



**SDM D/L Workshop – 17 Jan 2019**

**SESAR 2020 – Data Link R&D activities**

**SESAR JU**

Founding Members



EUROPEAN UNION



EUROCONTROL

# Why SESAR JU R&D activities in the D/L framework?



Need to complement VDL Mode 2 in the medium and long term

- More Users (number, types)
- More and more demanding D/L services

## EASA recommended to explore alternatives

EASA - Technical issues in the implementation of Regulation (EC) No 29/2009 (Data Link) report - Version 1.1:

6.2 Recommendations for further investigations:

*VDL2 was not designed for large data exchanges. Therefore, it is essential to expedite the fielding of specific technology for the **airport surface** (e.g., AeroMACS). In parallel, it is important to explore the use, for en route, of alternative technologies such as **satellite-based** communication (e.g., ESA project ANTARES or its precursor THAUMAS) and/or new technologies such as **L-band Digital Aeronautical Communication System (LDACS)***



# **SESAR2020 Wave 1 (i.e. current step)**

## **Snapshot on Data Link Related projects sustaining the Master Plan**

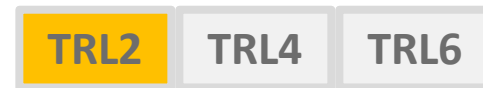


# CNS as a whole / Synergies between “pillars”



## Solution PJ.14-01-01 – CNS Environment Evolution (iCNS)

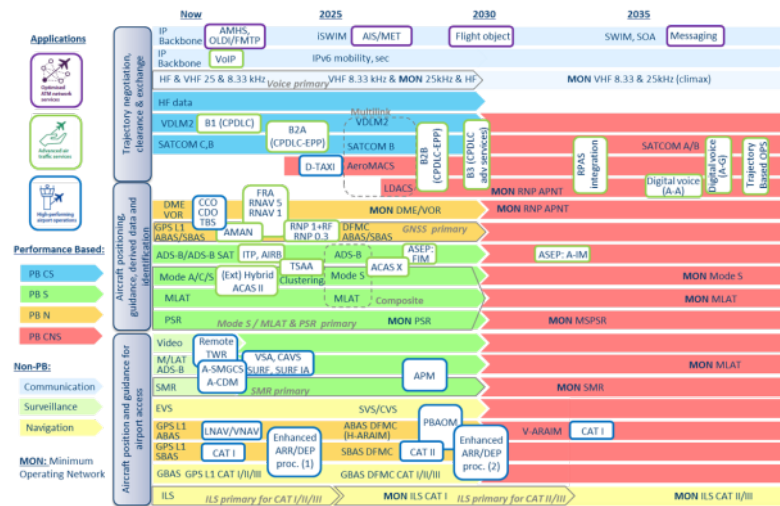
Maturity expected end 2019



### Scope:

Provide an integrated, global view of the future Communications, Navigation and Surveillance services:

- Identify CNS requirements
- Assess **cross-domain CNS opportunities & vulnerabilities**
- Identify short-term and long-term CNS evolution for both ground and airborne system
- Define the future integrated CNS architecture
- Define the integrated CNS spectrum strategy
- Identify areas where the CNS efficiency could be improved
- **Service and Performance-Based**
- Ensure Civil-Military CNS interoperability



: Achieved

: Planned to be achieved at the end of Wave 1



# The A/G Com System of Systems

## Solution PJ.14-02-04 – FCI Network Technologies incl. voice & mil. interfaces (FCI)

Maturity expected end 2019

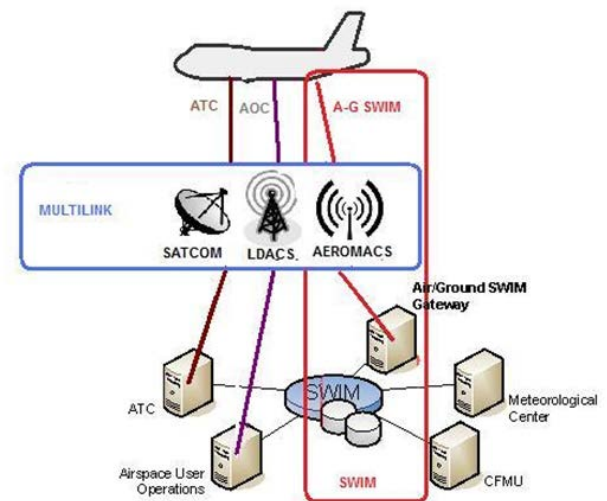


### Scope:

Develops and standardises the FCI elements that **integrate all the future communication systems** such as: LDACS, SatCom and AeroMACS.

Address **transversal topics including mobility, security, safety, and civil-military interoperability.**

Provide **interoperability with legacy systems** (e.g. VDL Mode 2-ATN/OSI)



: Achieved

: Planned to be achieved at the end of Wave 1



# The future terrestrial component

## Solution PJ.14-02-01 – FCI Future Terrestrial Data Link

### Scope:

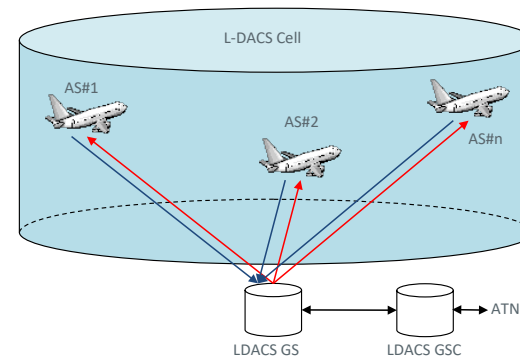
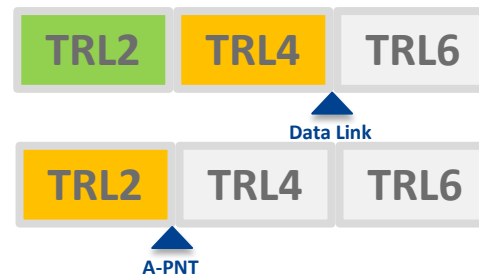
Part of the FCI

Develops and standardises the future terrestrial data link system (**LDACS** / L-band-Digital Aeronautical Communication System).

### Includes:

- **Wideband IPS Data Link** (as the successor of VDL Mode 2) + **digital voice**
- Alternative Position, Navigation and Timing (A-PNT) solution as a GNSS fall back

Maturity expected end 2019



: Achieved

: Planned to be achieved at the end of Wave 1



# The satellite component

## Solution PJ.14-02-02 – Future SATCOM

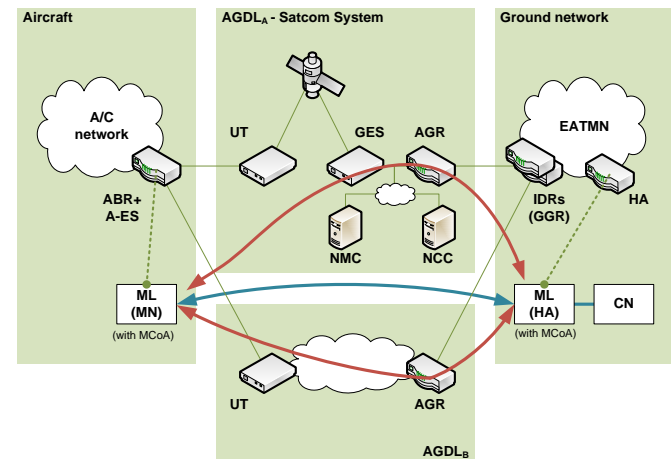
### Scope:

Part of the FCI

Develops and standardises the future **satellite data link** technology for the continental and oceanic regions including digital voice.

- Initial step - **Class B**: ATN-B1/ATN-B2 /OSI – **dual link with VDL Mode 2**
- Final step – **Class A**: ATN-B3, / **IPS, multilink, digital voice.**

Maturity expected end 2019



: Achieved

: Planned to be achieved at the end of Wave 1





# The broadband component at airport

## Solution PJ.14-02-06 – Completion of AeroMACS

### Scope:

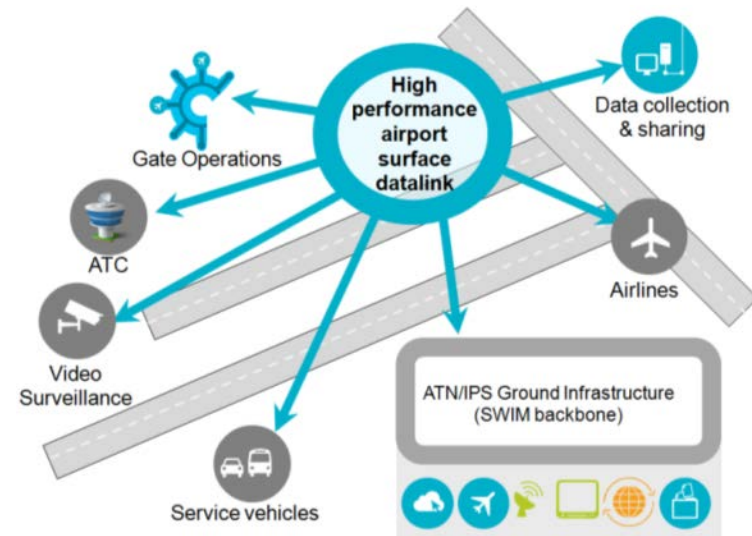
Part of the FCI

High bandwidth communication capabilities for critical communications on the airport surface between Airlines, ANSPs and Airport Authorities.

- **Ground/Ground** and **“Air”/Ground** services
- Wave 1 addresses **ATN/OSI and ATN/IPS support in multilink environment.**
- Validate **Voice** services

*Note: stand-alone AeroMACS already achieved TRL6 during SESAR 1*

Maturity expected end 2019



: Achieved

: Planned to be achieved at the end of Wave 1



# Validating ADS-C/EPP with large # of A/C in op conditions

## Very Large Scale Demonstration - PJ.31 & DIGITS EU

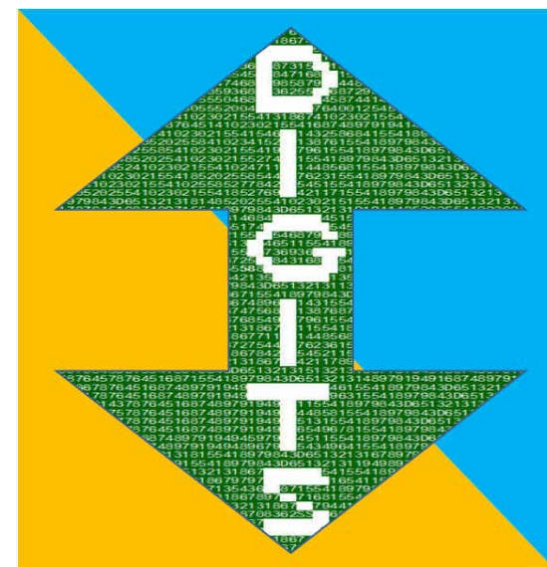
### Scope:

Demonstrate in operational environment the ATM **benefits** using **downlinked 4D trajectory data (ATN-B2, ADS-C/EPP)**.

Involve **7 airlines - 100 A/C** (A320 retrofit & forward-fit) during **revenue flights (~28 000 flights)**.

Flying through **DFS, ENAV, NATS, MUAC\*** airspaces.

\*: op system



# SESAR2020 Wave 2: the subsequent step

“Further maturing”

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**Data Link related proposed activities**

# SESAR2020 - Wave 2

Previous slides address Wave 1 Industrial Research Projects.

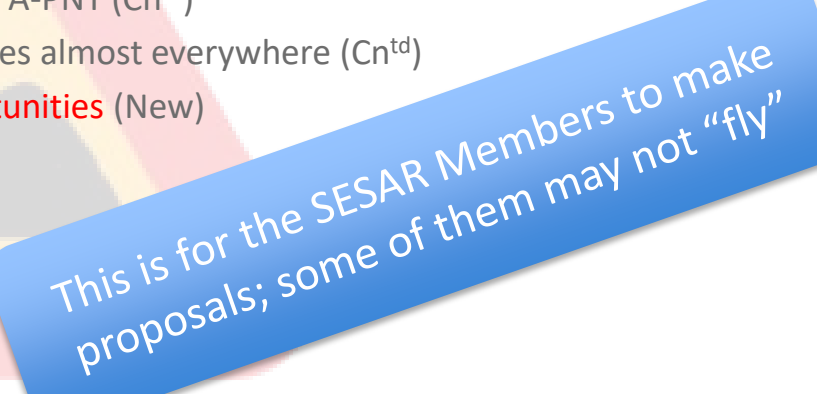
Most of these Projects will be completed by end 2019 and will not achieve TRL-6 (TRL-6 = SESAR JU objective).

Continuation is planned to further progress maturity **toward TRL-6** through a 2<sup>nd</sup> Wave of projects (reserved to Members).

**Call** has been **launched 10<sup>th</sup> Jan 2019** / **submission** of offers: **16 April 2019** / expected T0: Q3 2019, duration: ~3 years

Proposed Wave 2 Industrial Research portfolio includes the following D/L related items:

- **Integrated CNS&S - Cross CNS domain consistencies and opportunities** (Service & Performance based) (Cn<sup>td</sup>)
- **FCI Services: The Mobile Communication System of Systems** (Cn<sup>td</sup>)
- **L-DACS: L-DACS**, the Wide Band successor of VDL Mode 2 & A-PNT (Cn<sup>td</sup>)
- **Future Satellite Comm.: Class A SatCom** - Connecting mobiles almost everywhere (Cn<sup>td</sup>)
- **Hyper Connected ATM: Considering all connectivity opportunities** (New)



This is for the SESAR Members to make proposals; some of them may not "fly"

Open VDLs (non-restricted to members) are also being defined (call expected H2 2019)



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# Thank you very much for your attention!



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Founding Members



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