



RPAS Definition Phase

- 1st Workshop
- SJU, Brussels 4th September 2014

founding members



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Welcome

Slots	Topics	Speakers
09:30/09:40	SJU Keynote Speech	Florian Guillermet
09:40/09:50	EASA Keynote Speech	Eric Sivel
09:50/10:05	EC (DG MOVE) Keynote Speech	Koen de Vos / Frédéric Claus
10:05/10:20	Introduction to the RPAS Definition Phase	Denis Koehl
10:20/10:40	EU ATM Master Plan Update	Henk Hof
10:40/11:00	SESAR 2020 Programme	Peter Hotham
11:00/11:20	Coffee Break	
11:20/12:00	Definition Phase - Objectives and Scope	Mike Lissone
12:00/12:30	Definition Phase - Work already undertaken	RPAS Definition Phase Team
12:30/13:00	Definition Phase - Identification of work packages	RPAS Definition Phase Team
13:00/13:30	Definition phase - Work Planning	RPAS Definition Phase Team
13:30/14:00	Open Discussions	Denis Koehl/Mike Lissone
	AOB	





GENERIC RPAS ISSUES

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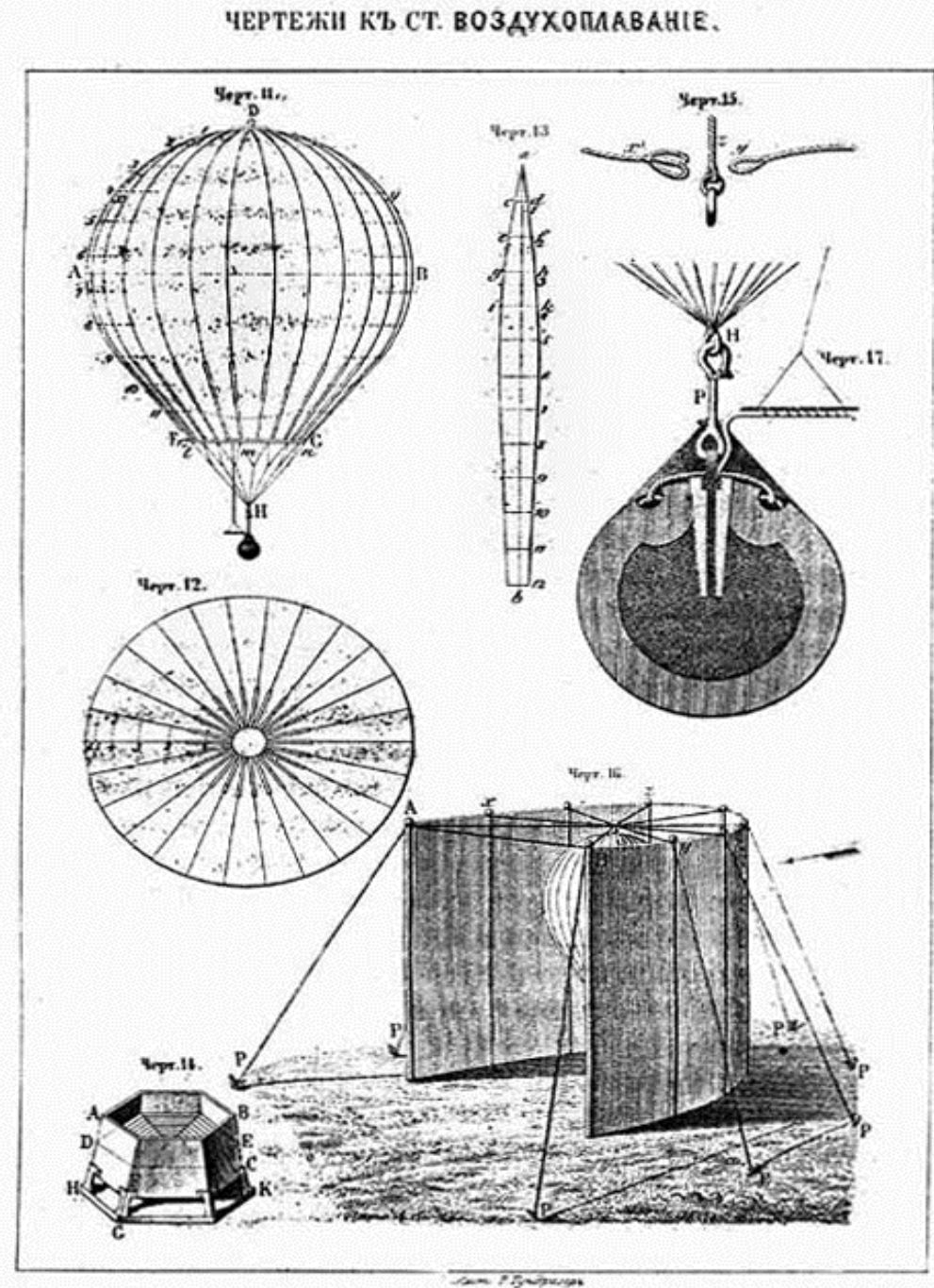
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History of RPAS

- 1849
- Austrian balloons bombed Venice
- Wind issue

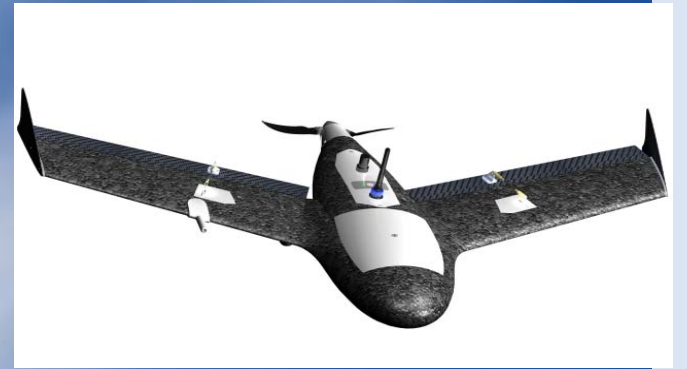


What are Unmanned Aircraft?

- DRONES?
- UAV?
- Unmanned aircraft systems
- Autonomous aircraft
- ??????????????????
- NO!!! They are called RPAS and they are a sub set of UAS!
 - Remote pilot station or ground station
 - Data link
 - Remote piloted aircraft



RPAS ARE AIRCRAFT



EUROPEAN AVIATION SYSTEM

- **Conservative**
- **Lead in time at least 5 years**
- **RPAS integration driven by innovation**
 - GOOGLE
 - FACEBOOK
- **RPAS just another airspace user**
- **<150 kg State specific (for now)**
- **Civil and military have same integration obstacles**



RPAS what is your perception?



Or societal benefits?

**THEY ALL WANT
AIRSPACE ACCESS**



MAIN OBJECTIVE

Safe integration of civil and Mil RPAS operations into the European aviation system and ATM from 2016

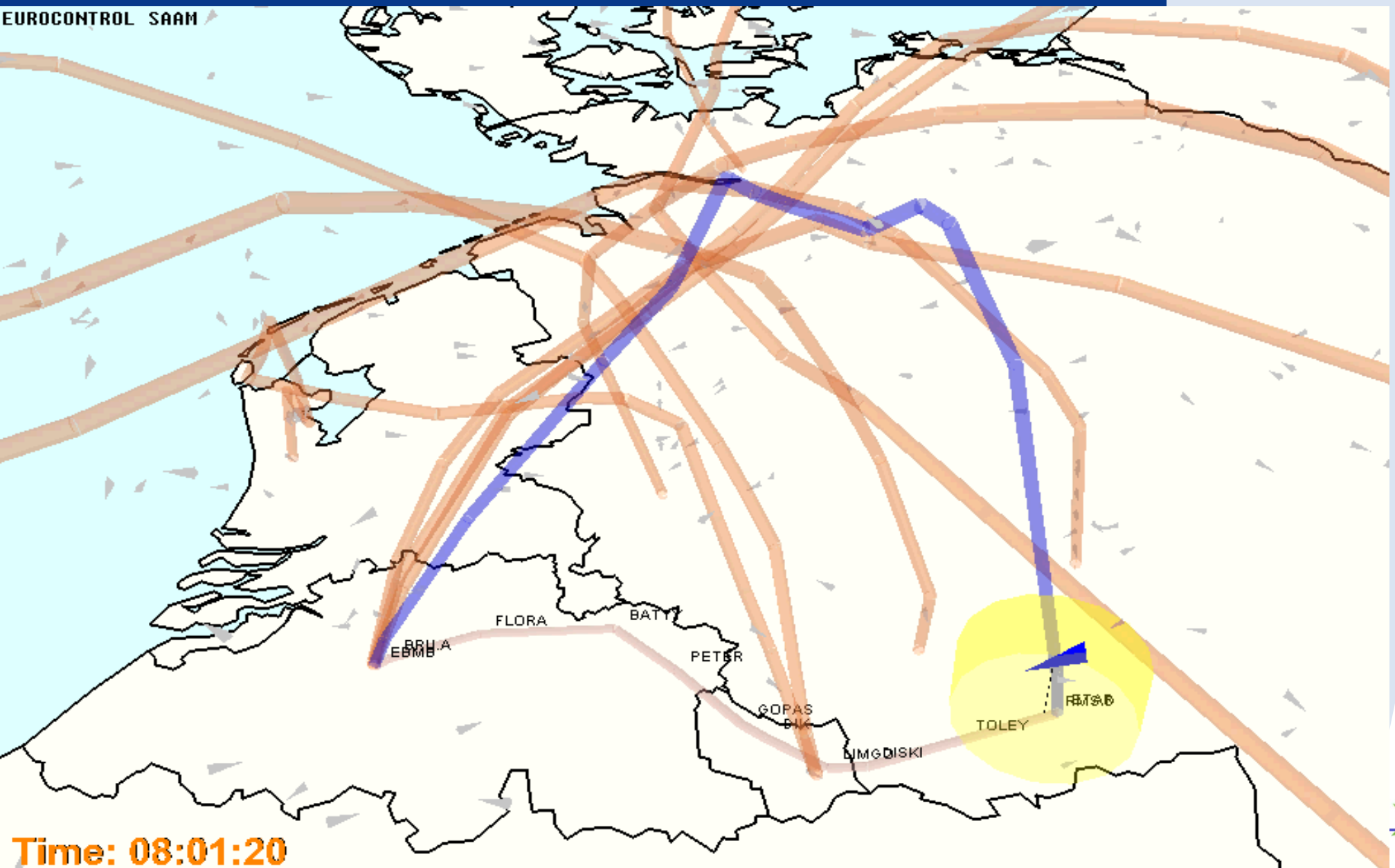
- Phased integration (scalability)
- Non-segregated ATM environments
- SESAR COMPLIANT – Integrated into the European ATM Master Plan



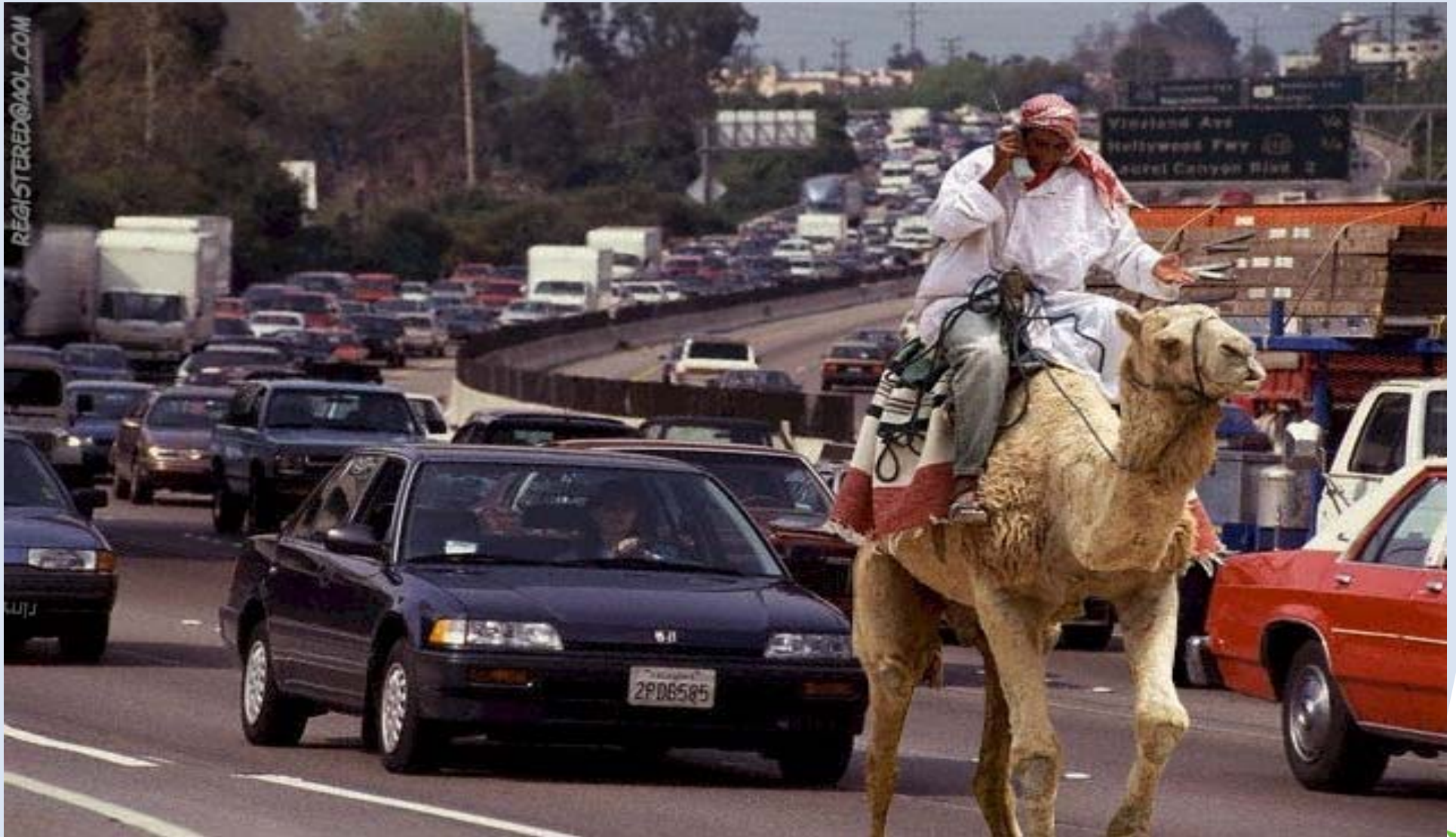
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INTEGRATION or ACCOMODATION



INTEGRATION CHALLENGES (1)



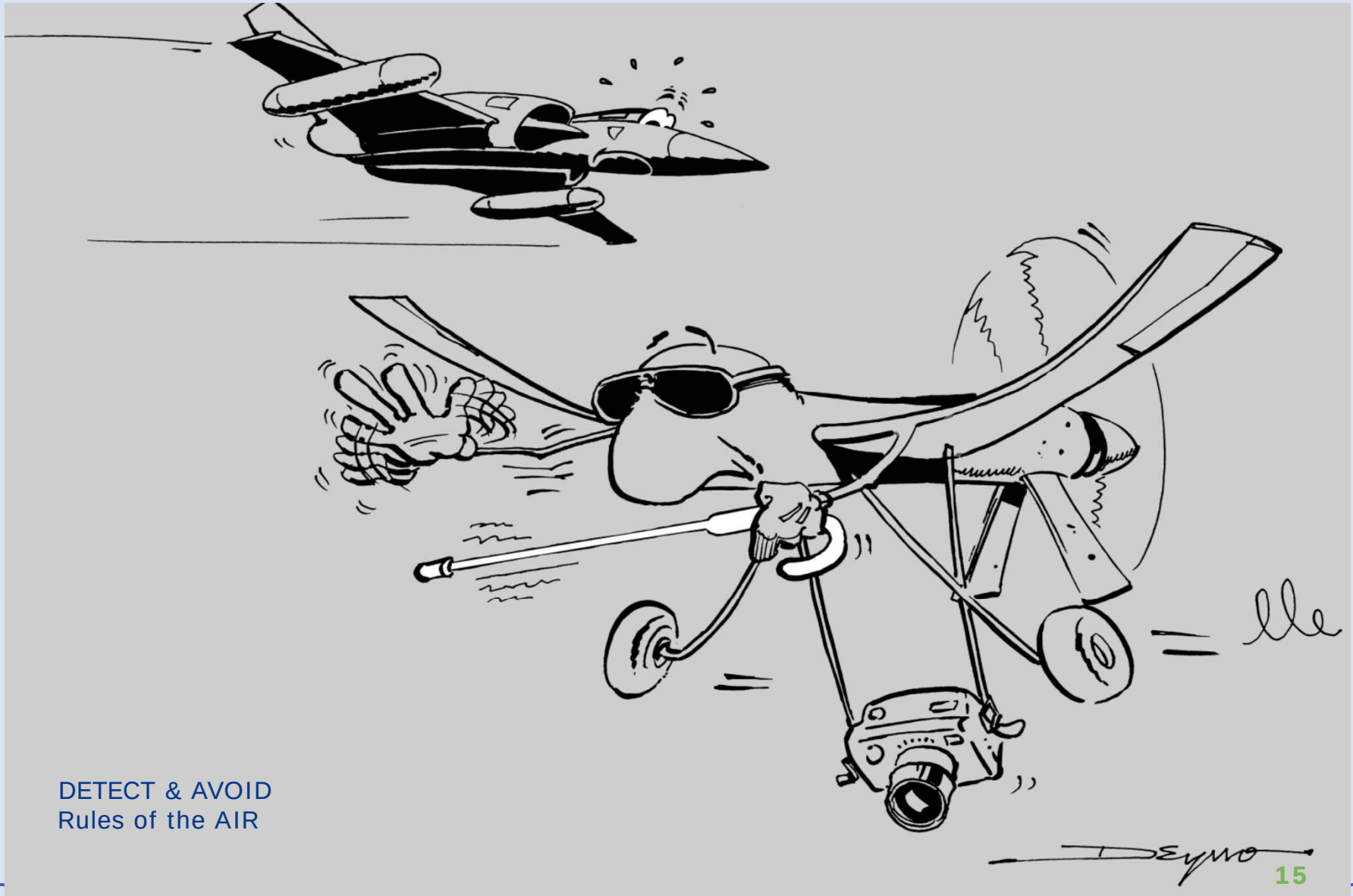
INTEGRATION CHALLENGES (2)



- DATA LINK requirements
- SPECTRUM



INTEGRATION CHALLENGES (3)



R&D GAP ANALYSIS

Identification of gaps in technology or procedures led to the following topics:

- Detect & Avoid
- Human factors
- C2 (Command & Control)
- Contingency – e.g loss of link, ...
- Security
- SESAR compliance



What is the state of play

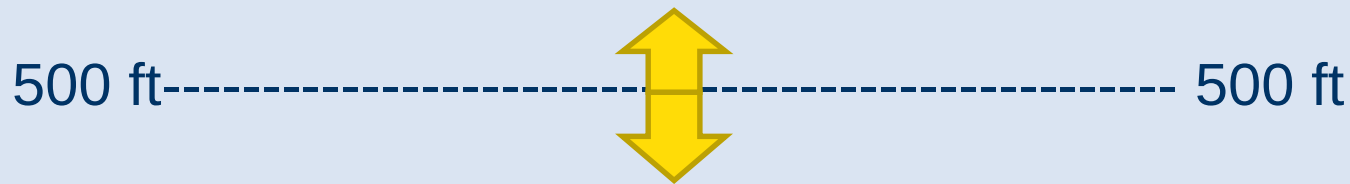
- **15 countries have regulation (not harmonised)**
 - 6 allow operations under strict conditions
- **2200+ civil approved commercial companies and growing**
- **Most operators and manufacturers have no aviation back ground**
- **Economic potential estimated at several billions before end 2020**
- **Pragmatic European approach.....**



TYPES OF OPERATIONS

Instrument Flight Rules (**IFR**)

Visual Flight Rules (**VFR**)



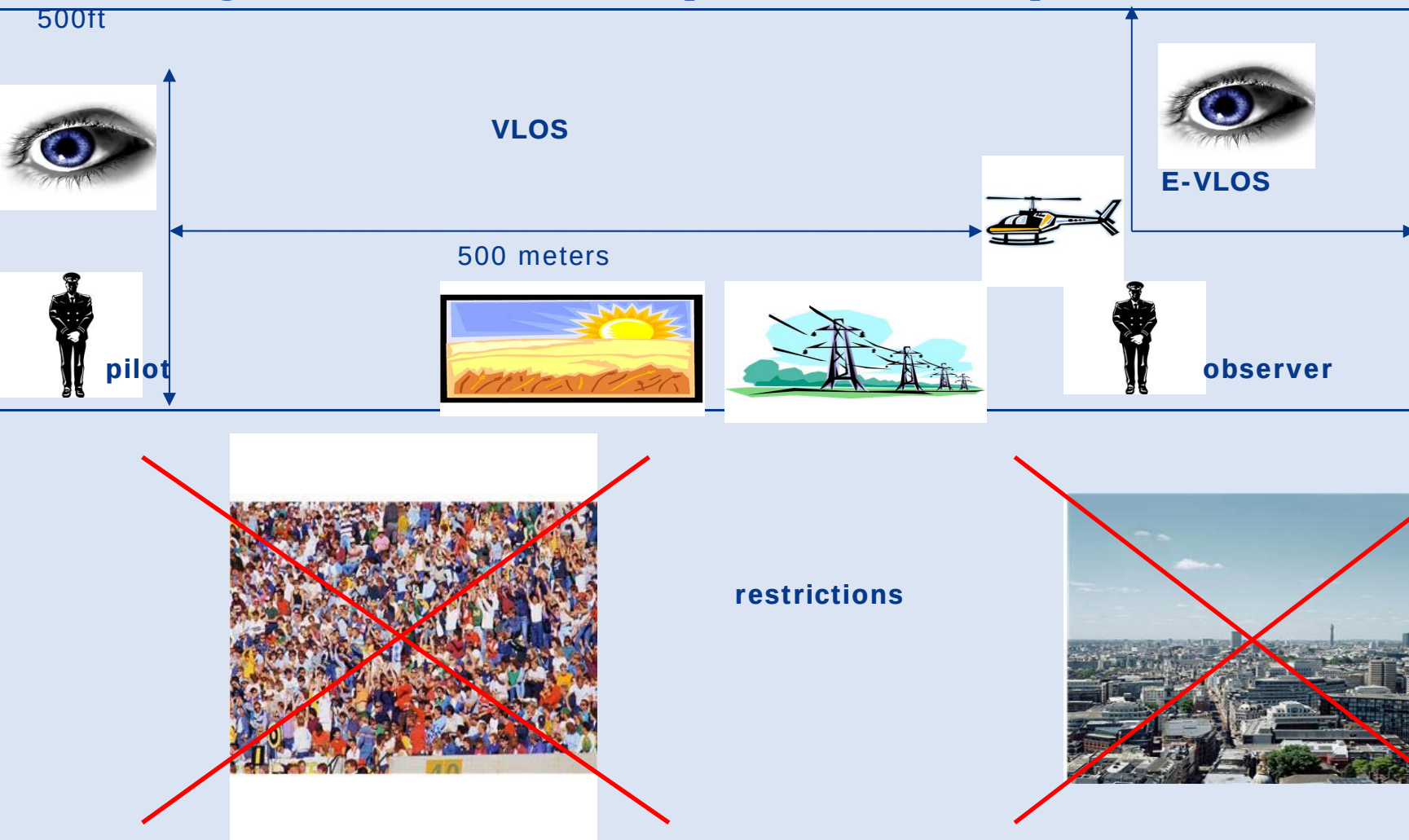
Very Low Level Operations

- Visual Line of sight (**VLOS**)
- Extended- Visual line of sight (**E-VLOS**)
- Beyond visual line of sight (**B-VLOS**)



(E)VLOS

Very Low Level operations (<500 ft AGL)

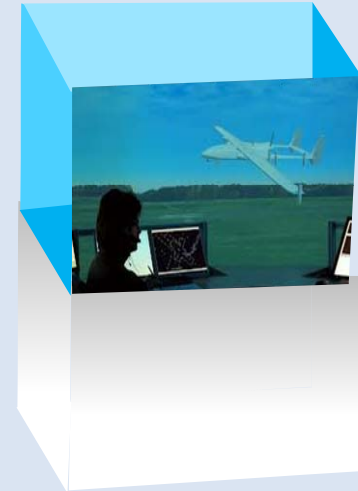


VLOS & E-VLOS

Timeframe 2014- 2018

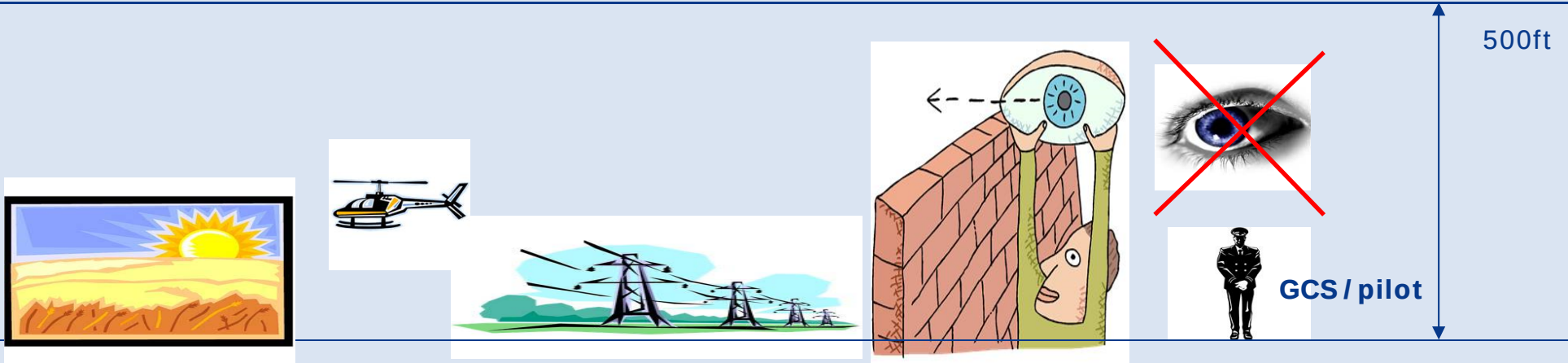
Small R&D effort identified:

- Security – e.g. flight planning operations
- Human factors – e.g. pilot & observer team work
- Contingency



B-VLOS

Very Low Level operations (500 ft AGL)



restrictions



B-VLOS

Timeframe 2014-2020

Large R&D effort identified

- Detect & avoid (replicate the human ability to see & avoid)
 - C2 communications
 - Human factors including mixed fleet compatibility
 - Contingency
 - Security
 - SESAR compliance
-
- B-VLOS below 500ft is completely new to aviation



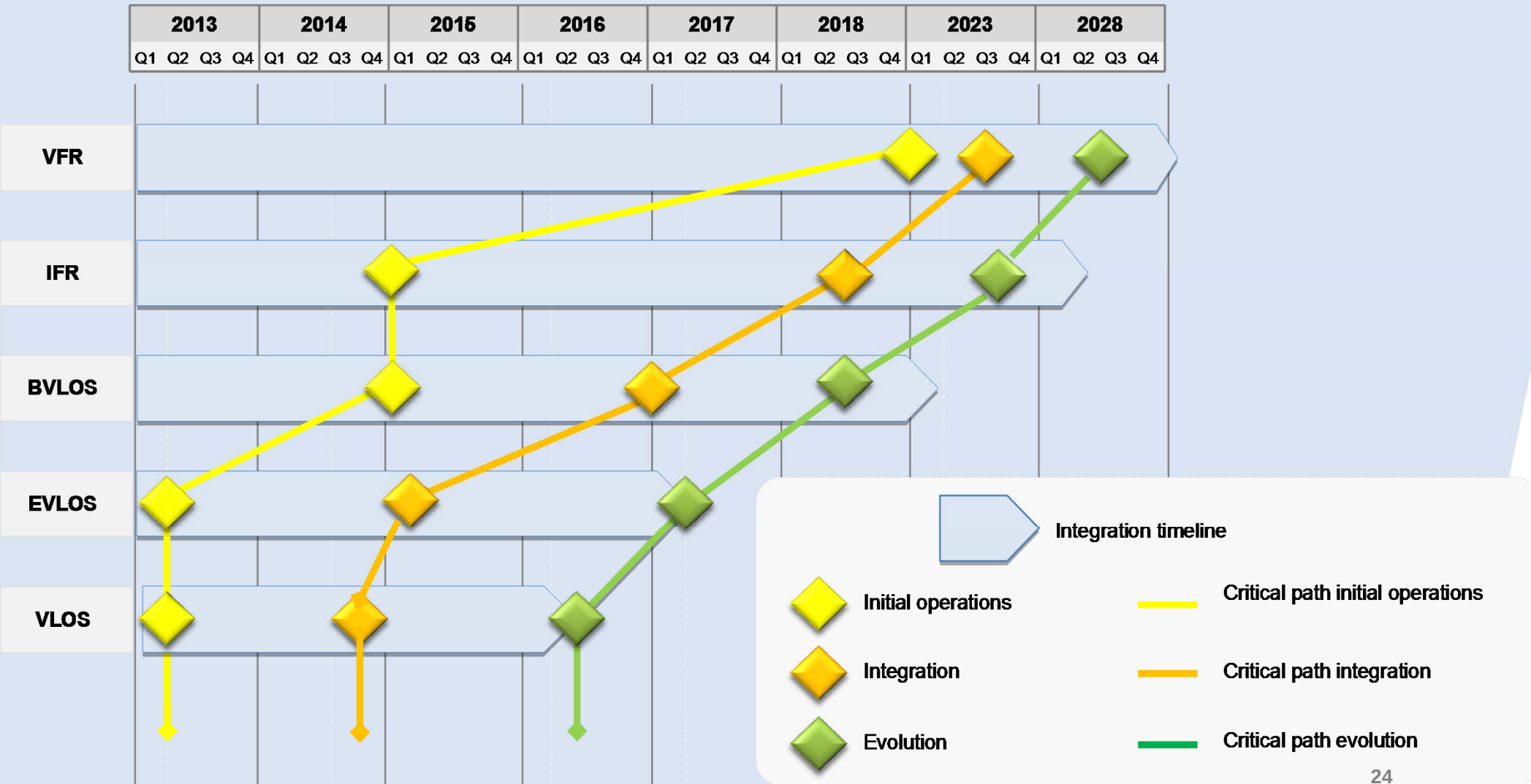
Timeframe 2014-2028

Large R&D effort identified

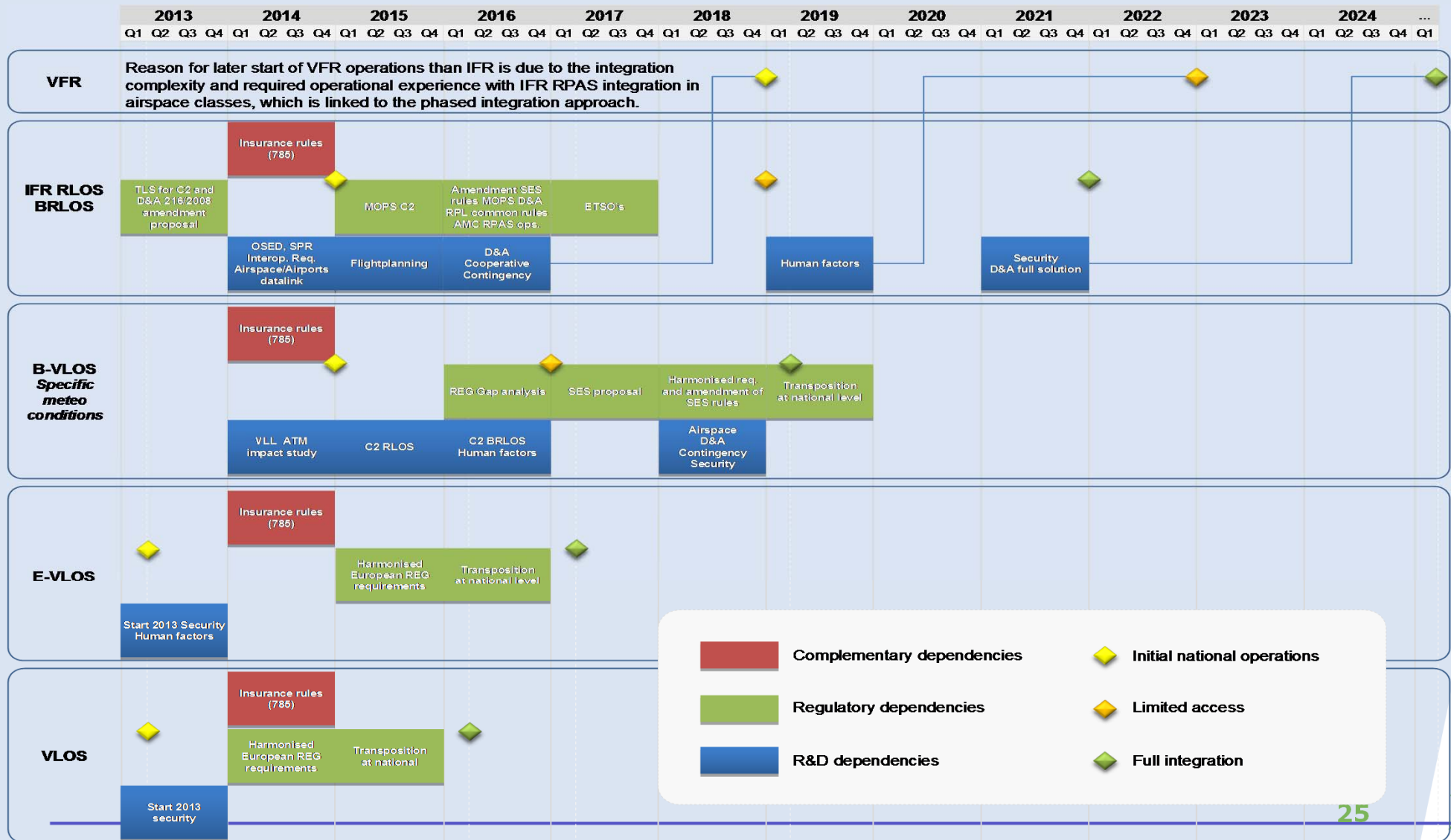
- Detect & avoid
- Airspace and Airports access
- C2 communications
- Human factors
- Contingency
- Security
- SESAR compliance



EUROPEAN RPAS R&D ROADMAP TIMELINE



EUROPEAN RPAS INTEGRATION ROADMAP





Objective & scope

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European objective

Safe integration of RPAS operations
into European aviation system and ATM
from 2016

- Non-segregated ATM environments –
 - Including VLL -



Objective and scope RPAS Definition phase

- Integrate RPAS R&D activities into SESAR 2020
- Integrate into ATM Master plan
- Up to DOW level 1
- Before end 2014

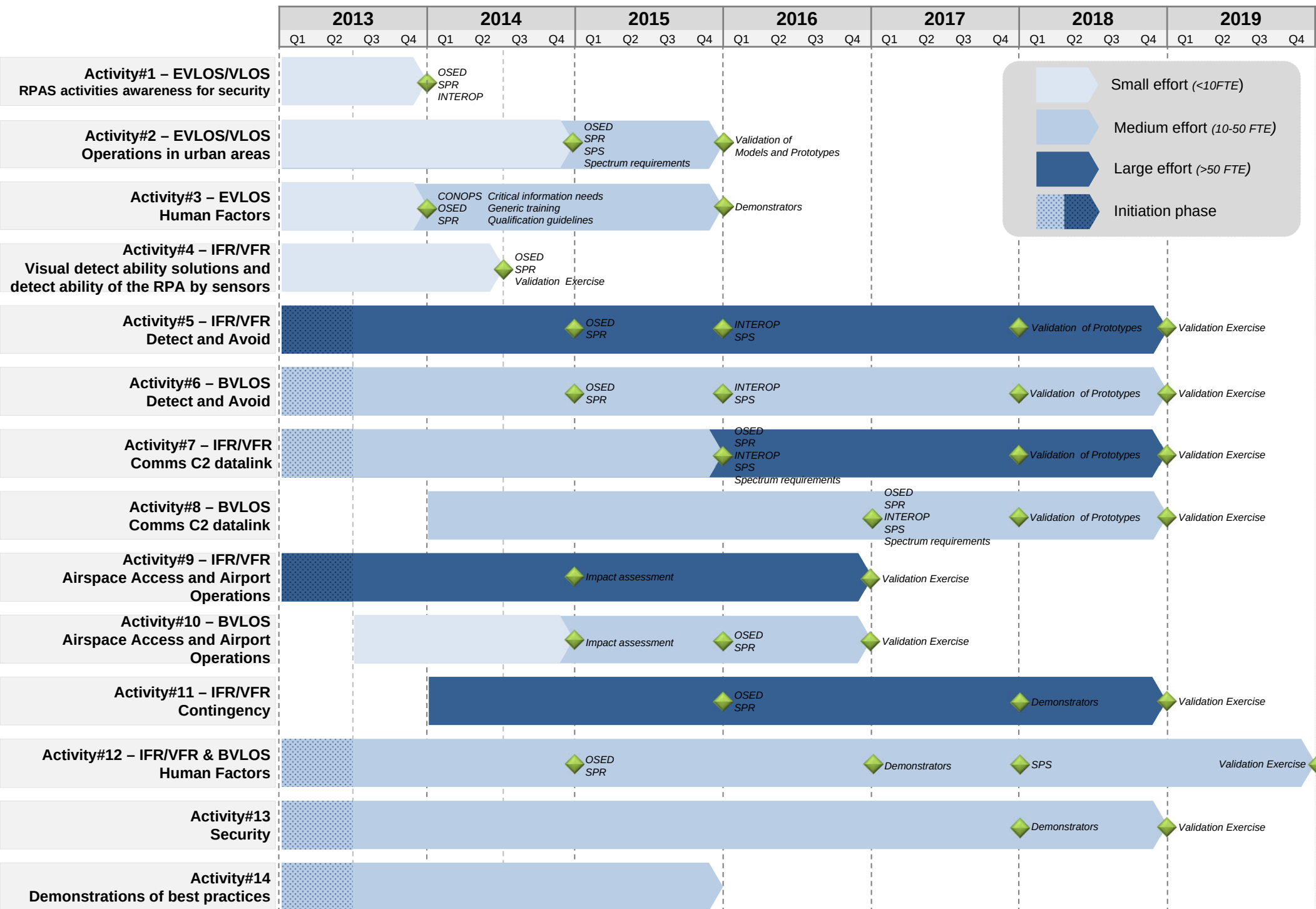




Work already undertaken

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RPAS Integration into DOW

- Use R&D road map
- 14 R&D activities based on types of operations
- Very detailed roadmap



Consolidated RPAS activities

- **Activity 1 D&A**
- **Activity 2 C2**
- **Activity 3 Airspace & airport access**
- **Activity 4 Contingency**
- **Activity 5 Human Factors**
- **Activity 6 Security**
- **Activity 7 Demos and best practices**





Workplan and timeline

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Workplan

- Assessment of 7 activities
 - Gaps
- R&D dashbord (not in the R&D roadmap)
 - Overview of R&D activities
 - Maturity (E-OVCM)
 - Maintenance
- Key delivreables
- WORKSHOPS are for WORK!

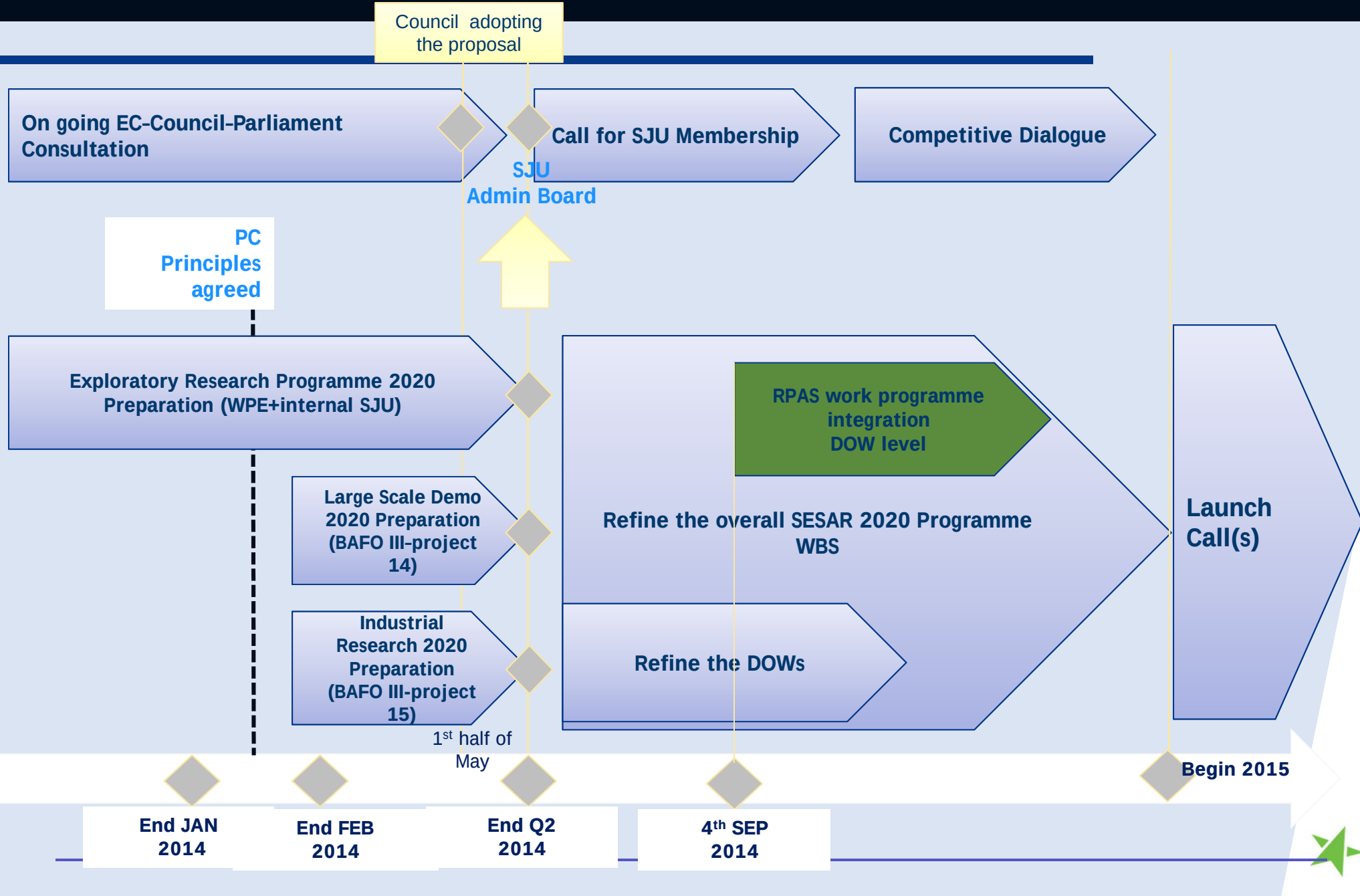


Roles and allocation of work?

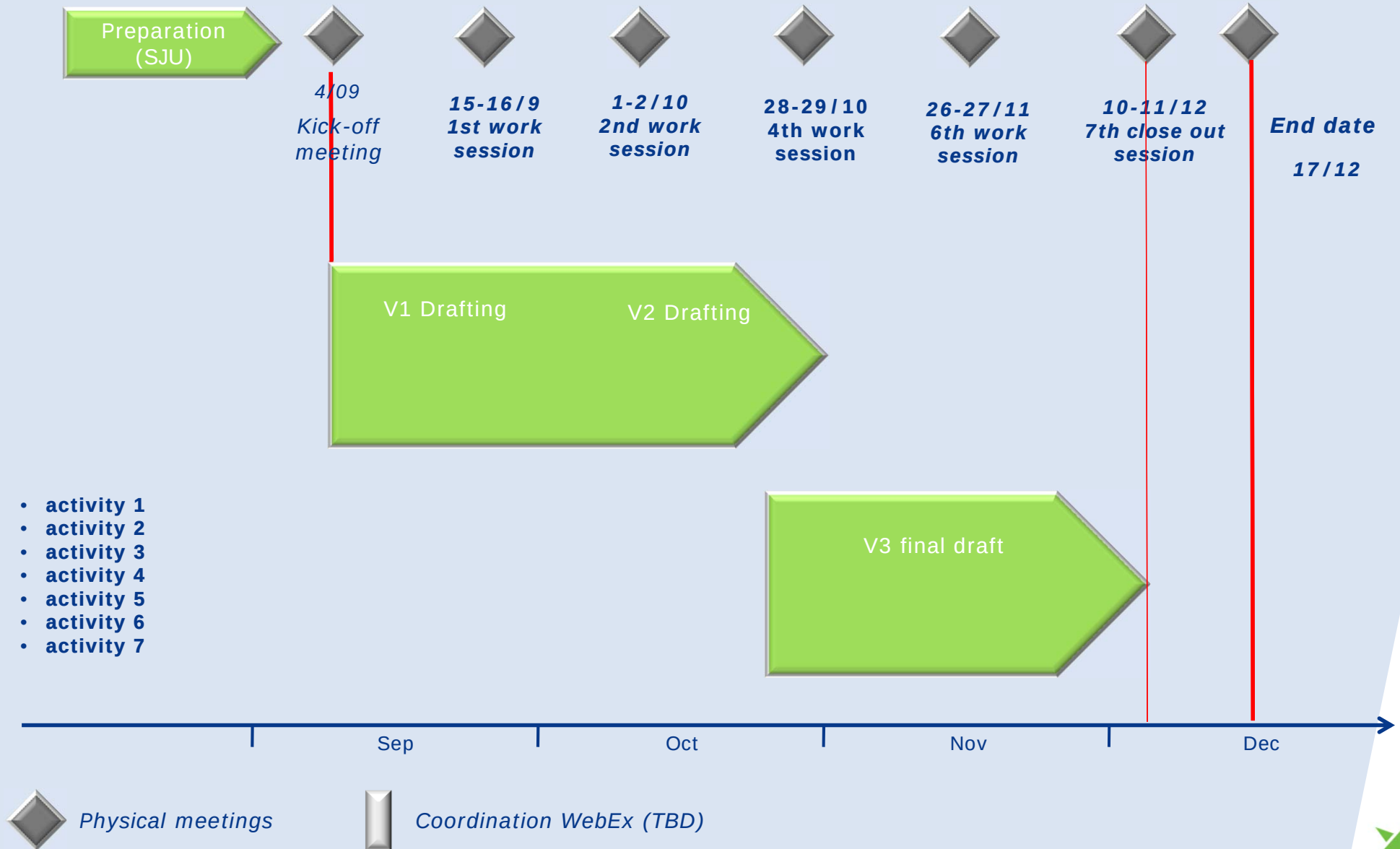
- Activity 1 D&A –
- Activity 2 C2 –
- Activity 3 Airspace & airport access –
- Activity 4 Contingency –
- Activity 5 Human Factors –
- Activity 6 Security –
- Activity 7 Demos and best practices –



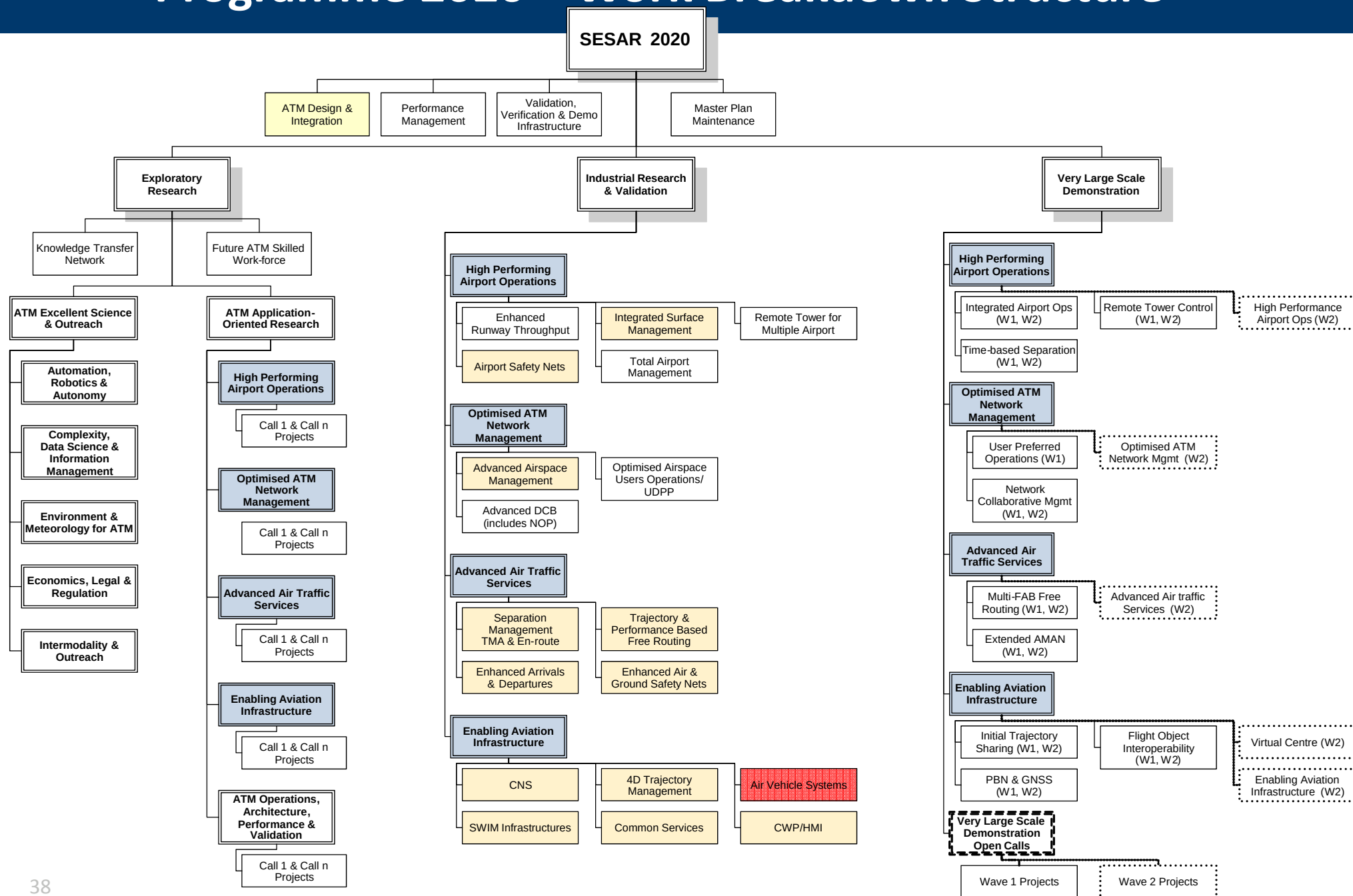
Define the new 2020 programme(s)



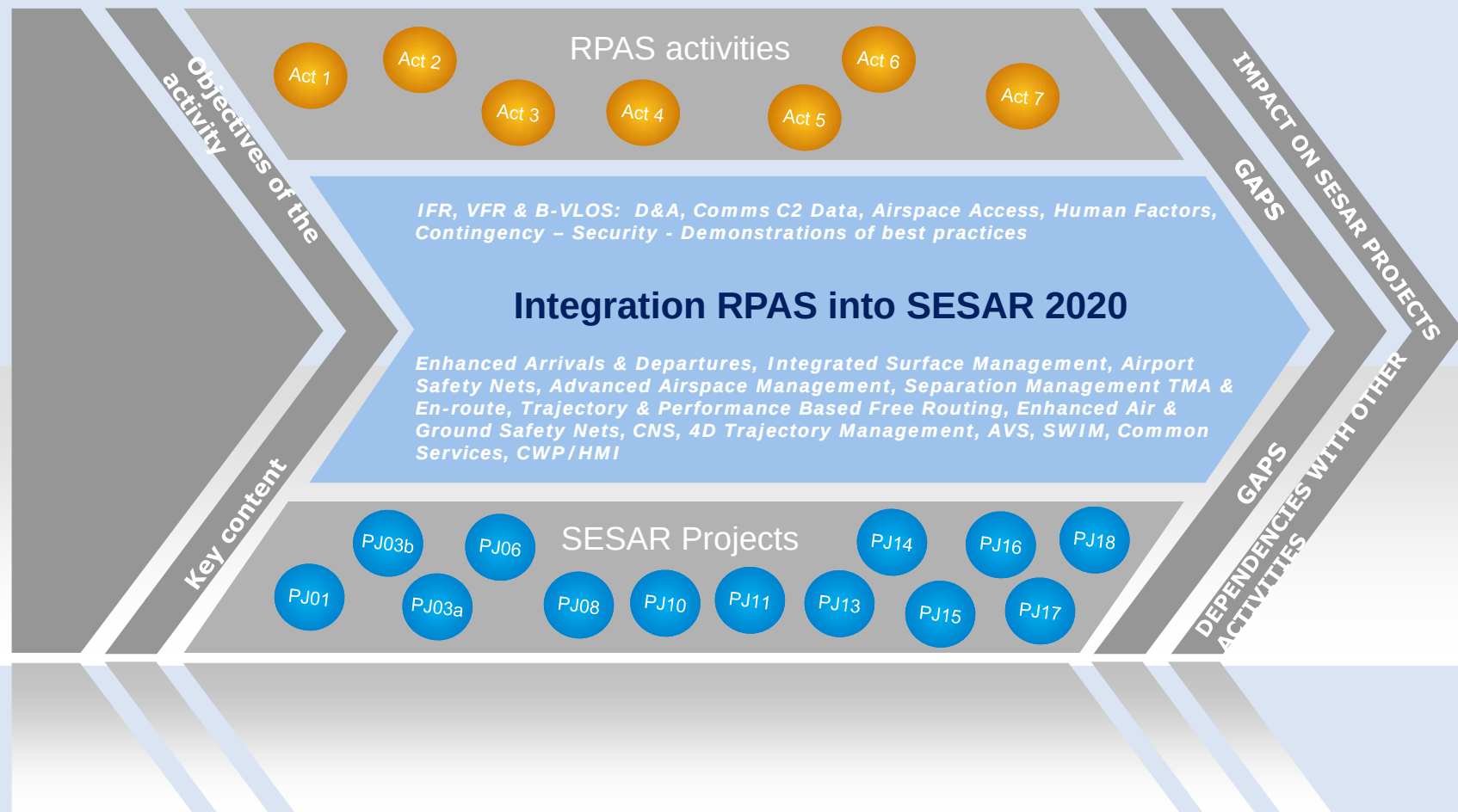
Work plan for RPAS Definition Phase (September – December 2014)



Programme 2020 – Work Breakdown Structure



RPAS



Latest update :							ECTL Contribution	Partners		
Activities	Project Code	Description	Start Date Initiation	Status Start Date Execution	Planned End Date	Closed at		SJU	EC	OTHERS
ACT 1		IFR/VFR & BVLOS - D & A					%	√		
ACT 2		IFR/VFR & BVLOS - Comms C2 data link								
ACT 3		IFR/VFR & BVLOS - Airspace Access and Airports Operations								
ACT 4		IFR/VFR & (B)VLOS - Contingency								
ACT 5		IFR/VFR & BVLOS - Human Factors								
ACT 6		Security								
ACT 7		Demonstrations of best practices								





RPAS INTEGRATED ROADMAP

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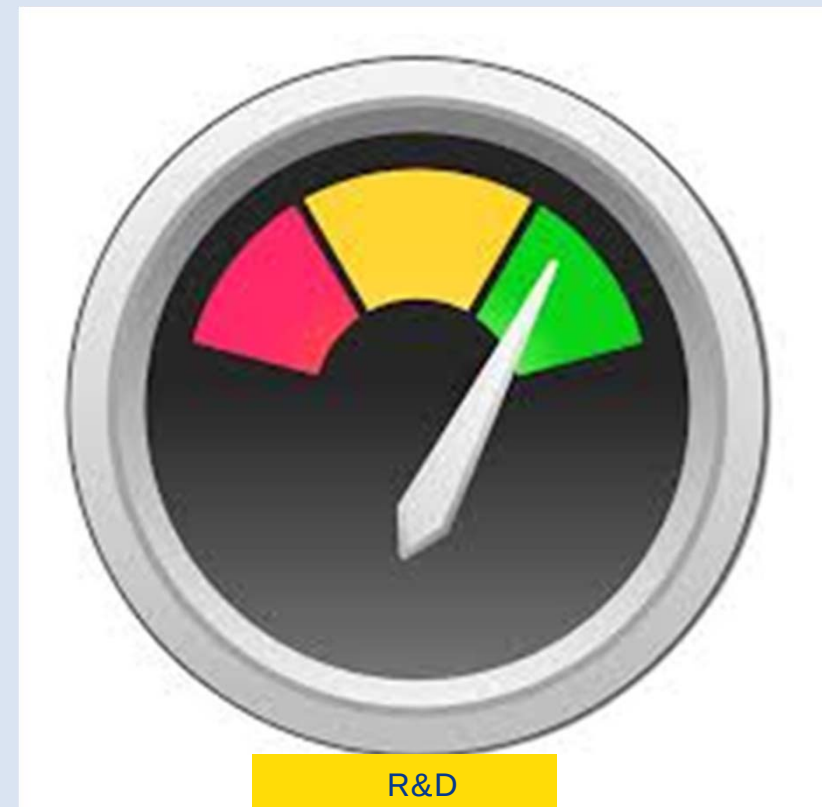
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Overview of RPAS R&D activities

- **R&D DASHBOARD**
- **Providing clear overview**
 - What
 - When
 - Who
- **E-OVCM maturity**
- **Maintenance**



Overview of RPAS INTEGRATION

■ INTEGRATION DASHBOARD

■ Providing clear overview

- REG
- R&D
- COMPLEMENTARY

■ Maintenance



REG



R&D



COMPLEMENTARY





Thanks for your attention

