Supporting European Aviation

EUROCONTROL

EUROCONTROL NETWORK MANAGER USER FORUM 2023

Network Operations Concept

2-3 February 2023

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NETWORK MANAGER

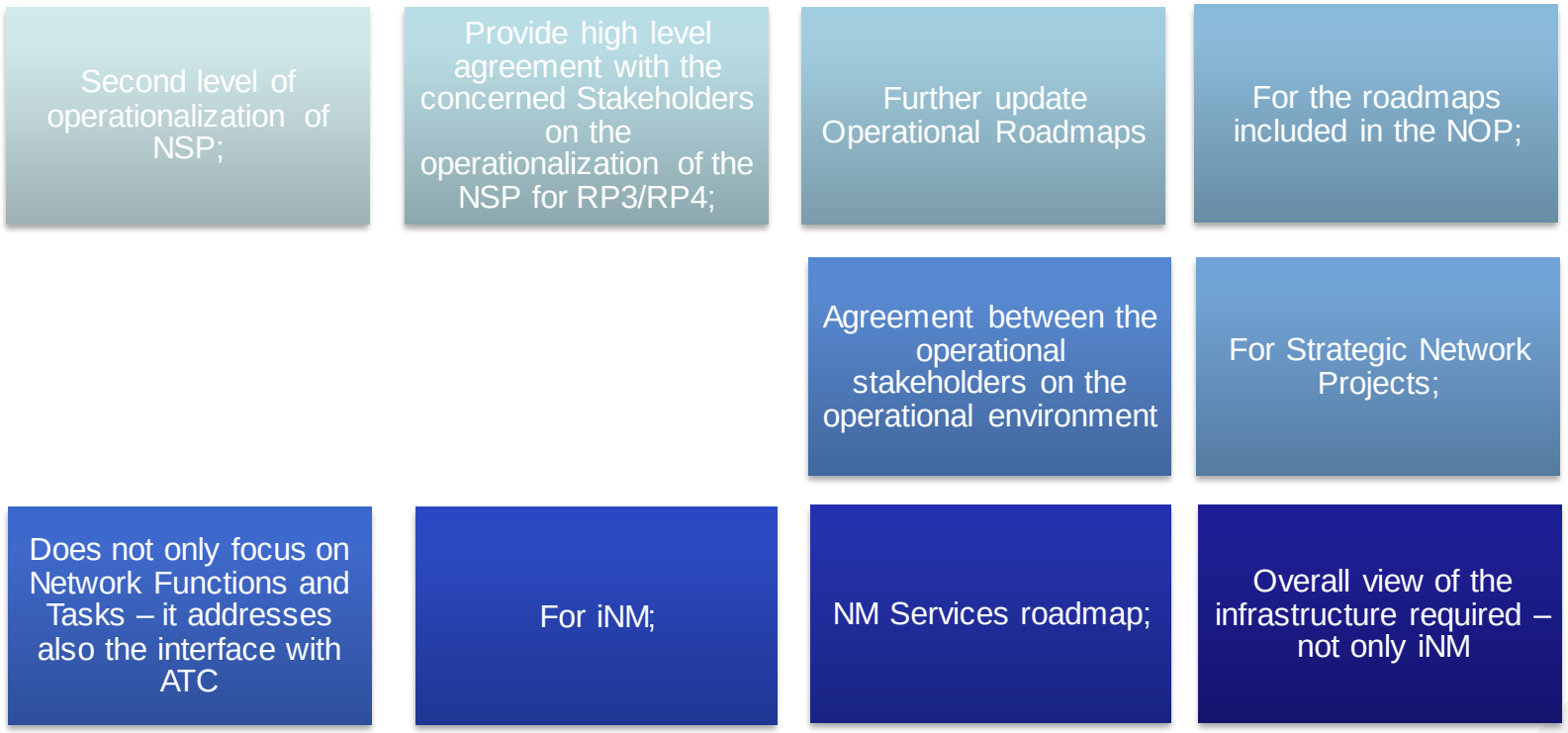
Background

- **2014: First release** of the **“Network Operational Concept”**
- **2016: Second release** of the **“High Level Network Operational Framework 2019”.**
- **2020: Third release** of the **“High Level Network Operational Framework 2029”.**
- **2022: Fourth release** of the **“High Level Network Concept of Operation CONOPS 2029”**

Extensive operational stakeholders consultation
through the
Network Cooperative Decision Making Processes

Network ConOps, which is the purpose?

- Provide a **common high-level view** of the target European network operations by 2029
- **High Level Implementation Roadmap** description;
- Overall **detailed implementation planning** will be through the NOP.
- Addresses **all the network components** as per their definition in the NF IR.
- Necessary for:



Network ConOps, which is the purpose? OPERATIONALIZATION

- **Operationalization** is a process of defining the measurement of a phenomenon that is **not directly measurable**, though its existence is inferred by other phenomena. Operationalization thus defines a **fuzzy concept so as to make it clearly distinguishable**, **measurable, and understandable by empirical observation**. In a broader sense, it defines the **extension** of a **concept**—describing what is and is not an instance of that concept.

What is it not the Network ConOps?

Summary of existing documentation.

Showing **how to achieve,** but what to achieve.

Re-writing existing documentation – it is putting the ends together.

Detailed planning document.

A plan neither a program, therefore the links with ATMMP, SDP or OEP do not need to be highlighted as it is mainly oriented towards the content.

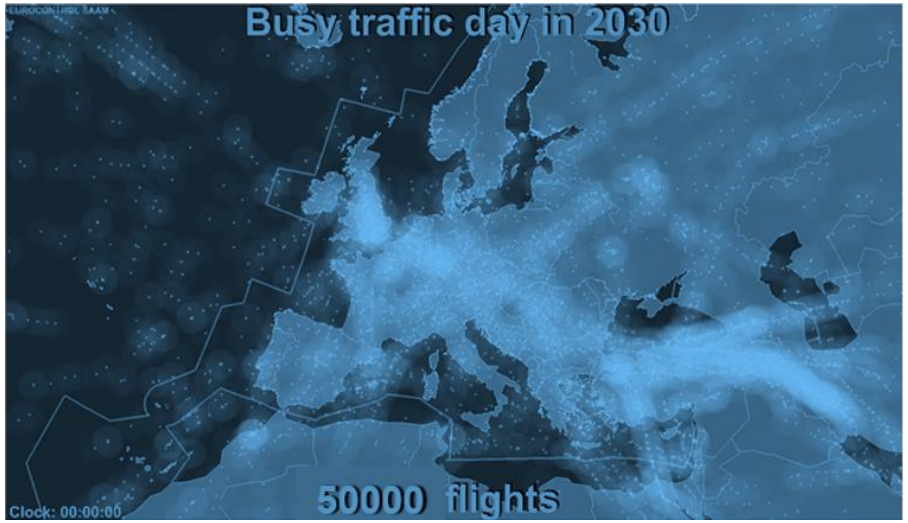
NETWORK CONOPS structure

- It follows the standard CONOPS structure, first assessing the **current situation of network operations and identified shortcomings**.
- It assess the **impact on performances** addressing the overall cost and performance benefits of this CONOPS.
- It does propose a way forward via **5 main Direction of Change** (DoC):

- Each of identified DOCs and related operational elements are grouped in **two clusters** (**by 2025 and 2025-2029**), which are organized **in the operational phases (strategic, pre-tactical, tactical, execution and post OPS)**, addressing for each phase the expected improvements for each snapshot (2025 and 2029).

Network traffic demand

- The European ATM network needs to accommodate around **50 000 flights per day in a peak day in 2029**, which is an approximate increase of 40% compared with the 2019 traffic demand. (37.000 flights in NM area)



- Unexpectedly **strong traffic growth needs to be accommodated**.
- The Network CONOPS addresses the needs of the substantial **improvements** of European ATM Network in terms of:
  - **Capacity**
  - **Flight efficiency predictability**
  - **Cost-effectiveness**
  - **Sustainability**

Network CONOPS essential improvements by 2029

- In order to manage the predicted traffic demand in 2029 and achieve improvements in major performance areas, some **essential building blocks** need to be put in place, as follows:

Full dynamicity of airspace organization and utilization;

Cross border airspace structures and delegation of ATS provision, where and when required

Enhanced Air-Ground data exchanges (including ATN B2);

Full implementation of FF-ICE/R1 services and initial integration of FF-ICE/R2 services;

Continuous trajectory synchronization and information sharing from the planning horizon into the flight execution phase;

Full sharing of relevant flight information with all Network Actors

Full scalability and resilience

- It also includes the **High-Level Roadmap** that put in place all required components and Network/Local level in time dimension from 2022 till 2029

Major improvements compared with the previous edition

- Core **NM part** (flight, flow) and their **interfaces with OPS Stakeholders** were quite well covered, however some improvements were made to make the document flexible and adaptable.
- **ANSP's system improvements** that are local or have limited interfaces with NM were also revisited and made them more visible.
- **Infrastructure evolutions** included in the document.
- **Roles and responsibilities** of all Network Operational Stakeholders to have a better ConOps approach.
- The **operational enhancements** stemming from **new NM system (iNM)** are included in DoC.
- Specific Annex has been developed to cover the **NMOC improvements in the context of iNM**.

Additional document changes (1)

- The transition to **full digitalization was clarified**, more explicit linked to a human centric network;
- Expanded Operational context with **traffic expectation** in 2030 (50.000 flights)
- Included military traffic demand (**5th generation**);
- Included **military operations** in timeframe scenarios and phases descriptions
- Better focus on **balance of performance** achievements;
- More attention was put on **environment**;
- Included some **resilience capabilities** (scalability, grouping ability, antifragility);
- New thinking of **resources management**;

Additional changes (2)

- Better described the contribution of **CNS infrastructures** to achieve the operational improvements expected for each timeframe scenario;
- Better reference to **global approach** (ICAO, FAA);
- Better description of **crisis management**;
- **Set up the scene** (where we want go in 2030);
- Established a clear **view/identification on infrastructure** (mainly CNS) contributions on the overall Network Operations;
- Included **FF-ICE planning service** (preliminary eFPLs) , important tools for correct traffic forecast;
- Better defined change in 2029 concerning **new entrants** (HAO and UTM);
- Further elaborated on the expected **changes of roles and responsibilities** for NM/ANSP engineering personnel;

Most important directions for:

2025

- Cross-border FRA and connectivity with TMA;
- ASM/ATFCM integration and scenario management;
- TMA optimisation;
- Extension of transfer and coordination dialogue capabilities;
- Automated multi slot swapping;
- FF-ICE R1 services;
- Rolling Network Plan and CDM platform;
- Extended AMAN;
- AOP/NOP integration;
- Integration of small/regional airports into the Network;
- iNM initial deliveries (EAD/CACD integration)
- SWIM YP exchanges of network, aeronautical and flight data

2029

- Dynamic Airspace Configurations (DAC);
- Flexibility and dynamicity of airspace utilisation;
- Integration of ATFCM/ATC (INAP);
- Network UDPP;
- Enhanced CPDLC exchanges;
- Enhanced DCB (multi constraint resolver);
- EPP integration;
- Network 4D trajectory management;
- Enhanced APOC process;
- iNM delivery;
- Enhanced ATC automation (conflict resolution tools)
- ATC virtualisation;

Network Roadmaps

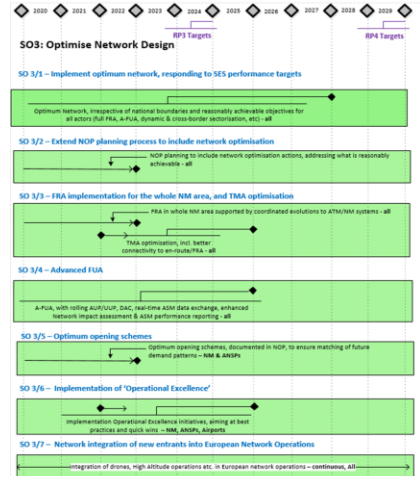
- The **Network Roadmaps** are maintained and published **in NOP 2022-2026** edition (https://www.eurocontrol.int/publication/european-network-operations-plan-2022-2026)

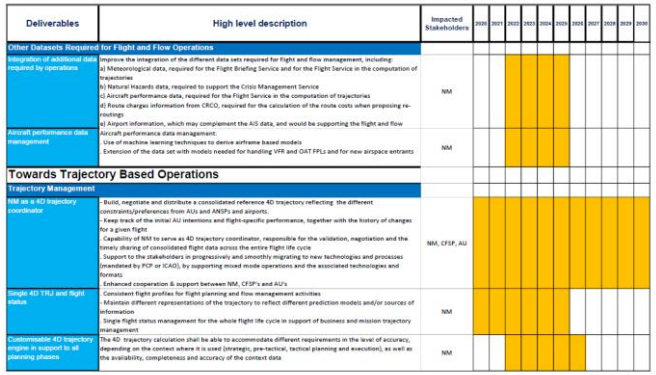
- In order to provide a comprehensive and detailed view of the three levels of the Network Strategy Plan - Strategic, Operational and Technical - the Network Manager has developed three roadmaps:

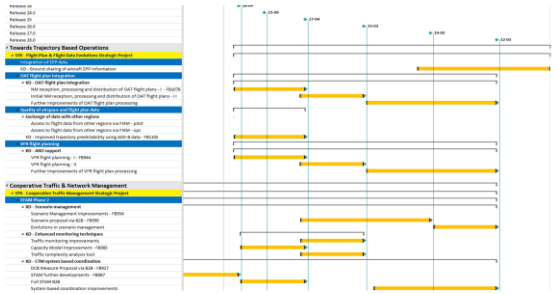
  - The **Network Evolution roadmap** is the one contained in the High Level Network CONOPS 2029 presented on the next slide.

  - The **Network Operational Roadmap** is been aligned with CONOPS roadmap for the next edition of NOP;

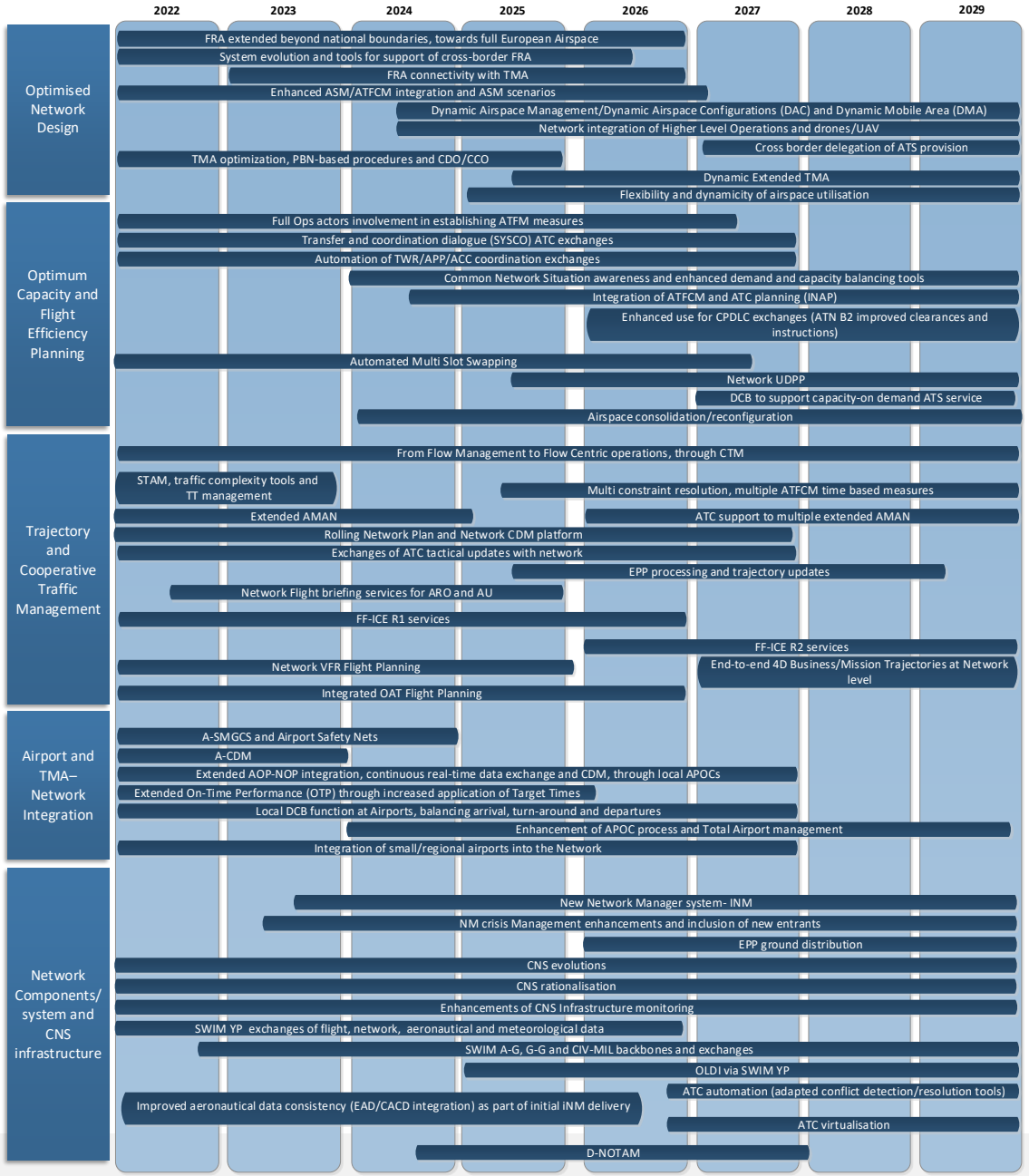
  - The **Network Technical Roadmap** currently covers the NM release process (up to NM 27) and afterwards will be replaced by the technical roadmap that will be developed by NM together with iNM contractor.







Network Evolution roadmap- CONOPS High level roadmap



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