

Supporting  
European  
Aviation



# Civil-Military ATM Cooperation support to improving ATS Route Network and ATFM

Civil-Military cooperation workshop

Lima, Peru, 2 to 5 December 2019



NETWORK  
MANAGER

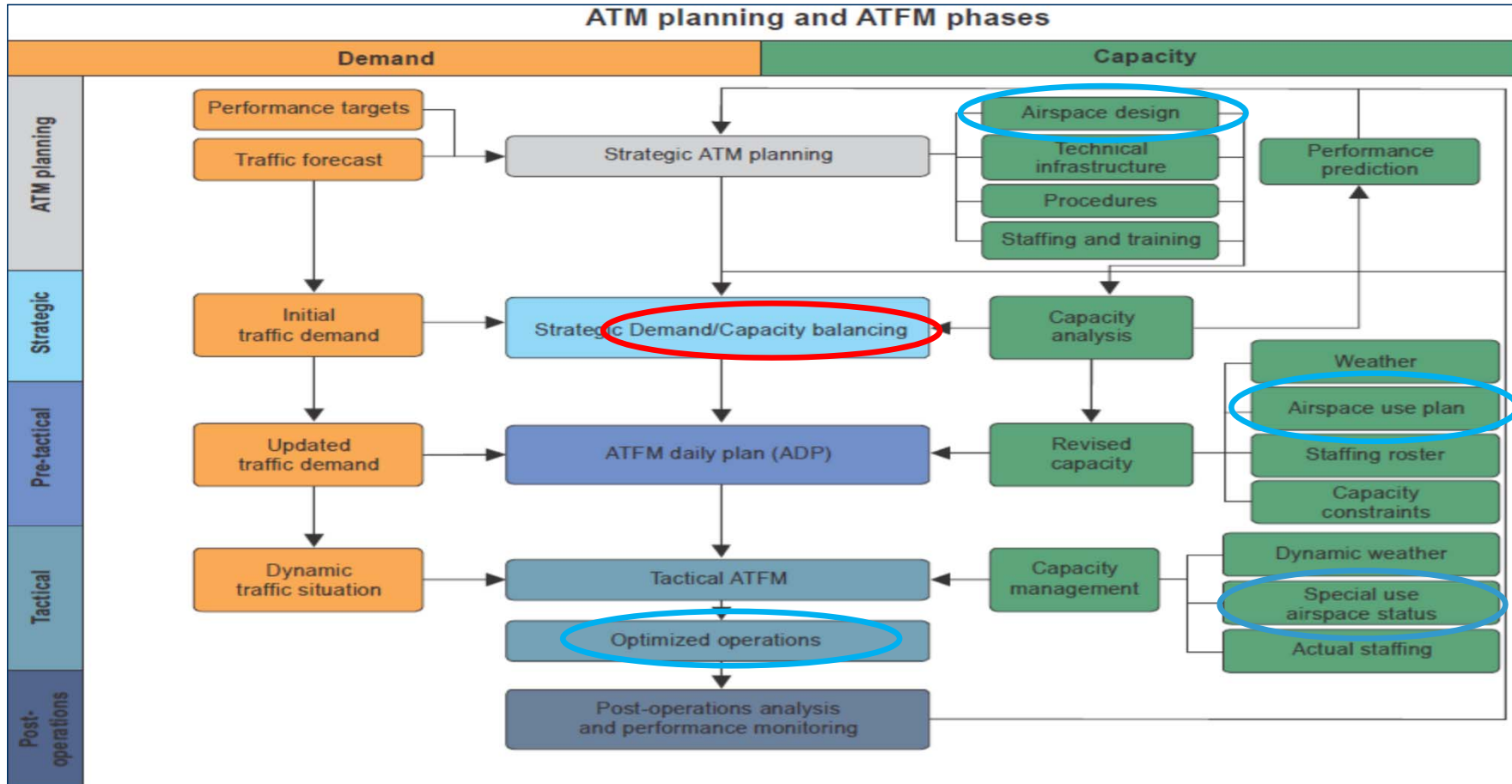




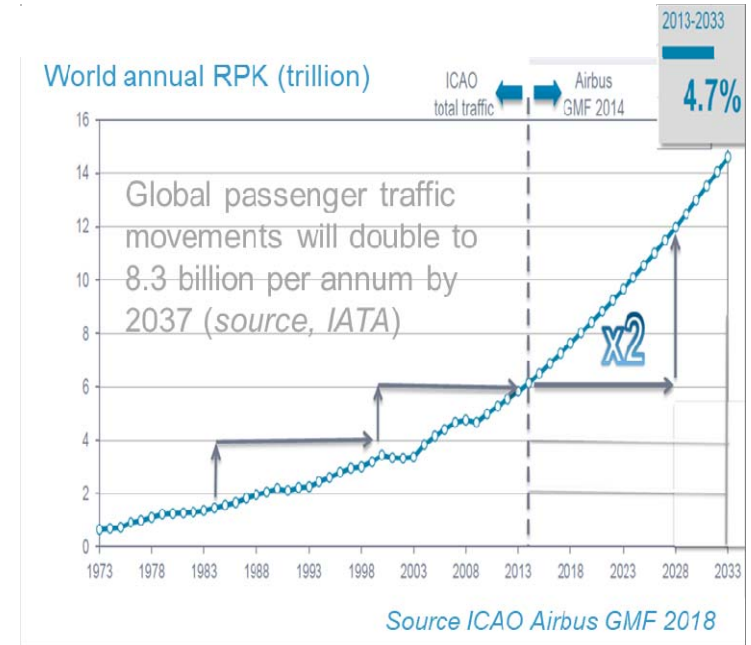
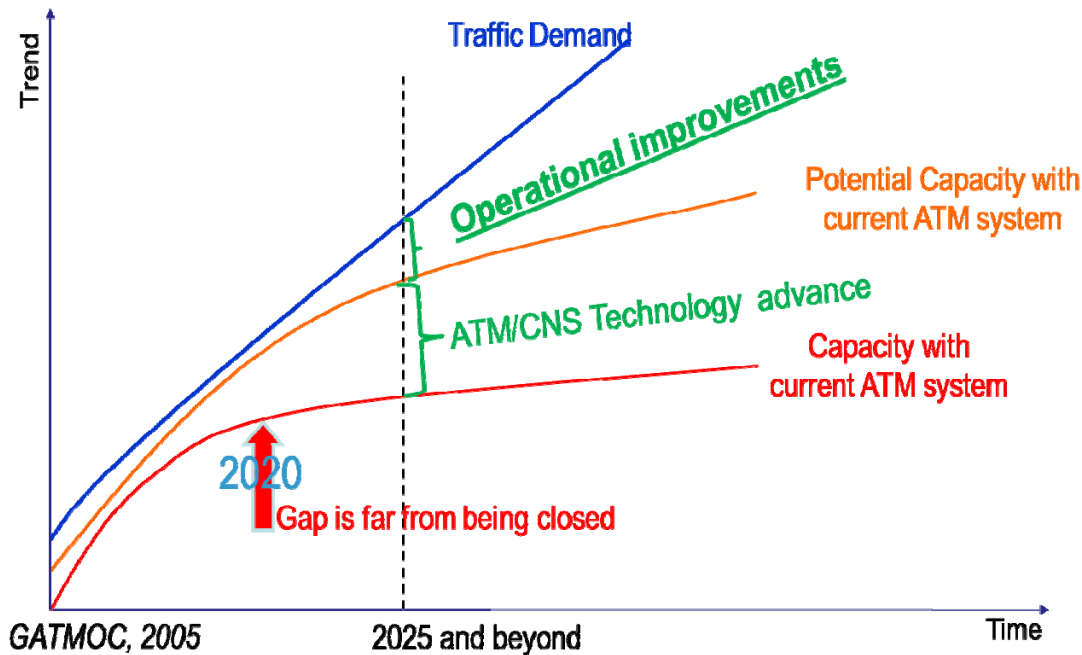
## Overview

- Problem statement
- Why Civil Military Coordination support?
- How to support?
- What could the Military do to enhance FUA?
- Benefits
- A-FUA

# ICAO Manual on Collaborative ATFM



# ATM System Capacity challenge



**Alleviate the limits to air traffic growth by improving airspace capacity and user operating efficiency within high level of safety**



## What are the risks?

- Less flexibility for airspace users – operating efficiency/delays
- Airspace and airport congestion – cost efficiency
- ATC and coordination overload – airspace capacity
- Greater levels of CO2 emissions – environment
- Higher number of airspace conflicts – safety

# Key civil-military areas of improvement



## Strategic airspace design/configuration

- Route network development
- ATC sectorization optimization
- Airspace availability improvement

## Airspace User Operations

- Trajectory Management
- Performance-Based Navigation
- Wide information sharing and management

## Airspace organization and management

- Optimization of trajectories & flows
- **Flexible and dynamic ASM/FUA**
- Synchronization of ASM-ATFM-ATS processes

## Demand and Capacity balancing/ATFM

- Optimized resources management
- Planning adjusted to mitigate imbalances
- Dynamic adaptations to changes

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**COLLABORATIVE DECISION-MAKING**

**Reduced delays**

**Increased capacity**

**Improved routing profile**

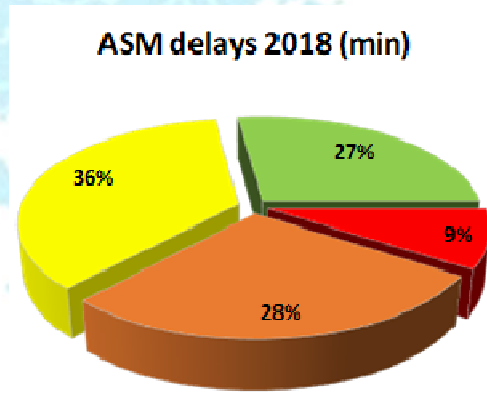
# ASM impact on delays



- The contribution of ASM delays on the total ATFM delay can be significant in certain regions and/or days
- Huge increase in Europe in 2018

YEAR	NR_DAYS	REGULATION REASON	TOTAL DLYS 2018	TOTAL DLYS 2017
2018	315	ATC CAPACITY	7,535,774	4,442,139
<b>2018</b>	<b>315</b>	<b>WEATHER</b>	<b>7,870,892</b>	<b>4,670,415</b>
2018	315	ATC STAFFING	1,101,819	1,471,058
<b>2018</b>	<b>315</b>	<b>AERODROME CAPACITY</b>	<b>1,686,298</b>	<b>2,112,081</b>
2018	315	INDUSTRIAL ACTION (ATC)	2,108,648	694,917
<b>2018</b>	<b>315</b>	<b>AIRSPACE MANAGEMENT</b>	<b>609,772</b>	<b>186,275</b>
2018	315	OTHER	452,737	218,695
<b>2018</b>	<b>315</b>	<b>SPECIAL EVENT</b>	<b>488,567</b>	<b>390,386</b>
2018	315	EQUIPMENT (ATC)	368,331	343,845
<b>2018</b>	<b>315</b>	<b>ENVIRONMENTAL ISSUES</b>	<b>124,832</b>	<b>144,972</b>
2018	315	AERODROME SERVICES	25,498	25,857
<b>2018</b>	<b>315</b>	<b>ATC ROUTING</b>	<b>10,892</b>	<b>31,396</b>
2018	315	ACCIDENT/INCIDENT	6,740	10,588
<b>2018</b>	<b>315</b>	<b>INDUSTRIAL ACTION (NON-ATC)</b>	<b>1,926</b>	<b>6,916</b>
2018	315	NOT REGULATED/NOT SPECIFIED	948	1,249
			<b>23,994,219</b>	<b>14,750,789</b>

How ASM can help?



# Integrated view of ASM & ATFM measures



## ATFM Strategic Phase – ASM Level 1

Airspace & route planners, ACCs/FMPs and Airspace Management Entity

Identify choke points, sector capacity and demand imbalances

Deliver airspace and CDR availability

## ATFM Pre-tactical phase – ASM Level 2

AMCs/ACCs/FMPs

Analyze-define routing scenarios to solve capacity shortfalls

Allocate airspace in accordance with flexibility and dynamicity principles

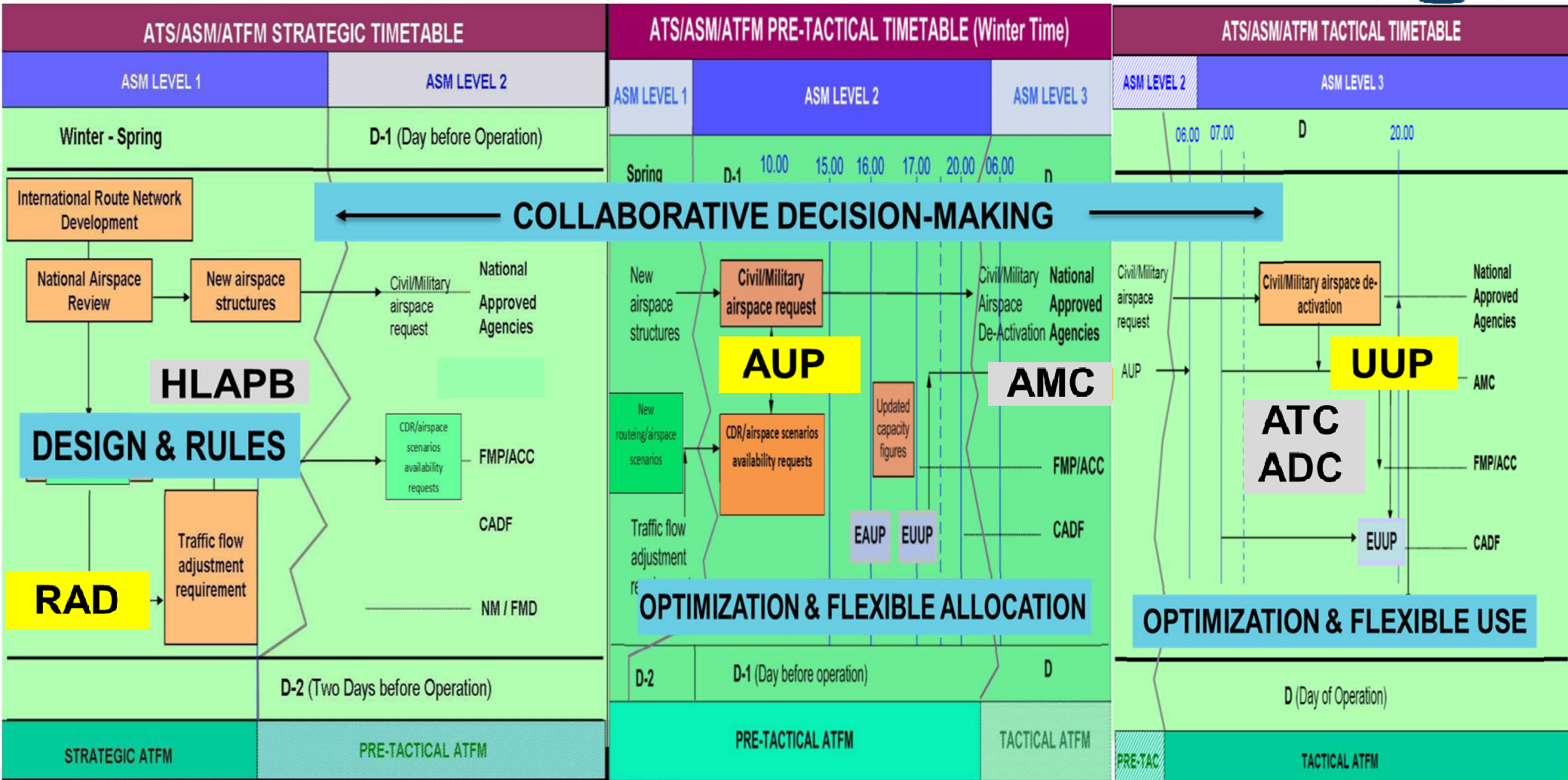
## ATFM Tactical phase – ASM Level 3

AUs/ATCOs/ADCs

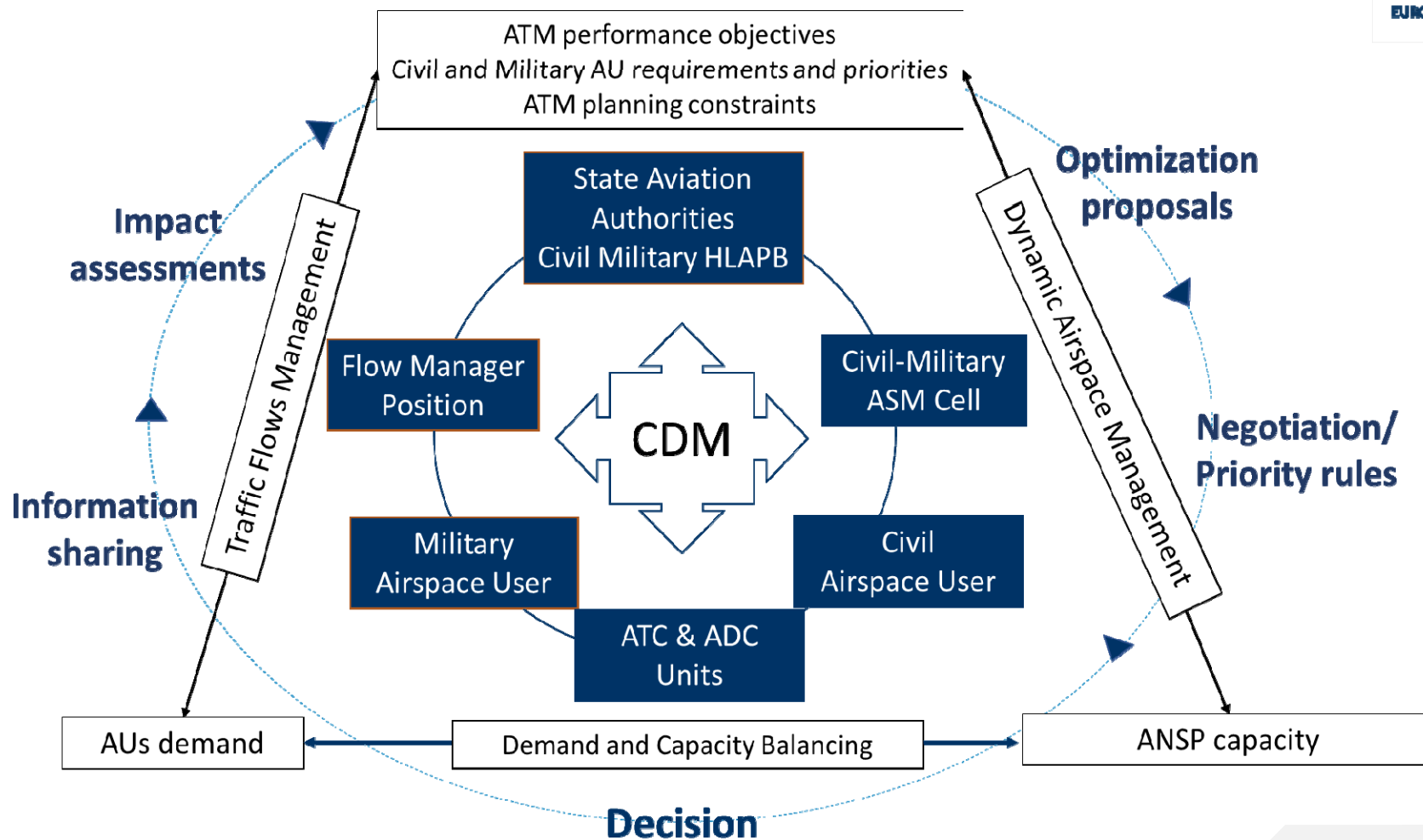
Optimize route options and reroute traffic flows at short notice

Release unused airspace

# Civil-Military ASM – ATFM – ATS processes in Europe



# Civil-Military operational CDM





# Performance monitoring & benefits of FUA / ASM

## Strategic ASM

Airspace-route availability delivery to route & flow optimization needs

Airspace Capacity

## Pre-tactical ASM

Effectiveness of ARES (SUA) booking procedures

Flight & Mission Efficiency

Effectiveness of GAT planning on available ARES

## Tactical ASM

Effectiveness of ARES (SUA) usage

ATC capacity

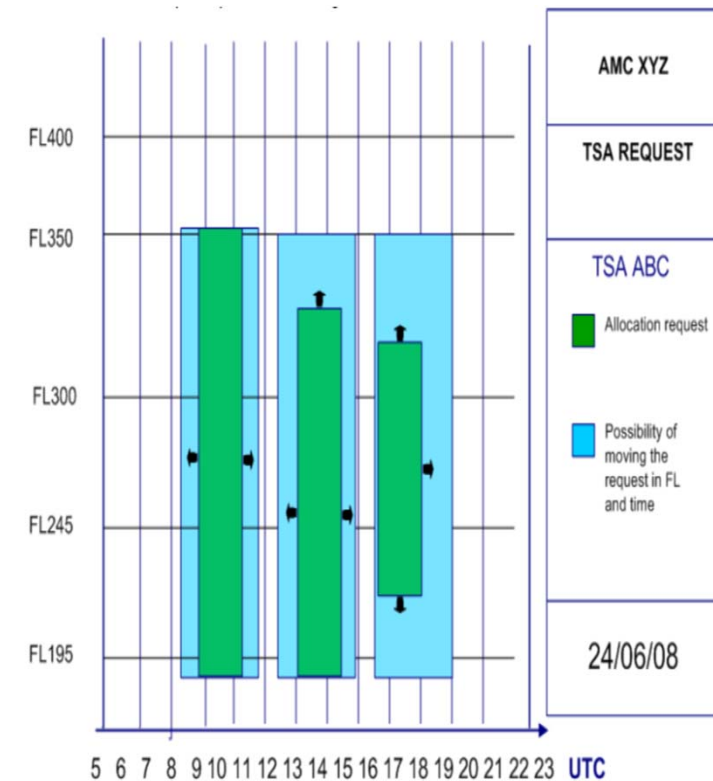
Effectiveness of GAT usage of available ARES

# Example of European military support to ATM System Capacity

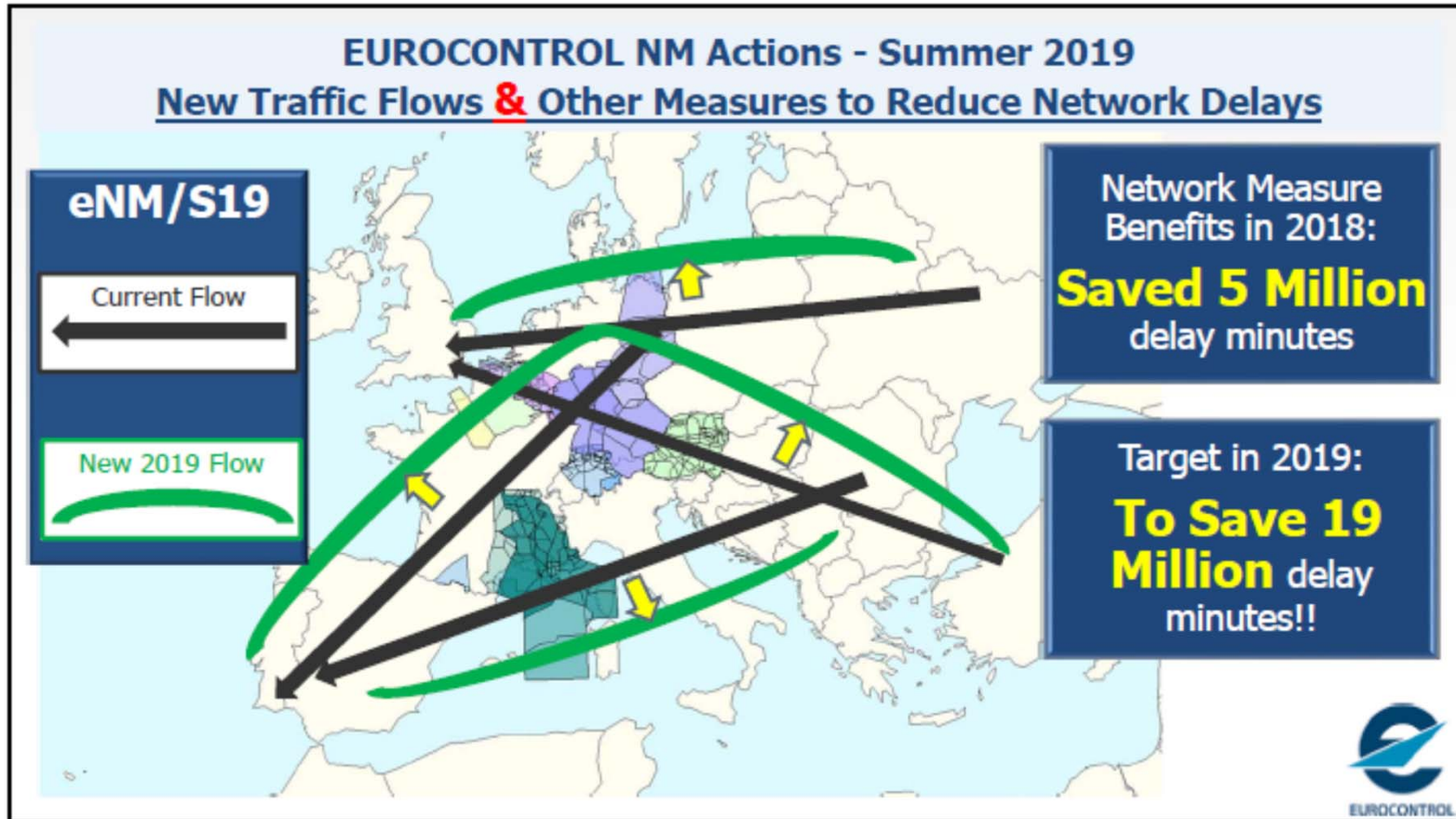


During summer 2019, the military support measures focused on:

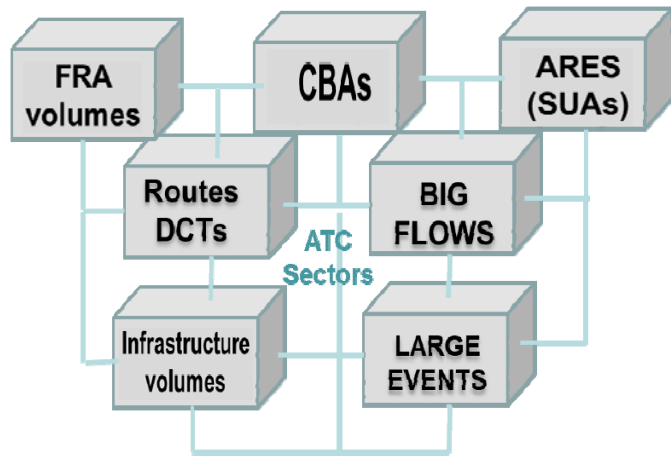
- Keeping military ARES use plan stable after D-1 as much as possible
- Implementing a vertical modularity whenever possible (reporting upper ARES level limit at D-1)



# Civil benefits



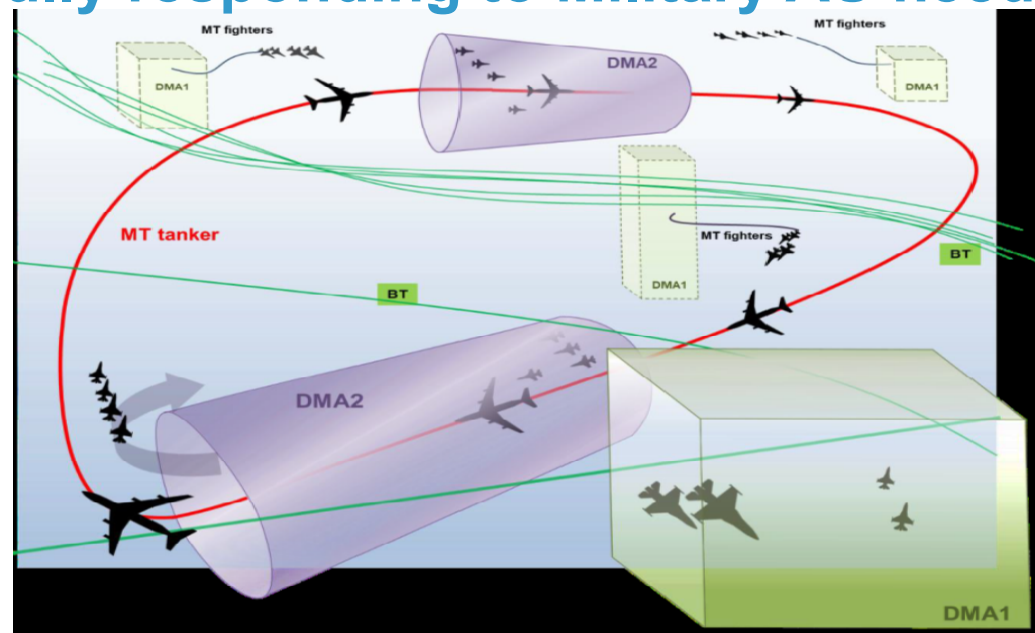
# A-FUA / Dynamic Airspace Configuration



DMA design types of ARES (SUAs):

- 1 – geographical location flexibility
- 2 – flexibly connected to military trajectory
- 3 – a moving “bubble” around the aircraft/formation/activity

## Fully responding to Military AU needs



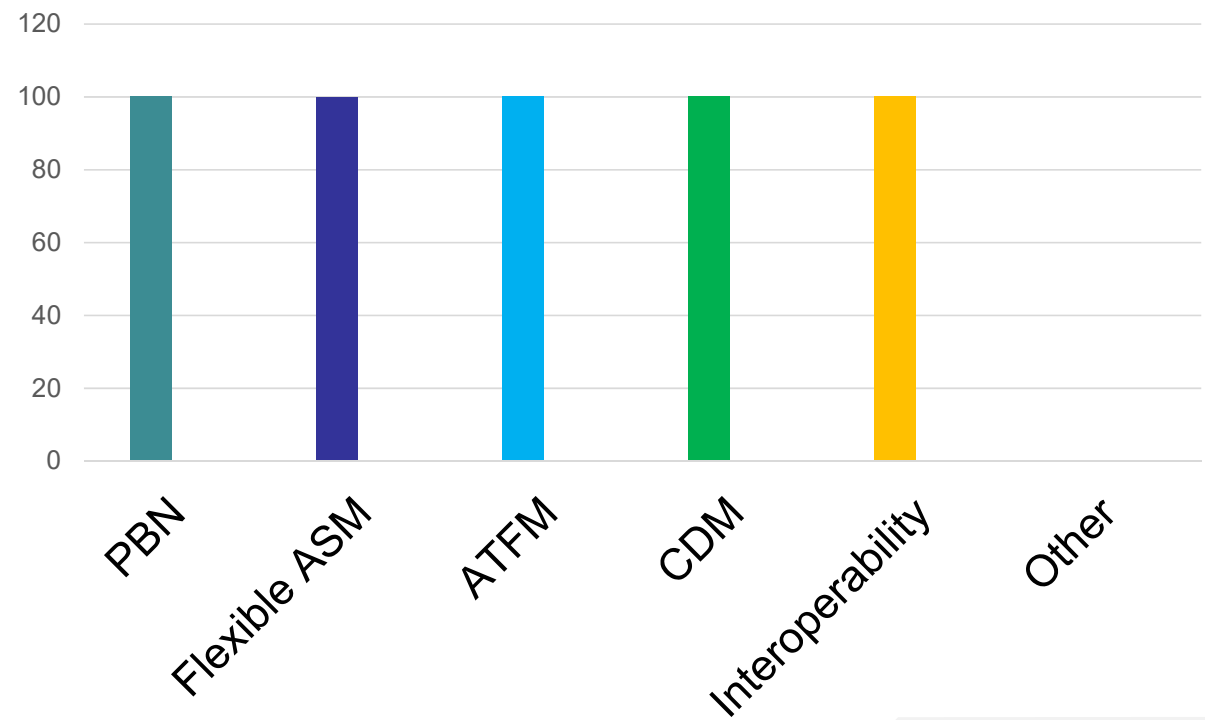
**Integrated & performance oriented  
ASM-DCB-ATS  
solution**

## Food for discussion



Which of the following improvements offer greatest satisfaction

- To civil ANSPs?
- To Military Airspace Users?
- To Civil Airspace Users?



# Thank you



## Civil-military cooperation in aviation

POWERED BY THE

Directorate European Civil-Military Aviation and the Network Manager

Enhancing ATM performance while safeguarding  
national security and defence needs.