



Results & Impacts of ICAO ANC/12

Integration & Harmonisation of SESAR and NextGen into the global framework

ATM 2013 Seminar

June 13 2013

Michael Standar

founding members



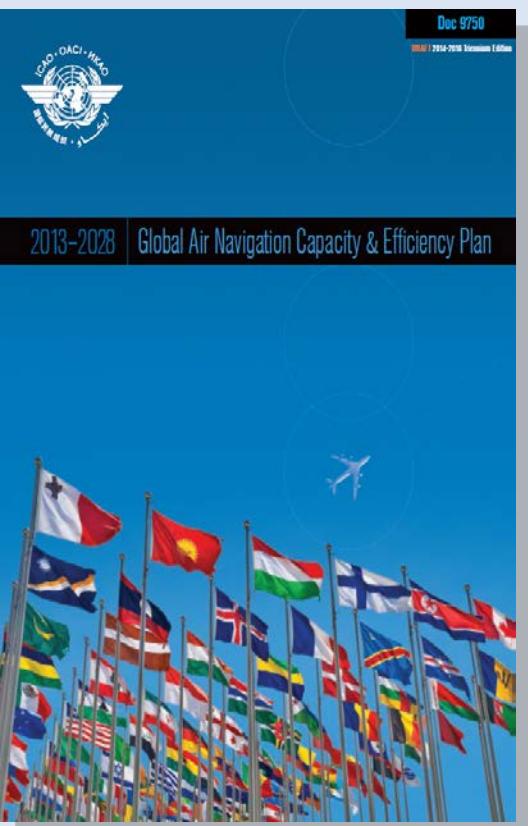
EUROPEAN COMMISSION



EUROCONTROL

12th Air Navigation Conference

ICAO Headquarters
Montréal, Canada
19–30 November 2012



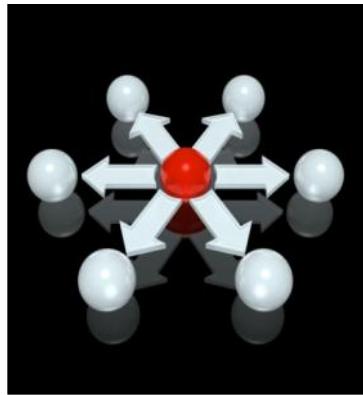
Has endorsed:

- Revised Global Air Navigation Plan (GANP)
 - Aviation System Block Upgrades (ASBU)
 - Operational & performance improvements
 - Available for global deployment
 - Ensuring global interoperability
 - Allowing better synchronisation
 - Technical systems roadmaps
 - Basis for ICAO work plan in next 10 years
- Proposals for improving planning & standardisation processes: principles agreed, more to be done

FUNDAMENTAL CHANGES TO BE ACHIEVED IN STEPS

INTEGRATION OF AIRPORTS

Integrating airports
- time synchronised operations of surface trajectories and flight turn-around



THE 4D TRAJECTORY PRINCIPLE

Integrating airspace users flight systems to build predictable time synchronised flight precision



THE SYSTEM WIDE INFORMATION MANAGEMENT

The Intranet for Air Traffic Management



AUTOMATION

Human operators concentrate on high value-added tasks



COLLABORATIVE NETWORK PLANNING

Integrated with airport operations planning and airspace user flight planning



SESTAR IS ORGANISED IN THREE PHASES

Definition
phase

2006-2008

Development
phase

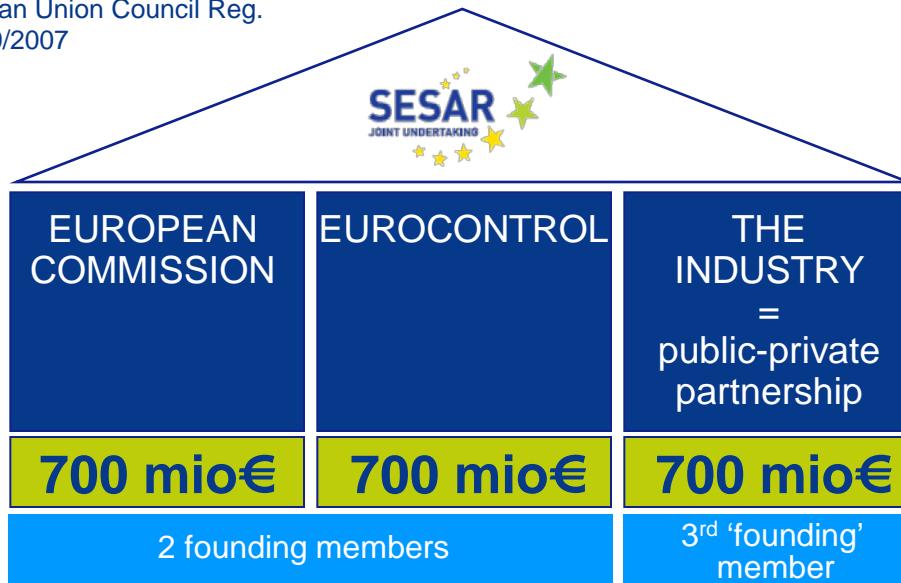
Managed by the
SESTAR Joint Undertaking

2008-2014

Deployment
phase

2015-2025

Created by the
European Union Council Reg.
N° 219/2007



Budget: €2.1 billion

Public-Private Partnership: a première

- Innovation from private sector
- Public financial stability & enforcement power



What is SESAR

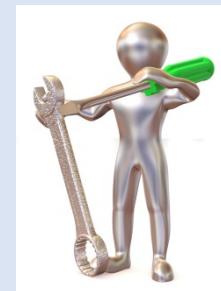
•1. Partnership

- 3000 persons, 110 companies, airspace users, military, staff, reg. authorities...*



•2. Pragmatism

- *Operational procedures and technical systems are validated in real life operational environments*
- *Demonstration flights (e.g. Green flights)*



•3. Business cases

- *Involvement of suppliers, integrators and investors*
- *Direct link to standardisation and regulation*



Global Perspective Magnifies Issues Encountered at European Scale, Calls for Similar Arrangements

Global traffic development spreads the same issues globally
-> We need timely global standards for interoperability

Deployment where and when needed, but based on common principles/rules/data & interoperable technologies

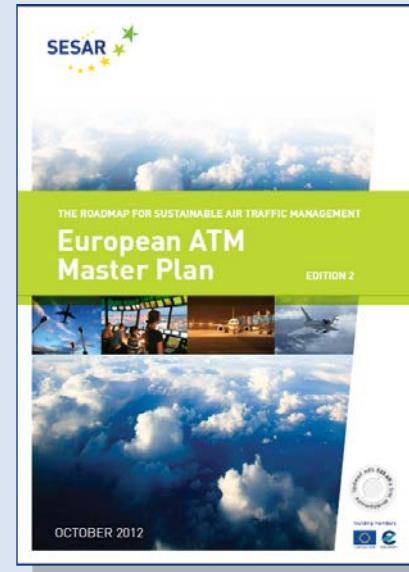
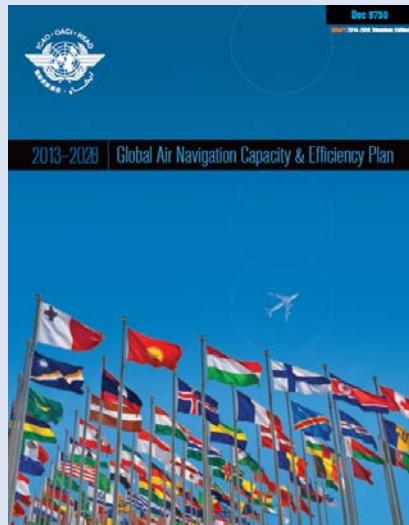
-> One-size –does-not-fit-all

Cooperation early in life cycle is more efficient
-> Among programmes, within/across regions, with ICAO
-> On requirements, R&D activities



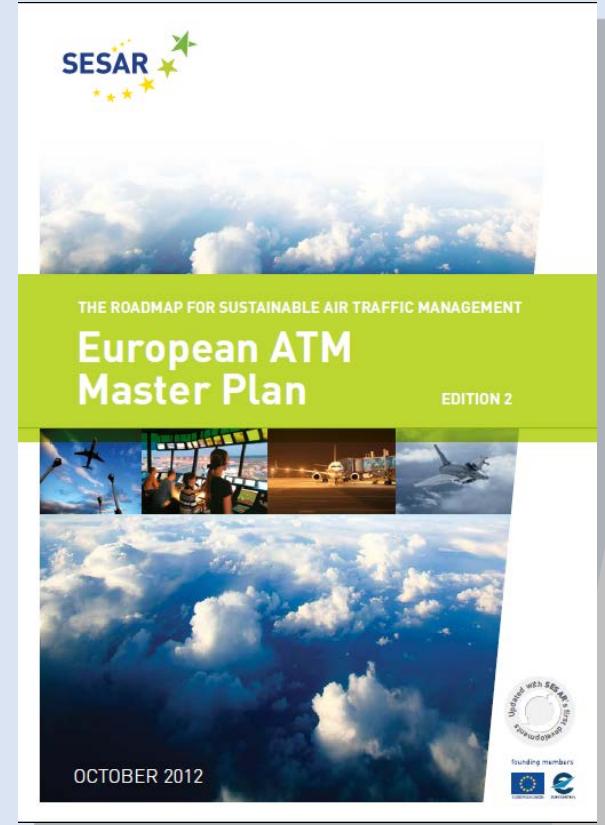
ICAO GANP / European ATM Master Plan: Concurrent, Complementary, not Competitive

- Same philosophy
 - Need to improve ATM performance
 - Through harmonisation of systems, procedures
 - And regulations
 - Through deployment of a series of step changes
 - Aim at the Global ATM Operational Concept
- Mutual impact, Global ↔ European
 - From concept definition to operations
 - For timely and useful standards



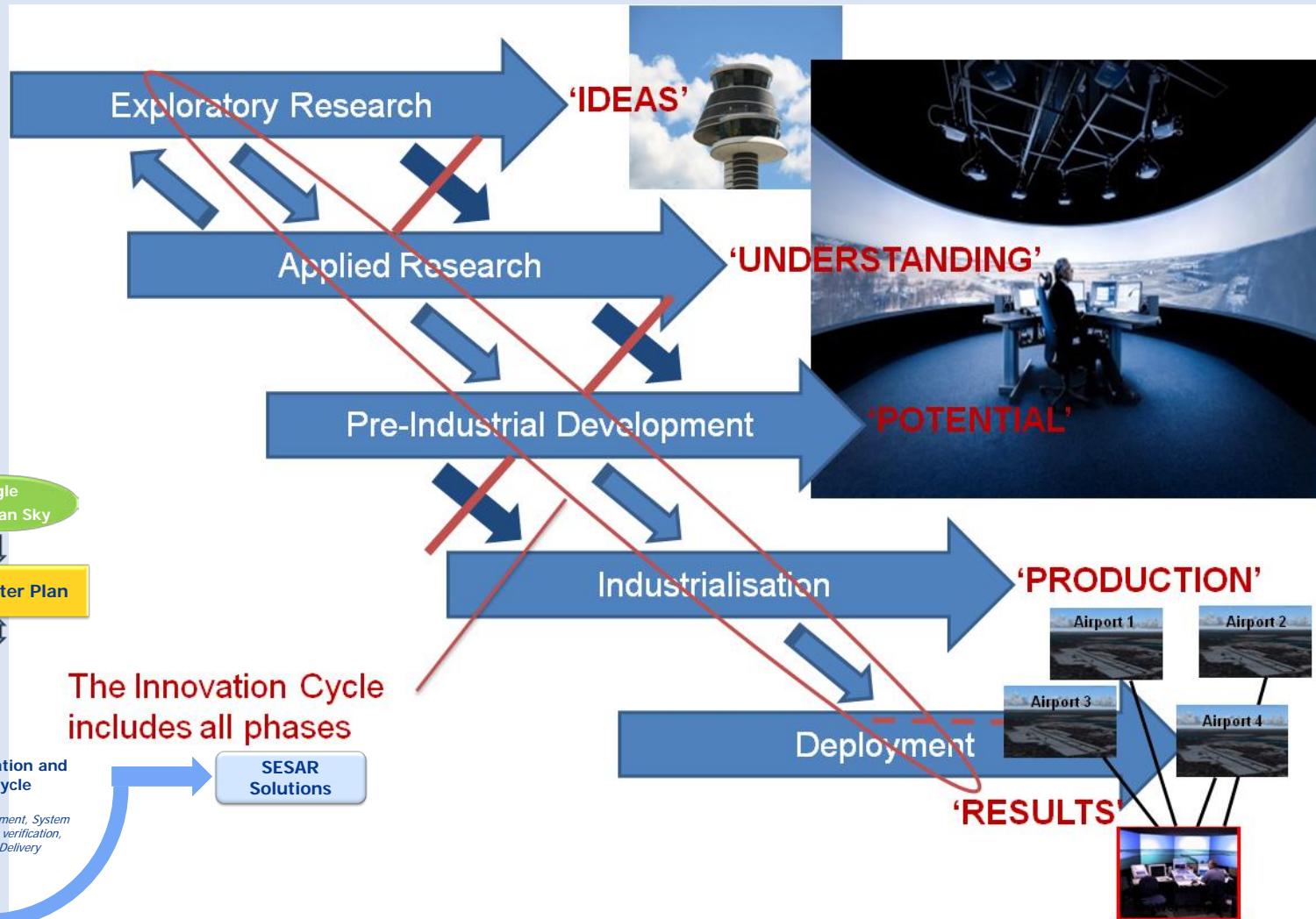
European ATM Master Plan

- **Aims at successful, timely & efficient deployment**
 - Includes additional essential considerations
 - Features not requiring global interoperability
 - Institutional, managerial, **regulatory** aspects, e.g.
 - Change management process
 - Effective commitment of all actors
 - Financial instruments
 - European Single European Sky
 - » Common regulatory framework incl. performance
 - » FABs
- **Bridges R&D and deployment in a consistent plan**
 - A cohesive programme across industry through SESAR
 - An objective: wide cooperation



Research-Innovation – The ‘Pipeline Principle’

- delivering SES performance improvement

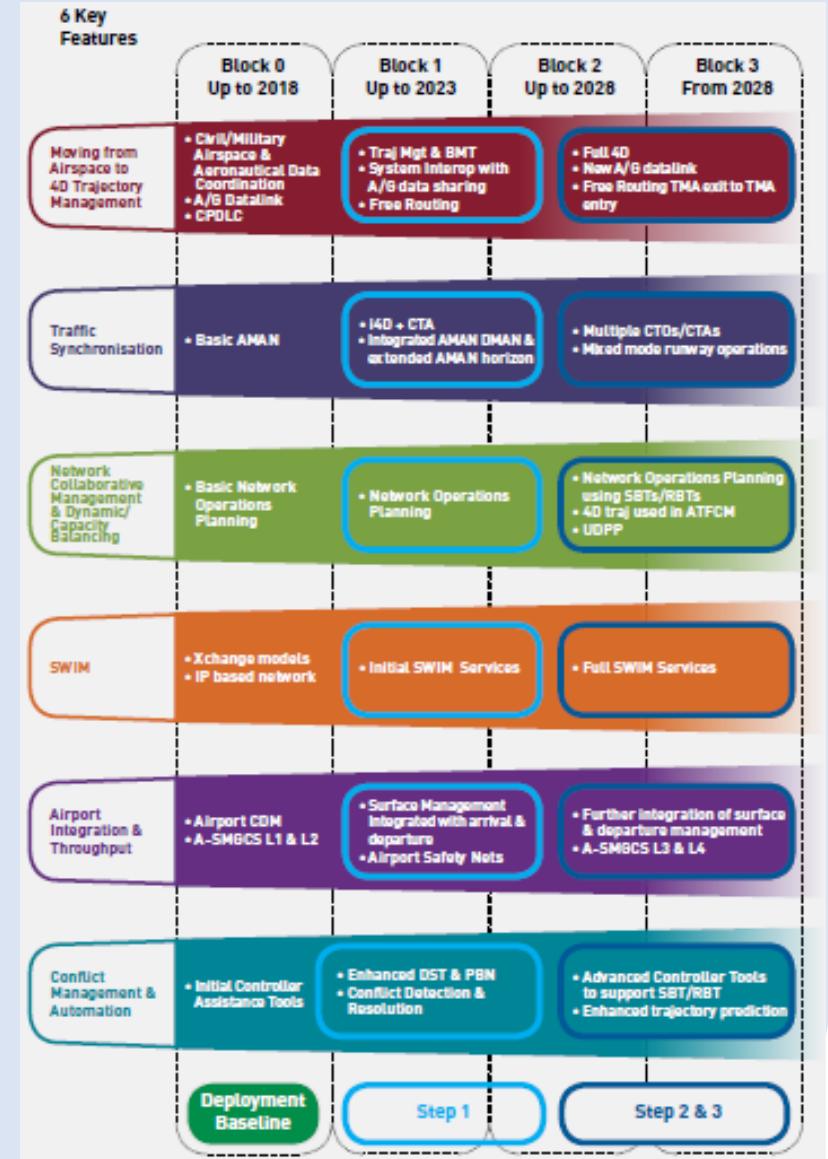
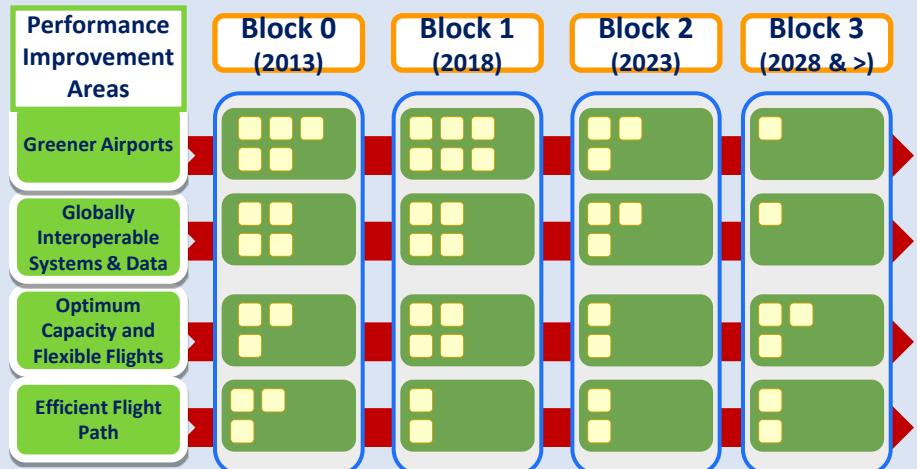


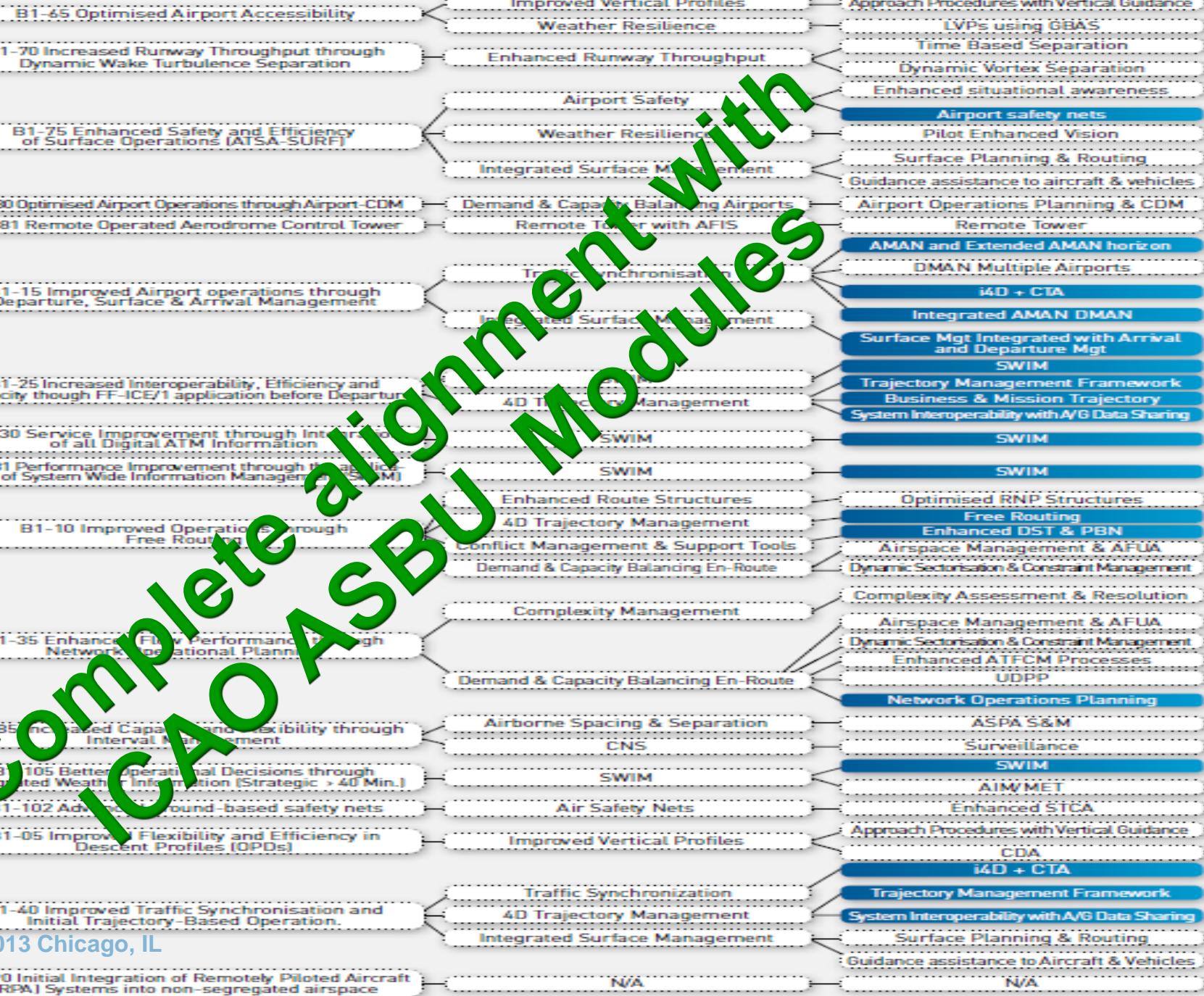
European ATM Master Plan Mapping with ICAO ASBUs: Steps and Blocks

Same notions of

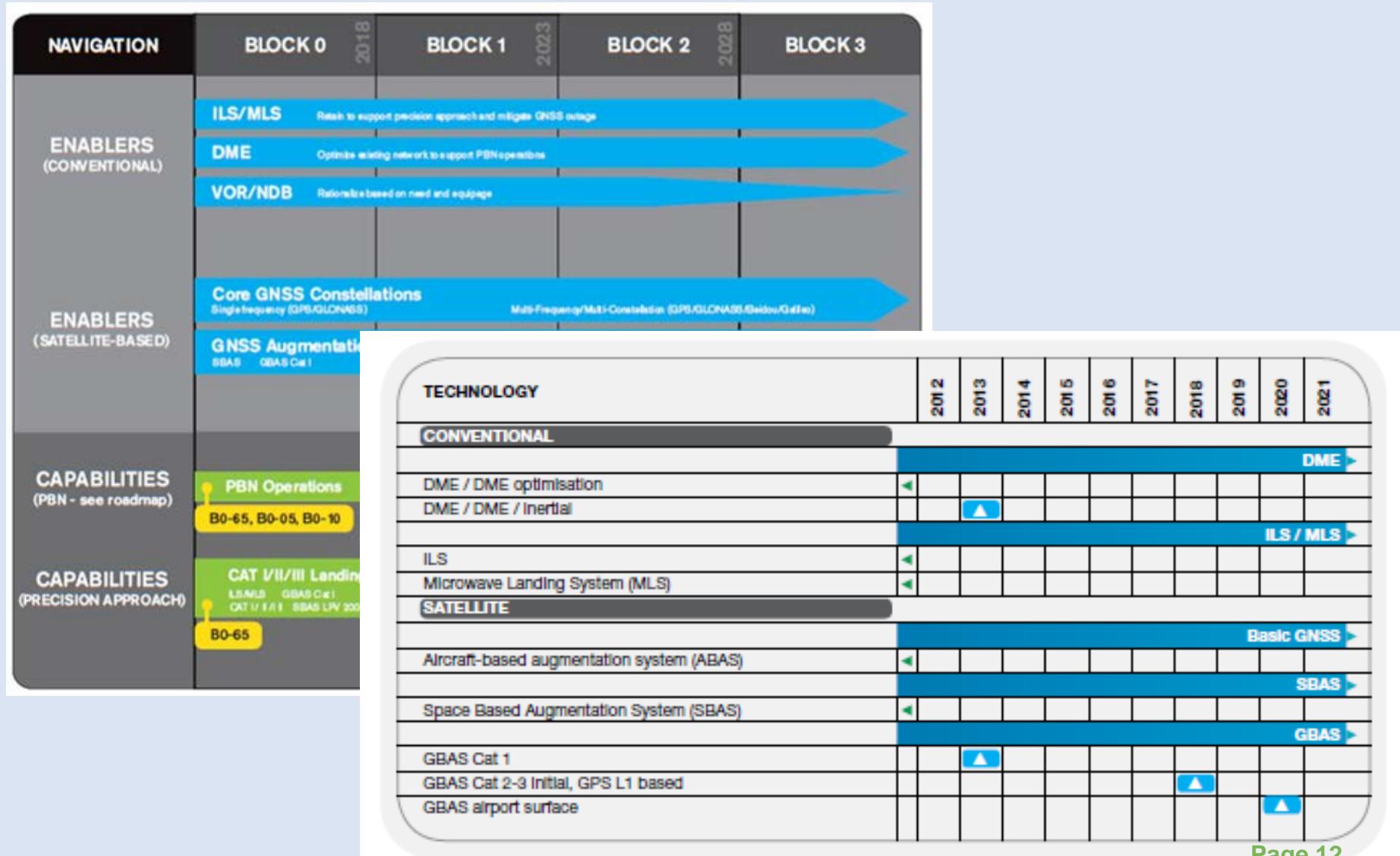
- Progressive deployment
- Performance orientation
- Synchronised actions

Presentation tailored
to audience



ICAO Module**SESAR Operational Changes**

European ATM Master Plan Technology Roadmaps consistent with those of the GANP



Challenges

- **Sensitivity of solutions to local situations**
 - The issue is not the target but the path to it
 - New good ideas not an exclusivity of Europe or US
 - Buy-in to a well understood common plan is essential
- **Need for new interoperable standards**
 - How to get them timely, widely recognised
- **Need for consistent plans to mutually support individual business cases**
 - Cooperation within/across regions to optimise synchronised deployments
 - Need for training, change management
 - Need to validate, demonstrate
- **Europe can assist a lot, while fulfilling European specific objectives**
- **Risk of global bottleneck: process, resources, representation (geographical), recognition/endorsement of delegated work**



Data
Communications:
a typical
challenge area

Essential Considerations for Europe & Global Plan

The network of actors & assets

The flight trajectory over time

Measured business performance



RPAS

Wake

Informed decisions taken collaboratively on early and accurate information

Partnership – Interoperability

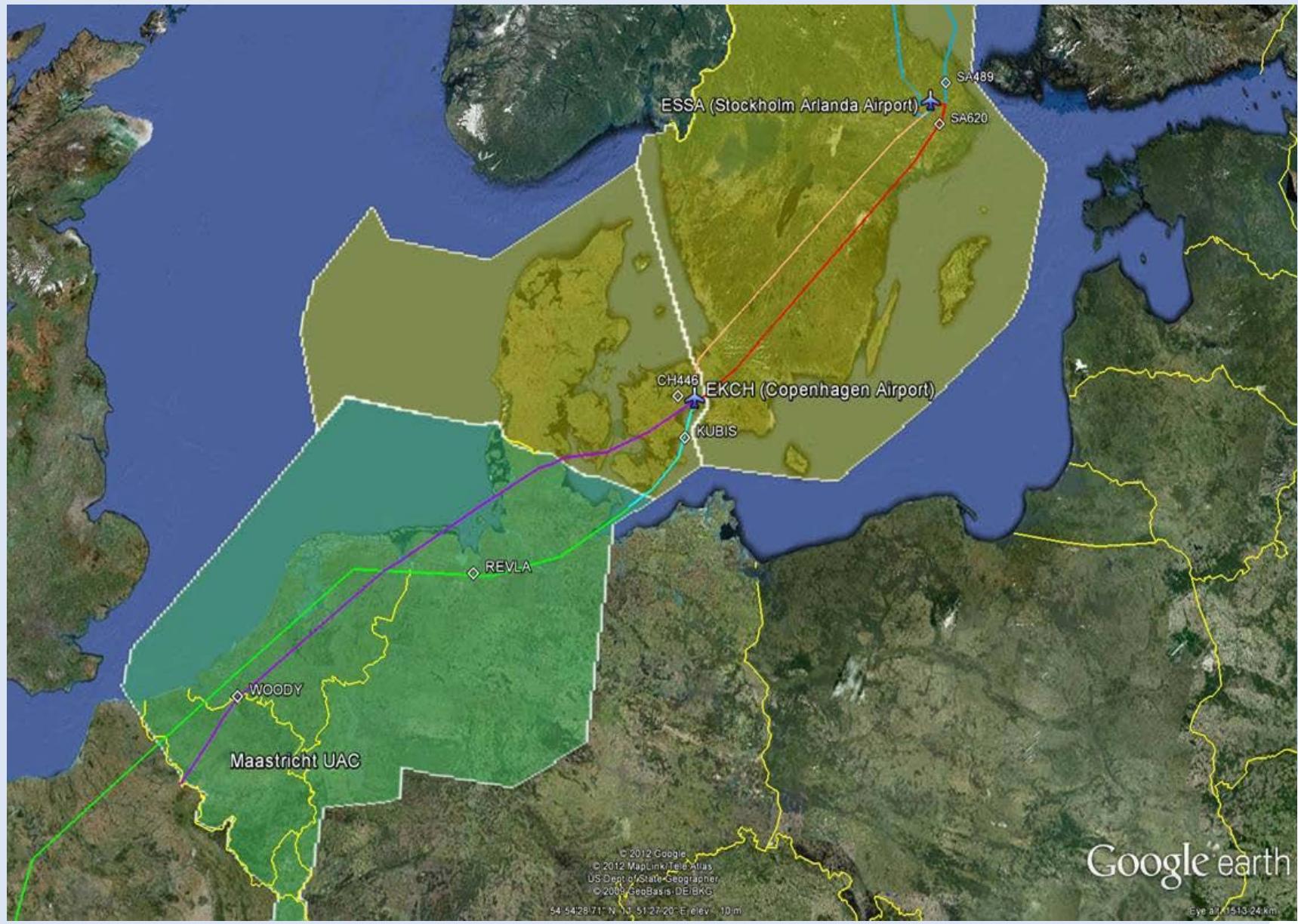
"BEBS"

SWIM and data comm. are cornerstones

Some Key Critical Issues



4D Trajectory Management

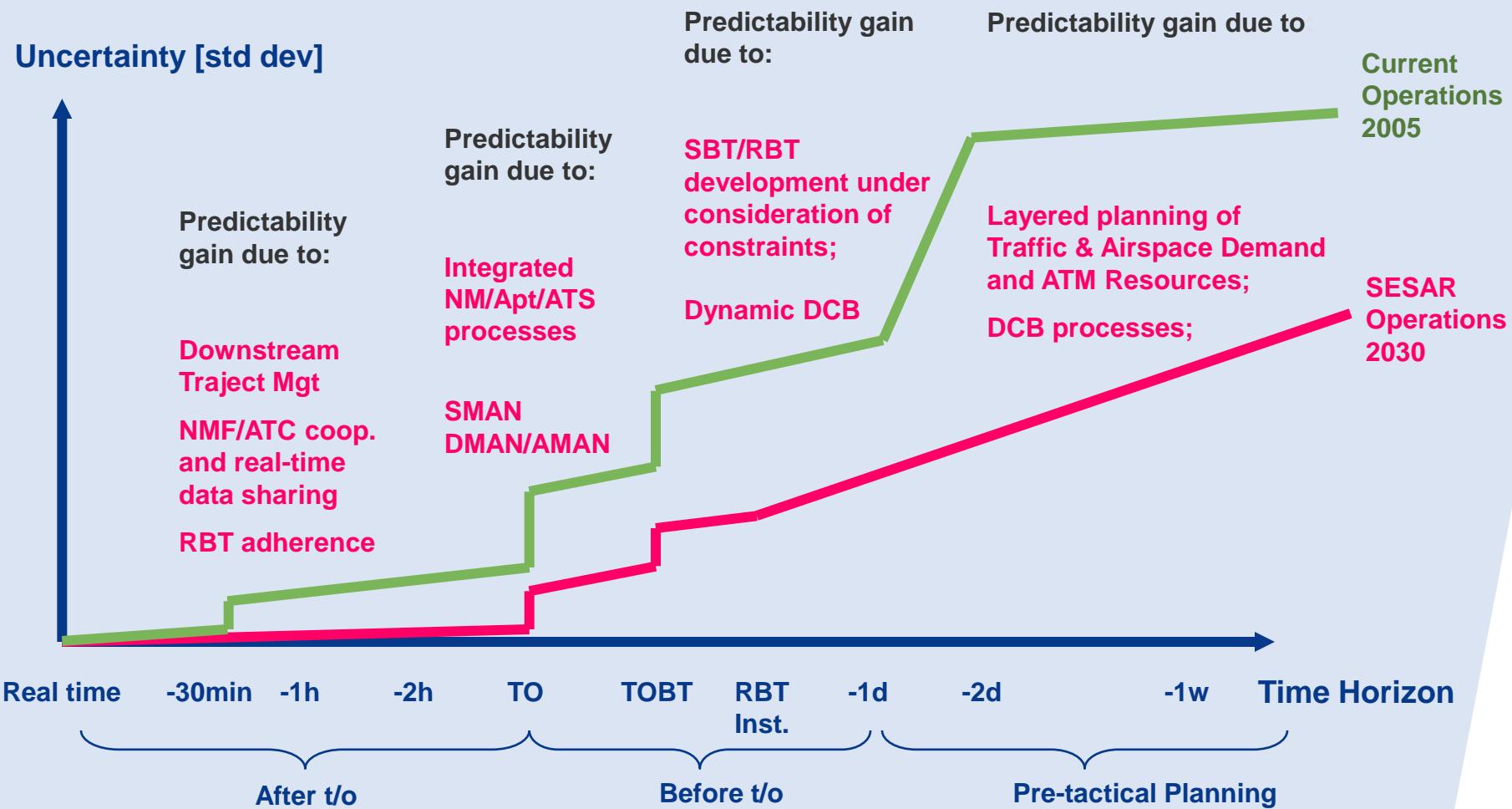


The SESAR Trajectories

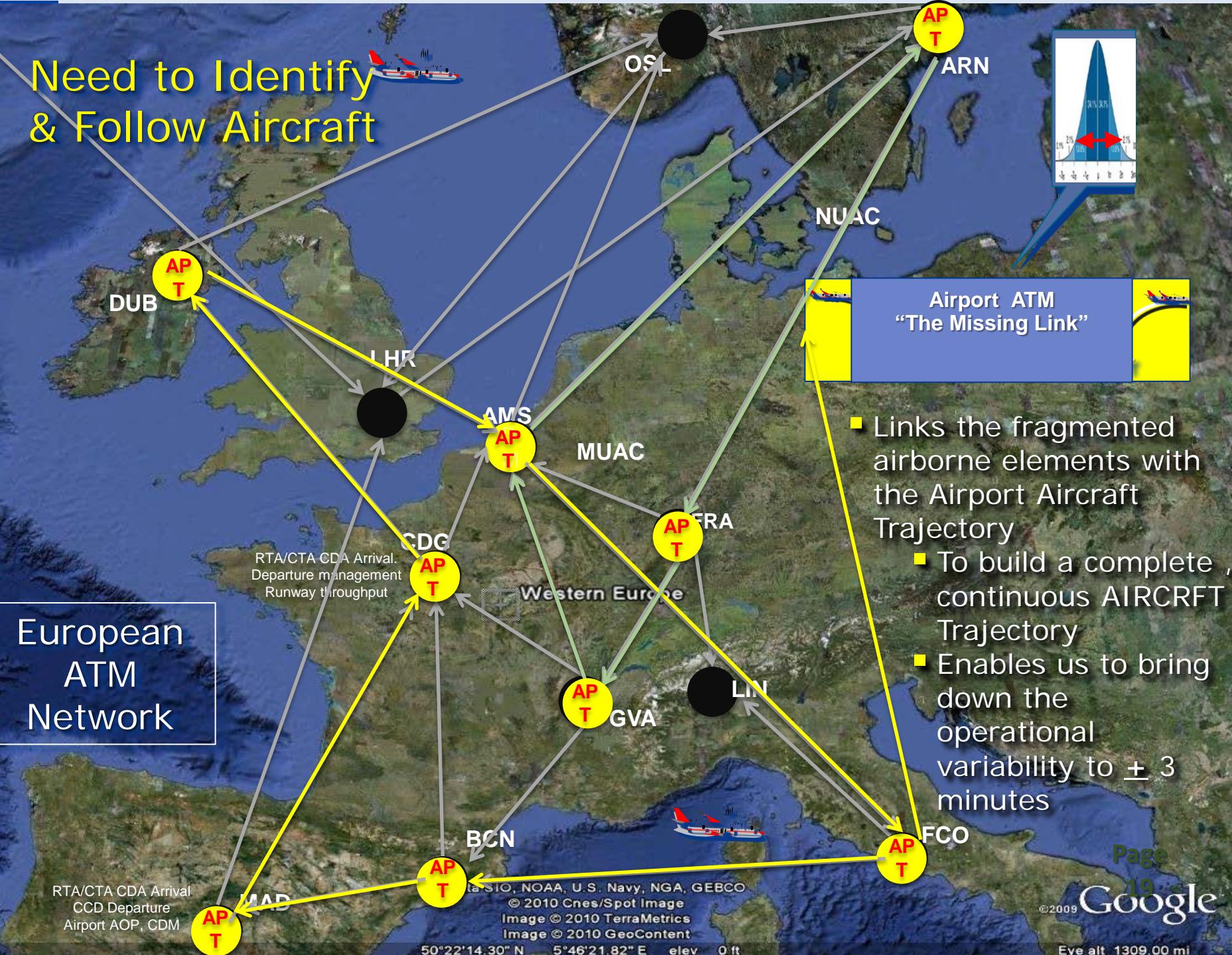
- Aircraft (FMS) Trajectory
- Ground Local ATC Trajectory
 - TP via RDP (State Vector)
 - TP via FDP (Flight Intent)
- Strategic Business Trajectory
- Reference Business Trajectory
- Reference Mission Trajectory
- Airport Transit View

Performance Benefit Mechanism

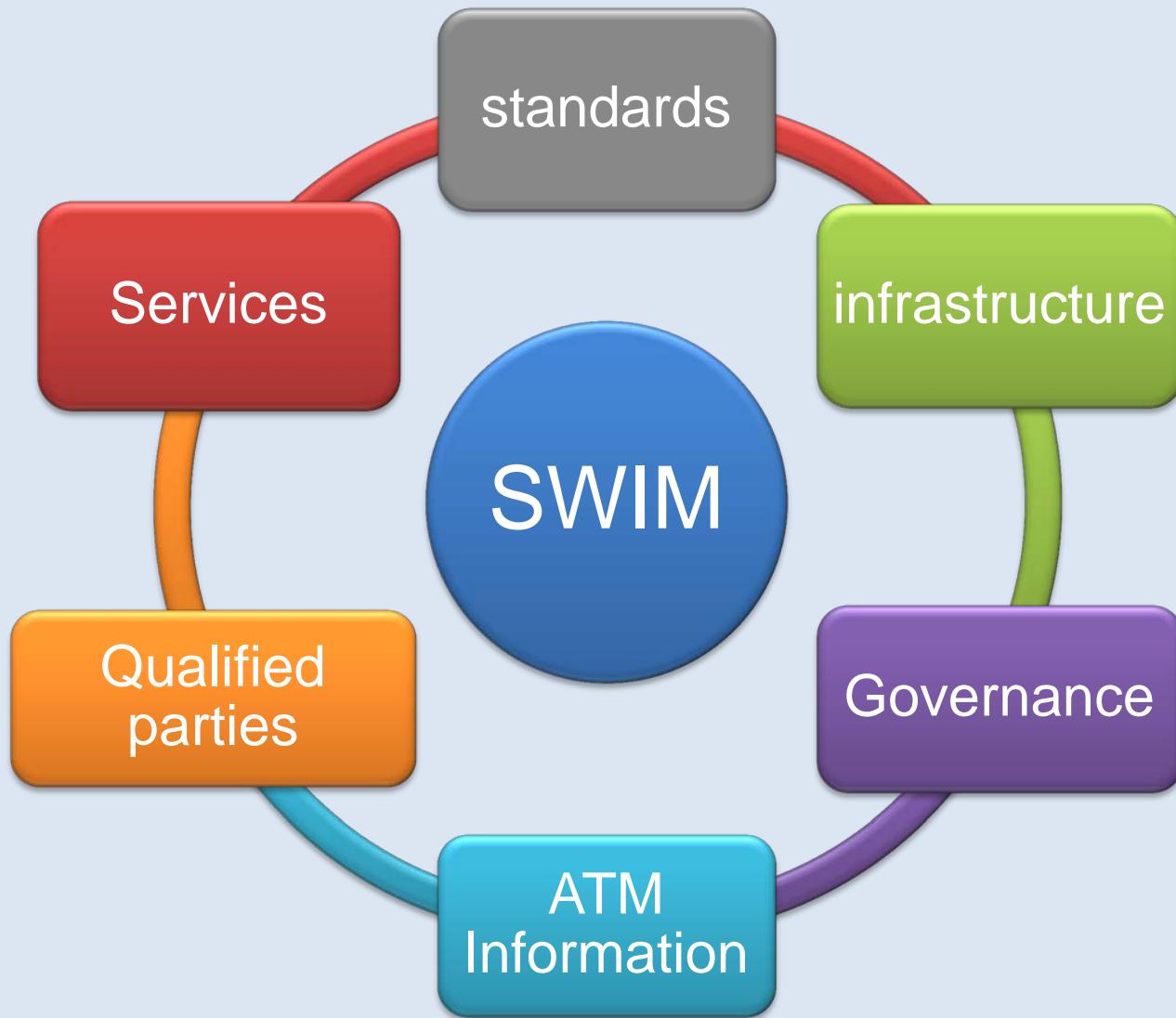
Predictability & Planning Stability



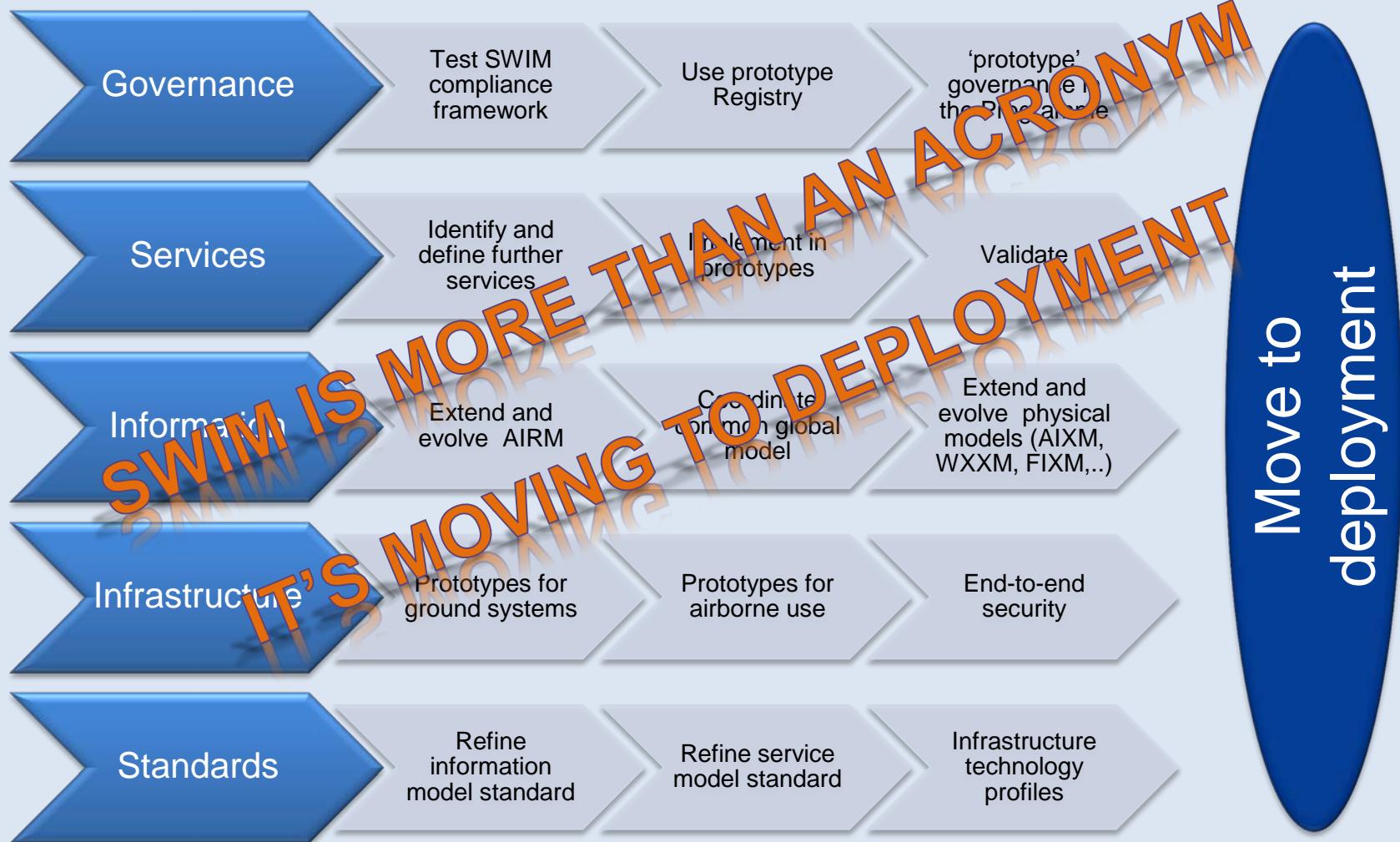
Need to Identify & Follow Aircraft



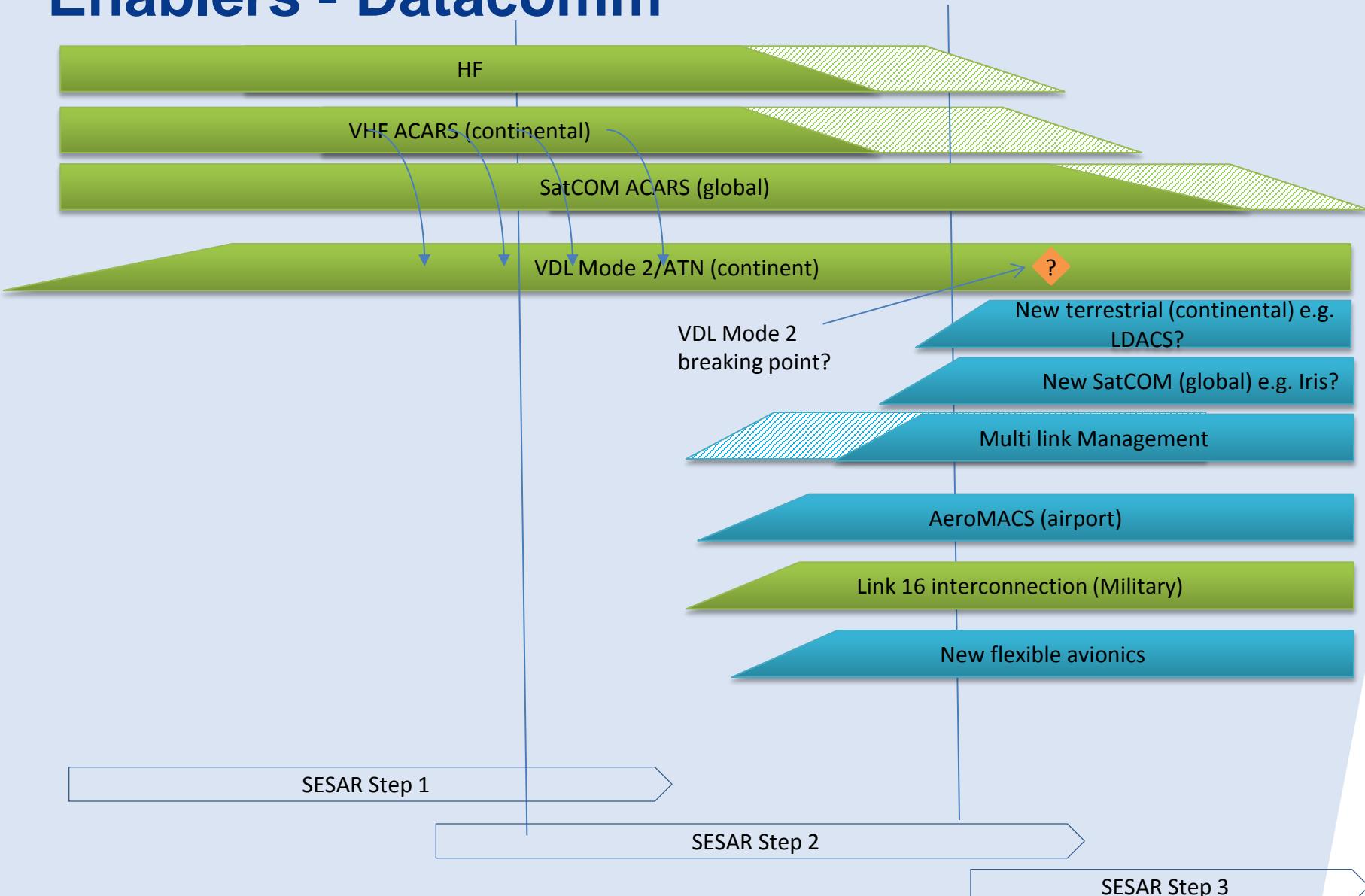
SWIM Definition



SWIM in SESAR – next steps?



Enablers - Datacomm



: Legacy or currently implemented technology
: Future technologies

BEBS, MCBS,

Best-Equipped-Best-Served or

Best-Efficiency-Best-served or

Most-Capable-Best-Served or

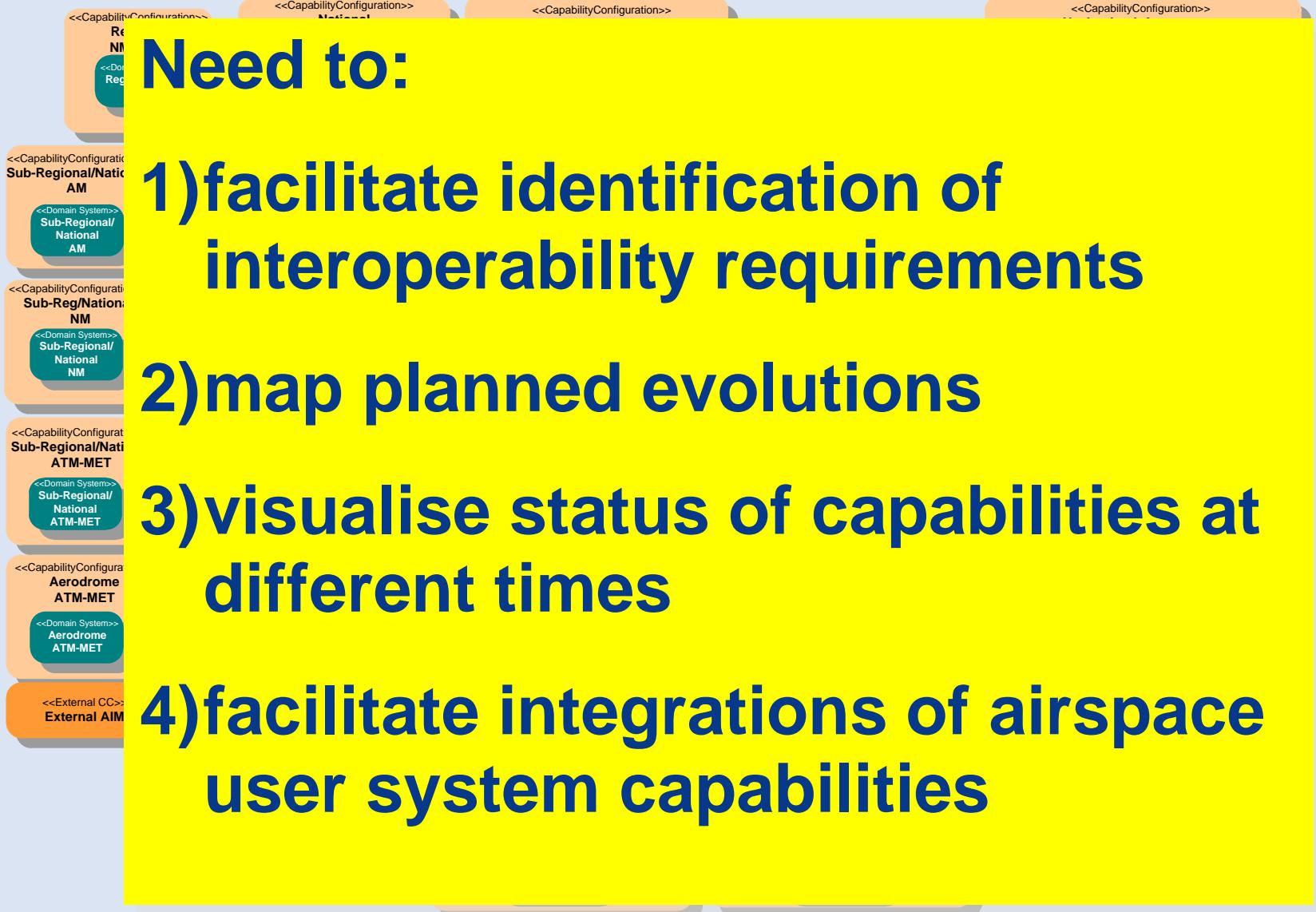
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Two elements;

- Operational service priority**
- Economic/Financial incentives!**



Architecture



RPAS and ATM

- **Integration of RPAS in the ATM is a key priority for the future ATM in Europe**
- **European roadmap for integrating RPAS in the Aviation System from 2016**
 - R&D perspective
 - State of play in Europe
 - Regulatory framework



Airport Capacity – Wake Vortex Considerations Achievements

RECAT 1

- European and US Regional approach
- European and US Wake data bases
- New knowledge and methodologies
- US Deployment at Memphis shows benefits

Time Based Spacing (TBS)

- TBS head wind procedures validated
- Exploits wake and wind knowledge
- Safety case delivered
- Deployment decision at London Heathrow



CREDOS (cross-wind departure)

WIDAO (CDG closely spaced parallel runway operations)

Wake Vortex: Next Steps

Moving to dynamic pairwise via static pairwise separation

Static Pairwise (RECAT 2)

- Common European and US methodologies
- 100 X 100 aircraft matrix
- Customise categories by airport traffic mix
- Proposal to ICAO for new wake separations provisions



Dynamic Pairwise (RECAT 3)

- Technology development on:
 - Weather Radar
 - Wake detection (Lidar)
 - Down link of aircraft weather parameters

Integrates TBS, Weather Dependent and aircraft sensors

Benefit driven phased approach to deployment



Wake Vortex: Required Commitment

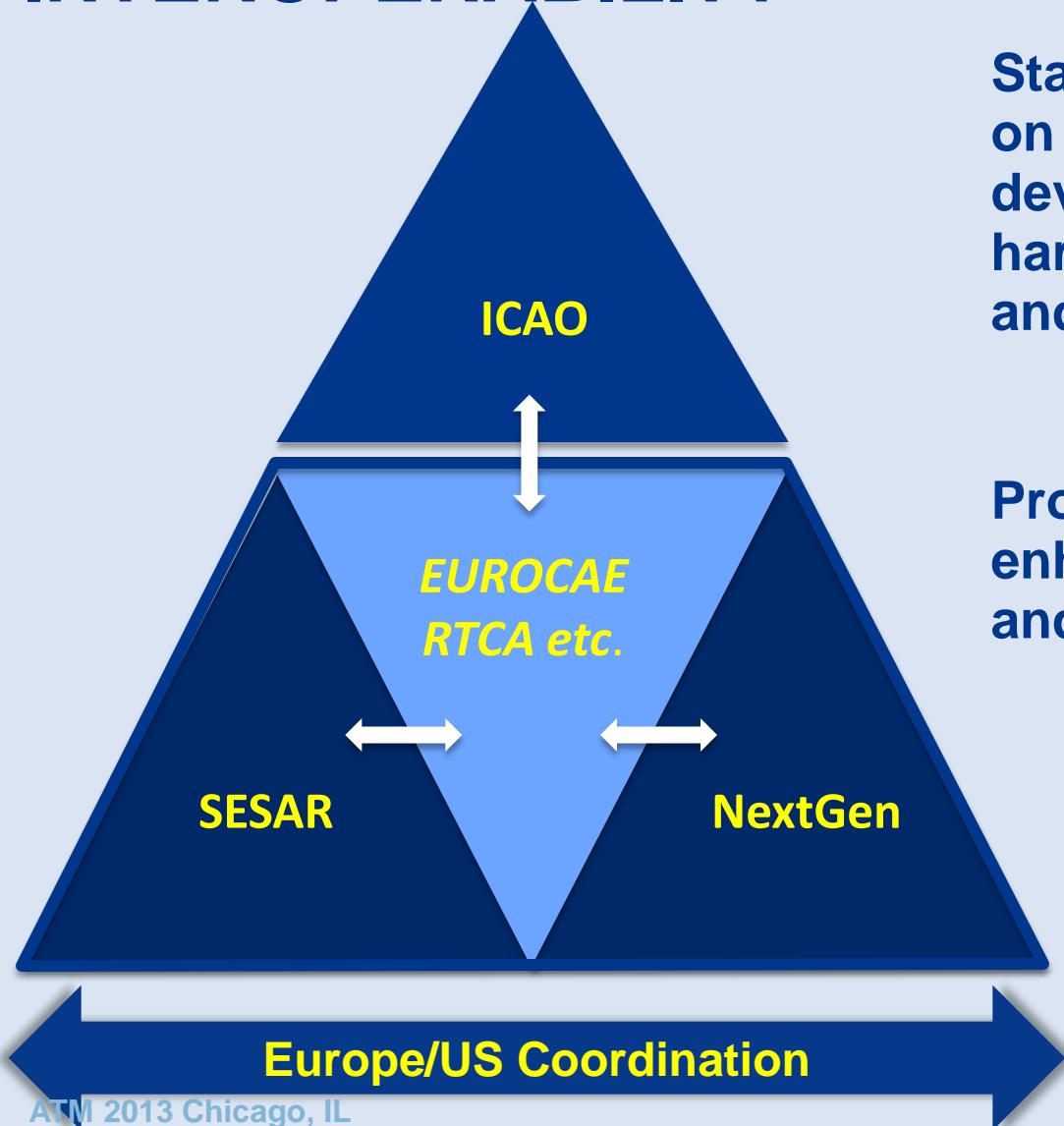
RECAT 2 is a pre-requisite to reaching RECAT 3.

**Europe is committed to deliver RECAT 2 together
with the US to ICAO in December 2014**

**Will need to start work on R3 operational and
technical scope as soon as possible**



GLOBAL COOPERATION & INTEROPERABILITY



Standards built on SESAR and NextGen developments will support harmonised Implementation and Regulation

Programme level coordination enhanced by interoperability and wider industry buy-in.





US/FAA Coordination



It is about identifying interoperability issues in SESAR that needs to be harmonised to safeguard both development and deployment activities

Strong coordination with FAA/NextGen and other regional modernisation programmes is essential for standardisation activities in ICAO and in standard making bodies like EUROCAE and RTCA.

The need for global interoperability and standards requires support at the ICAO level and a concerted approach is essential

ATM 2013 Chicago, IL

30





EU-US MoC Annex 1



Work Area 1 – Transversal

Work Area 2 – Information Management

Work Area 3 – Trajectory Management

Work Area 4 – CNS & Airborne Interoperability

Work Area 5 – Demonstration Projects



Conclusions

- **One size does not fit all, But**
 - Solution involving interoperability should be implemented the same way by all
 - Business cases are not independent, but must reflect the conditions of those who invest and operate
- **Transition is complex and must be anticipated**
 - It is easier to converge when cooperating early
- **12th ICAO Air Navigation Conference**
 - The starter of a regular improved planning process
- **Interoperability, a constant consideration locally, regionally and globally**



Thank You!

