



**AATIP**

**ASEAN Air Transport Integration Project**

*A project funded by the European Union  
and implemented by EASA*  
**ASEAN Air Transport Integration Project**



*in partnership with EUROCONTROL, UKCAA and DGAC France*



# FUA experiences and the application of Enhanced FUA

**ICAO/IATA Workshop on Cross Border ATFM  
Jakarta 21-22 October 2015**

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EU-AATIP Project

[easa.europa.eu](http://easa.europa.eu)



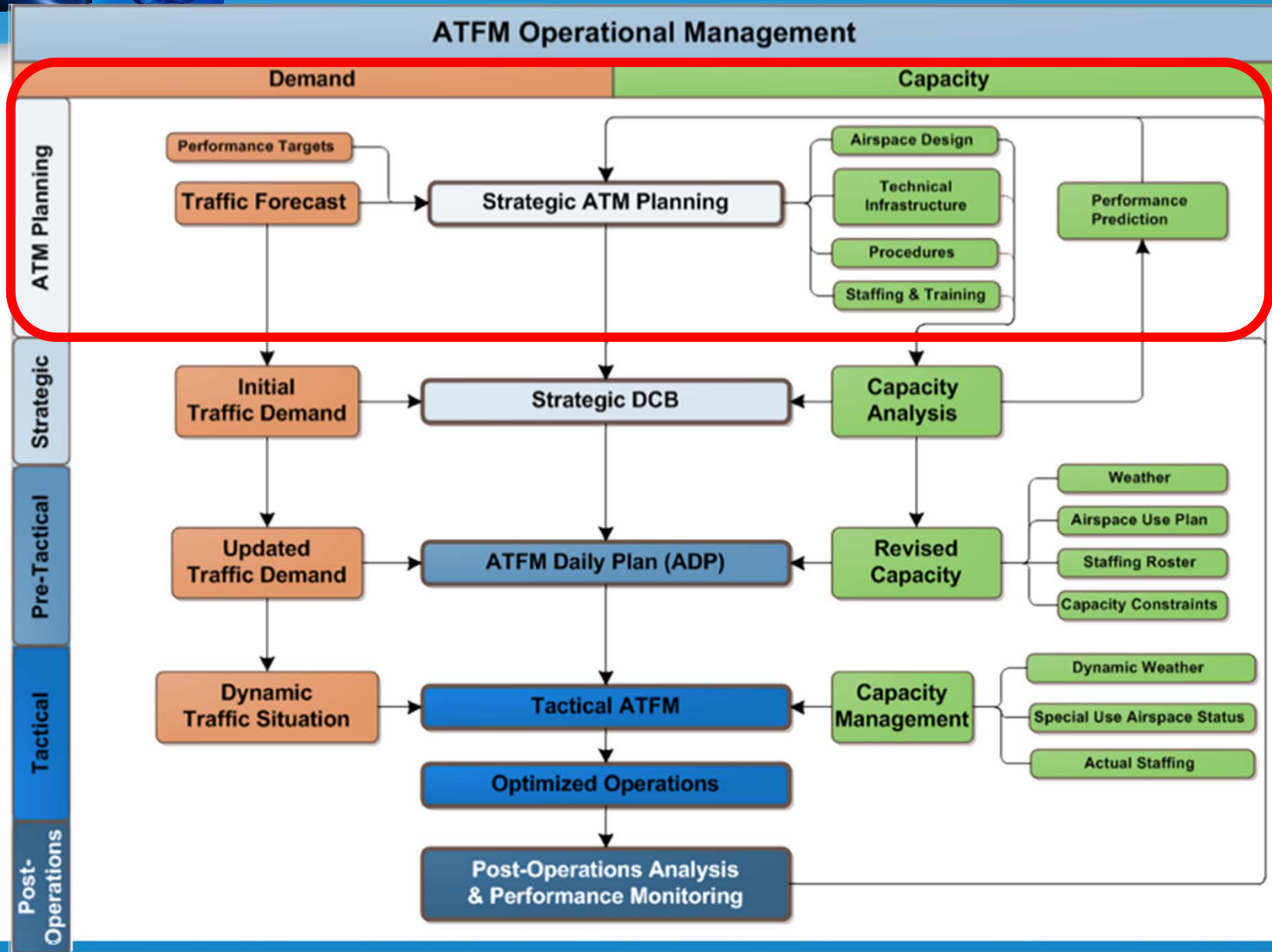
Ensuring a 'Flexible Use of Airspace'....

## **Presentation structure:**

- **Why FUA at a workshop on ATFM**
- **How FUA is applied in Europe**
- **Benefits of FUA**
- **Dynamic Management of Airspace**



# ICAO Manual on ATFM





# ICAO Manual on ATFM



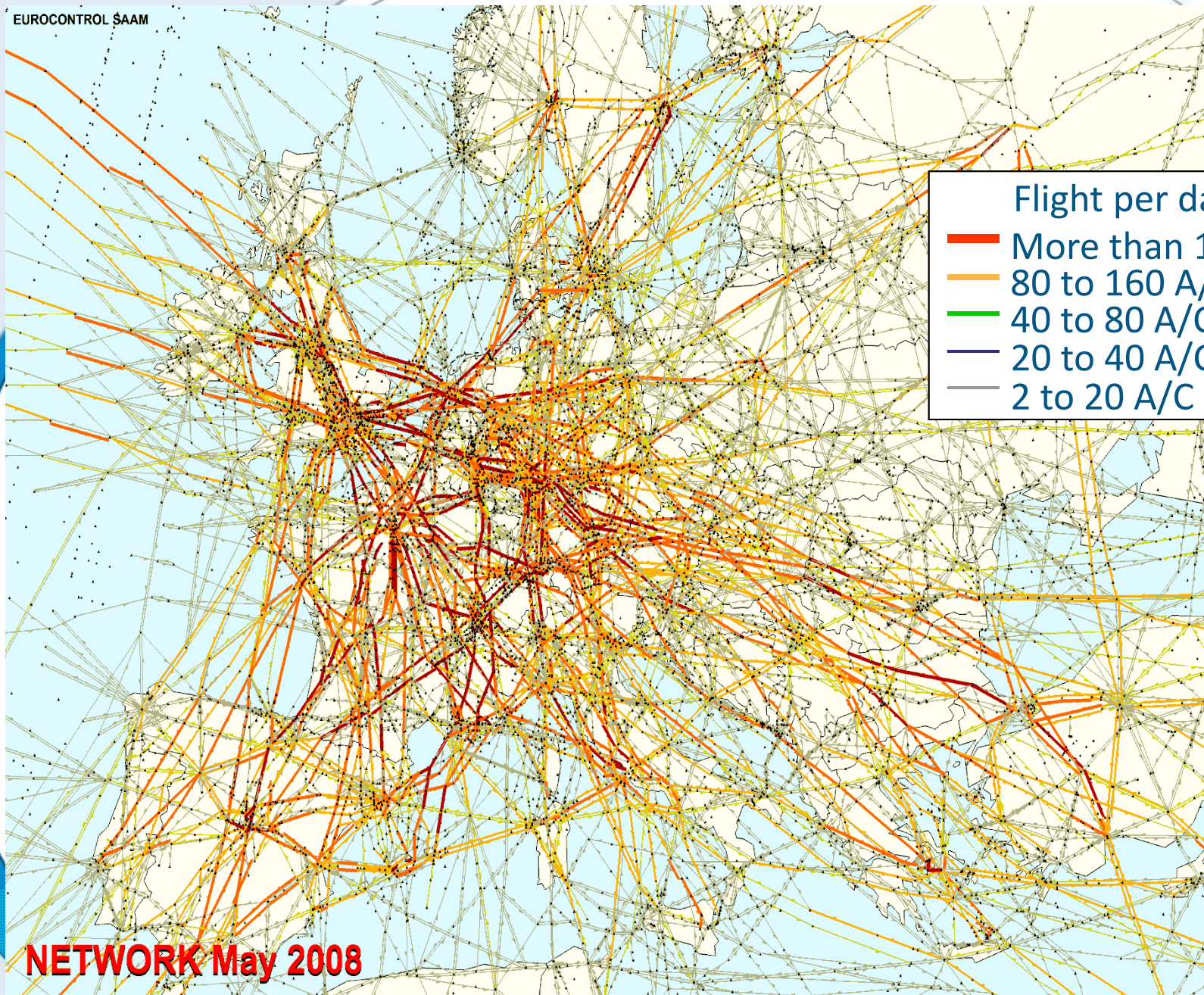


# Overview of Europe's Traffic



- **Dense Route Network**
- **1000 airports**
- **30000 aircraft per day**
- **1000 control sectors**
- **80% of traffic is European internal**
- **50% of traffic flies less than 600km**
- **Military requirements**

EUROCONTROL SAAM



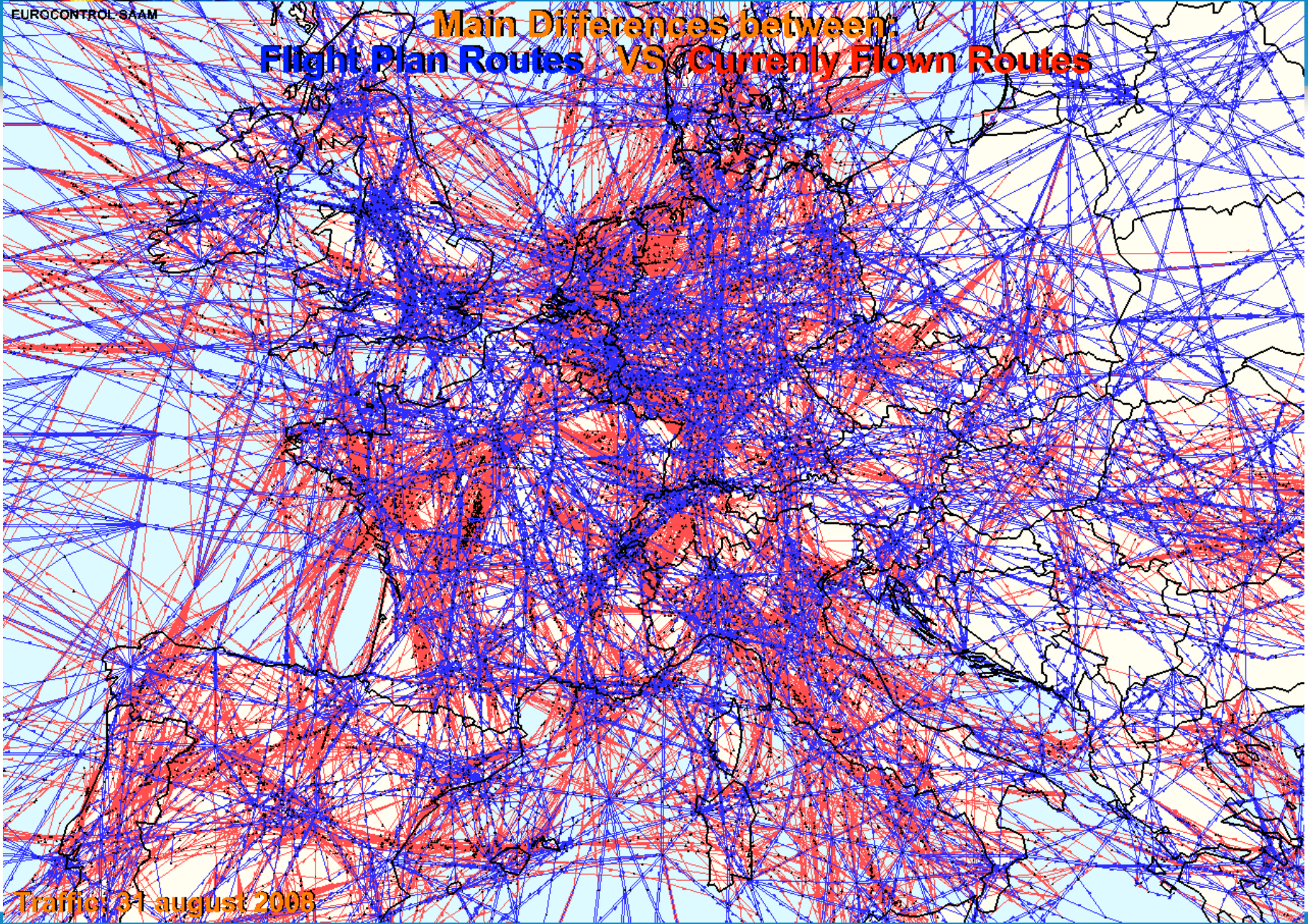
- Flight per day
- More than 160 A/C
  - 80 to 160 A/C
  - 40 to 80 A/C
  - 20 to 40 A/C
  - 2 to 20 A/C

**NETWORK May 2008**



EUROCONTROL SAAM

# Main Differences between: Flight Plan Routes VS Currently Flown Routes



Traffic: 31 august 2008



# ATM System Improvements Strategy

## 1. Strategic Planning of Airspace

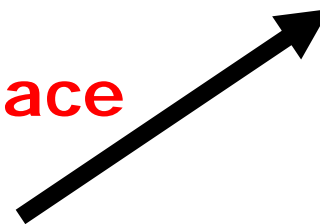
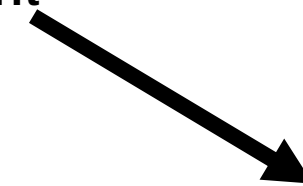
Route network Development  
National Re-Sectorisation

## 2. Controller Workload

ATC procedures  
System Support

## 3. Better Use and Management of Airspace

RVSM  
Perf Based Navigation  
*Flexible Use of Airspace*



**Increased Capacity**  
Reduced Delays  
Improved Flight Profiles







**How to satisfy all the stakeholders'  
requirements ?**

**Since 1996 through ...**

**FLEXIBLE USE OF  
AIRSPACE  
CONCEPT**



## The basis of the FUA concept

- Airspace no longer designated as civil or military airspace, **a continuum**
- Airspace used flexibly on a day to day basis → necessary airspace segregation only of **temporary nature**;
- Ensure **more efficient sharing** through joint civil/military strategic planning and pre-tactical airspace allocation: Airspace Management Cells (**AMCs**)

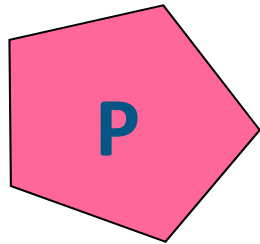


# Fundamental principle of FUA

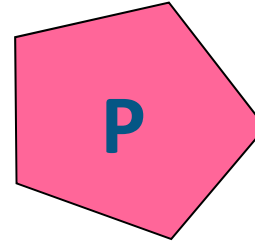
**Airspace should not be designated as either pure civil or military airspace, but rather be considered as a continuum in which all user requirements have to be accommodated to the extent possible.**



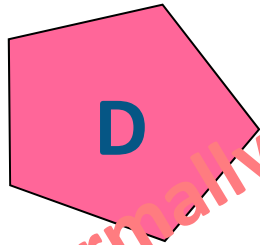
# Non-FUA vs. FUA



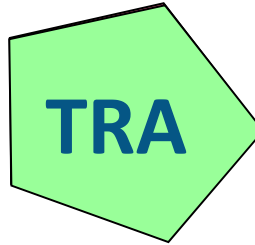
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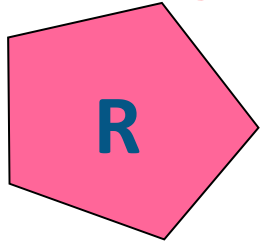
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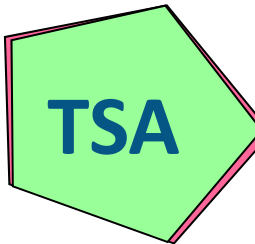
**DANGER**



**CROSSING POSSIBLE  
WHEN ACTIVE / RELEASED  
AS SOON AS ACTIVITY  
STOPS**



**RESTRICTED**



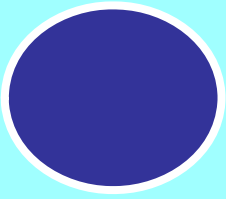
**RELEASED AS SOON AS  
ACTIVITY STOPS**

*Normally published as  
occupied H24*



# Through Civil / Military Coordination ...

ASM Level 1

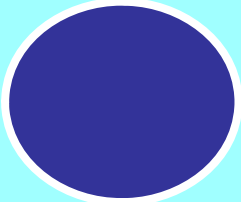


## ***Strategic Level***

Definition and review of national airspace policy and organisation, establishment of pre-determined airspace structures

High-Level  
Civil / Military  
Airspace Policy  
Body

ASM Level 2

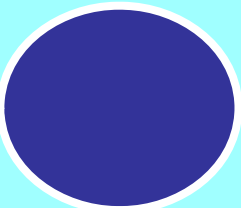


## ***Pre-tactical Level***

Day-to day airspace allocation according to user requirements

Joint  
Civil / Military  
Cell (AMC)

ASM Level 3



## ***Tactical Level***

Real-time use of airspace allowing a safe separation between civil and military aircraft

Appropriate  
Civil / Military  
ATS Units



# CDR Categorisation

**CDR 1**

Permanently plannable during the times published in AIP

- Expected to be available most of the time
- Plannable same way as permanent ATS routes

**CDR 2**

Non-permanently plannable

- Daily allocated as negotiated
- Plannable only in accordance with daily AUP/EAUP
- Part of pre-defined routing scenario

**CDR 3**

Not Plannable

- Usable upon ATC instructions only as short notice routing

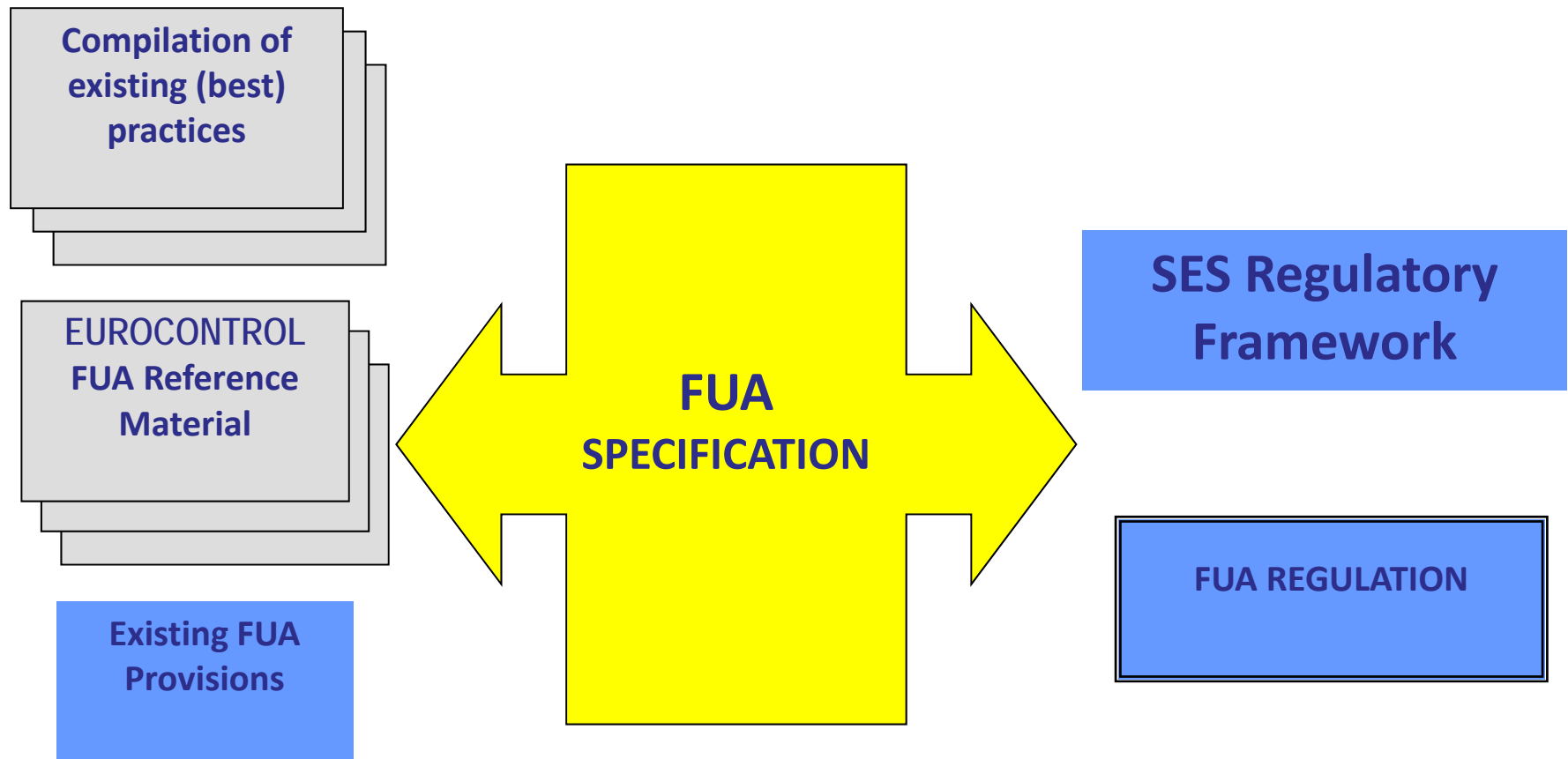


# ASM Notification Process

- ▶ Mil airspace users advise on requirement;
- ▶ National Airspace Use Plan (AUP);
- ▶ Put together by the Network Manager, becomes European Airspace Use Plan (EAUP);
- ▶ Used by Aircraft Operators in improving flight trajectory.



# Regulatory aspect in regard to FUA Concept



**FUA Specification seen as an interface**





# FUA Specifications

Edition 1.1  
Edition date: 10/01/2009  
Reference nr: EUROCONTROL-SPEC-112  
ISBN: 978-2-87497-056-6

EUROCONTROL Specifications

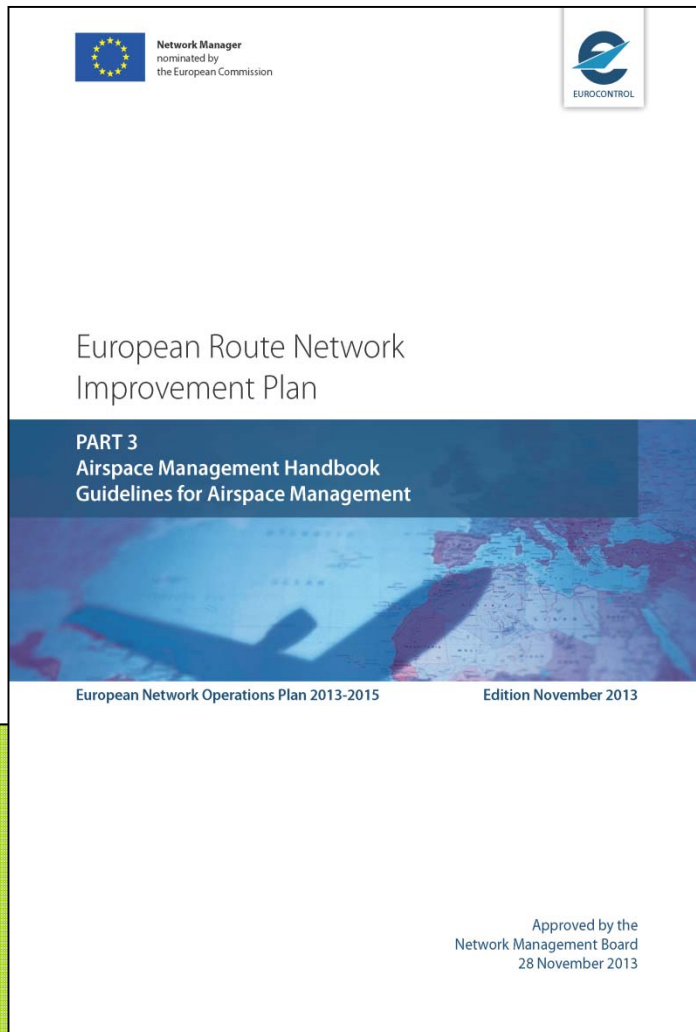
EUROCONTROL Specification for  
the application of the Flexible Use of Airspace (FUA)



- provides details of procedures and requirements for the application of FUA
- addresses essential interoperability requirements
- a means of compliance



# ASM Handbook

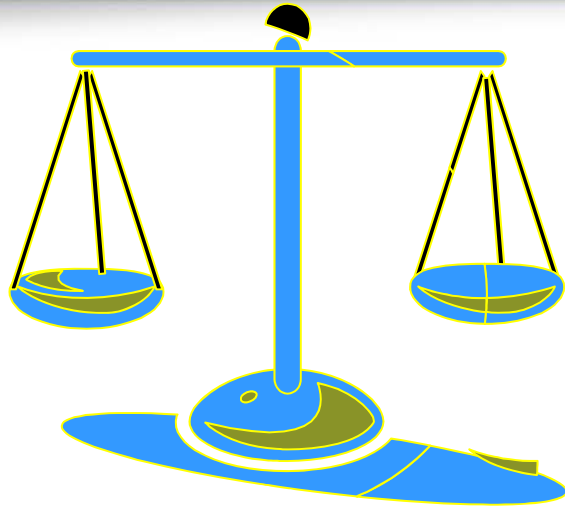


- FUA Concept described
- Processes & procedures at all three ASM Levels
- It is the reference document for FUA Regulation

**EUROCONTROL**  
**FUA Guidance Documents**



# Benefits



**340.000 tons CO<sub>2</sub>/year**



**108.000 tons fuel/year**



**87 million Euro/year**





# Assessment of FUA Operations

**POTENTIAL ECONOMY NOT UTILISED**

1 week day

By not planning on available CDRs

10.321 NM on 2.784 flights

Fuel :

**129 T**

CO<sub>2</sub> Emissions :

**105.780 €**

**407 T**



# ASM/ATFCM Process

## The Problem

Airspace not used optimally

Impact on performance of Network

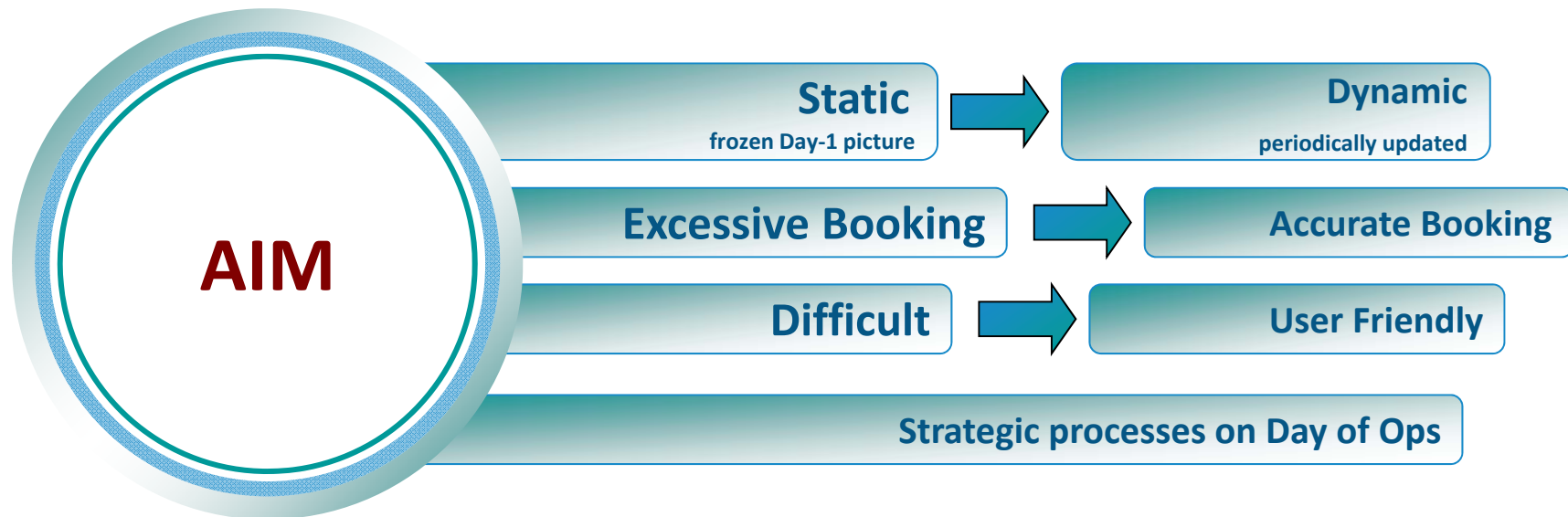
After notification at 15.00 On Day -1 – tactical

Work load intense

Opportunities not used

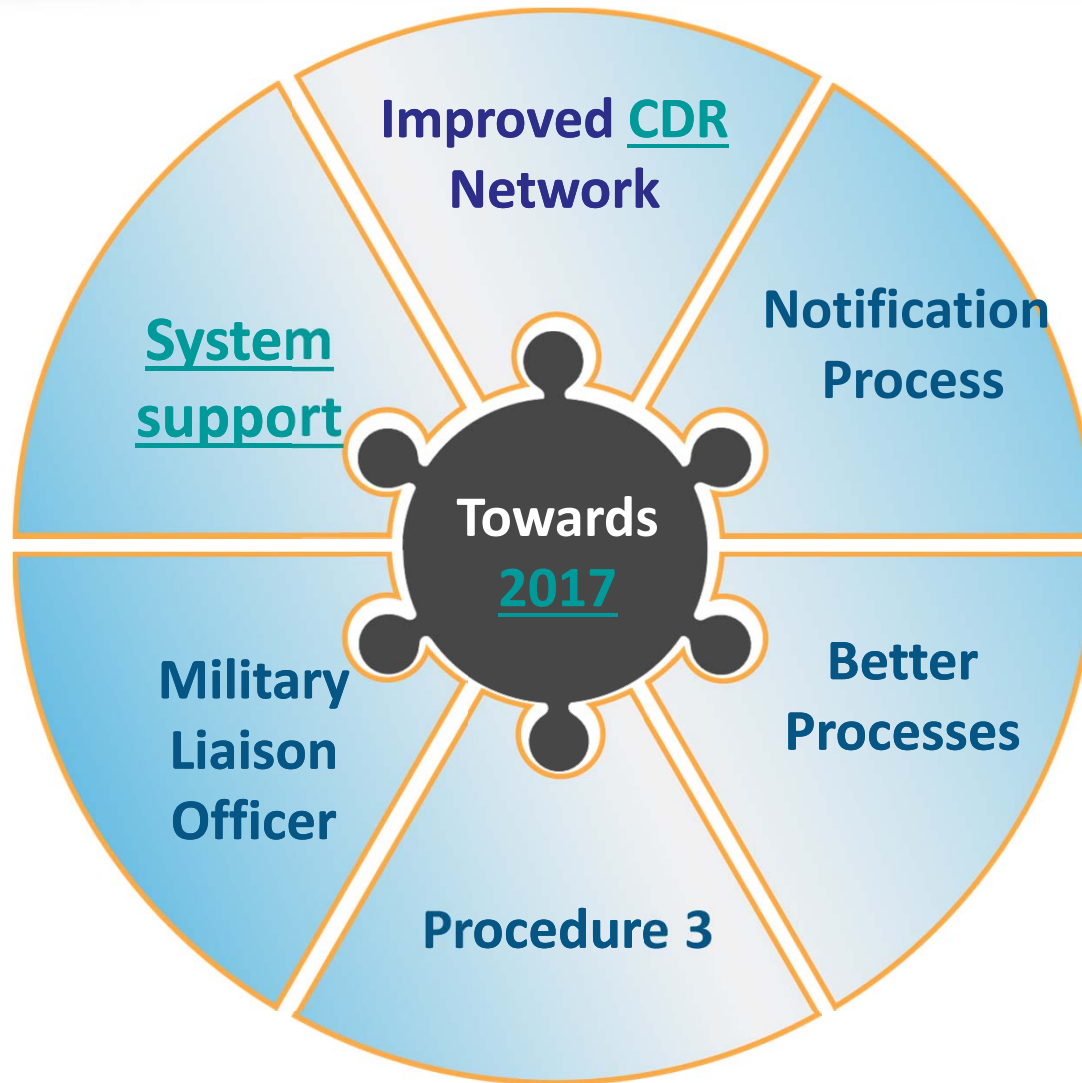


# Enhanced ASM Process





# Enhanced ASM Processes

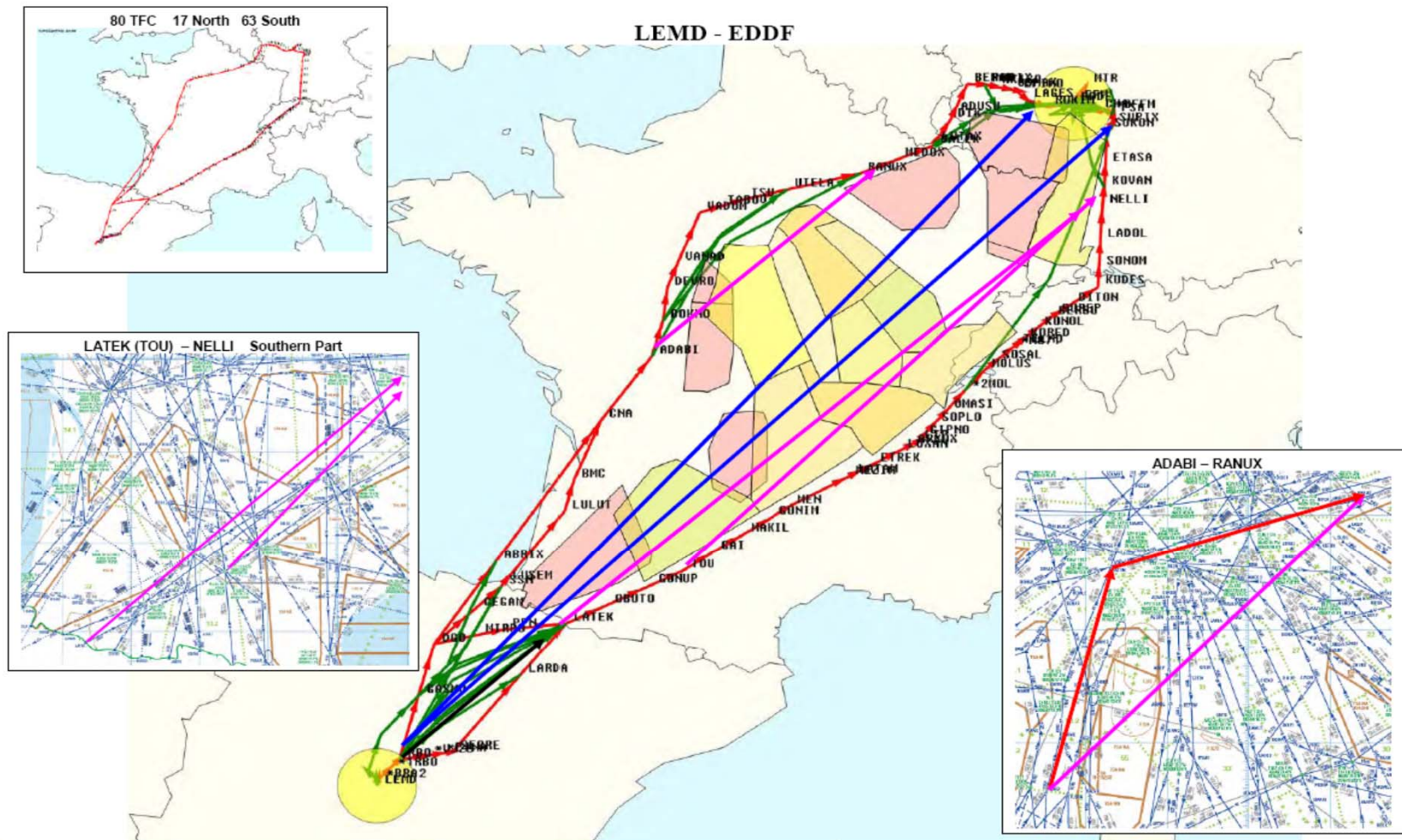




# Improved CDR Network

## Improving airspace utilisation

6



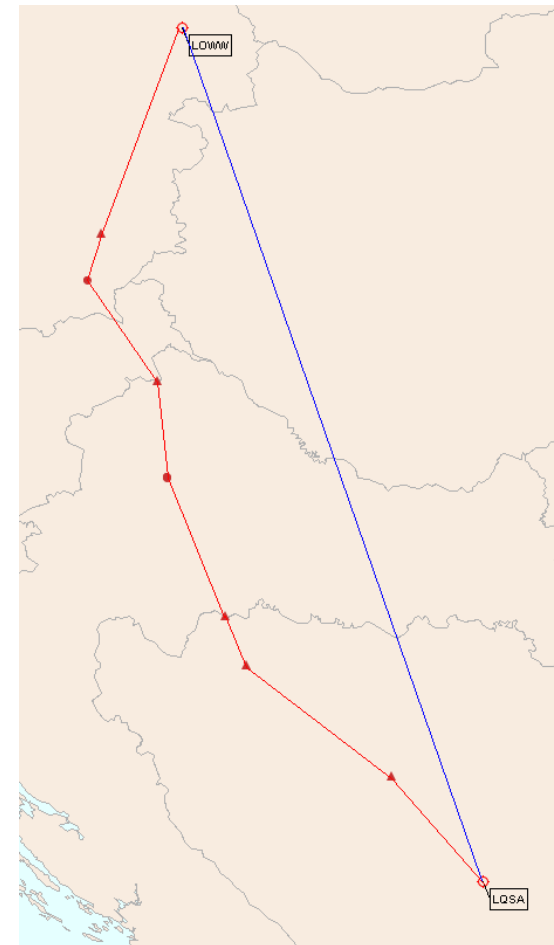




# Tracks far from optimum

- **LQSA-LOWW 51NM** difference between flown track and direct distance.
- **No better airway links published or available.**

...and what is actually flown...  
(daily)





# System Support to Civ/Mil ASM coordination

## CIAM

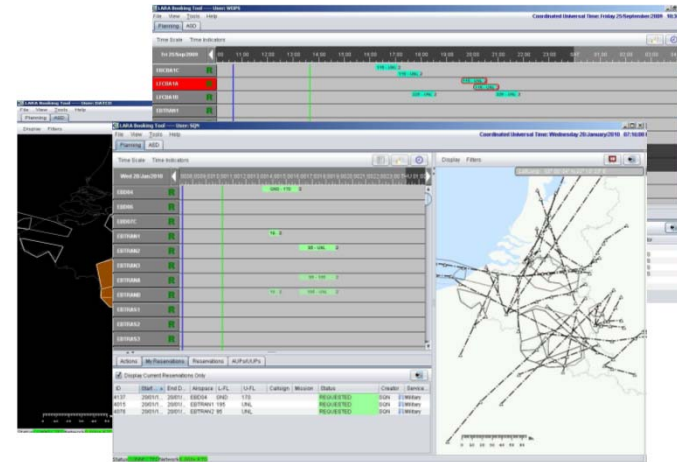
- ▶ Enables interface between airspace managers and the Network Manager

## Airspace Data Repository

- ▶ Enables users to keep up-to-date with airspace status data

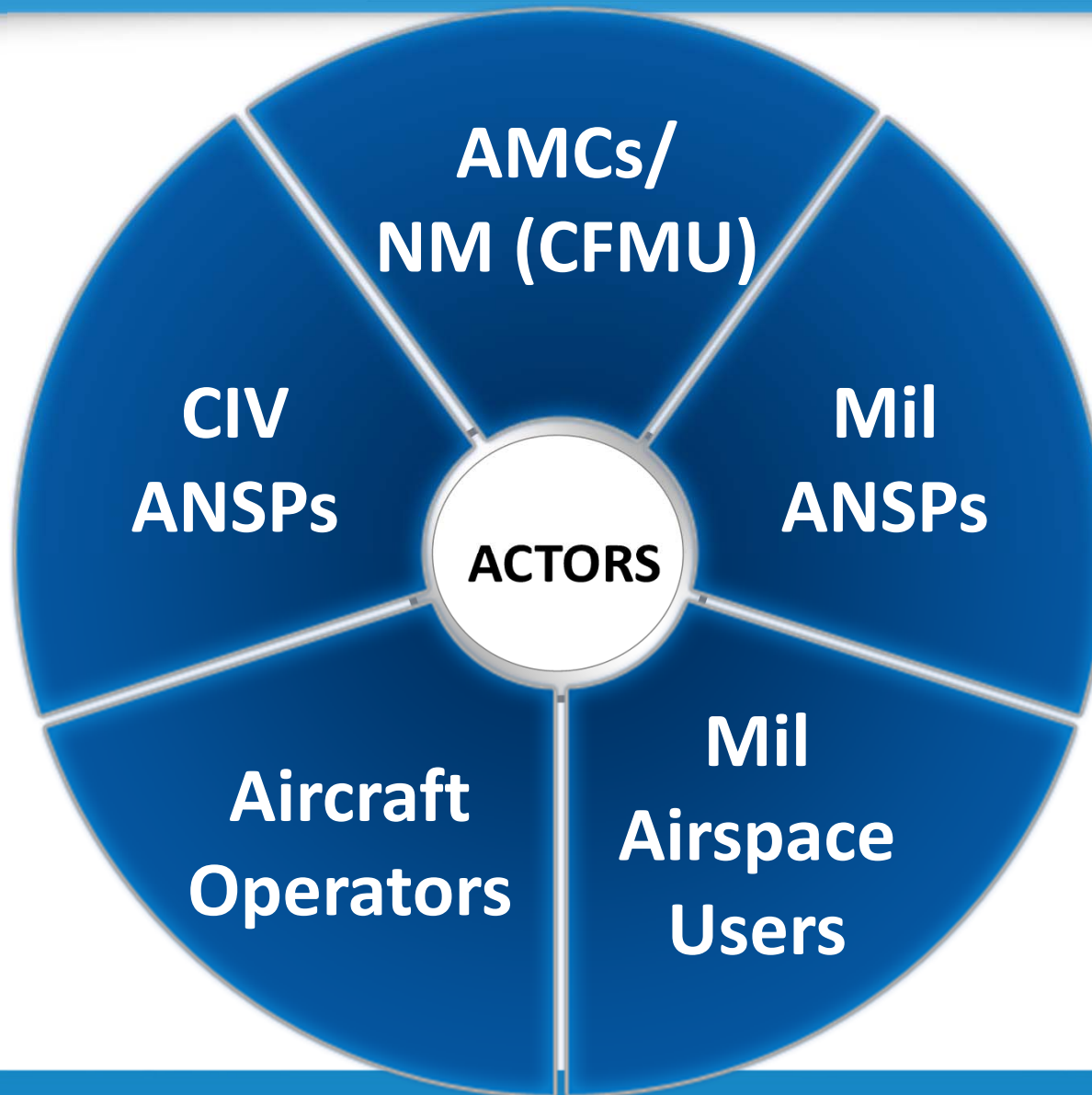
## ASM support system

- System to support airspace planning and allocation, CIV – MIL coordination, common situational awareness and collection of statistical ASM data





# Commitment





# Enhanced ASM/ATFCM Process



Flight efficiency

Predictability

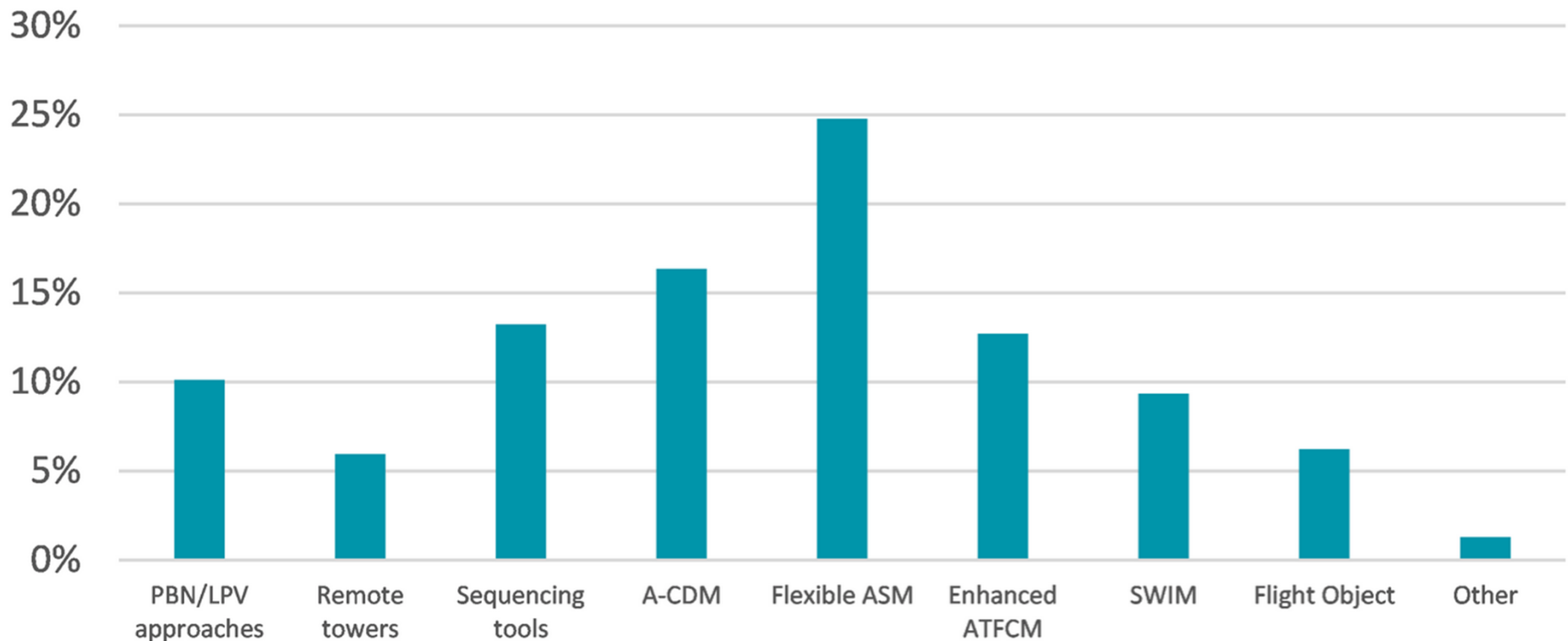
Environmental

Optimised capacity



# Enhanced ASM/ATFCM Process

Which of the following innovations offer the greatest all-round benefits to ANSPs and airspace users?





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# Thank you.

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