SESAR

2018

European ATM Master Plan Level 3

Implementation View

Progress Report 2018

EUROPEAN UNION

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SESAR

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EXECUTIVE SUMMARY

What is the role of the European Master Plan Level 3 Implementation Report?

The European ATM Master Plan (MP) Level 3 Implementation Report provides a holistic view of the implementation of commonly agreed actions to be taken by ECAC States, in the context of the implementation of SESAR. These actions are consolidated in the form of "Implementation Objectives" that set out the operational, technical and institutional improvements that have to be applied to the European ATM network to meet the performance requirements for the key ATM performance areas defined in the MP Level 1 – safety, capacity, operational efficiency, cost efficiency, environment and security.

What is the overall progress of SESAR implementation?

This 2017 Level 3 Report is based on the MP Level 3 2017 Implementation Plan that included 50 Implementation Objectives. Three (3) out of these 50 Objectives are so called "Initial" Implementation Objectives which provide advanced notice to stakeholders but which contain aspects requiring further validation. Therefore they were not yet monitored at local level in 2017. In order to reflect to the largest extent the results of SESAR 1 and its mature and performing SESAR Solutions, the 2017 edition of the Plan introduced a new type of Implementation Objectives called "Local". These Objectives are addressing solutions considered beneficial for specific operating environments, therefore for which a clear widespread commitment for implementation has not been expressed yet. Typically this is the case for local deployments which may include selected main/core operating environments, subject to positive business cases at local level. Amongst the 50 Implementation Objectives included in the 2017 Implementation Plan, four (4) belong to this new "Local" category.

Overall, the implementation progress of the Master Plan Level 3 at ECAC level is steady. A very solid baseline is being implemented, paving the way for the deployment of the more advanced functionalities envisaged by the PCP and other SESAR 1 results as well as preparing the ground for the incoming SESAR2020 functionalities while, at the same time acknowledging the very high pressure on the Air Navigation Service Providers to deploy the already mandatory elements, especially in the framework of the Performance Scheme. A massive number of Objectives associated to the SESAR Baseline implementation (16 Objectives) are expected to be achieved in 2018/2019 shortly to be followed by the advent of the PCP implementation in the timeframe 2021/2023.

It should be noted that there were few Objectives introduced recently, which are at very early phases of implementation planning or for which concrete implementation plans have not been defined yet. For these Objectives it is premature to establish implementation trends and therefore to identify fully reliable estimated achievement dates.

What are the most important implementation issues per SESAR Key Feature?

a) Optimised ATM Network Services

The overall progress of the Implementation Objectives in this key feature is mostly in accordance with the implementation plan, with two implementation spikes expected in 2018 (for the Objectives associated to the SESAR baseline) and in 2021 (for the Objectives related to the PCP). However, it should be observed that the implementation of "Collaborative Flight Planning" Objective (FCM03) is particularly slow (the very initial completion date for the Objective was expected for 2005, now it is

2018). As this Objective is the cornerstone of the move from the local-centric operations towards the SESAR target concept of flight and flow-centric operations, with the NM playing a central role as information integrator, all involved actors should work in full concert for its swift implementation.

Other functionalities mainly related to NOP and ATFCM are progressing well, both on the side of NM and the ANSPs.

b) Advanced Air Traffic Services

A clear success implementation story in this key feature is the finalisation of implementation of Direct Routing within the regulated (PCP) applicability area and the sustained progress of Free Route implementation. The Free Route Objective is expected to be implemented on time and it is encouraging to see that more and more ANSPs are extending the Free Route airspace below FL 310. Cross-border implementation of Free Route has started impetuously and is already applicable or will soon be in many parts of Europe.

Another improvement in this key feature is the implementation of AMAN tools, confirming the positive trend of the previous years. Basic AMAN is deployed in 20 locations, with another seven (7) on their way to implement before 2019 and, more important, the deployment of basic AMAN is constantly extending with the applicability area of the Objective having grown to 33 locations, from 20 in 2014. The extension of the AMAN horizon (up to 200 NM) is also slowly building up speed despite more complex requirements often requiring coordination with multiple neighbouring ANSPs. While a robust achievement date cannot yet be estimated as on third of the stakeholders have not yet finalised the implementation plans, there are no elements indicating that the 2023 deadline is endangered.

Some implementation issues are identified in implementation of navigation (NAV) Objectives. In particular, the Objective related to implementation of the approach with vertical guidance (NAV10) that follows the deadlines of ICAO resolution 3711. Although this is a non-mandatory deadline, there is an uncertainty regarding the publishing of EASA PBN IR so the stakeholders show some reluctance in the implementation. These issues should be resolved once PBN IR is published. This will also require the recalibration of the Objective to align with the European approach. Moreover, the current lack of EGNOS coverage over the entire ECAC (or even EU) area has been raised as impeding the successful implementation of the Objective.

c) High Performing Airports

The set of Objectives grouped under this key feature provides an incremental evolution of functionalities, starting with basic A-SMGCS Surveillance and further evolving towards more complex functionalities (A-SMGCS Runway Monitoring and Conflict Alerting), unlocking and culminating with the PCP's improvement of runway safety with ATC clearance monitoring as well as with the automated assistance to controller for surface movement planning and routing. Therefore the implementation of A-SMGCS surveillance is particularly important as this is the baseline Implementation Objective without which other A-SMGCS functionalities cannot be deployed. It is observed that amongst the "PCP airports", having to implement the full set of functionalities, 6 have not yet implemented the basic A-SMGCS Surveillance. However, the current plans indicate that they will finalise implementation before 2020, most of them in the timeframe 2018/2019.

Basic A-CDM implementation also shows some delays against the deadline (12/2016). Out of 25 PCP airports, 18 have implemented this important pre-requisite to date. However, remaining airports are

either going to become an A-CDM airport in 2018, or already functioning as an Advanced TWR Airport which means that they are connected to the network and already provide the relevant DPI information.

The 2017 reporting exercise confirmed the need to re-assess the applicability of Time Based Separation (TBS) Implementation Objective (AOP10). It seems that the commitment and feasibility of using this functionality at airports is still not there as half of the airports on the (PCP) applicability list have no plans yet to implement the functionality or consider it as not applicable. Only 3 airports have either implemented or are in the process of implementation.

d) Enabling Aviation Infrastructure

Based on the 2017 reporting on the Implementation Objectives in this key feature, the following challenges should be addressed:

- **CNS infrastructure**

  There is a clear need for a more elaborate strategy dealing with the CNS infrastructure, particularly the rationalisation part, and this need is actively pursued as one of the main priorities for the MP update 2018. Most of the Objectives derived from the legacy Implementing Rules for interoperability (ITY) are either late or present a serious risk of delay vis-à-vis the initial compliance dates. Out of six (6) ITY Objectives, only ITY-ACID is still on track, while the others present risks or delays going up to 4 years (ITY-FMTP).

- **DLS Recovery**

  In 2016, the SESAR Deployment Manager has been mandated by the EC to act as Data Link Services (DLS) Implementation Project Manager and on this basis it developed a DLS Recovery Plan aiming to set a realistic path for the successful DLS implementation. In accordance to the Recovery Plan substantial progress has been achieved in the deployment of the DLS transitional solution through a harmonized approach. Considering the 5th of February 2018 deadline imposed by the IR (EU) No 2015/310, some EU Member States implemented DLS in accordance with the Implementing Rule, whilst some others demonstrated clear and proofed plans to implement with multi-frequency enhancement by December 2018. ECAC wide, the implementation will extend well after 2018/2019, with (Non-EU) States reporting plans up to 2023. As DLS is a critical enabler for the progress towards i4D and other new concepts of operations aiming for digitalisation and virtualisation, it is of particular importance to maintain the implementation momentum.

- **Creating the basis for SWIM**

  As the information management moves towards the implementation of SWIM (yellow and blue profile), there are number of Implementation Objectives that set the baseline for the efficient implementation of SWIM. These are mainly Aeronautical Data Quality (ADQ) requirements set in the associated implementing rule, and some other requirements such as the e-TOD, IPv6 implementation and also deployment of a common data exchange model AIXM5.1. The analysis in this report shows that almost all ANSPs in the ECAC region have already upgraded their infrastructure to support the FMTP but the overall implementation is 4 years late. Regarding AIXM 5.1 implementation, most of the ECAC ANSPs will implement this model in 2018 while ADQ implementation continues to be delayed currently being expected to be implemented in 2020. E-

TOD implementation is also delayed by approximately 2 years, towards the end of 2020. The delay seems to be mostly due to the institutional issues related to the involvement of a multitude of organisations in the establishment of a National TOD Policy.

- **Synchronised and interoperable evolution of the ATM system**

Although the ATM system is not seen as a part of aviation infrastructure in the classical sense of the definition, it is considered as the crucial infrastructure in the operational terms. From the larger ECAC perspective, the ATM systems should evolve in synchronised and interoperable manner according to the Single Sky principles. Today, the evolution of the ATM systems is largely organised around few major technological initiatives involving different ANSPs. These are COOPANS, 4-flight and iTEC. These alliances are based on the common system provider rather than on geographical, FAB or any other operational principle. The impact of this approach to technology deployment in Europe should be assessed in terms of synchronisation, interoperability and the impact on airspace de-fragmentation (main reasons for creating FABs). Map below illustrates the current approach to FDPS evolution in the ECAC area (system manufacturers and planed major upgrades).

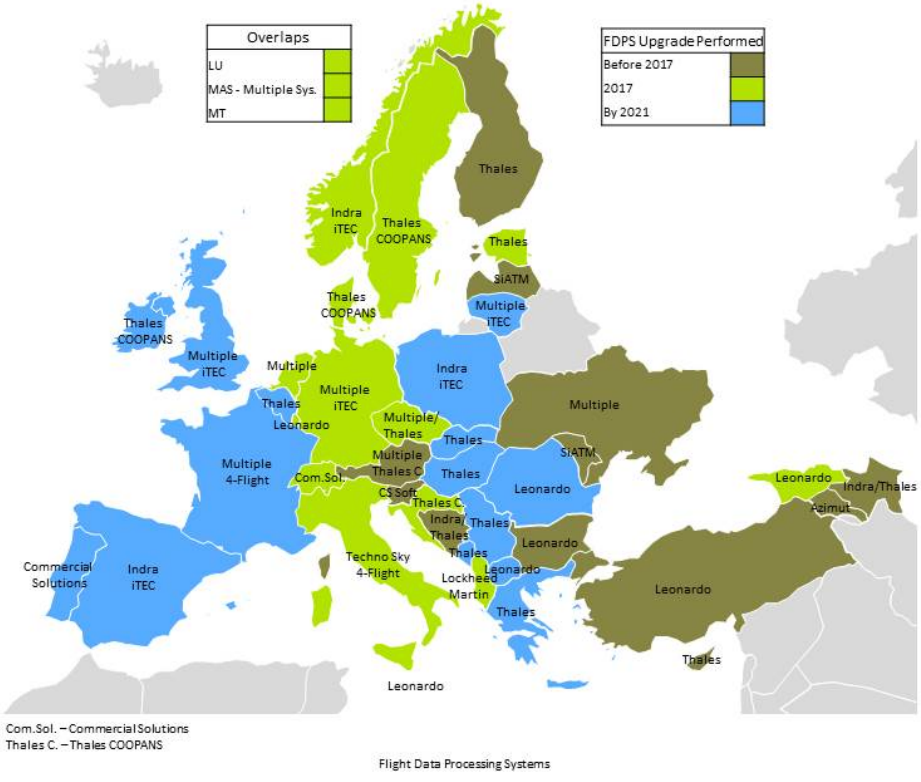

Figure i: Approach to technology in ECAC area

SESAR Solutions

SESAR Solutions refer to new or improved operational procedures or technologies that aim to contribute to the modernisation of the European and global ATM system, being very much the end product of the SESAR research and innovation pipeline.

This edition of the Report takes the first steps towards a more SESAR Solutions centric approach by giving more prominence to the links between Implementation Objectives and SESAR Solutions[1] and by providing a strategic, high level view of the level of implementation of the SESAR1 Solutions. As for the SESAR1 committed Solutions (Solutions for which there already exists a commitment for implementation either through regulatory actions and/or through inclusion in the Level 3 of the MP), the status shows steady progress and so far stakeholders have reported plans in line with the expected deadlines. However, as the monitoring of implementation form a SESAR Solution perspective is in its early phases, it is still premature to evaluate potential implementation issues or delays.

[1] The links between the implementation objectives and the SESAR Solutions are presented in the individual Deployment Views as well as, in a consolidated format, in Annex A.

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1 INTRODUCTION

The Level 3 of the European ATM Master Plan

The European ATM Master Plan (hereafter referred to as 'the Master Plan') is the main planning tool for setting the ATM priorities and ensuring that the SESAR Target Concept becomes a reality. The Master Plan is an evolving roadmap and the result of strong collaboration between all ATM stakeholders. As the technological pillar of the SES initiative, SESAR contributes to achieving the SES High-Level Goals and supports the SES regulatory framework.

The Master Plan details not only a high-level view of what is needed to be done in order to deliver a high-performing ATM system, but also explains why and by when. It therefore sets the framework for the development activities performed by the SESAR Joint Undertaking (SJU) in the perspective also of the deployment activities to be performed by all operational stakeholders under the coordination of the SESAR Deployment Manager and in accordance with the Deployment Programme to ensure overall consistency and alignment.

The Master Plan is structured in three levels available through the European ATM portal (www.atmmasterplan.eu); the Level 3 "Implementation view" contains the Implementation Plan enriched with elements from the Implementation Report fed by elements coming from reporting processes, such as the LSSIP[1] (Local Single Sky ImPlementation) as shown in Figure 1.

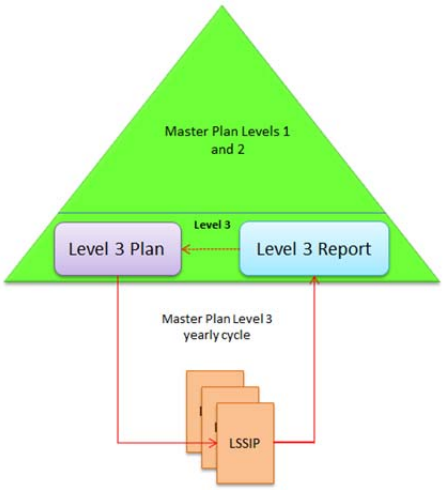


Figure 1: Master Plan Level 3 yearly cycle

The Implementation Objectives constitute the backbone of the Level 3 and provide all civil and military implementing parties (ANSPs, Airport Operators, Airspace Users and Regulators) with a basis for short to medium term implementation planning. It also serves as a reference for States/National Supervisory Authorities (NSAs) to fulfil their roles regarding the supervision of safe and efficient provision of air navigation services as well as the timely implementation of SESAR.

Together the Master Plan Level 3 Implementation Plan and Report, based on the LSSIP process, constitute a mechanism that enables the ECAC wide implementation monitoring and planning of the Master Plan – recording benefits, alternative solutions implemented, success stories, problems in implementation, etc.

Master Plan Level 3 2017 Implementation Report

The structure of the 2017 Master Plan Level 3 Report consists of:

- **Executive Summary** that highlights the most important findings of the report.
- **Strategic View** is the view that provides an overview of implementation progress in 2017, per SESAR Key Feature/major ATM change, and gives an outlook of future developments. This view also includes a set of aggregated elements related to the progress of implementation of the SESAR Solutions. This represents the first steps taken towards a more SESAR Solution centric Report.
- **Deployment View** is the view that provides a detailed analysis of the implementation progress per Implementation Objective, providing also an expected evolution as well as a list of relevant references showing the multiple interdependencies affecting each individual Objective.
- **Annexes** provide support documents for easier reading and understanding of the report, such as mappings between Master Plan elements.

[1] Local Single Sky ImPlementation (LSSIP) – the ECAC-wide EUROCONTROL reporting process on Single European Sky ATM implementation changes.

The main information sources for the production of this document remain the LSSIP State reports which have been developed based on the provisions of the Master Plan Level 3 2017 Implementation Plan, reflecting the implementation status on 31st December 2017. These reports are complemented with dedicated surveys performed using the LSSIP network, the EUROCONTROL CNS business intelligence database, OLDI information extracted from EUROCONTROL FMTP database, PBN map tool, Network Manager tools and individual stakeholder sources.

The implementation progress in this report is assessed against the implementation dates set in the Master Plan Level 3 2017 Implementation Plan. These Full Operational Capability (FOC) dates represent the dates agreed by the ATM community and they indicate the date by which implementation of the concept or technology should be completed. This means that every implementation beyond the FOC dates set in the Objective, potentially results in missed performance benefits, both at local and Network level. It should be however noted that the Level 3 of the Master Plan also takes into account local conditions. National stakeholders involved in this process can decide which technical concepts are the most promising for their own operating environment, with the exception of regulated and mandatory items included in the Master Plan Level 3 (items based on the Implementing Rule).

It must be noted that the Level 3 addresses the full scope of the Master Plan mature and deployable elements as Implementation Objectives, some of which relate to the PCP and its Deployment Programme. The Master Plan Level 3 Report aggregates the progress reported in year-1 in LSSIP by 41 ECAC States (+MUAC), on every active Implementation Objective.

Based on SDM's Deployment Programme, the reporting on PCP deployment follows a different timescale and is made on elements, which, although related to various Implementation Objectives, are described with a different granularity and for a different purpose. The Master Plan Level 3 covers the entire ECAC geographical scope, which is another reason why the aggregation of results on PCP-related Implementation Objectives may provide results that may be different, but complementary, to the SDM reporting.

Although delivered to SESAR Joint Undertaking, the target audience of this report is the whole ATM community. The report aims at the wide range of ATM professionals, from technical experts to executives – assessing both very technical implementation issues at individual Implementation Objective level, but also provides more general, ECAC wide overview of progress.

2 STRATEGIC VIEW

The long-term vision for the SESAR project is enabled through effective sharing of information between air and ground actors, across the Network from a gate-to-gate perspective. This will be achieved along with the optimisation of the enabling technical infrastructure, making greater use of standardised and interoperable systems, with advanced automation ensuring a more seamless, cost-efficient and performance-based service provision, allowing Europe to remain at the cutting edge of Air Traffic Management.

This long-term vision is expressed through the SESAR Target Concept and is supported by SESAR through the implementation of a number of operational changes, adhering to the strategic characteristics described by the four Key Features (described on the right), enabling increased digitalisation and paving the way for virtualisation and decarbonisation of aviation as envisaged by the Commission's Aviation Strategy for Europe.

To provide a highly focused strategic outlook in this edition of the Report, the Strategic View is structured utilising "Major ATM Changes". This concept, first introduced in the 2015 Report (carried over in the Report 2016 and subsequently introduced in the Implementation Plan 2017, as a recognition of its viability), breaks down the four Key Features into distinct elements to provide a logical grouping of implementation objectives while still maintaining a holistic view of SESAR progress. This allows for a better understanding of the current status and future evolution of the different lines of change of the Master Plan as a whole, and of Level 3 in particular.

The "Major ATM Changes" include several operational changes that are grouped into implementation blocks. The mapping on the following pages show how all these elements fit together into the overall picture of the Master Plan, and into each of the four Key Features.

This 2017 edition of the Report takes first steps towards a more SESAR Solution centric approach vis-a-vis the Master Plan. This new approach is enshrined in the 2018 Master Plan update campaign and has cascaded down into the 2018 edition of Level 3 (Plan) of the Master Plan (which will represent the basis for the next edition of the Report). In anticipation of a stronger focus on SESAR Solutions, this edition of the Report now gives higher prominence, not only at the level of the Deployment

The four SESAR Key Features:

Optimised ATM network services

An optimised ATM network must be robust and resilient to a whole range of disruptions. It relies on a dynamic, online, collaborative mechanism, allowing for a common updated, consistent and accurate plan that provides reference information to all ATM actors. This feature includes activities in the areas of advanced airspace management, advanced dynamic capacity balancing and optimised airspace user operations, as well as optimised network management through a fully integrated network operations plan (NOP) and airport.

Advanced air traffic services

The future European ATM system will be characterised by advanced service provision, underpinned by the automated tools to support controllers in routine tasks. The feature reflects this move towards automation with activities addressing enhanced arrivals and departures, separation management, enhanced air and ground safety nets and trajectory and performance-based free routing.

High-performing airport operations

The future European ATM system relies on the full integration of airports as nodes into the network. This implies enhanced airport operations, ensuring a seamless process through collaborative decision-making, in normal conditions, and through the further development of collaborative recovery procedures in adverse conditions. In this context, this feature addresses the enhancement of runway throughput, integrated surface management, airport safety nets and total airport management.

Enabling aviation infrastructure

The enhancements of the first three Features will be underpinned by an advanced, integrated and rationalised aviation infrastructure. It will rely on enhanced integration and interfacing between aircraft and ground systems. Communications, navigation and surveillance (CNS) systems, SWIM, trajectory management, Common Support Services and the evolving role of the human will be considered in a coordinated way for application across a globally interoperable ATM system. The continued integration of general aviation and rotorcraft and the introduction of remotely-piloted aircraft systems (RPAS) into the ATM environment is a major activity in this feature.

Views[1] but also in the Strategic View section by presenting a consolidated view on the progress of SESAR Solutions within the EU Member States, Norway and Switzerland, (aggregated, as well as structured per Key features) in the following pages[2]. The analysis covers the total of 63 SESAR 1 Solutions and is based on data obtained from the SESAR Deployment Manager (SDM) Deployment Programme (DP) monitoring process and Master Plan Level 3 (MP L3) monitoring process (LSSIP) as well as through a dedicated questionnaire circulated via the LSSIP network. Within each SESAR Key Feature, the solutions are split between **committed** (solutions linked to the PCP and/or addressed in the ATM MP L3) and **non-committed** (solutions implemented in a voluntary way without coordination)[3]. The committed solutions also differentiate between those which are related to regulatory requirements (PCP) and those which are included in the ATM MP L3, without being regulated.

The overall progress of implementation of SESAR 1 Solutions

SESAR 1 (committed - PCP)	20/23	Solutions under implementation
	1/23	Solution completed
	8/23	Solutions being deployed
	11/23	Solutions planned for deployment
	3/23	Solution not planned
SESAR 1 (committed - MPL3 non-PCP)	12/12	Solutions under implementation
	0/12	Solution completed
	12/12	Solutions being deployed
	0/12	Solutions planned for deployment
	0/12	Solution not planned
SESAR 1 (non-committed)	23/28	Solutions under implementation
	5	Solutions without any planned implementation initiatives

[1] A consolidated view of the links between implementation objectives and SESAR Solutions is available in Annex A.

[2] A more elaborated analysis of the SESAR Solutions implementation is available in the Executive View of the European ATM Master Plan (Level 1) Edition 2018.

[3] The mapping of the SESAR Solutions to the Key Features and the split between PCP-related, MPL3 (non-PCP) related and non-committed Solutions is detailed in Annex B.

Optimised ATM Network Services

Allocation of Implementation Objectives per Major ATM Changes[4]:

Major ATM Change	Pre-SESAR	(P)CP	New Essential Operational Changes / *Operational Changes*
ATFCM	**ATFM slot exchange** **Basic network operations planning** • FCM03-Collaborative flight planning **STAM** • FCM04.1-STAM Phase 1	**Automated support for traffic complexity assessment** • FCM06-Traffic complexity assessment **CTOT to TTA for ATFCM purposes** • FCM07-CTOT to TTA for ATFCM purposes (initial, not-monitored objective) **Enhanced STAM** • FCM04.2-STAM Phase 2	**UDPP** • FCM09-Enhanced ATFM Slot Swapping
NOP	**Basic network operations planning** • FCM03-Collaborative flight planning • FCM05-Interactive Rolling NOP	**Collaborative NOP** • FCM05-Interactive Rolling NOP	
Free Route & Advanced FUA	**Civil/military airspace and aeronautical data coordination** • AOM13.1-Harmonise OAT and GAT handling • AOM19.1-ASM support tools to support AFUA	**ASM and A-FUA** • AOM19.1-ASM support tools • AOM19.2-ASM Management of real time airspace data • AOM19.3-Full rolling ASM/ATFCM process **Free route (*)** • AOM21.1-Direct Routing • AOM21.2-Free Route Airspace	

(*) These operational change is described in the section addressing Advanced Air Traffic Services

Implementation status of SESAR Solutions related to the Optimised ATM network services Key Feature:

SESAR 1 (Committed PCP + MPL3 - Implementation progress[5])

SESAR 1 (PCP)

4/5	Solutions under implementation
0/5	Solution completed
2/5	Solutions being deployed
2/5	Solutions planned for deployment
1/6	Solution not planned

SESAR 1 (MPL3 non-PCP)

1/1	Solutions being deployed

SESAR 1 (non-committed)

1/1	Solutions under implementation
2	Two airports have implemented the Solution at two airports
2	Two airports are planning/implementing the Solution

[4] The allocation of implementation objectives per Major ATM Changes and per Key Features reflects the allocation defined in the ATM Master Plan Level 3 Implementation Plan 2017 which is the basis for this edition of the Report. The restructured Key Features as identified in the European ATM Master Plan (Level 1) Edition 2018 will be reflected in the next edition (2018) of the Report.

[5] The deployment percentages do not take into account the part corresponding to Airspace Users, and only partially the one corresponding to the Network Manager. In many instances the Network Manager is substantially more advanced than the average figure.

Advanced Air Traffic Services

Allocation of Implementation Objectives per Major ATM Changes:

Major ATM Changes	Pre-SESAR	(P)CP	New Essential Operational Changes / *Operational Changes*
Enhanced arrival sequencing	**Basic AMAN** • ATC07.1-AMAN • ATC15.1-Initial extension of AMAN to En-Route	**AMAN extended to en-route airspace** • ATC15.2-Extension of AMAN to En-route	**AMAN/DMAN integration including multiple airports** ***Airborne Separation Assistance System (ASAS) spacing*** ***Controlled Time of Arrival (CTA)*** ***Enhanced Safety Nets*** • ATC02.9-Enhanced STCA for TMAs
PBN	**Introduction of PRNAV** • ENV01-Continuous Descent Operations • ENV03-Continous Climb Operations • NAV03.1-RNAV-1 in TMAs • NAV10-APV Procedures • ATC02.8-Ground based safety nets (MSAW and APM)	**Enhanced TMA using RNP-based operations** • NAV03.2-RNP1 in TMAs	**Advanced RNP** **Trajectory-based tools** ***Enhanced Safety Nets*** **Additional objective:** • NAV12 - Optimised low-level IFR routes in TMA
Free Route	• ATC02.8-Ground based safety nets (APW) • ATC17-Electronic Dialog supporting COTR	**Free route** • AOM21.1-Direct Routing • AOM21.2-Free Route Airspace • ATC12.1-MONA, TCT and MTCD	**Sector team operation** • ATC18-Multi Sector Planning **Trajectory-based tools** ***Enhanced Safety Nets***

Implementation status of SESAR Solutions related to the Advanced Air Traffic Services Key Feature:

SESAR 1 (Committed PCP + MPL3 - Implementation progress)

SESAR 1 (PCP)

8/8 Solutions under implementation
1/8 Solution completed in 25 states
6/8 Solutions being deployed
1/8 Solution planned for deployment

SESAR 1 (MPL3 non-PCP)

7/7 Solutions being deployed

SESAR 1 (non-committed)

8/9 Solutions under implementation
23 Implementation initiatives completed by 11 Stakeholders
23 Planned/ongoing implementation initiatives by 9 Stakeholders

High Performing Airport Operations

Allocation of Implementation Objectives per Major ATM Changes:

Major ATM Changes	Pre-SESAR	(P)CP	New Essential Operational Changes / *Operational Changes*
Collaborative Airport	**Initial airport CDM** • AOP05-Airport CDM **Additional Objectives:** • ENV02-Collaborative Environmental Management	**Airport operations plan** • AOP11-Initial Airport Operations Plan • FCM05-Interactive Rolling NOP	**Collaborative airport**
Surface management	**A-SMGCS L1 and L2** • AOP04.1-A-SMGCS Surveillance • AOP04.2-A-SMGCS Runway Monitoring and Conflict Alerting (RMCA) **Additional Objectives:** • SAF11-Prevent Runway Excursions	**Automated assistance to controller for surface movement planning and routing** • AOP13-Automated Assistance to Controller for Surface Movement Planning and Routing **Airport safety nets** • AOP12-Improve RWY safety with ATC clearance monitoring **DMAN synchronised with pre-departure sequencing** **DMAN integrating surface management constraints**	**Integrated surface management** **Integrated surface management datalink** ***Ground Situational Awareness*** ***Enhanced Airport Safety Nets*** ***Airport Safety Nets Vehicles***
Enhanced / Optimised operations in the vicinity of the runway	**Crosswind reduced separations for arrivals** **Operations in LVC**	**TBS for final approach** • AOP10-Time based separation	**LVPs using GBAS** ***Approach & Departure Separations***
Remote Tower			***Remote Tower*** • AOP14-Remote Tower Services

Implementation status of SESAR Solutions related to the High Performing Airport Operations Key Feature:

SESAR 1 (Committed PCP + MPL3 - Implementation progress)

2015	2023
18%	

SESAR 1 (PCP)

5/5	Solutions under implementation
0/5	Solution completed
0/5	Solutions being deployed
5/5	Solution planned for deployment

SESAR 1 (MPL3 non-PCP)

4/4	Solutions being deployed

SESAR 1 (non-committed)

10/10	Solutions under implementation
36	Implementation initiatives completed at 28 different airports
60	Planned/ongoing implementation initiatives at 40 different airports

Enabling Aviation Infrastructure

Allocation of Implementation Objectives per Major ATM Changes:

Major ATM Changes	Pre-SESAR	(P)CP	New Essential Operational Changes / *Operational Changes*
Pre-SWIM & SWIM	**IP network** • ITY-FMTP-FMTP over IPv6 **B2B services** **Information reference and exchange models** • INF07-eTOD • ITY-ADQ-Aeronautical Data Quality	**Common Infrastructure Components: SWIM registry, PKI** • INF08.1-iSWIM Yellow TI Profile (initial, not-monitored objective) **SWIM technical infrastructure and profiles** • INF08.1-iSWIM Yellow TI Profile **Aeronautical information exchange** • INF08.1-iSWIM Yellow TI Profile **Meteorological information exchange** • INF08.1-iSWIM Yellow TI Profile **Cooperative network information exchange** • INF08.1-iSWIM Yellow TI Profile **Flight information exchange** • INF08.1-iSWIM Yellow TI Profile • INF08.2-iSWIM Blue TI Profile(initial, not-monitored objective) • FCM08-Extended Flight Plan ***Communications infrastructure*** • COM12-NewPENS	***Digital Integrated Briefing***
Data Link	**A/G datalink** • ITY-AGDL-A/G Data-link	**Initial trajectory information sharing (i4D)**	**Information sharing and business trajectory** **Mission trajectory**
CNS Rationalisation	**ADS-B, WAM** • ITY-ACID-Aircraft Identification • ITY-SPI-Surveillance performance and interoperability **GNSS, GBAS, SBAS** ***Communications infrastructure*** • COM10-Basic and enhanced AMHS • ITY-AGVCS2-8,33KHz below FL195	***Communications infrastructure*** • COM11-Voice over IP (*) • COM12-NewPENS	**CNS rationalisation**

(*) Not mandated by the PCP Regulation but enabling some SESAR 1 operational changes

Implementation status of SESAR Solutions related to the Enabling Aviation Infrastructure Key Feature:

SESAR 1 (Committed PCP + MPL3 - Implementation progress)

SESAR 1 (PCP)

3/5	Solutions under implementation
0/5	Solutions completed
0/5	Solutions being deployed
3/5	Solutions planned for deployment
2/5	Solutions not planned

SESAR 1 (non-committed)

4/8	Solutions under implementation
5	Implementation initiatives completed by 5 ANSPs
13	Planned/ongoing implementation initiatives by 10 ANSPs

Air Traffic Flow and Capacity Management (ATFCM)

The objective of the Air Traffic Flow and Capacity Management (ATFCM) is to optimise traffic flows in a way that minimizes delay and make best use of the airspace and the air traffic control capacity while enabling airlines to operate safe and efficient flights.

The ATFCM activities are divided into three phases spanning from one year before the flight up to the day of operation: strategic, pre-tactical and tactical. Each of these phases contains a number of important activities coordinated through NMOC.

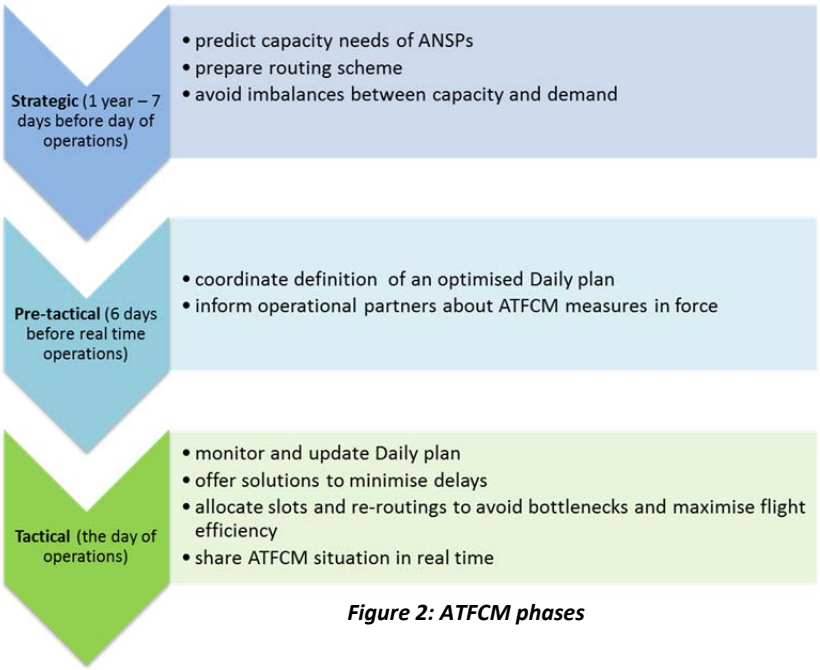


Figure 2: ATFCM phases

A lot of these activities are covered by active implementation objectives in the Master Plan Level 3 2017 Implementation Plan: **FCM03** (Implement collaborative flight planning), **FCM04.1** (STAM Phase 1), **FCM04.2** (STAM Phase 2), **FCM06** (Traffic complexity assessment) and **FCM09** (Enhanced Slot Swapping). In addition, the achieved Level 3 objective **FCM01** (Enhanced tactical flow management) and the initial, not yet monitored objective **FCM07** (CTOT to TTA) also fall into this Major ATM Change.

Implementation status at the end of 2017

The progress of FCM03, FCM04.1, FCM04.2 and FCM06 objectives as reported in LSSIP 2017, is shown on figure 3 (applicability area only – as defined in Level 3 2017 Implementation Plan).

Implementation of collaborative flight planning (FCM03) continues to be extremely slow with only 6 implementers having reported completion in 2017. Considering that this is a pre-SESAR objective, introduced in 2002 its FOC date has already undergone several postponements during the last few years. It is anticipated that 2018 will see a surge in implementation activity, bringing it close to 80% completion.

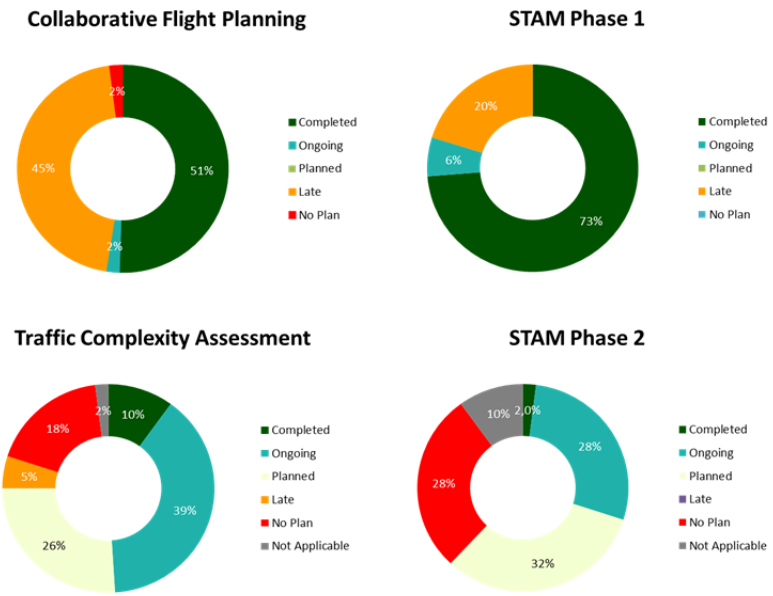


Figure 3: Progress of implementation for FCM 03, FCM04.1, FCM04.2 and FCM06 as reported in LSSIP 2017

In 2017, the STAM Phase 1 (FCM04.1) implementation was subject to significant progress, completed by almost all operational Stakeholders. STAM Phase 2 (FCM04.2) implementation is still in its early stages. It is expected that implementation will progress slowly over the next

few years, with the main bulk of implementation expected in 2021. The reports indicate a tendency for the stakeholders to make use of the STAM tools made available by the NM

A series of improvements were made in flight plan processing by IFPS, including the capability to exchange Extended Flight Plan information using B2B interface with some Airspace Users, on trial basis.

Three States and MUAC have now completed the implementation of the traffic complexity assessment tool (FCM06) and implementation is ongoing in fifteen (15) States. Overall we are still in an early stage of implementation as the target date is set to 12/2021. It is expected that most of the States will complete the implementation in the final year before the FOC.

Enhanced Slot Swapping implementation (FCM09) is one of the NM priorities and is progressing on time within scheduled deadlines.

SUCCESS STORY: SCENARIO MANAGEMENT BY NM

In order to close the gap between ATC and ATFCM, Short-Term ATFCM Measures (STAM) need to be developed requiring dynamic coordination between more than one ACC, the AOs and NM. While STAMs measures focus on solving specific local issues the Network impact needs to be taken into account including the link to Scenario Management services. Scenarios are the means by which the best possible airspace organisation combined with the best ATFCM measures can be implemented to meet airspace demand and to take into account traffic flows, airport and ATC capabilities. The existing Scenario Management process being enhanced to:

- Create a single repository, in the NM system, as a first step to store all scenarios to facilitate and support usage, querying, post ops and revalidation.
- Support efficient coordination
- Automate in order to reduce operator implementation/ simulation workload
- Improve the rerouting options to improve solution outcomes
- Standardise publication processes
- Facilitate efficient post ops analysis
- Scenario AIRAC revalidation as it is essential to have a repository containing valid scenarios

Future developments

The NM technical solution supporting STAM Phase 2 will be subject to a phased operational deployment in the timeframe 2019/2020.

NM has also plans to implement enhanced monitoring techniques by2018+. These will include the detection of local overloads through the use of occupancy counts and traffic complexity assessments, combined with a continuous monitoring of impact at network level.

Regarding enhanced ATFM slot swapping, the next steps to be taken by the NM in 2018 will be to trial operationally the benefits of allowing flights to share delay between a maximum of 3 other flights using ‘multiple-swaps’; and to assess the feasibility and risks of facilitating more long and short haul slot swapping by making it possible to swap pre-allocated with allocated ATFM slots.

The use of B2B Web Services for the DCB tools will be further expanded.

CONCLUSION	**COLLABORATIVE FLIGHT PLANNING IMPLEMENTATION DELAYS SHOULD BE ADDRESSED AND SUPPORT FOR IMPLEMENTATION FROM NM GIVEN TO THE LOCAL STAKEHOLDERS.**

STAKEHOLDERS REG ASP APT AU NM MIL IND

Network Operations Plan (NOP)

The Network Operations Plan (NOP) provides a short to medium-term outlook of how the ATM Network will operate, including expected performance at network and local level. It gives details of capacity and flight efficiency enhancement measures planned at network level and by each Area Control Centre (ACC), as well as an account of airport performance assessment and improvement measures that are planned at those airports that generate a high level of delay.

The NOP outlines the operational actions to be taken by the Network Manager and other stakeholders, needed to respond to the performance targets set by the Performance Framework of the Single European Sky (SESII) package. The NOP also provides both a qualitative and a quantitative assessment of the impact of these actions on the performance of the European ATM network. As such, it represents a consolidated network flow and capacity overview, enabling operational partners to anticipate or react to any events and to increase their mutual awareness of the situation from the strategic phase to the real-time operations phase and into post operations analysis. All this is achieved by using a number of tools that support network operations.

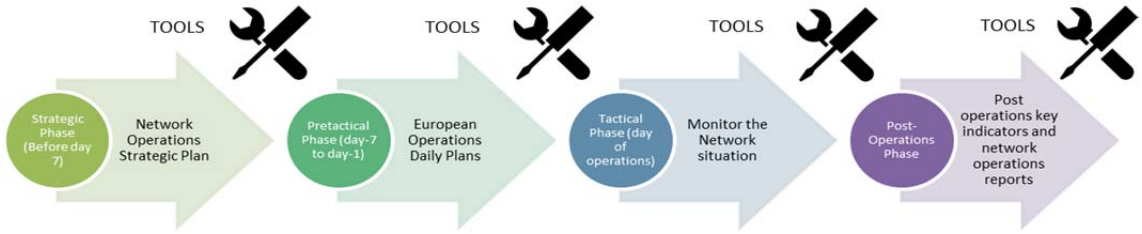


Figure 4: NOP phases

The operations planning process consolidates forecasts and plans from all partners involved in ATM operations (ANSPs, airports, AOs, MIL) and from the EUROCONTROL units in charge of flow, capacity, and airspace management. Starting with the strategic planning of capacity, the process moves to an operational level with the development of derived seasonal, weekly and daily plans (the so-called 'NOP Coordination'). Currently the applicable network operations plan is the European Network Operations Plan 2018-2019/22. The related implementation objective is **FCM05** with an implementation date of 12/2021, supported by the system related objective **AOM19.1** on Airspace Management support tools (part of the "Free Route & Advanced FUA" Major ATM Change) as well as by objective **AOP11** on Airport operations plan (included in the "Collaborative airport" Major ATM Change).

Network Operations Planning contains six main elements:

- ✓ Local and Network Operational Planning
- ✓ Route Network and Airspace Structure Development
- ✓ Airspace Management (ASM)
- ✓ ATM (ATS/ASM/ATFCM) Procedures
- ✓ Airspace Modelling

SUCCESS STORY: NM B2B IMPROVEMENTS

The objective of these improvements is an extension of the targeted users of NM B2B web services (Publish/Subscribe Flight Data in particular) to FMP, by making the Publish/Subscribe Flight Data message a complete alternative to EFD.

The module improves the Flight Data via Publish/Subscribe providing more information as well as means for re-synchronisation, contingency. It aims to:

• Make flight version number available via B2B. The goal is to provide users with the version number for any given flight updates via publish/subscribe and via Request/Reply. It will help to determine which flight update is the latest. This is especially important in case of system failure, contingency, etc.

The Module also improves the efficiency in processing the tactical updates:

• Support the update of multiple tactical plans at the same time in B2B. The goal is to provide users with the ability to update multiple tactical plans (Update Capacity plan, Update OTMV plan) at once. It should help improve the efficiency in processing the tactical updates.

Implementation status at the end of 2017

The initial steps of the interactive Rolling NOP were previously implemented through the deployment of the NOP portal and through the NM B2B interfaces. The service was further improved with enriched airspace and flight information and the access to the NOP data was progressively extended through NM B2B, aiming for the implementation of the functionality as envisaged by the PCP IR. The interfaces with Airport Operation Plan (AOP) are planned for 2020/2021 mainly for PCP airports.

The vast majority of States have started implementation or have set-up definite implementation plans, with the objective to complete implementation before the FOC date of 2021. The ANSPs/Airport component for this objective includes the development of ATFM procedures for NOP access as well as for staff training. The objective also addresses the integration of Airport Operation Plan (AOP) within the NOP.

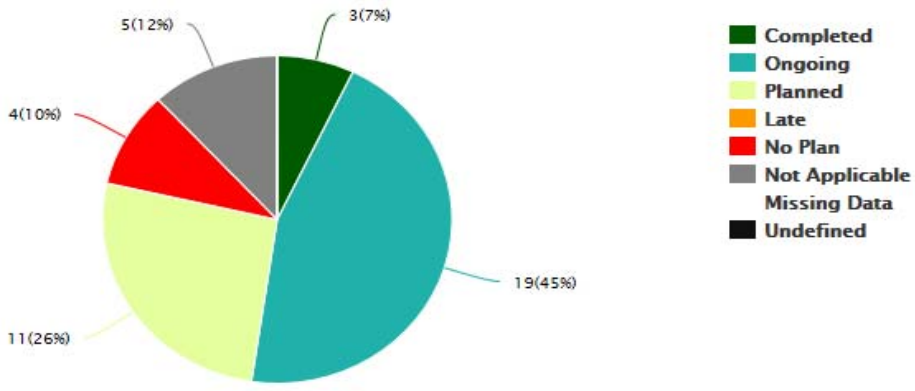


Figure 5: Progress of implementation for FCM05 objective as reported in LSSIP 2017

Future developments

NM will continue to develop the 'Rolling/Dynamic Network Plan' which aims at displaying network situational information updated in real time, instead of a daily Plan publication and teleconference. It will address hotspots, network events, ATFCM measures and ATFM Information Messages and will be made available via B2B services and via the n-CONECT platform. The NOP will become the main transversal tool supporting collaborative planning. It will evolve towards a "one stop shop" with "look ahead" capabilities, for NM to communicate and exchange information with all relevant stakeholders and further develop "Common Network Awareness" and "Collaborative Network planning".

The NM will continue to progress the integration of airports with the network through enhanced information sharing between the AOP and the NOP. Additional airports will be integrated within the Network based on the advanced Tower concept. Timely exchange of relevant airport and network information will improve common situational awareness, enhance Demand Capacity Balancing (DCB) processes and collaborative traffic management (better prediction of traffic demand, more accurate trajectories, more reliable traffic counts, more up-to-date capacities) and support a more efficient operational performance for stakeholders and the Network due to better resource allocation. The Extended DPI concept will be realised by means of a new B2B service called Predicted Departure Planning Information (Predicted DPI, P-DPI) and by appending the existing DPI services (Early DPI, Target DPI target and Target DPI Sequence) with additional fields.

Advanced Flexible Use of Airspace (AFUA)

According to the basic flexible use of airspace (FUA) principle, airspace should no longer be designated as military or civil but should be considered as a single continuum and used flexibly on a day-to-day basis. All users can have access, and on the basis of their specific needs, their requests should be managed to achieve the most efficient use of airspace. Wherever possible, permanent airspace segregation should be avoided.

Advanced FUA has been created to advance from civil-military coordination to cooperation. This will further enhance both FUA operations and network performance by introducing:

- Integration ASM, ATFCM and ATS
- Area modularity in airspace design
- Enriched and continuous data-sharing between civil and military
- Cooperative decision-making involving all actors (airspace configurations)
- Use of performance measurement in the pre-tactical phase.

The AFUA concept is inherently linked to the evolution of Airspace Management (implementation objectives **AOM19.1** on ASM support tools to support AFUA, **AOM19.2** on ASM Management of real time airspace data and **AOM19.3** on Full rolling ASM/ATFCM process and ASM information sharing).

An additional initiative functionally related to improved civil-military cooperation is the implementation of harmonised handling of operational air traffic (OAT) and general air traffic (GAT) across Europe, as defined in the "EUROCONTROL Specification for harmonised Rules for OAT under IFR rules inside controlled Airspace (EUROAT)" and covered by the implementation objective **AOM13.1** on Harmonised OAT and GAT handling.

Implementation status at the end of 2017

According to 2017 LSSIP reporting, one year before the FOC date 12 States within the applicable area for AOM13.1 declared the objective as 'completed' while 16 others are still 'on-going' with an upsurge in implementation being expected in 2018. Once implemented, this objective will bring increased efficiency and safety of civil-military operations through use of common rules and procedures for OAT handling and for OAT/GAT interface.

Figure 6: EUROAT implementation

The set of AOM19.X objectives is an important enabler for the PCP sub-functionality 3.1. Deployment is expected to take place sequentially, with AOM19.1 being implemented first, unlocking the potential for the other two objectives to maximise the benefits through the upcoming digitalisation and increased agility of the ATM system.

Chronologically, objective AOM19.1 has the earliest deadline, of 12.2018. Based on LSSIP data, 7 States have completed it and majority of the remaining States report plans to complete within the deadline of 12/2018. However, as the current level of implementation is quite low within the States reporting on-going deployment, there is a potential risk of a slight delay in implementation. This potential risk needs to be controlled, as the objective is enabling the other 2, more advanced objectives, AOM19.2 and AOM19.3. Amongst the 15 States that have already implemented ASM tools, the majority rely on LARA (Local and sub-Regional ASM Support System) as the technical solution, whilst in terms if connectivity to the Network Manager, the B2B connection is the preferred option.

As AOM19.2 and AOM19.3 have 12.2021 as their implementation deadline, it is still premature to provide a reliable estimate of the achievement date as the implementation plans are still in their infancy. However it is encouraging to see that in 2017, the number of States reporting implementation plans has increased, in particular for AOM19.2. Now, it is important that these plans will materialise within the expected deadlines.

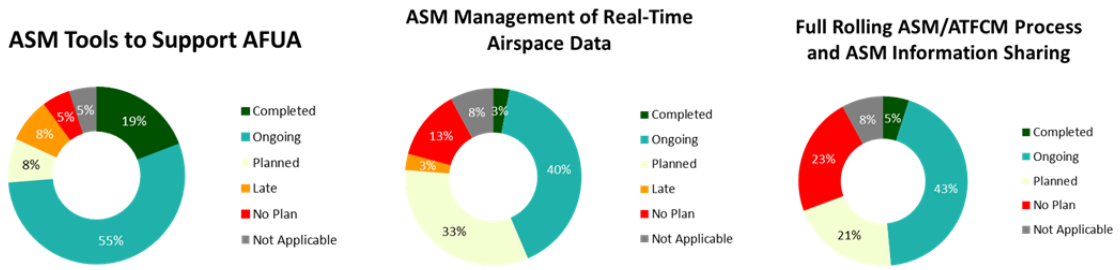


Figure 7: ASM tools implementation

SUCCESS STORY: LARA IMPLEMENTATION IN HUNGARY

Hungary has implemented their ASM tool (LARA) following a logic and concise approach. Concept, training and implementation were aimed at rapidly generating benefits by:

- deploying the system to civil and military users alike,
- encompassing the pre-tactical and tactical phases of airspace management and
- sharing the data with a wider audience.

In 2014 Hungary decided to implement EUROCONTROL's ASM Support System LARA. Expected benefits were more automated airspace management, more effective national civil-military cooperation and advanced capability for sub-Regional (FABCE) cooperation.

LARA is being used in Hungary operationally since 2016. In May 2017 the system was upgraded to LARA V3. The system is comprised of a central server, 5 military clients (installed at the military aerodromes and MilAIS) and 5 civil clients (installed at the AMC, and various TWR units). Military users insert their reservation requests into LARA, other users transmit their requests via traditional means (email, Fax) and the data is introduced by the AMC. In addition to the AMC manageable areas, the system is used to manage 50-60 Drone Areas (established by NOTAMS) on a daily basis.

The AMC is located in the ACC OPS Room and is responsible for pre-tactical and tactical airspace management. The AUP/UUP are created using LARA and exchanged with NM via B2B. The system is used in the tactical phase to activate/deactivate temporary reserved/segregated areas. In the long term this data is foreseen to be directly exchanged with the ATC System. Initial tests have been performed to use the export of LARA data with PRSIMIL for the production of KPIs.

Hungary is using Netbriefing – a tool that allows users (mainly General Aviation) to access MET, AIS and FPL information via the internet. In the future LARA is foreseen to also deliver and integrate airspace data.

Future developments

According to information reported through LSSIP 2017, 19 additional States in 2018 will complete AOM13.1 implementation, while 23 States will finalise the implementation of AOM 19.1, creating the basis for the implementation of the more advanced AOPM19.2 and APOM19.3. For the medium term, this will enable a full rolling ASM/ATFCM process ensuring a continuous, seamless and reiterative airspace planning and allocation based on airspace requests for any time period, including support for the deployment of airspace configurations. Compared to today's airspace scenarios, which by their nature are static, this will enable flexible solutions that can be dynamically adapted to traffic demand to respond to different regional/local performance objectives, which may vary in time and place.

CONCLUSION	**AS THE ASM TOOLS AIMING FOR A FULL ROLLING ASM/ATFCM PROCESS ARE ON THE CRITICAL PATH FOR THE TRANSITION TOWARDS TRAJECTORY-BASED OPERATIONS, ALL CONCERNED STAKEHOLDERS SHOULD ACTIVATE AND/OR INVIGORATE THEIR IMPLEMENTATION PLANS SO AS TO ENSURE THAT THE DEADLINES FOR IMPLEMENTATION WILL BE MET AS APPROPRIATE.**

STAKEHOLDERS REG ASP APT AU NM MIL IND

Enhanced Arrival Sequencing

Arrival manager (AMAN) tools improve sequencing and metering of arrival aircraft by integrating with the ATC systems and providing controllers with advisories to create an optimal arrival sequence, reducing holding and low-level vectoring. Through this major ATM change, arrival sequencing is expected to move from local AMAN tools taking into account local constraints to a full integration of the AMAN with the en-route environment, including multiple airports and taking into account network considerations by also assessing the impact on other traffic flow. This is being achieved through the transmission of AMAN information to the upstream en-route sectors using the arrival management information exchange message (AMA) or other generic arrival message providing similar functionality. This will provide an enhanced arrival sequence allowing for a smoother accommodation of AMAN constraints.

The aircraft holding time at congested airports is cut by reducing its cruising speed during the final en-route phase of flight, when it is still several hundred miles away from the airport. In doing so, flight efficiency is increased by reducing the overall fuel burn and CO2 emissions. Less airborne congestion in terminal areas will also contribute to improving operational safety by reducing pilot/ controller workload and to reducing noise for the communities living beneath the holding stacks.

From the Master Plan Level 3 perspective, this Major ATM Change relies on a set of 3 implementation objectives that address the generation of AMAN constraints, as well as the seamless propagation of the these constraints to the upstream sectors for up to a distance of 180-200 Nautical Miles (NM). The implementation objectives are covering:

- Basic Arrival Manager (AMAN) tools to improve sequencing and metering of arrival aircraft in selected TMAs and airports (objective **ATC07.1**);
- Information exchange tools in adjacent/subjacent ACCs, to support Basic AMAN operations (objective **ATC15.1**).
- Extended AMAN to en-route airspace (objective **ATC15.2**), up to 180-200 NM.

While the implementation of basic AMAN tools is a local endeavour (therefore the applicability area of ATC07.1 is defined in terms of implementing airports), its further extension to en-route requires the involvement of multiple stakeholders (in many instances ANSPs in neighbouring countries or even beyond), therefore introducing a network dimension.

SUCCESS STORY: XMAN BY SKYGUIDE

Extended-AMAN (XMAN) allows for an early sequencing of arrival traffic by extending the AMAN horizon from the airspace close to the airport to further upstream and so allowing more smooth traffic management. Air Traffic Controllers implement system advisories by, for example, instructing pilots to adjust the aircraft speed, thus reducing the need for holding and decreasing fuel consumption.

The FABEC XMAN project has been implemented stepwise since 2012. The first step uses currently available systems and technologies in order to establish cross-centre arrival management in the airspace controlled by FABEC ANSPs. A second Step takes into account validated SESAR results in order to improve the en-route part of cross-centre arrival management in the overall FABEC airspace.

The first step of the XMAN in Zürich was completed in 2017. Its benefits are a reduction of fuel burn and of CO2/NOX emissions for ZRH arrivals through reduction of stack holdings, reduced speed in en-route phase and more optimized arrival transition phase.

Implementation status at the end of 2017

According to the 2017 LSSIP monitoring exercise, the positive trend in the implementation of basic AMAN is confirmed. Basic AMAN is deployed in 20 locations, with another 7 on their way to implement it by the deadline of 12/2019. It is also encouraging to note that the deployment of basic AMAN is continuously extending and that the applicability area of the objective has grown from 20 locations in 2014, to 33,.

With regard to the extension of the AMAN to adjacent ACCs, there was no increase in 2017, with 8 States declaring it completed. The number of States reporting planned delays in the implementation, has grown

from 7 in 2016 to 12 in 2017. The number of States that have reported to have no plans for implementation went down to 1 (3 in 2016), but this is counterbalanced by a corresponding increase in the number of States declaring the objective as not applicable (from 16 in 2016, to 18 in 2017). In several instances, the 'Not Applicable' status is justified by the fact that the subsequent ATC15.2 objective is to be implemented instead.

Building upon ATC15.1, objective ATC15.2 was first introduced in 2016 with an extension of the AMAN horizon to 180-200 nautical miles. For many ANSPs its implementation will require coordination with neighbouring countries and beyond. Within the 24 States that are in the applicability area for this objective, 10 reported it as 'No Plan' (11 in 2016) and 4 reported it as 'Planned' (5 in 2016) while 8 States reported the implementation as ongoing. UK and DE have completed the implementation of the objective (UK only in 2016). CH has also completed implementation, but a second phase within FABEC mantains the project as ongoing. Of the ANSPs progressing towards implementation, only MUAC and FR have reported a significant progress (47% and 73% respectively) during the reporting year. Implementation is understandably slow due to more complex requirements often necessitating coordination with multiple neighbouring ANSPs.

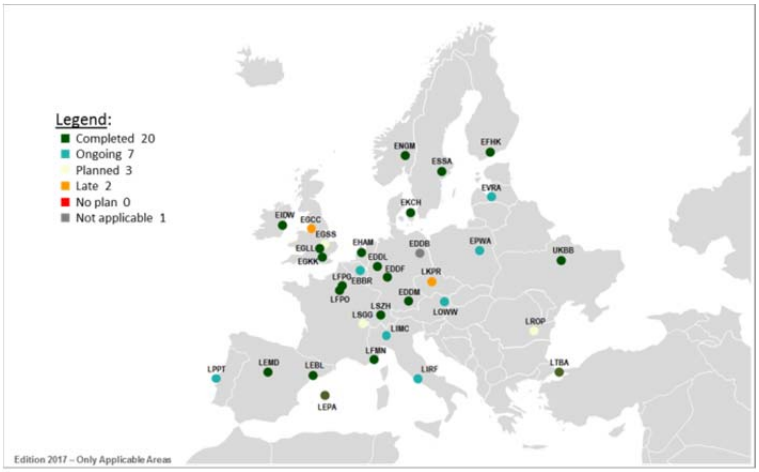


Figure 8: Basic AMAN (airports) as reported in LSSIP 2017

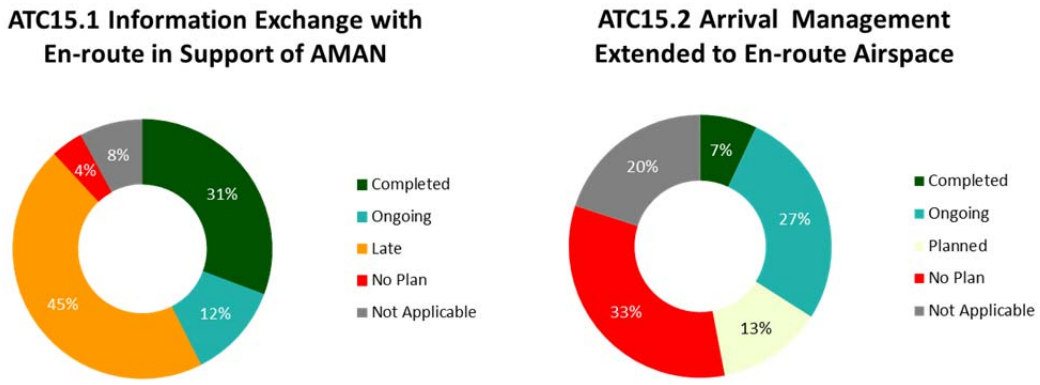


Figure 9: Extension of AMAN to en-route (ATC15.1 and ATC15.2)

Future developments

Implementation of basic AMAN is gaining speed, with 10 additional airports expected to finish implementation in the next 2 years. The extension of AMAN information to en-route will continue to grow, both in terms of distance as well as in terms of number of implementations. The complexity of AMAN tools will also evolve, with the integration of Departure Manager constraints (where applicable) and the integration in en-route sectors of AMAN constraints received from multiple airports. The evolutions will also consider new concepts of operations, e.g. related to the use of target times, taking into account network considerations through further data exchanges with the NM.

STAKEHOLDERS REG ASP APT AU NM MIL IND

Performance Based Navigation

ICAO's PBN concept has expanded area navigation (RNAV) techniques, originally centred upon lateral navigation accuracy only, to a more extensive statement of required navigation performance (RNP) related to accuracy, integrity, availability and continuity along with how this performance is to be achieved in terms of aircraft and crew requirements. RNP relies primarily on the use of satellite technologies. The PBN major ATM change leverages on the advanced navigational capabilities of aircraft allowing the implementation of more flexible and environmentally friendly ATS routes and approach procedures. This will enable better access to airspace and airports and will lead to a reduction of the greenhouse gases emissions providing a direct contribution towards the decarbonisation of aviation.

From the perspective of the Master Plan Level 3, the major ATM change is structured along several objectives:

- RNAV1 in TMA operations (Objective **NAV03.1**), ATS routes, SID/STAR, initial approach segment
- RNP1 in TMA operations (Objective **NAV03.2**), ATS routes, SID/STAR, initial approach segment
- APV procedures (Objective **NAV10**), RNP approach procedures with vertical guidance.

The implementation of RNAV1 procedures is an interim step through a global RNAV environment based on the Performance Based Navigation, in particular RNP1. It is up to the individual States, airports and aircraft operations to evaluate the business need for RNAV1 and/or RNP1 according to local circumstances, unless the deployment is regulated (e.g. PCP, PBN IR when available). The purpose of the implementation of APV procedures is the transition from conventional non-precision approach (NPA). It refers to the implementation of RNAV (GNSS) APV procedures based on APV/Baro (an approach with barometric vertical guidance) and/or APV/SBAS (an approach with geometric vertical guidance), which may be restricted by the coverage limitation of EGNOS satellite signal within the concerned airspace. In addition, several other objectives are considered to support the implementation of the change:

- Continuous Descent Operations - CDO (Objective **ENV01**)
- Continuous Climb Operations – CCO (Objective **ENV03**)
- Optimised low-level IFR routes in TMA for Rotorcraft (Objective **NAV12**).

SUCCESS STORY: BLUEGNSS MONITORING

Global navigation satellite system (GNSS) is a fundamental enabler for the implementation of PBN.
The 12th ICAO Air Navigation Conference, held on 2012, recommended that States publish information specifying the GNSS elements that are approved for use in their airspace. Therefore, States need to have a clear understanding of the performances of GNSS signals with respect to related standards in order to be satisfied with their operational use in combination with augmentation systems (RAIM, future Advanced RAIM, SBAS or GBAS) according to the specific phase of flight. States may decide to monitor signals from GNSS core constellations continuously to assess the performance periodically. GNSS performance monitoring may be considered as one of the fundamental enablers for the implementation and acceptance of RNP APCH operations, paving the way for Galileo acceptance in aviation.
The BLUEGNSS project is adopting a regional and multi-source approach to GNSS monitoring through the deployment of an innovative network devoted not only to standard GNSS performance assessment and data recording, but also to interference assessment and reporting.
The project's GNSS monitoring solution is the first to be fully ICAO compliant, as described in the ICAO GNSS Manual. It is modular, expandable and interoperable with other systems.
The network, developed within the BLUE MED airspace scope, is composed of dedicated stations developed by IDS and installed in Milano Linate (I), Luqa (M), Kos (G), Larnaca (C) integrated with public data from EDAS, IGS and EUREF network. Data are collected by a Central Monitoring Facility, installed on ENAV Operational System Information that generates GNSS performance reports.
Two kinds of reports are elaborated; one monthly and one daily. All reports are automatically generated and uploaded into the reserved area of the BLUE MED website www.bluemed.aero. The monthly report generates performance reports for GPS, Galileo and EGNOS. The KPIs are the ones defined in the GNSS Manual. The daily reports refer to parameters computed by the GNOME sentinel and so a daily report for each location where the sentinel is installed is generated. The parameters are mainly accuracy, DOP and availability. For each day also an interference report on main bands is produced. The regional approach allows significant costs savings in terms of sharing of information and development of technological solutions. The network and related density of stations is optimized. Based on the performance reports results demonstrating GNSS compliance towards SARPS, Italian National Supervisory Authority removed some restrictions on the use of GPS over Italian Air Space.

Implementation status at the end of 2017

According to 2017 LSSIP reporting, a large number of the 22 States having "completed" implementation of RNAV1 (NAV03.1) at major aerodromes and TMAs, have plans for further implementation at smaller aerodromes too which is quite encouraging. Four other States are fairly close to completion reporting implementation levels of above 80% so it is reasonable to expect completion in the near future.

Objective NAV03.2 was created in 2017 so as to better reflect the alignment between the Level 3 of the Master Plan and the PCP Regulation and to allow better tracking of the RNAV1 and RNP1 implementations. 11 States within PCP applicability and 14 other non-PCP States do not have implementation plans yet. Absence of firm commitment for implementation plans is, most probably, the result of uncertainty related to PBN IR finalisation. Alongside PBN IR uncertainty, 8 States clearly indicated lack of business (operational) need for RNP1 implementation. However, taking into account the fairly long FOC date, no delays are expected at this time.

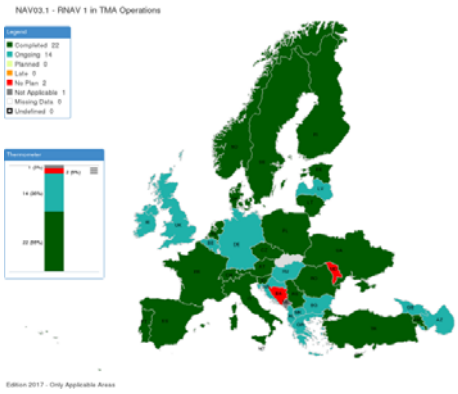


Figure 10 RNAV1 status of implementation as reported in LSSIP 2017.

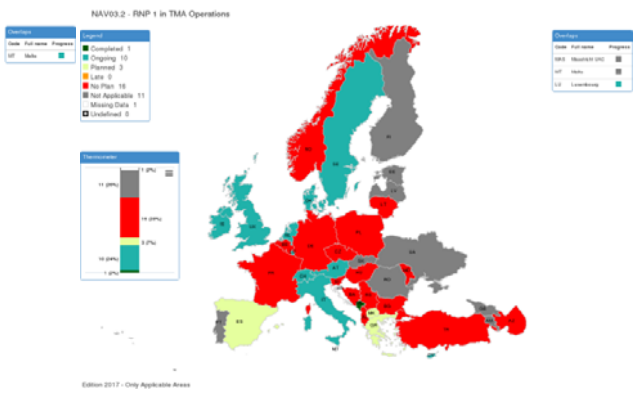


Figure 11: RNP1 status of implementation as reported in LSSIP 2017.

Continuous descent operations (CDOs – ENV01) and Continuous climb operations (CCOs – ENV03) are being deployed in a number of airports/TMAs following local initiatives.

The completion of ENV01 was delayed for one more year compared to last year estimate (now is 12/2018) with a slow progression in 2017 (only 3 more airports reported completion). In 2018 a surge in implementation is expected with an increase from 50 to 60 locations were CDO will be implemented. However it is expected that ENV01 will be subject to a major revisit in 2018 in line with the results from the European CCO/CDO Task Force. The CCO objective (ENV03) is in its first year of monitoring. Despite being monitored for the first time and not having a predefined applicability area, 84 Airports have reported on its implementation status which is very encouraging. Out of the 84, 42 Airports have already completed implementation while 30 other are in the process of implementation, with the latest implementation expected for 12/2020.

The NAV12 objective addressing optimised low-level IFR routes in TMA for Rotorcraft was introduced in the Master Plan Level 3 Plan in year 2017. It is therefore in its first year of monitoring. 2 States have already completed implementation while 3 other have reported ongoing deployment. All other States either have no plans yet, or consider it as not applicable to their business needs and operational environment.

Future developments

Future developments in this area are reliant on the upcoming PBN Implementing Rule. Once the IR has been published, all NAV related objectives will need to be re-calibrated to ensure alignment with its provisions.

CONCLUSION	**ENSURE ALIGNMENT OF THE OBJECTIVES WITH THE PBN IR, ONCE PUBLISHED.** **REVISIT THE ENV01 AND ENV03 IN LINE WITH THE RESULTS OF THE EUROPEAN CCO/CDO TASK FORCE.** **FULL EGNOS COVERAGE SHOULD BE ENSURED WITHIN THE WHOLE ECAC AREA IN ORDER MAXIMISE THE BENEFITS OF RNP APPROACH PROCEDURES WITH VERTICAL GUIDANCE DEPLOYMENT.**

STAKEHOLDERS REG ASP APT AU NM MIL IND

Free Route

Free route airspace (FRA) is a specified airspace within which users can freely plan a route between a defined entry point and a defined exit point, with the possibility of routeing via intermediate (published or unpublished) waypoints, without reference to the air traffic services (ATS) route network, subject of course to availability. Within such airspace, flights remain subject to air traffic control.

According with the PCP IR, Free Route may be deployed both through the use of Direct Routing Airspace (as a possible interim step) or directly through Free Routing Airspace (FRA). This approach is matched by the Master Plan Level 3 Plan through two different implementation objectives:

- Implementation of Direct Routing Airspace - implementation objective **AOM21.1**
- Implementation of Free Route Airspace - implementation objective **AOM21.2**

FRA is a key landmark in achieving free routing across European airspace on the road to SESAR business trajectories and 4D profiles. By 2019/20, additional savings of between 60,000-75,000 NM a day can be expected, with consequential fuel, environmental and cost benefits. FRA will make it possible to meet the demands of future airspace users over the next 50 years, such as civil and military RPAS, hypersonic transport, spaceplane operations to sub-orbit, wireless network balloons and airships.

Airspace users

The move from a fixed route network to availability of free-route airspace offers significant opportunities to airspace users. Savings in distance from these improvements could be as much as 25,000 NM a day. Flying distances can be reduced by approximately 7.5 million NM, representing the equivalent of 45,000 tons of fuel saved, or a reduction in emissions of 150,000 tonnes, or EUR 37 million. Airspace users are gradually adapting their flight planning systems to fully exploit the potential of FRA while the concept is compatible with current navigation capability.

ANSPs

Operating a FRA environment offers improved predictability thanks to more stable trajectories while at the same time enhancing the use of conflict detection tools. This concept can lead to a wider distribution of conflicts compared with the concentration of conflicts generated by the current fixed route network. In addition, ANSPs have not identified any major problems that would prevent implementation of the concept even in one of the busiest volumes of airspace in the world – the area covered by the Maastricht Upper Area Control Centre.

It should be noted that PCP IR specifies system requirements for FRA need to be implemented: MTCD/CDT and conformance monitoring (**ATC12.1**); and APW (**ATC02.8**). The progress of these elements can be found in Deployment View of this document.

Implementation status at the end of 2017

According to 2017 LSSIP reporting, within the "regulated" area (EU+, above FL310), the implementation of Direct Routes (AOM21.1) is virtually completed with only one State (ES) having partly implemented the functionality. In a very limited number of States, outside the regulated applicability area, the implementation will continue, with implementation plans extended to the end-2019. It is therefore recommended to consider the objective as achieved within its applicability area but to continue to track it for the purposes of ICAO ASBUs monitoring within the ICAO EUR Region.

The implementation of FRA (AOM21.2) is progressing very well and it expected that all ECAC States will have had implemented the functionality (at least above FL310) by end-2021. It is being observed that the current implementations are more and more addressing the airspace below FL310 and/or the cross-border airspace.

CONCLUSION	**OBJECTIVE AOM21.1 SHOULD BE CONSIDERED ACHIEVED BUT MONITORING SHOULD CONTINUE FOR THE PURPOSE OF THE ICAO ASBUS REPORT.** **IMPLEMENTATION OF FRA IS VERY MUCH ENCOURAGED BELOW FL310 AND IN CROSS-BORDER AIRSPACE.**

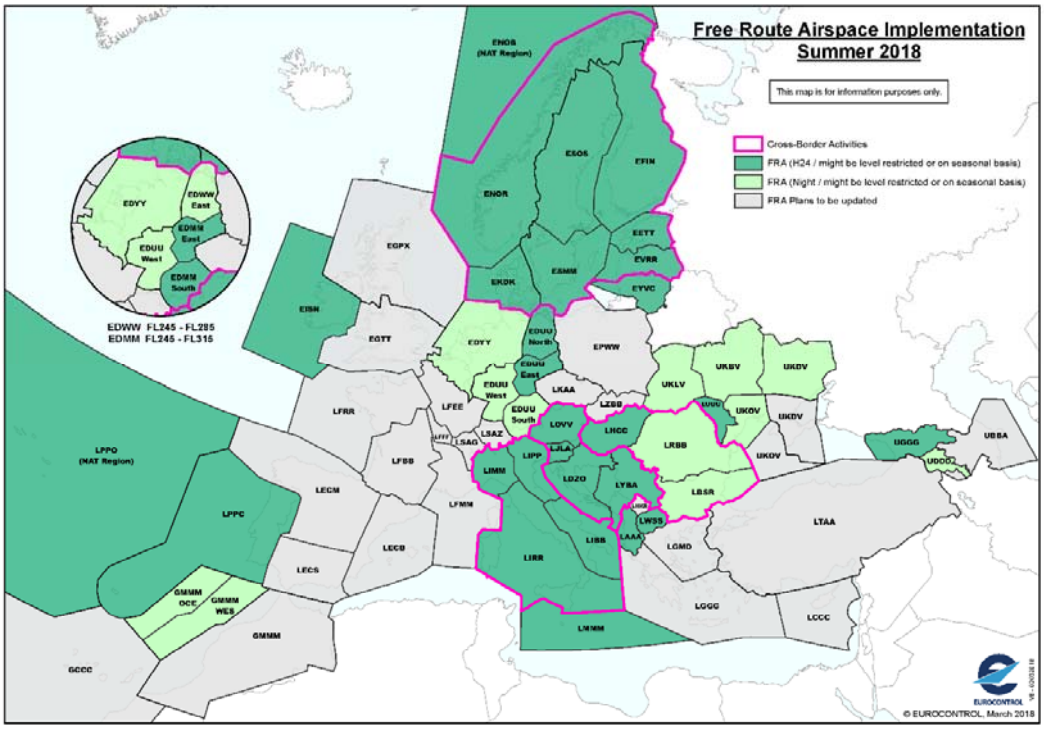


Figure12: FRA implementation summer 2018 (source NM)

SUCCESS STORY: SOUTH EAST COMMON SKY INITIATIVE FREE ROUTE AIRSPACE (SECSI FRA)

In just less than a year the two Free Route Airspaces SAXFRA (Slovenian Austrian Cross-border Free Route Airspace) and SEAFRA (South-East Axis Free Route Airspace - Bosnia and Herzegovina, Croatia, Serbia and Montenegro) were merged into the South East Common Sky Initiative Free Route Airspace (SECSI FRA), and on 1 February 2018 SECSI FRA went operational.

SECSI FRA is a specified airspace within which airspace users may freely plan a route between a defined entry point and a defined exit point, with the possibility to route via intermediate (published or unpublished) waypoints, without reference to the ATS route network, subject to airspace availability. Within this airspace, flights remain subject to ATS.

Full cross-border FRA allows airlines to take better advantage of wind or adapt to network disruptions. The better use of FRA options at flight planning level improve predictability and reduce ATC workload.

SECSI FRA offers to airspace users significant and substantial benefits, by delivering the shortest route options from Central Europe to South Eastern Europe. Based on the shortest route assignment potential savings per day are up to 1.940 NM in flight distance, 285 minutes in flight time, a reduction in fuel consumption of 8,000 kg and a reduction in CO2 emissions of 25,500kg. SECSI FRA is expected to deliver potential savings of 600.000-700.000 NM in flight distance per year.

SECSI FRA not only works towards achieving the goals of the European Commission regarding the implementation of “Free Route” across Europe but also fulfils airspace user´s requests for having multiple route options available for the same city-pair.

This was the significant milestone towards Free Route airspace across all of Europe – achieved by six (States) and five (5) ANSPs, with support by EUROCONTROL Network Manager.

Future developments

By the end of 2017, a substantial number of ACCs have either fully or partially implemented Free Route Airspace operations. By the end of 2019, most European airspace (except French, Spanish and Swiss ACCSs is expected to have implemented FRA, with all airspace having this type of operations by 2021/2022. This progress is the result of very close cooperation between the Network Manager, the ANSPs, military partners and airspace users. Cross-border implementation has begun and is already applicable (see the Success Story above) or soon will be, for many parts of Europe.

Remote Tower

The typical operating environments for remote tower services are airports below third level node, with a single runway, non-complex runway layout and low capacity utilisation. But remote tower services are not limited to those environments only. The concept is also feasible for medium density aerodromes where simultaneous movements can be expected, as well as for larger aerodromes with multiple simultaneous movements.

The implementation objective dealing with RT concept was introduced in the Level 3 in 2017 (**AOP14**). This is a local objective that has no defined applicability area. Any airport can implement the concept and the dedicated State monitoring will capture this implementation.

Implementation status at the end of 2017

Approval given:

- Sweden: 2 single remote towers in operation

Projects:

- Numerous: Sweden, Norway, Germany, UK, Hungary, France, Poland, Turkey, etc. (see Figure 13)

Type of airport environment:

- Small to midsize: eg. Budapest (contingency solution – remote tower)

SESAR projects focus:

- Multiple remote towers (three remote towers)
- Supervisory roles

EASA REMOTE TOWER IMPLEMENTATION SUPPORT

EASA rulemaking task to address the Remote Tower implementation was first set-up in 2014 to address single mode RT at low density airports. This phase was completed in 2015 with publication of ED Decision 2015/014/R and ED Decision 2015/015/R. As the implementation progressed and more industry solutions became available, Phase 2 was launched in 2016 with an extended scope to address busier environments and more complex modes of operation. The approach is to produce guidelines on 'Remote Aerodrome Air Traffic Services (ATS)' that will repeal and replace the existing guidance on single Remote Tower; and also to produce Guidance Material (GM) and Acceptable Means of Compliance (AMC) to the ATCO training and licensing Regulation (2015/340) that will replace and repeal the existing GM and AMC. Following the NPA/ED Decisions (expected 2018), EASA will set up a 'remote aerodrome ATS' implementation and support action.

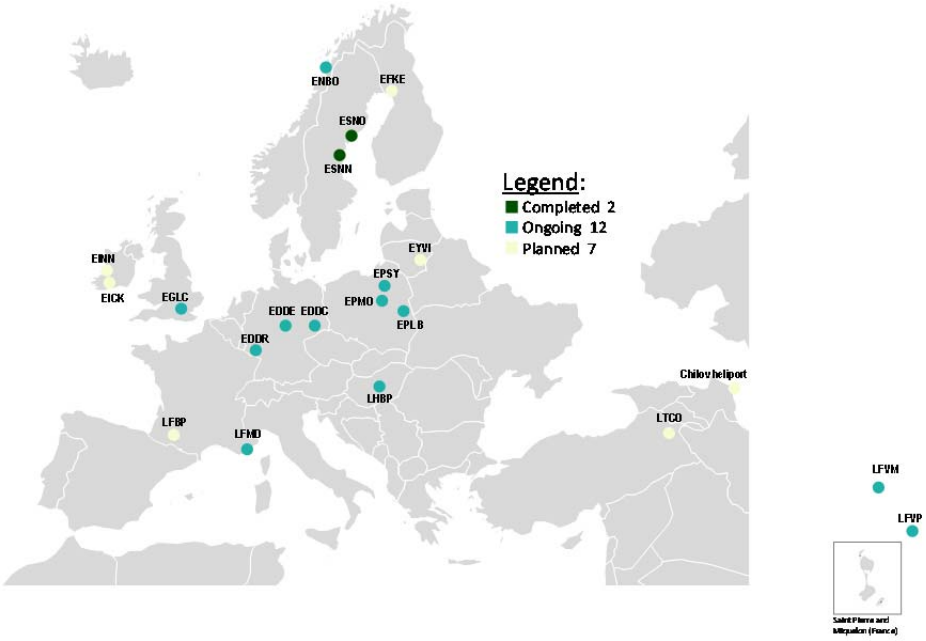


Figure 13: RT implementation

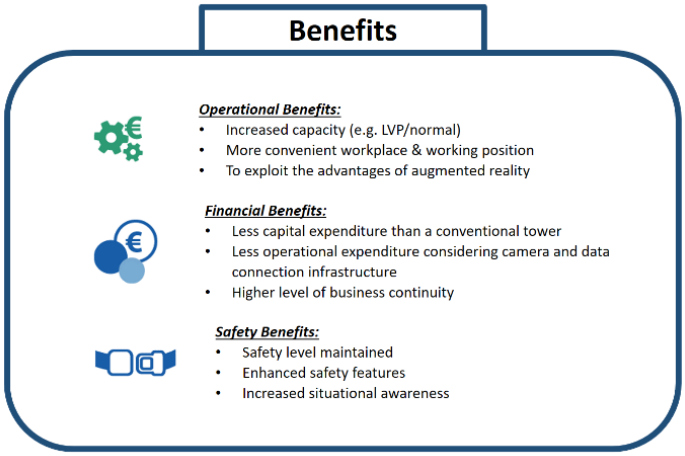
SUCCESS STORY: REMOTE TOWER IMPLEMENTATION PROJECT AT BUDAPEST. A NEW APPROACH FOR MID-SIZE AIRPORTS

HungaroControl laid down the foundations of a full-scale remote tower implementation at Budapest with successfully demonstrating the capabilities of a video system as part of a SESAR Large Scale Demonstration project called Budapest 2.0. This live trial project proved the viability of the remote tower solution for medium size airport environments such as Budapest Airport. The remote tower concept of HungaroControl (rTWR) promotes a structured and complex implementation approach for medium airports. The backbone of the solution is the integration between a ground surveillance system and a video system. At Budapest, Indra Navia AS duplicated the Advanced Surface Movement Guidance and Control System (A-SMGCS),, and the Canadian Searidge Technologies delivered the camera system (including fix, PTZ and thermal cameras), the video wall and the related tech instruments.

The integration of these systems provides a solution which supports air traffic controllers in a more efficient service provision as it provides visual features that would not be possible at conventional operation. Track data gathered from the surveillance system may be linked to objects on the video wall, so dynamic flight labels are available for controllers. Other supplementary data (i.e. met data) may be displayed to enable prompt information access and decision making.

The remote tower represents the next generation of tower service provision where maintaining visual observation is possible during a wide range of visibility conditions. The air traffic controllers are able to maintain visual observation of the area of responsibility (even on previously blind spots) via digital image which could result in increasing the capacity without compromising safety. The location independent nature of remote towers has considerable benefits from a redundancy and business continuity point of view.

The rTWR center is located in the headquarters of HungaroControl, further away from the territory of the airport, the same venue as hosted the Budapest 2.0 demonstration project.



The arrival and departure air traffic at Budapest Liszt Ferenc International Airport is currently controlled from the 34-year-old emblematic control tower. Due to the implementation of the Remote Tower system Budapest Airport (BUD) is the first among the world's medium-capacity airports, where the arrival and departure air traffic control can be independent from airport environment. From 2017 the remote contingency tower is in operation, approved by the Hungarian CAA. HungaroControl frequently provides service from that facility to maintain and develop the related competency. The improvement has not stopped; HungaroControl aims to shift to full-time remote operation as of 2020. In order to achieve this, the latest technology features are being validated and – if accepted – implemented in the operational system. The current system is planned to be extended with further cameras and functions such as intuitive PTZ control and AI based target tracking.

Collaborative Airport

The Airport Collaborative Decision Making (A-CDM) project integrates processes and systems aimed at improving the overall efficiency of operations at European airports. This in turn allows the ATM Network to function more fluently. A-CDM is about partners – airport operators, aircraft operators, ground handlers, air traffic control and the Network Manager – working together more efficiently and transparently in how they work and share data.

The A-CDM Manual gives a thorough view on the concept and its implementation. The related Level 3 implementation Objective is **AOP05** and the implementation date is **12/2016**. Related level 3 implementation objective on the Airport Operations Plan (AOP) is also relevant in this area (**AOP11**), as well as its integration in NOP (**FCM05-APO03**). In addition, Level 3 implementation objective **ENV02** provides the collaborative approach to environmental issues for the airport.

SUCCESS STORY: DPI THROUGH NM'S B2B SERVICES

Copenhagen Airport (CPH) and NM successfully started exchanging information via our business-to-business (B2B) web services on 21 March 2018, a milestone achievement as CPH becomes the first collaborative decision-making (A-CDM) airport to forgo the legacy ATFN technology for data exchange. It will now send all its Departure Planning Information (DPI) messages via NM's B2B Web services.

NM's B2B web services enable the automatic exchange of digital information supporting network-wide collaborative processes, as they integrate them seamlessly with local processes. The interface provided by NM gives system-to-system access to NM's services and data, allowing customers to provide, retrieve and use the NM information in their own systems, depending on their business needs.

NM's B2B automatic data exchange brings several benefits, including enhanced data quality, better accuracy, more timely information, simplified processes, reduced costs and improved safety.

In 2018 NM is collaborating with another five A-CDM airports (Amsterdam, Lisbon, Trondheim, Stavanger and Bergen) which intend to send DPI messages via B2B, as well as with another five ADV ATC TWR airports (Warsaw, Exeter, Norwich, Derry and Coventry). This could raise the total number of airports sending DPI messages via B2B up to 12.

SUCCESS STORY: A-CDM AT PALMA DE MALLORCA

Palma de Mallorca Airport has successfully completed the integration process in the Airport-Collaborative Decision Making (A-CDM) program. This is the third Spanish airport to finish the A-CDM implementation, after Madrid – Barajas and Barcelona – El Prat, both in 2015. All in all, the main three Spanish airports served more than 128 million passengers in 2017.

A MoU was signed in 2016 among all the partners with the following objectives:

- Create the necessary coordination framework.
- Prepare a joint strategy for the implementation.
- Ensure the technical resources for exchanging information.
- Implement procedures to improve predictability.
- Establish monitoring mechanisms to assess improvements.

This implementation represents a radical change in the usual way of working at the airport. Greater efficiency in resources management is achieved, thanks to joint decision making, which is possible by sharing the information available for each of the actors involved.

The A-CDM system enables EUROCONTROL, airlines, handlers, ANSPs, and airports to share updated and accurate information and subsequent benefits for all the parties involved. Having data available in advance, enables improvements in planning, reduction in taxi times and delays and reduction in fuel costs and environmental impacts. As for the passengers, the benefit is also important since it improves the punctuality, reduces the number of missed connecting flights and makes more information available during events that impact on the quality of service.

Implementation status at the end of 2017

	Phases	Airports	No.
DPI IMPLEMENTATION	First information exchange	MUC, BRU, CDG, FRA, HEL, DUS, LHR, ZRH, OSL, FCO, SXF, MAD, STR, MXP, LGW, VCE, PRG, BCN, GVA, LIN, ORY, CPH, PMI, ARN, HAM, LYS, NAP, BGO, SVG, TRD, AMS, LIS, DUB, VIE, IST, WAW, NCE, ATH	38
	Development DPI-ICD	MUC, BRU, CDG, FRA, HEL, DUS, LHR, ZRH, OSL, FCO, SXF, MAD, STR, MXP, LGW, VCE, PRG, BCN, GVA, LIN, ORY, CPH, PMI, ARN, HAM, LYS, NAP, BGO, SVG, TRD, AMS, LIS, DUB, VIE, IST, WAW, NCE, ATH	38
	Locally Implemented	MUC, BRU, CDG, FRA, HEL, DUS, LHR, ZRH, OSL, FCO, SXF, MAD, STR, MXP, LGW, VCE, PRG, BCN, GVA, LIN, ORY, CPH, PMI, ARN, HAM, LYS, BGO, SVG, TRD, AMS, LIS, DUB, VIE, IST, WAW, NCE, ATH	37
	DPI Operational Evaluation	MUC, BRU, CDG, FRA, HEL, DUS, LHR, ZRH, OSL, FCO, SXF, MAD, STR, MXP, LGW, VCE, PRG, BCN, GVA, LIN, ORY, CPH, PMI, ARN, HAM, LYS, BGO, SVG, TRD, LIS	30
	DPI Operational at NMOC	MUC, BRU, CDG, FRA, HEL, DUS, LHR, ZRH, OSL, FCO, SXF, MAD, STR, MXP, LGW, VCE, PRG, BCN, GVA, LIN, ORY, CPH, PMI, ARN, HAM, LYS	26

In the end of 2017, A-CDM was fully implemented in 26 airports in Europe. The figure below also shows the Advanced ATC Tower airports, which are implementing A-CDM with a reduced scope. This implementation corresponds to SESAR Solution #61.

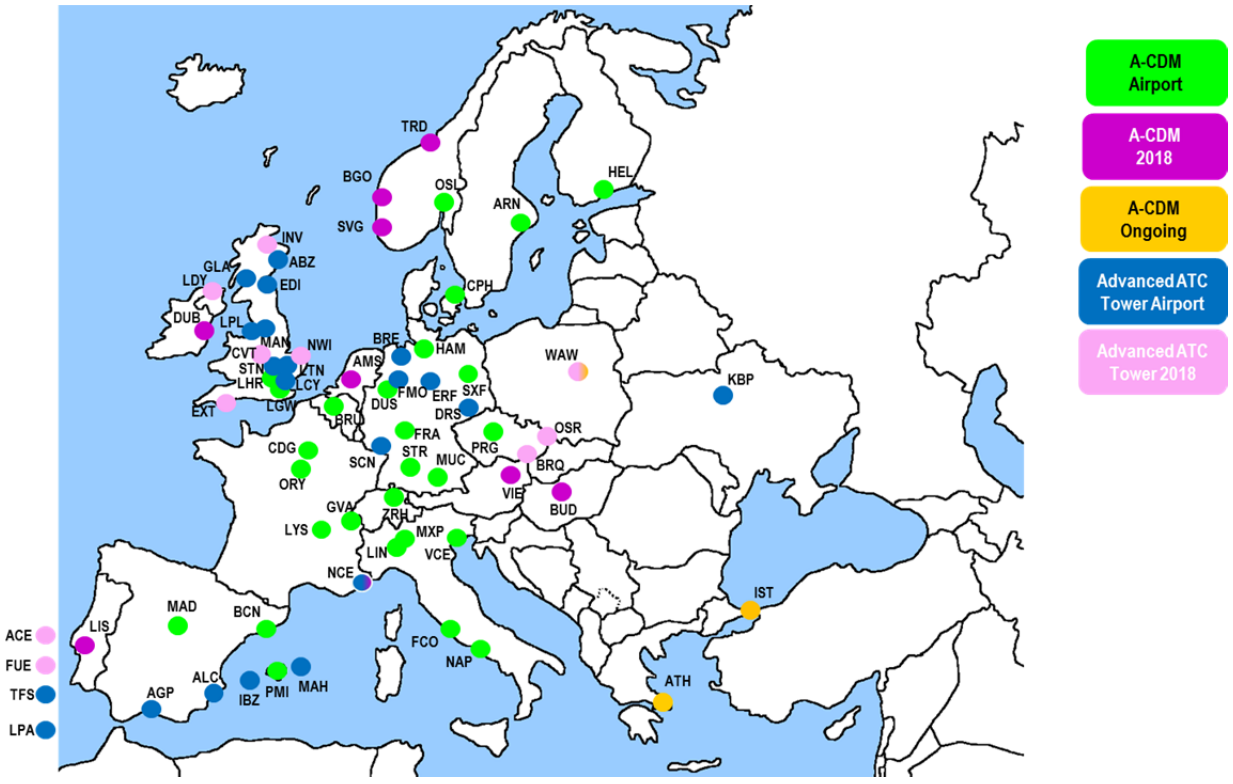


Figure 14: A-CDM and Advanced ATC Tower implementation in 2017 and 2018 expectations

Future developments

It is planned that eight (8) additional airports will implement A-CDM by the end of 2018. Similarly for Advanced ATC Tower, nine (9) airports will be operational in 2018.

STAKEHOLDERS REG ASP APT AU NM MIL IND

Surface Management

At busy airports across the Europe the management of arrival and departures coupled with efficient and safe movement on the airport surface is a crucial part of managing an on-time airport. Improving the airport surface operations is one of the key SESAR initiatives. Surface Management provides critical situational awareness, visibility, alerts, and decision support – enabling the airport to keep its stakeholders aware of the status of operations and availability of key resources.

The technical solutions considered for this 'Major ATM Change' and represented at Level 3 of the Master Plan, include different Airport Surface Movement Guidance and Control System (A-SMGCS) services, such as surveillance (**AOP04.1)**, RMCA (**AOP04.2**), CATC and CMAC (**AOP12**) and planning and routing service (**AOP13**). In addition, there is one Level 3 implementation objective related to implementation of runway safety action plans for runway excursions (**SAF11**). This action plan includes number of best practices for all national stakeholders, aimed at improving runway safety and surface management in general. The action plan for prevention of runway incursions (former implementation objective **AOP01.2**) is considered as implemented in ECAC area.

Safety

Support to the controller in detecting potentially hazardous conflicts or infringements of runways and route deviations on taxiways and apron areas. Provides critical situational awareness, visibility, alerts, and decision support.

Capacity

Reduction of delay and improvement in traffic throughput in low visibility conditions.

Operational Efficiency

More efficient control of surface traffic.

Environment

Reduction in fuel burn and emissions. Reduced noise and emissions due to limiting ground engine running time attributable to better timed operations.

SUCCESS STORY: LFV RIPP (RUNWAY INCURSION PREVENTION PROGRAMME)

LFV contributes to increased aviation safety performance through collaboration with customers, partners and other stakeholders. The RIPP project, the purpose of which is to reduce the number of runway incidents, is a suitable example. LFV also has meetings with customers and stakeholders to discuss interfaces for cooperation and security.

There is still a harmonization between LFV, Naviair and NUAC with regards to working methods, processes and routines focusing on aviation security.

LFV has ongoing tactical as well as strategic meetings with the Armed Forces to develop aviation security based on the perspective that the Armed Forces contribute with. LFV is also active in international contexts and participates in several internationally aviation safety operations such as:

- EUROCONTROL Safety Team
- CANSO Europe Safety Directors Group
- SESAR

Implementation status at the end of 2017

Table 1: Implementation of airport safety nets as reported in LSSIP 2017

PCP Airports			Airport Safety Nets Services			
State	**Code**	**Airport**	**A-SMGCS surveillance**	**A-SMGCS RMCA**	**CATC and CMAC**	**Planning and Routing**
AT	LOWW	Vienna	☑	☑	12/2020 (40%)	12/2020 (8%)
BE	EBBR	Brussels	☑	☑	☑	n.p.
DK	EKCH	Copenhagen	☑	☑	12/2020 (25%)	12/2023 (2%)
FR	LFMN	Nice	☑	☑	12/2022 (5%)	12/2023 (0%)
FR	LFPG	Paris, Charles de Gaulle	☑	☑	06/2021 (23%)	12/2023 (0%)
FR	LFPO	Paris Orly	☑	☑	06/2022 (23%)	12/2023 (0%)
DE	EDDB	Berlin Brandenburg	n.a.	n.a.	n.a.	n.a.
DE	EDDF	Frankfurt Main	☑	12/2018 (43%)	12/2020 (28%)	12/2023 (0%)
DE	EDDL	Düsseldorf	08/2018 (51%)	08/2019 (25%)	12/2020 (25%)	12/2023 (0%)
DE	EDDM	Munich	☑	☑	12/2020 (25%)	12/2023 (0%)
IE	EIDW	Dublin	☑	☑	06/2018 (94%)	n.p.
IT	LIMC	Milan Malpensa	12/2018 (78%)	12/2020 (5%)	12/2019 (50%)	n.p.
IT	LIRF	Rome Fiumicino	12/2019 (78%)	12/2020 (5%)	12/2023 (13%)	n.p.
NL	EHAM	Amsterdam	☑	☑	12/2020 (5%)	n.p.
NO	ENGM	Oslo	☑	☑	n.p.	n.p.
ES	LEBL	Barcelona	☑	12/2019 (50%)	12/2020 (10%)	12/2023 (0%)
ES	LEMD	Madrid Barajas	☑	12/2019 (33%)	12/2020 (10%)	12/2023 (0%)
ES	LEPA	Palma de Mallorca	☑	12/2019 (33%)	12/2020 (10%)	12/2023 (0%)
SE	ESSA	Stockholm Arlanda	☑	12/2018 (40%)	12/2020 (25%)	n.p.
CH	LSZH	Zurich	☑	☑	12/2018 (24%)	12/2022 (8%)
TR	LTBA	Istanbul Ataturk	☑	☑	n.p.	n.p.
GB	EGCC	Manchester	09/2020 (37%)	08/2020 (10%)	12/2020 (40%)	08/2020 (0%)
GB	EGKK	London Gatwick	☑	☑	☑	n.p.
GB	EGLL	London Heathrow	12/2018 (93%)	12/2018 (85%)	☑	12/2023 (8%)
GB	EGSS	London Stansted	☑	☑	12/2020 (28%)	n.p.

☑ completed, n.p. – no plan yet, n.a. – not applicable, m.d. – missing data

Future developments

The information reported through LSSIP 2017 indicates that implementation objective related to A-SMGCS surveillance function will be postponed to end 2018. This adds one additional year to what is reported for last year. Therefore, it is all the more important to follow up the implementation of A-SMGCS functionality to ensure delays are minimised. This is the reason why the conclusion from last year is retained in the 2017 report.

CONCLUSION	**DELAYS IN IMPLEMENTATION OF A-SMGCS SURVEILLANCE CAN POTENTIALLY IMPACT THE TIMELY IMPLEMENTATION OF OTHER SUBSEQUENT A-SMGCS FUNCTIONALITIES.**

STAKEHOLDERS REG ASP APT AU NM MIL IND

Enhanced operations in the vicinity of runway

The operations in the vicinity of the runway, namely those referring to the approach phase, can be optimised by a series of improvements in the operational process. Whilst maintaining safety levels, these improvements will offer benefits in terms of capacity, contribute to savings in terms of costs and mitigate environmental impacts and provide benefits to airlines, ANSPs and airports.

The technical solutions considered in this 'Major ATM Change' and represented at Level 3 of the Master Plan, include Time-Based Separation (**AOP10**) in the PCP phase. Time-Based Separation (TBS) enables separation of aircraft in sequence on the approach to the runway using time intervals rather than distances. A TBS system requires a sequencing tool based on merging the wind profile measurement and heuristic techniques.

Capacity
Improvement in aircraft landing rates and a potential reduction of capacity constraint at an airport by alleviating, avoiding and complying with environmental restrictions.

Cost efficiency
Reduction in fuel consumption and potentially reduced environmental mitigation costs.

Environment
Reduction in fuel burn, emissions, noise and atmospheric emissions due to reduced holding times and lower drag and trust facilitated by these functionalities.

SUCCESS STORY: AUGMENTED APPROACHES TO LAND (AAL) - AEROPLANE LANDS USING ONLY SATELLITE NAVIGATION BY DFS

Bremen is the first airport in Germany to have implemented a precision approach procedure using EGNOS (European Geostationary Navigation Overlay Service), a satellite-based augmentation system (SBAS) that supplements GPS and other satellite navigation systems. It improves the position accuracy of GPS from 10-20 metres to 1-3 meters.

SBAS provides an innovative alternative to the conventional instrument landing system (ILS) and can also be used in poor visibility for category I (CAT I) weather conditions.

The International Civil Aviation Organisation ICAO approved the satellite-based SBAS precision approach procedure, naming it: "LPV 200". The pilot is guided down to a height of 200 feet above ground using satellite-based technology that guides the aeroplane horizontally and vertically. When the pilot has the runway in sight, it is safe to land.

Up until now, it has only been possible to guide aircraft to the "decision height" by means of ground-based systems such as ILS or systems such as GBAS, which supplement the satellite guidance with a ground-based station. The new SBAS technology offers clear advantages compared to conventional approach procedures. In addition to being an extremely precise alternative to ILS, SBAS does not require ground infrastructure that is expensive to operate and requires a great deal of maintenance.

EGNOS geostationary satellites supplement GPS signals to achieve the high degree of precision for the SBAS procedure. Together, they fulfil the requirements needed for precision approach procedures and comply with ICAO standards.

In autumn 2016, NetJets and DFS tested the latest approach procedures with GBAS. This project was awarded an innovation prize by the European Commission in early March 2017 as part of the Augmented Approaches to Land project.

Not all aircraft manufacturers equip their aeroplanes with EGNOS receivers. DFS believes that incentives will need to be established so that aircraft can be equipped with this technology in the long term.

Implementation status at the end of 2017

The map below shows the implementation status for the Time-Base Separation at the end of 2017. This objective is already implemented at London Heathrow Airport/EGLL. Vienna Schwechat/LOWW has started the implementation which is expected to be completed by the end of 2020.

The possible use of Time Based Separation is being evaluated at Frankfurt airport and approach, with initial steps underway as a pilot project. Paris-Orly (LFPO), Dublin (EIDW), Madrid Barajas (LEMD) and Manchester Airport (EGCC) have also planned implementation of this objective.

By the FOC date (12/2023), only nine (9) out of 16 airports identified in the PCP IR will have completed implementation of this objective. Six (6) airports have not yet established concrete implementation plans and two (2) (LIRF, LIMC) have declared it as not applicable. Overall, the objective is still at early stages of implementation.

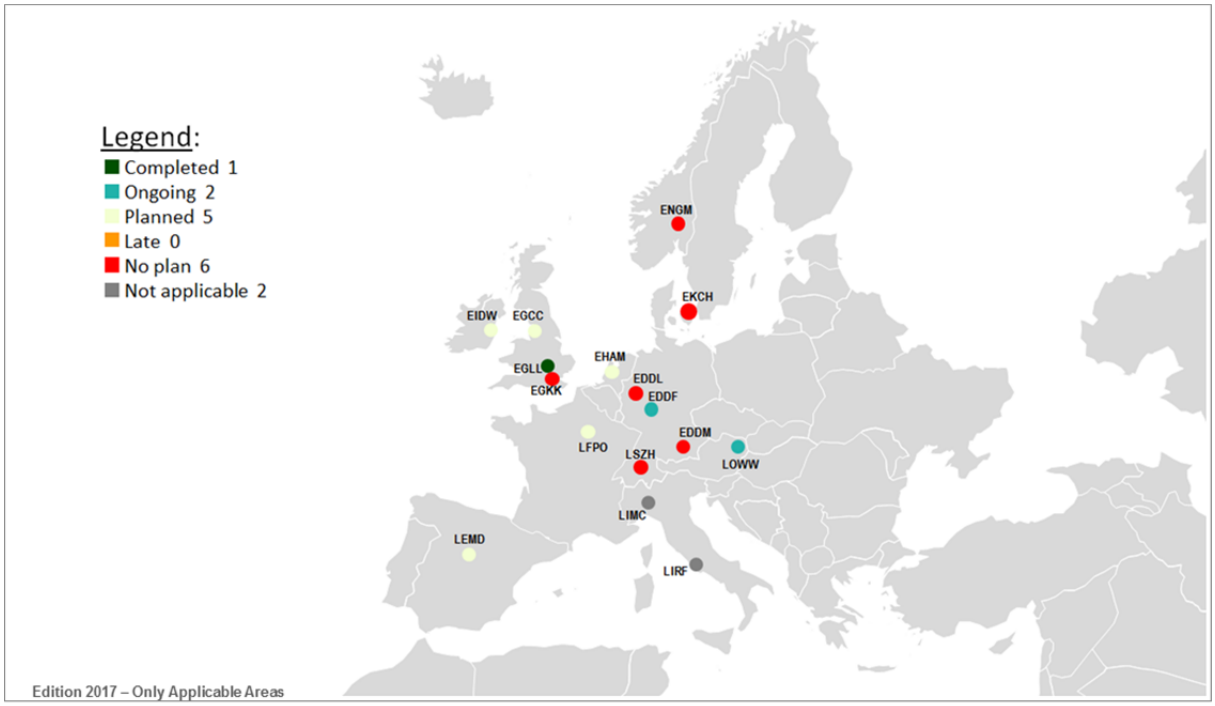


Figure15: TBS implementation as reported in LSSIP 2017

Future developments

Last year's report called for the review of the applicability area for the time based implementation objective. This year results again show that only 9 airports will have completed the objective until the regulated deadline which might lead to non-compliance with the PCP IR. However it is expected that the PCP review currently taking place will also address this aspect.

STAKEHOLDERS REG ASP APT AU NM MIL IND

Pre-SWIM & SWIM

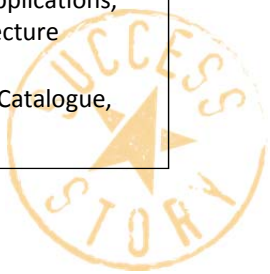
SWIM represents a complete paradigm change in how information is managed during its full lifecycle and across the whole European ATM system. The aim of SWIM is to provide information users with relevant and comprehensive information. This means making the right air traffic management information available at the right time.

A number of MP L3 objectives contain provisions for implementing technological solutions that facilitate the transition towards initial SWIM operations. These elements relate to infrastructure (transition to IPv6 as required by **ITY-FMTP** objective), common data model (as required by **ITY-ADQ** and **AOM19.1** to enable network wide exchanges). These elements are considered as pre-SWIM elements. Master Plan Level 3 2017 Implementation Plan also includes two (2) initial SWIM objectives on yellow profile (**INF08.1**) and blue profile (**INF08.2**). Both of these are initial objectives , meaning no reporting was performed relating to them in the 2017 LSSIP monitoring exercise. In addition objective **FCM08** on Extended FPL is linked to SWIM implementation.

SUCCESS STORY: FROM PENS TO NEWPENS

The current PENS contract has started in December 2009 and will expire on 30/11/2019. 30 ANSPs and EUROCONTROL have become PENS users within this period. The current PENS has been successful in allowing the ANSPs to replace their bilateral point-to-point international connections by PENS as a European-wide any-to-any ATC G-G IP backbone. Although PENS is recognised as successful in many ways, areas for further improvement have been identified. These improvements will allow NewPENS to build on the success of the current PENS and to realise the vision of evolving from being “a” means of inter-ANSP G-G communications in Europe, to becoming “the” means of inter-ANSP G-G communications in Europe. NewPENS is expected to improve the service currently offered by PENS in the following domains:

- Open up to the rest of the ATM community: open to a wider spectrum of stakeholders (i.e. Military, ATM providers, Airlines, Airports, etc).
- Cost: while the communication costs could be gradually reduced over time, a new contract resulting from a high-quality re-tendering would allow reaching better prices.
- Stability and continuity: the NewPENS contract has duration of up to 10 years. This long life time should allow NewPENS users to invest in using NewPENS.
- Enhanced Governance: layered governance organisation (top management board, PENS executive board, ATS board).
- Capable & affordable: NewPENS is providing differentiated services satisfying entry-level solutions, mid-level solutions as well as very demanding high-end solutions.
- Future ATM applications: NewPENS is expected to provide support for future ATM applications, including those based on the System-Wide Information Management (SWIM) architecture developed by SESAR.
- Technological evolutions: NewPENS offers services assembled in a Technical Service Catalogue, from which users may select those services required for their business needs.



Implementation status at the end of 2017

The results show that almost all ANSPs in the ECAC region have already upgraded their infrastructure to support the FMTP. Regarding AIXM 5.1 implementation, most of the ECAC ANSPs will implement this model in 2018 while ADQ implementation is delayed.

Table 2: Implementation of PRE-SWIM elements in ECAC region as reported in LSSIP 2017

State[1]	FMTP	AIXM 5.1	ADQ
AL	☑	2018	2018
AM	2018	n.a.	2018
AT	☑	2018	2019
AZ	☑	2018	2018
BA	☑	2018	2019
BE	☑	☑	2019
BG	☑	☑	2018
CH	☑	☑	2023
CY	☑	☑	2018
CZ	☑	2021	2018
DE	☑	☑	2020
DK	☑	☑	2020
EE	2018	☑	2018
ES	☑	2018	2023
FI	2018	2018	2020
FR	2018	☑	2022
GE	☑	n.a.	2019
GR	2018	2018	2018
HR	☑	☑	2018
HU	☑	☑	2019
IE	☑	2018	2018

State	FMTP	AIXM 5.1	ADQ
IT	☑	2018	2018
LT	☑	2018	2018
LU	☑	n.a.	2020
LV	☑	☑	2018
MAS	☑	☑	n.a.
MD	☑	n.a.	☑
ME	☑	2018	2020
MK	2019	n.a.	n.a.
MT	2018	n.a.	2018
NL	☑	2023	2018
NO	☑	2018	2018
PL	☑	☑	2018
PT	2019	2018	2020
RO	☑	☑	2020
RS	☑	2019	2020
SE	2018	☑	2021
SI	☑	2018	2018
SK	☑	2018	2018
TR	☑	n.p.	2022
UA	2019	☑	n.a.
UK	2020	2018	2022

☑ completed; n.p. no plan yet; n.a. not applicable

Future developments

EUROCONTROL has developed three technical Specifications that form the foundation of SWIM's information services. These three Specifications make it easier for airlines, ANSPs, MET Service Providers, the Network Manager and other key players in European aviation to provide, describe and consume information services in a standardised manner. The three Specifications are:

- EUROCONTROL Specification for SWIM Service Description:
  - sets out requirements for describing information services;
  - defines the minimum set of elements a service description has to contain to make it searchable and useful.
- EUROCONTROL Specification for SWIM Information Definition
  - contains requirements for information definitions;
  - contributes to the semantic interoperability of information.
- EUROCONTROL Specification for SWIM Technical Infrastructure (TI) Yellow Profile
  - describes requirements for system interfaces (e.g. protocols);
  - sets out requirements for IT infrastructure capabilities to facilitate the reliable, secure and efficient exchange of information;
  - contributes to technical interoperability.

[1] Main ANSP of the State

Data Link

The Data Link Services (DLS) Implementing Rule (adopted on 16 January 2009 by the European Commission and amended by Commission Implementing Regulation 2015/310) lays down requirements for the coordinated introduction of data link services based on air-ground point-to-point data communications, a two-way communication between an aircraft and a ground communication entity.

The Controller-Pilot Data Link Communication (CPDLC) application provides air-ground data communication for the ATC service. It enables 4 data link services (DLIC, ACM, AMC and ACL) that provide for the exchange of communication management and clearance/information/request messages which correspond to voice phraseology employed by air traffic control procedures. The controllers are provided with the capability to issue ATC clearances (level, heading, speed, directs etc.), radio frequency assignments, and various requests for information. The pilots are provided with the capability to respond to messages, to request/receive clearances and information, and to report information. A "free text" capability is also provided to exchange information not conforming to defined formats.

The associated implementation objective, based on the IR, was created in 2010 (**ITY-AGDL**).

Implementation status at the end of 2017

In 2016, the SESAR Deployment Manager was mandated by the EC to act as Data Link Services (DLS) Implementation Project Manager and on this basis a DLS Recovery Plan was developed aimed at setting a realistic path to upgrade from today's DLS implementation status in Europe. Only one (1) State (CZ) reported the completion of the objective in February 2017 instead of December 2016. Seven (7) States (BG, CY, GR, PL, RO, SI & UK) reported the status "Ongoing" with a projected implementation date by February 2018 and another five (5) States (IT, LV, LT, MT & MK) with a projected implementation date after February 2018, like for LT by December 2019. Eleven (11) States (DK, EE, FI, FR, MD, ME, NO, PT, RS, SK & ES) reported the status "Late" with a projected implementation date as late as December 2023 for ME and RS. The main reason for delay is the late procurement of New ATM systems capable of handling DLS functionalities and required VDL Infrastructure.

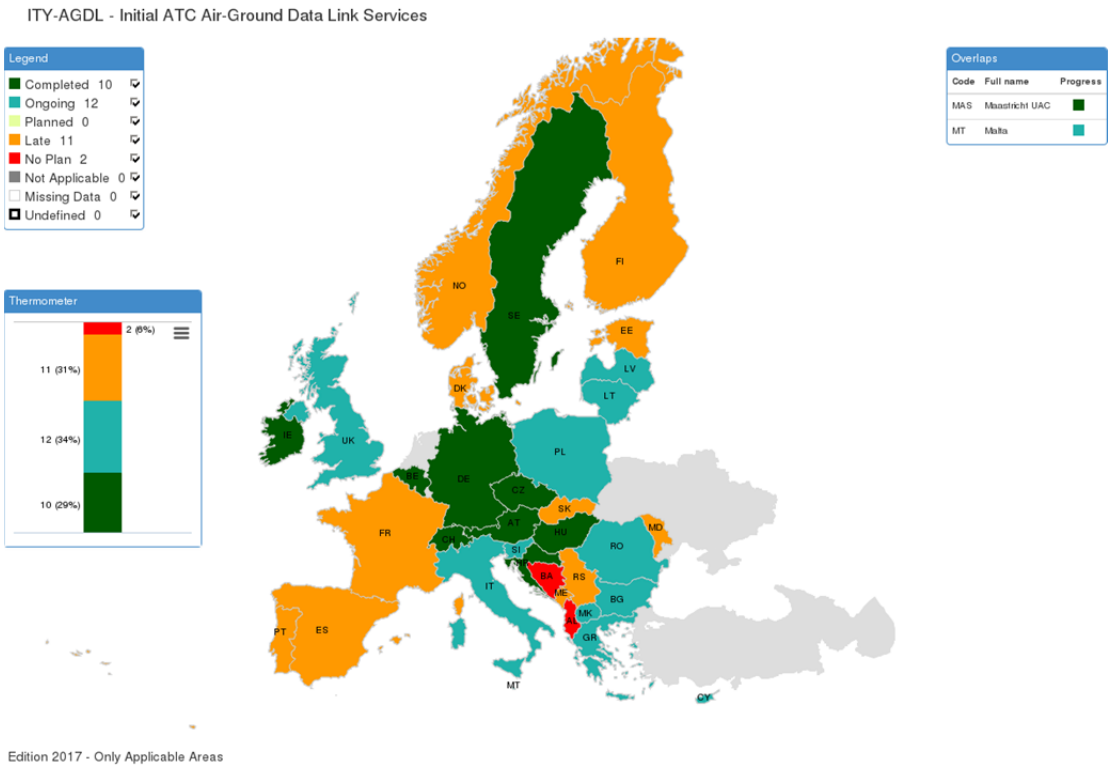


Figure16: Datalink implementation as reported in LSSIP 2017

DLS implementation – SDM Main Achievements

On 18th October 2016, the SESAR Deployment Manager (SDM) received a mandate from the European Commission to act as Data Link Services (DLS) Implementation Project Manager. Specifically, the mandate was intended to recover from the fragmented and unsynchronized deployment of DLS in Europe, building on SDM technical expertise and its unique position as coordinator of the SESAR Deployment Framework Partnership.

Relying on its role as coordinator, the SDM was able to fulfill this role successfully. In particular, stakeholders required to implement DLS under coordination of the SDM worked jointly in an unprecedented way, defining and executing two dedicated projects known as Path 1 and Path 2 (as per DLS Recovery Plan). Moreover, SDM fostered the cooperation among key relevant bodies (NM, EASA, EUROCAE, ETSI), which led to a strengthening of the standardization framework and the improvements of the performances of Data Link Services. Within this framework, Communication Service Providers SITA and ARINC stepped up their efforts, in order to upgrade the communication network as necessary to implement the multi-frequency where needed.

In accordance with the DLS Recovery Plan, the SDM and all partners succeeded in achieving substantial progress for the deployment of the DLS transitional solution (as per ELSA study) through a harmonized approach. In consideration of the 5th of February 2018 deadline imposed by the IR (EU) No 2015/310, some Member States implemented DLS in accordance with the Implementing Rule, whilst some others have demonstrated clear and proofed plans to implement with multi-frequency enhancement by December 2018.

Moreover, under SDM guidance DLS performance increased substantially as demonstrated by Path I Project and reported by NM. In particular, Provider Abort (PA) rate decreased by approximately 67% and technical round trip delay decreased by approximately 43% (starting from July to November 2017). It is worth noting that these results have been obtained despite a slight increase in Aircraft using Datalink Services.

Furthermore, Service Areas and the overall DLS Architecture have been defined in Path II Project , leading to the identification of an intermediate step towards the target solution consisting in the implementation of a single ATN ground network. Work is ongoing in order to better define all the necessary aspects needed for the target solution definition and implementation. In this sense, it is worth mentioning that the SDM, within 2017 CEF Transport Calls framework, encouraged the submission of a multi-stakeholder project led by ENAV and ENAIRE and counting 20 project contributors , aiming to further define the steps toward the target solution. Moreover, with respect to the airborne domain, two IPs led by Portugalia and AirFrance have been submitted for 2017 CEF Transport Calls, with the aim of proceeding towards the direction suggested by the SDM concerning the upgrade to “best in class” avionics.

The abovementioned SDM achievements put the DL Service provision in Europe on the right track. In this sense it is worth mentioning that the increase in DLS performance will produce growing benefits day after day for the European airlines and passengers.

STAKEHOLDERS REG ASP APT AU NM MIL IND

CNS rationalisation

Development of the CNS rationalisation segment of the infrastructure key feature is one of the main priorities for the ATM Master Plan update 2018.

In en-route and terminal areas, the SES vision for ground SUR foresees the combination of ADS-B with independent Surveillance, the latter provided by Monopulse Secondary Surveillance Radar (MSSR), Mode S or Wide Area Multilateration (WAM). The focus is on performance-based modernisation and rationalisation of the European ATM surveillance Network. It covers both ground surveillance (such as ADS-B, multilateration and Mode S) as well as airborne surveillance applications. At Master Plan Level 3, two (2) implementation objectives deal with this subject, Surveillance Performance and Interoperability (**ITY-SPI**) and Aircraft Identification (**ITY-ACID**)

The NAV part is addressed through PBN major ATM change, as the Level 3 implementation objectives also include actions on infrastructure (**NAV03.1, NAV03.2**, **NAV10** and local **NAV12** implementation objectives).

In the pre-SESAR phase, the main driver for the COM part is the SES interoperability Regulation IR (8.33kHz below FL195 (**ITY-AGVCS2)**, Datalink (**ITY-AGDL**) and the support for the deployment of new technologies such as AMHS (**COM10**). In the PCP timeframe the baseline will be enriched with Voice over IP (**COM11**) and New PENS (**COM12**).

SUCCESS STORY: NAVIGATION AID RATIONALISATION AND UPGRADE BY NATS

Commercial aircraft have been using ground-based radio beacons to help them navigate for over 50 years. The widespread availability of on-board satellite navigation systems now enables these beacons to be switched from a primary navigation aid to a back-up role.

With ground-based navigation aids operating in a back-up role, SESAR 1 has identified that a significant number could be removed across Europe – reducing the need for ongoing operating/maintenance costs and replacement of life-expired equipment.

In the UK, NATS has incorporated these ideas into a rationalisation and upgrade programme aimed at removing over 30 navigation aids within the coming years, while sustaining a core network as a backup to satellite navigation. This programme is partly supported by the EU's Connecting Europe Facility.

Implementation status at the end of 2017

The table below shows integrated implementation progress of relevant Master Plan Level 3 implementation objectives in this area, based on LSSIP 2017 information. It has been observed that very few States have implemented all the functionalities. The individual progress assessments show that there are some risks of delays identified for the SPI implementation because some States have missed the 2015 implementation milestones. However, it seems that they are adjusting the plans to meet the final deadline. In addition, delays are envisaged for AGVCS2. The EC INEA through CEF has identified the 8.33 radio capability retro-fit as one of the priorities in 2017; consequently several States have applied for funding. This might have a positive effect to reduce the planned delays. Based on 2017 information, the rest of the objectives in this arear appear to be progressing on time.

Table 3: Implementation of "Communication" and "Surveillance" related objectives as reported in LSSIP 2017

State	ACID	SPI	AGVCS2	AMHS	VoIP
AL	2019	2019	2018	☑	2020
AM	☑	☑	n.a	2018	2018
AT	2019	2019	2020	☑	2020
AZ	☑	☑	n.a	☑	2018
BA	2020	2021	2021	2018	2020
BE	2020	2020	2018	☑	2020
BG	2018	2020	2020	☑	2018
CH	☑	☑	2018	2018	2022
CY	2020	2018	2018	☑	2020
CZ	☑	2020	☑	2019	2020
DE	2020	2020	2020	☑	2020
DK	2018	2020	2018	☑	2018
EE	2018	☑	2020	2018	2019
ES	2019	2020	2018	☑	2020
FI	2020	2020	2018	2018	2020
FR	2025	2020	2026	2018	2020
GE	2018	n.a.	n.a.	2018	2018
GR	2020	2018	2020	2018	2020
HR	☑	☑	2020	2018	2020
HU	☑	2019	2018	2018	2018
IE	2018	☑	2020	☑	2019

State	ACID	SPI	AGVCS2	AMHS	VoIP
IT	2025	2020	2025	2018	2021
LT	2019	☑	2019	2018	2019
LU	2018	2018	2020	☑	2021
LV	2020	2019	2020	2018	2020
MAS	☑	☑	n.a	☑	☑
MD	☑	☑	n.a	☑	☑
ME	☑	☑	2018	2018	2020
MK	2019	2018	2018	2020	2018
MT	2020	☑	2018	2019	☑
NL	2019	☑	2019	2024	2020
NO	2020	2020	2025	2018	2020
PL	2020	2020	2020	2018	2020
PT	2021	2020	2020	2018	2020
RO	2018	2019	2018	☑	2020
RS	☑	☑	2020	2018	2020
SE	2020	2019	2018	2018	2020
SI	☑	2020	2020	☑	2020
SK	2020	2020	2020	☑	2022
TR	n.a.	n.a.	n.a.	☑	2020
UA	2019	2018	n.a.	2018	2019
UK	2019	2020	2020	2018	2020

☑ completed; n.a. not applicable

Future developments

The 2018 ATM Master Plan should provide more details on the evolution of the CNS strategy in Europe.

3 DEPLOYMENT VIEW

How to read Deployment View assessments?

Stakeholders – Stakeholders included in this field are all those who are included in the Implementation Objective, those that have the dedicated SLoAs to complete.

FOC – Full Operational Capability date as defined in the MP L3 2017 Implementation Plan. The FOC date is defined as the date by which full operational capability should be achieved by all stakeholders.

Estimated achievement – The date of estimated achievement is calculated as the year when the Objective's implementation reaches 80% of completion in the applicability area. However, for some Objectives, in particular the recent ones which are in an early planning phase, a reliable estimated achievement date cannot always be defined. In these situations, the "Status" (see below) is not presented.

Table 4: Understanding progress assessment status

Status	Progress assessment
On Time	Implementation progress is on time. No delays expected.
Risk of delay	The estimated achievement date is in line with the FOC date, but there are risks that could jeopardise the timely implementation of the Implementation Objective.
Planned delay	The estimated achievement date is beyond the FOC date. Stakeholders already envisage delays in implementation. The FOC date is still in the future, some corrective measures can still be taken to achieve the Objective in line with its FOC date.
Late	The estimated achievement date is beyond the FOC date and the FOC date is in the past.
Achieved	The Objective has fulfilled the achievement criteria (80% completion in the applicability area). For some Objectives (PCP/SES/ICAO ASBU related), the Objective may be monitored until 100% achievement.
Closed	The Objective can be declared as closed because it is replaced or renamed, or it is considered as no longer relevant nor contributing to the European ATM Network Performance.

Applicability area – As defined in the MP L3 2017 Implementation Plan.

SESAR Solutions – Shows the link with the functionally related SESAR 1 Solution, if any.

SESAR Key Feature – This reference shows the SESAR Key Feature under which the Implementation Objective belongs.

PCP sub-functionality – This reference shows the functional relationship between the Implementation Objective and the PCP sub-functionality. This link does not necessarily mean that the Implementation Objective fully covers the PCP functionality (e.g. it can be part of the functionality, enabler or pre-requisite). Therefore, the overall progress of the Objective cannot be in any way taken as a progress of the PCP sub-functionality.

EOC/OC – This reference shows the Essential Operational Change/Operational Change where the Implementation Objective fits.

ICAO ASBU – This reference shows the link between the Implementation Objective and the ICAO ASBU.

OI steps – This reference shows the link between Operational Improvement steps and Implementation Objectives. The MP L3 2017 Implementation Plan shows the level of coverage of the OI step with the particular Objective.

Network Strategy Plan – This reference shows the link with the relevant Strategic Objective as listed in the Network Strategy Plan.

Completion Rate evolution – The graphs shows the past (if applicable) and future evolution of the Implementation Objective completion rate. The scale of each graph is adapted to the particular case (non-standardised) to show the estimation when the Objective reaches 80% of completion. In some cases when the estimated achievement date is not provided by the States (e.g. plans for implementation are yet to be defined), the 80% mark is not reached. For these Objectives the estimated achievement at ECAC level is not available yet.

Main 2017 developments – This section summarises the main developments in the Objective's implementation, based on the reported LSSIP information and expert judgement/analysis. In some cases this information is complemented by the information from the Network Manager and Prisme Fleet database for aircraft equipment information.

Map – The maps highlight the progress of implementation at State or Stakeholder level (as relevant) and reflect the progress reported through the LSSIP 2017. The progress scale used in the maps is the following:

Table 5: Understanding the LSSIP implementation progress

"Progress"	Definition	Computed percentage
Completed	The development or improvement aimed by a SLoA is fulfilled in accordance with the MP L3 Plan Finalisation Criteria. Relevant info should be provided confirming the completion, e.g. completion date, reference(s) to a publication(s), evidences of compliance with relevant national or EC regulations, EUROCONTROL released data, an audit confirming compliance or completion etc. For those Objectives where the implementation depends on adjacent countries, an SLoA can be reported "Completed" if the implementation is at least achieved with **one** adjacent country.	**100%**
Ongoing	Implementation has **kicked off** but is not yet fully completed and the planned implementation date is **within** the SLoA finish date.	**1-99%**
Planned	A planned schedule and proper (approved and committed budgeted) actions are specified **within** the SLoA finish date for completion (last Checkpoint is within the SLoA finish date) but not yet kicked off (SLoA/Objective covered by stakeholder's Business Plan). Relevant information must be explained.	**0%**
Late	An SLoA shall be reported "Late" in the case when there is a **firm commitment** to implement the SLoA (e.g. budget and schedule approved) but foreseen to be achieved **after** the SLoA finish date, and relevant information must be explained.	**0-99%**

"Progress"	Definition	Computed percentage
No Plan	1) The Stakeholder has not yet defined a project management/ implementation plan for this SLoA with assigned financial and human resources, but has the intention to implement it for the next year; or 2) The Stakeholder cannot develop a project management/implementation plan with relevant financial or human resources for the implementation of this SLoA due to (local/national) austerity measures, but has the general intention to implement it; or 3) The Stakeholder is in the scoping phase where he is developing a feasibility study including a cost benefit analysis etc. and hence has not yet finally decided on a project management/implementation plan to implement the SLoA. For any case, the Stakeholder must provide a justification.	**0-99%**
Not Applicable	1) The Stakeholder is not part of the MP L3 Plan 'Applicability Area'; or 2) The Stakeholder is part of the MP L3 Plan 'Applicability Area', however: • The Stakeholder does not provide the required service for this SLoA i.e. Military not providing ATC services to GAT or in the case of MUAC providing only upper area control services; or • The Stakeholder has reviewed the SLoA and there is no intention to implement it because it is not justified particularly in terms of the cost/benefit ratio or there are national/local restrictions in terms of environment or legislation which prevent the Stakeholder to implement it; or • The Stakeholder is implementing alternative solutions to the one described in the SLoA (e.g. not distributing information via a leaflet, but via other electronic means). For any case, the Stakeholder must provide a justification.	-
Missing Data	Lack of data from a Stakeholder makes it impossible to define "Progress". If following the closure of the LSSIP Database, at the end of the yearly LSSIP cycle, the information required is missing in the LSSIP Database.	**0%**

List of MP L3 Implementation Objectives

Table6: List of MP L3 Implementation Objectives

ITY-FMTP – Common Flight Message Transfer Protocol	85
ITY-SPI – Surveillance Performance and Interoperability	86
NAV03.1 – RNAV 1 in TMA Operations	62
NAV03.2 – RNP1 in TMA Operations	63
NAV10 – APV procedures	64
NAV12 – Optimised Low-Level IFR Routes in TMA for Rotorcraft	65
SAF11 – Prevent Runway Excursions	75

AOM13.1 Harmonise OAT and GAT handling

Stakeholders:
- ANSPs
- Military
- Regulators

FOC: 12/2018

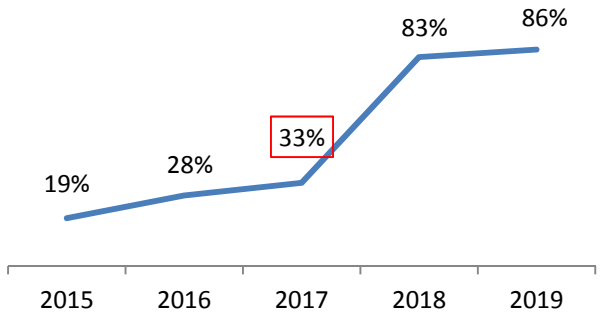
Estimated achievement: 12/2018

On time

Applicability Area:
All ECAC States, except AL, LV, LU, MAS, MT and MD

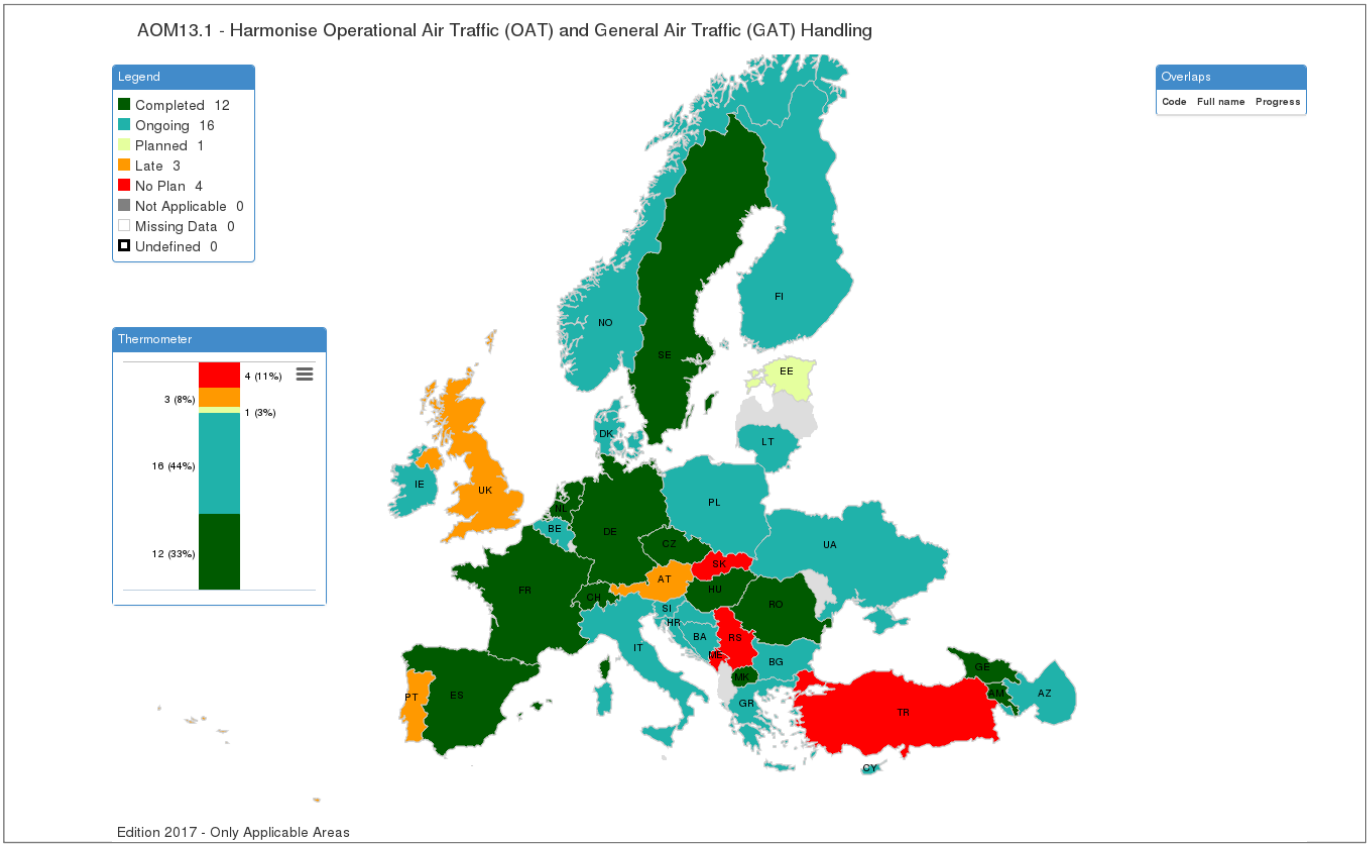
SESAR Solutions:	-
SESAR Key Features:	Optimised ATM Network Services
EOC/OC:	-
ICAO ASBU:	No corresponding ASBU
OI Steps:	AOM-0301, AAMS-10a, AIMS-19b
Network Strategy Plan:	SO6/2

Completion Rate Evolution (% of States completed the objective)



Main 2017 developments:

One year before the FOC date twelve (12) States within the applicability area declare this Objective as 'completed' (two (2) more than in previous year: ES, FR) and sixteen (16) as 'on-going' (with the percentage of implementation varying between 8 and 91%). Only three (3) States (UK, PT, AT) already declared this Objective as 'late' with the implementation date between 2019-2020. The estimated 80% threshold of achievement for this Objective, following the States' declarations, will be reached at the end of 2018. The main reason for declaring this objective as 'not applicable' (see applicability area) is lack of or negligible OAT traffic in the airspace of the States. In case of 'no plan' status (SK, TR, RS, ME) the main reasons are legislative (lack of proper legislation passed) or linked to lack of decision on implementation of EUROAT.



AOM19.1 ASM tools to support A-FUA

Stakeholders:
- ANSPs
- Network Manager

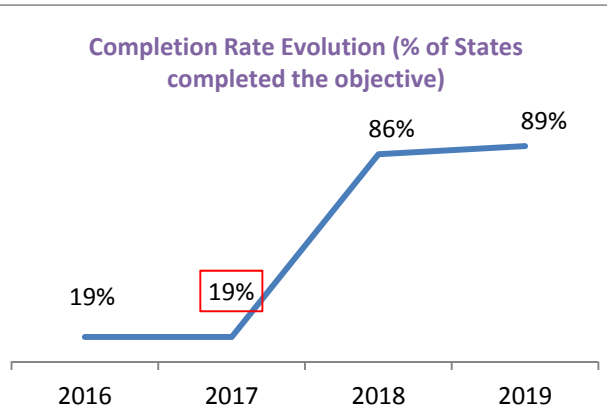
FOC: 12/2018

Estimated achievement: 12/2018

Risk of delay

Applicability Area:
All ECAC States except Armenia, FYROM, Malta, Luxembourg and Moldova

SESAR Solutions:	Solution #31 Variable profile military reserved areas and enhanced civil-military collaboration
SESAR Key Features:	Optimised ATM Network Services
PCP Sub-Functionality:	S-AF3.1 ASM and Advanced FUA
ICAO ASBU:	B0-FRTO, B1-FRTO, B1-NOPS
OI Steps:	AOM-0202, AOM-0202-A
Network Strategy Plan:	SO3/2, SO3/3

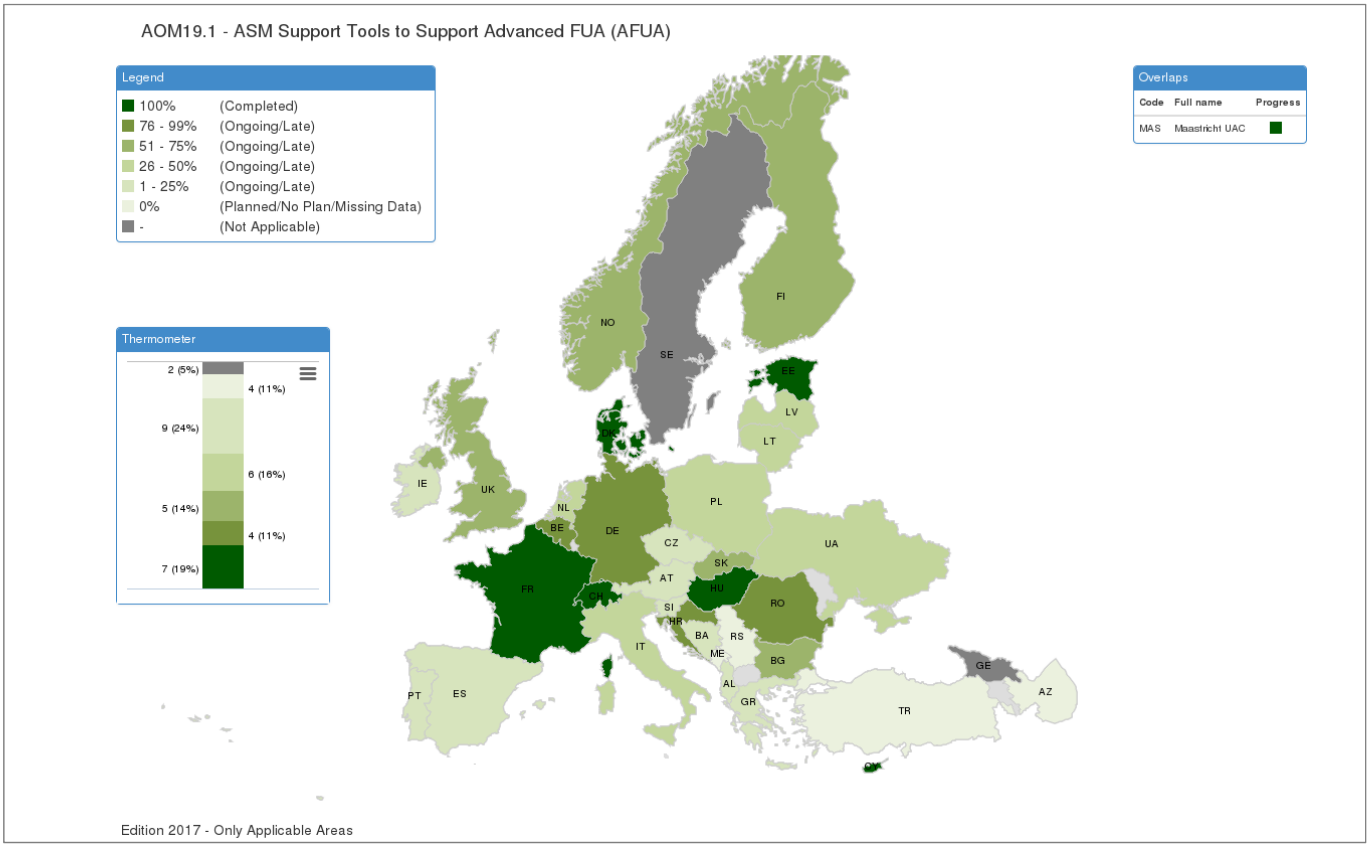


Main 2017 developments:

The objective is an important enabler for the PCP sub-functionality 3.1. Seven (7) States have completed it (CH, CY, DK, EE, FR, HU and MAS) and most of the remaining States report plans within the deadline of 12/2018. However it is for the first year that 3 States (CZ, NL and UK) report plans that go beyond the deadline, whereas two (GE and SE) report that there is no operational need for an automated ASM tool and one (TR) is considering its implementation.

Fifteen States have implemented local ASM tools; some are local solutions but a majority of them rely on LARA (Local and sub-Regional ASM Support System). Eleven out of these fifteen are connected to NM through a B2B connection.

Considering the proximity of the deadline and the still low level of completion, the status of the objective is changed to 'Risk of delay'.



AOM19.2 ASM management of real-time airspace data

A reliable estimated achievement date can not be defined at this time.

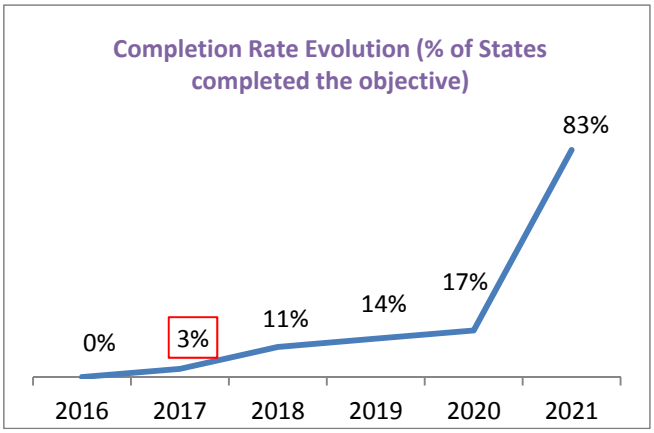
Stakeholders:
- ANSPs
- Airspace Users
- Network Manager

FOC: 12/2021

Estimated achievement: Not available

Applicability Area:
All ECAC States except Armenia, Luxembourg and Moldova

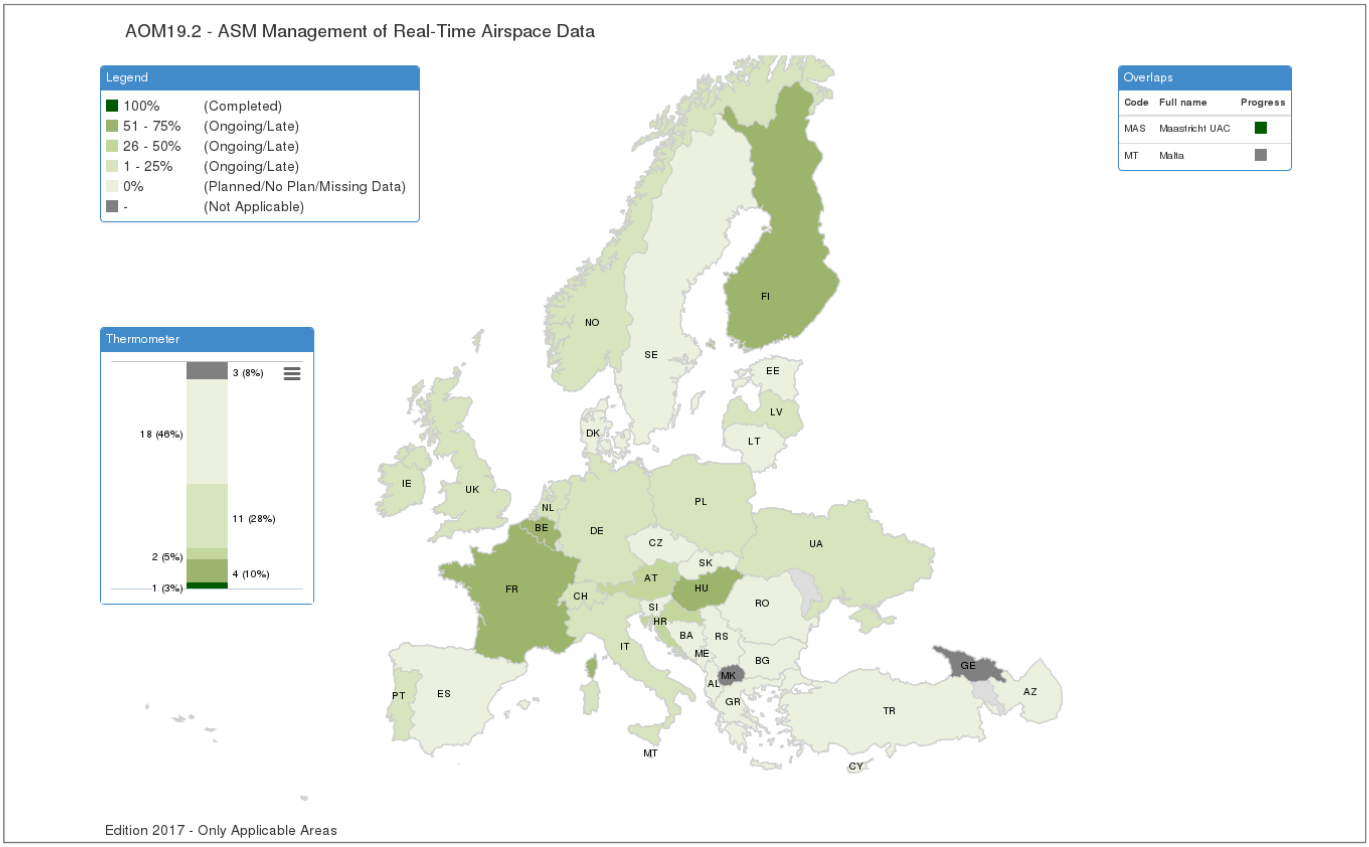
SESAR Solutions:	Solution #31 Variable profile military reserved areas and enhanced civil-military collaboration
SESAR Key Features:	Optimised ATM Network Services
PCP Sub-Functionality:	S-AF3.1 ASM and Advanced FUA
ICAO ASBU:	B1-FRTO, B1-NOPS
OI Steps:	AOM-0202-A
Network Strategy Plan:	SO3/2, SO3/3



Main 2017 developments:

The requirements for the implementation of this objective and stakeholders' plans to complete it have both increased in clarity during 2017. The number of States reporting the objective 'no plan' is now 5 compared to 11 which shows that some steps are being taken, although for the time being these are quite preliminary and mostly involve the setting up of implementation projects.

No estimated achievement date can still be calculated. It is to be noted that one (1) State (FR) already reported the objective 'Late' due a necessary system upgrade only taking place in Dec/2022. Although the implementation deadline is 12/2021 and it might be too early to assess the objective as 'risk of delay', there are certainly some elements for concern and stakeholders should take measures to activate and/or invigorate their implementation plans.



AOM19.3 Full rolling ASM/ATFCM process and ASM information sharing

A reliable estimated achievement date can not be defined at this time.

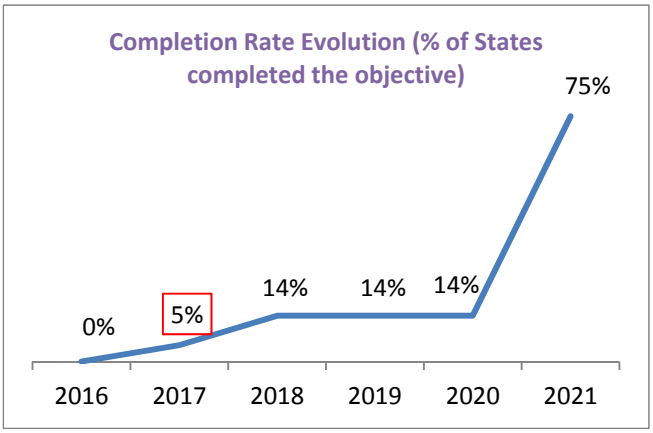
Stakeholders:
- ANSPs
- Airspace Users
- Network Manager

FOC: 12/2021

Estimated achievement: Not available

Applicability Area:
All ECAC States except Armenia, Luxembourg and Moldova

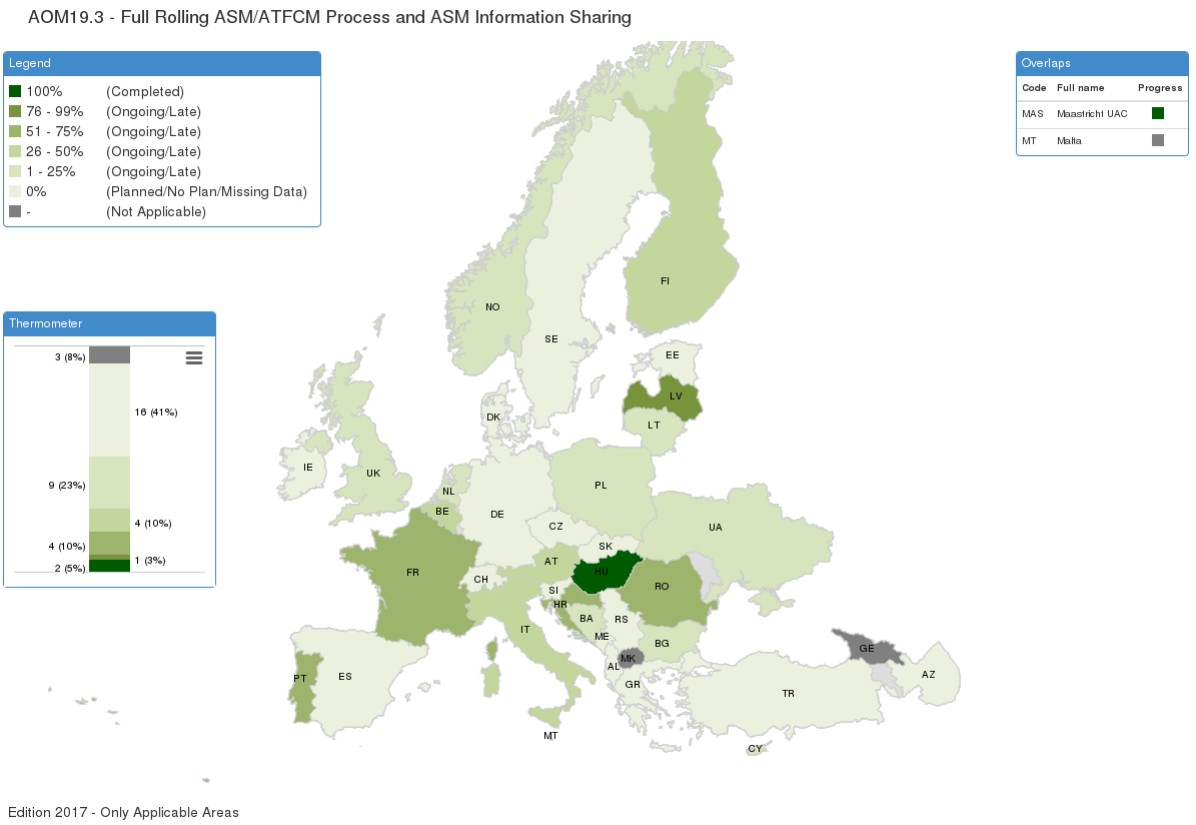
SESAR Solutions:	Solution #31 Variable profile military reserved areas and enhanced civil-military collaboration
SESAR Key Features:	Optimised ATM Network Services
PCP Sub-Functionality:	S-AF3.1 ASM and Advanced FUA
ICAO ASBU:	B1-FRTO, B1-NOPS
OI Steps:	AOM-0202, AOM-0202-A
Network Strategy Plan:	SO3/2, SO3/3



Main 2017 developments:

Stakeholders are activating their implementation plans but there has been little progress since 2016 and the still high number of States (9) reporting the objective as 'no plan' is a cause for concern. There may be a misunderstanding and/or lack of clarity of NM's roadmap and requirements to implement the objective and this should be addressed, especially for those stakeholders' not having projects funded through CEF. For those who reported the objective planned or ongoing, the majority stakeholders are still in the very early implementation stages.

Although the implementation deadline is 12/2021 and it might be too early to assess the objective as 'risk of delay', there are certainly some elements for concern and stakeholders should take measures to activate and/or invigorate their implementation plans.



FCM03 Collaborative Flight Planning

Stakeholders:
- ANSPs
- Network Manager

FOC: 12/2017

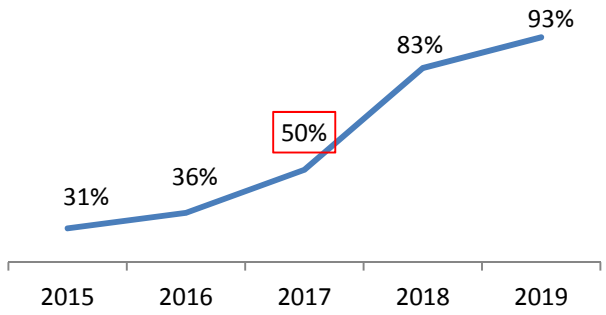
Estimated achievement: 12/2018

Late

Applicability Area:
All ECAC States

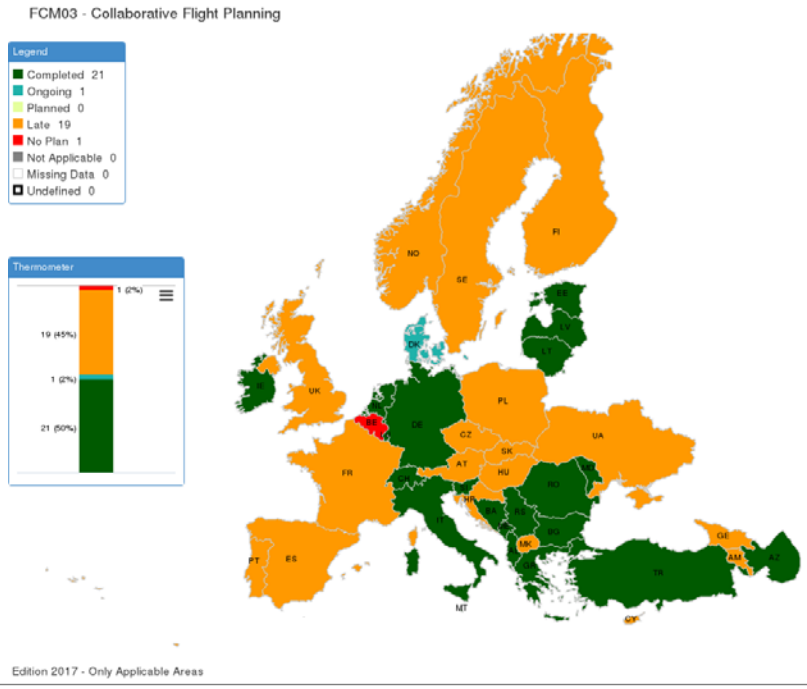
SESAR Solutions:	-
SESAR Key Features:	Optimised ATM Network Services
PCP Sub-Functionality:	- Basic Network Operations Planning - Pre-requisite for PCP/AF4 Network Collaborative Management
ICAO ASBU:	B0-NOPS
OI Steps:	IS-0102
Network Strategy Plan:	SO4/2, SO5/1, SO5/6

Completion Rate Evolution (% of States completed the objective)



Main 2017 developments:

Implementation continues to be tremendously slow with only 6 implementers having reported completion in 2017. Overall, only half of the States in the applicability area have declared completion which could be considered as a low completion rate taking into account that the objective was introduced in 2002 (the first FOC was end 2005) and that it has suffered several postponements of its FOC date over the last 15 years. The expected surge in implementation in 2017 has been missed and a substantial increase in completion rate (from 50% to more than 80%) is now provisionally expected for 2018. However, full implementation over the entire area of applicability is expected only in 2021. It should be noted that the objective is considered implemented when the NM has integrated the received messages in the operational system. This requires the capability of the local ANSP systems to generate and transmit AFP messages but also a testing and validation period with the NM. It should also be noted that only automatic AFPs should be considered as the manual AFPs in most of the cases contain incorrect data. It is observed that for several States (e.g. AZ, DE, GR, IE, MD, TR, SI) having reported completion, the integration within NM has not yet been tested (or the tests have failed) and the AFP messages are not yet integrated in the operational NM system or the messages are not sent automatically as required by the Objective (ME, RS). Therefore the real completion rate, reported by NM following the AFP integration in the NM system is lower than the one reported by the States.



FCM04.1 STAM phase 1

Stakeholders:
- ANSPs
- Airspace Users
- Network Manager

FOC: 10/2017

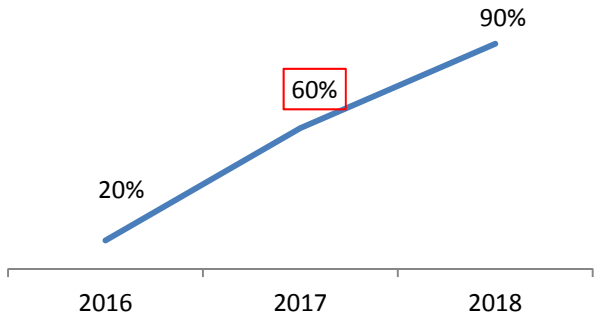
Estimated achievement: 10/2018

Late

Applicability Area:
FR, DE, IT, PL, ES, CH, AT, BE, CZ, HR

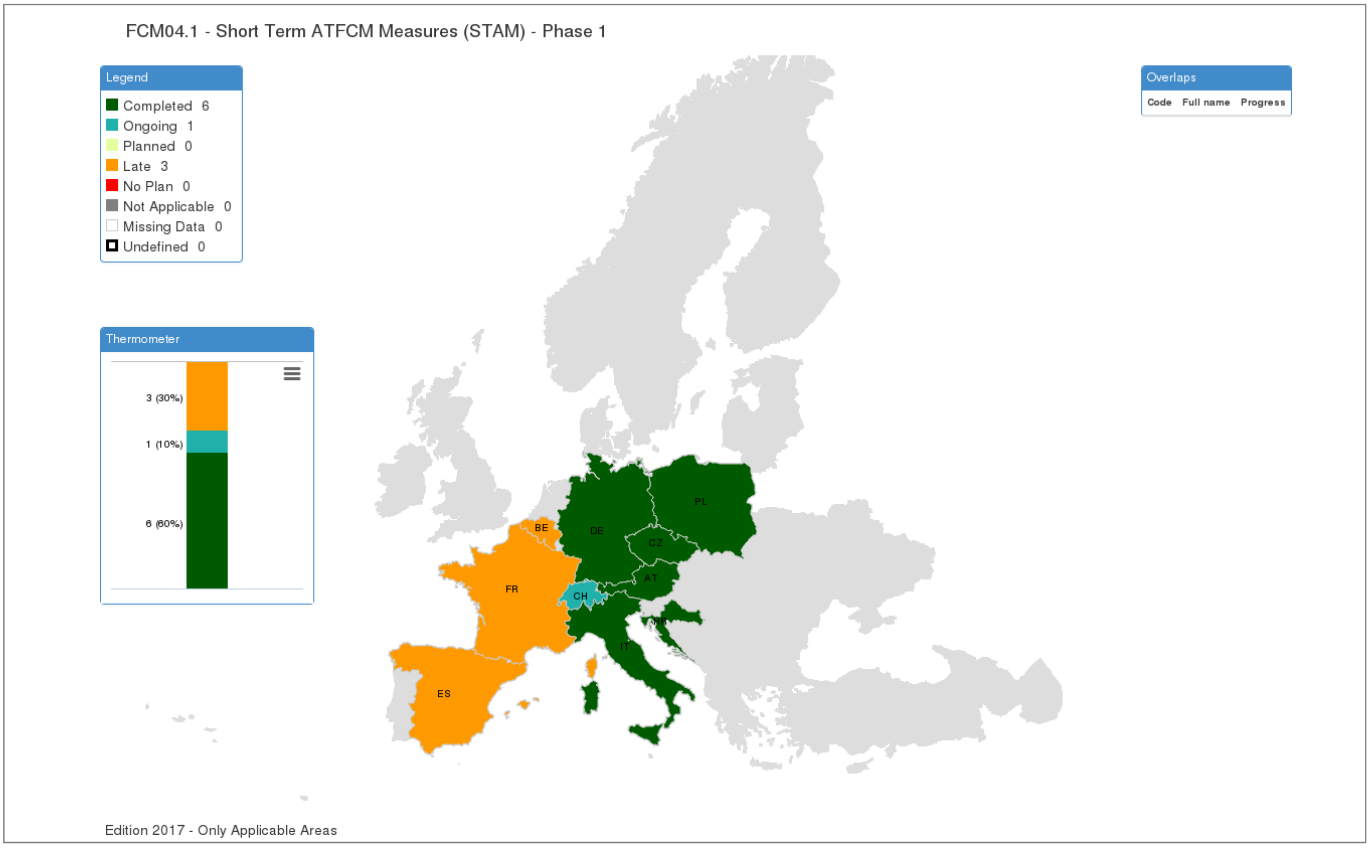
SESAR Solutions:	-
SESAR Key Features:	Optimised ATM Network Services
PCP Sub-Functionality:	Pre-requisite for PCP AF4 Network Collaborative Management
ICAO ASBU:	B0-NOPS
OI Steps:	DCB-0205
Network Strategy Plan:	SO4/3, SO5/4

Completion Rate Evolution (% of States completed the objective)



Main 2017 developments:

Significant progress in the year 2017, took place in six (6) FABCE states (AT, BA, CZ, HR, SI, SK), where STAM Phase 1 was completed within a common FABCE project. Despite the ten (10) states being in the applicability area of this objective, the implementation was reported in fourteen (14) states. In twelve (12) states STAM Phase 1 implementation is completed. In FR the implementation is completed in four (4) out of five (5) ACCs, the fifth ACC estimates completion in October 2018. BE estimates completion in October 2018 and ES in June 2018. Thus it is expected that the objective will be implemented on time with only three (3) States (BE, ES, FR) estimating a delay of approximately 1 year. Although CH reported status as ongoing, it should actually be considered as late considering the applicable progress criteria. In order to capture all implementation progress, it is recommended to further extend applicability area and continue monitor FCM04.1 during 2018.



FCM04.2 STAM phase 2

A reliable estimated achievement date can not be defined at this time.

Stakeholders:
- ANSPs
- Airspace Users
- Network Manager

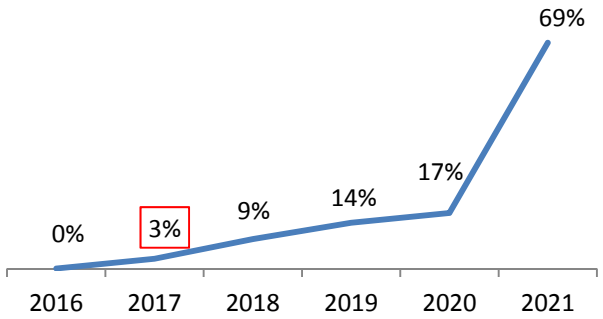
FOC: 12/2021

Estimated achievement: Not available

Applicability Area:
All EU+ States

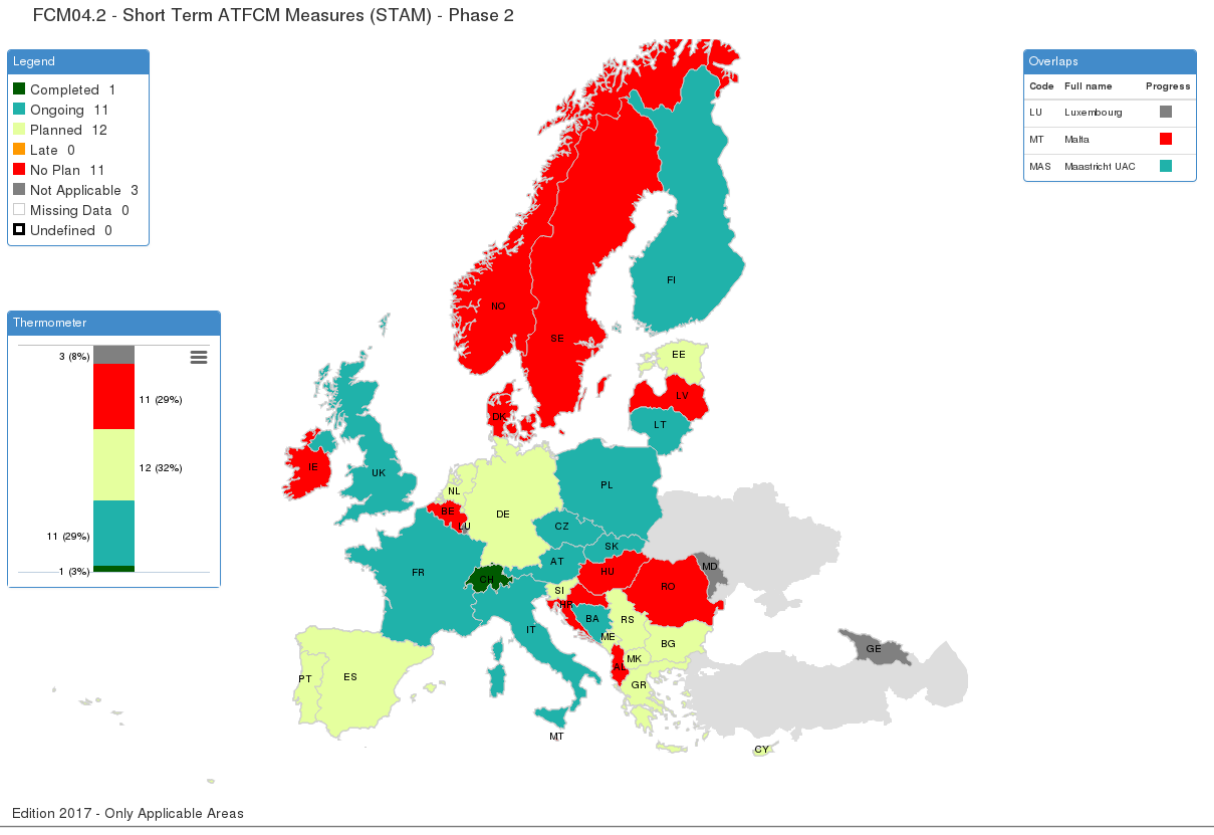
SESAR Solutions:	Solution #17 Advanced Short ATFCM Measures (STAM)
SESAR Key Features:	Optimised ATM Network Services
PCP Sub-Functionality:	S-AF4.1 Enhanced Short Term ATFCM Measures
ICAO ASBU:	B0-NOPS
OI Steps:	DCB-0308, ER APP ATC 17
Network Strategy Plan:	SO4/3, SO5/4

Completion Rate Evolution (% of States completed the objective)



Main 2017 developments:

This objective was introduced in the plan in year 2016, reflecting the PCP requirements as well as SDM's Deployment Programme. In 2017, four (4) additional States reported implementation activities have started (ongoing) and other four (4) additional States established a plan for implementation. One (1) State i.e. CH reported implementation completed. Eleven (11) States in the applicability area said they have no implementation plans yet. It is expected that implementation will progress slowly over the next years, since the main bulk of implementation being expected in 2021, as required by the PCP Regulation. The reports indicate a tendency for the stakeholders to make use of the STAM tools to be made available by the NM while fewer (4) ANSPs have reported plans for the development of local tools.



FCM05 Interactive rolling NOP

Stakeholders:
- ANSPs
- Airspace Users
- Airport Operators
- Network Manager

FOC: 12/2021

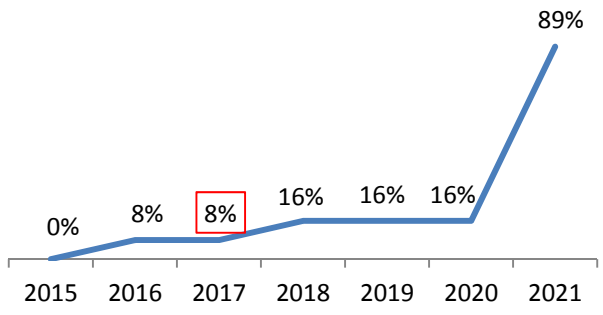
Estimated achievement: 12/2021

On time

Applicability Area:
All ECAC States except Armenia, FYROM, Luxembourg, Maastricht UAC and Moldova

SESAR Solutions:	Solution #20 – Initial collaborative NOP
SESAR Key Features:	Optimised ATM Network Services
PCP Sub-Functionality:	S-AF4.2 Collaborative NOP
ICAO ASBU:	B0-NOPS, B1-NOPS
OI Steps:	DCB-0102, DCB-0103-A
Network Strategy Plan:	SO2/1, SO2/2, SO2/3, SO2/4

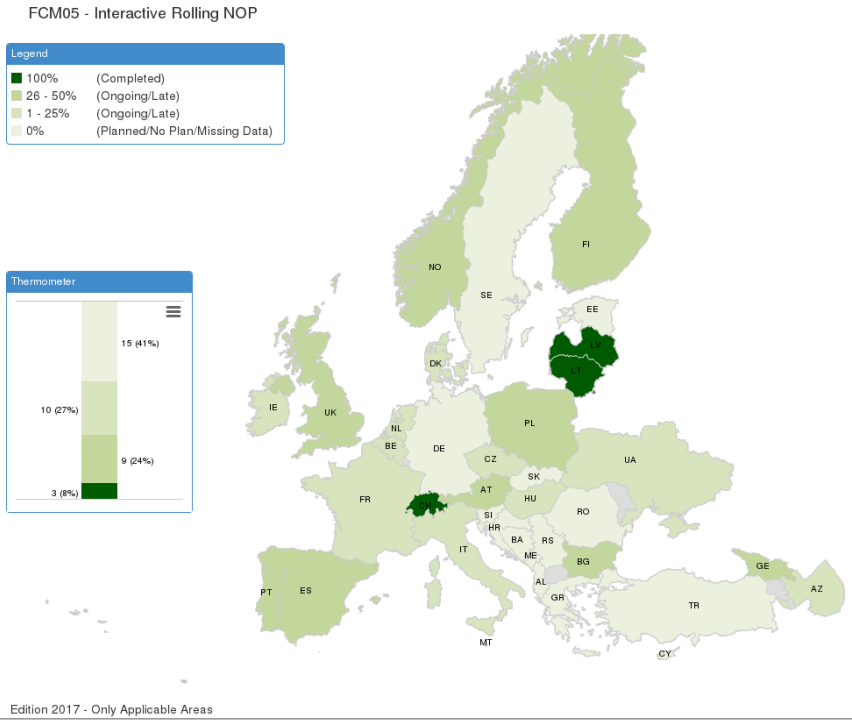
Completion Rate Evolution (% of States completed the objective)



Main 2017 developments:

The interactive rolling NOP is implemented and made available by the NM. However it is constantly evolving and the functionality is being updated to reflect the concept evolution. The scope of this Implementation Objective is addressing the interactive rolling NOP functionality as envisaged by the PCP IR. The final goal would be a migration to a new platform with enhanced functional capabilities.

The vast majority of States have started implementation or have set-up concrete implementation plans, with the objective to complete implementation before the FOC date of 2021. The ANSPs/Airport component of this objective include the development of ATFM procedures for NOP access as well as the staff training. The objective also covers the integration of Airport Operation Plan (AOP) within the NOP. The AOP/NOP interface is under development with several airports, as this function is required by the PCP IR. The implementation is driven by and under the leadership of NM which is the subject of most of the SLoAs (12) NM. Out of these 12, eight (8) have already been implemented while the remaining four (4) are progressing according to the plans and will be sequentially deployed between 2018 and 2021.



FCM06 Traffic Complexity Assessment

A reliable estimated achievement date can not be defined at this time.

Stakeholders:
- ANSPs
- Network Manager

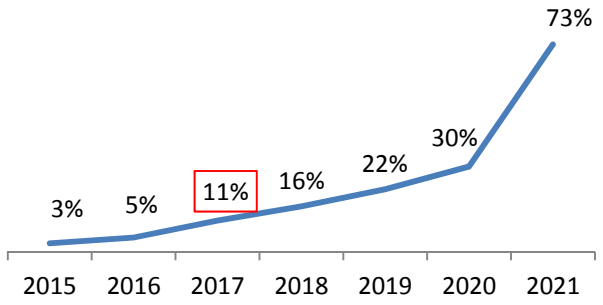
FOC: 12/2021

Estimated achievement: **Not available**

Applicability Area:
All EU+ States

SESAR Solutions:	Solution #19 Automated support for Traffic Complexity Detection and Resolution
SESAR Key Features:	Optimised ATM Network Services
PCP Sub-Functionality:	S-AF4.4 Automated Support for Traffic Complexity Assessment
ICAO ASBU:	B0-NOPS, B1-NOPS
OI Steps:	CM-0101, CM-0103-A, NIMS-20
Network Strategy Plan:	SO4/3, SO5/4

Completion Rate Evolution (% of States completed the objective)

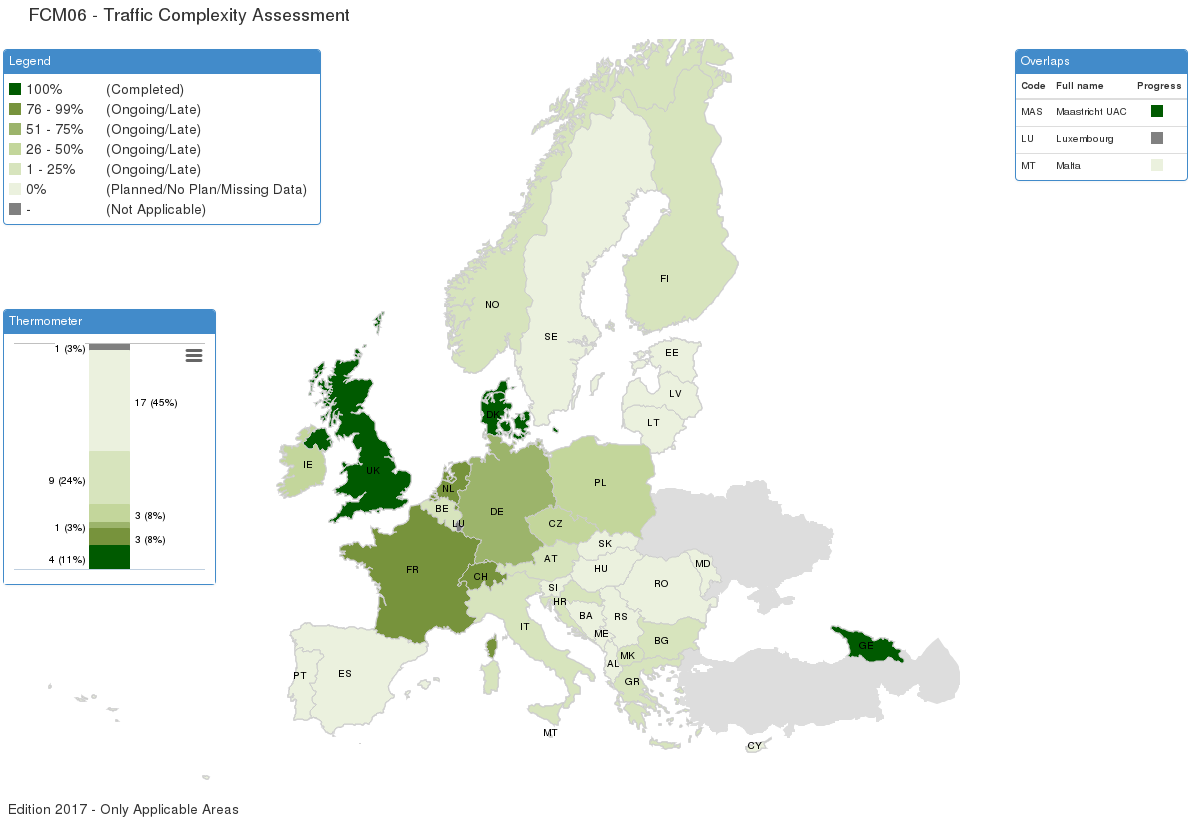


Main 2017 developments:

Three States and MUAC have now completed the implementation of this objective, and the implementation is ongoing in fifteen (15) States.

Overall we are still in an early implementation stage as the target date is set to 12/2021. It is expected that most of the States will complete the implementation during the last year before the FOC.

At the current rate of planned implementation, the objective of completion by the timeframe will however not be fully achieved (~73%). The lack of concrete implementation plans in some States may therefore jeopardize the on-time implementation, although the corrective actions can still be taken to respect the FOC date.



FCM09 Enhanced ATFM Slot swapping

Stakeholders
- Network Manager
- Airspace Users

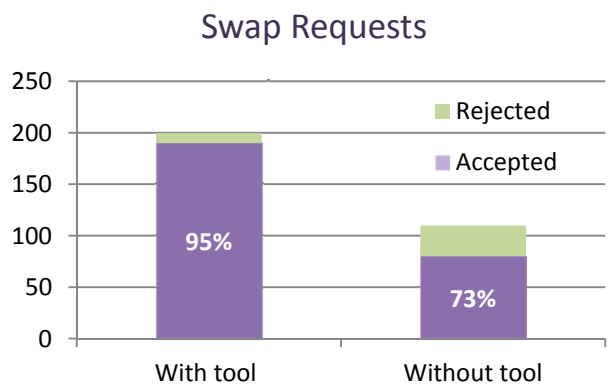
FOC 12/2021

Estimated achievement 12/2021

On time

Applicability Area
All ECAC States

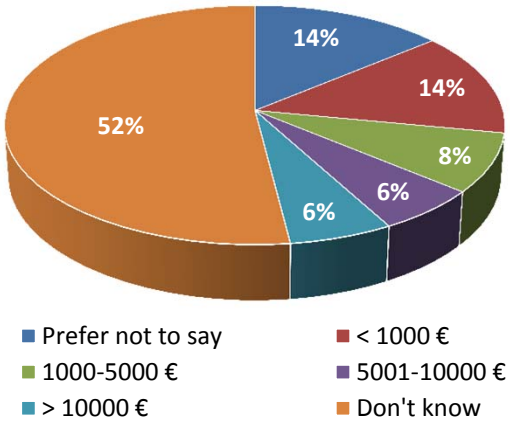
SESAR Solutions:	Solution #56 Enhanced ATFM Slot Swapping
SESAR Key Features:	Optimised ATM Network Services
EOC/OC:	Intermediate step towards UDPP – User Driven Prioritisation Process
ICAO ASBU:	B1-ACDM, B1-NOPS
OI Steps:	AUO-0101-A
Network Strategy Plan:	SO6/1



Main 2017 developments

This objective mostly involves the NM and the Airspace Users during ATFM constrained situations. The pre-tactical phase facility offered by the NM was integrated into the NM system to provide: airlines and airline groups with better visibility to identify slot-swap candidates; and an easier interface to request these to NM. In practice slot swapping facilitates the Airspace User to balance the priorities of flights subject to the same ATFM regulation. A higher priority flight may transfer a portion of its ATFM delay to a lower priority flight or a low priority flight may increase its proportion of delay to benefit a neutral priority flight (reducing their delay). In addition to this, slot swapping can be used to reduce the delay of a flight by re-using the slot of a to-be cancelled flight from the same airline or airline grouping. The next steps to be taken by the NM in 2018 will be to trial operationally the benefits of allowing flights to share delay between maximum three (3) other flights using 'multiple-swaps'; and to assess the feasibility and risks of facilitating more long and short haul slot swapping by making it possible to swap pre-allocated with allocated ATFM slots.

The savings achieved by using the Enhanced Slot-Swapping (source: Network Manager)



- 4900 € - the average cost saved per single ATFM slot swap
- 7-8 M€ per year saving currently
- 500 M€ estimated over 20 years

AOM21.1 Direct Routing

Stakeholders:
- ANSPs
- Network Manager

FOC: 12/2017

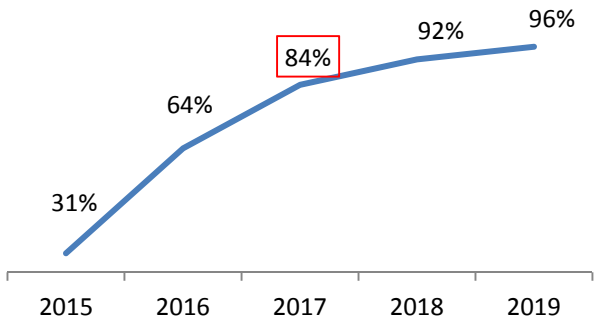
Estimated achievement: 12/2017/8

Achieved

Applicability Area:
25 ECAC States

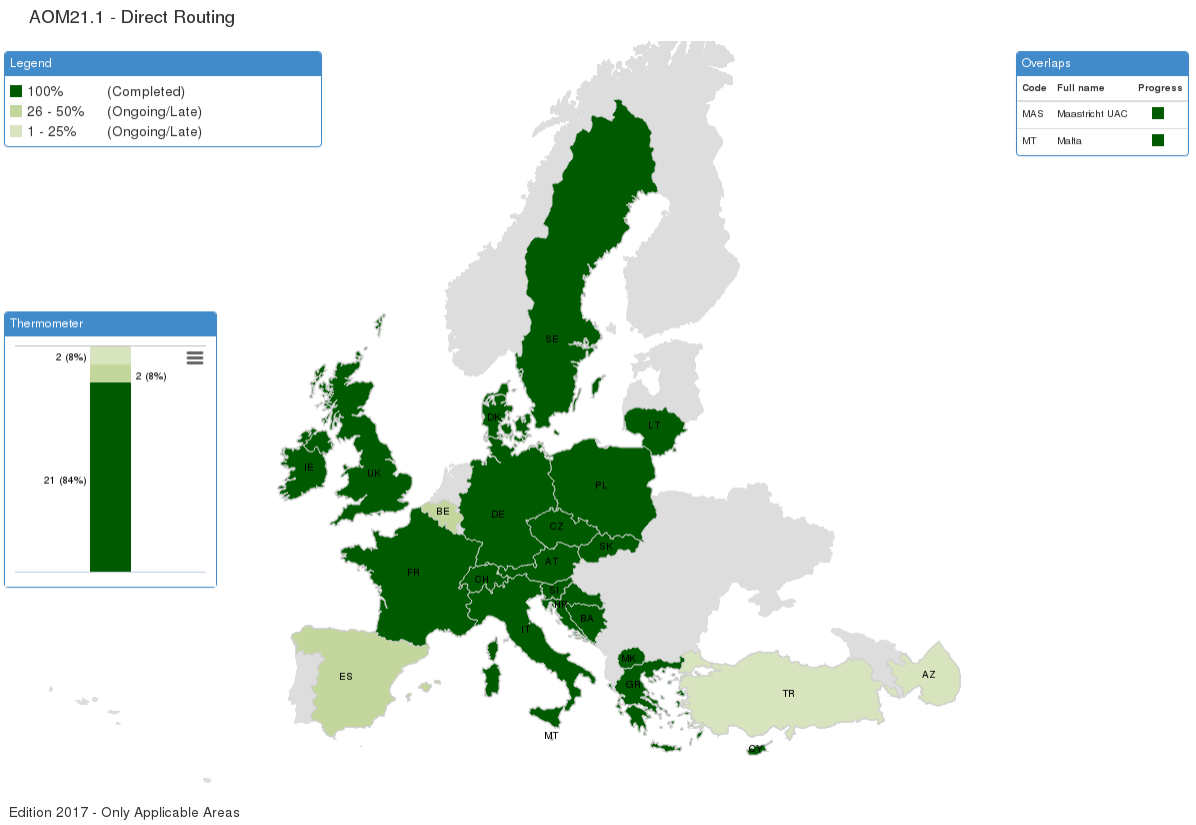
SESAR Solutions:	Solution #32 Free Route through the use of Direct Routing
SESAR Key Features:	Advanced Air Traffic Services Optimised ATM Network Services
PCP Sub-Functionality:	S-AF3.2 Free Route
ICAO ASBU:	B0-FRTO, B1-FRTO
OI Steps:	AOM-0401, AOM-0402, AOM-0500
Network Strategy Plan:	SO3/1, SO3/4

Completion Rate Evolution (% of States completed the objective)



Main 2017 developments:

Among the applicable States twenty two (22) report full implementation of this Objective. It has to be noted that Seventeen (17) States report it as 'not applicable' due to the fact that they have already implemented full FRA or planed to deploy full FRA before 1 January 2018 (fifteen (15) States) and due to no service provision above FL310 (three (3) States). Within the "regulated" area (EU+, above FL310), the implementation of Direct Routes (AOM21.1) is virtually completed with only one State (ES) having only partly implemented the functionality. In a very limited number of States, outside the regulated applicability area, the implementation will continue, with implementation plans extended until end-2019. It is therefore recommended to consider the objective as 'Achieved'



AOM21.2 Free Route Airspace

Stakeholders:
- ANSPs
- Airspace Users
- Network Manager

FOC: 12/2021

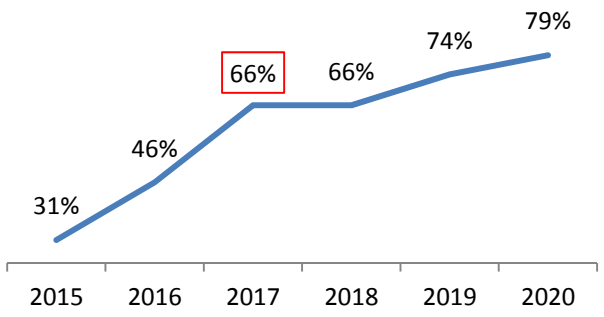
Estimated achievement: 11/2021

On time

Applicability Area:
All ECAC States except Azerbaijan, Belgium, Luxembourg and Netherlands

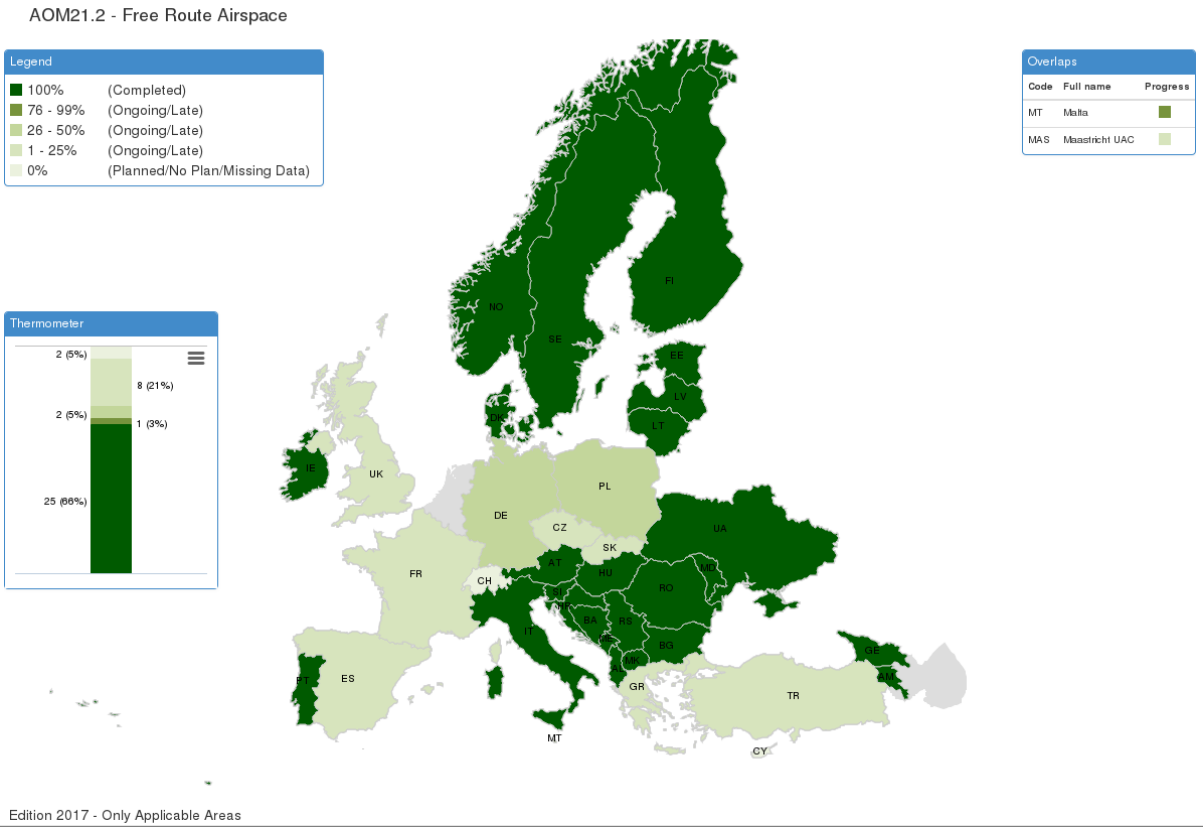
SESAR Solutions:	Solutions #33 & #66
SESAR Key Features:	Advanced Air Traffic Services Optimised ATM Network Services
PCP Sub-Functionality:	S-AF3.2 Free Route
ICAO ASBU:	B1-FRTO
OI Steps:	AOM-0401, AOM-0402, AOM-0501, AOM-0505, CM-0102-A
Network Strategy Plan:	SO3/1, SO3/4

Completion Rate Evolution (% of States completed the objective)



Main 2017 developments:

The implementation of this Objective is progressing well and no delay is expected. The estimated achievement is planned in the year of FOC. In the last year additional seven (7) States (AL, AM, BA, GE, LT, ME, RS) reported it as 'completed'. One (1) State (CH) changed the status from 'on-going' to "planned" being the second State with CY to declare this status and no implementation started yet. For the eleven (11) States that plan the implementation of this objective until FOC the implementation progress percentage varies between 3 and 85% with majority reporting the implementation progress to be lower than 50%.



ATC02.8 Ground-based Safety Nets

Stakeholders:
- ANSPs

FOC: 12/2016

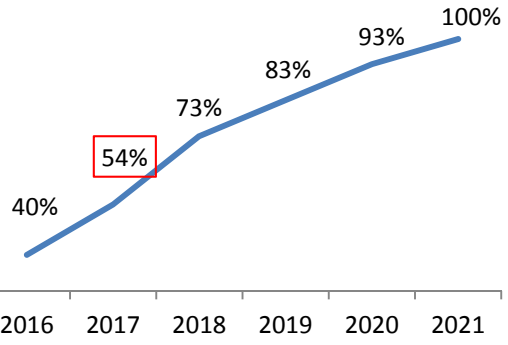
Estimated achievement: 12/2019

Late

Applicability Area:
All ECAC States except the Netherlands

SESAR Solutions:	-
SESAR Key Features:	Advanced Air Traffic Services
PCP Sub-Functionality:	Only APW: Pre-requisite for S-AF3.2 Free Route (PCP)
ICAO ASBU:	B0-SNET, B1-SNET
OI Steps:	CM-0801
Network Strategy Plan:	SO4/1

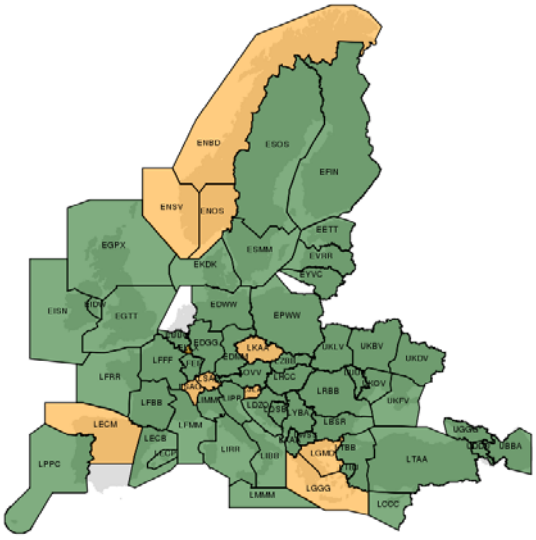
Completion Rate Evolution (% of States completed the objective)



Main 2017 developments:

Five (5) additional States have completed the implementation in 2017, bringing the total to twenty-two (22) (corresponding to ~54% of the applicability area)
This is however insufficient as the target date for completion was set at the end of the year 2016.
This delay is, in several cases, reported as due to alignment with a major upgrade, or replacement, of the ATM system.
The overall objective completion is expected by end 2019.

ATC02.8-ASP01-Implement the APW function only



Legend
- Completed 54
- Ongoing 0
- Planned 0
- Late 11
- No Plan 0
- Not Applicable 0
- Missing Data 0
- Undefined 0

Overlaps

Code	Full name	Progress
EDUU	EDUU	
ELLX	ELLX	

Edition 2017 – Only Applicable Areas - Main ANSPs Only

ATC02.8 - Ground-based Safety Nets – Overall Objective

Legend
- Completed 22
- Ongoing 1
- Planned 0
- Late 18
- No Plan 0
- Not Applicable 0
- Missing Data 0
- Undefined 0

Overlaps

Code	Full name	Progress
MAS	Maastricht UAC	
MT	Malta	
LU	Luxembourg	

Edition 2017 – Only Applicable Areas

ATC02.9 Enhanced STCA for TMAs

First year of monitoring.

Stakeholders:
- ANSPs

FOC: 12/2020

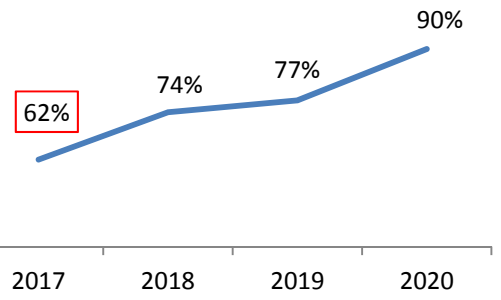
Estimated achievement: 12/2020

On time

Applicability Area:
TMAs, according to local business needs

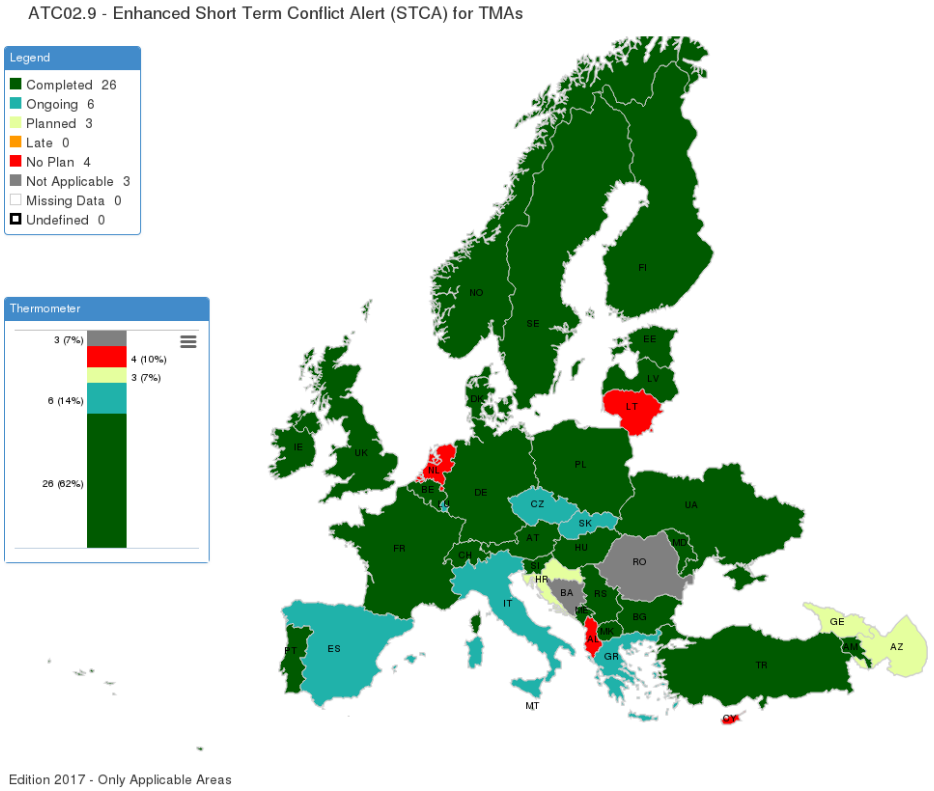
SESAR Solutions:	Solution #60 – Enhanced STCA for TMAs
SESAR Key Features:	Advanced Air Traffic Services
EOC/OC:	Enhanced Safety Nets
ICAO ASBU:	B0-SNET, B1-SNET
OI Steps:	CM-0801, CM-0811
Network Strategy Plan:	SO4/1

Completion Rate Evolution (% of States completed the objective)



Main 2017 developments:

This objective is specifically monitored for the first year in 2017.
This objective addresses the implementation of an enhanced algorithm for STCA in TMA based on SESAR results, aiming at further reducing the rate of false alerts and make the STCA more efficient.
Some States, who already have implemented the STCA 'normal' functionality in their TMAs, might not need for "enhancement" due to the level of traffic and TMA configuration. Therefore the used En-route algorithm can be considered fit for purpose, and the Objective is declared as Complete whether the STCA in TMA is implemented as 'normal' or 'enhanced'.
Considering this and using the "normal' algorithm, the objective is already implemented in twenty-six States (62%).
The overall completion is expected to be achieved by the FOC date, and is therefore on-time .



ATC07.1 AMAN tools and procedures

Stakeholders:
- ANSPs

FOC: 12/2019

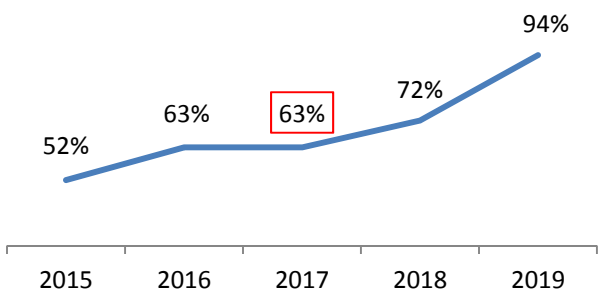
Estimated achievement: 12/2019

On time

Applicability Area:
23 PCP airports + 8 non-PCP airports

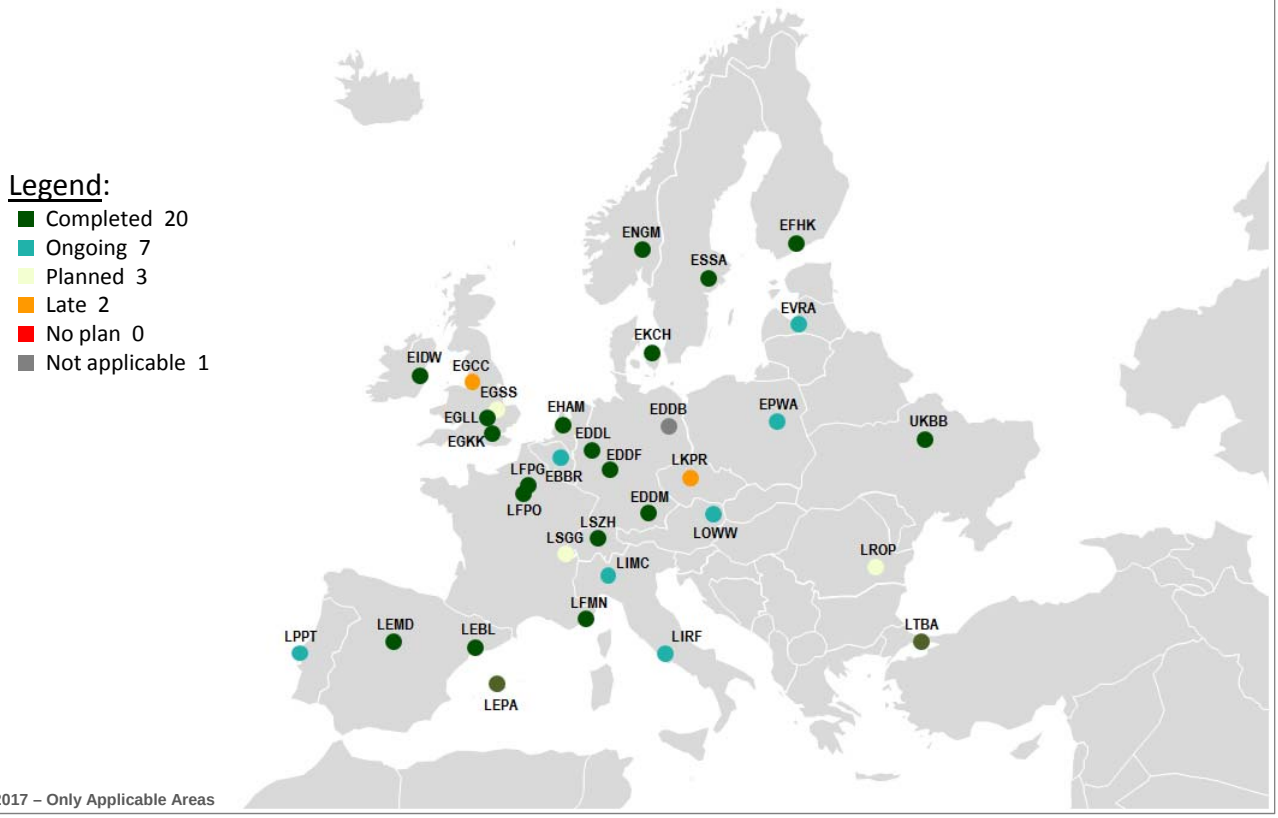
SESAR Solutions:	-
SESAR Key Features:	Advanced Air Traffic Services
PCP Sub-Functionality:	Basic AMAN Facilitator for: - S-AF1.1 AMAN Extended to En-Route Airspace (PCP) - AMAN/DMAN Integration Including Multiple Airports (OC)
ICAO ASBU:	B0-RSEQ
OI Steps:	TS-0102
Network Strategy Plan:	SO4/1

Completion Rate Evolution (% of Airports completed the objective)



Main 2017 developments:

A moderate, positive trend in the implementation of basic AMAN is confirmed for 2017, with one additional operational introduction with respect to 2016. Basic AMAN is deployed in 20 locations, with another 7 on their way to implement it by the deadline of 12/2019. Of these, the progress in 2017 varies from 20% to 66% completion of the required actions. Two airports (Prague and Manchester) have plans to implement this objective beyond the FOC date, with a target completion by 2022. Another 3 airports (Bucharest, London Stansted and Geneva) have plans to complete the implementation by the FOC date, but deployment actions had not yet started in 2017.
Finally, the voluntary applicability area of the objective has grown to 33 locations, from 20 in 2014.



ATC12.1 MONA, TCT and MTCD

Stakeholders:
- ANSPs

FOC: 12/2021

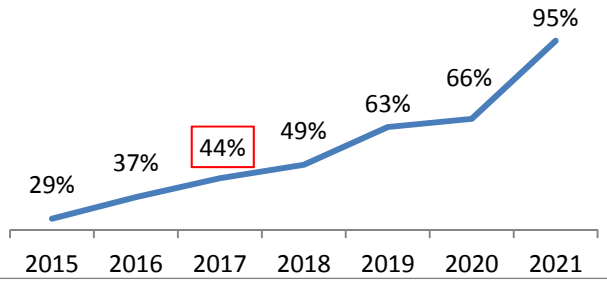
Estimated achievement: 12/2021

On time

Applicability Area:
All ECAC States except Luxembourg

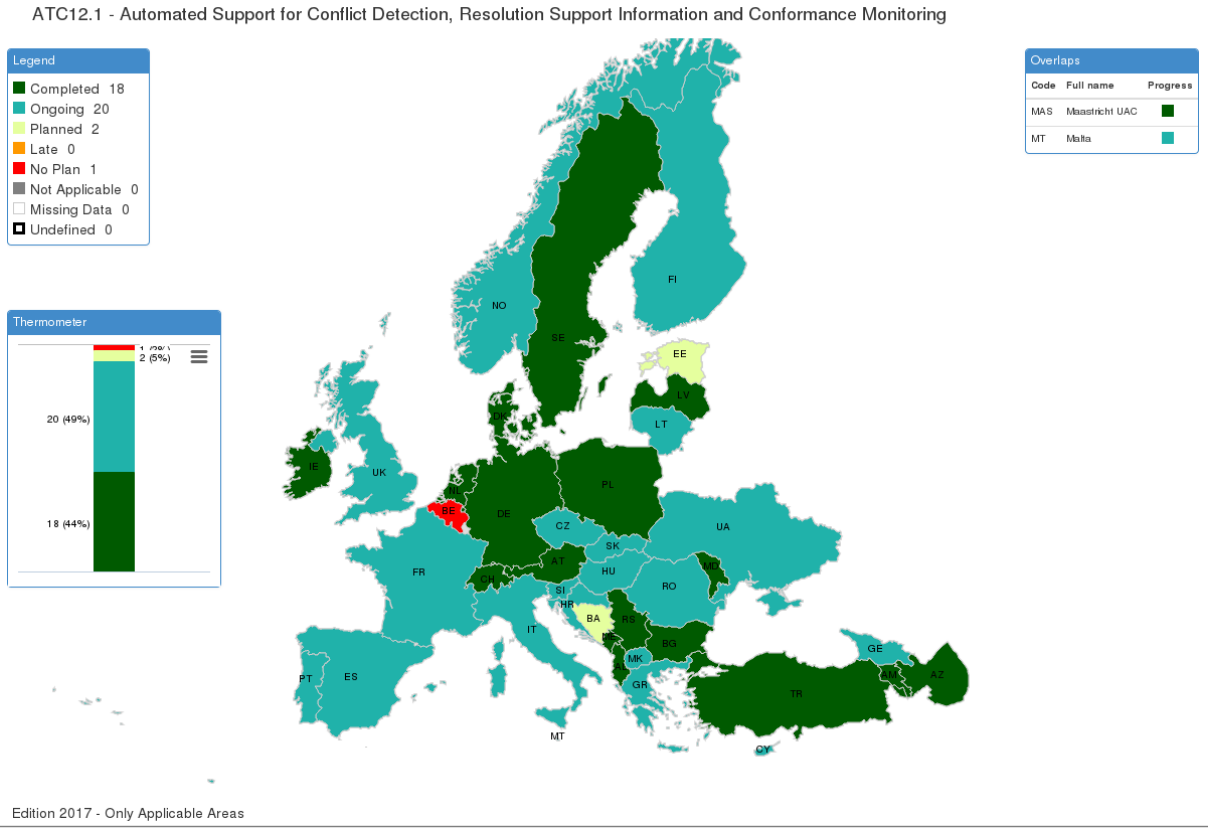
SESAR Solutions:	Solution #27 – MTCD and conformance monitoring tools
SESAR Key Features:	Advanced Air Traffic Services
PCP Sub-Functionality:	Pre-requisite for S-AF 3.2 Free Route (PCP)
ICAO ASBU:	B1-FRTO
OI Steps:	CM-0202, CM-0203, CM-0205, CM-0207-A
Network Strategy Plan:	SO3/1, SO4/1

Completion Rate Evolution (% of States completed the objective)



Main 2017 developments:

MTCD is progressing well, with already 44% of completion rate achieved, and only a few ANSPs declaring no plans for the implementation of the conflict support function. Implementation of a Tactical Controller Tool is currently an optional feature in this objective. Only 8 ANSPs have completed its implementation and just 54% of the Organisations have either been implementing it, or have plans to do so. Implementation of the conformance monitoring function (ASP03) is the most advanced feature, with 55% of completion rate in 2017. Overall the objective is progressing at a relatively fast pace. Implementation of new ATM systems in the incoming years will allow to achieve full completion within the target date of 12/2021. Within its applicability area, only one (1) ANSP is reporting a 'No Plan' (Belgocontrol of Belgium), where the function exists in their ATM system, but is currently inhibited.



ATC15.1

Implement, in en-route operations, information exchange mechanisms, tools and procedures in support of basic AMAN

Stakeholders:
- ANSPs

FOC: 12/2017

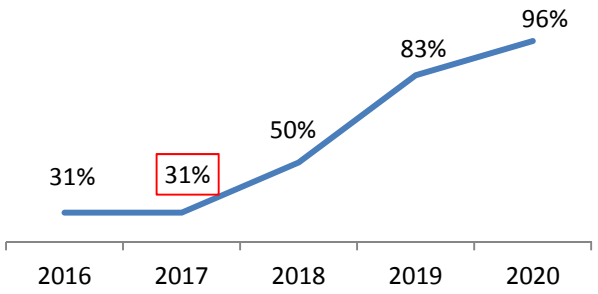
Estimated achievement: 12/2019

Late

Applicability Area:
EU States except CY, GR, LT, LU, MT, SK and SI.
Plus: BA, MAS, NO, CH, TR

SESAR Solution:	-
SESAR Key Features:	Advanced Air Traffic Services
PCP Sub-Functionality:	Predecessor of S-AF1.1 AMAN extended to En-Route Airspace (PCP)
ICAO ASBU:	B0-RSEQ
OI Steps:	TS-0305
Network Strategy Plan:	SO4/1

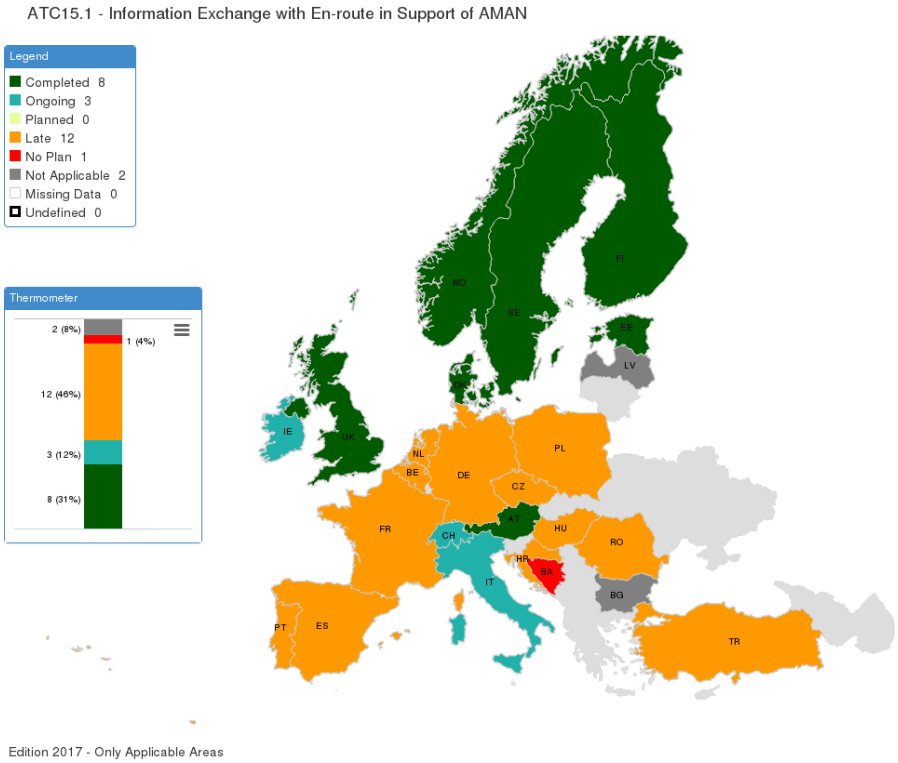
Completion Rate Evolution (% of States completed the objective)



Main 2017 developments:

The objective requires information exchange between AMAN systems supporting the respective TMAs and the first upstream ATS systems of the surrounding en-route control sectors. To note that The FOC date of this objective will be aligned to that of Basic AMAN (12/2019) in the MPL3 Plan ed. 2018. as this objective builds on ATC07.1.

There has been no evolution in its implementation in 2017, with 8 States declaring it completed. The number of States reporting a planned delay in the implementation has grown from 7 in 2016, to 12 in 2017. The number of States reporting the objective as not applicable grew from 16 in 2016, to 18 in 2017. With only a 31% of completion in the applicability area (discounting those declaring the objective as not applicable), it could be argued that even the forecast completion in 2019 may be difficult to achieve for a number of States, in particular those (BE, PT, HR and RO) who have reported a progress close to 0%. In some cases the problem is linked to lack of resources, in others to the coordination with adjacent centres/ANSPs, or change to a new ATM system.



ATC15.2 Arrival Management extended to en-route airspace

A reliable estimated achievement date can not be defined at this time.

Stakeholders:
- ANSPs
- Network Manager

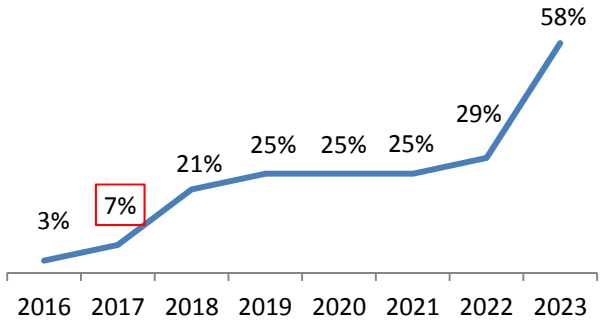
FOC: 12/2023

Estimated achievement: Not available

Applicability Area:
ACCs within the extended AMAN horizon, including those adjacent to TMAs serving/associated to PCP airports

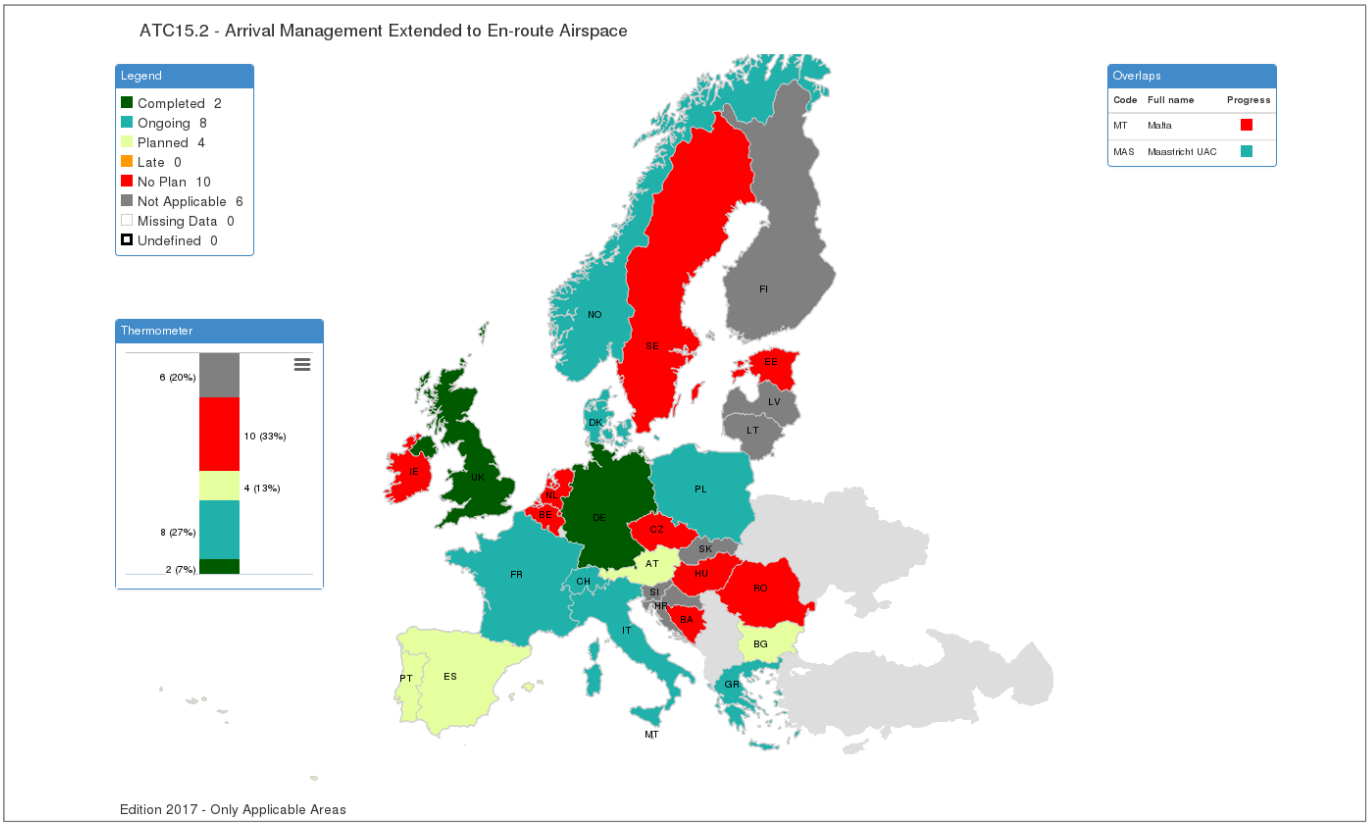
SESAR Solutions:	Solution #05 Extended Arrival Management (AMAN) horizon
SESAR Key Features:	Advanced Air Traffic Services
PCP Sub-Functionality:	S-AF1.1 Arrival Management Extended to En-route Airspace
ICAO ASBU:	B1-RSEQ
OI Steps:	TS-0305-A
Network Strategy Plan:	SO4/1

Completion Rate Evolution (% of States completed the objective)



Main 2017 developments:

First introduced in 2016, building upon ATC15.1 with the extension of the AMAN to 180-200 nautical miles. For many ANSPs its implementation will require coordination with neighboring countries. Within the 24 States that are in the applicability area of this objective, 10 report it as 'No Plan' (11 in 2016) and 4 as 'Planned' (5 in 2016). UK and DE have completed the objective (UK only in 2016). CH has completed it, but a second phase within FABEC keeps the project ongoing. Of those ANSPs progressing towards its implementation, only MUAC and FR have reported a significant progress (47% and 73% respectively).



ATC17 Electronic Dialogue supporting COTR

Stakeholders:
- ANSPs

FOC: 12/2018

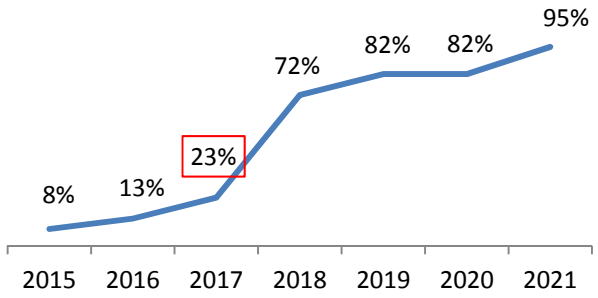
Estimated achievement: 12/2019

Planned delay

Applicability Area:
All ECAC States except SK, IE and UA

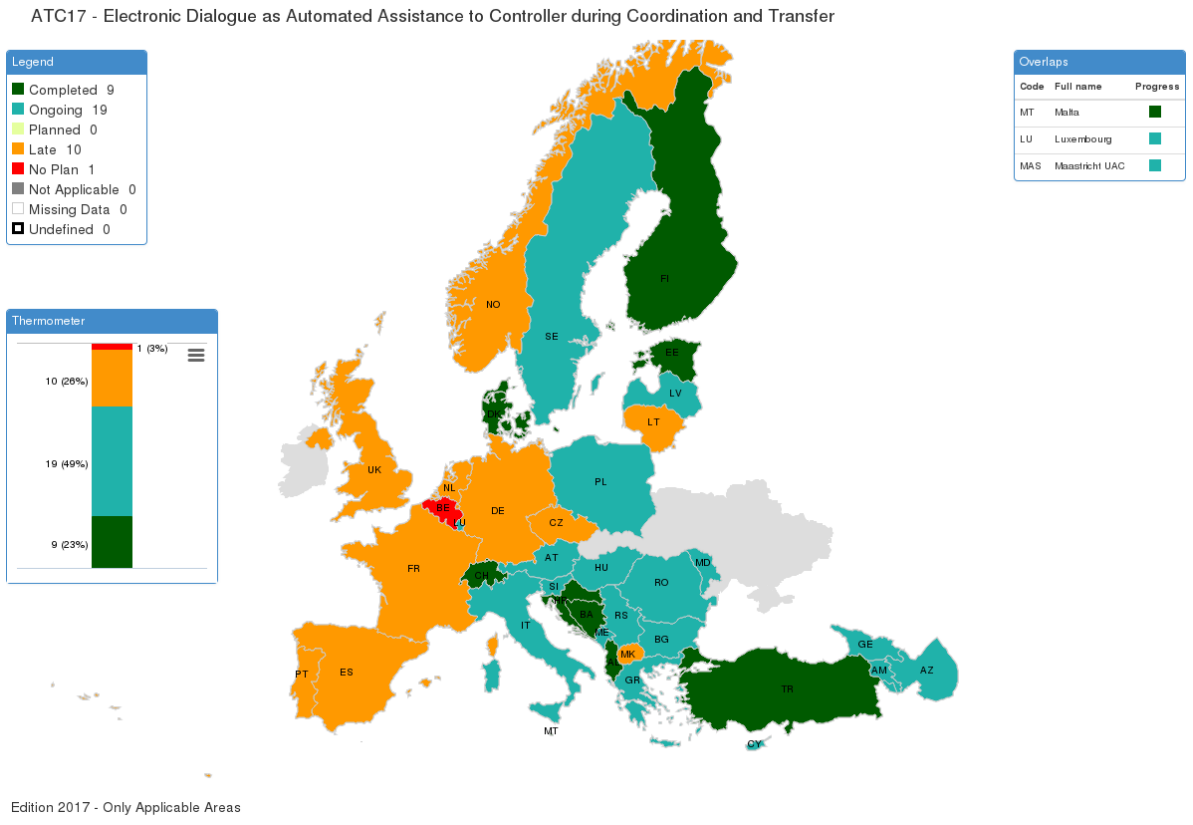
SESAR Solutions:	-
SESAR Key Features:	Advanced Air Traffic Services
PCP Sub-Functionality:	Enabler for S-AF3.2 Free Route
ICAO ASBU:	B0-FICE
OI Steps:	CM-0201
Network Strategy Plan:	SO3/1, SO4/1

Completion Rate Evolution (% of States completed the objective)



Main 2017 developments:

This objective complements the services implemented with ITY-COTR, a regulated provision based on IR. Achievement of this objective is delayed, compared to last year reports, with a current estimated achievement date of 2019. By the FOC date completion should reach 72%, which is a much lower ratio of the target 79% reported, for the same date, only one year ago. Four (4) States (AL, BA, MT and TR) have completed the objective in 2017. The number of administrations declaring delays went up from six (6) in 2016, to ten (10) in 2017. In a good number of cases, this follows the scheduled implementation of a new ATM system. Most OLDI messages are already available in many ATM systems across the applicability area but, in a number of cases their operational introduction is pending on the signing of an agreement between neighbouring ACCs.



ATC18 Multi Sector Planning En-route – 1P2T [Local]

First year of monitoring.

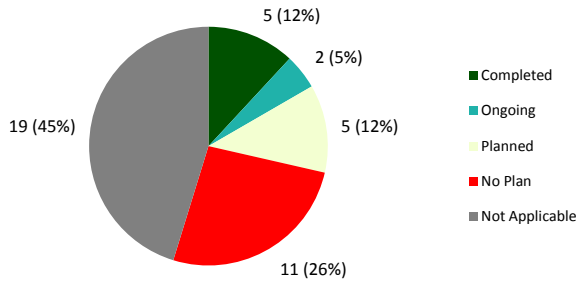
Stakeholders:
- ANSPs

FOC: **Not available**

Estimated achievement: **Not available**

Applicability Area:
Subject to local needs and complexity

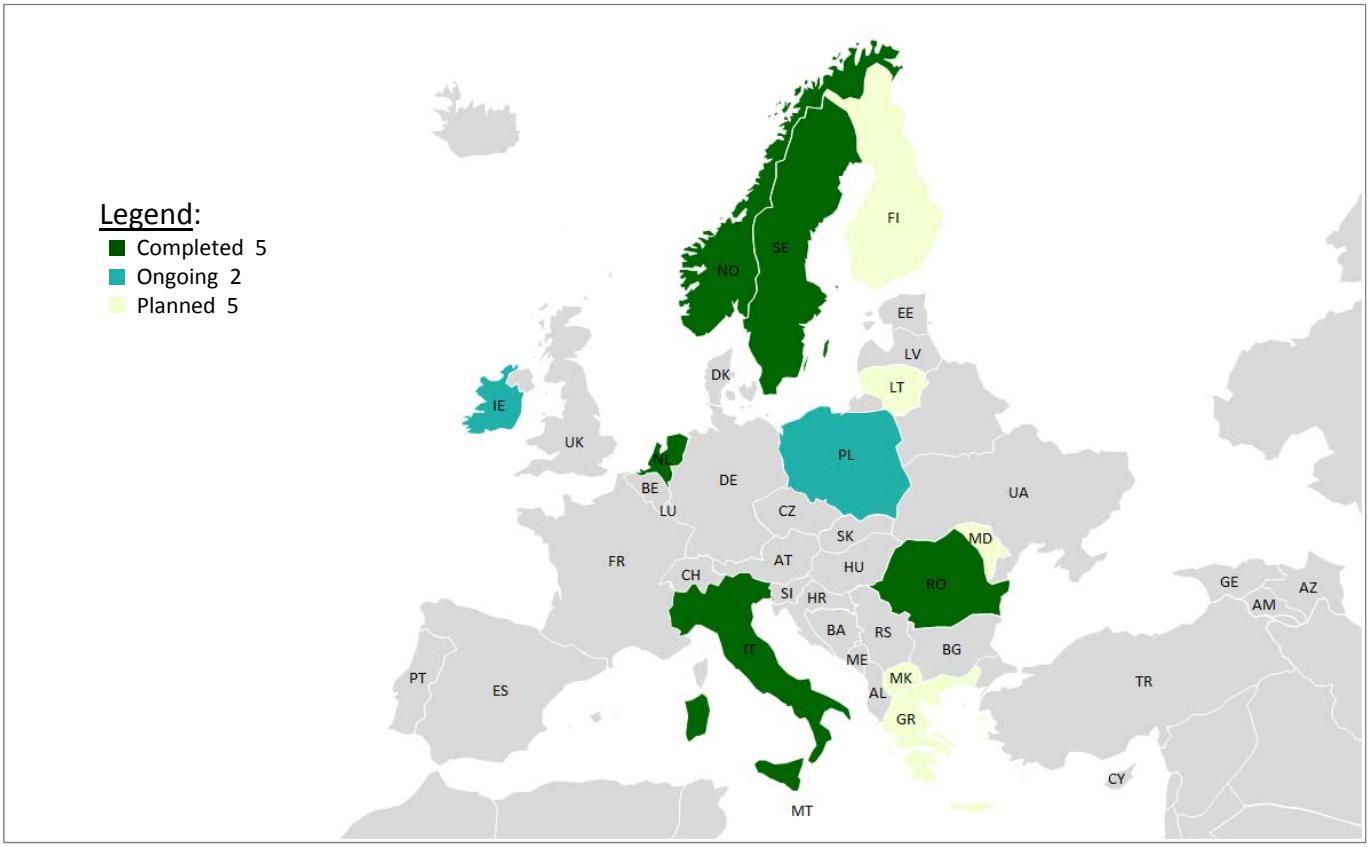
SESAR Solutions:	Solution #63 - Multi Sector Planning
SESAR Key Features:	Advanced Air Traffic Services
EOC/OC:	Sector Team Operation
ICAO ASBU:	No corresponding ASBU
OI Steps:	CM-0301
Network Strategy Plan:	SO4/1



Note: ATC18 implementation is subject to local needs/decision.

Main 2017 developments:

This is a new objective and it has no associated pre-defined applicability area. Also, as its implementation is based on purely local considerations, there is no FOC date associated to it. In its first year of monitoring, four (5) ECAC ANSPs have declared Multi-sector planning already implemented (IT, NL, NO, RO and SE). Another two (2) declared it as ongoing (IE and PL). Finally, five (5) reported plans to implement it in the incoming future (FI, GR, LT, MK and MD). Eleven (11) administrations reported having no (current) plans for its implementation, with a number of them already investigating its feasibility. Another 19 declared it as not applicable. For some this was either because of their current sectors number and/or configuration, or current ATM system ability, or lack of substantial benefits compared to their current operations.



ENV01 Continuous Descent Operations (CDO)

Stakeholders:
- ANSPs
- Airspace Users
- Airport Operators

FOC: 12/2013

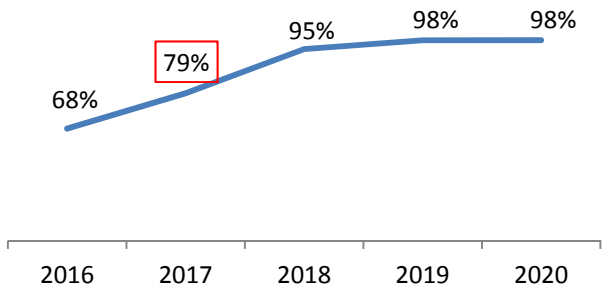
Estimated achievement: 12/2018

Late

Applicability Area:
59 airports

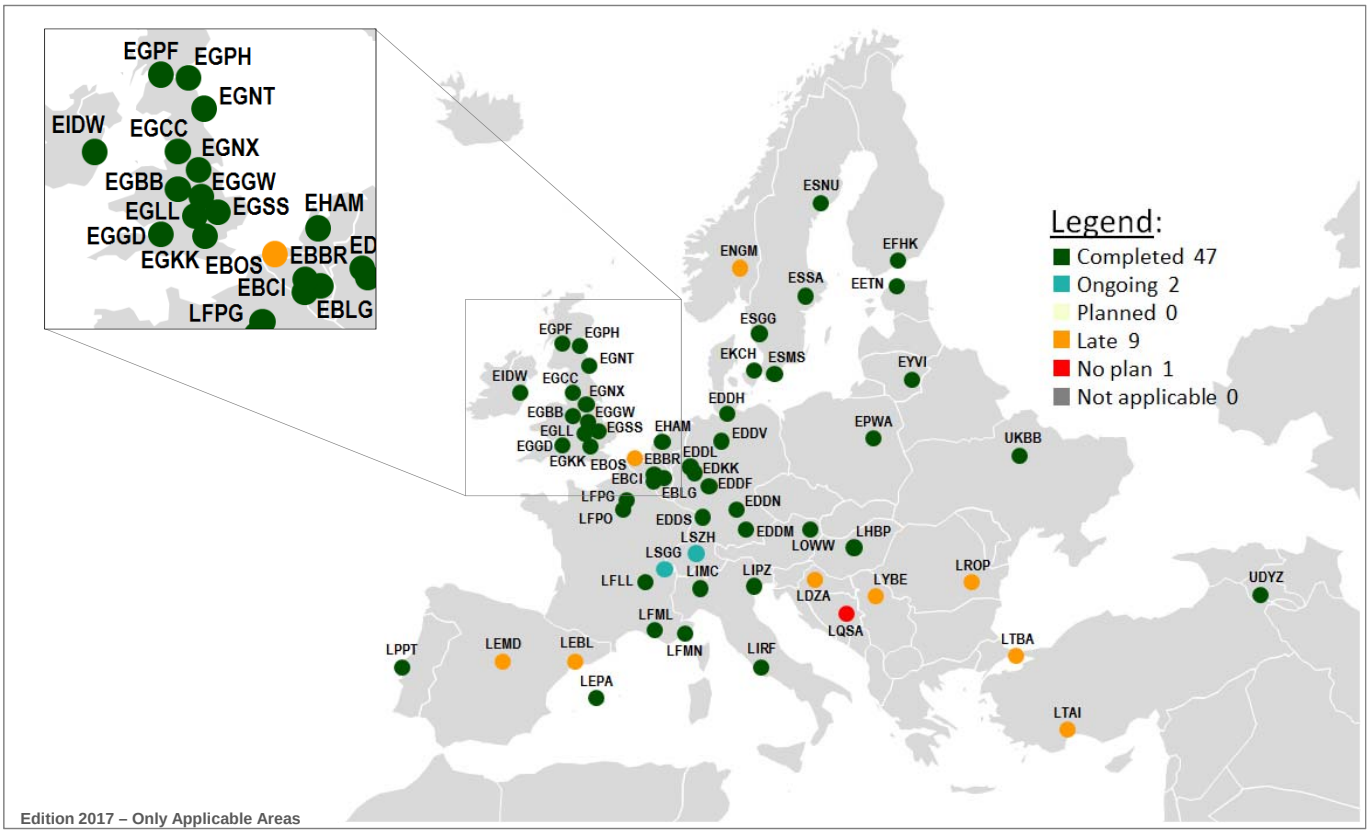
SESAR Solutions:	-
SESAR Key Features:	Advance Air Traffic Services
EOC/OC:	-
ICAO ASBU:	B0-CDO
OI Steps:	AOM-0701
Network Strategy Plan:	SO6/5

Completion Rate Evolution (% of Airports completed the objective)



Main 2017 developments:

The objective completion was delayed for one more year comparing to last year estimate (12/2018). The overall number of airports that have completed this functionality is slowly progressing with regard to the FOC date. In 2017, three more airports, namely Charleroi, Liege and Tallinn have completed this functionality. Around 15% of airports in applicability area report delays in implementation, whereby Spanish airports plan the completion of this functionality by March 2018 and the majority of airports plan the completion of this functionality by the end of 2018. It seems that actions relating to monitor performance are the most challenging for implementation. It was also reported that some airports are performing CDO only at the pilot requests, some others only at night time. It should also be mentioned that some airports reported an ongoing status reflecting the performance as measured by the PRU, even if such report is not aligned with the LSSIP taxonomy. This is the case for Swiss airports Geneva and Zurich.



ENV03 Continuous Climb Operations (CCO) [Local]

First year of monitoring.

Stakeholders:
- ANSPs
- Airspace Users
- Airport Operators

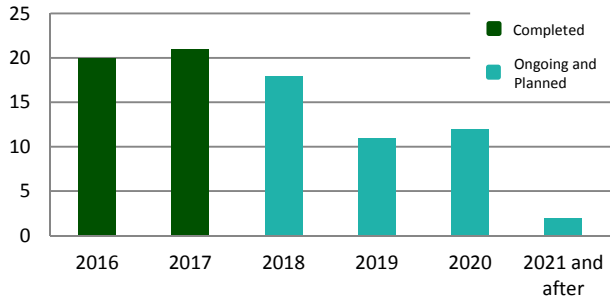
FOC: Not available

Estimated achievement: Not available

Applicability Area: Aerodromes subject to local needs and complexity

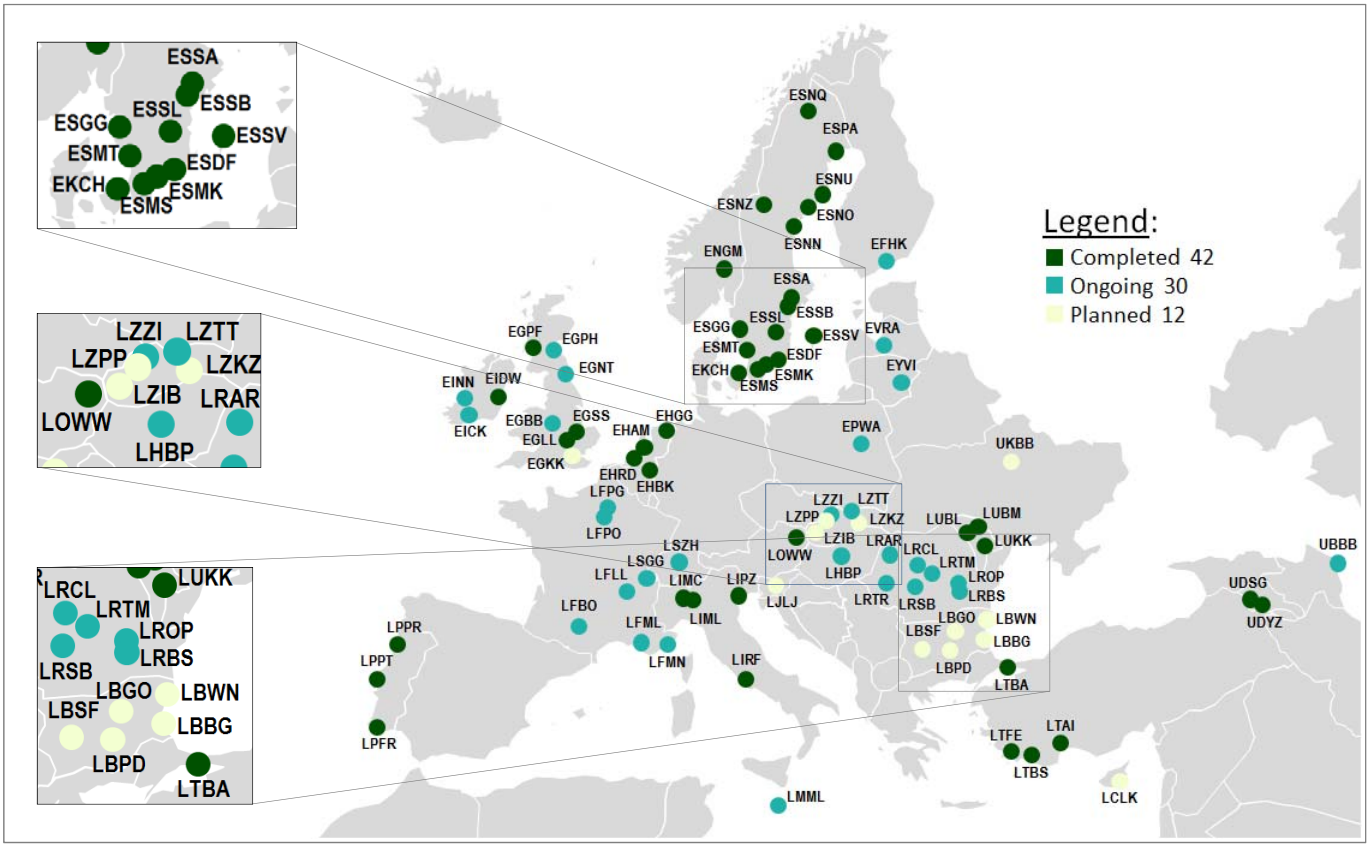
SESAR Solutions:	-
SESAR Key Features:	Advance Air Traffic Services
EOC/OC:	-
ICAO ASBU:	B0-CCO
OI Steps:	AOM-0703
Network Strategy Plan:	SO6/5

Implementation progress (number of airports completed the objective)



Main 2017 developments:

The Objective is in its first year of monitoring. As it is a Local Objective, reporting is on a voluntary basis. However, this Objective should be considered in relation to Objective ENV01-Continous Descent Operations. A total of 84 Airports reported on its implementation status. Whereby by end of 2017, 42 airports reported the completion of this Objective. Another 30 reported that the implementation is "Ongoing", with the latest projected implementation date for EVRA-Riga and all Romanian Airports by December 2020. Twelve (12) Airports reported that the implementation is "Planned" with the latest projected implementation date for EGKK-London Gatwick by December 2024.



NAV03.1 RNAV 1 in TMA Operations

Stakeholders:
- ANSPs
- Airspace Users

FOC: 12/2023

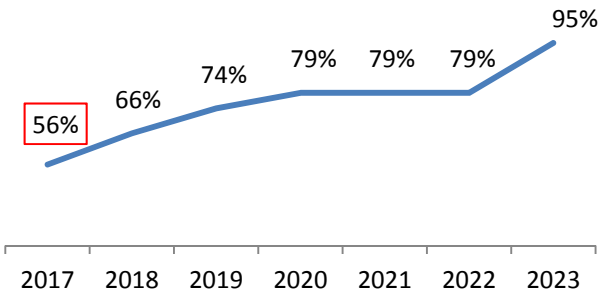
Estimated achievement: 12/2023

On time

Applicability Area:
All ECAC States, except LU, MAS and SK

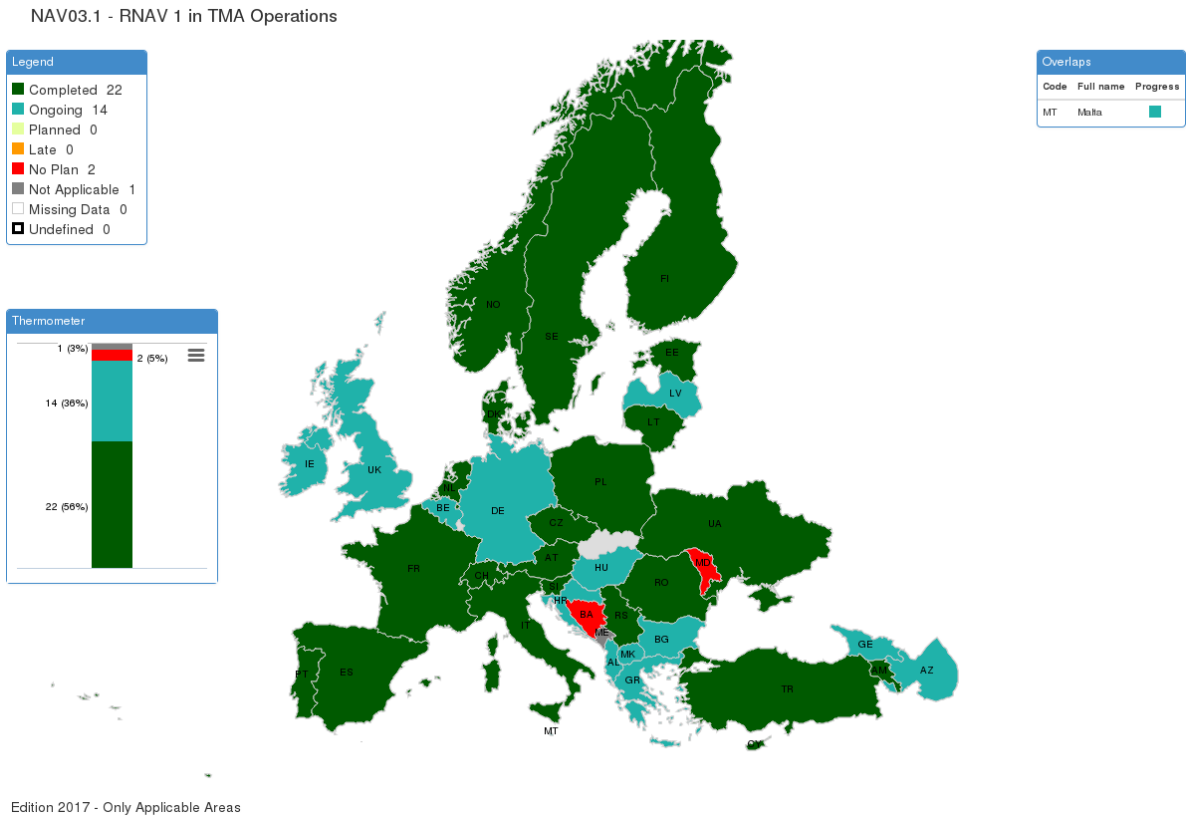
SESAR Solutions:	-
SESAR Key Features:	Advanced Air Traffic Services
EOC/OC:	- Introduction of P-RNAV - Predecessor of S-AF1.2 Enhanced TMA using RNP-based operations
ICAO ASBU:	B0-CDO, B0-CCO, B0-APTA
OI Steps:	AOM-0601, CTE-N08
Network Strategy Plan:	SO6/5

Completion Rate Evolution (% of States completed the objective)



Main 2017 developments:

In the year 2017, CY, ES, SI and TR progressed to "completed" implementation. A big bulk of 22 states which "completed" implementation at major aerodromes and TMAs, have plans for further implementation at smaller aerodromes too. Quite few States are very close to completion (AZ at 88%, BE at 91%, BG at 93%, HU at 70%, IE at 80 and UK at 77%). The states below 20% completion are AL, GE, LU, MK, MT and SK. The only two States that reported 'no plan' yet, are BA and MD. ME reported "not applicable" due to lack of surveillance coverage in TMA. Completion rate is around 56%. This is, most probably, the result of uncertainty related to PBN IR finalisation. Taking into account quite long FOC date, no delays are expected at this time. According to the EUROCONTROL PRISME CNS business intelligence, in 2017 about 91% of the flights (ICAO FPLs) had RNAV1 capability, out of which 4% were "Non-GNSS" equipped.



NAV03.2 RNP 1 in TMA Operations

First year of monitoring. A reliable estimated achievement date can not be defined at this time.

Stakeholders:
- ANSPs
- Airspace Users

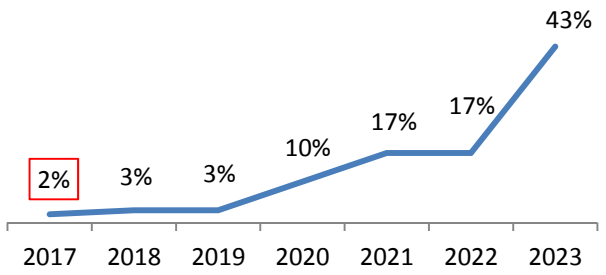
FOC: 12/2023

Estimated achievement: Not available

Applicability Area:
Mandatory for TMAs in PCP Regulation Annex. For all other ECAC TMAs, according to local needs.

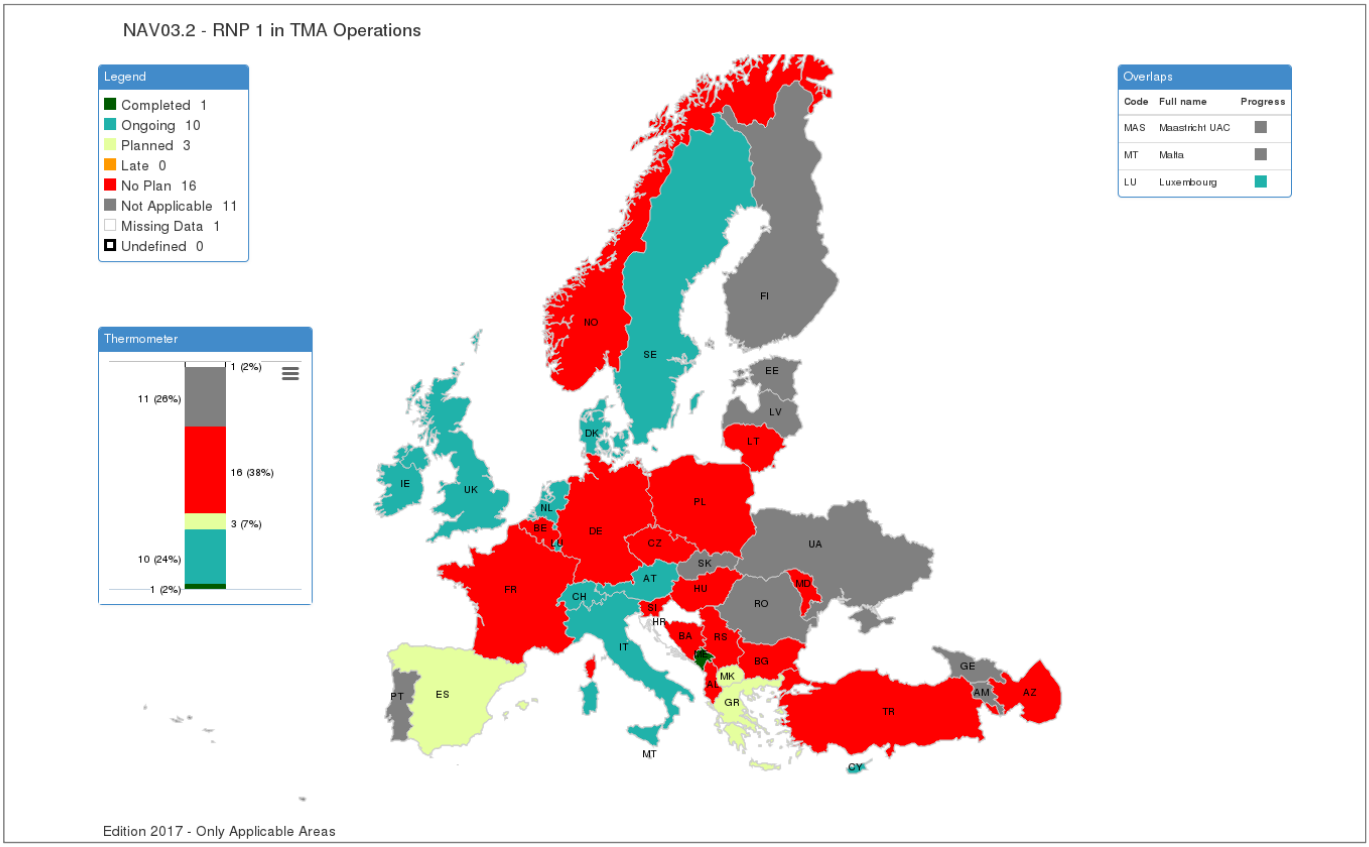
SESAR Solutions:	Solutions #09 & #51
SESAR Key Features:	Advanced Air Traffic Services
EOC/OC:	S-AF1.2 Enhanced TMA using RNP-Based Operations
ICAO ASBU:	B1-APTA
OI Steps:	AOM-0603, AOM-0605
Network Strategy Plan:	SO6/5

Completion Rate Evolution (% of States completed the objective)



Main 2017 developments:

This objective reflects PCP regulation requirements. In 2017 only ME reported “completed”. However ME did not implement RF option. Eleven (11) states within PCP applicability have no plans for implementation yet. Fourteen (14) other non-PCP states has no plans for RNP1 implementation. A few states have medium-high completion rate (CY at 80%, AT at 46% and CH at 45%). While ES, GR, IE, LU, MK and NL have low completion rate below 10%. Absence of firm committed implementation plans is, most probably, the result of uncertainty related to PBN IR finalisation. Beside PBN IR uncertainty, eight (8) states clearly indicated lack of business (operational) need for RNP1 implementation. Taking into account quite long FOC date, no delays are expected at this time. According to the EUROCONTROL PRISME CNS business intelligence, in 2017 about 54% of the flights (ICAO FPLs) had RNP1 capability.



NAV10 APV procedures

Stakeholders:
- ANSPs
- Airspace Users
- Regulators

FOC: 12/2016

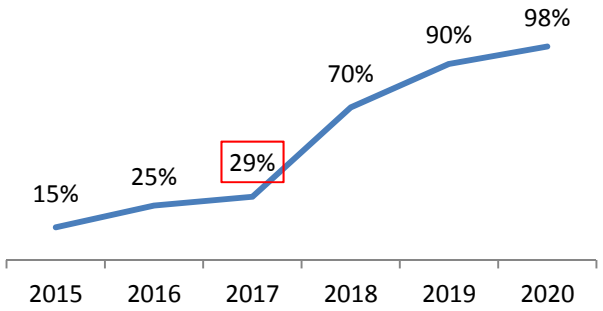
Estimated achievement: 12/2019

Late

Applicability Area:
All ECAC States except Maastricht UAC

SESAR Solutions:	Solution #103 Approach Procedure with vertical guidance (LPV)
SESAR Key Features:	Advanced Air Traffic Services
PCP Sub-Functionality:	Pre-requisite for S-AF1.2 Enhanced TMA Using RNP-Based Operations
ICAO ASBU:	B0-APTA
OI Steps:	AOM-0602, AOM-0604
Network Strategy Plan:	SO6/5

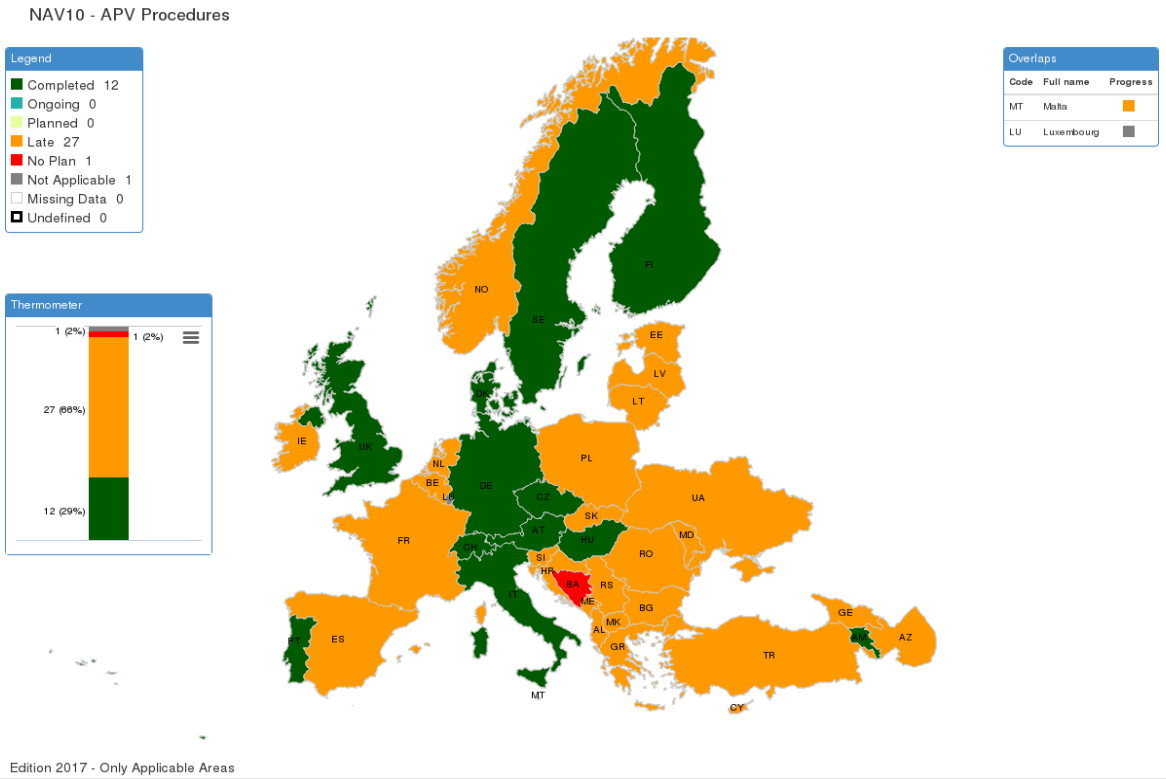
Completion Rate Evolution (% of States completed the objective)



Main 2017 developments:

Additional two (2) States have completed this implementation objective in 2017 (IT and HU). The states very close to completion are BE at 90%, SK at 98%, PL at 85%, above 75% are BG, FR, IE, NL and NO. These states estimate completion date by December 2018. Low level of completion below 30% is reported by AL, EE , GR and LT.

Despite implementation progress recorded in 2017, objective is assessed as 'late' at ECAC level, as the official FOC date was reached at the end of 2016. Some reluctance exists in implementation, as well as in update of the objective NAV10 e.g. FOC date, probably caused by PBN IR uncertainty. According to the EUROCONTROL PRISME CNS business intelligence, in 2017 about 71% of the flights (ICAO FPLs) were RNP APCH by any means capable, out of which 59% of had LNAV/VNAV (Baro) and 2,7% LPV (SBAS) capability. However it should be noted that the EGNOS Service area is not covering yet the entire ECAC area, neither all the EU28 states, potentially impeding the full deployment of the objective.



NAV12

Optimised Low-Level IFR Routes in TMA for Rotorcraft [Local]

First year of monitoring.

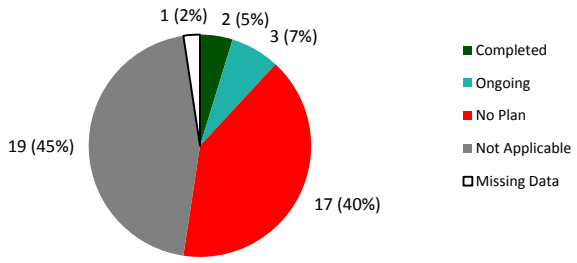
Stakeholders:
- ANSPs
- Airspace Users

FOC: **Not available**

Estimated achievement: **Not available**

Applicability Area:
TMAs subject to local needs and complexity

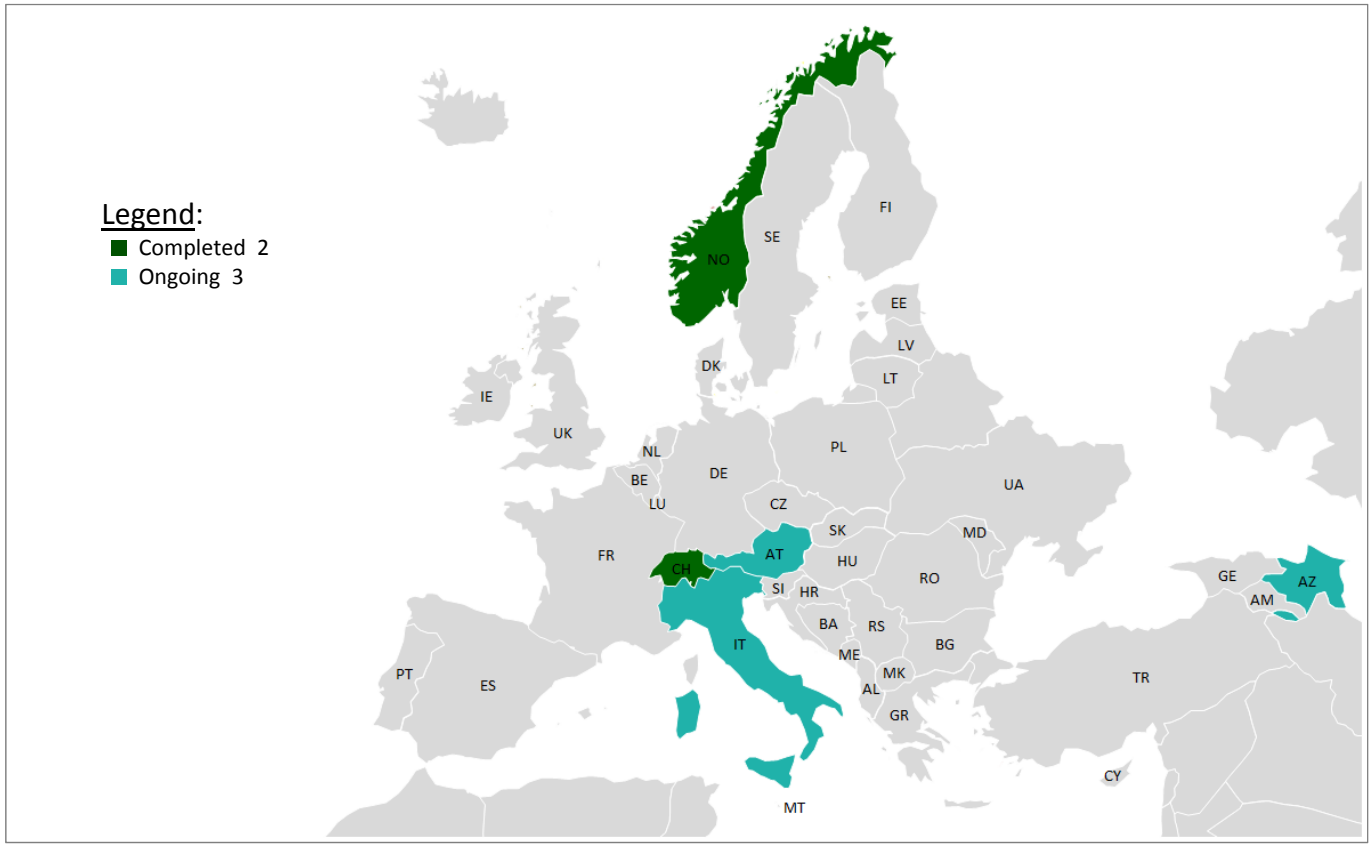
SESAR Solutions:	Solution #113 Optimised low-level IFR routes for rotorcraft
SESAR Key Features:	Advanced Air Traffic Services
EOC/OC:	-
ICAO ASBU:	B1-APTA
OI Steps:	AOM-0810
Network Strategy Plan:	SO6/5



Note: NAV12 implementation is subject to local needs/decision.

Main 2017 developments:

This objective is introduced in the plan in year 2017. Its applicability is subject to local needs in a State. In the first year of monitoring 2017, CH and NO completed implementation of Low-Level IFR routes for rotorcrafts. AT, AZ and IT are working on the implementation. The first PinS and IFR routes in AT and AZ may be expected by 2019. All other States either have no plans yet, or consider it as not applicable to their business needs and operational environment.



AOP04.1 A-SMGCS Surveillance (former Level 1)

Stakeholders:
- ANSPs
- Airport Operator
- Airspace Users
- Regulators

FOC: 12/2011

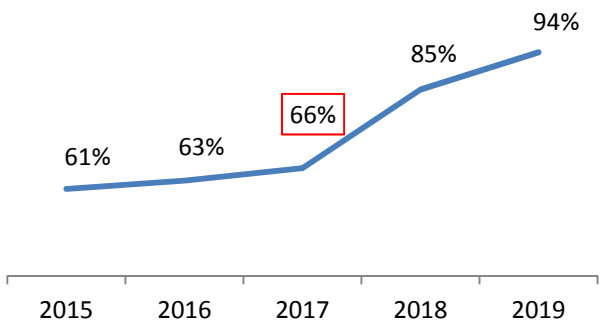
Estimated achievement: 12/2018

Late

Applicability Area:
25 PCP + 22 non-PCP airports

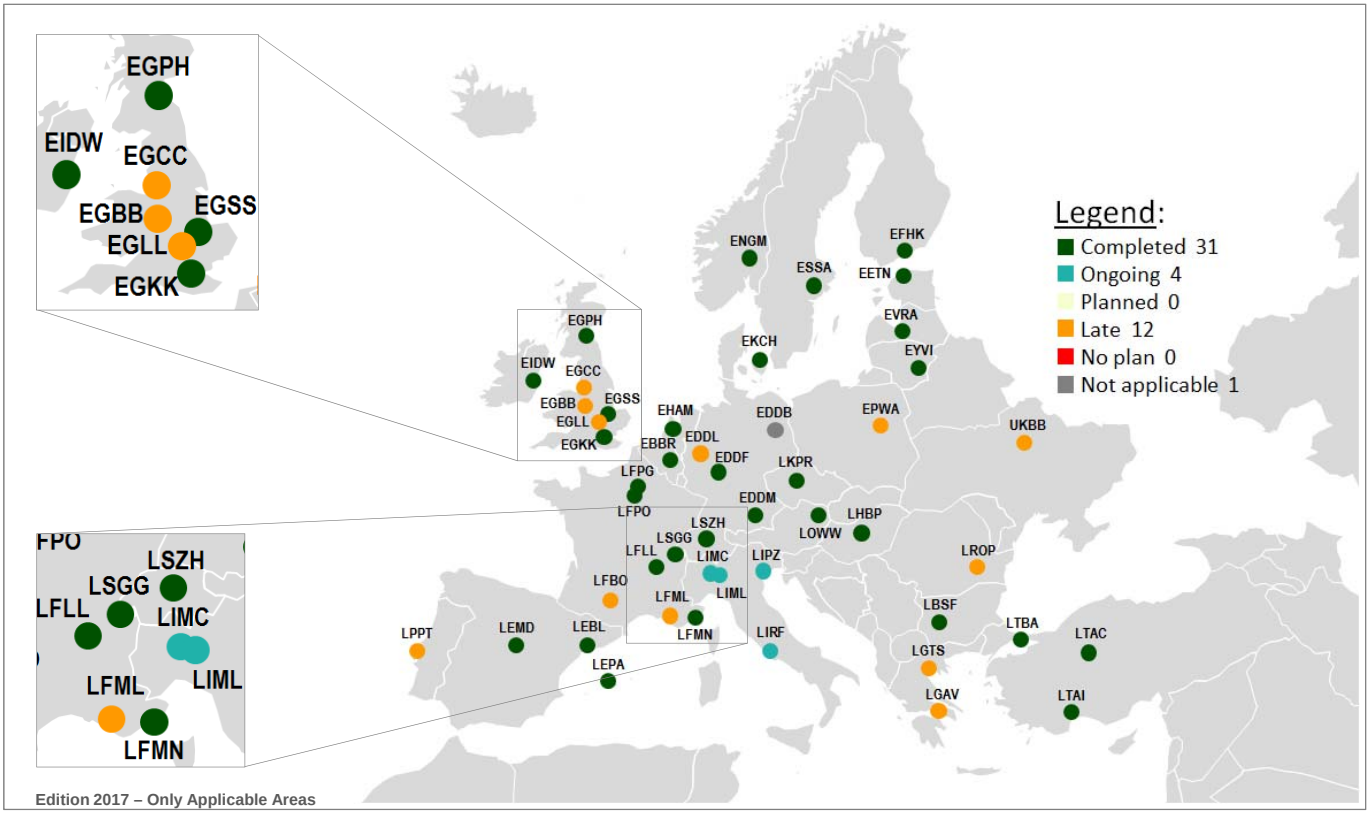
SESAR Solutions:	-
SESAR Key Features:	High Performing Airports
PCP Sub-Functionality:	Pre-requisite for: - S-AF2.2 DMAN Int. Surface Management Constraints (PCP) - S-AF2.4 Automated Assistance to Controller for Surf. Movement Planning and Routing (PCP) - S-AF2.5 Airport Safety Nets (PCP) Integrated Surface Management (EOC)
ICAO ASBU:	B0-SURF
OI Steps:	AO-0201, CTE-S02b, CTE-S03b, CTE-S04b
Network Strategy Plan:	SO6/6

Completion Rate Evolution (% of Airports completed the objective)



Main 2017 developments:

This baseline objective sets-up the infrastructure to build up all the functionalities related to surface movement and guidance. According to 2017 reporting, 66% of the airports in applicability area have completed the objective. In 2017, two additional airports have completed the A-SMGCS surveillance project, and these are Sofia Airport (LBSF) and London Stansted airport (EGSS). There are still six (6) PCP airports that have not completed this objective yet (EDDL, EDDB, LIMC, LIRF, EGLL and EGCC).This could jeopardize the timely implementation of subsequent functionalities related to A-SMGCS. There is an impression that A-SMGCS surveillance is a part of PCP. However, Regulation (EU) 716/2014 specifies that A-SMGCS Level 1 is a pre-requisite and should to be implemented before the other functionalities. It should also be mentioned that some airports reported an ongoing status instead of late (LIRF, LIPZ, LIMC, LIML).



AOP04.2 A-SMGCS RMCA (former Level 2)

Stakeholders:
- ANSPs
- Airport Operator

FOC: 12/2017

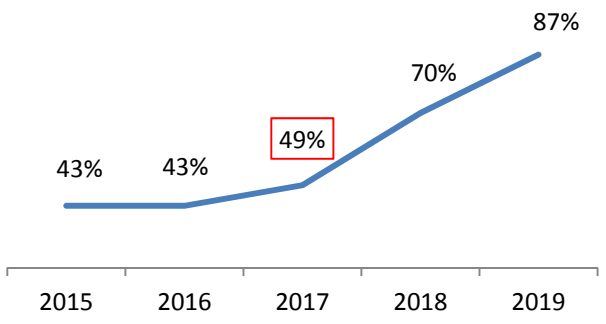
Estimated achievement: 12/2019

Late

Applicability Area:
25 PCP + 22 non-PCP airports

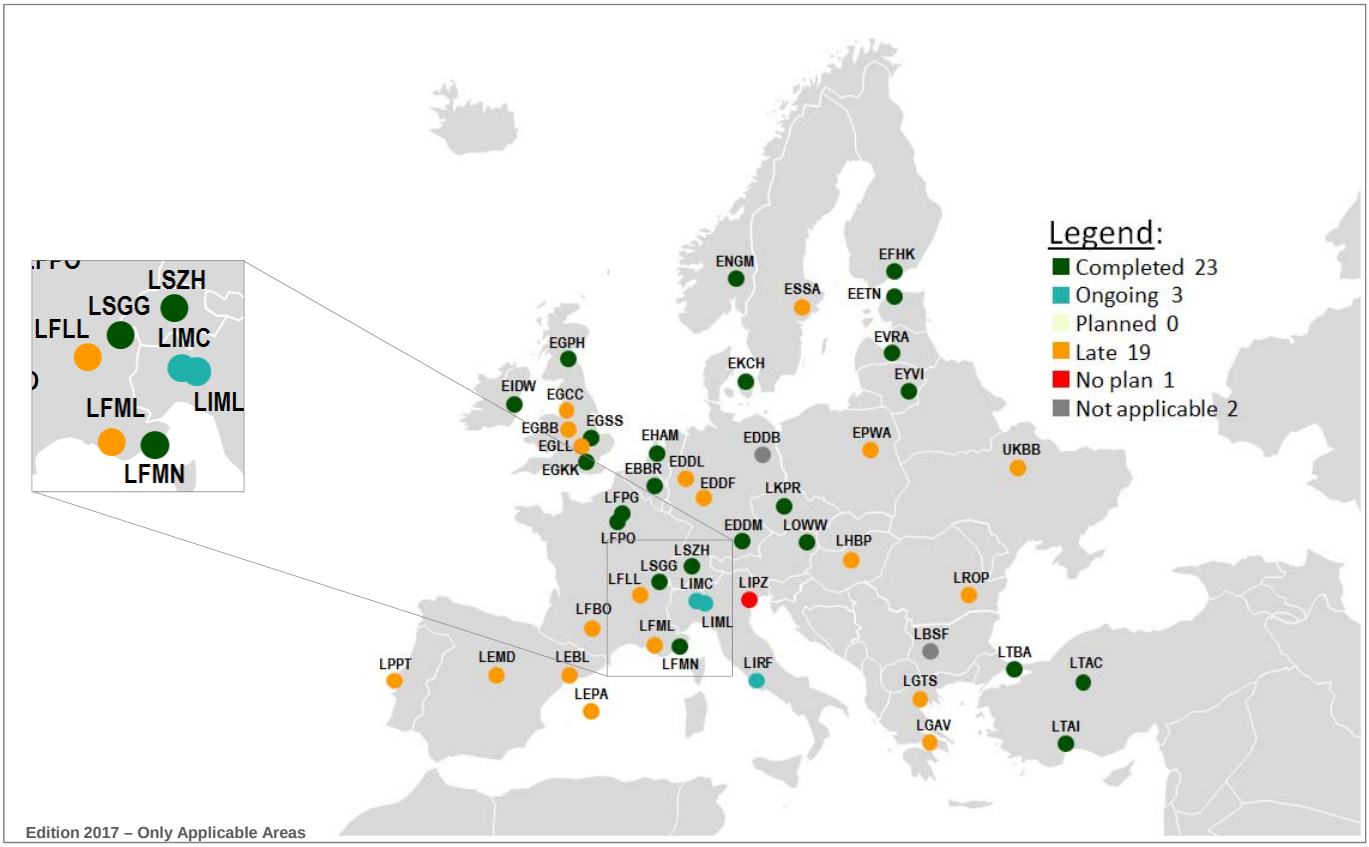
SESAR Solutions:	-
SESAR Key Features:	High Performing Airports
PCP Sub-Functionality:	Pre-requisite for: - S-AF2.2 DMAN Int. Surface Management Constraints (PCP) - S-AF2.4 Automated Assistance to Controller for Surf. Movement (PCP) Planning and Routing (PCP) - S-AF2.5 Airport Safety Nets Integrated Surface Management (EOC)
ICAO ASBU:	B0-SURF
OI Steps:	AO-0102, AO-0201, CTE-S02b, CTE-S03b, CTE-S04b
Network Strategy Plan:	SO6/6

Completion Rate Evolution (% of Airports completed the objective)



Main 2017 developments:

A-SMGCS RMCA implementation builds on the implementation of AOP04.1 and it is an important pre-requisite towards the implementation of PCP AF2. Since 2015, the risks of delayed implementation of this objective have been reported and notified, mainly due to AOP04.1 delays. Now in 2017, the objective FOC date is definitely passed and objective is assessed as 'late'. In 2016, two airports achieved the objective (EFHK, EGSS), leading to a total of 23 airports having this functionality operational. 11 PCP airports still have not implemented this functionality, which is a significant number taking into account that this implementation objective is an important pre-requisite for AF2 functionalities. The main reason for delays is reported to be a need for a system upgrade to integrate the warning function. It should also be mentioned that some airports reported an ongoing status instead of late (LIRF, LIMC, LIML).



AOP05 Airport CDM

Stakeholders:
- ANSPs
- Airspace Users
- Airport Operators
- Network Manager

FOC: 12/2016

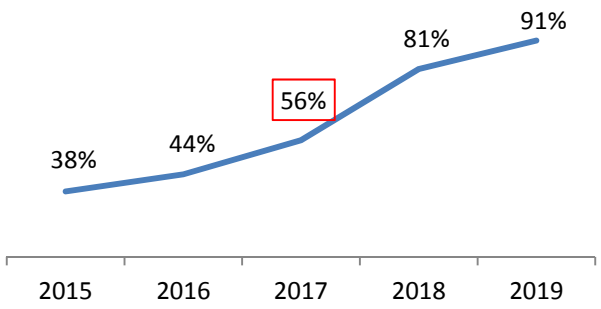
Estimated achievement: 04/2019

Late

Applicability Area:
25 PCP + 21 non-PCP

SESAR Solutions:	-
SESAR Key Features:	High Performing Airports
PCP Sub-Functionality:	Pre-requisite for: - S-AF2.1. DMAN synchronised with pre-departure sequencing (PCP) - Collaborative Airport (EOC)
ICAO ASBU:	B0-ACDM
OI Steps:	AO-0501, AO-0601, AO-0602, AO-0603, TS-0201
Network Strategy Plan:	SO6/4

Completion Rate Evolution (% of Airports completed the objective)

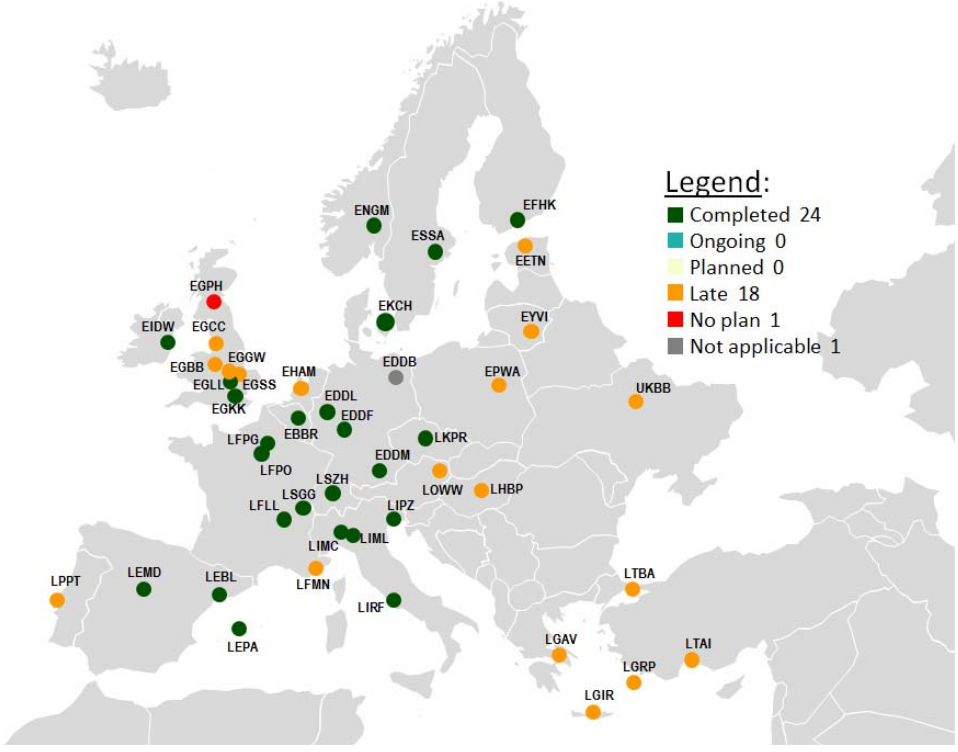


Main 2017 developments:

Four (4) additional Airports (Dublin, Lyon, Palma and Stockholm) have completed the implementation during this new reporting cycle , leading to a total of twenty-four (24) A-CDM airports in Europe by the end of 2017 (it should be noted that due to a technical issue, automatic processing at Dublin has been stopped and DPI is not used operational at NMOC. Full reintroduction expected for Q2 2018). Also A-CDM has been implemented in 3 German airports (Berlin-Schönefeld , Stuttgart and Hamburg) which are not in the applicability area of the objective.

Regarding the PCP airports, out of twenty-five (25) airports mentioned in PCP-IR, seventeen (17) have now implemented A-CDM and are connected to the Network Manager Operational Centre (NMOC).

The implementation is ongoing, while late compared to the FOC date, at another eighteen (18) airports, with ten (10) airports are in the process of becoming operationally connected to NMOC (DPI exchanges) during year 2018: Naples, Bergen, Stavanger, Trondheim, Amsterdam, Lisbon, Vienna, Istanbul Ataturk, Warsaw and Nice.



Edition 2017 – Only Applicable Areas

AOP10 Time Based Separation

A reliable estimated achievement date can not be defined at this time.

Stakeholders:
- ANSPs
- Airspace Users
- Regulators

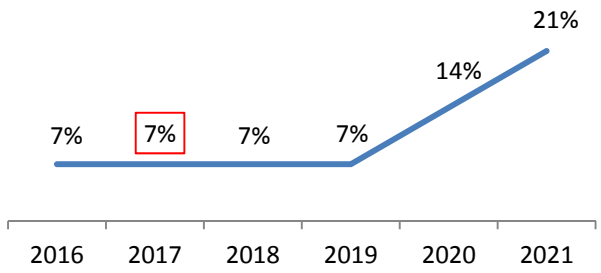
FOC: 12/2023

Estimated achievement: **Not available**

Applicability Area:
16 PCP airports

SESAR Solutions:	Solution #64 Time-Based separation
SESAR Key Features:	High Performing Airports
PCP Sub-Functionality:	S-AF2.3 Time-Based Separation for Final Approach
ICAO ASBU:	B1-RSEQ, B2-WAKE
OI Steps:	AO-0303
Network Strategy Plan:	SO6/5

Completion Rate Evolution (% of Airports completed the objective)



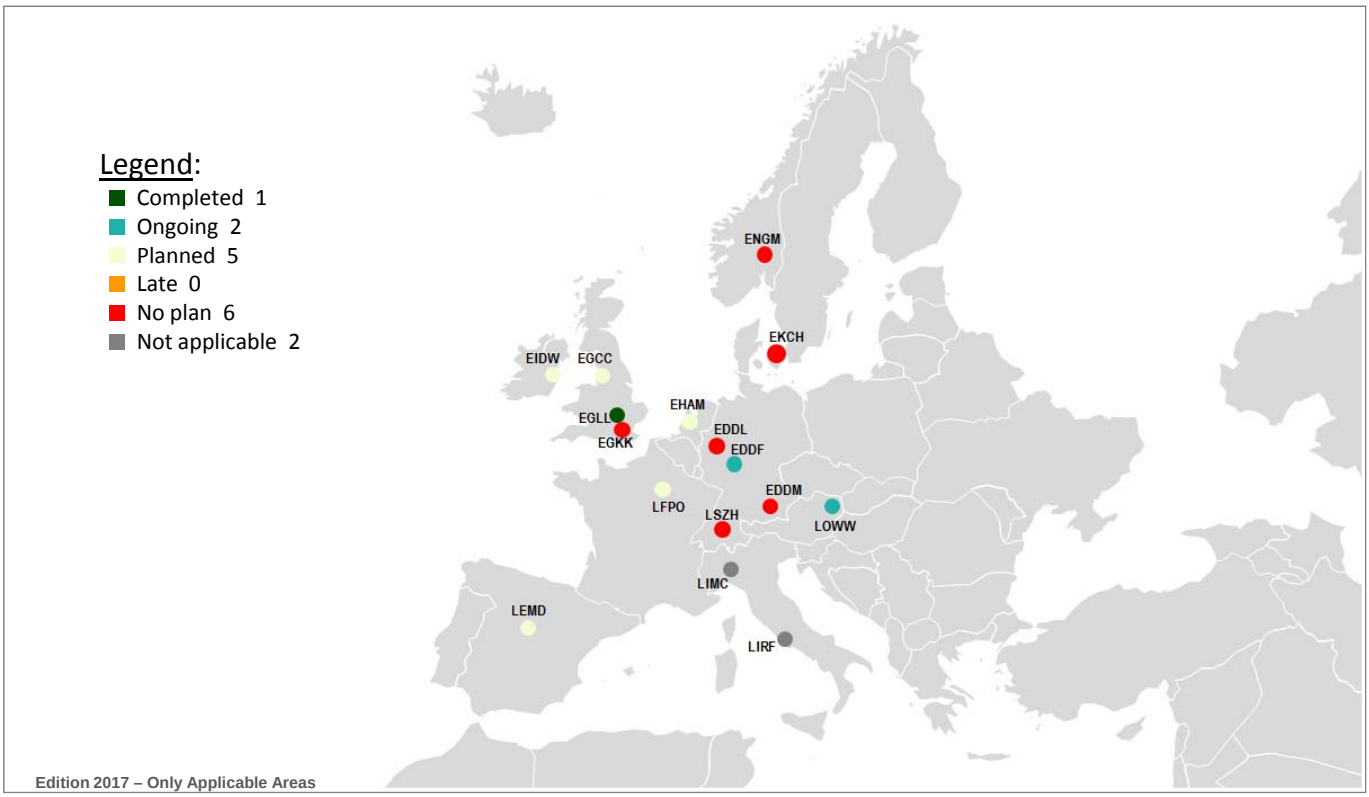
Main 2017 developments:

The objective is already implemented at London Heathrow Airport/EGLL. Vienna Schwechat (LOWW) has started the implementation and is planning to be completed by the end of 2020.

The possible use of Time Based Separation is being studied at Frankfurt airport and approach, with initial work started as a pilot project. Paris-Orly (LFPO), Dublin (EIDW), Madrid Barajas (LEMD) and Manchester Airport (EGCC) have also planned the implementation of this objective.

By the FOC date (12/2023), only nine (9) out of 16 airports identified in the PCP IR will have completed the objective. Six (6) airports do not have established concrete implementation plans yet and two (2) (LIRF, LIMC) declared as not applicable.

Overall, the objective is still at early implementation stages.



AOP11 Initial Airport Operations Plan

Stakeholders:
- ANSPs
- Airspace Users
- Airport Operators

FOC: 12/2021

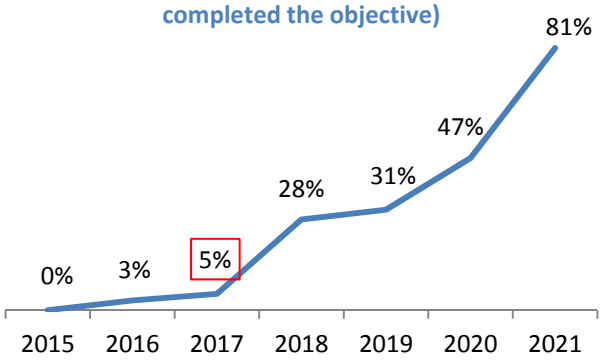
Estimated achievement: 12/2021

On time

Applicability Area:
24 PCP Airports
15 non-PCP airports

SESAR Solutions:	Solution #21 Airport Operations Plan and AOP-NOP Seamless Integration
SESAR Key Features:	High Performing Airports Optimised ATM Network Services
PCP Sub-Functionality:	S-AF2.1 DMAN synchronised with pre-departure sequencing S-AF4.2 Collaborative NOP
ICAO ASBU:	B1-ACDM, B1-NOPS
OI Steps:	AO-0801-A
Network Strategy Plan:	SO6/2

Completion Rate Evolution (% of Airports completed the objective)



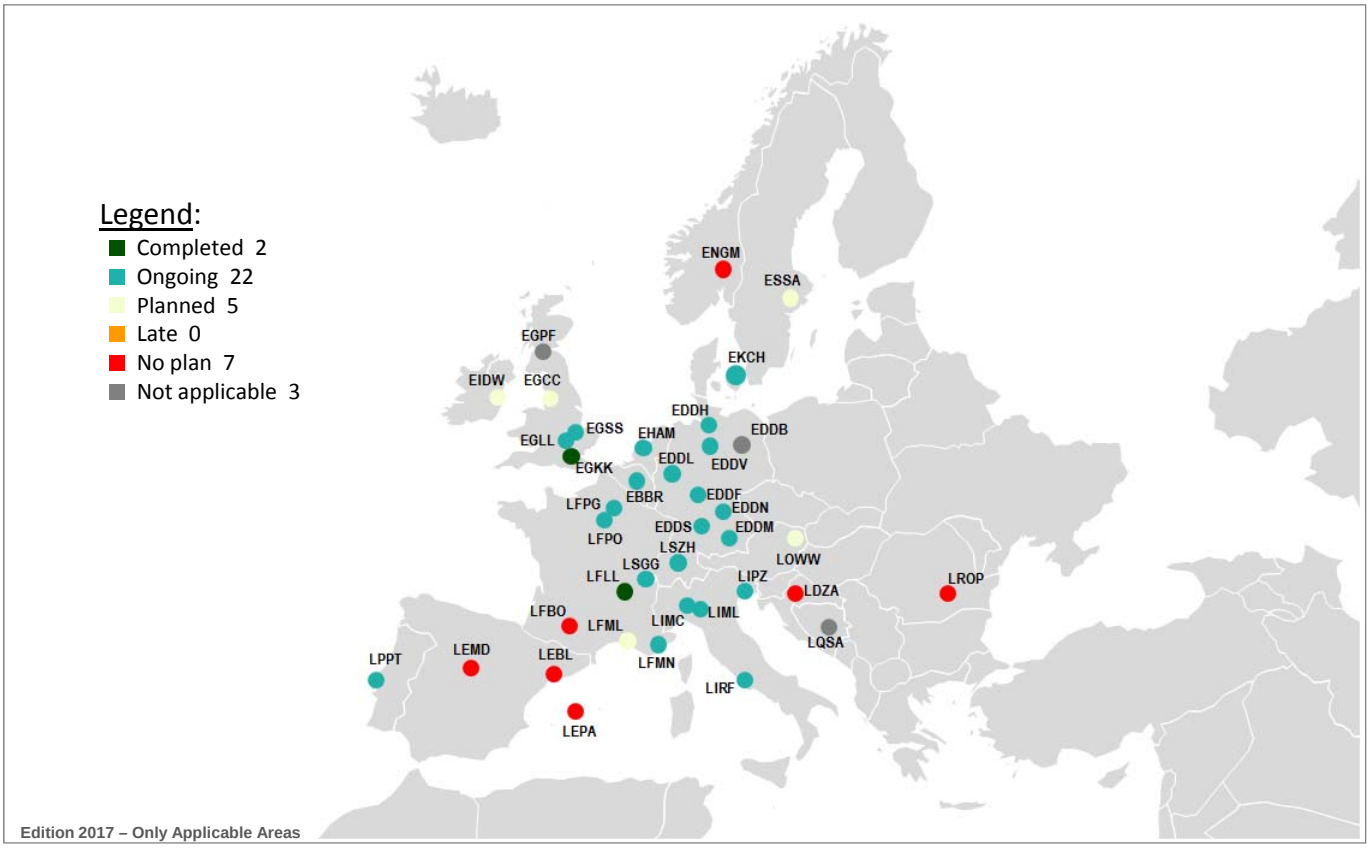
Main 2017 developments:

A second airport, Lyon/LFLL, has declared the completion of the implementation of this objective (in addition of Gatwick/EGKK).

The ongoing implementation has increased from fourteen (14) to twenty-three (23) airports.

On this basis, 30 out of 40 airports (25 PCP and 15 non-PCP) will have completed the objective by the FOC date (12/2021).

It must be noted that, considering some possible variable interpretation, the content of an initial AOP should be rapidly clarified so as to ensure an harmonised and consistent implementation across Europe.



AOP12 Improve RWY safety with CTAC and CMAC

Stakeholders:
- ANSPs
- Airspace Users
- Airport Operator

FOC: 12/2020

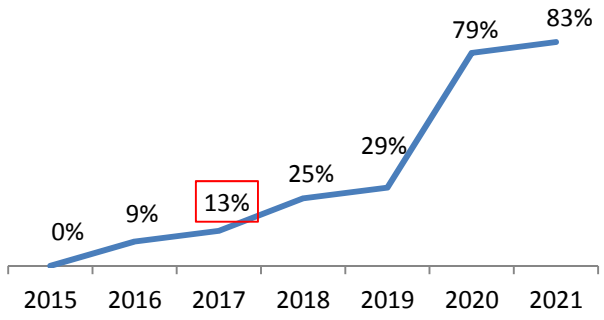
Estimated achievement: 06/2021

Planned delay

Applicability Area:
25 PCP airports

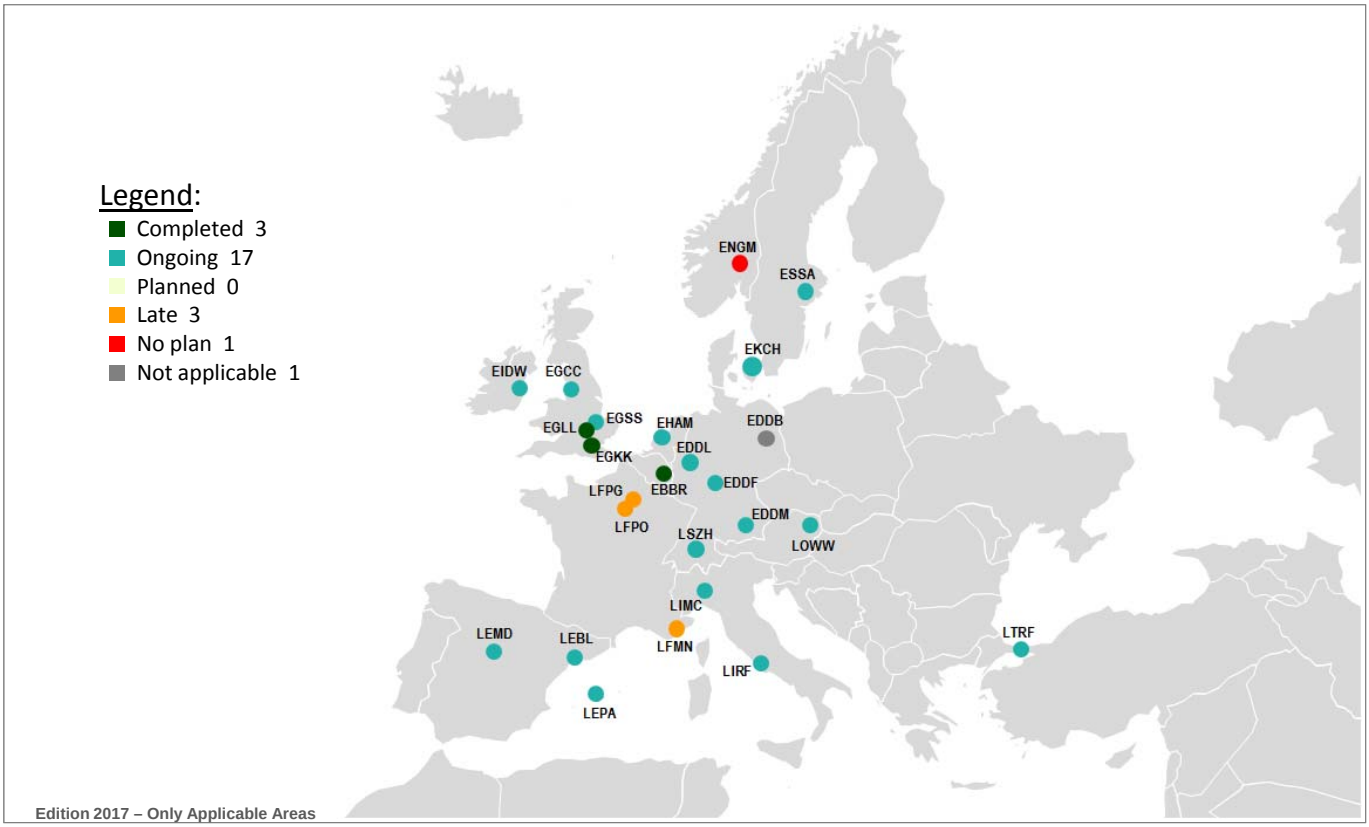
SESAR Solutions:	Solution #02 Airport Safety NETS
SESAR Key Features:	High Performing Airports
PCP Sub-Functionality:	S-AF2.1 DMAN synchronised with pre-departure sequencing S-AF2.5 Airport Safety Nets
ICAO ASBU:	B1-SURF
OI Steps:	AO-0104-A
Network Strategy Plan:	SO6/6

Completion Rate Evolution (% of Airports completed the objective)



Main 2017 developments:

One (1) additional airport has completed this implementation objective in 2017. This is London Heathrow airport (EGLL). In addition, two (2) airports have started the implementation in 2017, Copenhagen airport (EGCH) and new Istanbul airport (LTRF). Dublin airport (EIDW) is very close to completion at 94% of implementation. On the negative side, in 2017, three (3) airports have reported the planned delays in implementation of this functionality. These are French airports Nice, Paris Charles de Gaulle and Orly (LFMN, LFPG and LFPO). This is due to introduction of new SYSAT system that is planned for 2022. Currently all PCP airports are reporting plans to implement this functionality except Oslo Gardermoen airport that still has not defined concrete plans for the implementation. As this poses some risks for timely implementation of this functionality, the overall status in the applicability area is assessed as planned delay, even though the delay is very small, approx. 6 months beyond the originally planned completion date.



AOP13

Automated assistance to controller for surface movement planning and routing

A reliable estimated achievement date can not be defined at this time.

Stakeholders:
- ANSPs
- Regulators

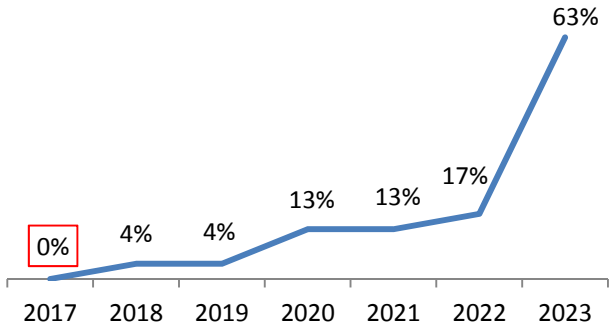
FOC: 12/2023

Estimated achievement: Not available

Applicability Area:
25 PCP airports

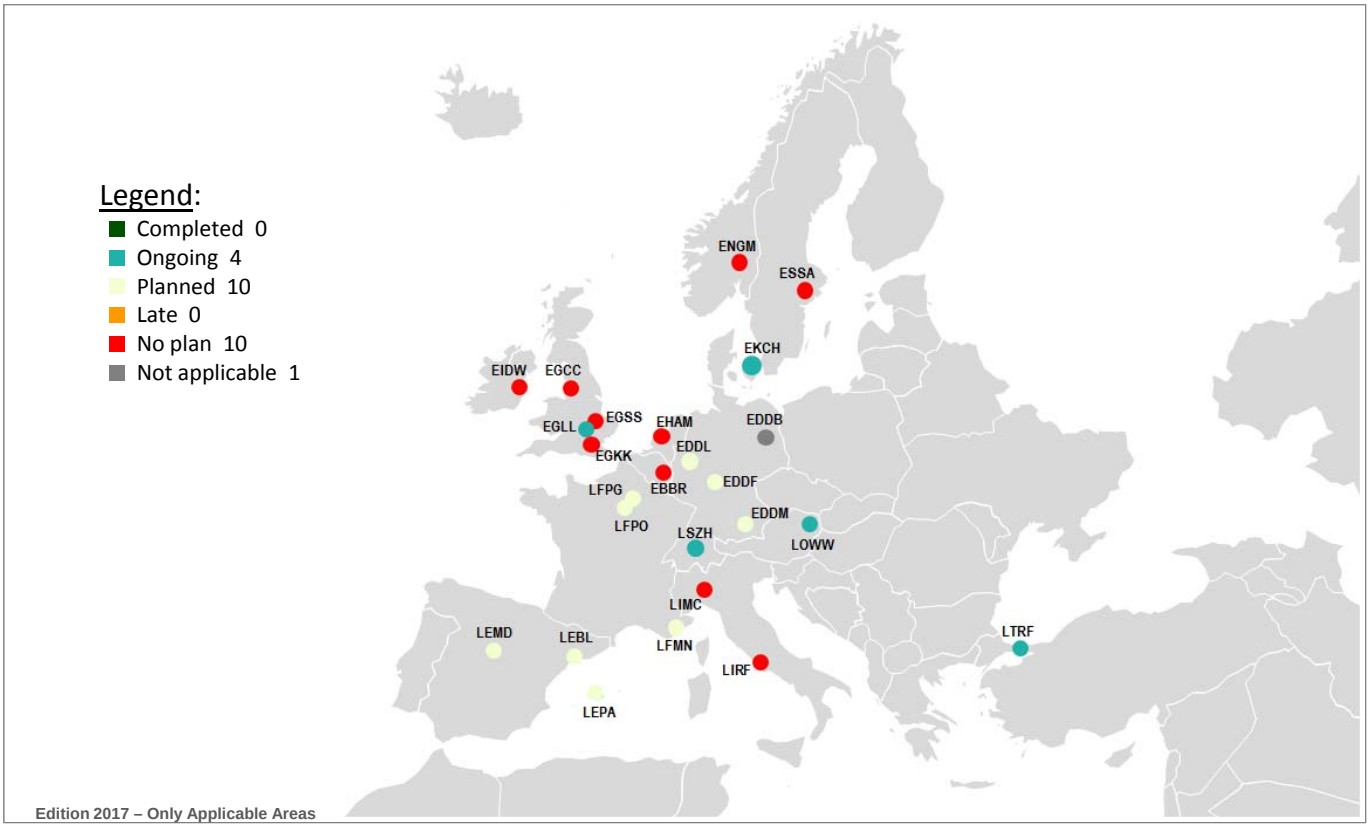
SESAR Solutions:	Solution #22 Automated Assistance to Controller for Surface Movement Planning and Routing
SESAR Key Features:	High Performing Airports
PCP Sub-Functionality:	S-AF2.4 Automated assistance to controller for surface movement planning and routing
ICAO ASBU:	B1-RSEQ, B2-SURF, B1-ACDM
OI Steps:	AO-0205, AERODROME-ATC-18, AERODROME –ATC-44a
Network Strategy Plan:	SO6/6

Completion Rate Evolution (% of Airports completed the objective)



Main 2017 developments:

After two years of monitoring this implementation objective, there is still no reliable estimation whether airports will achieve it on time. Almost 40% of the airports have not yet defined any concrete implementation plans. Another 40% (10 airports) have defined the plans, but did not start the implementation yet. Remaining 20% of the airports (5 airports) have started the implementation. Most of them are currently at a very initial stages of the implementation, below 10% of progress. The most advanced in implementation seems to be the new Istanbul Airport (LTFM), that is being built, with over 10% of the implementation progress. According to reported information, new Istanbul airport will be the first airport that will operate this functionality already at the end of 2018.



AOP14 Remote Tower Services [Local]

First year of monitoring.

Stakeholders:
- ANSPs
- Regulators
- Airport Operators

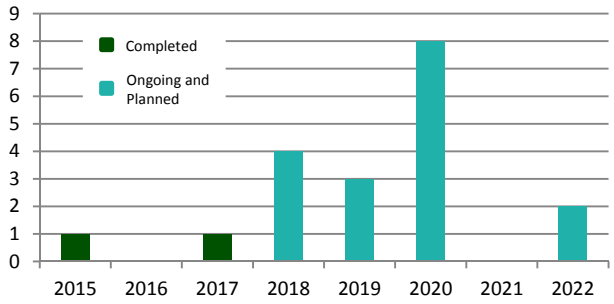
FOC: **Not available**

Estimated achievement: **Not available**

Applicability Area:
Low to medium complexity aerodromes, subject to local needs

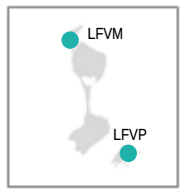
SESAR Solutions:	Solutions #12 & #71(one aerodrome) and #52 (two aerodromes)
SESAR Key Features:	Advanced Air Traffic Services
EOC/OC:	Remote Tower
ICAO ASBU:	B1-RATS
OI Steps:	SDM-0201, SDM-0205
Network Strategy Plan:	-

Implementation progress (number of airports completed the objective)

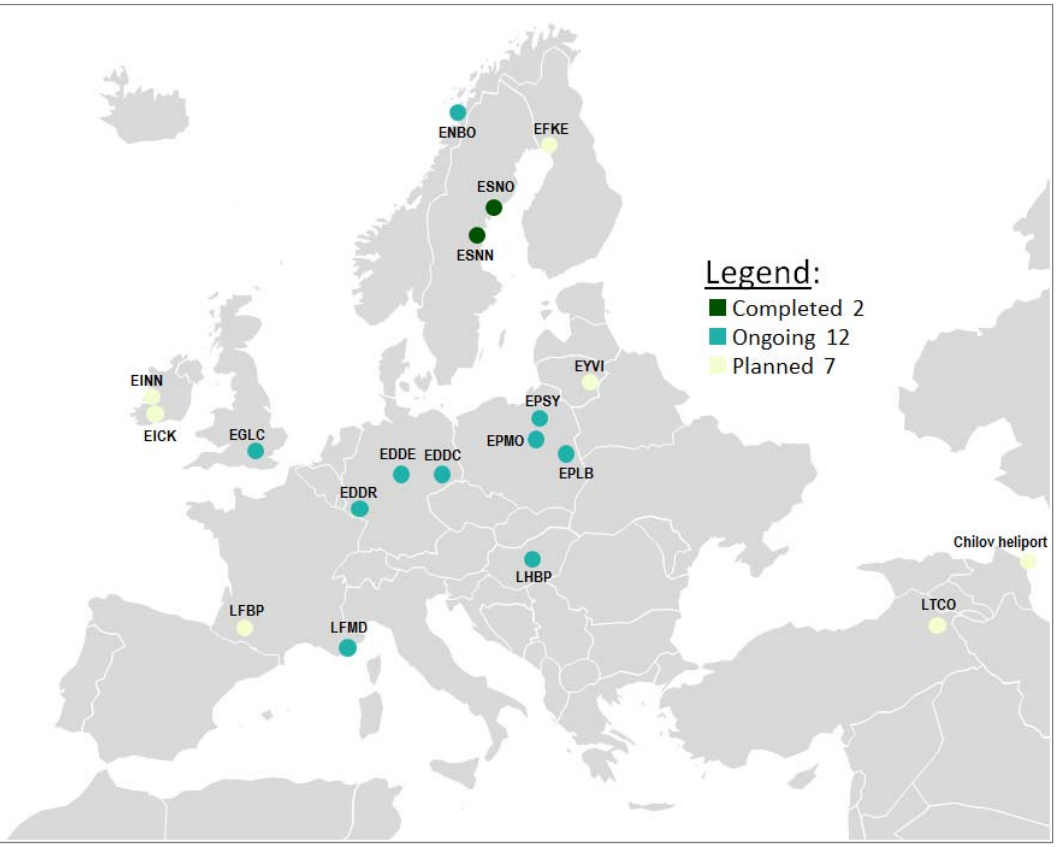


Main 2017 developments:

In the first year of monitoring for this local Objective twelve (12) States reported their implementation plans. One State (SE) reported full implementation of remote ATS centre providing ATS and MET services to two airports. Six (6) States (DE, FR, HU, NO, PL, UK) reported this Objective as 'on-going' with the implementation percentage between 10 and 70%. These States described different implementation scenarios: from one remote tower facility providing services for one airport, to more advanced centres providing services to several airports simultaneously. In total ATS services from remote towers are being implemented for 14 airports in Europe. Moreover, Avinor (NO) is also implementing AFIS service provision from remote tower centre for 12 airports. Remote Contingency Tower has been reported by one State (HU). Five (5) States (AZ, FI, IE, LT, TR) reported this Objective as 'planned' for 9 European airports. 29 States reported this Objective as Not Planned or Not Applicable at this moment.



Saint Pierre and Miquelon (France)



ENV02 Airport Collaborative Environmental Management

Stakeholders:
- ANSPs
- Airspace Users
- Airport Operators
- EUROCONTROL

FOC: 12/2016

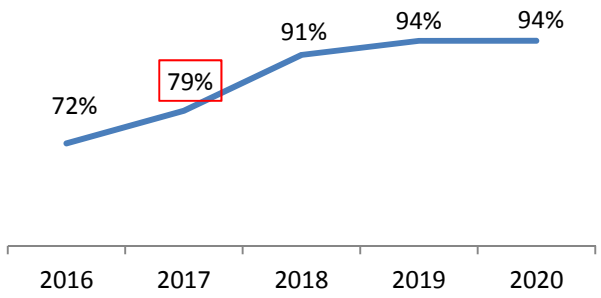
Estimated achievement: 03/2018

Late

Applicability Area:
47 airports

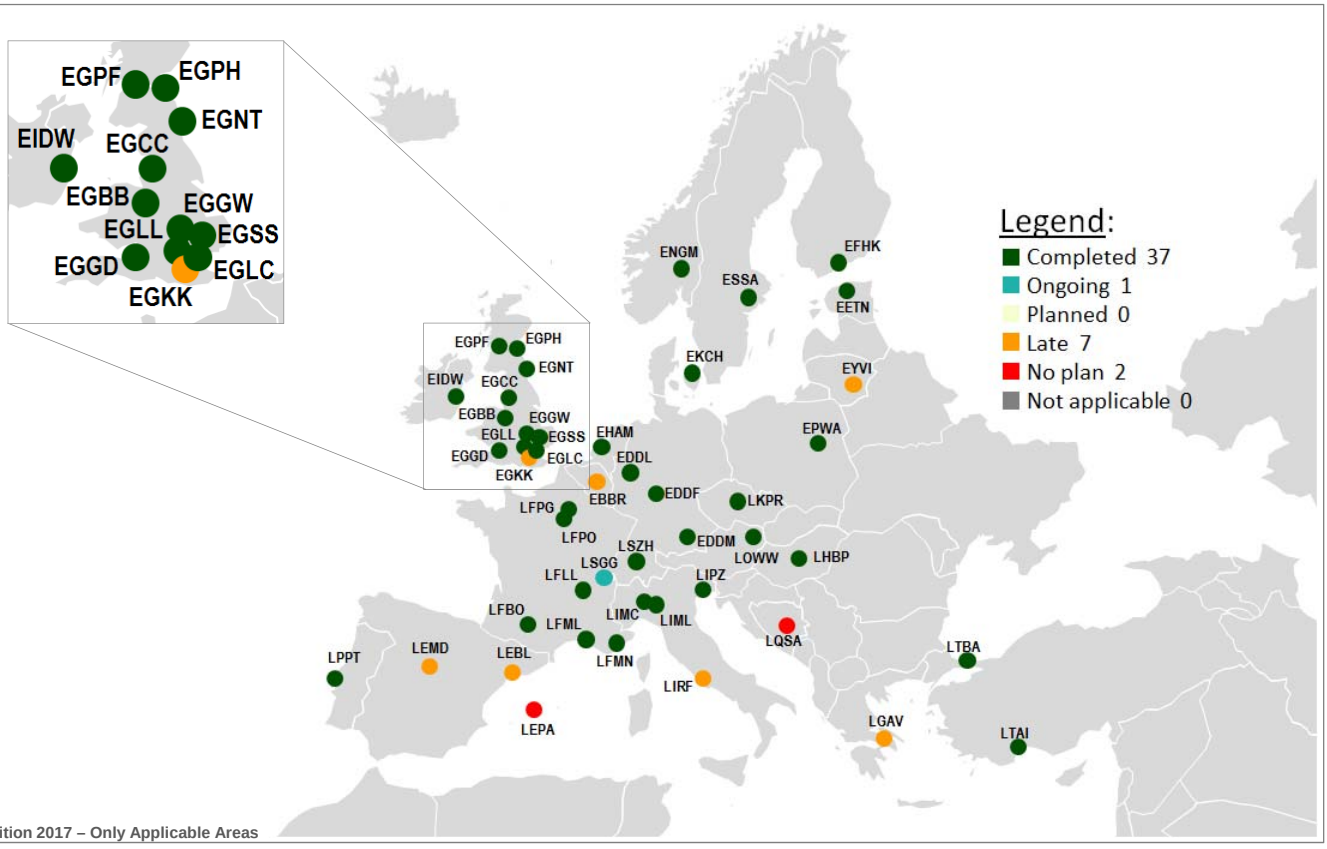
SESAR Solutions:	-
SESAR Key Features:	High Performing Airports
EOC/OC:	-
ICAO ASBU:	No corresponding ASBU
OI Steps:	AO-0703, AO-0705, AO-0706
Network Strategy Plan:	-

Completion Rate Evolution (% of Airports completed the objective)



Main 2017 developments:

Implementation progress is roughly at the same level as in 2016, e.g. very slow. Only one (1) additional airport (EETN - Tallinn) completed this Objective in 2017. The issues that caused delays in implementation seem to be related to the establishment of Partnership Agreements among Stakeholders as well as Airport Policies and Procedures still to be developed related to pollution mitigation. The majority of airports plan the implementation of this Objective by the end of 2018. Two (2) airports, namely Sarajevo and Palma de Mallorca reported having “No Plan” yet (although they are ”late”) for the implementation of this Objective. One (1) airport has incorrectly reported an “ongoing” status instead of “late” (LSGG - Geneva) with an implementation planned by December 2022, thus 6 years later than foreseen.



SAF11 Prevent Runway Excursions

Stakeholders:
- ANSPs
- Airspace Users
- Airport Operator
- Network Manager
- Regulators

FOC: 02/2018

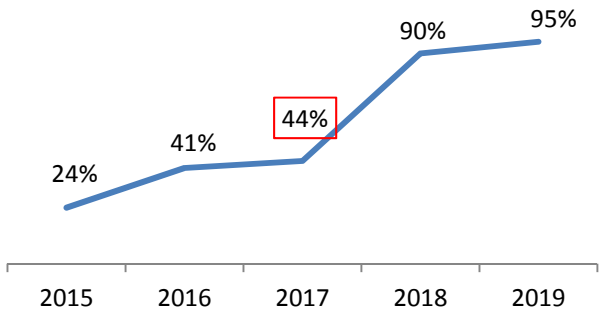
Estimated achievement: 12/2018

Planned delay

Applicability Area:
All ECAC States, except MT

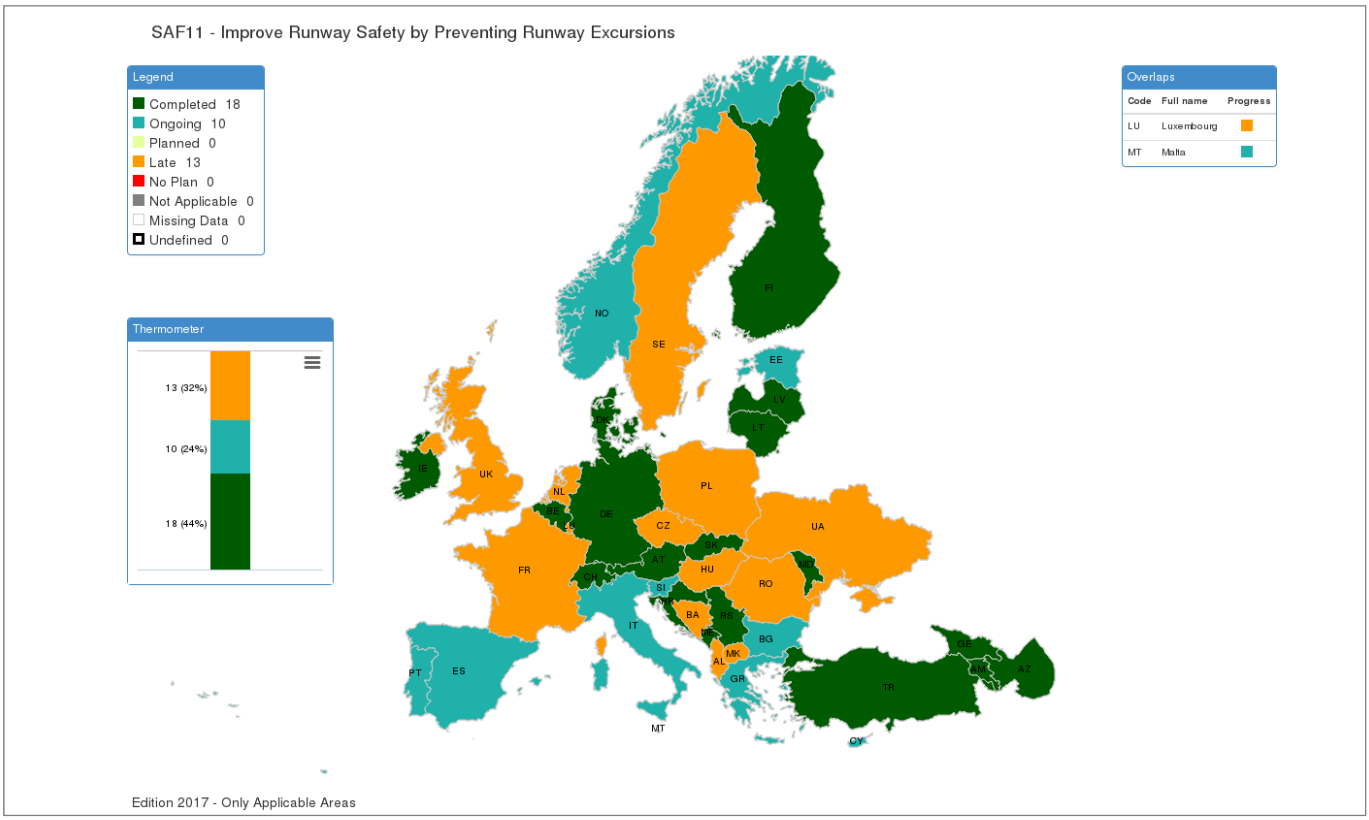
SESAR Solutions:	-
SESAR Key Features:	High Performing Airports
EOC/OC:	-
ICAO ASBU:	No corresponding ASBU
OI Steps:	PRO-006a
Network Strategy Plan:	-

Completion Rate Evolution (% of States completed the objective)



Main 2017 developments:

Little progress has been made in deploying this objective during 2017, with only one additional State (Moldova) having completed this objective, bringing to the total achieved to 18 States (44%).
While the FOC date is set to 02/2018, the implementation is ongoing in 10 other States and expected to be completed on-time, while 13 States will be late. (Note: due to the unusual FOC date set at the start of the year (31/01/2018), some States have planned their implementation by the end of the same year).
However the overall ECAC implementation for this Objective is expected to be achieved by the end of 2018, hence the delay will be limited to less than 1 year.



COM10 Migrate from AFTN to AMHS

Stakeholders:
- ANSPs
- Industry
- EUROCONTROL

FOC: 12/2018

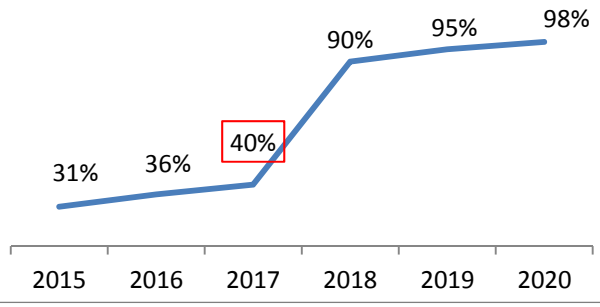
Estimated achievement: 12/2018

On time

Applicability Area:
All ECAC States

SESAR Solutions:	-
SESAR Key Features:	Enabling Aviation Infrastructure
EOC/OC:	Predecessor of 'CNS Rationalisation' (EOC)
ICAO ASBU:	No corresponding ASBU
OI Steps:	CTE-C06c
Network Strategy Plan:	-

Completion Rate Evolution (% of States completed the objective)



Main 2017 developments:

All States have approved plans for implementation of this objective, which is progressing at modest rate: in 2017, two more States (Cyprus and Moldova) have fully completed the objective and three (Hungary, Czech Republic and Serbia) have implemented AMHS capability. By the other hand, Italy, The Netherlands and FYROM have changed their progress from Ongoing to late. At functionality level, there is a good progress on implementation of the AMHS Level 1 (ASP01), which is the core of the objective, where 88% of the States have completed the respective actions (see map). The implementation of the AMHS Level 2 is proving to be more difficult, observing only 45% of completion. Nevertheless, it is expected that the implementation of the objective will be achieved by the FOC date, which was extended in order to take into account the current developments on the security aspects for Extended AMHS as well as on Directory Services.

COM10-ASP01-Implement AMHS capability (Basic ATSMHS) and gateway facilities to AFTN

Edition 2017 - Only Applicable Areas - Main ANSPs Only

Note: the map shows the implementation status of a significant SLoA (ASP01) and not of the entire Objective

COM11 Voice over Internet Protocol (VoIP)

Stakeholders:
- ANSPs

FOC: 12/2020

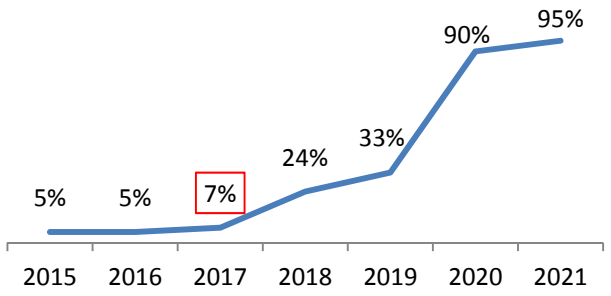
Estimated achievement: 12/2020

On time

Applicability Area:
All ECAC States

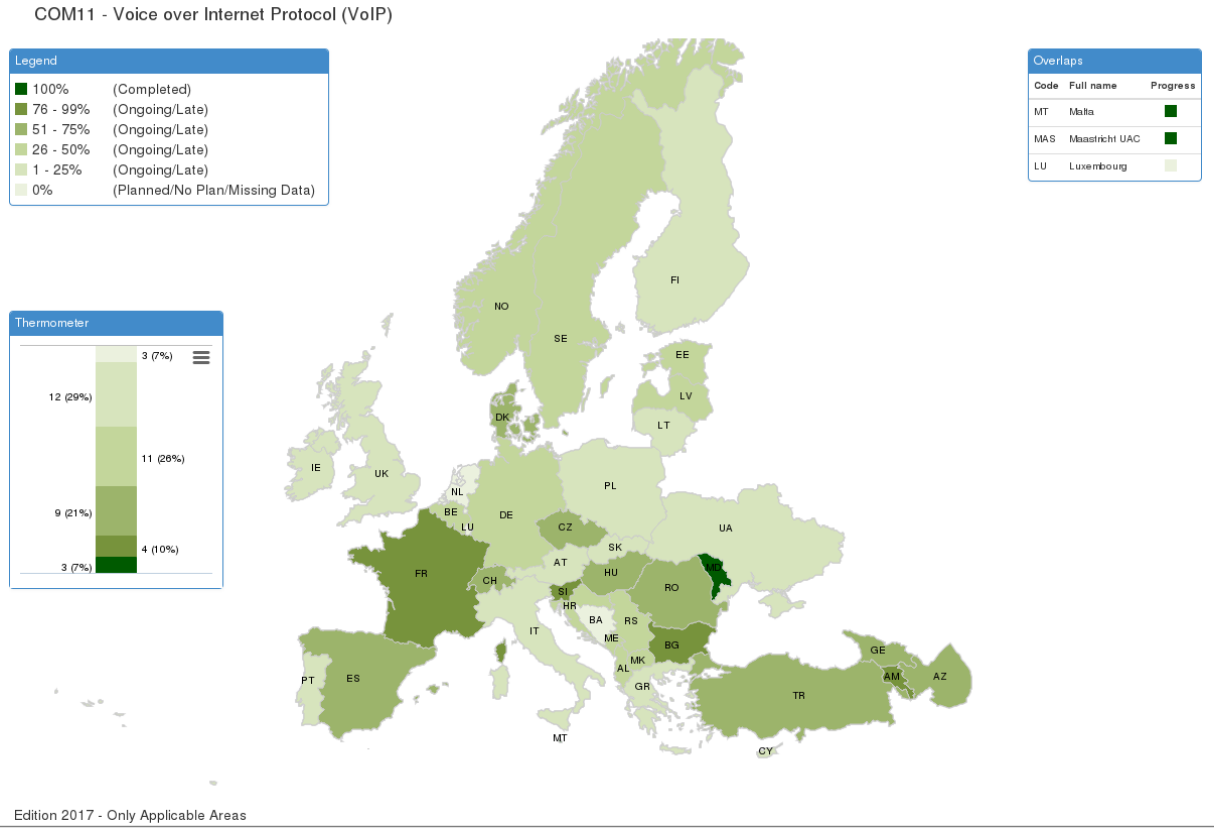
SESAR Solutions:	-
SESAR Key Features:	Enabling Aviation Infrastructure
EOC/OC:	-
ICAO ASBU:	No corresponding ASBU
OI Steps:	CTE-C05a, CTE-C05b
Network Strategy Plan:	SO8/4

Completion Rate Evolution (% of States completed the objective)



Main 2017 developments:

Implementation progress is slow, with very small improvements every year. During the year of 2017, no State has implemented the objective. Moreover, whereas last year only one State was declared as late, this year three additional States have declared this status. Five States (plus MUAC) have completed the Upgrade and put into service Voice Communication Systems to support VoIP inter-centre telephony. Nevertheless for different States, the operation is still subject to the capabilities of the adjacent ACC centers.
Overall, the implementation of this objective is on time, remaining within the FOC date, although the progress made in the last couple of years has been slow.



COM12 NewPENS

First year of monitoring.

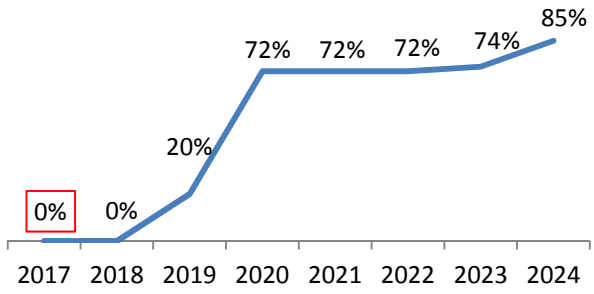
Stakeholders:
- ANSPs
- Airport Operators
- Airspace Users
- Network Manager

33 ANSPs :	**31/12/2020**
Other stakeholders :	**31/12/2024**
Estimated achievement: 12/2024	**On time**

Applicability Area:
-Area1(signatories ANSPs): 33 ANSPs
-Area2: Stakeholders from all ECAC States not part of Area1

SESAR Solutions:	-
SESAR Key Features:	Enabling Aviation Infrastructure
EOC/OC:	Enabler for AF5 Initial System Wide Information Management (SWIM)
ICAO ASBU:	B1-SWIM
OI Steps:	CTE-C06b
Network Strategy Plan:	SO2/3, SO2/4, SO8/3, SO8/4

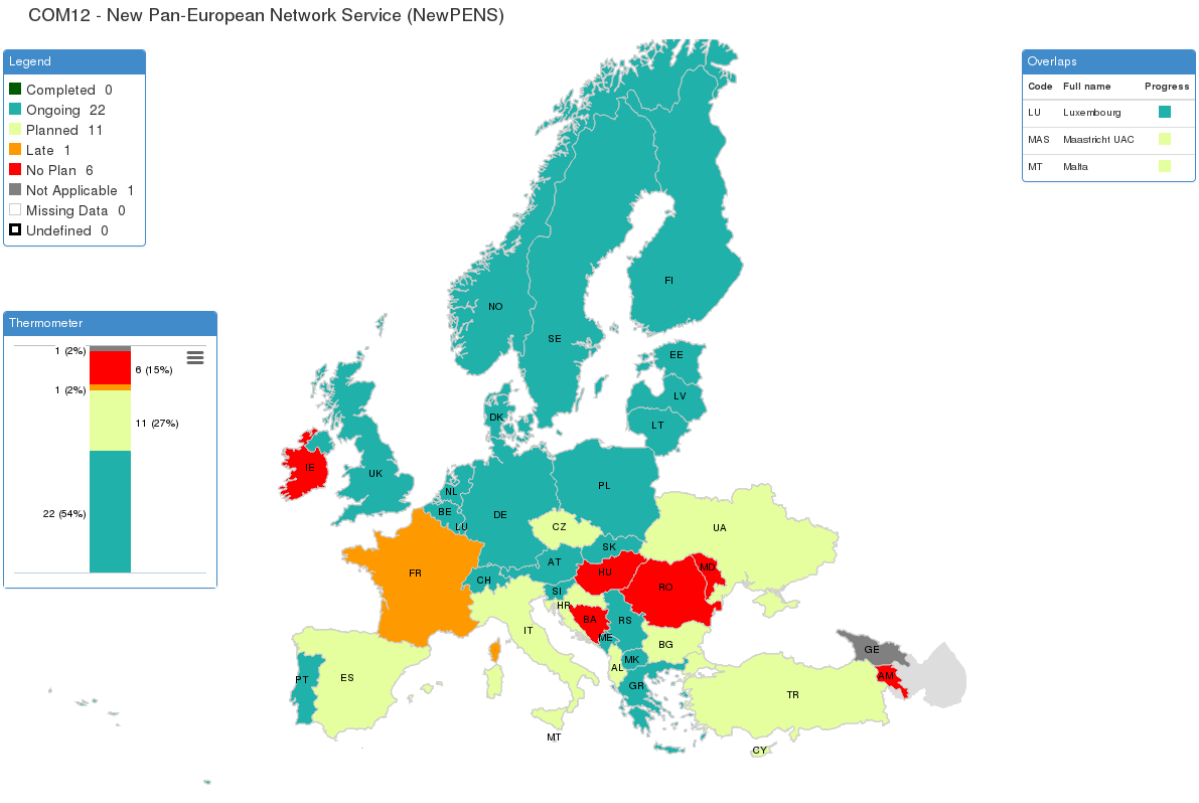
Completion Rate Evolution (% of States completed the objective)



Main 2017 developments:

The year of 2017 was the first one when the monitoring of Objective COM12 was performed. To be noted that 33 ANSPs have signed a NewPENS Common Procurement Agreement with EUROCONTROL and thus their implementation date is expected to be the same. – this group of ANSPs corresponds to Applicability Area 1 For those ANSPs, the FOC date is end of 2020, whereas for other States and for other stakeholders not included in applicability area 1, the FOC date is end of 2024.

Looking into the information reported, from the States where their ANSP is not part of the common procurement, only Moldova has not yet reported plans to implement NewPens.



FCM08 Extended Flight Plan

A reliable estimated achievement date can not be defined at this time.

Stakeholders:
- ANSPs
- Network Manager
- Airspace Users

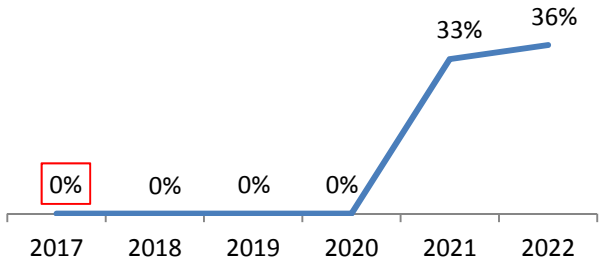
FOC: 12/2021

Estimated achievement: Not available

Applicability Area:
All ECAC States

SESAR Solutions:	Solution #37 Extended Flight Plan
SESAR Key Features:	Enabling Aviation Infrastructure
PCP Sub-Functionality:	S-AF4.2 Collaborative NOP S-AF4.4 Automated Support for Traffic Complexity Assessment
ICAO ASBU:	B1-FICE
OI Steps:	AUO-0203
Network Strategy Plan:	SO5/1, SO5/6

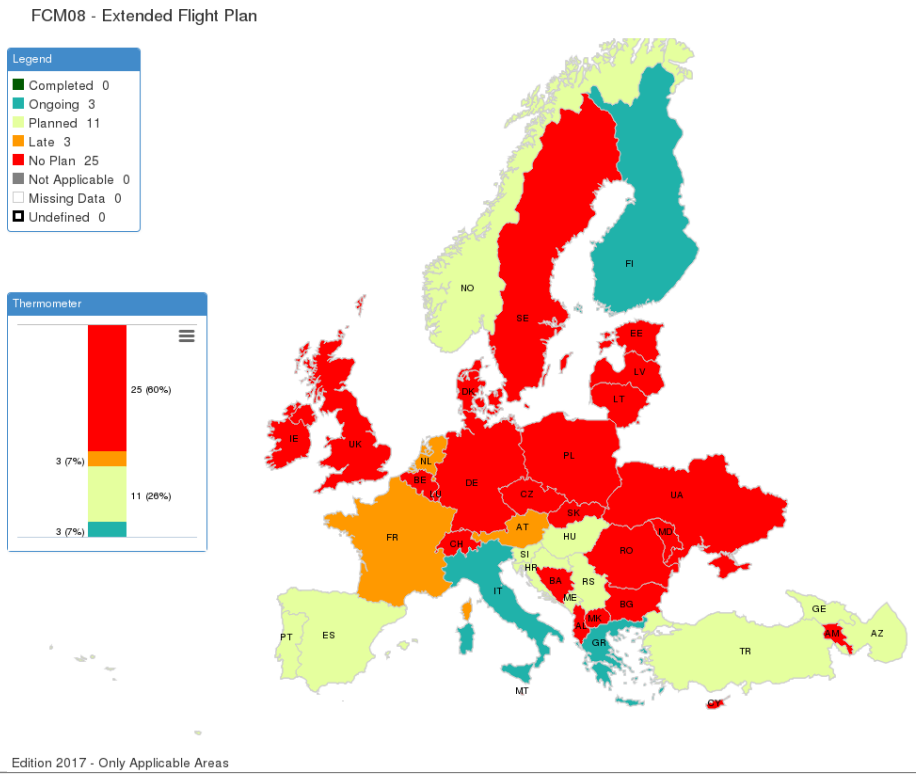
Completion Rate Evolution (% of States completed the objective)



Main 2017 developments:

This is an objective introduced in Level 3 in 2016, therefore being the second year of reporting it is premature to establish conclusive implementation trends. Most of the States (25) have not yet established any concrete implementation plans, while those having reported Plans (11 States) are in very initial planning stages. 3 States already estimate that they are going to be late. However many States explain the lack of plans by the fact that the requirements seems not to be mature enough and that clear specifications are still missing. The ICAO FF-ICE (Flight and Flow Information for a Collaborative Environment) concept might impact the deployment of this objective as this approach would require standardised interfaces expected by 2020 (drafts are already available). If these provisions will not be available as expected, there is a potential risk for delay in the implementation of the Objective.

NM deployed the EFPL exchanges using B2B interface with some Airspace Users on trial basis; the extension of deployments with other Operational Stakeholders will depend on their readiness to receive EFPL via B2B.



INF07 Electronic Terrain and Obstacle Data (e-TOD)

Stakeholders:
- ANSPs
- Airport Operators
- Regulators

FOC: 05/2018

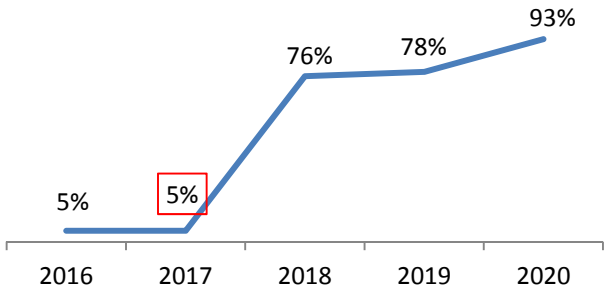
Estimated achievement: 11/2020

Planned delay

Applicability Area:
All ECAC States except Maastricht UAC

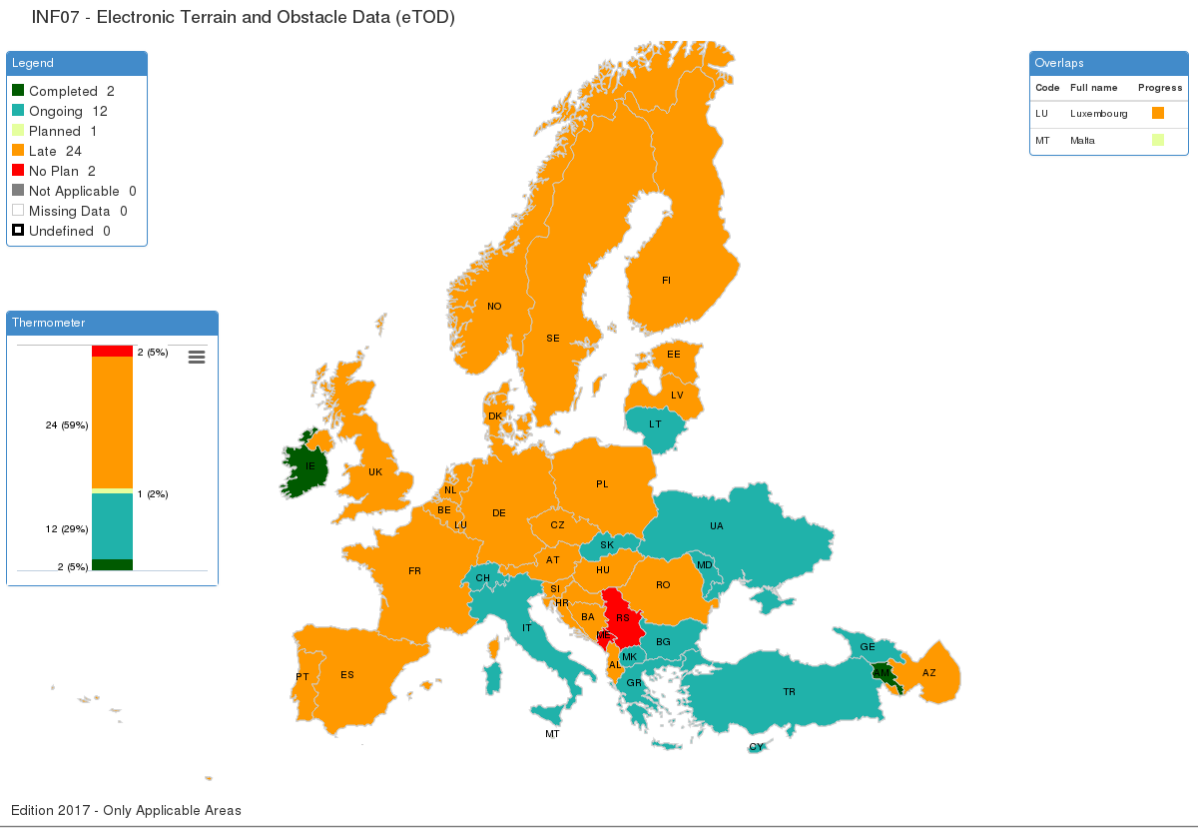
SESAR Solutions:	-
SESAR Key Features:	Enabling Aviation Infrastructure
EOC/OC:	Information reference and exchange models
ICAO ASBU:	No corresponding ASBU
OI Steps:	AIMS-16
Network Strategy Plan:	SO2/5

Completion Rate Evolution (% of States completed the objective)



Main 2017 developments:

No progress in terms of the number of States completing this objective, only 2 such as in previous cycle – Ireland and Armenia. There was a significant increase in the amount of States that declared being "late", a total of 24 States, 14 more than last year. The number of "No Plan" decreased from 5 to 2 States. REG 01 entails a very important activity -"Establish National TOD Policy"- because other REG, ASP and APO SLoAs depend on its availability to further progress and conclude their implementation activities. Nevertheless, only (18) States have completed that activity and (20) are Late, the action was due for November 2015. For ASP01 and APO01 the situation is equally bad as they are dependent on the completion of REG 01. The deadline for implementation is approaching, States may consider to address the "Support to States" of EUROCONTROL for possible support on the implementation of REG01.



ITY-ACID Aircraft identification

Stakeholders:
- ANSPs
- Airspace Users

FOC: 01/2020

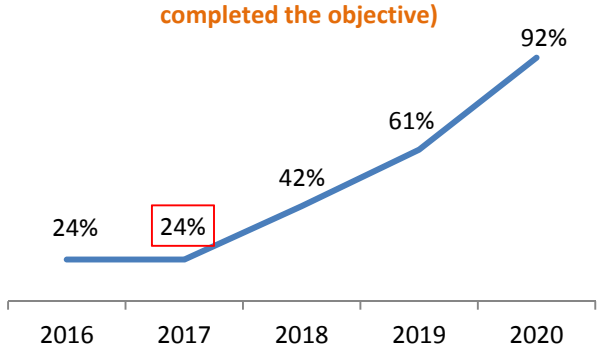
Estimated achievement: 01/2020

On time

Applicability Area:
All EU+ States

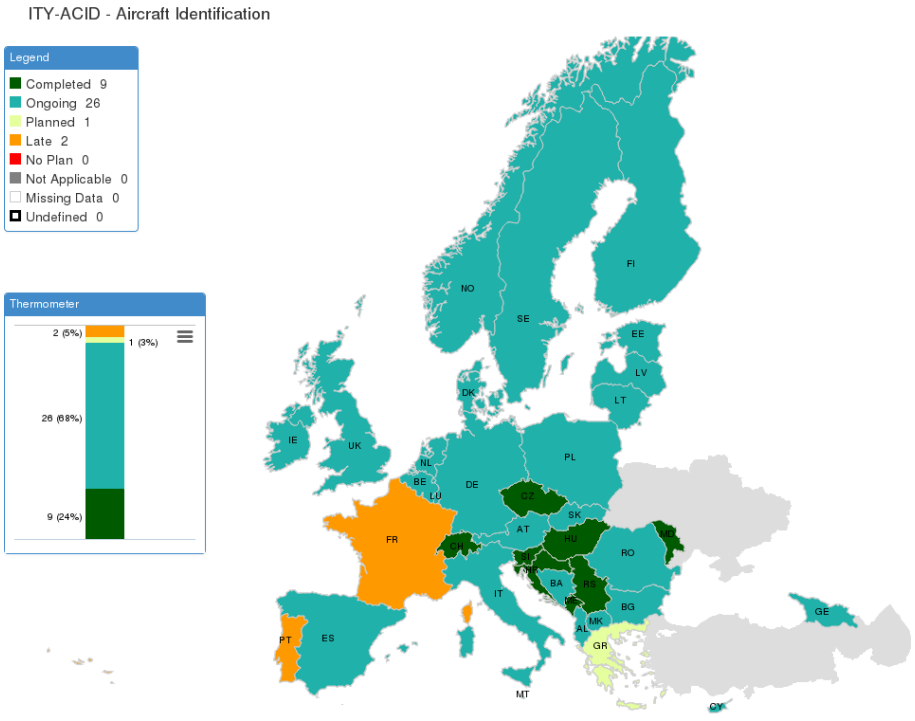
SESAR Solutions:	-
SESAR Key Features:	Enabling Aviation Infrastructure
EOC/OC:	Predecessor of 'CNS Rationalisation' (EOC)
ICAO ASBU:	No corresponding ASBU
OI Steps:	GSURV-0101
Network Strategy Plan:	SO8/2

Completion Rate Evolution (% of States completed the objective)



Main 2017 developments:

The progress in the deployment of appropriate infrastructure is constant. The appropriate surveillance coverage is provided in the en-route airspace all over Europe. There are still gaps at low levels/altitudes but implementations plans are reported so these gaps are expected to be filled before the FOC date. The stakeholders are reminded that in order to claim completion with the objective, the airspace where downlinked aircraft identification is used shall be declared as such to the NM in order to provide network benefits through the use of the conspicuity code. As these network benefits will be maximised when the downlinked aircraft identification will be used in an as large as possible contiguous area, it is encouraging to note that many States which are outside the applicability area have reported implementation plans or even completion, providing the objective with a significant pan-European coverage. Only two (2) military stakeholders (IT and FR) expect delays in implementation, but this delay is allowed by the Regulation, provided that the appropriate steps will be taken as required by Article 11 of Regulation 1206/2011.



ITY-ADQ

Ensure Quality of Aeronautical Data and Aeronautical Information

Stakeholders:
- ANSPs
- Airport Operators
- Regulators
- Industry

FOC: 06/2017

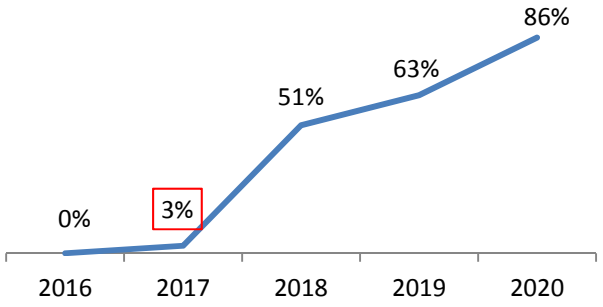
Estimated achievement: 12/2020

Late

Applicability Area:
All EU+ States except GE, FYROM and Maastricht UAC

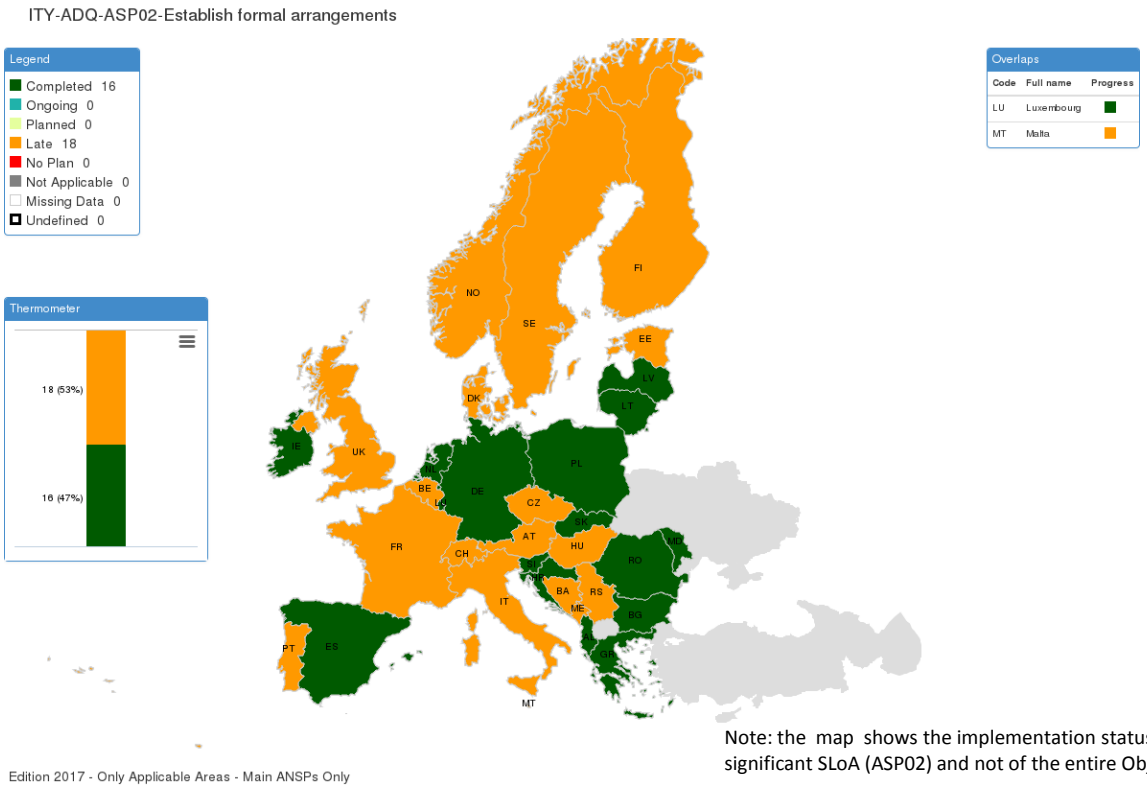
SESAR Solutions:	-
SESAR Key Features:	Enabling Aviation Infrastructure
EOC/OC:	Prerequisite for: - S-AF1.2 – Enhanced Terminal Airspace using RNP-based Operations - AF5 - Initial SWIM
ICAO ASBU:	B0-DATM
OI Steps:	IS-0202, IS-0204
Network Strategy Plan:	SO2/5

Completion Rate Evolution (% of States completed the objective)



Main 2017 developments:

The FOC(06/2017) date was reached and at State level there is only one declared completion – Moldova. This poor progress was expected taking into account the high number of States that declared being Late in the last cycle. Some SLoAs that are on the critical path for ADQ implementation, such as Formal Arrangements (ASP02), did show some good progress with 16 ANSP declaring "Completed" (see map). It needs to be recognised that a lot of individual progress has been made by many stakeholders, mostly ANSP, nevertheless overall compliance is disappointing. This is notably due to strong dependencies on a wide range of data originators, challenging requirements, tool adaptions or procurement or a lack of resources. States are strongly urged to recover existing delays since ADQ compliance will provide an optimum baseline for later certification in accordance with the upcoming EASA rule Part-AIS. Note: EASA Opinion 02/2018 has been published on 8/3/2018 and the OJEU publication of Part-AIS is envisaged for the first half of 2019.



Note: the map shows the implementation status of a significant SLoA (ASP02) and not of the entire Objective

ITY-AGDL Initial ATC Air-Ground Data Link Services

Stakeholders:
- ANSPs
- Airspace Users
- Regulators
- Military

ATS unit ops. capability: 02/2018
Aircraft capability: 02/2020

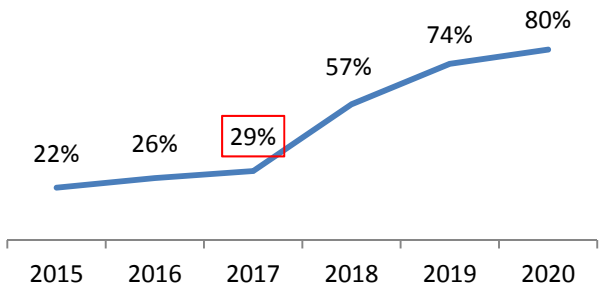
Estimated achievement: 12/2020

Planned delay

Applicability Area:
All EU+ States except GE, LU and NL

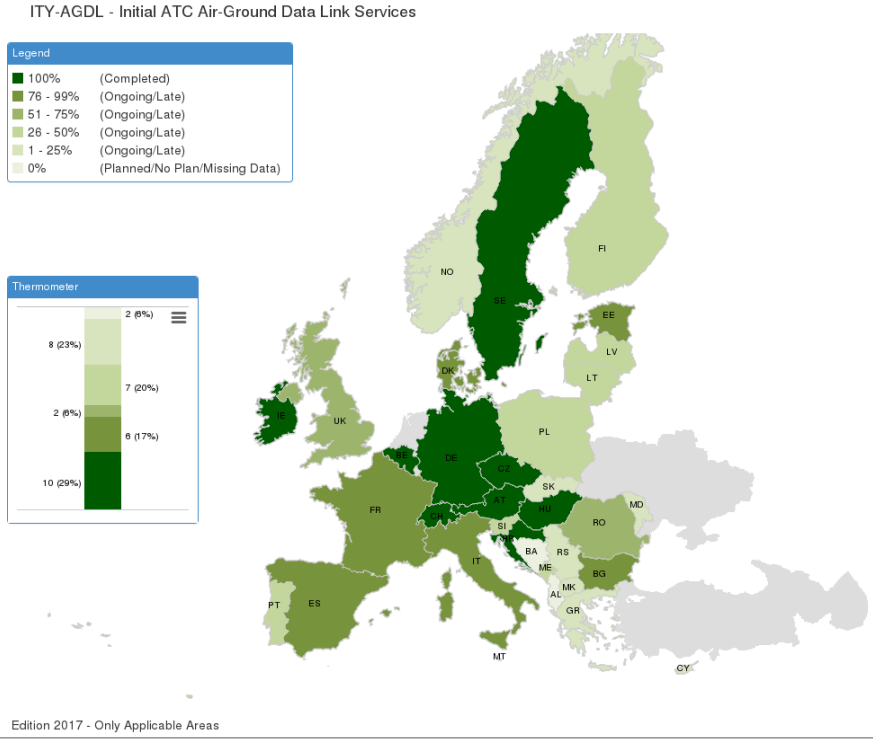
SESAR Solutions:	-
SESAR Key Features:	Enabling Aviation Infrastructure
PCP Sub-Functionality:	-A/G datalink -Pre-requisite for S-AF 6.1 Initial Trajectory Information Sharing (i4D) (PCP)
ICAO ASBU:	B0-TBO
OI Steps:	AUO-0301
Network Strategy Plan:	SO4/1, SO8/3

Completion Rate Evolution (% of States completed the objective)



Main 2017 developments:

In 2016, the SESAR Deployment Manager has been mandated by the EC to act as Data Link Services (DLS) Implementation Project Manager and on this basis it developed a DLS Recovery Plan aiming to set a realistic path from today's DLS implementation status in Europe. Only one (1) State (CZ) reported the completion of the objective in February 2017 instead of December 2016. Seven (7) States (BG, CY, GR, PL, RO, SI & UK) reported the status "Ongoing" with a projected implementation date by February 2018 and another five (5) States (IT, LV, LT, MT & MK) with a projected implementation date after February 2018, like for LT by December 2019. Eleven (11) States (DK, EE, FI, FR, MD, ME, NO, PT, RS, SK & ES) reported the status "Late" with a projected implementation date as late as December 2023 for ME and RS. The main reason for delay is the late procurement of New ATM systems capable to handle DLS functionalities and required VDL Infrastructure. According to the EUROCONTROL PRISME CNS business intelligence, at the end of 2017, almost 30% of the flights were equipped and ready to use CPDLC via ATN VDL2, as prescribed in the DLS Regulation.



ITY-AGVCS2 Implement AGVCS below FL195

Stakeholders:
- ANSPs
- Airspace Users
- Military
- Network Manager
- Regulators
- Airport Operators

Freq. converted: 12/2018

State Aircraft: 12/2020

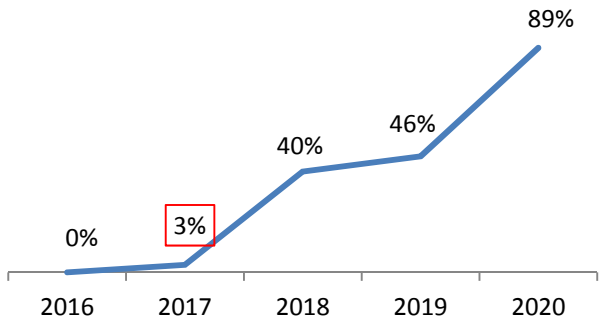
Estimated achievement: 12/2020

Planned delay

Applicability Area:
All EU+ States except Georgia and Moldova

SESAR Solutions:	-
SESAR Key Features:	Enabling Aviation Infrastructure
EOC/OC:	-
ICAO ASBU:	No corresponding ASBU
OI Steps:	CTE-C01a
Network Strategy Plan:	SO8/1

Completion Rate Evolution (% of States completed the objective)

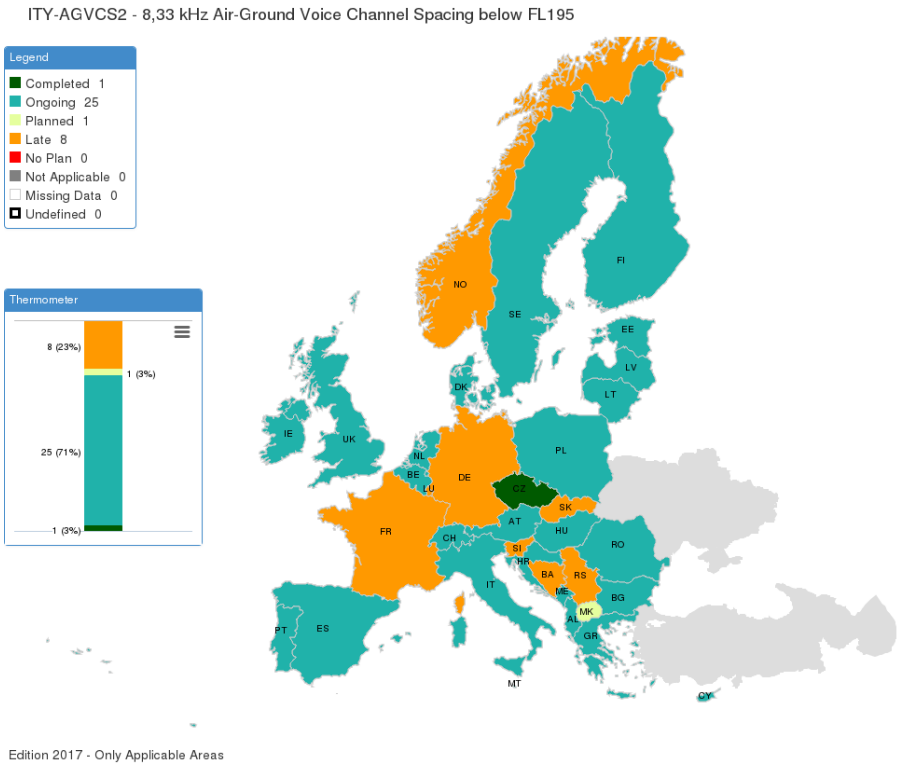


Main 2017 developments:

The objective is now in its crucial phase with one (1) year to convert all frequency assignments required by Reg. (EU) 1079/2012. The number of States formally reporting the objective late has increased from one (3) to eight (8) which is a cause for concern and the reason to assess the objective as 'Planned delay'.

The EC has tasked NM, through the 8.33 VCS ISG, to take a central role in the coordination of the implementation of 8.33kHz below FL195 and it is strongly recommended that all States including ECAA, actively participate in the group.

The equipment of GA is still a concern due to the high cost of equipage and certification as well as the time available for installation. The EC INEA through CEF has identified the 8.33 radio capability retro-fit as one of the priorities in 2017; consequently several States have applied for funding.



ITY-FMTP Common Flight Message Transfer Protocol

Stakeholders:
- ANSPs
- Military

FOC: 12/2014

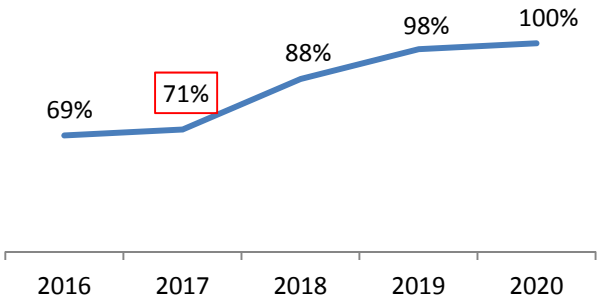
Estimated achievement: 12/2018

Late

Applicability Area:
All ECAC States

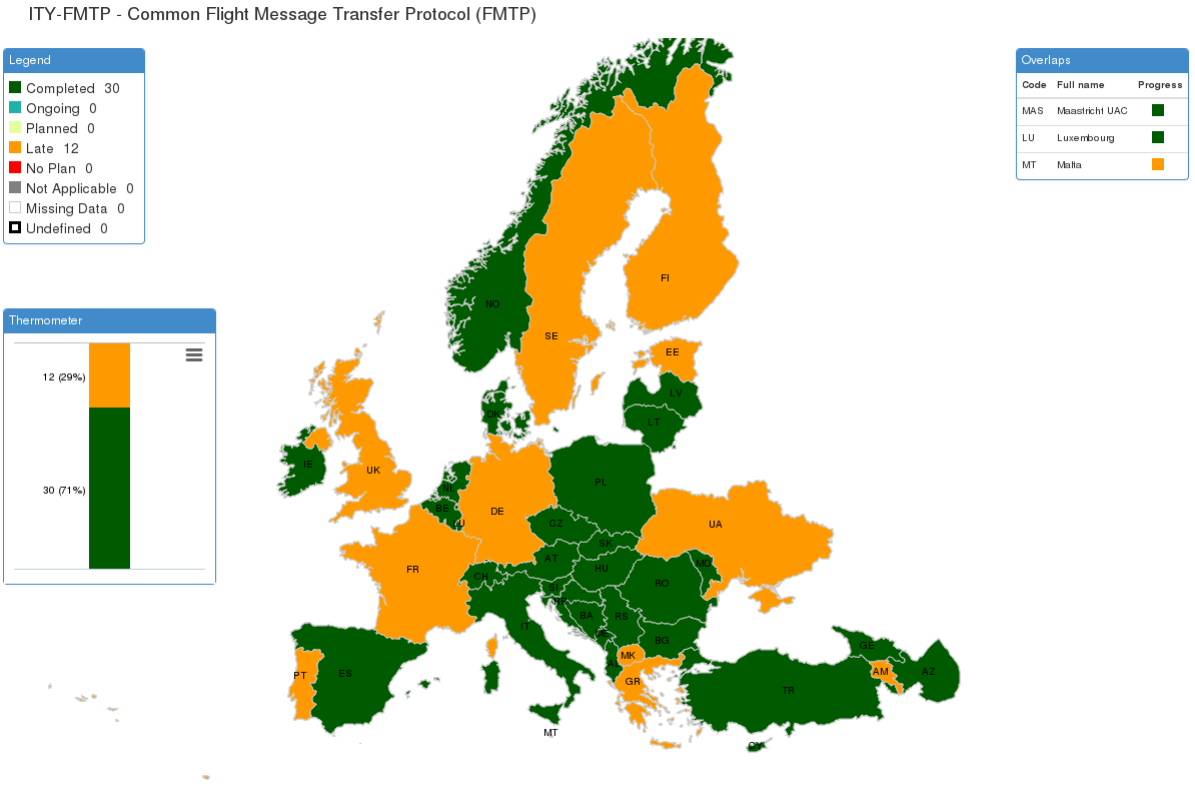
SESAR Solutions:	-
SESAR Key Features:	Enabling Aviation Infrastructure
PCP Sub-Functionality:	-IP Network -Pre-requisite for SWIM-related operational changes and PCP AF5 (Initial SWIM)
ICAO ASBU:	B0-FICE
OI Steps:	CTE-C06
Network Strategy Plan:	SO8/3

Completion Rate Evolution (% of States completed the objective)



Main 2017 developments:

Implementation is late, with four (4) years of delay. Only DK completed the objective in June 2017. Twelve (12) States (AM, EE, FI, FR, DE, GR, MT, PT, SE, MK, UA & UK) reported the Objective "Late" with the latest projected implementation date foreseen by UK for December 2020, thus with a delay of 6 years. The main problems for delay are slow migration from IPv4 to IPv6 (for MK, EE & PT), foreseen implementation during next major system upgrades (for UA) and especially the ability of neighbouring ACC's to support FMTP (example: DE-FR-UK, depending on FR system upgrades planned by end 2018 and PENS availability, or FI-SE depending on FI system upgrades planned by March 2018). Delay also occurred due to budget restrictions and introduction of new ATM Systems (example: GR-MK-MT, budget restrictions for GR, MT awaiting GR implementation and MK procuring a new ATM System with IPv6 for April 2019).



ITY-SPI Surveillance Performance and Interoperability

Stakeholders:
- ANSPs
- Airspace Users
- Military
- Regulators

FOC: 06/2020

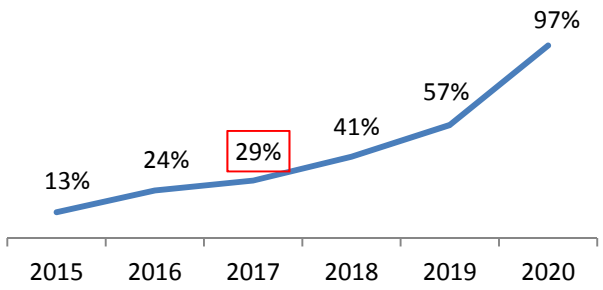
Estimated achievement: 06/2020

Risk of delay

Applicability Area:
All EU+ States

SESAR Solutions:	-
SESAR Key Features:	Enabling Aviation Infrastructure
EOC/OC:	Predecessor of 'CNS Rationalisation' (EOC)
ICAO ASBU:	B0-ASUR
OI Steps:	GSURV-0101
Network Strategy Plan:	SO8/3, SO8/4

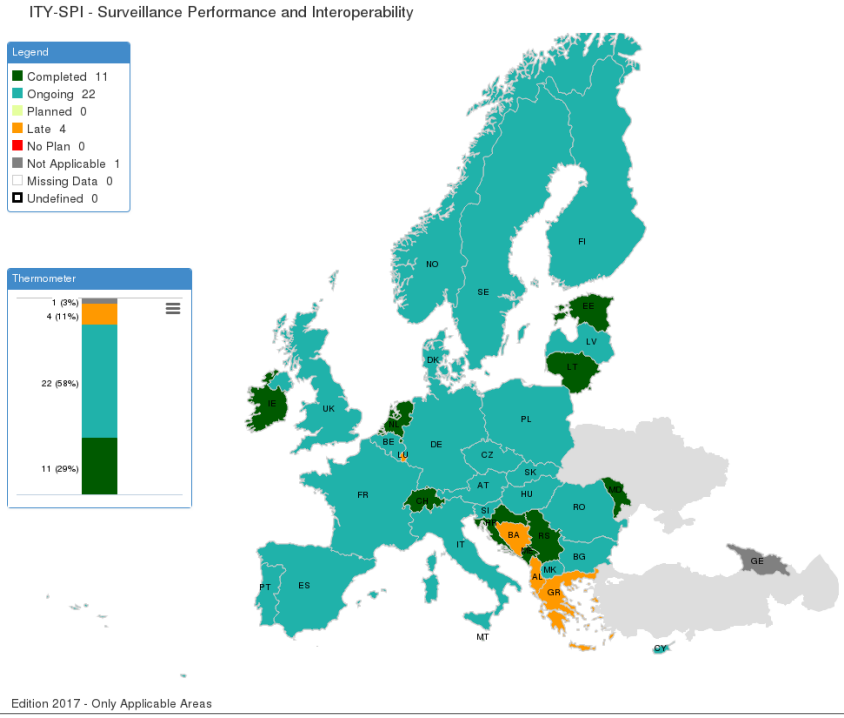
Completion Rate Evolution (% of States completed the objective)



Main 2017 developments:

Within the applicability area, the overall implementation progress is good. However, it is observed that there are EU States (GR, LU) which have missed the 2015 implementation milestones and are currently late. Based on the reported plans, it is expected that they will catch up with this delay in 2018. There is also good visibility from the Military stakeholders with regard the equipage plans of their fleets. It should be noted that the level of implementation of the objective does not provide a full picture with regard the level of implementation of the Regulation (EU) No 1207/2011, as amended, and multiple sources of information, in particular at State level, should be corroborated in order to obtain a complete picture of the implementation. It is also encouraging to observe that voluntary implementation is taking place outside the Applicability Area (EU+) making it a truly pan-European implementation.

Regarding the airspace users capabilities, the current information indicates that in the core area of Europe (Paris area) more than 80% of the flights are compliant with the ITY-SPI requirements for Mode S ELS and about 15% of the flights are compliant with the ITY-SPI requirements for ADS-B v2.



4 ANNEXES

Annex A

Relevant mappings of the Level 3

Table 7: Mapping of the L3 to Major ATM Changes, SESAR Key Features, SESAR 1 Solutions, DP2017 families and ICAO ASBUs

Key Features	Level 3 Implementation Objectives	Major ATM changes	SESAR Solutions	DP family	ICAO ASBUs
	AOM13.1 - Harmonise OAT and GAT handling	Free Route & Advanced FUA	-	-	-
	AOM19.1 - ASM tools to support A-FUA	Free Route & Advanced FUA	#31	3.1.1	B0-FTRO B1-FRTO B1-NOPS
	AOM19.2 - AMS management of real-time airspace data	Free Route & Advanced FUA	#31	3.1.2	B1-FRTO B1-NOPS
	AOM19.3 - Full rolling ASM/ATFCM process and ASM information sharing	Free Route & Advanced FUA	#31	3.1.3	B1-FRTO B1-NOPS
	FCM03 - Collaborative flight planning	ATFCM	-	4.2.3	B0-NOPS
	FCM04.1 - STAM phase 1	ATFCM	-	4.1.1	B0-NOPS
	FCM04.2 - STAM phase 2	ATFCM	#17	4.1.2	B0-NOPS
	FCM05 - Interactive rolling NOP	NOP	#20	4.2.2 4.2.4	B0-NOPS B1-NOPS
	FCM06 - Traffic Complexity Assessment	ATFCM	#19	4.4.2	B0-NOPS B1-NOPS
	FCM09 - Enhanced ATFM Slot swapping	ATFCM	#56	-	B1-ACDM B1-NOPS
	AOM21.1 - Direct Routing	Free Route	#32	3.2.1 3.2.3	B0-FRTO B1-FRTO
	AOM21.2 - Free Route Airspace	Free route	#33, #66	3.2.1 3.2.4	B1-FRTO
	ATC02.8 - Ground based safety nets	Free Route	-	3.2.1	B0-SNET B1-SNET
	ATC02.9 – Enhanced STCA for TMAs	Enhanced Arrival Sequencing	#60	-	B0-SNET B1-SNET
	ATC07.1 - Arrival management tools	Enhanced Arrival Sequencing	-	1.1.1	B0-RSEQ
	ATC12.1 - MONA, TCT and MTCD	Free Route	#27	3.2.1	B1-FRTO
	ATC15.1 – Initial extension of AMAN to En-route	Enhanced Arrival Sequencing	-	1.1.2	B0-RSEQ
	ATC15.2 - Extension of AMAN to En-route	Enhanced Arrival Sequencing	#05	1.1.2	B1-RSEQ
	ATC17 - Electronic Dialog supporting COTR	Free Route	-	3.2.1	B0-FICE
	ATC18 – Multi Sector Planning En-route – 1P2T	Free Route	#63	-	-
	ENV01 – Continuous Descent Operations	Performance Based	-	-	B0-CDO

		Navigation			
	ENV03 – Continuous Climb Operations	Performance Based Navigation	-	-	B0-CCO
	NAV03.1 – RNAV1 in TMA Operations	Performance Based Navigation	-	-	B0-CDO B0-CCO B0-APTA
	NAV03.2 – RNP1 in TMA Operations	Performance Based Navigation	#09, #51	1.2.3 1.2.4	B1-APTA
	NAV10 - APV procedures	Performance Based Navigation	#103	1.2.1 1.2.2	B0-APTA
	NAV12 – Optimised Low-Level IFR Routes in TMA for Rotorcraft	Performance Based Navigation	#113	-	B1-APTA
	AOP04.1 - A-SMGCS Surveillance (former Level 1)	Surface management	-	2.2.1 2.5.2	B0-SURF
	AOP04.2 - A-SMGCS RMCA (former Level 2)	Surface management	-	2.2.1	B0-SURF
	AOP05 - Airport CDM	Collaborative Airport	-	2.1.1 2.1.3	B0-ACDM
	AOP10 - Time Based Separation	Enhanced operations in the vicinity of the runway	#64	2.3.1	B1-RSEQ B2-WAKE
	AOP11 - Initial Airport Operations Plan	Collaborative Airport	#21	2.1.4	B1-ACDM B1-NOPS
	AOP12 - Improve RWY and Airfield safety with CATC detection and CMAC	Surface management	#02	2.1.2 2.5.1	B1-SURF
	AOP13 – Automated assistance to Controller for Surface Movement planning and routing	Surface management	#22	2.4.1	B1-ACDM B1-RSEQ B2-SURF
	AOP14 – Remote Tower Services	Remote Tower	#12, #71, #52	-	B1-RATS
	ENV02 – Airport Collaborative Environmental Management	Collaborative Airport	-	-	-
	SAF11 - Improve runway safety by preventing runway excursions	Surface management	-	-	-
	COM10 - Migration from AFTN to AMHS	CNS rationalisation	-	-	-
	COM11 - Voice over Internet Protocol (VoIP)	CNS rationalisation	-	3.1.4	-
	COM12 - NewPENS	Pre-SWIM & SWIM	-	5.1.2 5.2.1	B1-SWIM
	FCM08 – Extended Flight Plan	Pre-SWIM & SWIM	#37	4.2.3	B1-FICE
	INF07 - Electronic Terrain and Obstacle Data (e-TOD)	Pre-SWIM & SWIM	-	-	-
	ITY-ACID - Aircraft identification	CNS rationalisation	-	-	-
	ITY-ADQ - Ensure quality of aeronautical data and aeronautical information	Pre-SWIM & SWIM	-	-	B0-DATM
	ITY-AGDL - Initial ATC air-ground data link services	Data link	-	6.1.1 6.1.2 6.1.3 6.1.4	B0-TBO
	ITY-AGVCS2 – 8.33 kHz Air-Ground Voice Channel Spacing below FL195	CNS rationalisation	-	-	-

	ITY-FMTP - Apply a common flight message transfer protocol (FMTP)	Pre-SWIM & SWIM	-	-	B0-FICE
	ITY-SPI - Surveillance performance and interoperability	CNS rationalisation	-	-	B0-ASUR

Annex B

For SESAR Solutions not covered in the MPL3 and subject to a specific survey (performed in the period December 2017 – February 2018 through the LSSIP network), the results are summarized in the tables, under the heading "Others, non committed (i.e. non MPL3) Solutions".

SESAR 1 Solutions distribution (per KF)

Optimised ATM Network Services

Committed MPL3, PCP-related Solutions:

Sol #17	Advanced short-term ATFCM measures (STAMs)
Sol #18	Calculated take-off time (CTOT) and target time of arrival (TTA)
Sol #19	Automated support for traffic complexity detection and resolution
Sol #20	Initial collaborative network operations plan (NOP)
Sol #31	Variable profile military reserved areas and enhanced civil-military collaboration

Committed MPL3, non PCP-related Solutions

Sol #56	Enhanced air traffic flow management (ATFM) slot swapping

Others - Non committed (i.e. non MPL3) Solutions

Sol #57	User-driven prioritisation process (UDPP) – departure	2	Implemented in two locations in two States (FR – CDG and DE – Frankfurt)
		2	Planned in two States (AT, PL)

Advanced Air Traffic Services

Committed MPL3, PCP-related Solutions:

Sol #05	Extended arrival management (AMAN) horizon
Sol #09 & #51	RNP 1 operations
Sol #32 & #65	Direct Routing
Sol #33	Free Route through the use of Free Routing for flights both in cruise and vertically evolving in cross ACC/FIR borders and within permanently low to medium complexity environments
Sol #103	Approach Procedures with vertical guidance

Committed MPL3, non PCP-related Solutions

Sol #27	Enhanced tactical conflict detection & resolution (CD&R) services and conformance monitoring tools for en-route
Sol #60	Enhanced STCA for TMA specific operations (*)
Sol #62	Precision area navigation (P-RNAV) in a complex terminal airspace
Sol #63	Multi-Sector Planning
Sol #66	Automated support for dynamic sectorisation
Sol #104	Sector Team Operations - En-route Air Traffic Organiser
Sol #113	Optimised Low Level IFR routes for rotorcraft

(*) partially addressed by ATC02.9. Objective requires to be amended to fully address this Solution.

Non-committed Solutions

Sol #06	Controlled time of arrival (CTA) in medium-density/medium-complexity environments	Not implemented nor currently planned by stakeholders.
Sol #08	Arrival management into multiple airports	0 Not yet implemented in any State 2 Planned implementation in two States (DE, PT)
Sol #10	Optimised route network using advanced RNP	0 Not yet implemented in any State 3 Planned implementation in 3 States (DE, IT, NL)
Sol #11	Continuous descent operations (CDO) using point merge	5 Implemented in 5 States (AT, DE, FR, HU, IE) 4 Planned in 4 States (IT, LT, LV, PT) *Note that this Solution overlaps with Sol #107 and Sol #108*
Sol #69	Enhanced STCA with down-linked parameters	8 Implemented by eight ANSPs (AT, DE, DK, IE, MD, MT, MUAC, PL) 5 Planned by five ANSPs (AM, ES, FR, LT, PT)
Sol #105	Enhanced airborne collision avoidance system (ACAS) operations using the autoflight system	Airborne solution. Only 2% of aircraft equipped.
Sol #107	Point merge in complex terminal airspace	3 Implemented in three States (DE, HU, IE) 3 Planned in three States (IT, LV, PT) *Note that this Solution overlaps with Sol #11 and Sol #108*
Sol #108	Arrival Management (AMAN) and Point Merge	3 Implemented in three States (DE, FR, IE) 2 Planned in three States (IT, PT) *Note that this Solution overlaps with Sol #11 and Sol #107*

High Performing Airport Operations

Committed MPL3, PCP-related Solutions:

Sol #02	Airport safety nets for controllers: conformance monitoring alerts and detection of conflicting ATC clearances
Sol #12, #52 & #71	Remote TWR
Sol #21	Airport operations plan (AOP) and its seamless integration with the network operations plan (NOP)
Sol #22	Automated assistance to controllers for surface movement planning and routing
Sol #53	Pre-departure sequencing supported by route planning
Sol #64	Time-based separation

Committed MPL3, non PCP-related Solutions

Sol #70	Enhanced ground controller situational awareness in all weather conditions
Sol #106	DMAN Baseline for integrated AMAN DMAN

Non-committed Solutions

Sol #01	Runway status lights	2	Implemented in two locations in two States (CH – Zurich and FR – CDG)
		0	Currently not planned in any other location
Sol #04	Enhanced traffic situational awareness and airport safety nets for vehicle drivers	0	Not yet implemented in any State
		5	Planned in 5 airports in 4 States (AT-Vienna, DK-Copenhagen, FR-ORY, IT-Malpensa and Fiumicino)
Sol #13	Remote TWR for contingency situations	4	Implemented in four States (DK, ES, HU, LT)
		2	Planned in two States (AT, NL)
Sol #23	D-TAXI service for controller-pilot datalink communications (CPDLC) application	0	Not yet implemented in any State
		4	Planned in 4 airports in 2 States (DE-3 PCP airports, PT-LIS)
Sol #47	Guidance assistance through airfield ground lighting	1	Implemented in 1 airport in 1 state (LV-RIGA)
		4	Planned in airports in 4 States (CH-ZRH, LV-Riga, NL-Schiphol, PT-Lisbon)
Sol #48	Virtual block control in low visibility procedures (LVPs)	1	Implemented in one airport/ State (LV-Riga)
		2	Planned in two airports/States (LV-Riga, PL-EPGD)
Sol #54	Flow based integration of arrival and departure management	0	Not yet implemented in any State
		6	Planned in 6 airports in 5 States (AT-Vienna, FR-CDG, IT-Malpensa and Fiumicino, LV-Riga, PL-EPWA)
Sol #55	Precision approaches using GBAS Category II/III	0	Not yet implemented in any State
		11	Planned in at least 11 airports in 7 States (DE-EDDM, ES-MAD & BCN, FR-location not decided, IT-Malpensa & Fiumicino, PL- EPPO; EPWR; EPMO, PT-Not decided, SE-Arland)
Sol #61	A low-cost and simple departure data entry panel for the airport controller working position	19	Implemented in 19 airports of 4 States (DE, UK, ES, FR)
		18	Planned in 18 airports of 4 States (ES, PL, UK, CZ)
			For this Solution the broader concept of Advanced TWR is

		used.
Sol #70	Enhanced ground controller situational awareness in all weather conditions	8 Implemented in 8 airports in 6 States (AT-VIE, CH-ZRH & GVA, FI-HEL, FR-CDG & ORY, HU-LHBP, LV-Riga) 6 Planned in at least 6 airports in 5 States (DE-locations not decided, DK-Copenhagen, ES-LEMH & LEVX, PL-EPGD, PT-Lisbon)
Sol #116	De-icing management tool (**)	4 Implemented in 4 airports in 4 States (AT-VIE, CH-ZRH, FI-HEL, FR-CDG) 4 Planned in at least 4 airports in 4 States (HU-LHBP, NL-AMS, PL-EPWA, SE-locations undecided)

(**) Note that DIMT as part of A-CDM process (i.e. not as described in Sol. #116) is already incorporated in MPL3

Enabling Aviation Infrastructure

Committed MPL3, PCP-related Solutions:

Sol #28	Initial ground-ground interoperability
Sol #35	Meteorological information exchange
Sol #37	Extended flight plan
Sol #46	Initial system-wide information management (SWIM) technology solution
Sol #115	Extended Projected Profile (EPP) availability on ground

Committed MPL3, non PCP-related Solutions

None

Others - Non committed (i.e. non MPL3) Solutions

Sol #34	Digital integrated briefing	0 Not yet implemented nor planned in any State 0
Sol #67	AOC data increasing trajectory prediction accuracy	0 Not yet implemented in any State 1 Planned by one State (FR)
Sol #100	ACAS Ground Monitoring and Presentation System	No available CONOPS. Solution technically mature but not implementable operationally due to legal/safety issues.
Sol #101	Extended hybrid surveillance	Airborne solution
Sol #102	Aeronautical mobile airport communication system (AeroMACS)	0 Not yet implemented nor planned in any State 0
Sol #109	Air traffic services (ATS) datalink using Iris Precursor	No implementation information is available
Sol #110	ADS-B surveillance of aircraft in flight and on the surface (*)	3 Implemented in three States (DE, FR, HU) 7 Planned by seven States (AT, EE, ES, IT, LT, PT, SK) As other infrastructure Solutions, it should be addressed within CNS strategy and rationalisation

Sol #114	Composite Surveillance ADS-B / WAM	3	Implemented in three States (AM, AT, LV)
		7	Planned by seven States (DK, FR, LT, LV, MK, PL, RO)
			As other infrastructure Solutions, it should be addressed within CNS strategy and rationalisation

(*) The same function, without specifying through ADS-B, is covered in MPL3 ed. 2018 (Impl. Obj. AOP04.1)

Annex C

Acronyms

A	
AAL	Augmented Approaches to Land
A/G	Air/Ground
ACC	Area Control Centre
A-CDM	Airport Collaborative Decision making
ACL	ATC Clearances and Information service
ACM	ATC Communication Management service
ADQ	Aeronautical Data Quality
ADS-B	Automatic Dependent Surveillance - Broadcast
AF	ATM Functionality
AFP	ATC Flight plan Proposal message
AFTN	Aeronautical Fixed Telecommunications Network
AFUA	Advanced Flexible Use of Airspace
AGDL	Air-Ground Data Link
AIP	Aeronautical Information Publication
AIRM	ATM Information Reference Model
AIXM	Aeronautical Information eXchange Model
AL	Albania
AM	Armenia
AMA	Arrival Management Message
AMAN	Arrival Manager
AMC	ATC Microphone Check service
AMHS	ATS Message Handling Service
ANSP	Air Navigation Service Provider
AOM	Airspace organisation and management
AO	Aircraft Operator
AOP	Airport Operations Plan
APOC	Airport Operations Centre
APT	Airport
APV	Approach with Vertical Guidance
APW	Airborne Proximity Warning
ASBU	Aviation System Block Upgrade
ASM	Airspace Management
A-SMCGS	Advanced Surface Movement Control and Guidance System
ASP	Air Navigation Service Providers
AT	Austria
ATC	Air Traffic Control
ATCO	Air Traffic Control Officer
ATFCM	Air Traffic Flow and Capacity Management
ATFM	Air Traffic Flow Management
ATM	Air Traffic Management
ATN	Aeronautical Telecommunications network
ATS	Air Traffic Services
ATSU	Air Traffic Service Unit
AU	Airspace Users
AUP	Airspace Use Plan
AZ	Azerbaijan
B	
BA	Bosnia Herzegovina
BE	Belgium
BG	Bulgaria
B2B	Business-to-Business
C	
CAA	Civil Aviation Authority
CATC	Conflicting ATC Clearances
CBA	Cost Benefit Analysis
CCO	Continuous Climb Operations
CDM	Collaborative Decision Making
CDO	Continuous Descent Operations
CEF	Connecting Europe Facility
CEM	Collaborative Environmental Management
CFSP	Computer Flight Plan Software Provider
CH	Switzerland
CMAC	Conformance Monitoring for Controllers
CNS	Communications, Navigation and Surveillance
COM	Communications
COTR	Coordination and Transfer
CPDLC	Controller Pilot Data Link Communications
CTOT	Calculated Take Off Time
CY	Cyprus
CZ	Czech Republic
D	
DCB	Demand and Capacity Balancing
DCT	Direct Routing
DLS	Data Link Services
DE	Germany
DK	Denmark
DLIC	Data Link Initiation Capability
DMAN	Departure Manager
DP	Deployment Program
DPI	Departure Planning Information (NM message)

E	
EAUP	European Airspace Use Plan
EC	European Commission
ECAC	European Civil Aviation Conference
EE	Estonia
EFD	ETFMS Flight Data
EGNOS	European Geostationary Navigation Overlay Service
ELSA	Enhanced Large Scale ATN deployment
ENV	Environment
EOC	Essential Operational Change
ERNIP	European Route Network Improvement Plan
ES	Spain
ETFMS	Enhanced Tactical Flow Management System
eTOD	Electronic Terrain and Obstacle Data
EU	European Union
EUREF	Reference Frame Sub-Commission for Europe
F	
FAB	Functional Airspace Block
FABEC	Functional Airspace Block Europe Central (Belgium, France, Germany, Luxembourg, Netherlands, Switzerland)
FCM	Flow and Capacity Management
FI	Finland
FIR	Flight Information Region
FIS	Flight Information Services
FL	Flight Level
FMP	Flow Management Position
FMTP	Flight Message Transfer Protocol
FOC	Final Operational Capability
FPL	Flight Plan
FR	France
FRA	Free Route Airspace
FRQ	Frequencies
FSA	First System Activation
FUA	Flexible Use of Airspace
G	
GAT	General Air Traffic
GBAS	Ground Based Augmentation System
GE	Georgia
GNSS	Global Navigation Satellite System
GR	Greece
H	
HR	Croatia
HU	Hungary
I	

ICAO	International Civil Aviation Organisation
IE	Ireland
IFPS	Initial Flight Plan Processing System
IFR	Instrument Flight Rules
IND	Industry
INEA	Innovation and Networks Executive Agency
INF	Information Management
INP	Initial Network Plan
IP	Internet Protocol
IP	Implementation Project
IR	Implementing Rule
ISRM	Information Service Reference Model
IT	Italy
ITY	Interoperability
J	
JV	Joint Venture
K	
KEA	Key Environmental Area
KPI	Key Performance Indicators
L	
LARA	Local And sub-Regional Airspace Management
LT	Lithuania
LSSIP	Local Single Sky ImPlementation
LU	Luxembourg
LV	Latvia
LVC	Low Visibility Conditions
M	
MAS	Maastricht UAC
MD	Moldova
ME	Montenegro
MHz	Megahertz
MIL	Military Authorities
MK	Former Yugoslav Republic of Macedonia
Mode S	SSR Selective Interrogation Mode
MONA	MONitoring Aids
MPL3	Master Plan Level 3
MSSR	Monopulse Secondary Surveillance Radar
MT	Malta
MTCD	Medium Term Conflict Detection
MUAC	Maastricht Upper Area Control (Centre)
N	
N/A	Not applicable
NAV	Navigation
N-CONECT	Network-Common Enhanced Collaborative ATM
NDB	Non-Directional Beacon

NL	Netherlands
NM	Network Manager
NMOC	Network Manager Operational Centre
NO	Norway
NOP	Network Operations Plan
O	
OAT	Operational Air Traffic
OC	Operational Change
OI	Operational improvements
OLDI	On Line Data Interchange
OTMV	Occupancy Traffic Monitoring Values
P	
PA	Provider Abort
PBN	Performance Based Navigation
PCP	Pilot Common Project
PENS	Pan-European Network Services
PL	Poland
PRB	Performance Review Body
PRISME	Pan-European Repository of Information Supporting the Management of EATM
P-RNAV	Precision RNAV
PT	Portugal
R	
RAIM	Receiver Autonomous Integrity Monitoring
REG	Regulatory Authorities
RIPP	Runway Incursion Prevention Programme
RNAV	Area Navigation
RNP	Required Navigation Performance
RO	Romania
RP2	Reference Period 2
RPAS	Remotely Piloted Aircraft Systems
RS	Serbia
RWY	Runway
S	
SACTA	Automated Air Traffic Control System
SAF	Safety
SBAS	Satellite Based Augmentation System
SDM	SESAR Deployment Manager
SE	Sweden
SECSI-FRA	South East Common Sky Initiative – Free Route Airspace
SES	Single European Sky
SESAR	Single European Sky ATM Research
SI	Slovenia
SJU	SESAR Joint Undertaking
SK	Slovak Republic
SLoA	Stakeholder Line of Action
SMI	Safety Management Indicator
SMS	Safety Management System
SOA	Service Oriented Architecture
SPI	Surveillance Performance and Interoperability
SSR	Secondary Surveillance Radar
STAM	Short-Term ATFCM Measures
SWIM	System-Wide Information Management
T	
TBS	Time Based Separation
TCP/IP	Transmission Control Protocol / Internet Protocol
TCT	Tactical Controller Tool
TMA	Terminal Manoeuvring Area
TR	Turkey
TTA	Target Time of Arrival
TWR	Tower
U	
UA	Ukraine
UDPP	Users Driven Prioritisation Process
UK	United Kingdom
UUP	Update Airspace Use Plan
V	
VCCS	Voice Communication and Control System
VoIP	Voice over Internet Protocol
VOR	Very High Frequency Omnidirectional Radio Range
W	
WAM	Wide Area Multilateration
WP	Work Package
X	
XMAN	Cross Border Arrival Management

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