



Partnering
for excellence
in global
aviation



World ATM Congress 2017

Operated by CANSO in partnership with ATCA

Integration of all vehicles

Robin Garrity, SESAR JU



Context

- SESAR has traditionally been focussed on mainline Airspace Users
- SESAR 2020 now brings all AUs into the 'family'
- Industrial Research projects must now consider how research concepts will affect, or provide benefits to, the whole family, manned and unmanned
- In this session, we hear from some new family members



Content

Matthew Baldwin (European Commission)
- keynote address

1. Jean-Philippe Ramu (NetJets) – Business Aviation
2. Isabel del Pozo de Poza (EHA) – Rotorcraft
3. Juan Ignacio Del Valle – (EDA) – Military and IFR RPAS
4. John Korna (NATS) – General Aviation and ANSPs
5. Marc Kegelaers (Unifly) – VLL ‘drones’



Matthew Baldwin

Deputy Director-General for Mobility and
Transport, DG MOVE





Save-The-Date

SESAR U-Space Workshop

20 April 2017

The Hague,
Netherlands

Organised by:



Hosted by:



19-21 April 2017 | Delft & World Forum, The Hague
Hosted & Powered by RoboValley

Business aviation

Dr Jean-Philippe Ramu

NetJets Europe pilot

EBAA Consortium - SESAR Technical Manager



Business aviation – what and where

EUROPE

Economic Impact

Business Aviation is a leading contributor to the European job market, securing nearly half a million jobs and accounts for revenues of almost EUR 100 billion.

98 bn € in output

(quantifies the sector's output, sales plus inventory increase and self-made assets).

27 bn € in GVA

(quantifies the monetary worth of the production generated by firms in the Business Aviation sector and its suppliers).

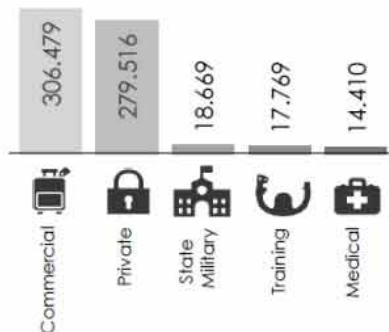
21 bn € in labour compensation

(provides all wages and salaries, incl. compensation of the self-employed, linked to the sector's economic activity).

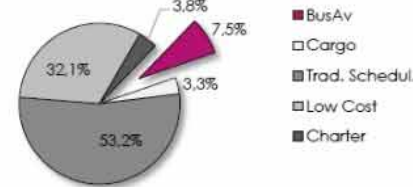
+1K BusAv Operators

+1K operated Airports

Departures 2015



Market Share (Number of departures)



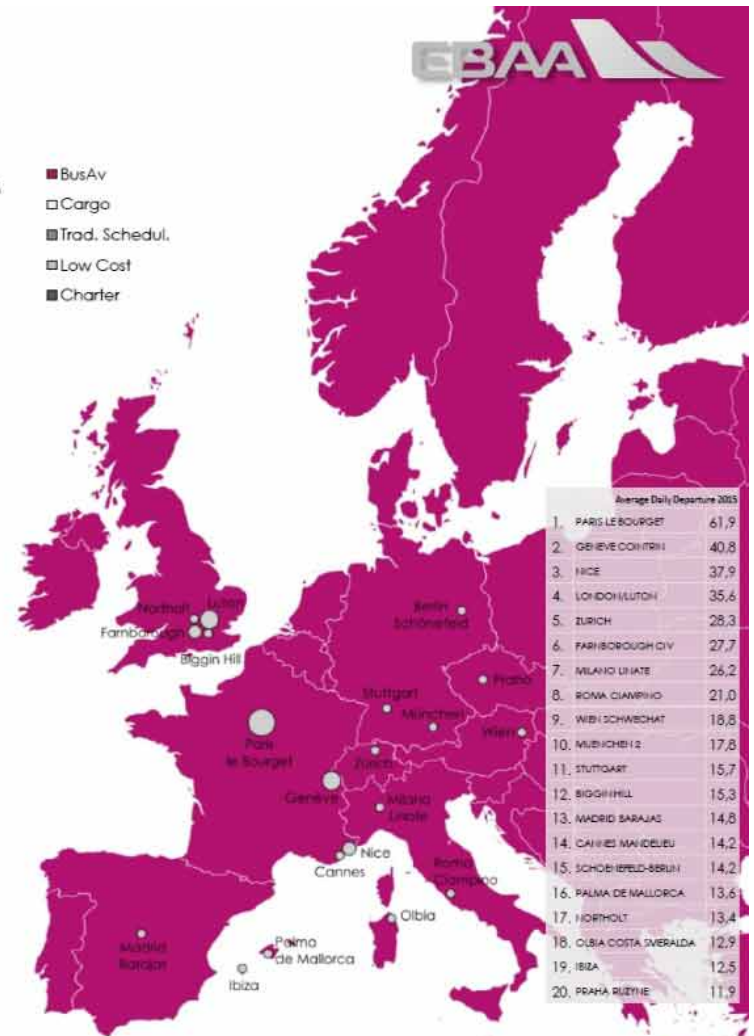
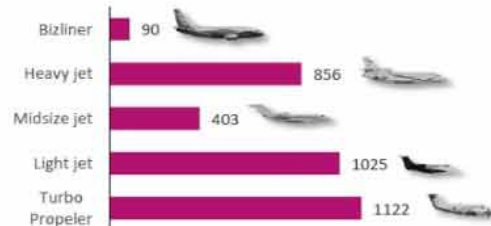
Operations

Total employment
(direct & indirect)

371K jobs



Fleet: 3,496 based aircraft



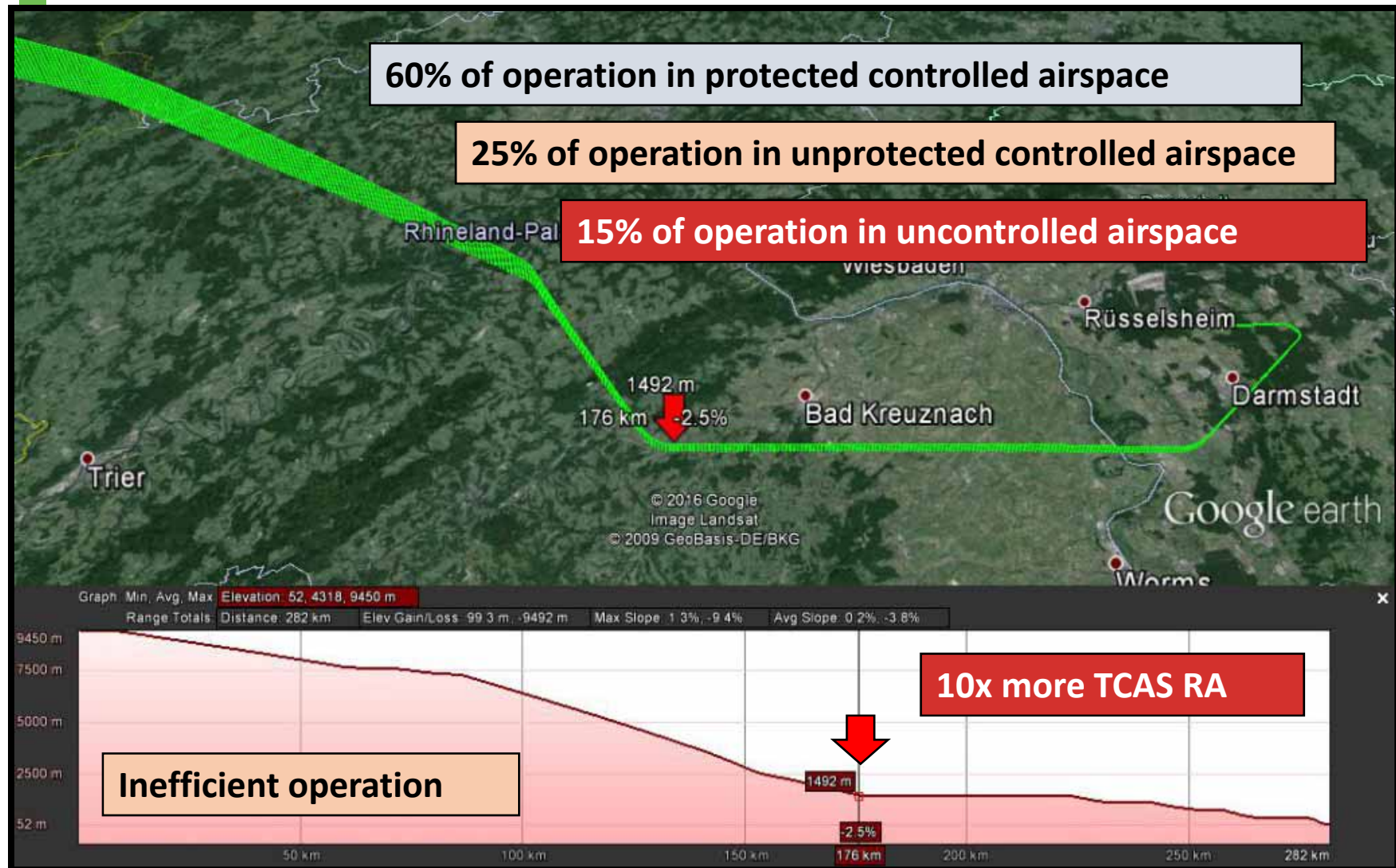
Sources : Eurocontrol – WingX Advance – Handbook of Business Aviation – Amstat – Booz Allen Hamilton

Challenges with major airports

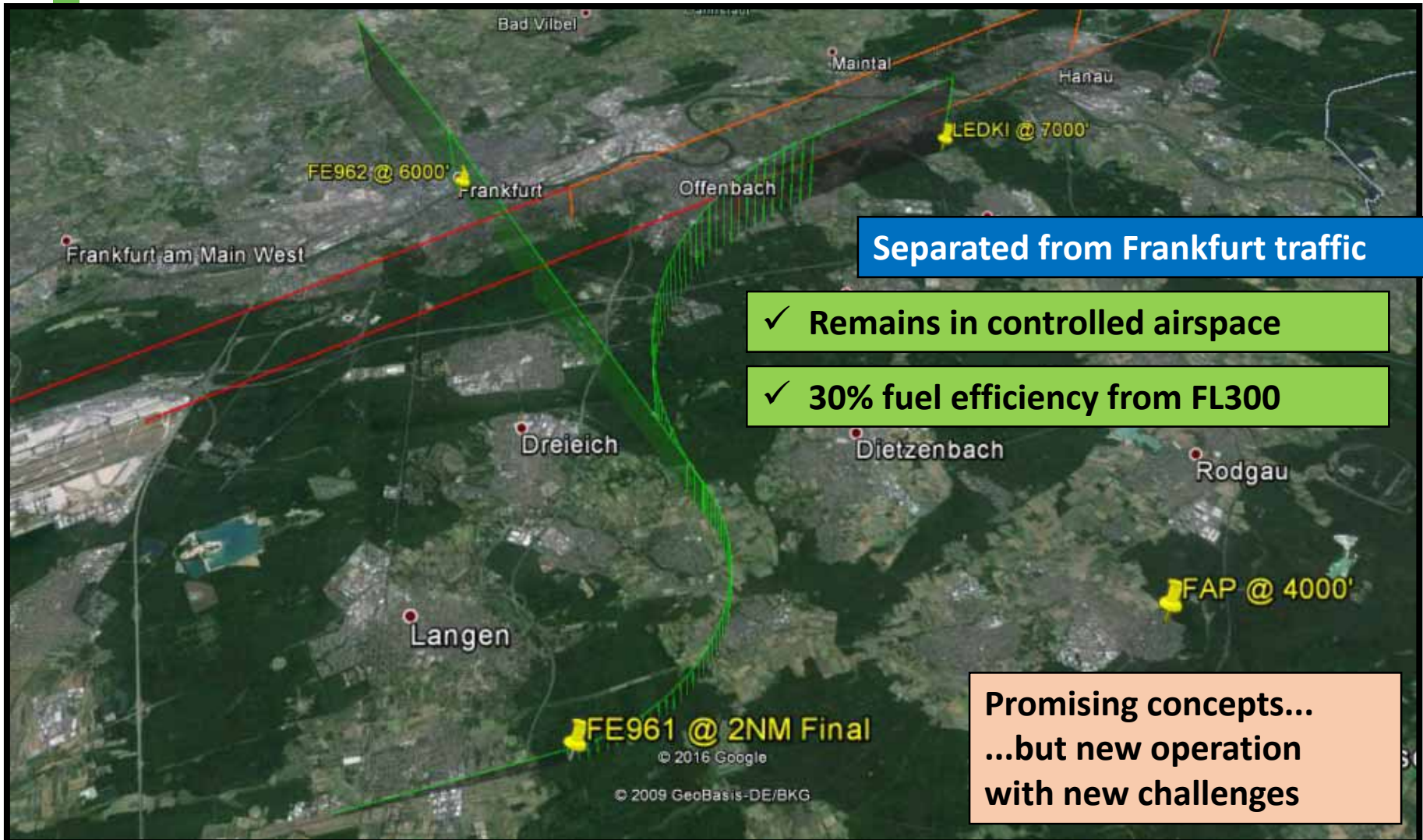
- Flexible departure time as opposed to on-time departure time
- Wake vortex free arrivals and capacity increase



Challenges with satellite airports



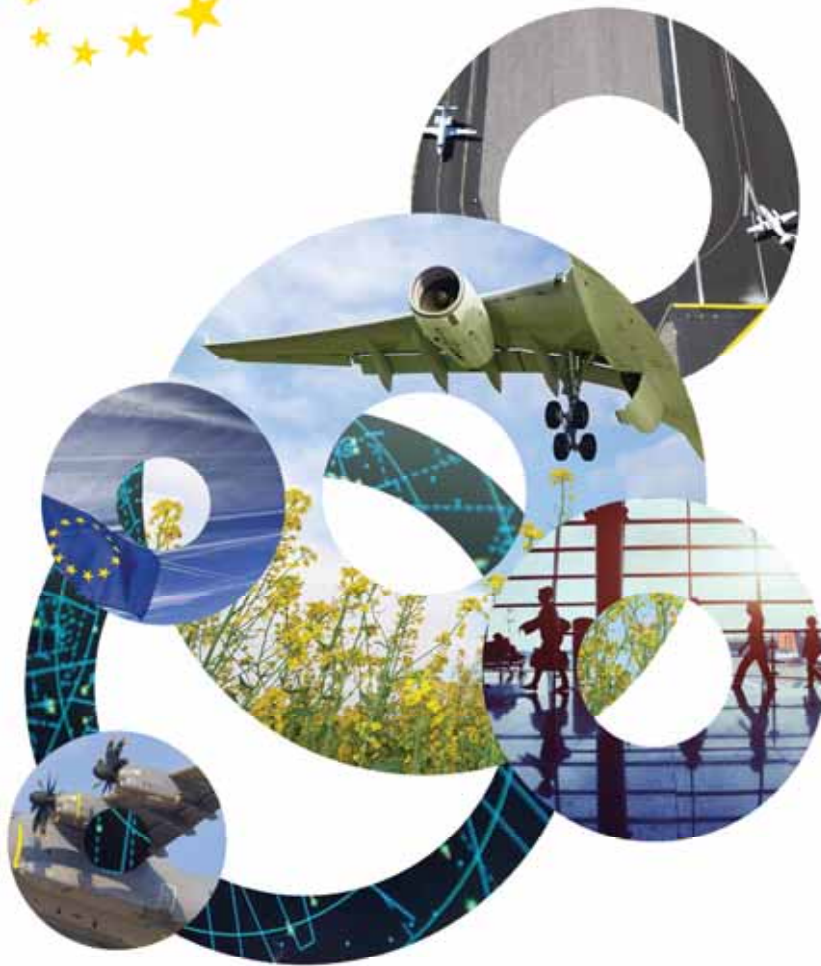
Benefit study – Egelsbach and Frankfurt



Challenges with secondary airports

- Circling approaches supported by visual RNAV procedures enabling ecological paths and enhancing safety in challenging terrain
- TIS and FIS enabling enhanced cooperation between IFR and VFR traffics in uncontrolled airspaces





**Thank you
for your attention**

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Rotorcraft integration in the Single European Sky

Dr. Isabel del Pozo

European Helicopter Association (EHA)



Agenda

- Who we are & our mission
- EHA objectives in SESAR to foster RC
- Rotorcraft operational needs & challenges
- Achievements in SESAR1
- Our aspirations for SESAR 2020



The European Helicopter Association (EHA)

→ We are the rotorcraft voice in Europe

EHA



HeliOffshore
Safety Through Collaboration

AMAC (Associate Members Advisory Council)



Affiliated Member



NHAC = National Helicopter Associations Committee



The European Helicopter Association - mission

1. Recognition of the rotorcraft's unique capabilities
2. Tailored sustainable rule
3. Equal access to the Single European Sky (SES)



EHA objectives in SESAR: to foster RC

- Integrate rotorcraft (RC) operations in the SESAR Concept of Operation (ConOps) and in the European ATM Master Plan
- Consider RC specific aspects in the SESAR R&D projects, when relevant
- Promote, coordinate and follow RC dedicated activities in SESAR



Rotorcraft main fields of activity



**HELICOPTER AIR AMBULANCE
(HEALTH SECTOR)**



SEARCH AND RESCUE



POLICE



**FIRE FIGHTING
(CIVIL PROTECTION)**

**26,5 billion € Gross
Value Added (GVA)***

Global turnover (mil €) 7.535
N° employees 35.000



**OIL AND GAS
(ENERGY SECTOR)**



**AIR TAXI/CHARTER
(BUSINESS SECTOR)**



AERIAL WORK

*Data source: year 2014

RC operational needs



1. IFR access to VFR Final Approach and Take-off Areas (FATOs)

- Point-in-Space (PinS) RNP approaches/departures procedures to/from heliports

2. Rotorcraft integration in dense/constrained airspace

- Specific Low Level IFR routes (LLR)

3. Rotorcraft access to busy airports

- Simultaneous-Non-Interfering (SNI) rotorcraft
- IFR approach/departure procedures to/from heliports located at airports



RC challenges



1. Latest RC have the highest technology standards

- Satellite based navigation, 4-Axes Autopilot, LPV certification, Steep Approaches up to 9,9°

2. Rotorcraft Operators Need to operate 24/7

- Operations in all weather situation (VMC and IMC)

→ Problem:

- No LLR IFR Routes, lack of rotorcraft adapted procedures



Achievements in SESAR 1

- Rotorcraft community recognised as a player in the development of the future European ATM system
- Rotorcraft unique capabilities and specific operations are considered in SESAR ConOps and in the European ATM Master Plan
- R&D Projects and Large Scale Demonstrations dedicated to RC operations (P04.10, PROuD) are paving the way for operational implementation
 - Low Level IFR Routes RNP- 0.3 and PinS network for emergency rotorcraft operations (ENAV in Piemonte region)
 - LLR network and LPV approaches published in Norway (PIONEERS project)



Aspirations for SESAR 2020

- Integration of Low Level IFR rotorcraft routes in 4D managed dense airspace with connections to enhanced RNP approaches to RC landing locations
- Technologies relying on SVS/EVS/CVS to improve accessibility into small aerodromes in low visibility conditions
- Datalink and ADS-B IN broadcast services to support rotorcraft operations → separation of IFR & VFR traffic in uncontrolled airspace





**Thank you
for your attention**

More information:
www.eha-heli.eu



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RPAS Air Traffic Integration

Juan Ignacio del Valle

European Defence Agency

Expert Point of view



European Defence Agency

Facts & figures



Established
2004

Based in
BRUSSELS

130 staff
connected with 2,500
experts in
Member States



**Jorge
DOMEcq**

EDA Chief
Executive



27 Member States

(all EU members except
Denmark)
& Administrative Arrangements
with Norway, Serbia, Switzerland
and Ukraine)

General budget

30,5 Mio

Number and value of ad-hoc
projects:

22 projects / 70 Mio

Value R&T projects 2004-2016
run within EDA: **€1 billion**

European Defence Agency



“... to support the Council and the Member States in their effort to improve the European Union’s defence capabilities for the Common Security and Defence Policy.” *

Mission

*Treaty of Lisbon, signed in 2007, entered into force in 2009



European Defence Agency



Enabling RPAS operations

The issue

- **Currently in Europe: RPAS (both civil and military) operations in segregated airspace**
 - Restrictions for operations and training
 - Segregation more difficult as air traffic density increases
- **Defining the issue: RPAS traffic integration in non segregated airspace**
 - Military? State? Civil? → Same barriers for RPAS operations
 - RPAS? UAV, drones, robots? → RPAS; MALE type (RPS – ATC)
 - Integration? insertion, accommodation? → Integration
 - Non segregated air space? → General Air Traffic (GAT)
 - GAT: IFR, VFR? A-G? VLL, U-Space? → IFR RPAS; A-E



Enabling RPAS operations

Barriers and enablers

- **Integration of IFR RPAS Traffic into GAT**
- **Barriers**
 - ATM concept of operations not adapted to RPAS
 - Regulatory framework not adapted to RPAS
 - Maturity of required technology
- **Enablers**
 - ICAO RPAS CONOPS; ICAO SARPS; ECRL ATM CONOPS
 - EASA RMT 0230 – Reg. framework accommodate UAS in the EU aviation system
 - Tech gaps & solutions → European ATM Master Plan → Exploratory Research; Industrial R&D → Standardisation



Integration of IFR RPAS traffic into GAT EDA and SJU industrial R&D

ATI Tech Areas	SESAR 2020 Wave 1	EDA & pMS Industrial R&D
DAA	PJ.11 – ACAS Xu	MIDCAS SSP (Ad Hoc) TRAWA (Pilot Project – PA)
C2 Datalink	PJ.03a, PJ.10, PJ.11	DeSIRE2 (OB) – SATCOM C2
Airspace access and airports ops	PJ.03a – RPAS ground ops PJ.10 – RPAS IFR Integration	ERA (Ad Hoc) – ATOL and autotaxi
Contingency	PJ.10	ERA (Ad Hoc) - Emergency
Human Factors		RPS – Standardisation (OB)
Security	PJ.03a, PJ.10, PJ.11	



Integration of IFR RPAS traffic into GAT EDA and SJU cooperation

- EDA Contribution to EU ATM Master Plan update
- SJU Support in the definition of new R&D initiatives at EDA
- Support in evaluations
- Experts involvement in projects execution as stakeholder or observers
- Common objective in R&D → Standardisation through established European standardisation organisations



Enabling RPAS operations

Summary: EDA approach

- Objective: Integration of IFR RPAS Traffic into GAT
- Barriers: ATM CONOPS, regulations, tech. maturity
- Enablers: CONOPS Update, RMT.0230, R&D

EDA monitors the on going work on the applicable CONOPS, contributes to the update of the EU ATM Master Plan and leads specific dual-use Industrial R&D initiatives that ensure standardisation activities of key ATI technological enablers which in turns supports Rulemaking Tasks





**Thank you
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Integration of all vehicles: General aviation (GA) and ANSPs

John Korna

NATS



Context

- **Historically, UK ANSP and GA challenges have been:**
 - Infringements of controlled airspace
 - Mid-air collision risk
 - Controlled flight into terrain
- **Other topics old and new of interest**
 - Oil rig “wrong deck” landings
 - Cost and complexity to certify GA ADS-B installations
 - Appropriate use of low cost “good enough” technology by GA
 - Drones



EVA outcomes

See, be Seen and Avoid

- It can be really difficult to visually acquire aircraft (and drones!)
- Pilots typically overestimate their ability to spot other aircraft
- A pilot who sees no aircraft may believe they are the only one in that airspace, thus a pilot may relax their scan – making the odds of spotting other a/c even less likely
- Traffic information, either from an ATS Unit, or a cockpit device can prevent that downward spiral
- Traffic Alert Displays must minimise heads down time
- UK CAA now has requirements and approval procedures for low cost, low power, low/no integrity ADS-B devices: CAP1391



This is the aircraft you are looking for





Aspirations for the SESAR programme

- **Maintain, or reduce safety and service risks for airspace users as demand increases**
- **Lower or remove barriers; close the GA business case**
 - Compelling benefits in answer to “So what’s in it for me?” challenge
 - Reduce risk of divergent technologies and closed eco-systems
- **Development of seamless, transparent interoperability between existent & emergent airspace users, commercial aircraft, and ground services ATM & in future UTM**
- **Mutually interoperable technology capability and service solutions with appropriate Size, Weight and Power-Cost (SWaP-C) for all GA stakeholder communities**



Technology, standards, regulation & cost

- **Need for appropriate “Risk Based” avionic requirements for low hours, low budget users**
 - Perfect solutions will cost too much, take too long and not be bought
- **Generating suitable enabling standards take time and commitment from all stakeholders – easy to be overtaken by events**
 - Modern rapid, frugal innovation will enable non-traditional technology actors to produce low cost solutions
 - If there is a perceived market/need someone will look to fulfil it
- **Make it easy for stakeholders to adopt - give them something they want!**
 - Clear, compelling answers to “What is in it for me?”
 - Seek to build user pull, showing how GA benefits; benefits should not all be for Commercial Air Traffic or ANSPs
- **Interoperability, interoperability, interoperability**





Thank you
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Drones in VLL airspace

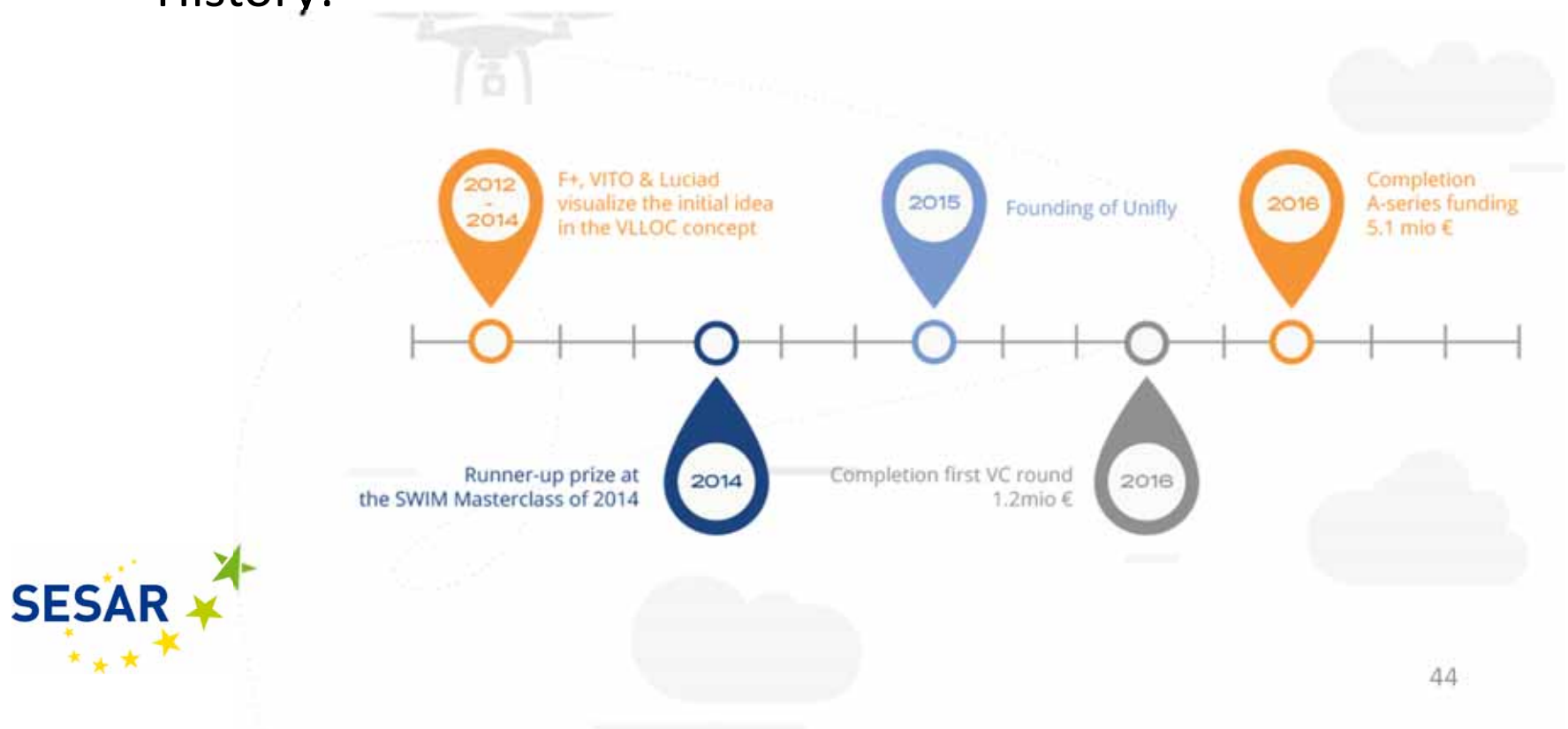
Marc Kegelaers

Unifly



Unify – the company

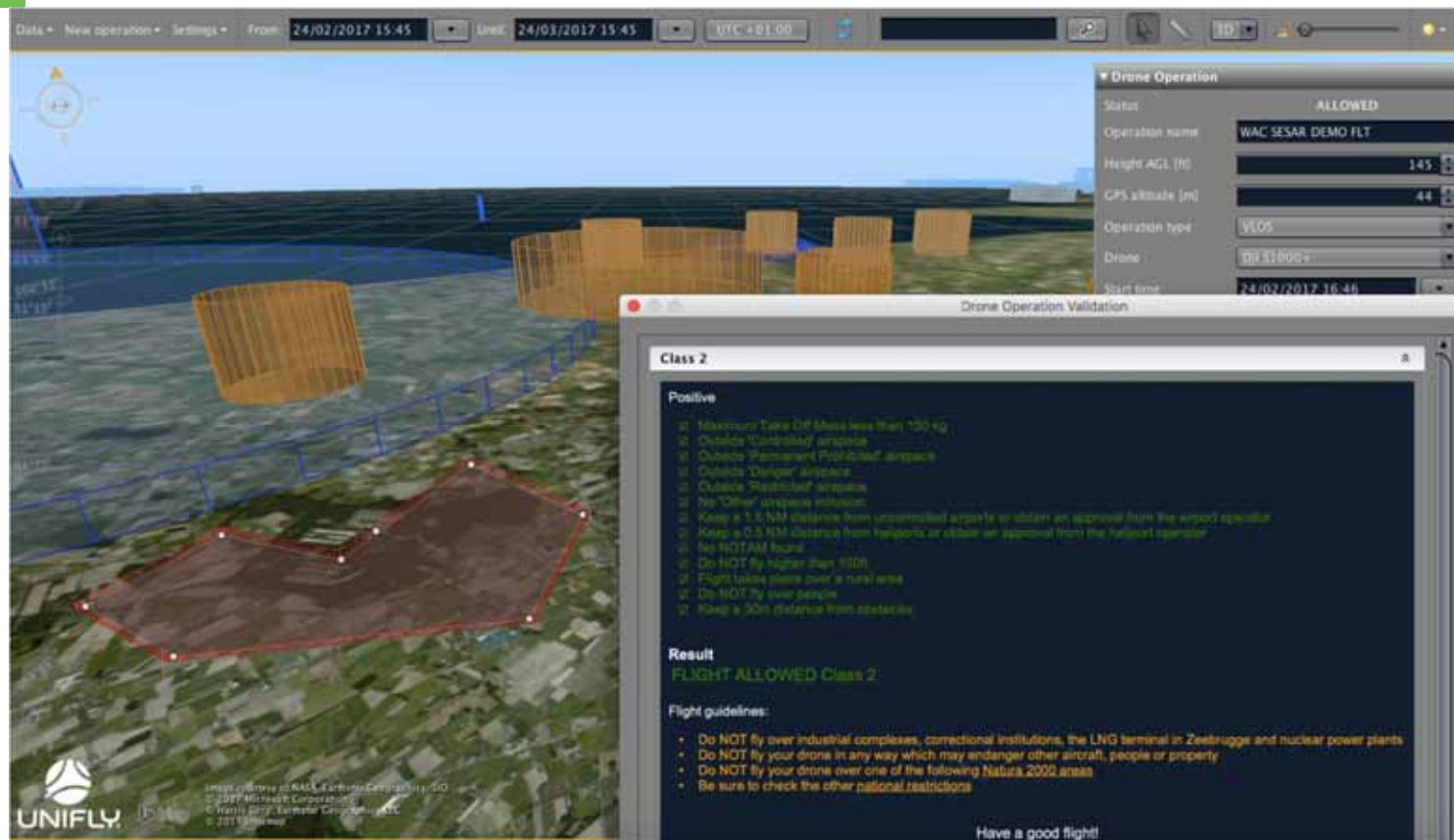
- Young / Scale Up
- “Operations Ready” UTM Solution
- History:



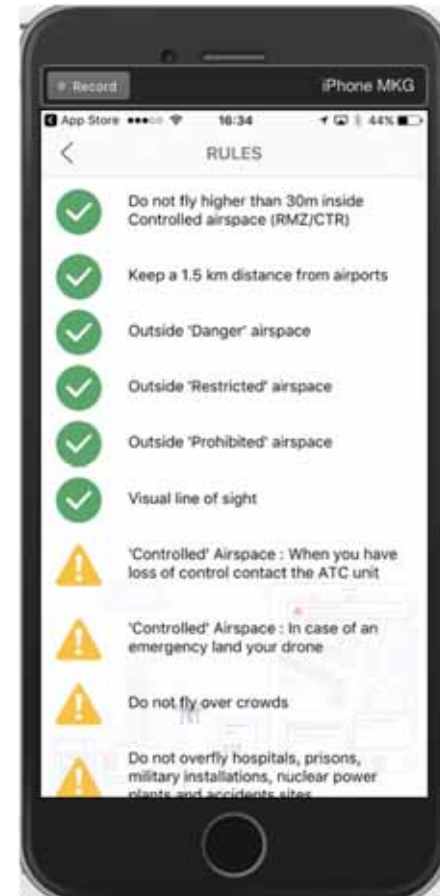
The challenge



The solution – use of EAD data



EAD for recreational users



Unifly & SESAR

- **SESAR SWIM Masterclass 2014 Runner-up**
- **H2020 SESAR UTM Exploratory Research**
 - Topic 1 – UTM Concept definition = **CORUS**
 - Topic 4 – Ground-based technology = **CLASS**
 - Topic 6 – Security & Cyber-resilience = **SECOPS**
- **Next: H2020 SESAR UTM VLD (?)**
- **Ideal integration unmanned/manned**





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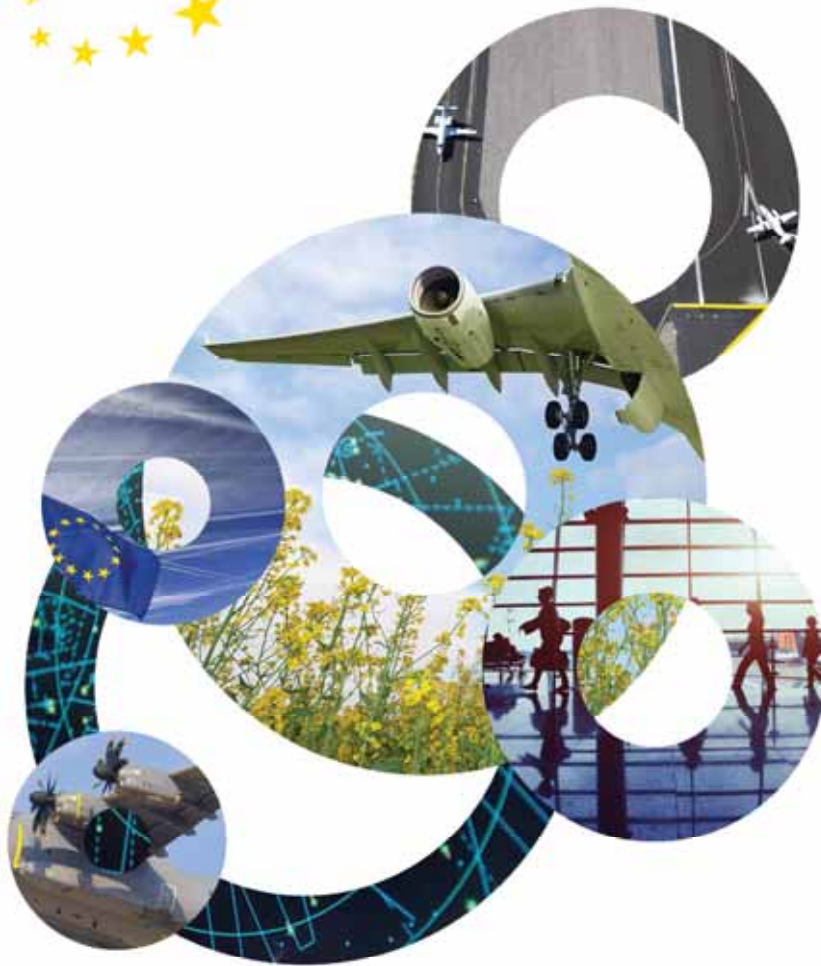
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