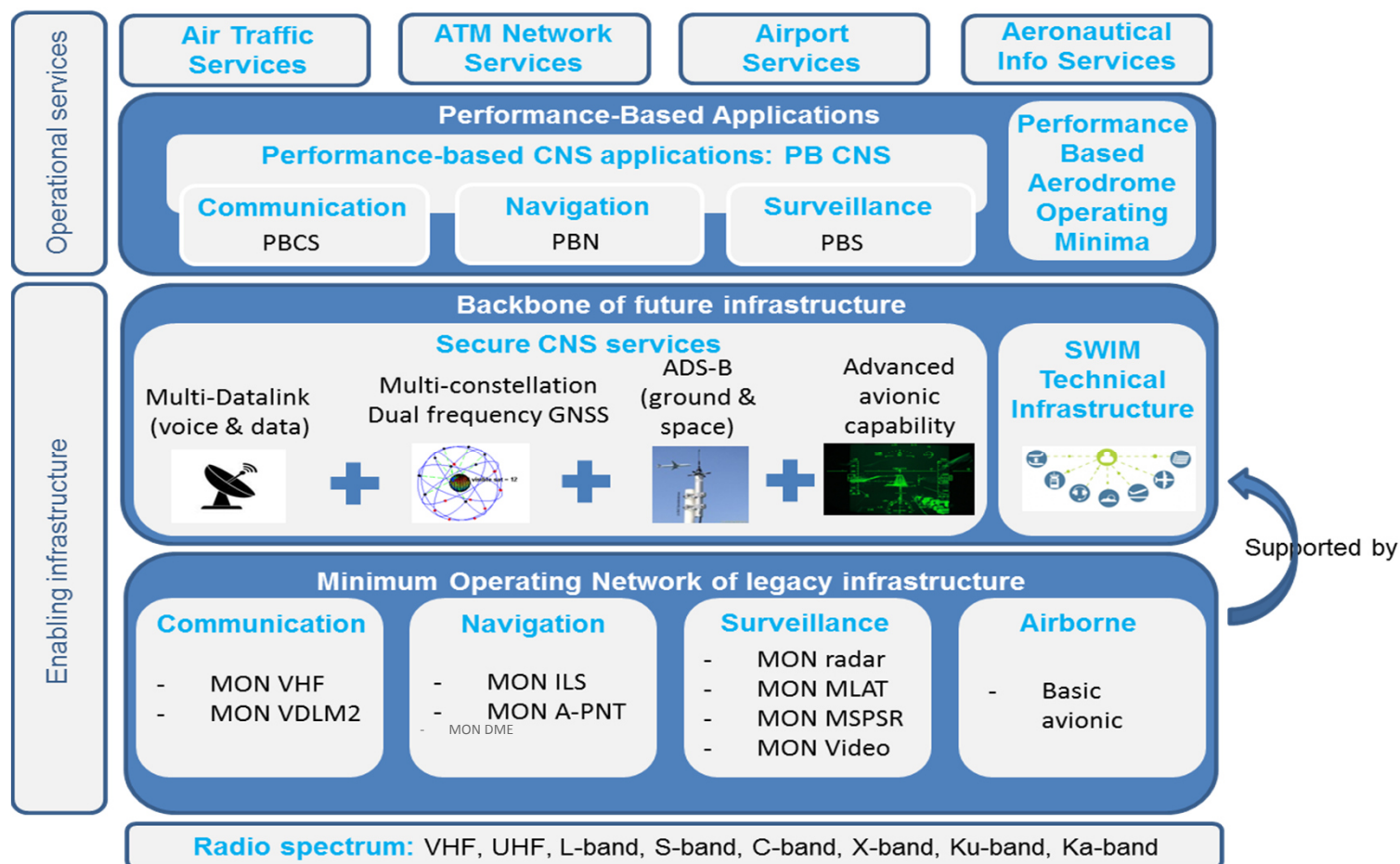
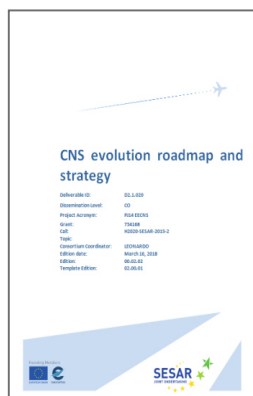


SWIM A/G as part of iCNS

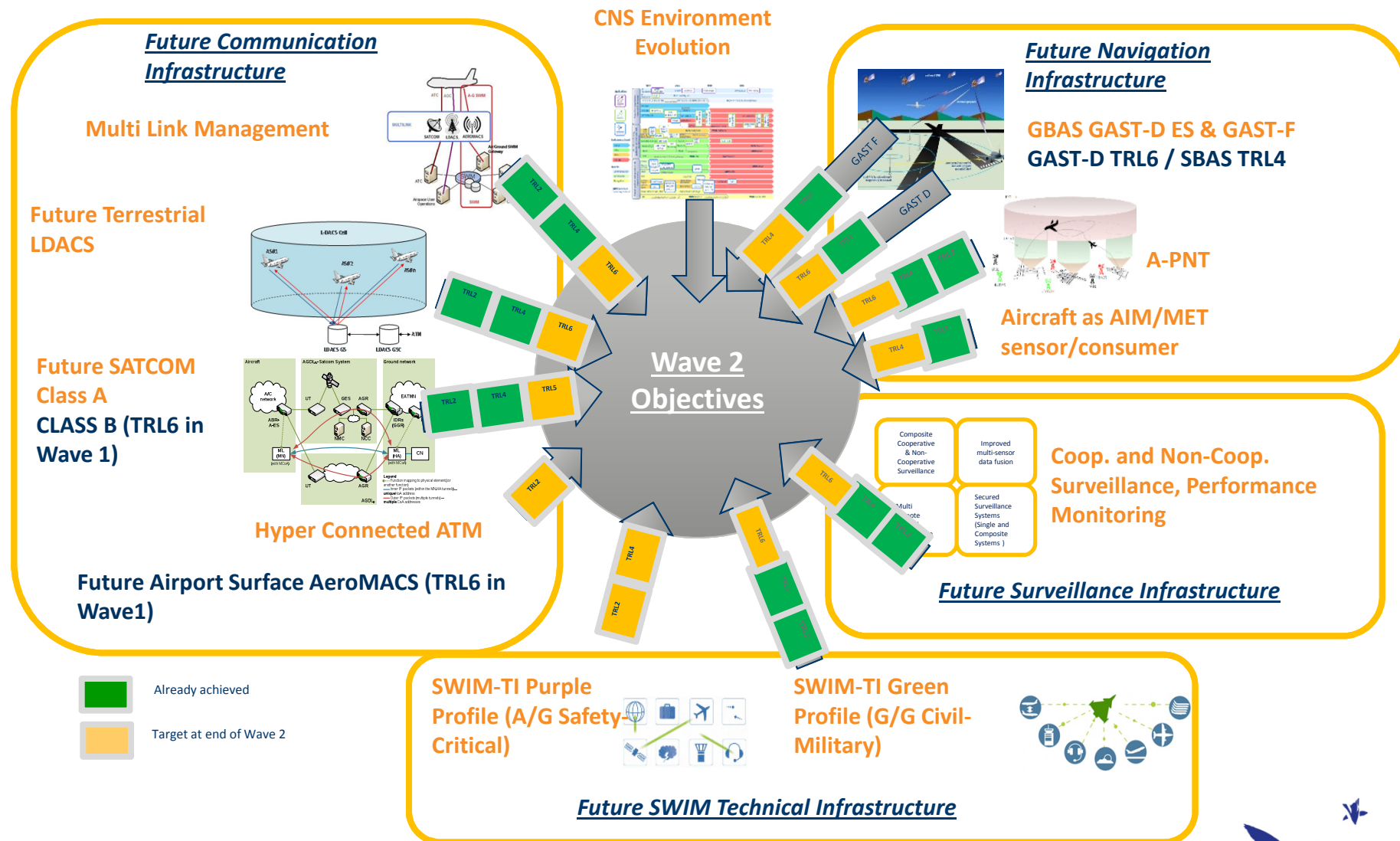


Integrated CNS and SWIM Architecture

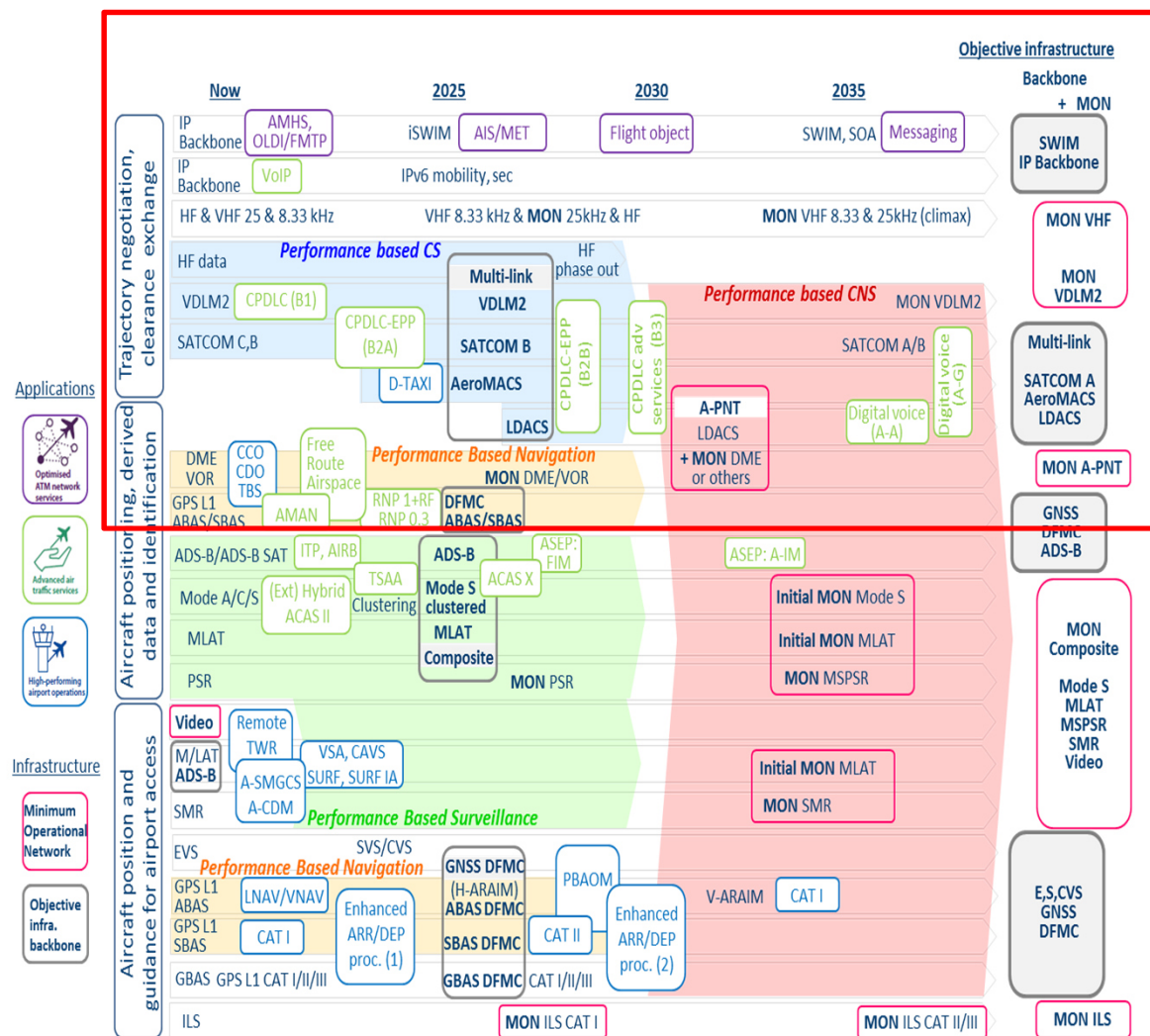
CNS Roadmap & Strategy



S2020 Wave 2 Development Objectives



SESAR iCNS - Roadmap: COM Transition path



Main highlights for COM:

1. From 2025 Multi-link based on:

- Terrestrial
 - VDL2 (capacity limit 2024)
 - and LDACS from 2025
- Satellite
 - SATCOM Class B
- Airport Surface
 - AeroMACS

2. Gradual development of

- CPDLC: B1
- CPDLC-EPP: B2A, B2B,
- CPDLC Adv: B3

3. SWIM PP

4. From 2035/2035+

- MON VHF 8.33 kHz & 25kHz Climax
- MON VDL2
- SATCOM Class B to Class A
- Digital Voice (A-A, A-G)





Thank you

SWIM in Wave 2 & Wave 3



Founding Members

