



FROM INNOVATION TO SOLUTION

# The European ATM Master Plan



founding members



EUROPEAN UNION



EUROCONTROL

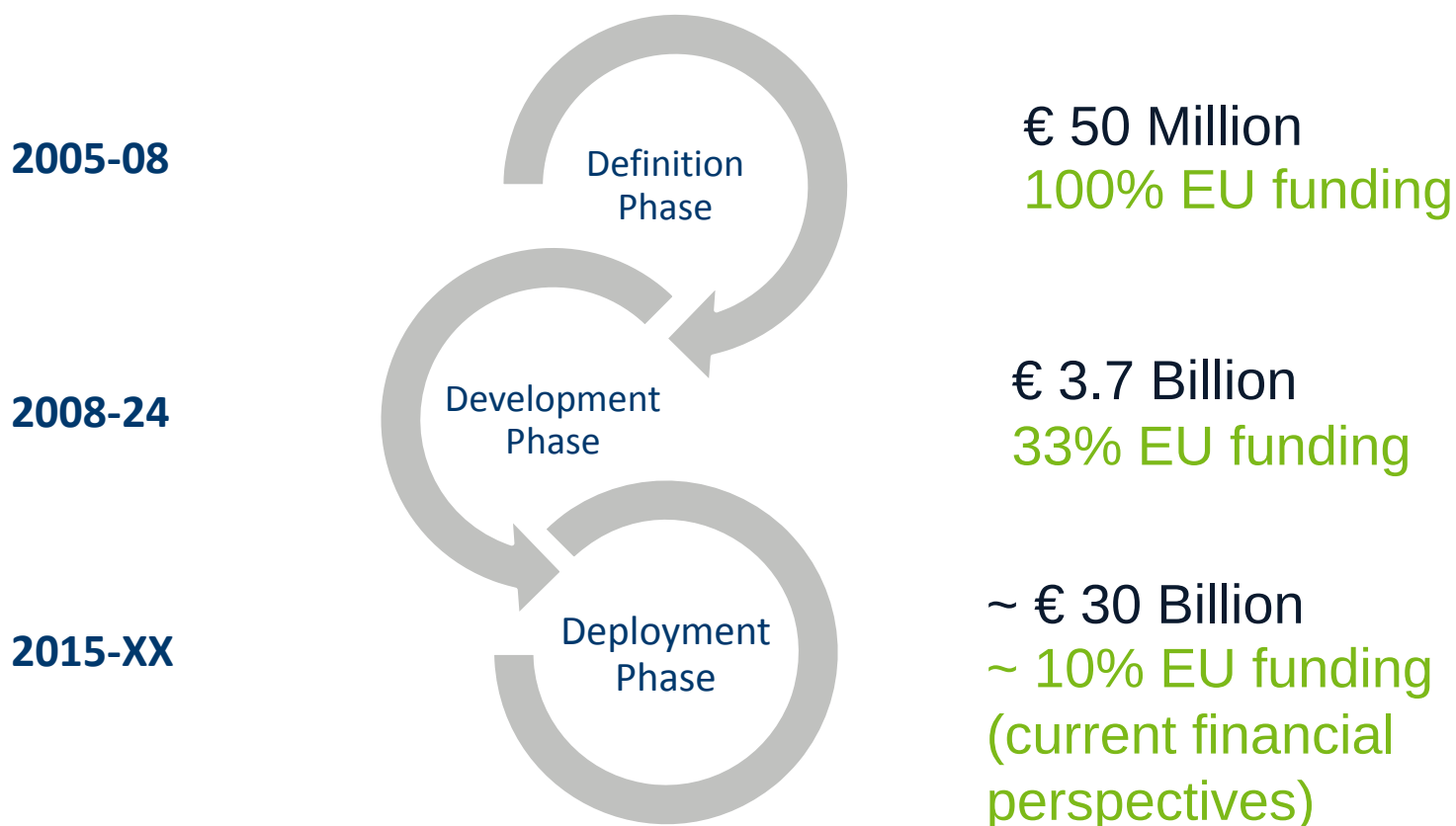
# Connecting the dots



- Why we need to act
- What needs to be done
- When it needs to be done

**THE MASTER PLAN DEFINES THE PRIORITIES FOR EU FUNDING**

# Public investments play a pivotal role



SECURING THE LINK BETWEEN PUBLIC AND PRIVATE ENGAGEMENT

# A transparent and collaborative process

## Broad stakeholder involvement



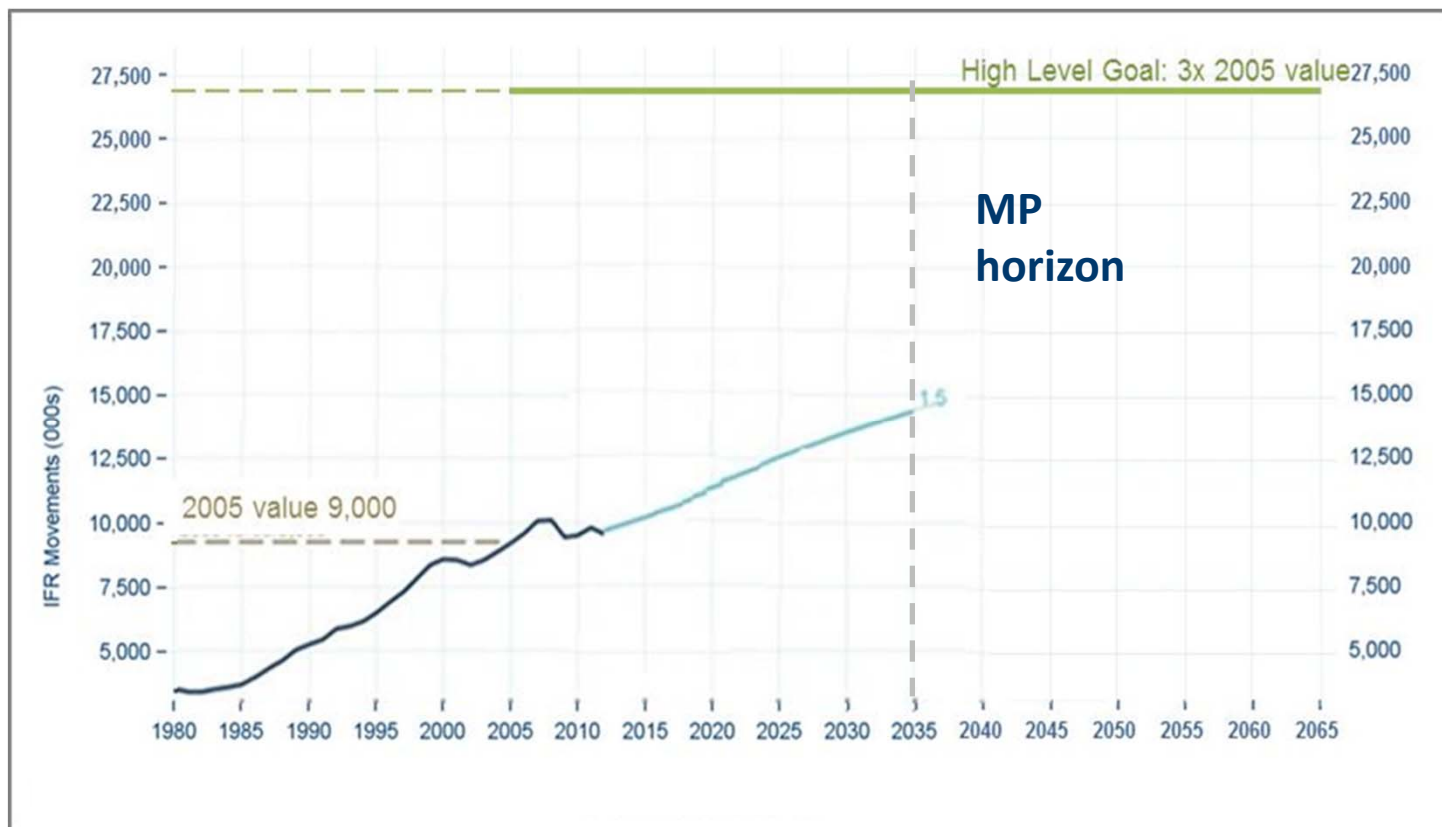
## Partnership as the key to success

- Agree where there is a need to act
- Articulate a clear vision
- Set the right priorities

**THE KEY IS TO AGREE THE RIGHT AMBITION LEVEL THAT ALL CAN SHARE**

**WHY WE NEED TO  
ACT**

# The context has evolved



THE OPPORTUNITY WAS TAKEN TO “RETHINK” SESAR



LUTION

# Key challenges addressed

When we talk about SESAR we talk about SES

Consistency with SES regulatory framework. SESAR performance ambition level is now cross-readable with SES Performance pillar

To-date the main driver was to build capacity

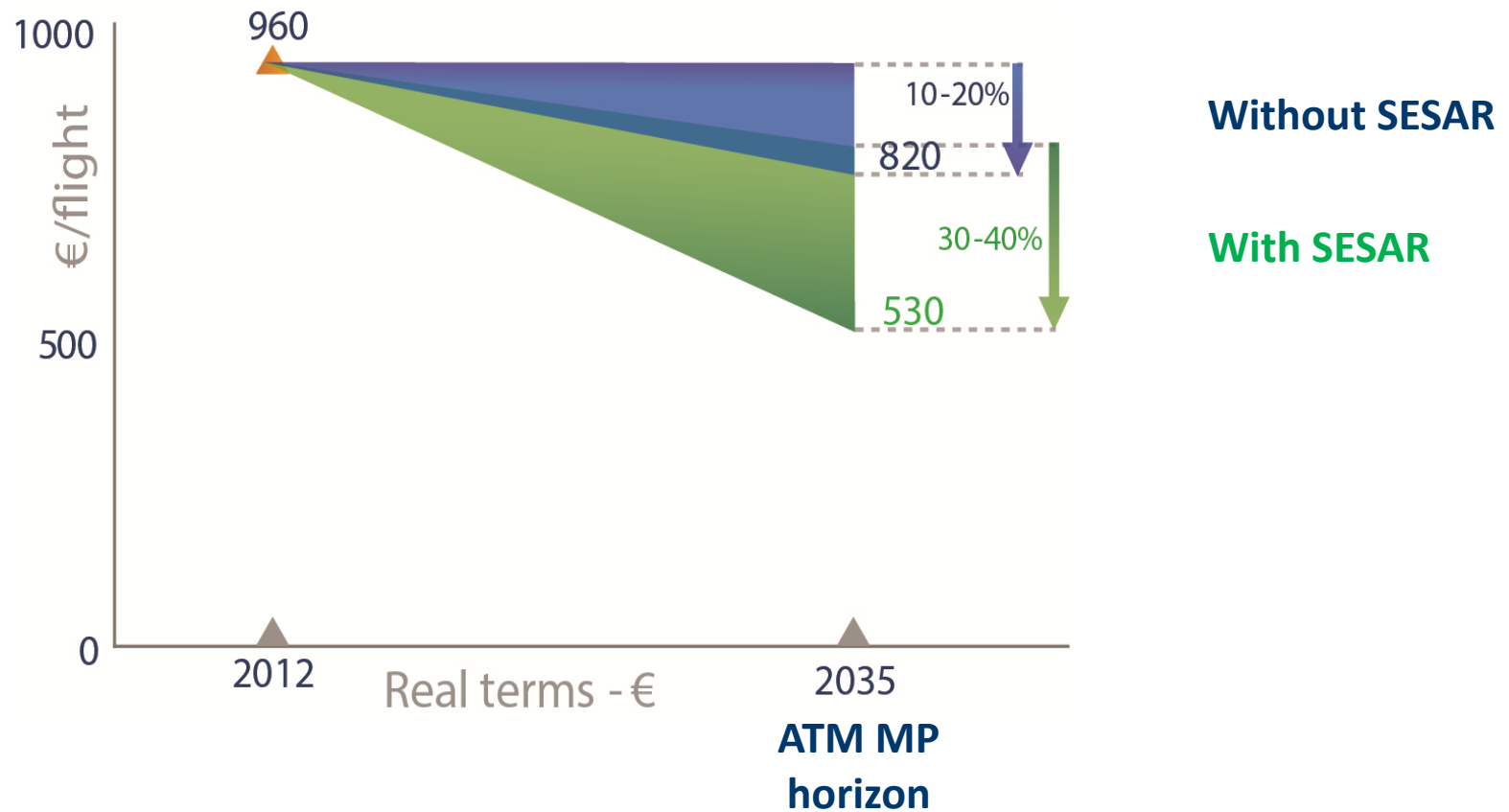
The main driver moving forward is to help address the cost issue

We have today all conditions for a change

This update brings closer than ever the 3 processes of the SESAR lifecycle that are now activated (Definition>Development>Deployment)

**WHEN ITS NOT IN THE ATM MASTER PLAN IT IS NOT IN SESAR/SES**

# Towards higher levels in ANS productivity



**SIGNIFICANT IMPROVEMENT IN OTHER PERFORMANCE AREAS ARE ALSO TARGETED**



**WHAT NEEDS TO BE DONE**

# Connecting technology & performance

## Role of enabling technology in other industries

### Electricity



### Banking



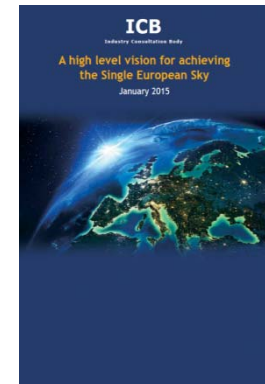
### Postal



### Technology



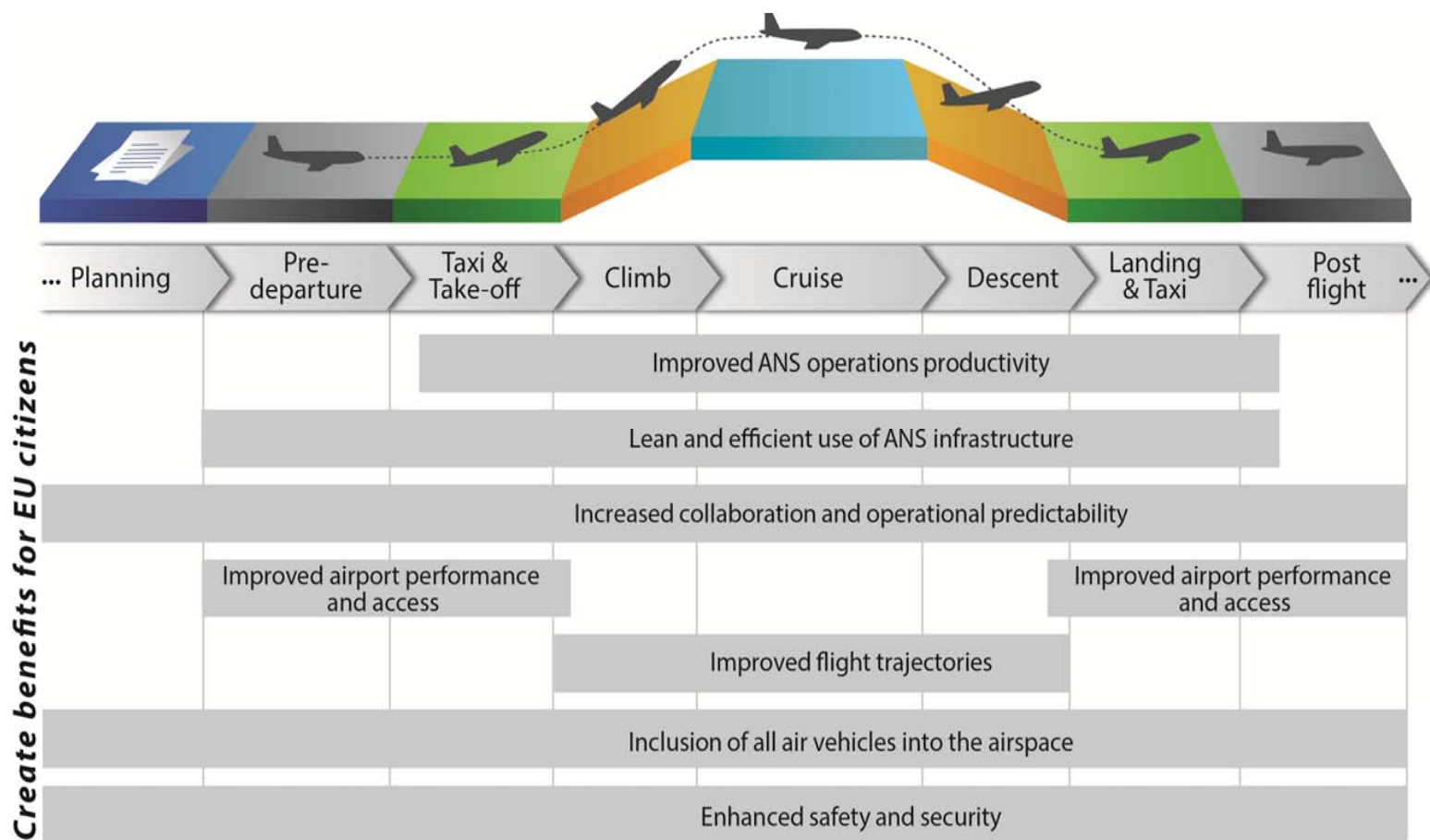
## PRB, flight path, ICB and CANSO vision



IS ATM SO DIFFERENT COMPARED TO OTHER BUSINESS?



# SESAR vision targets 7 improvement areas



**LOOKING AT THE FLIGHT AS A WHOLE, WITHIN A FLOW AND NETWORK CONTEXT**

# SESAR to enable step-change in system capabilities

## Automation of routine tasks



Automation and use of data communication to ease controllers & support staff workload

## Integration of all vehicles



All air vehicles fully integrated in ATM environment (incl. RPAS)

## Flight-centric operations



Air users fly their preferred, more direct route in a flow and network context

## Integrated systems



Lean and modular systems, easily upgradable and interoperable

## Sharing of information



Information shared digitally via common information platform

## Virtualization



Virtualization allowing dynamic capacity management

FROM INNOVATION TO SOLUTION

# Achievement of SESAR ambition will require the implementation of critical enabling infrastructures

Not exhaustive

## New CNS Infrastructure



### Data-link Communication

- Multilink ( LT<sup>1</sup> SATCOM datalink, LDACS<sup>3</sup> , Aeromacs)

### Precision Navigation

- GBAS, SBAS, GNSS, A-PNT<sup>4</sup>

### Future of Surveillance

- Multi-layered infrastructure (SSR, ADS-B<sup>5</sup> ,Wide-area Multilateration)

### Adequate CNS to integrate all air vehicles<sup>2</sup>

- Low cost ADS-B<sup>5</sup> , GNSS and datalink solutions

## New controller tools & practices



### Virtual center to enable decoupling of infrastructure from service provision

- Flexible load balancing
- Common standards to enable interoperability
- Sectorless ATM
- Advanced airspace management tools.

### Human machine interface technologies to enhance automation

- Conflict detection and resolution tools
- Advanced CWP functions (e.g. multi-touch)

## System wide information & service



### ATM information shared digitally via a common platform (SWIM)

- Common data model (AIRM, runtime registry)
- AOP/NOP integration
- Cyber-security proofed
- Military-civil inter-ops.

### Harmonized delivery of ATM services

- Open standards
- Service delivery using the common information platform

## Trajectory based management



### Trajectory based ATM system

- Gate-to-gate trajectory information (incl. taxi) is shared by all actors
- Optimised trajectories taking into account priorities and constraints
- Synchronized AIM/ MET<sup>6</sup> information
- Network Management and Demand and Capacity Balancing
- Airport Integration and Throughput

1. Long Term; 2. RPAS, CA, Rotorcraft; 3. Digital Aeronautical Communication System; 4. Ground-Based Augmentation System, Global navigation satellite system, Alternative Positioning, Navigation, and Timing ; 5. Automatic dependent surveillance – broadcast; 6. Aeronautical Information / Meteorological information;

# Stronger emphasis on global interoperability

**SESAR/NextGen State of Harmonization reflected**



**All elements are traceable and feed into the ICAO Global Air Navigation Plan**



# Master Plan priorities have been fully reflected in SESAR 2020



## Setting the right priorities



## DEFINITION

Range of possible options were assessed during the Master Plan update process

## Delivering the right solutions



## DEVELOPMENT

SESAR 2020 programme reflects Master Plan priorities (scope, timing etc ...)



# A reshaped R&D programme

## THE SESAR 2020 PROGRAMME STRUCTURE



2 waves : 2016-19 & 2019-21, synchronised with the European ATM Master Plan update cycle

# Putting the research community in the driving seat

***SESAR exploratory research drives the development and evaluation of innovative or unconventional ideas, concepts, methods and technologies; that can define and deliver the performance required for the next generation of European ATM system, and thus contribute to its successful evolution***

Reviewed, updated and approved by the  
SESAR Scientific Committee

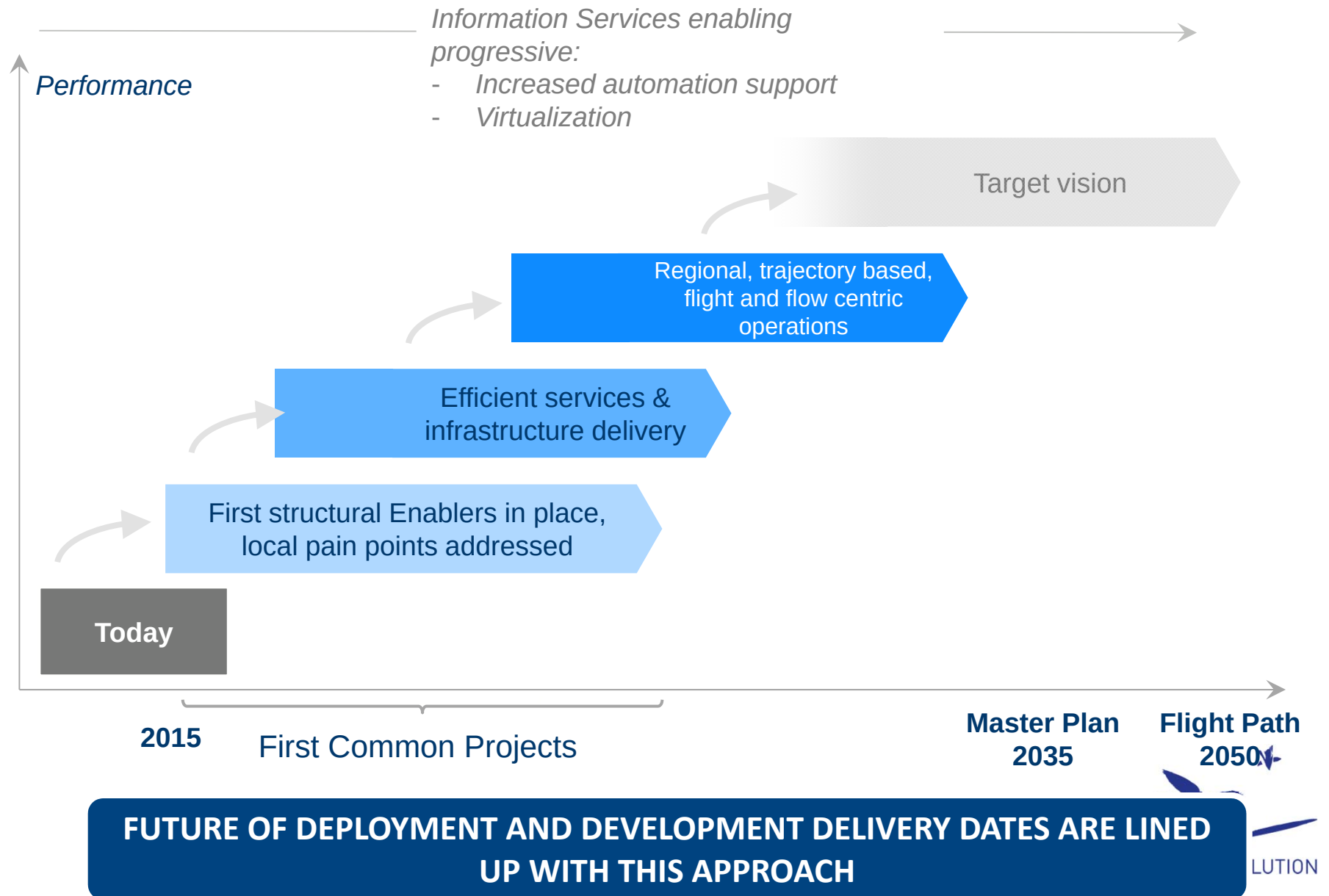


**CONCENTRATES ON EARLY MATURITY EXCELLENT SCIENCE AND INITIAL APPLICATIONS TO ATM, FEEDING THE EUROPEAN ATM MASTER PLAN**

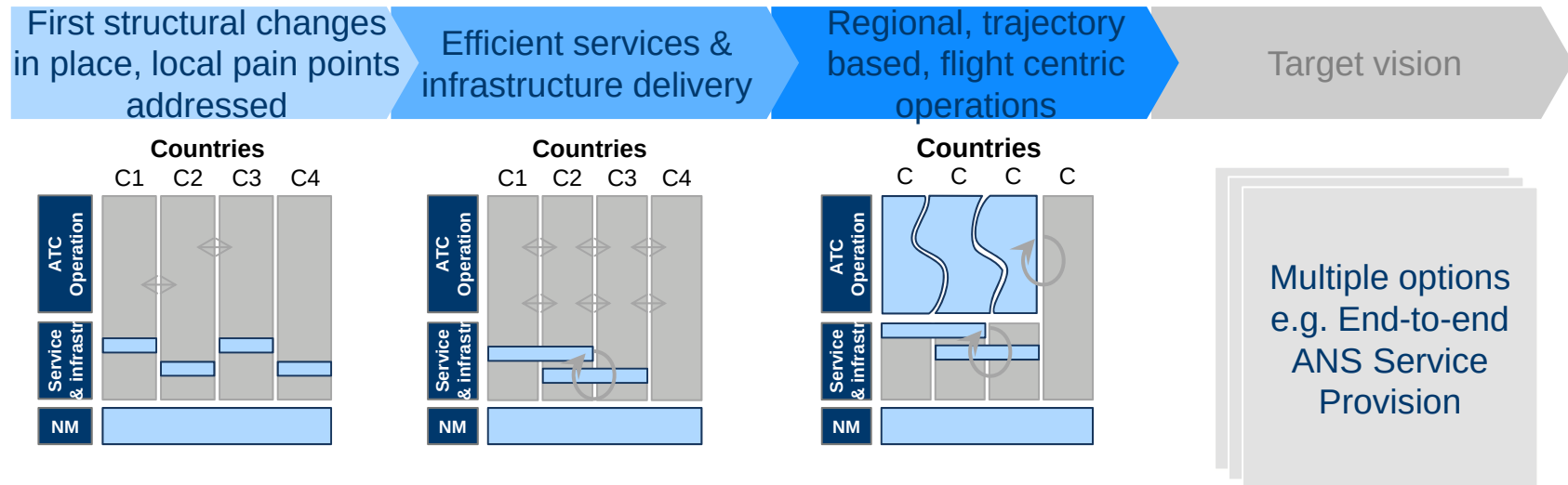


**WHEN IT NEEDS TO BE DONE**

# Deployment progressively moves from structural enablers to target vision



# SESAR will enable change in ATM model to achieve the ambition



Range of possible evolution options will increase as solutions mature

WE DO NOT DEFINE HOW MODELS SHOULD EVOLVE. ANY DECISION WILL HAVE TO BE TAKEN BY RELEVANT DECISION MAKERS

## To summarize

- The ATM Master Plan has a **structuring impact** on both development and deployment activities now running in parallel
- Technology options **are prioritised** are directly hooked to SESAR performance ambitions and to the SES policy
- We look at the research community to help us feed the ATM Master Plan with **innovative ideas** and further shape the SESAR Vision

