

EUROPEAN ATM MASTER PLAN

Digitalising
Europe's
Aviation
Infrastructure

Implementation view



SESAR
JOINT UNDERTAKING

founding members



Progress report 2020

Reference year 2019

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. In order to maintain the alignment with the other two Levels of the Master Plan, the “Implementation Objectives” are grouped per Essential Operational Changes as defined in the Executive view of the Master Plan.

What is the overall progress of SESAR implementation?

This 2020 Level 3 Report (reference year 2019) is based on the Master Plan Level 3 Implementation Plan edition 2019, that includes 54 active (i.e. monitored at network/national/local level) implementation objectives. As in the previous editions of the Plan, in order to reflect to the largest extent the results of SESAR 1 and its mature and performing SESAR Solutions, the 2019 edition of the Plan contained several “Local” Implementation objectives. These objectives are addressing solutions considered beneficial for specific operating environments, and for which a widespread and coordinated commitment for implementation has not been expressed yet. Amongst the 54 active implementation objectives included in the 2019 Implementation Plan, ten (10) belong to this “Local” category. They are the following:

- AOP14 - Remote Tower Services
- AOP15 - Enhanced traffic situational awareness and airport safety nets for the vehicle drivers
- AOP16 - Guidance assistance through airfield ground lighting
- AOP17 - Provision/integration of departure planning information to NM Operations Centre
- AOP18 - Runway Status Lights (RWSL)
- ATC18 - Multi-Sector Planning En-route – 1P2T
- ATC19 - Enhanced AMAN-DMAN integration
- ATC20 - Enhanced STCA with down-linked parameters via Mode S Enhanced Surveillance
- ENV02 - Airport Collaborative Environmental Management
- ENV03 - Continuous Climb Operations

Six of these Objectives (AOP15, AOP16, AOP17, AOP18, ATC19 and ATC20) were introduced in the Plan in 2019, therefore are addressed for the first time in the Report.

Overall, the implementation progress of the Master Plan Level 3 is steady, with advances in implementation recorded all across the ECAC area. For 34 objectives (excluding local ones) at least one State/Airport has finalised completion in 2019. Table below shows the top performers of the current cycle:

Implementation Objective	SESAR Solution reference	Change in the number of States completed the objective (2019 vs. 2018)	States completed the objective in 2019	Progress evolution in 2019 (Completion rate)	Number of States completed the objective (Total number in Applicability area)
ITY-ACID (Aircraft identification)	-	+7	AT, BA, GE, HR, LT, PL, RO	+16% (36%)	15 (42)
COM12 (New PENS)	-	+6	AT, FI, HU, LT, RO, SI, SK	+17% (17%)	6 (43)
ITY-AGVCS2 (Deployment of 8.33 kHz)	-	+5	AT, CH, EE, LT, RO	+17% (37%)	13 (35)
ATC15.1 (AMAN in en-route)	-	+5	HU, FR, PL, SK, TR	+13% (61%)	17 (28)
AOM21.2 (Free Route)	#33, #66	+5	GE, MUAC, MT, PL, SK	+12% (67%)	26 (39)
INF07 (Electronic Terrain and Obstacle data)	-	+5	GE, IL, LT, LV, TR	+11% (21%)	5 (43)

In terms of the overall cumulative completion rate (percentage of States/Airports within the applicability area of the objective which have finalised implementation), 12 objectives have a rate above 50%, the top performers being the following ones¹:

Implementation Objective	SESAR Solution reference	Change in the number of States/Airports completed the objective (2019 vs. 2018)	States/Airports completed the objective in 2019	Progress evolution in 2019 (Completion rate)	Number of States/Airports completed the objective (Total number in Applicability area)
ITY-FMTP (Flight Message Transfer Protocol)	-	+1	BA	+1% (77%)	34 (44)
AOP04.1 (Advanced Surface Movement Guidance and Control – Surveillance)	-	+2	EDDL, EGGL	0 (70%)	39 (56)
SAF11 (Prevention of runway excursions)	-	+2	IL, RO	+3% (69%)	29 (43)
ATC02.9 (Short Term Conflict Alert for Terminal Areas)	#60	-1	GE, IT (-IE, FI, SI)	-3% (69%)	29 (42)

While acknowledging the continuous progress achieved in 2019 in the deployment of implementation objectives, this progress did not match the plans reported in the previous cycle. In some instances some States/Airports reverted from a “completed” status, leading to a reduction in the completion rate level. Out of the seven (7) implementation objectives expected to be completed in 2019, none has been achieved. The expected implementation dates for these objectives have been shifted by 1 or 2 years. Currently 18 objectives are late (meaning that the agreed FOC date has passed but the implementation has been completed by less than 80% of the States in the applicability area). Other eight (8) objectives are not yet late (the FOC date is still in the future), but based on the current implementation status and the closeness of their respective FOCs, they are either at risk of delay or delays in implementation are already planned by some administrations. Moreover, for nine (9) objectives implementation is at its very early steps, or concrete implementation plans have not been defined yet, so the current information does not allow a reliable estimation of the expected achievement date. Eleven (11) objectives are planned to be completed in 2020. However, these plans were put in place before the economic crisis caused by COVID19 pandemic, so it is reasonable to expect that some of these plans will change, being impacted by the inherent reprioritisation activities run by the implementing stakeholders. Still the implementation objectives having a potential positive cost-efficiency effect are identified in this document. This identification, together with their closeness to completion (also shown in the document), could represent valuable information in the reprioritisation process.

The charts below indicate the current status of the implementation objectives as captured in the LSSIP 2019 reporting cycle. They address objectives applicable to States (Chart 1) and Airports (Chart 2). In line with the indications received to specifically identify those activities that are expected to contribute to cost efficiency, objectives which contribute to the Cost-Efficiency KPA are highlighted in green in the charts below².

The implementation status of the objective is indicated by the colour of its designator³:

- On time
- Risk of delay
- Planned delay
- Late
- Estimated achievement date not available yet

¹ A consolidated table showing the progress in 2019 as well as the implementation status for all monitored implementation objectives is available in Annex B.

² The link between the objectives and the Cost-Efficiency KPA is based on the information on the expected benefits as provided in the MP L3 2019 Implementation Plan.

³ The detailed description of the statuses is available in Chapter 3 “Deployment view - How to read deployment view assessment”.

What are the most important implementation evolutions per SESAR Essential Operational Change (EOC)⁴?

a) CNS Infrastructure and Services

The EOC is containing mostly infrastructure related implementation objectives, impacting in some instances (e.g. 8.33 kHz deployment, Mode S/ADS-B carriage, initial CPDLC) both ground as well as airborne systems and constituents, involving a multitude of stakeholders. With one exception (NAV10), all the other seven (7) objectives are either already late or planned to be delayed/at risk of delay. This might be explained by the fact that these implementations are usually complex, lengthy and costly. It should also be noted that beside their direct contribution to the key performance areas, all the Objectives within the EOC are essential in the provision of the supporting technical infrastructure, unlocking multiple operational improvements, which in their turn are expected to bring positive performance contributions.

b) ATM Interconnected Network

The EOC is focussed on the integration between the operational stakeholders (Airports, ANSPs, Airspace Users) as well as the Network Manager in the process of flow and capacity management, supported as needed by underlying technical infrastructure (NewPENS and SWIM yellow TI profile). Due to the mix of implementation objectives (11 within the EOC), the progress is quite uneven. The most advanced is the objective on “Collaborative Flight Planning” (FCM03), which is also the longest standing objective, initially being expected to be completed in 2005. Apart from FCM03 and AOM13.1, addressing the handling of OAT flights in ECAC, all the other objectives have completion rates below 20% and most of them will not be completed during the next cycle. In terms of supporting infrastructure, the objective on NewPENS (COM12), even if currently only at 17% of completion rate, has the perspective to be achieved in 2020, due to, in particular, its potential for improved cost-efficiency. The objective FCM08 on the deployment of Extended Flight Plan (EFPL) has not yet been implemented anywhere and, taking into account the evolution from the initially envisaged “EFPL” towards ICAO’s FF-ICE1, there is a need to stop its monitoring and to replace the objective by a new one in due time.

c) Digital AIM and MET services

For the time being, the EOC is relying on two (2) implementation objectives addressing the electronic terrain and obstacle data as well as the aeronautical data quality. Even if they are “Late”, the individual progress made by many stakeholders needs to be recognised, in particular taking into account the complexity of the issues faced in the implementation process. In most of the cases, the complexity is caused by the multitude of stakeholders involved in implementation, sometimes from outside the usual ATM scope.

d) U-space services

For the moment, there are no implementation objectives associated with this EOC.

e) Virtualisation of service provision

The EOC contains one implementation objective on the provision of Remote Tower Services (AOP14) and grouping four (4) SESAR Solutions. More and more airports, including airports with medium traffic volumes, are expressing their interest in the deployment of remote tower either for the provision of services or as contingency locations. The number of implementations is expected to quadruple in the next 3 years. Taking into account the improved cost-efficiency brought by the remote tower services, both in terms of infrastructure deployment, maintenance and operation as well as in terms ATCOs optimisation it is expected that the current implementation pace to be maintained or even accelerated.

⁴ The assignment of individual implementation objectives to EOCs is shown in the individual Deployment Views and consolidated in Annex A

f) Airport and TMA performance

This EOC contains the largest number of implementation objectives (17) spreading from basic A-SMGCS functionalities to advanced automation tools, from environment related objectives to safety related ones and from arrival management tools to time based separation and PBN. These differences are also reflected in the progress levels. The objectives addressing basic functionalities (basic AMAN, A-SMGCS Surveillance, Airport CDM, prevention of Runway excursions) are well advanced having completion rates of more than 50%. The more recent objectives, addressing advanced and more complex functionalities, are in earlier deployment phases, with completion rates not going beyond 25%. Also the applicability areas of the implementation objectives differ, with substantially more airports interested in the deployment of basic functionalities. Within the EOC, six (6) objectives are on “local” nature, and for which a widespread and coordinated commitment for implementation has not been expressed yet. Among the six, four (4) have been monitored for the first time this cycle so understandably the level of interest across stakeholders is still low. The environment related objectives show a steady progress and also have the largest applicability areas, going up to 82 airports in ECAC (for the Continuous Climb Operations objective, ENV03), out of which 51 have already finalised implementation. A special remark is needed for the NAV related objectives and in particular for the one addressing the deployment of RNAV1 in TMAs, which has been the most impacted by the publication of the PBN Regulation (EU) 2018/1048. The need to review the implementation of RNAV1 in TMAs and to formalise this implementation in a “Transition Plan” has led many States (15) to re-assess the previously completed status of the objective, justifying the steep decrease of its completion rate. Still the functionality and the availability of “RNAV1 in TMA” is in place, even for the States that have “re-opened” the Objective.

g) Fully dynamic and optimized airspace

The EOC relates mostly to implementation objectives addressing airspace management as well controller support tools. Within the EOC, two (2) implementation objectives are very close to achievement, having completion rates of around 70%. This is very positive as these objectives have direct and immediate impact on the efficient operations of airspace users (AOM21.2 on Free Route Airspace) and on the ANSP cost efficiency (ITY-FMTP addressing the replacement of the ageing X25 connections with IP ones). The “local” objective on multi-sector planning is the other objectives within the EOC having an expected direct impact on the cost-efficiency of ANSP though the potential improved ATCO productivity. This objective is already implemented in six (6) States as well as planned or in implementation in another seven (7) States.

h) Trajectory Based Operations

For the time being, the EOC is only containing implementation objectives related to the deployment of safety nets in general, as well as to the improvement of such tools in specific environments (e.g. use of multi-hypothesis algorithms for STCAs in complex TMAs or the enhancement of STCA with the use of airborne derived data). The overall implementation progress of safety nets (ATC02.8) is quite slow, however, among the tools covered by the objective (APW, MSAW and APM) the one addressing area proximity warning, bringing a direct support to the deployment of Free Route Airspace shows a very good level of implementation having reached 84% completion. The more advanced STCA features are less attractive at ECAC level as the operational need exists mostly in very complex environments.

i) Multimodal Mobility and Integration of all Airspace Users

Currently only one objective belongs to this EOC and it is addressing the deployment of IFR routes for rotorcraft operations (NAV12). The objective is quite recent, having been created in 2017 as a “local” implementation objective. In 2019, it has been subject to a complete review in order to have it aligned with the PBN Regulation. With this occasion, its scope has changed from “local” to “Pan-European”. Its progress is very low (no State has implemented the objective yet), in particular due to the lack of business/operational needs, with only three (3) States planning to implement it by end 2021, followed by three (3) others by end 2024.

SESAR Solutions

This edition of the Report continues on the path already opened by the previous edition towards a more SESAR Solutions centric approach, by giving more prominence to the links between implementation objectives and SESAR Solutions⁵ and by providing a strategic, high level view of the level of implementation of all SESAR 1 Solutions. The majority of the SESAR1 Solutions are already covered by implementation objectives (so called “SESAR 1 committed solutions⁶”), therefore their evolution is derived from the evolution of the associated implementation objectives. With regard to the SESAR 1 Solutions which have not yet evolved into implementation objectives, the implementation situation and plans have been captured through a specific questionnaire included in the LSSIP process, with a synoptic view provided in each individual EOC analysis of this report.

⁵ 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

⁶ The full distribution between committed/non-committed solutions as well as the implementation objectives associated to committed solutions is available in Annex C

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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 needs to be done to deliver a high-performing ATM system, but also explains why and by when. It sets the framework for the development activities performed by the SESAR Joint Undertaking (SJU), also in the perspective of setting up a coordinated approach to deployment actions required by operational stakeholders to ensure overall consistency and alignment to a common implementation plan. This is done in accordance to the Deployment Programme of the SESAR Deployment Manager.

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 LSSIP¹ (Local Single Sky ImPlementation) as shown in Figure 1.

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 Master Plan Level 3 Implementation Plan and Report based on LSSIP processes constitute the mechanism that enables the ECAC+² wide implementation monitoring and planning of the Master Plan.

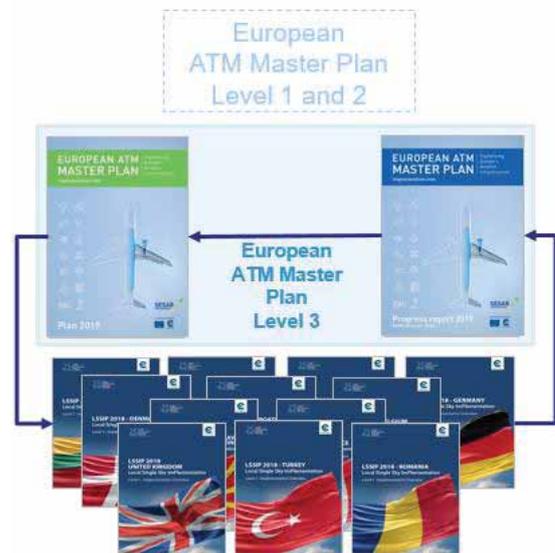


Figure 1. Master Plan Level 3 yearly cycle

Master Plan Level 3 2020 Implementation Report

The structure of 2020 Master Plan Level 3 Report (reference year 2019) consists of:

- **Executive Summary** that highlights the most important findings of the report.
- **Synoptic View** is the view that provides an overview of implementation progress in 2019, per Essential Operational Change (EOC), 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.

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

² ECAC+ - ECAC States plus Comprehensive Agreement States (Israel and Morocco).

- **Deployment View** is the view that provides a detailed analysis of the implementation progress per Level 3 implementation objective, providing also an expected evolution as well as a list of relevant references showing the multiple interdependencies affecting each individual objective. The information is supplemented with a histogram showing the distribution of implementation progress across the States/Airports which have not yet finalised the deployment.
- **Annexes** provide support documents for easier reading and understanding of the report, mostly mappings between Master Plan elements.

The main information sources for the production of this document are the LSSIP State reports which have been developed based on the provisions of the Master Plan Level 3 2019 Implementation Plan, reflecting the implementation status as well as the implementation plans on 31st December 2019. This information is without prejudice to reprioritisation actions that may have been put in place by stakeholders in 2020 due to the COVID19 crisis.

The implementation progress in this report is assessed against the implementation dates set in the Master Plan Level 3 2019 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 Level 3 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 Level 3 (items based on existing Implementing Rules).

The Level 3 addresses the full scope of the Master Plan mature and deployable SESAR Solutions as Implementation Objectives, some of which relate to the PCP and its Deployment Programme. The MP Level 3 Report aggregates the progress reported (in year-1) in LSSIP by 43 ECAC+ States (+MUAC), on every active Implementation Objective. This edition of the Report includes for the first time implementation progress information received from Israel and Morocco, which have recently joined the LSSIP process.

Based on SDM's Deployment Programme, the reporting on PCP deployment follows a different timescale and is made on elements which, although related to certain Implementation Objectives, are described with a different granularity and for a different purpose. The MP Level 3 covers the entire ECAC+ geographical scope, which is another reason why the aggregation of results on PCP-related implementation Objectives may provide a different, but complementary, view 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 a wide range of the 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 SYNOPTIC VIEW

The long-term, 2040, vision for the SESAR project, aims to deliver a resilient and fully scalable ATM system capable of handling growing air traffic made up of a diverse range of manned and unmanned air vehicles in all classes of airspace, in a safe, secure, sustainable manner.

It 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 through the implementation of a number of Essential Operational Changes (EOCs) - summarised on the right – and fully described in the Executive view of the European ATM Master Plan, edition 2020.

In order to maintain full coherence between the 3 Levels of the Master Plan, this edition of the Report is also structured based on the EOCs by assigning all Implementation Objectives and SESAR Solutions¹ to an individual EOC. In order to provide a highly focused strategic outlook, all Objectives/Solutions within an EOC are grouped into a “Synoptic View” which summarises the evolution of the associated Objectives/Solutions in 2019 and also provides estimations for their future, short term, developments.

The overall progress of implementation of SESAR Solutions

The Report provides a consolidated view on the progress of SESAR Solutions within the EU Member States, Norway and Switzerland and shows the links between the implementation objectives and the functionally related SESAR Solutions (where applicable). This approach has continued to evolve by further refining the information up to the level of EOC. Within each

The SESAR Essential Operational Changes: CNS infrastructure and services

Changes in the area of CNS will be driven by a service-based approach and a performance-based approach. This will enable the decoupling of CNS service provision from ATS and ATM data services. This change will make the European ATM system more flexible and resilient, allowing scalability.

ATM interconnected network

The ATM collaborative network enables all relevant stakeholders to participate in collaborative decision-making processes in a transparent framework, and to negotiate their preferences and reach agreements that benefit not only one but all of the stakeholders involved, thus contributing to the performance of the entire network.

Digital AIM and MET services

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.

U-space services

U-space is an enabling framework including a set of new services along with specific procedures designed to support safe, efficient and secure access to airspace for large numbers of drones.

Virtualisation of service provision

The ability to provide ATS from a remote location is relevant in all operating environments. In TMA, extended TMA and en-route environments, the virtual-centre concept allows a geographical sector to be managed from any place subject to the availability of some services crucial for the provision of ATS, namely CNS, MET, AIS and all data related to the flight plan. In airport environments, the remote tower concept supports several use cases that allow the provision of ATS from a remote tower centre (RTC), with a dynamic allocation of a number of physical aerodromes to remote tower modules.

Airport and TMA performance

This EOC covers both changes to operations at airports and in TMA airspace that allow maintenance of operational capacity under limiting conditions and changes that allow an increase in operational capacity during normal operations. This includes improvements to the planning and execution of operations at and around airports.

¹ The Level 3 Implementation Plan 2019 covers SESAR Solutions that were validated before June 2019. Therefore, only SESAR 1 Solutions are addressed in this document.

EOC, the Solutions are split between **regulated/committed** (Solutions linked to the PCP and/or addressed in the ATM MP L3, therefore being already in implementation) and **non-committed** (solutions implemented in a voluntary way without coordination at European level and not included yet in the ATM MP L3)². The Solutions within the scope of this Report are those listed in Annex 4 “SESAR 1 Solutions – Overview of the implementation plan in MP Level 3” of the MPL3 Plan 2019 (with the exception of Solution #28 “Initial ground-ground interoperability”, which in the meantime has been consolidated with R&D activities in SESAR 2020 on the integration of trajectory management processes).

Among the remaining 63 Solutions:

- 22 are addressing functionalities included in the PCP,
- 21 are related to implementation objectives in the MPL 3 Plan (without being associated to the PCP),
- For 20 Solutions, there is no implementation objective yet, therefore they are not included in the MPL3 Plan. However they may be subject to voluntary implementation, based on local, specific needs, without coordination at European level. Out of these 20 Solution, 13 are in implementation in various locations in the surveyed area, 5 are planned to be implemented while for 2 Solutions, plans have not been reported yet.

Fully dynamic and optimised airspace

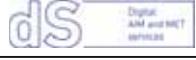
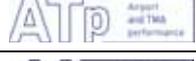
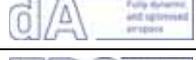
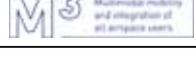
This EOC includes further steps towards Trajectory Based Operations by enhancing free-route airspace (FRA) processes and system support. It will need to cover large-scale crossborder FRA. There is a need to ensure a smooth transition between FRA and highly structured airspace based on dynamic airspace configuration (DAC) principles.

Trajectory-based operations

TBO is an overarching SESAR concept, based on a wide range of solutions that, when combined, help achieve the envisaged paradigm change. A trajectory is created and agreed for each flight representing the business needs of the airspace user and integrating ATM and airport constraints. This is the reference trajectory that the airspace user agrees to fly and that ANSPs and airports agree to facilitate.

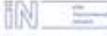
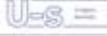
Multimodal mobility and integration of all airspace users

Mobility as a service will take intermodality to the next level, connecting numerous modes of transport, for people and goods, in seamless door-to-door services. Various modes of transport, such as car, train, helicopter, drone and aircraft, for different segments of a trip will be seamlessly combined.

EOC	Committed Solutions - PCP	Committed Solutions – MPL3	Non-committed Solutions	
			In implementation	Planned
	1	1	2	1
	8	2	1	1
	0	1	0	0
	0	0	0	0
	0	4	0	0
	6	7	6	1
	6	3	1	1
	1	2	3	1
	0	1	0	0

² The mapping of the full list of SESAR 1 Solutions to the EOCs and the split between PCP-related, MPL3 (non-PCP) related and non-committed Solutions as well as the links to implementation objectives (where available) is detailed in Annex C.

Allocation of Implementation Objectives per EOC³

EOC	Pre-SESAR	PCP	SESAR 1
	<ul style="list-style-type: none"> COM10-Basic and enhanced AMHS ITY-ACID-Aircraft Identification ITY-AGDL-A/G Data-link ITY-AGVCS2-8,33KHz below FL195 ITY-SPI-Surveillance perf and Interop 	<ul style="list-style-type: none"> COM11.1-Voice over IP (*) COM11.2-Voice over IP in Airport/Terminal(*) NAV10-RNP Approach to instrument RWY <p>(*) Not mandated by the PCP Regulation but enabling some SESAR 1 operational changes.</p>	<ul style="list-style-type: none"> NAV11-Precision approaches using GBAS Cat II/III – initial objective
	<ul style="list-style-type: none"> AOM13.1-Harmonise OAT / GAT handling FCM03-Collaborative flight planning 	<ul style="list-style-type: none"> AOP11-Initial Airport Operations Plan COM12-NewPENS FCM04.2-STAM Phase 2 FCM05-Interactive Rolling NOP FCM06-Traffic complexity assessment FCM07-CTOT to TTA for ATFCM purposes - initial objective FCM08-Extended Flight Plan INF08.1-ISWIM Yellow TI Profile INF08.2-ISWIM Blue TI Profile - initial objective 	<ul style="list-style-type: none"> FCM09-Enhanced ATFM Slot Swapping
	<ul style="list-style-type: none"> INF07-eTOD ITY-ADQ-Aeronautical Data Quality 	-	<ul style="list-style-type: none"> INF09 - Digital Integrated Briefing – initial objective
	-	-	-
	-	-	<ul style="list-style-type: none"> AOP14-Remote Tower Services
	<ul style="list-style-type: none"> AOP04.1-A-SMGCS Surveillance AOP04.2-A-SMGCS Runway Monitoring and Conflict Alerting (RMCA) AOP05-Airport CDM ATC07.1-AMAN ENV01-Continuous Descent Operations ENV02-Collaborative Environmental Management ENV03-Continuous Climb Operations SAF11-Prevent Runway Excursions NAV03.1-RNAV-1 in TMAs 	<ul style="list-style-type: none"> AOP10-Time based separation AOP12-Improve RWY safety with ATC clearance monitoring AOP13-Automated Assistance to Controller for Surface Movement Planning and Routing NAV03.2-RNP1 in TMAs 	<ul style="list-style-type: none"> AOP15-SNET for vehicle drivers AOP16-Guidance via AGL AOP18-RWY status lights ATC19-Enhanced AMAN DMAN integration
	<ul style="list-style-type: none"> ATC15.1-Initial extension of AMAN to En-route ATC17-Electronic Dialog supporting COTR ITY-FMTP-FMTP over IPv6 	<ul style="list-style-type: none"> AOM19.1-ASM support tools AOM19.2-ASM Management of real time airspace data AOM19.3-Full rolling ASM/ATFCM process AOM19.4-Management of Pre-defined Airspace Configurations AOM21.2-Free Route Airspace ATC12.1-MONA, TCT and MTCD ATC15.2-Extension of AMAN to En-route 	<ul style="list-style-type: none"> ATC18-Multi Sector Planning
	<ul style="list-style-type: none"> ATC02.8-Ground based safety nets 	-	<ul style="list-style-type: none"> ATC02.9-STCA for TMAs ATC20-STCA with Mode S DAP
	-	-	<ul style="list-style-type: none"> NAV12 - ATS IFR Routes for Rotorcraft Operations

³ The complete allocation of objectives to EOCs is also available in Annex A

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Content and graphical elements of the individual Synoptic Views

The source of the information in this document, including for all the graphical elements, is the one reported in the LSSIP 2019 cycle and reflects the status at 31st December 2019. The Views are structured per Essential Operational Changes (EOC) as identified in the Executive view of the European ATM Master Plan, edition 2020. Each View summarises the evolution of the Implementation Objectives and SESAR Solutions assigned to each respective EOC.



The graphical designator indicates the EOC and is fully consistent with the corresponding designator from the Executive view of the Master Plan.

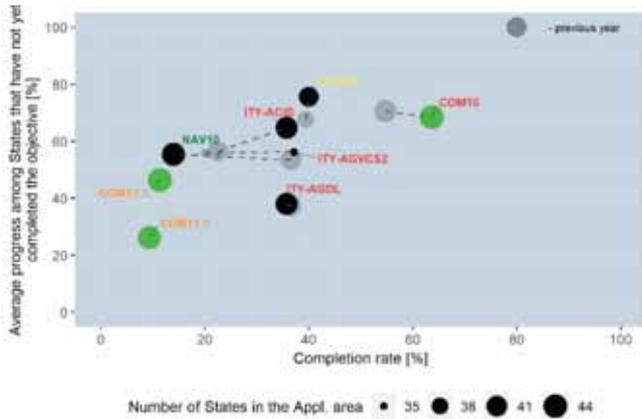
The implementation status table shows the consolidated evolution of the objectives within the EOC in 2019.

Implementation Objective	SESAR Solution ref.	Change in the number of States/Airports completed the objective (2019 vs. 2018)	States/Airports completed the objective in 2019	Progress evolution in 2019 (Completion rate)	Number of States/Airports completed the objective (Total number in Applicability area)	FOC	Implementation Status	Estimated achievement
AOM13.1	-	+2	DK, IL, PL (-MK)	+6% (45%)	17 (38)	12/2018	Late	12/2020
AOP11	#21	+1	EHAM, EDDL (-LSZH)	+2% (13%)	5 (38)	12/2021	On time	12/2021

It includes:

- The name of the objective;
- The SESAR Solution, if any, functionally linked to the objective;
- The number of States/Airports which have completed the objective in 2019 (compared with 2018);
- The States/Airports that have completed the objective in 2019. Minus (-) means that a particular State/Airport reviewed its status from “Completed” to any other status;
- The evolution of the completion rate in 2019 as percentage of completed States/Airports out of all States/Airports in the applicability area of the objective. The value between brackets shows the cumulative completion rate reached at the end of 2019;
- The absolute number of States/Airports that have completed the objective. The value between brackets shows the total number of States/Airports in the applicability area of the objective;
- The agreed Full Operational Capability as defined in the MP L3 2019 Implementation Plan;
- The implementation status is determined based on the estimated completion date relative to the Full Operational Capability of the objective. In some cases this information is not available, i.e. when estimated achievement date is not provided by the States (e.g. plans for implementation are yet to be defined);
- The estimated completion date based on the plans reported by stakeholders. However, for some objectives, in particular the recent ones, which are in early planning phase, or for the “Local” objectives, the estimated achievement date cannot always be defined.

The colour of the Implementation Status reflect the taxonomy of the progress assessment as defined in the Deployment Views section of this document.

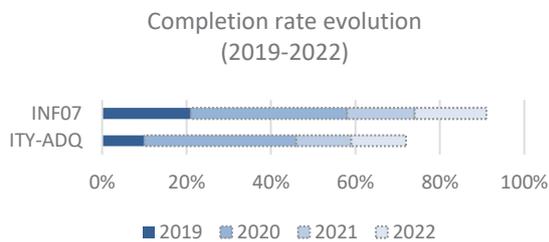


Scatter plots provide information on the Completion Rate of the Objectives (the number of States/Airports which have finalised implementation as a percentage of the overall number of States/Airports in the applicability area of the Objective) – X axis, as well as on the average progress among States/Airports which have not yet finalised the implementation of the Objective – Y axis. Therefore, Objectives scoring high on the Y axis are more likely to increase their completion rate (move along X axis) in the following cycles.

*Example: Objectives **ITY-AGDL** and **ITY-ACID** have the same completion rate (X axis) of 36%. However, **ITY-ACID** has a greater potential to increase its completion rate in the following years, since the average progress among States that have not yet implemented it is higher than in the case of **ITY-AGDL** (Y axis).*

The evolution compared with the previous year is also shown in the same graph. The colour used for the title of the Objective reflects its implementation Status, while the **green colour of the point** indicates objectives with expected cost-efficiency performance benefit.

Note: These charts do not include the “Local” Objectives, which do not have a predefined applicability area nor a FOC date.



Horizontal bar charts indicate, for each objective within the EOC, the current and the expected evolution of the completion rate (percentage of States having completed the objective within the applicability area) over the next 3 years, based on the plans reported in the National LSSIP documents. They do not include the “Local” Objectives. For these Objectives the expected evolution, in absolute numbers, is shown in their

individual Deployment Views.

Solution	Number of States implemented the solution	Number of States planning to implement the solution
#57	3 States, 8 locations indicated (CH; DE – EDDC, EDDF, EDDH, EDDM, EDDN, EDSS, EDDB; FR – LFPG)	4 States (AT; CH; PL; PT)
#67	Not yet implemented in any State	3 States (AT; CH; FR)

These tables show the number of implementation instances or implementation plans of SESAR Solutions, which are not yet covered by implementation objectives.

CNS Infrastructure and Services

Changes in the area of CNS will be driven by a service-based approach and a performance-based approach. This will enable the decoupling of CNS service provision from ATS and ATM data services. This change will make the European ATM system more flexible and resilient, allowing scalability. Through a service-based approach, CNS services will be specified through contractual relationships between customers and providers, with a clearly defined, European-wide set of harmonised services and level of quality. The performance-based approach will see a move from system/technology-based operations, where systems/technologies are prescribed, towards performance based services, which specify the ambition to be achieved within a specific environment.

The Essential Operational Change is supported by the following active implementation objectives:

- **COM10** on migration from Aeronautical Fixed Telecommunication Network (AFTN) to ATS Message Handling Service (AMHS)
- **COM11.1** and **COM11.2** on Voice over Internet Protocol (VoIP) in En-Route (COM11.1) and in Airport/Terminal (COM11.2) environments
- **ITY-ACID** on the capability of the ANSPs to establish individual aircraft identification using the downlinked aircraft identification feature, for all IFR/GAT flights
- **ITY-AGDL** on the deployment of initial ATC air-ground Data Link services
- **ITY-AGVCS2** addressing the coordinated introduction of ground/air voice communications based on 8,33 kHz channel spacing
- **ITY-SPI** on the performance, interoperability spectrum protection and safety requirements for surveillance
- **NAV10** addressing Required Navigation Performance (RNP) approach procedures

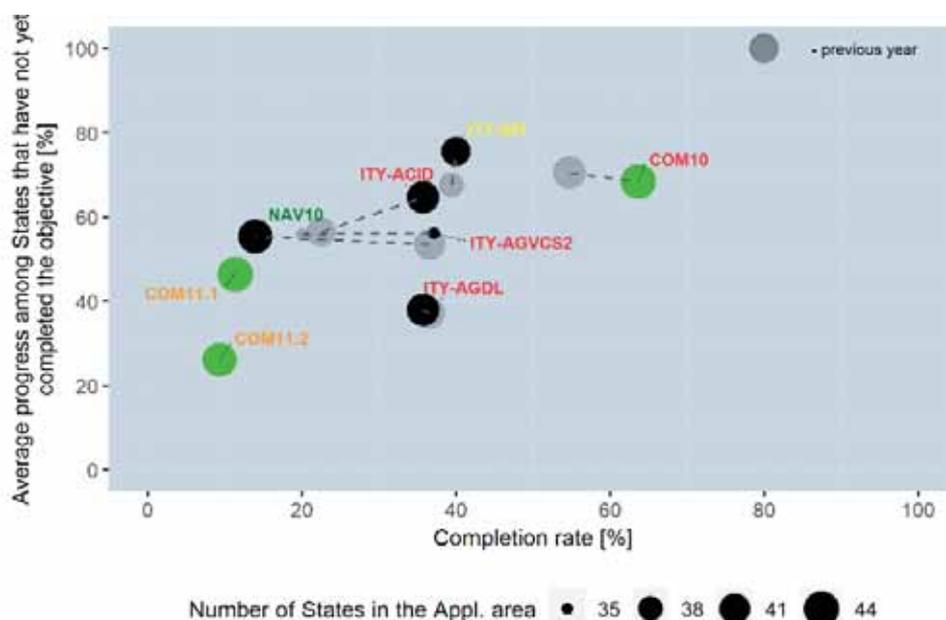
Implementation status at the end of 2019

Implementation Objective	SESAR Solution ref.	Change in the number of States completed the objective (2019 vs. 2018)	States completed the objective in 2019	Progress evolution in 2019 (Completion rate)	Number of States completed the objective (Total number in Applicability area)	FOC	Implementation Status	Estimated achievement
COM10	-	+4	HR, ME, RS, UA	+9% (64%)	28 (44)	12/2018	Late	12/2020
COM11.1*	-	+2	BG, ES	/ (11%)	5 (44)	12/2021	Planned delay	12/2022
COM11.2*	-	+2	BG, FR	/ (9%)	4 (44)	12/2023	Planned delay	>2023
ITY-ACID	-	+7	AT, BA, GE, HR, LT, PL, RO	+16% (36%)	15 (42)	01/2020	Late	12/2021
ITY-AGDL	-	0	None	0 (36%)	15 (42)	02/2018	Late	12/2023
ITY-AGVCS2	-	+5	AT, CH, EE, LT, RO	+17% (37%)	13 (35)	12/2018	Late	12/2022
ITY-SPI	-	0	BA, CY, ES (-EE, HR, LV)	0 (40%)	16 (40)	06/2020	Risk of delay	12/2020
NAV10	#103	-10	PL (-AT, BG, CH, DE, FI, IE, IT, MT, PT, TR, UK)	-23% (14%)	6 (43)	01/2024	On time	01/2024

* - new objective derived from COM11

The Essential Operational Change is grouping objectives across the C, N and S domains, with various evolutions. The progress of **COM10** Objective is confirming its growth (from 40% to 64% completion rate in 2 years) with the remaining States quite advanced in the implementation process. Based on the current planning data, the Objective is expected to achieve full implementation by the end of 2020. The 2 Objectives addressing the deployment of VoIP (**COM11.1** and **COM11.2**) were derived from the former COM11, having now different FOC dates for the 2 different operating environments (En-route and Airport/TMA). Both objectives have still a low completion rate and their progress is quite slow. This is also confirmed by the reported implementation plans, which already indicate minor delays with regard the agreed FOC dates. Of the 2 Objectives, the one addressing the deployment of VoIP en-route will have higher priority with the implementers, as it is the one being the most beneficial at network level. Within the Communication domain, there are also 2 Objectives derived from SES legislation: **ITY-AGDL** and **ITY-AGVCS2**. Both Objectives are late with a low completion rate. The one addressing

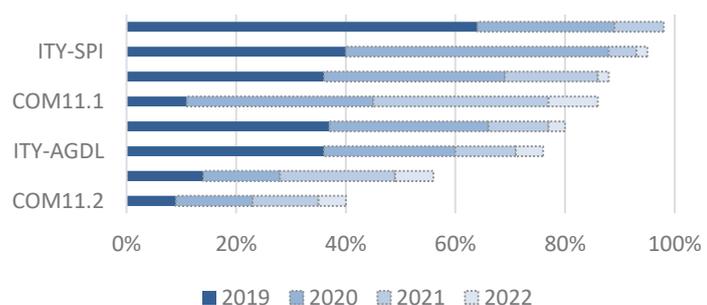
the deployment of initial data link communication will not be achieved before 2023, even if it is subject to a Regulation published in 2009 and initially applicable from 2013/2015. The situation is better with regard the deployment of 8.33 kHz channel spacing. Even if the implementation is late, many conversions have already been achieved (roughly 5700 out of the 9500 assignments in the EU are already 8.33 kHz), while the remaining ones are scheduled mostly between 2020 and 2025. These delayed conversions are justified by the need to accommodate non-equipped aircraft (in particular State aircraft as well as General Aviation) and have a limited impact on the Network. Two other Objectives derived from SES legislation are addressing the Surveillance domain: **ITY-ACID** and **ITY-SPI**. With regard ITY-ACID, the risk of delay identified in the previous Report has been confirmed and the Objective is now late. However, the deployment of appropriate surveillance coverage is progressing well and it is virtually achieved in en-route and around major airports. Even if subject to a small risk of delay, the implementation of the ITY-SPI Objective is progressing very well with almost all ANSP having implemented the relevant Stakeholder Lines of Action, with the remaining ones expected to be ready in 2020. The Navigation domain is represented by Objective **NAV10**. While not a recent Objective, its completion rate suffered a substantial dip (-23%) because of the need to re-assess the Objective to accommodate the requirements of the PBN Implementing Rule, in particular related to the development and formal approval of a PBN Transition Plan. This made many States to revert the status of the Objective from “Completed” to “Ongoing”, explaining the reduction in the completion rate. However it is important to note that the functionality and the availability of “APV procedures” is still in place, even for the States which have “re-opened” the Objective.



Future evolution

All the Objectives within the EOC are relying on the deployment of large technical infrastructure projects, which are lengthy and costly by their nature. However, once deployment of the infrastructure starts, it is expected to evolve at a constantly high pace and also to bring cost efficiency gains once implemented. This is achieved in particular through the rationalisation of the ageing technical infrastructure as well as through lower maintenance costs associated with the new infrastructure. Beside the direct contribution to the key performance areas, all these Objectives are essential in the provision of the supporting technical infrastructure unlocking multiple operational improvements. Based on

Completion rate evolution (2019-2022)



the current implementation levels and plans, their closeness to completion as well as, in particular, their potential cost-efficiency contributions, it is expected that both COM10 and COM11.1 will progress with priority in the near term, with COM11.2 to follow in a later phase, as possible means to achieve the savings imposed by the COVID19 pandemic crisis. The recent Regulation 2020/587 amending both the SPI and ACID Regulations will also alleviate the financial burden on the airspace users by delaying the carriage requirements by 6 months. Still, the risk of delay remains. For the remaining objectives, there is also a potential risk of further delays due to potential reprioritisation measures taken by implementers.

SESAR Solutions

Four SESAR Solutions belong to this EOC, without being yet subject to an implementation objective in the Level 3 of the Master Plan (#102 Aeronautical mobile airport communication system (AeroMACS), #Air traffic services (ATS) datalink using Iris Precursor, #110 ADS-B surveillance of aircraft in flight and on the surface and #114 Composite Surveillance ADS-B / WAM).

Solution	Number of States implemented the solution	Number of States planning to implement the solution
#102	Not yet implemented in any State	Not yet planned in any State
#109	Not yet implemented in any State	3 States (ES; FR; PT)
#110	3 States, 2 locations indicated (DE – EDDN; FR – LFKJ; HU)	11 States, 2 locations indicated (AT; DE; EE; ES; FR - LFBF, LFKB; HU; IT; LV; MT; NO; SK)
#114	1 State (AT)	11 States (AT; CH; CZ; DE; EE; FR; IT; LT; NO; PL; SK)

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ATM Interconnected Network

The ATM collaborative network enables all relevant stakeholders to participate in collaborative decision-making processes in a transparent framework, and to negotiate their preferences and reach agreements that benefit not only one but all of the stakeholders involved, thus contributing to the performance of the entire network.

The Essential Operational Change relies on the following active implementation objectives:

- **AOM13.1** on Harmonisation of Operational Air Traffic (OAT) and General Air Traffic (GAT) handling
- **AOP11** on Initial Airport Operations Plan
- **AOP17** on the Provision/Integration of departure planning information to NM Operational Centre
- **COM12** addressing New Pan-European Network Services (NewPENS)
- **FCM03** on Collaborative Flight Planning
- **FCM04.2** on Short Term ATFM Measures (STAM) Phase 2
- **FCM05** addressing the Interactive rolling Network Operations Plan (NOP)
- **FCM06** on Traffic Complexity Assessment
- **FCM08** on Extended Flight Plan
- **FCM09** addressing the Enhanced ATFM Slot swapping (FCM09 is only applicable to the NM and to the Airspace Users therefore there is no progress to be monitored at State level)
- **INF08.1** on Information exchanged using the SWIM yellow TI profile

Implementation status at the end of 2019

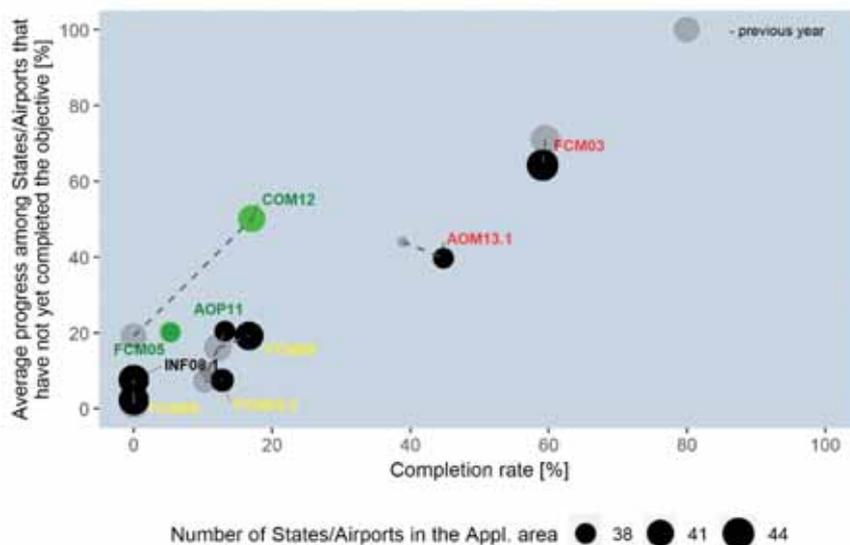
Implementation Objective	SESAR Solution ref.	Change in the number of States /Airports completed the objective (2019 vs. 2018)	States completed the objective in 2019	Progress evolution in 2019 (Completion rate)	Number of States/Airports completed the objective (Total number in Applicability area)	FOC	Implementation Status	Estimated achievement
AOM13.1	-	+2	DK, IL, PL (-MK)	+6% (45%)	17 (38)	12/2018	Late	12/2020
AOP11	#21	+1	EHAM, EDDL (-LSZH)	+2% (13%)	5 (38)	12/2021	On time	12/2021
AOP17*	#61	+2	GCCR, GCFV	-	10 (Local Obj)	N/A	N/A	N/A
COM12	-	+6	AT, FI, HU, LT, RO, SI, SK	+17% (17%)	6 (43)	12/2024	On time	12/2020
FCM03	-	+1	FI	-1% (59%)	26 (44)	12/2017	Late	12/2020
FCM04.2	#17	+1	LV	+3% (13%)	5 (39)	12/2021	Risk of delay	N/A
FCM05	#20	-1	(-CH)	-3% (5%)	2 (38)	12/2021	On time	12/2021
FCM06	#19	+2	CZ, LV	+5% (17%)	7 (42)	12/2021	Risk of delay	12/2022
FCM08	#37	0	None	0% (0%)	0 (43)	12/2021	Risk of delay	N/A
INF08.1	#35, #46	0	None	0% (0%)	0 (43)	12/2024	N/A	N/A

* - new objective

The Essential Operational Change is focussed on the integration between the operational stakeholders (Airports, ANSPs, Airspace Users) and the Network Manager in the process of flow and capacity management, supported as needed by underlying technical infrastructure (NewPENS and SWIM yellow TI profile). The Objectives addressing flow and capacity management show a mixed level of progress with an overall tendency for delays. The objective closest to completion is **FCM03**. This is also the oldest objective within the EOC having been created almost 20 years ago. However, it is expected that with the clarifications recently brought by the IFPS User Manual, the level of implementation will see a steep revival after years of slow progress. Several other FCM

Objectives, all derived from the PCP Regulation, present a risk of delay, having a slow and modest implementation progress. **FCM08** has not been implemented yet anywhere and taking into account the evolution from the initially envisaged "EFPL" towards ICAO's FF-ICE1 there is a need to reset the objective so as to fully take into account these recent evolutions. Therefore the Objective has to be "Deleted" and replaced by a new one in due time. Objective **FCM04.2** confirmed its slow implementation trend. Significant improvements

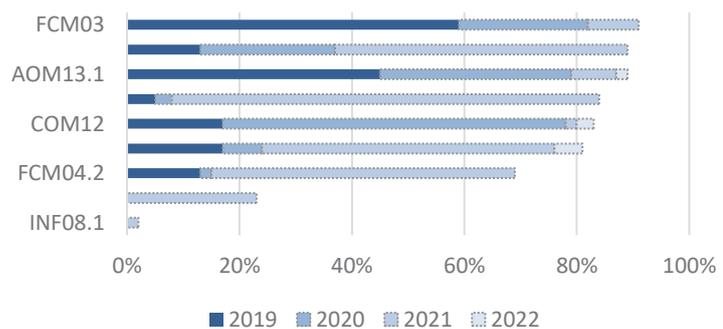
are expected after 2021, since in most ANSPs the implementation of this objective is depending on the finalisation of the n-Connect project by Network Manager. In terms of practical deployment, a substantial number of ANSPs (11) have indicated their plan to make use of the EUROCONTROL NM STAM application in the deployment process. **FCM05**, mostly driven by NM, is progressing well. Most of its components are implemented and made available by the NM, with new/improved functionalities planned to be made available every year. Implementation of **FCM06** is slow too and although there are still two more years until its FOC date, it is very unlikely that the Objective will be widely implemented by that date. One of the reasons is the lack of commonly agreed methodology for the complexity assessment of traffic (i.e. real demand against effective sector capacity). A number of States (including those who declared the implementation as completed) consider traffic load monitoring as sufficient and/or apply quite simplistic and largely qualitative complexity assessment metrics. The Slot Swapping addressed by **FCM09** is one of NM's priorities. The pre-tactical phase facility offered by NM has been integrated in the NM system. The objective is finalised by NM, while the Airspace Users and the Computerised Flight Plan Service Providers (CFSP) need to adapt their systems and procedures for the full implementation of the objective. A new local Objective (**AOP17**) introduced in 2019 is addressing the provision to NM of Departure Planning Information. This Objective is of relevance to smaller airports that do not need to implement a full A-CDM, but still allowing their better integration into the Network. Ten airports have already implemented the Objective, while at least three others will join in the next couple of years. With regard the underlying infrastructure, in 2019 the deployment of NewPENS was still on track, with 33 ANSP having signed the Common Procurement Agreement with EUROCONTROL. As far as SWIM yellow TI Profile (**INF08.1**) is concerned, many States have already initiated implementation projects and have concluded a few intermediate steps and tasks. Still the implementation is in its very early phase, making it premature to assess the chances of timely implementation.



Future evolution

The Objectives within the EOC have a quite uneven level of implementation, spreading from almost completion (FCM03) to early implementation actions (INF08.1). The Objectives having the potential to reach completion soon are AOM13.1, FCM03 and COM12. Among them, the infrastructure related COM12 on NewPENS has also the potential of bringing cost efficiency benefits, beside the security ones. The other Objective within the EOC identified in the Master Plan Level 3 Plan as having a positive cost efficiency impact is FCM05.

Completion rate evolution (2019-2022)



Its evolution is constant, its evolution being driven by the periodic NM Releases. The implementation progress of the other Objectives may suffer from the reprioritisation imposed on the implementers by the current COVID19 pandemic crisis.

SESAR Solutions

Two SESAR Solutions belong to this EOC, without being yet subject to an implementation objective in the Level 3 of the Master Plan (#57 on User-driven prioritisation process (UDPP) – departure and #67 on AOC data increasing trajectory prediction accuracy).

Solution	Number of States implemented the solution	Number of States planning to implement the solution
#57	3 States, 8 locations indicated (CH; DE – EDDC, EDDF, EDDH, EDDM, EDDN, EDDS, Eddb; FR – LFPG)	4 States (AT; CH; PL; PT)
#67	Not yet implemented in any State	3 States (AT; CH; FR)

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Digital AIM and MET services

The digitalisation of AIM and MET services will enable the implementation of services to provide static and dynamic aeronautical and meteorological information in digital form, useable by ATM systems and human operators. The output is a SWIM-compliant dynamic data set, subsets of which can be retrieved by individual requests for specific geographical areas, attributes or functional features. These services will also allow the on-board acquisition, processing and distribution of AIM, MET and other operational information, including the interpretation and representation of this information within the aircraft.

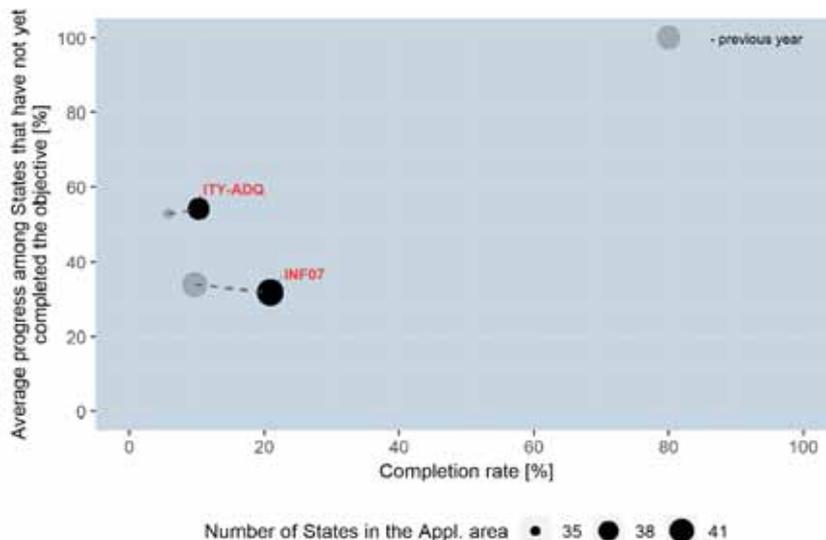
The Essential Operational Change relies on the following active implementation objectives:

- **INF07** on Electronic Terrain and Obstacle Data (e-TOD)
- **ITY-ADQ** on the Quality of Aeronautical Data and Aeronautical Information

Implementation status at the end of 2019

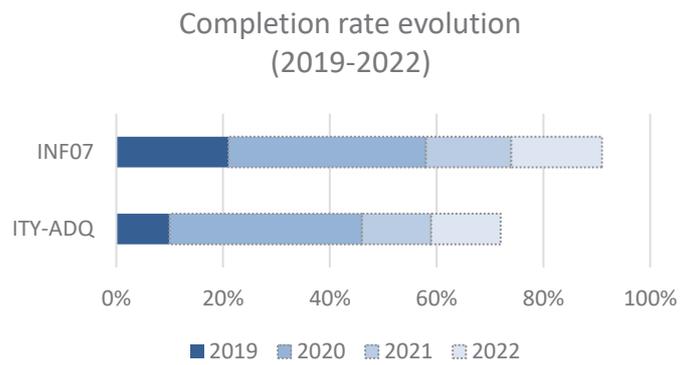
Implementation Objective	SESAR Solution ref.	Change in the number of States /Airports completed the objective (2019 vs. 2018)	States completed the objective in 2019	Progress evolution in 2019 (Completion rate)	Number of States/Airports completed the objective (Total number in Applicability area)	FOC	Implementation Status	Estimated achievement
INF07	-	+5	GE, IL, LT, LV, TR	+11% (21%)	5 (43)	05/2018	Late	12/2022
ITY-ADQ	-	+2	LT, LV, IL (-MD)	+4% (10%)	4 (39)	06/2017	Late	12/2023

Even if the 2 Objectives part of the Essential Operational Change are “Late”, the individual progress made by many stakeholders needs to be recognised, in particular taking into account the complexity of the issues faced in the implementation process. This complexity is due to the need to involve multiple stakeholders, sometimes from outside the usual ATM scope (e.g. government agencies) in implementation. This is more relevant for **INF07**, which is dependent on the establishment of a “National TOD Policy” involving several non-ATM stakeholders. This policy represents a cornerstone activity for TOD implementation as it defines the roles and responsibilities for all TOD stakeholders in a State. And the set-up of this policy is reported “Late” in 17 States. The progress of **ITY-ADQ** is equally slow, despite the topic being the subject of a SES Regulation. However, some of the Stakeholders Lines of Action that are on the critical path for ADQ implementation, (e.g. the establishment of Formal Arrangements), show good progress with 20 ANSPs having “Completed” the action, unlocking the potential implementation of the remaining actions. It is important to note that only adequate ADQ compliance will provide the optimum baseline for future certification in accordance with the upcoming EASA rule Part-AIS (amendment to 2017/373) with an envisaged applicability date of 27 Jan 2022.



Future evolution

Both Objectives within the EOC show a slow progress and their complete implementation is not foreseen in the near future. In the likely reprioritisation process that will follow the COVID19 pandemic crisis, there is a real risk that the initially planned implementation actions will be further delayed, beyond the reported plans and that the expected safety enhancements related to these objectives will have to be postponed.



SESAR Solutions

Within this EOC, there are no mature SESAR 1 Solutions not being yet subject to Implementation Objectives.

Virtualisation of service provision

The ability to provide ATS from a remote location is relevant in all operating environments: airport, TMA, extended TMA (E-TMA) or en route. In TMA, extended TMA and en-route environments, the virtual-centre concept allows a geographical sector to be managed from any place subject to the availability of some services crucial for the provision of ATS, namely CNS, MET, aeronautical information services (AIS) and all data related to the flight plan. In airport environments, the remote tower concept supports several use cases that allow the provision of ATS from a remote tower centre (RTC), with a dynamic allocation of a number of physical aerodromes to remote tower modules. It offers new alternatives for the provision of tower-related ATS and in some cases reduces ANS costs. The integration of approach services to these airports through a remote virtual centre is also possible.

For the time being, the Essential Operational Change relies on only one Objective addressing the provision of remote Tower services, grouping 4 SESAR Solutions:

- **AOP14** on Remote Tower Services

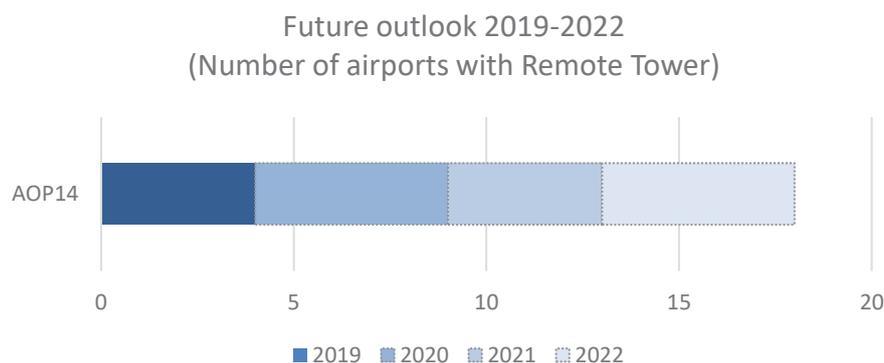
Implementation status at the end of 2019

Implementation Objective	SESAR Solution ref.	Change in the number of States /Airports completed the objective (2019 vs. 2018)	Airports completed the objective in 2019	Progress evolution in 2019 (Completion rate)	Number of States/Airports completed the objective (Total number in Applicability area)	FOC	Implementation Status	Estimated achievement
AOP14	#12, #13, #52, #71	+1	LHBP	-	4 (Local Obj)	N/A	N/A	N/A

New States/Airports are joining the applicability area of the Objective every year so currently the RTC services are implemented either for the provision of services or as a contingency facility in 3 States (4 locations) and planned or ongoing in another 19 locations spread across 15 States, all over Europe.

Future evolution

Based on the current plans, the number of RTC implementations is expected to quadruple in the next 3 years. Remote tower services bring improved cost-efficiency, both in terms of infrastructure deployment, maintenance and operation as well as in terms ATCOs optimisation. Given the cost optimisation needs imposed by the current economical crisis, it is advisable that more airports are considered as candidates for RTC service provision.



SESAR Solutions

Within this EOC, there are no mature SESAR 1 Solutions not being yet subject to Implementation Objectives.

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Airport and TMA performance

This EOC covers both changes to operations at airports and in TMA airspace that allow maintenance of operational capacity under limiting conditions and changes that allow an increase in operational capacity during normal operations. This includes improvements to the planning and execution of operations at and around airports, such as traffic sequencing, reduced separation, reduced and more predictable runway occupancy time, and enhanced management of taxiway throughput, for both arrivals and departures. This EOC also addresses the required coordination with TMA operations when aircraft sequencing for the runway begins, and, in addition, with extended arrival management in en-route airspace. It also includes solutions that increase the safety of operations and seeks to reduce environmental impact at or near airports.

The Essential Operational Change relies on the following active implementation objectives:

- **AOP04.1** on Airport Surface Movement Control and Guidance System (A-SMGCS) Surveillance (former Level 1) and **AOP04.2** on A-SMGCS RMCA (former Level 2)
- **AOP05** on Airport Collaborative Decision Making (CDM)
- **AOP10** addressing Time Based Separation
- **AOP12** on the Improvement of Runway safety with Conflicting ATC Clearances (CATC) and Conformance Monitoring for Controllers (CMAC)
- **AOP13** addressing the Automated assistance to controller for surface movement planning and routing
- **AOP15** on Safety Nets for vehicle drivers
- **AOP16** addressing the Guidance assistance through airfield ground lightning
- **AOP18** on Runway Status Lights
- **ATC07.1** on Arrival Manager (AMAN) tools and procedures
- **ATC19** on Enhanced Arrival Manager -Departure Manager (AMAN-DMAN) integration
- **ENV01** addressing Continuous Descent Operations (CDO)
- **ENV02** on Airport Collaborative Environmental Management
- **ENV03** addressing Continuous Climb Operations (CCO)
- **NAV03.1** on Area Navigation RNAV1 in TMA Operations
- **NAV03.2** on Required Navigation Performance RNP1 in TMA Operations
- **SAF11** addressing the Prevention of Runway Excursions

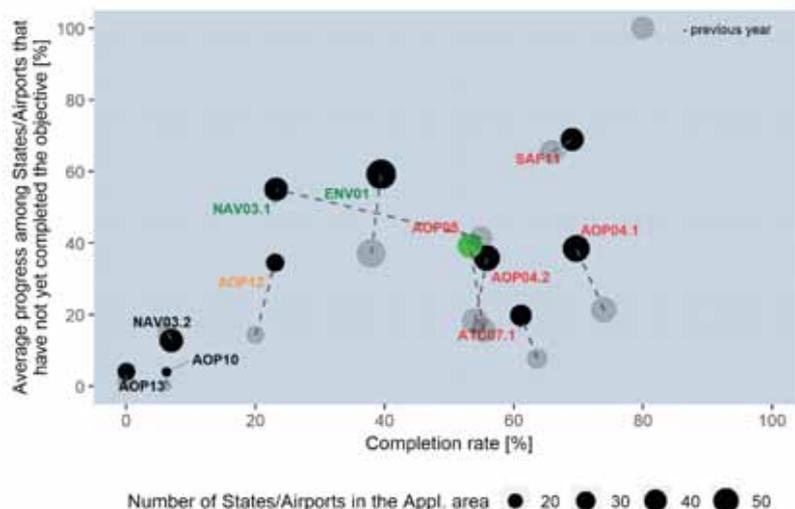
Implementation status at the end of 2019

Implementation Objective	SESAR Solution ref.	Change in the number of States/ Airports completed the objective (2019 vs. 2018)	State/Airports completed the objective in 2019	Progress evolution in 2019 (Completion rate)	Number of States /Airports completed the objective (Total number in Applicability area)	FOC	Implementation Status	Estimated achievement
AOP04.1	-	+2	EDDL, EGGL	0 (70%)	39 (56)	12/2011	Late	12/2020
AOP04.2	-	+2	EDDL, EGGL	+4% (56%)	29 (52)	12/2017	Late	12/2020
AOP05	-	-1	-EIDW	-2% (53%)	25 (47)	12/2016	Late	12/2020
AOP10	#64	0	None	0 (6%)	1 (16)	12/2023	N/A	N/A
AOP12	#02	+1	LSZH	+7% (23%)	6 (26)	12/2020	Planned delay	12/2024
AOP13	#22, #53	0	None	0 (0%)	0 (25)	12/2023	N/A	N/A
AOP15*	#04	+1	EDDF	-	2 (Local Obj)	N/A	N/A	N/A
AOP16*	#47	0	None	-	0 (Local Obj)	N/A	N/A	N/A
AOP18*	#01	0	None	-	1 (Local Obj)	N/A	N/A	N/A
ATC07.1	-	+1	EPWA	-3% (61%)	22 (36)	12/2019	Late	12/2021
ATC19*	#54	0	None	-	1 (Local Obj)	N/A	N/A	N/A
ENV01	-	+1	EGNT	-2% (39%)	28 (71)	12/2023	On time	12/2023
ENV02	-	+2	EGKK, LSGG	-	46 (Local Obj)	N/A	N/A	N/A

ENV03	-	+9	UBBB, LFPO, LFBO, LFML, LFMN, LFPG, LFLL, EGNT, EGPF	-	51 (Local Obj)	N/A	N/A	N/A
NAV03.1	-	-14	AZ (-AT, BG, DK, EE, ES, FI, FR, HU, IT, LT, NL, NO, PT, RS, SI)	-35% (23%)	10 (42)	06/2030	On time	06/2030
NAV03.2	#09, #51	+1	SK	+1% (7%)	3 (43)	06/2030	N/A	N/A
SAF11	-	+2	IL, RO	+3% (69%)	29 (43)	01/2018	Late	12/2020

* - new objective

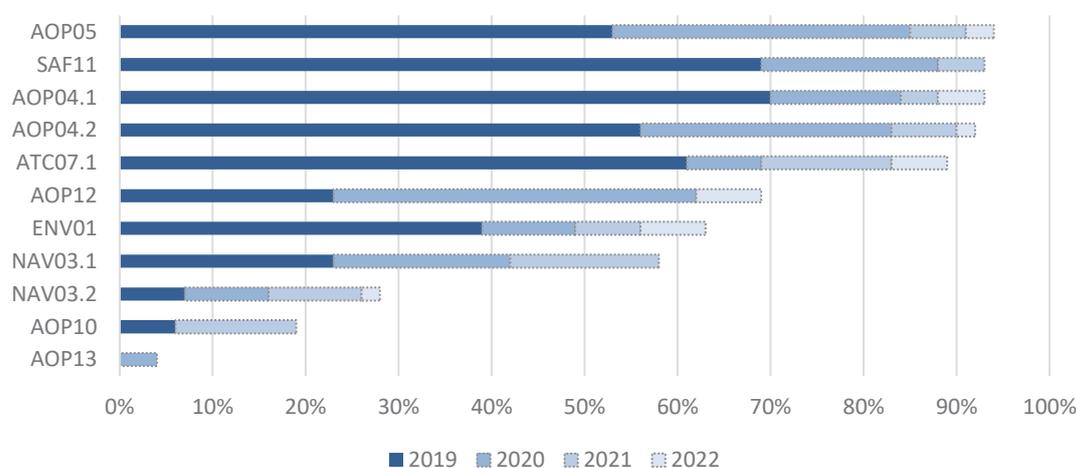
The content of the EOC is quite eclectic, combining pre-SESAR, baseline Objectives (**AOP04.1** and **AOP4.2**), PCP related objectives (e.g. **AOP12**, **AOP13**), as well as local objectives derived from SESAR 1 Solutions (e.g. **AOP15**, **AOP16**, **ATC19**). The EOC provides an evolutive roadmap, with increased functionalities on and around Airports. It starts with the basic surveillance on the airport movement area (**AOP04.1**) and adds more complex features, up to automated assistance to controller for surface movement planning and routing (**AOP13**). Even if the baseline Objectives have passed their FOC date, it is encouraging that every year, more airports are joining their applicability areas (for AOP04.1 the applicability area grew from the initial 16 locations to currently 56). For the more advanced A-SMGCS features (**AOP12**, **AOP13**) the implementation is very slowly building up so some delays in implementation are already expected. Three local Objectives, derived from mature SESAR Solutions have been monitored for the first time this cycle. They (**AOP15**, **AOP16** and **AOP18**) are addressing in particular the airport safety and the increase in situational awareness. As they are very recent Objectives, they have low completion numbers but depending on the operational needs and business priorities, they have potential for growth. In terms of safety, they are complemented by **SAF11** addressing practical recommendation for the reduction of runway excursions. Concerning the latter, its implementation has seen a substantial boost over the last two years which will hopefully be maintained as, within the EOC, the Objective is the closest to completion. The Objectives related to environmental benefits (**ENV01**, **ENV02** and **ENV03**) are all showing progresses but to different extents. ENV03 achieved the highest increase among them, with 9 airports having reported completion in 2019 while 31 other ones are already in the process of implementation or are planning it. The Objectives impacting the TMAs are addressing the deployment of basic AMAN (**ATC07.1**) as well as the deployment of PBN (**NAV03.1** and **NAV03.2**). The progress of **ATC07.1** implementation is almost stagnating however it is encouraging that the applicability area of the objective has increased by 20% over the last 3 years, which explains the low progress of the completion rate. With regard the deployment of PBN in TMAs, both objectives, but in particular **NAV03.1**, have been impacted by the publication of the PBN Regulation. The need to review the implementation of RNAV1 in TMAs and to formalise this implementation in a “Transition Plan” has led many States (15) to re-assess the previously completed status of the objective, justifying the steep decrease of its completion rate. Still the functionality and the availability of “RNAV1 in TMA” is in place, even for the States which have “re-opened” the Objective.



Future evolution

Taking into account the wide variety of the Objectives within the EOC, their nature (local/multi-national, regulated/not-regulated, recent/pre-dating SESAR) it is expected that these differences will be reflected in the future evolution as well. An important factor is also that new airports are joining every year the applicability area of certain Objectives (in particular related to A-SMGCS but also to environment). Because of the new entrants, the completion rate evolution seems to stagnate while the implementation in absolute terms is in fact progressing well (e.g. almost all airports in the initial applicability area of AOP04.1/AOP04.2 have finalised implementation). Taking into account the current economic crisis, it is expected that the Objective having a potential cost efficiency impact (AOP05) will get higher priority in implementation. However, this Objective is quite well advanced in terms of progress so any reprioritisation will probably not bring major changes in its evolution. Among the other Objectives, the ones addressing A-SMGCS as well as Safety (prevention of runway excursions) are quite advanced in terms of completion. Still it is not excluded that due to reprioritisation needs, in particular for the new entrants in the applicability areas of AOP04.1/AOP04.2 to review and postpone their implementation plans. The remaining Objectives within the EOC are not expected to be achieved before 2020.

Completion rate evolution (2019-2022)



SESAR Solutions

Seven SESAR Solutions belong to this EOC, without being yet associated to implementation objectives in the Level 3 of the Master Plan (#23 on D-TAXI service for controller-pilot datalink communications (CPDLC) application, #48 on Virtual block control in low visibility procedures (LVPs), #116 on De-icing management tool, #117 on Reducing Landing Minima in Low Visibility Conditions using Enhanced Flight Vision Systems (EFVS), #11 on Continuous descent operations (CDO) using point merge, #107 on Point merge in complex terminal airspace and #108 on Arrival Management (AMAN) and Point Merge).

Solution	Number of States implemented the solution	Number of States planning to implement the solution
#23	1 (LT)	3 States, 8 locations indicated (AT; CH; PL - EPGD, EPKK, EPKT, EPPO, EPRZ, EPWA, EPMO, EPWR)
#48	Not yet implemented in any State	1 State, 1 location indicated (PL - EPGD)
#116	4 States, 2 locations indicated (AT -LOWW; DE; DK; FR - LFPG)	8 States, 5 locations indicated (AT; BE - EBBR; CH - LSZH; CZ; EE - EETN; HU - LHBP; PL - EPWA; SE)
#117	1 State, 1 location indicated (FR - LFPB)	1 State, 1 location indicated (BE- EBAW)
#11	4 States, 3 locations indicated (AT, FR – LFPG; HU - LHBP; LT - EYVI)	4 States, 2 locations indicated (IE; IT - LIME; LT; NO - ENGM)
#107	6 States, 5 locations indicated (AT-LOWW; ES - GCLP; HU - LHBP; IE; LV - EVRA; NO - ENGM)	3 States, 2 locations indicated (IT – LIME; NO – ENGM; PT)
#108	3 States, 2 locations indicated (FR - LFPG; IE; NO - ENGM)	1 State, 2 locations indicated (ES – LEMG, GCTS)

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Fully dynamic and optimized airspace

This Essential Operational Change includes further steps towards TBO by enhancing free-route airspace (FRA) processes and system support. It will need to cover large-scale cross-border FRA and there is a need to ensure a smooth transition between FRA and highly structured airspace based on dynamic airspace configuration (DAC) principles.

FRA will allow user-preferred routing, supported by collaborative decision-making processes, and the Network Manager will play a central role in facilitating the coordination of stakeholders through its network management functions. The dynamic airspace concept delivers an optimised and coordinated organisation of airspace activations and reservations, able to support optimised traffic flows in a free-route environment, as well as other uses of airspace (e.g. military). It will also require the development of new ATS working methods supported by automation and new tools.

The Essential Operational Change relies on the following active implementation objectives:

- **AOM19.1** on Airspace Management (ASM) tools to support Advanced-Flexible Use of Airspace (A-FUA)
- **AOM19.2** on ASM management of real-time airspace data
- **AOM19.3** addressing a Full rolling ASM/ATFCM process and ASM information sharing
- **AOM19.4** on Pre-defined airspace configurations
- **AOM21.2** addressing Free Route Airspace
- **ATC12.1** on Monitoring Aids (MONA), Tactical Controller Tool (TCT) and Medium Term Conflict Detection (MTCDD)
- **ATC15.1** addressing the Implementation, in en-route operations, information exchange mechanisms, tools and procedures in support of basic Arrival Manager (AMAN)
- **ATC15.2** on Arrival Management extended to en-route airspace
- **ATC17** on Electronic Dialogue supporting Coordination and Transfer (COTR)
- **ATC18** on Multi Sector Planning en-route – 1 Planner/2 Tactical (1P2T)
- **ITY-FMTP** addressing a Common Flight Message Transfer Protocol

Implementation status at the end of 2019

Implementation Objective	SESAR Solution ref.	Change in the number of States/Airports completed the objective (2019 vs. 2018)	State/Airports completed the objective in 2019	Progress evolution in 2019 (Completion rate)	Number of States /Airports completed the objective (Total number in Applicability area)	FOC	Implementation Status	Estimated achievement
AOM19.1	#31	+3	BA, LV, NO	+6% (34%)	13 (38)	12/2018	Late	12/2021
AOM19.2	#31	0	None	-1% (5%)	2 (37)	12/2021	N/A	N/A
AOM19.3	#31	+2	LV, RO	+6% (14%)	5 (37)	12/2021	N/A	N/A
AOM19.4	#31	+2	BA, RO	+5% (11%)	4 (37)	12/2021	N/A	N/A
AOM21.2	#33, #66	+5	GE, MUAC, MT, PL, SK	+12% (67%)	26 (39)	12/2021	On time	12/2021
ATC12.1	#27	+3	HU, MT, RO	+5% (49%)	21 (43)	12/2021	Planned delay	12/2022
ATC15.1	-	+5	HU, FR, PL, SK, TR	+13% (61%)	17 (28)	12/2019	Late	12/2021
ATC15.2	#05	+2	BG, SE	+6% (18%)	6 (34)	12.2023	N/A	N/A
ATC17	-	+3	AM, GE, RO	+6% (32%)	13 (41)	12/2018	Late	12/2022
ATC18	#63	+1	PL	-	6 (Local Obj)	N/A	N/A	N/A
ITY-FMTP	-	+1	BA	+1% (77%)	34 (44)	12/2014	Late	12/2020

Among all objectives belonging to this EOC, only Free Route Airspace (**AOM21.2**) is being implemented on time, with the planned FOC date of 12/2021 and 67% of completion rate. Additional work is expected after 2021 in order to extend FRA limits both horizontally (cross-border FRA) and vertically. It should be noted that some cross-border FRA airspaces are already operational:

- **NEFRA:** North European FRA (EE, FI, LV, NO, DK and SE);
- **SEEN-FRA:** South East European Night Free Route (RO, BG, HU and SK);
- **FRASAI-FRA:** North-West of Spain - Santiago-Asturias (PT and ES: Lisbon and Madrid FIRs);
- **SECSI FRA:** South-East Common Sky Initiative (AT, BA, HR, ME, RS and SI).

As for the Advanced FUA (A-FUA) group of objectives (**AOM19.X**), the deployment of ASM tools (**AOM19.1**) is late, since the planned FOC date of 12/2018 has not been met. However, 22 States already deployed automated ASM support systems (15 of which rely on LARA – Local and sub-Regional ASM Support System), while their integration with NM systems proves to be more challenging. Other objectives in the same group, addressing management of real-time airspace data (**AOM19.1**), full rolling ASM/ATFCM process and ASM information sharing (**AOM19.2**) and pre-defined airspace configurations (**AOM19.3**), largely depend on the deployment of ASM tools, which explains quite modest completion rates reached so far. Consequently, their estimated achievement date cannot be defined at this time.

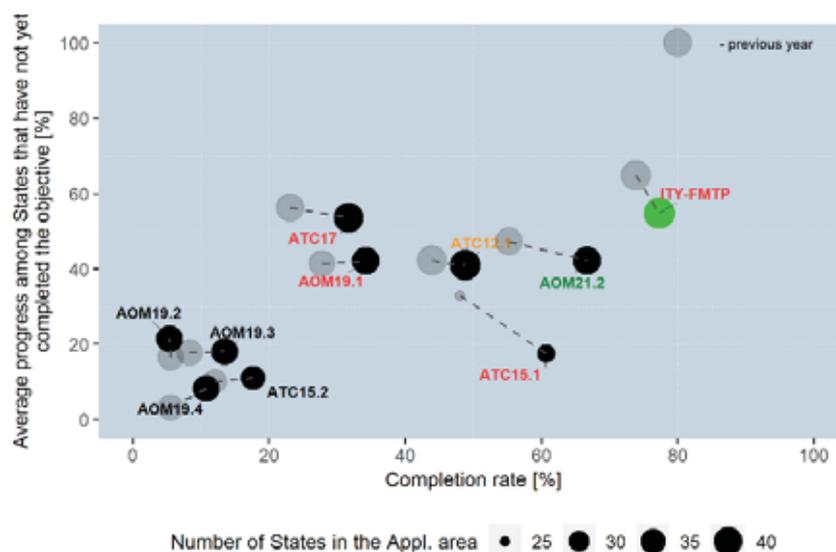
The implementation of MONA, TCT and MTCD (**ATC12.1**) has been completed by an additional 3 States during 2019, compared to the previous year. Medium Term Conflict Detection (MTCD) has been deployed in 34 ACCs (52% of applicability area). Tactical Controller Tool (TCT) has been declared “not applicable” by vast majority of implementers (21 ACCs), while conformance monitoring (MONA) functions are the most widely deployed ones (37 ACCs). Overall, the objective will likely not be completed before 2022, i.e. one year after the planned FOC date.

The objective that showed the greatest relative progress improvement (5 States, +15%) within this EOC in 2019 is **ATC15.1** – information exchange mechanisms, tools and procedures between AMAN in TMAs and respective en-route ATS units. Currently it is deployed in 61% of all applicable States and is expected to be achieved by 2021, two years after the planned FOC date. This objective is an important pre-requisite for **ATC15.2**, which explains the substantially lower completion rate of the latter.

ATC17 complements the services implemented with ITY-COTR and its implementation is still progressing relatively slowly. The estimated achievement date is again postponed to 2022, after several revisions in previous years as well. Interestingly, most OLDI messages are already available in many ATM systems, but their operational use is constrained by the still on-going coordination efforts with neighbouring ACCs.

Multi-sector planning en-route (**ATC18**) is a local objective that is currently implemented only by 6 States/ANSPs. The reasons for such a modest interest are local ATM environment characteristics (low number of sectors/simple configurations), ATM system capabilities and lack of perceived benefits with respect to current operations.

Contrary to expectations raised in previous cycle, **ITY-FMTP** has not been achieved in 2019. In fact, only one additional State (BA) reported completion, which accounts for 1% of the overall completion rate. The main problems for delay are slow migration from IPv4 to IPv6, foreseen implementation scheduled to take place together with next major system upgrades and especially the ability of neighbouring ACC’s to support FMTP. According to currently reported plans, the 80% threshold will be reached in 2020, while the full 100% completion rate across the applicability area will only be achieved in 2022.

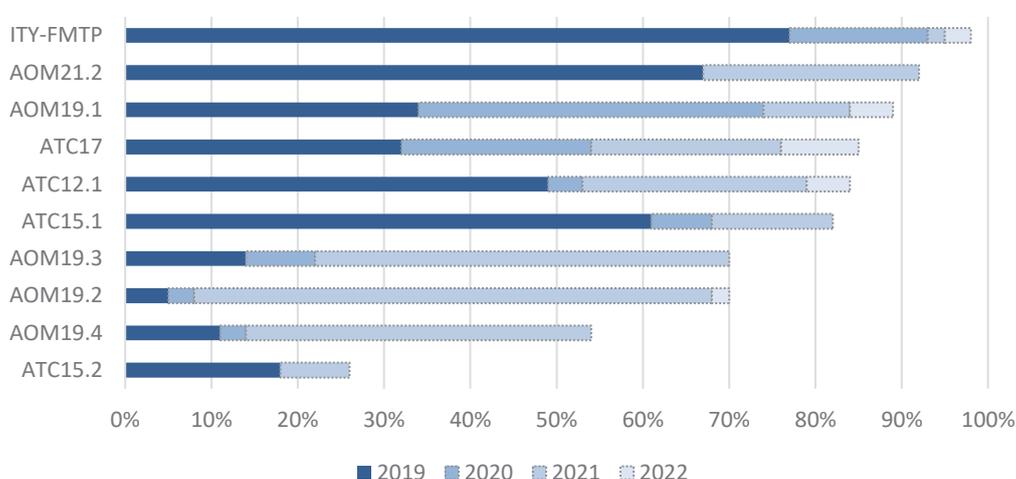


Future evolution

Among the Objectives within the EOC, the one addressing the deployment of flight data exchanges over IP (ITY-FMTP) is the closest to completion. This is a positive element as this Objective is also expected to bring cost efficiencies, through the lower operations/maintenance costs compared to those of the aging X.25, it is therefore anticipated the implementation to get a final boost. Objective ATC18 on multi-sector planner is also expected to bring cost efficiencies through improved ATCO productivity. Consequently, stakeholders are encouraged to consider its implementation whenever the operational and technical conditions allow. The deployment of free route (AONM21.2) is also expected to bring immediate and direct benefits to the airspace users therefore its sustained implementation has to continue.

Among the other Objectives within the EOC, the most advanced is ATC15.1, being also the Objective which showed the highest relative progress in 2019. However as the progress of the States which have not completed the Objective yet is quite low, it is not expected to see a major spike in 2020. The same for the other Objectives that are at risk of further delays due to the reprioritisation activities.

Completion rate evolution (2019-2022)



SESAR Solutions

Two SESAR Solutions belong to this EOC, without being yet subject to an implementation objective in the Level 3 of the Master Plan (#10 on Optimised route network using advanced RNP and #118 on Basic EAP (Extended ATC Planning) function).

Solution	Number of States implemented the solution	Number of States planning to implement the solution
#10	Not yet implemented in any State	3 States, 3 locations indicated (IE; IT - LIME, LIRF, LIMC; PT)
#118	3 States (BE; CH; FR)	3 States, 1 location indicated (CH - LSGG; MUAC; SK)

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Trajectory Based Operations

The integration of trajectory management processes into the planning and execution phases will involve the management, negotiation and sharing of the shared business trajectory (SBT) as well as the management, updating, revision and sharing of the reference business trajectory (RBT) and finally the transition from the SBT to the RBT.

The EOC also includes some legacy deployments (ground-based and airborne safety nets) that are already validated concepts, but have been included as they will facilitate trajectory execution for specific low-capability aircraft or in fall-back procedures.

The Essential Operational Change relies on the following active implementation objectives:

- **ATC02.8** addressing Ground-based Safety Nets
- **ATC02.9** on Short Term Conflict Alert (STCA) for Terminal Manoeuvring Areas (TMAs)
- **ATC20** on Enhanced STCA with down-linked parameters via Mode S Enhanced Surveillance (EHS) [Local]

Implementation status at the end of 2019

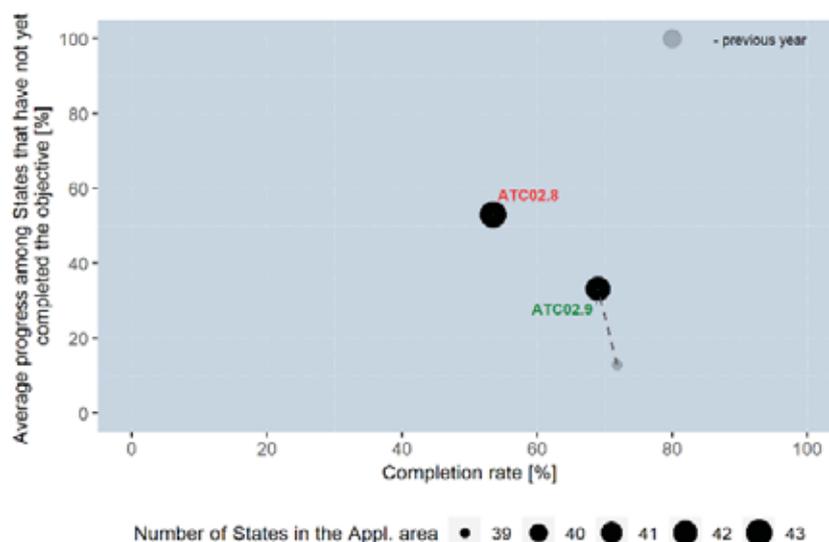
Implementation Objective	SESAR Solution ref.	Change in the number of States/Airports completed the objective (2019 vs. 2018)	State/Airports completed the objective in 2019	Progress evolution in 2019 (Completion rate)	Number of States /Airports completed the objective (Total number in Applicability area)	FOC	Implementation Status	Estimated achievement
ATC02.8	-	0	RO (-BA)	-1% (53%)	23 (43)	12/2016	Late	12/2022
ATC02.9	#60	+1	GE, IT (-IE, FI, SI)	-3% (69%)	29 (42)	12/2020	On time	12/2020
ATC20*	#69	-	RO, DE	-	10 (Local Obj)	N/A	N/A	N/A

* - new local objective

The implementation of ground-based safety nets (**ATC02.8**) is overall considered late with respect to the planned Full Operational Capability (FOC) date of 12/2016. However, progress varies greatly between the different types of safety nets:

- Area Proximity Warning (APW) **84%**
- Minimum Safe Altitude Warning (MSAW) **72%**
- Approach Path Monitoring (APM) **57%**

The main reason of delay is the natural alignment of safety nets implementation with major upgrades or replacements of the ATM systems by ANSPs, which are in many cases scheduled after the FOC date.



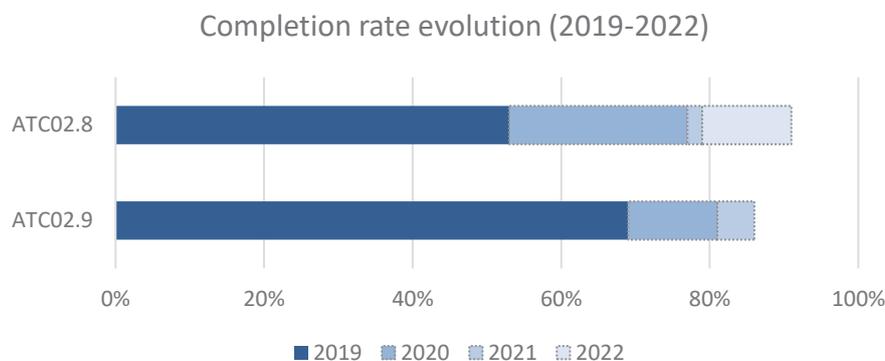
Enhanced STCA for TMAs (**ATC02.9**) is being implemented according to the schedule and the objective is planned to be completed by end 2020, although 7 out of 13 States that have not yet completed the objective reached a progress at or below 10% so far.

It should be noted that due to lower traffic complexity and TMA configuration, some ANSPs (including those declaring the objective as completed) use linear algorithms intended for en-route operations, while others have implemented or plan to implement STCA with enhanced functionalities, including multi-hypothesis algorithms designed to reduce nuisance alert rate.

Enhanced STCA with down-linked parameters via Mode S EHS (**ATC20**) is a local objective that doesn't have a common FOC date and its implementation is subject to local needs and complexity. Currently it is implemented at 10 States/ANSPs, with 5 more having already started or with plans for implementation. Another 19 States declared not to have yet firm plans, awaiting in some cases for a feasibility study to be performed.

Future evolution

As seen in the figure below, **ATC02.9** shows better progress and it is expected to be achieved (reaching 80% of completion rate) by end of 2020, while the achievement of **ATC02.8** will take two more years (2022), with substantial progress expected during 2020. Still this assessment is without prejudice to potential reprioritisation actions that may be taken by stakeholders.



SESAR Solutions

Five SESAR Solutions belong to this EOC, without being yet associated to an implementation objective in the Level 3 of the Master Plan (#06 on Controlled time of arrival (CTA) in medium-density/medium-complexity environment, #08 on Arrival management into multiple airports, #105 on Enhanced airborne collision avoidance system (ACAS) operations using the autoflight system, #100 on ACAS Ground Monitoring and Presentation System and #101 on Extended hybrid surveillance).

Solution	Number of States implemented the solution	Number of States planning to implement the solution
#06	2 States, one location indicated (AT; FI - EFHK)	2 States, 2 locations indicated (AT; PL - EPWA, EPMO)
#08	1 State, 2 locations indicated (DE - EDDL, EDDK)	1 State (CH)
#105	Not yet implemented in any State	3 States (LT; PT; CZ)
#100	3 States, one location indicated (AT; CZ; HU - LHBP)	2 States (LT; SI)
#101	Not yet implemented in any State	Not yet planned in any State

Multimodal Mobility and Integration of all Airspace Users

This EOC supports a safe, efficient and green travel experience and promotes use of the most appropriate means of transport. Mobility as a service will take intermodality to the next level, connecting numerous modes of transport, for people and goods, in seamless door-to-door services.

Various modes of transport, such as car, train, helicopter, drone and aircraft, for different segments of a trip will be seamlessly combined. The integration of RPAS, rotorcraft, and business and general aviation operations through IFR procedures using performance-based CNS infrastructure in the airspace surrounding airports, as well as in TMAs, is a priority.

The Essential Operational Change relies on the following active implementation objective:

- **NAV12** addressing ATS Instrument Flight Rules (IFR) routes for rotorcraft operations

Implementation status at the end of 2019

Implementation Objective	SESAR Solution ref.	Change in the number of States/ Airports completed the objective (2019 vs. 2018)	State/Airports completed the objective in 2019	Progress evolution in 2019 (Completion rate)	Number of States /Airports completed the objective (Total number in Applicability area)	FOC	Implementation Status	Estimated achievement
NAV12*	#113	-	None	-5% (0%)	0 (41)	06/2030	N/A	N/A

* This objective has been substantially changed in light of the newly published PBN Implementing Regulation (Commission Implementing Regulation 2018/1048)

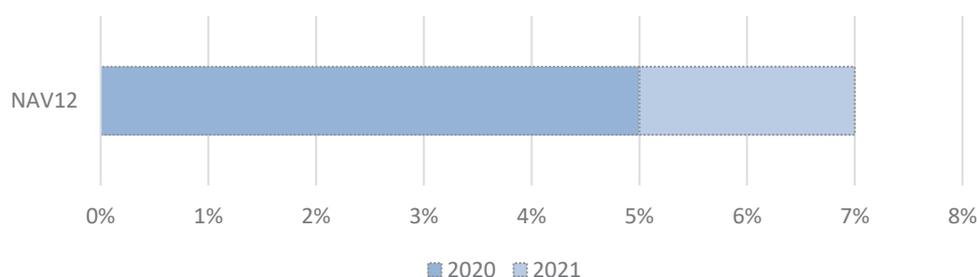
Despite being envisaged to cover various modes of transport and categories of airspace users, this Essential Operational Change is currently supported only by objective **NAV12**, aimed at providing IFR routes for rotorcraft. This objective has been substantially changed in light of the newly published PBN Implementing Regulation (Commission Implementing Regulation 2018/1048), which explains the slight dip in completion rate. In particular, only NO and CH have implemented low-level IFR routes for rotorcraft below FL150, with four other States reporting implementation as ongoing (AT, IT, CY and AZ).

It should also be noted that one of the main ongoing activities in the vast majority of States is the drafting and verification of PBN Transition Plan and this is expected to finish by 2021.

Future evolution

As seen in the figure below, a very limited progress evolution for **NAV12** is expected over the next few years. This can be explained by several factors, the main ones being lack of business needs and specificity of local operational environments. Only three States are expected to complete the objective by 2021.

Completion rate evolution (2020-2021)



SESAR Solutions

Within this EOC, there are no mature SESAR 1 Solutions not being yet subject to Implementation Objectives.

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3 DEPLOYMENT VIEW

How to read Deployment View assessments?

Stakeholders – Stakeholders included in this field are all those who are included in implementation objective, those which have the dedicated SLoAs to complete.

FOC – Full Operational Capability date as defined in the MP L3 2019 Implementation Plan. The FOC date is defined as the date by which full operational capability should be achieved by all stakeholders. Note that this is not applicable to the “Local” objectives which do not have an associated FOC date.

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

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

Status – based on the reported plans, it reflects the estimation of achievement within the FOC date of the objective.

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 which could jeopardise timely implementation of the implementation objective.
Planned delay	The estimated achievement date is beyond the FOC date. Stakeholders already envisage delays in implementation. 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	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	Objective can be declared as closed because it is replaced or renamed, or it is considered as no longer relevant nor contribution to the European ATM Network Performance.

PCP sub-functionality – This reference shows the functional relationship between implementation objective and PCP sub-functionality. This link does not mean that 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 PCP sub-functionality.

ICAO ASBU – This reference shows the link between implementation objective and ICAO ASBU.

OI steps – This reference shows the link between Operational Improvement steps and implementation objectives. MP L3 2019 Implementation Plan shows the level of coverage of the OI step with particular objective.

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

Expected benefits – Graphical identification (icons of the Key Performance Areas) of the expected benefits brought by implementation, based on the information provided in the MP L3 2019 Implementation Plan. The association of the icons to the KPA is as follows:

 Operational efficiency	Operational efficiency	 Capacity	Capacity
 Security	Security	 Environment	Environment
 Safety	Safety	 Cost efficiency	Cost efficiency

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

Note: as from this edition of the Report, two States (IL and MA) have joined the reporting process, therefore for most of the objectives the applicability area has been enlarged. In addition, other Airports (e.g. LYBE) have joined the applicability area of some airport related objectives. In some instances, this enlargement led to a reduction of the completion rate (in the cases where the progress in implementation has not outnumbered the increase in the applicability area).

Progress distribution – the histogram shows the distribution of the implementation progress among States/Airports which have not yet completed the implementation, as well as the mean value of this progress. It is computed based on the progress percentage reported by implementers via the LSSIP process. The number of States/Airports taken into account depends on the type of implementation objective:

- For “Local” objectives, which do not have a predefined applicability area, nor a FOC date, it only takes into account the States/Airports reporting “Ongoing” or “Planned”
- For “non-Local” objectives, it takes into account all States/Airports which are in the Applicability Area of the objective (including those reporting “Not yet planned” or “Not applicable”, as long as they are in the Applicability Area).

Main 2019 developments – This section summarises the main developments in objective implementation based on the reported LSSIP information and expert judgement/analysis. In some cases this information is complemented by the information from Network Manager and Prisme Fleet database for aircraft equipment information.

Applicability area – As defined in the MP L3 2019 Implementation Plan. It also provides information on the changes to the applicability areas compared with the previous edition of the Report.

Map – The maps highlight the progress of implementation at State or Stakeholder level (as relevant) and reflect the progress reported through LSSIP 2019. The colour coding used in the map and its meaning are the following:

Understanding LSSIP implementation progress as shown on the Map

"Progress"	Definition
Completed	<p>The development or improvement aimed by a SLoA is fulfilled in accordance with the MP L3 Plan Finalisation Criteria.</p> <p>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.</p>
Ongoing	<p>Implementation has kicked off but is not yet fully completed and the planned implementation date is within the FOC.</p>
Planned	<p>A planned schedule and proper (approved and committed budgeted) actions are specified within the FOC date for completion.</p>
Late	<p>There is a firm commitment to implement the Objective (e.g. budget and schedule approved) but it is foreseen to be achieved after the FOC date.</p>
Not yet Planned	<p>1) The Stakeholder has not yet defined a project management/implementation plan for the Objective</p> <p>2) 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.</p>
Not Applicable	<p>1) The Stakeholder is not part of the MP L3 Plan 'Applicability Area'; or</p> <p>2) The Stakeholder is part of the MP L3 Plan 'Applicability Area', however:</p> <ul style="list-style-type: none"> • The Stakeholder does not provide the required service for this; or • The Stakeholder implementation is not justified particularly in terms of operational needs; or • The Stakeholder is implementing alternative solutions
Missing Data	<p>Lack of data from a Stakeholder makes it impossible to define "Progress".</p>

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List of MP L3 implementation objectives

List of MP L3 implementation objectives addressed in the Report

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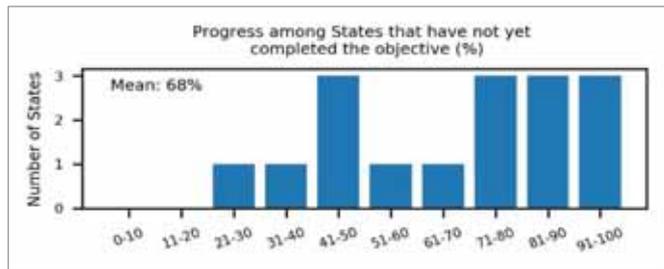
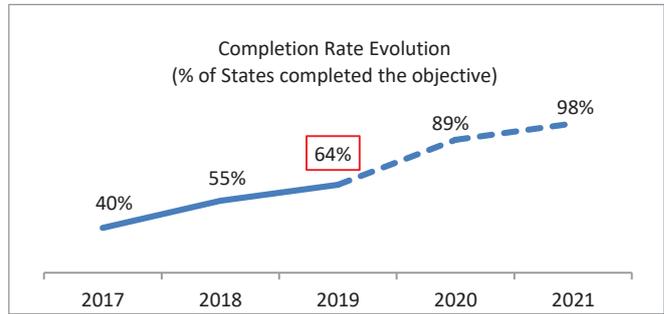
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* - new objective

EOC: CNS Infrastructure and Services

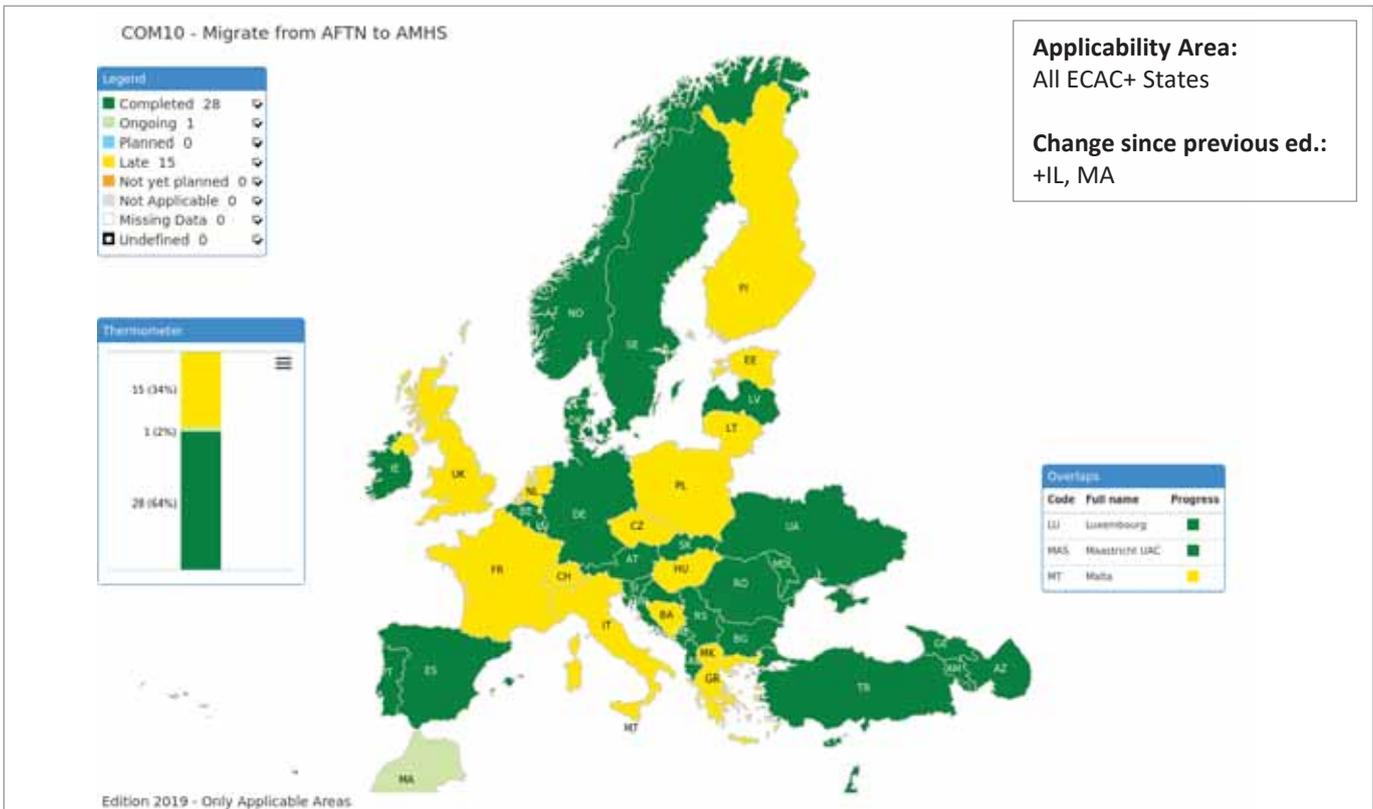
COM10 Migrate from AFTN to AMHS

Stakeholders:	FOC: <u>12/2018</u>
<ul style="list-style-type: none"> • ANSPs • Industry • EUROCONTROL 	Estimated achievement: 12/2020
SESAR Solutions:	No corresponding Solution
Status:	Late
ICAO ASBU:	No corresponding ASBU
OI Steps:	CTE-C06c
Network Strategy Plan:	No corresponding SO
Expected benefits:	



Main 2019 developments:

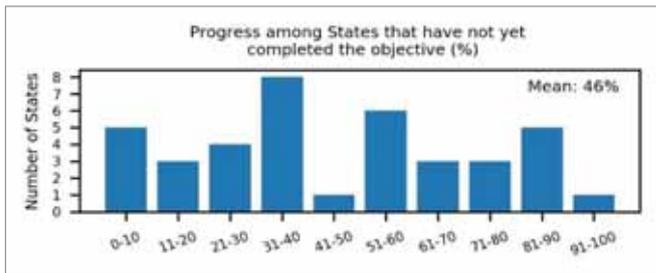
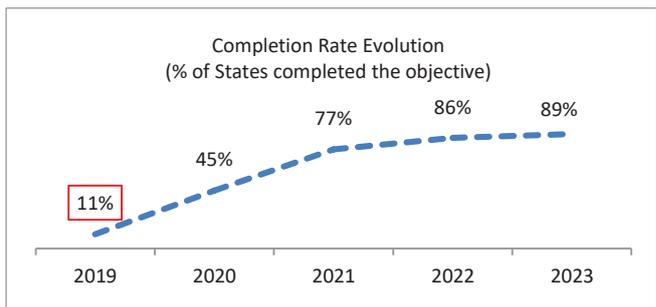
All States have approved plans for implementation of this objective, which made some progress this year: 4 additional States have fully completed the objective. On the other hand, as the FOC date for the objective was the end of 2018, the vast majority of remaining States (15/16) are late in the implementation, while one of the States which have joined the applicability area this year (MA) reports implementation as ongoing. At functionality level, there is a good progress on implementation of the AMHS Level 1 (ASP01), which is the core of the objective, where 93% of the States have completed the respective actions. The implementation of the AMHS Level 2 is proving to be more difficult, observing only 67% of completion. Although the FOC date has been extended to the end of 2018 in order to take into account the latest developments on the security aspects for Extended AMHS as well as on Directory Services, this objective has not yet been achieved.



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COM11.1 Voice over Internet Protocol (VoIP) in En-Route

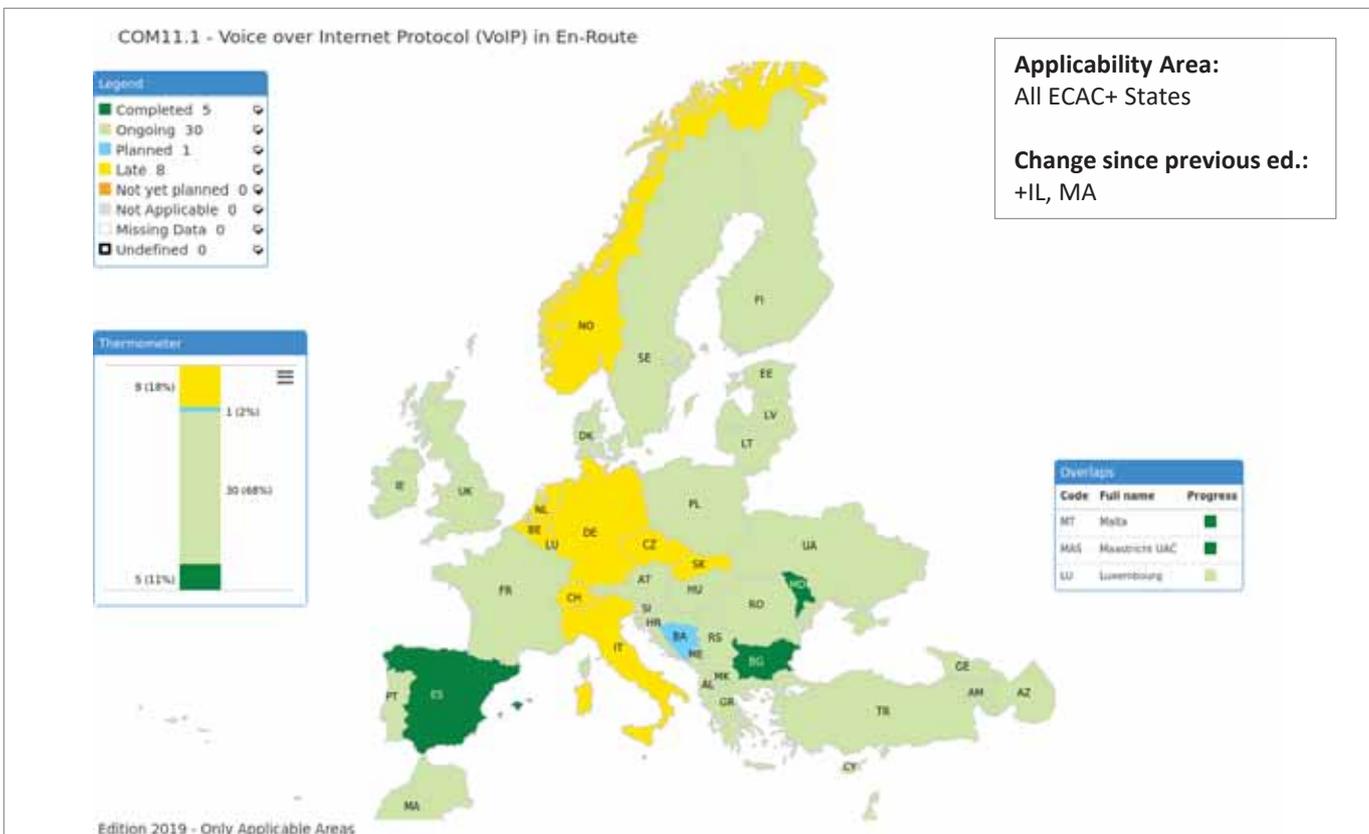
Stakeholders: • ANSPs	FOC: <u>12/2021</u> Estimated achievement: 12/2022
SESAR Solutions:	No corresponding Solution
Status:	Planned delay
ICAO ASBU:	No corresponding ASBU
OI Steps:	CTE-C05a, CTE-C05b
Network Strategy Plan:	SO8/4
Expected benefits:	



Main 2019 developments:

The old objective COM11 of the previous cycle was split in two new objectives: COM11.1 - harmonized VoIP implementation in the En-Route environment (FOC in 12/2021), and COM11.2 - covering Airport and Terminal Operating Environments (FOC in 12/2023), both objectives having inherited the applicability area of COM11.

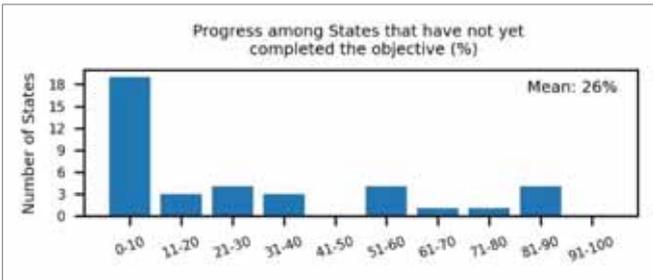
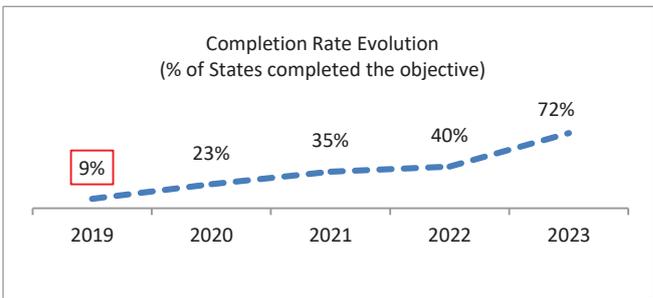
In this first year of implementation for COM11.1 the monitoring results show that 5 States have completed the implementation, 1 is planned, 8 are late and the remaining are ongoing. It should be noted that this is the continuation of implementation (for en-route only) of the former objective COM11 that showed a slow completion rate evolution, with marginal improvements each year.



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COM11.2 Voice over Internet Protocol (VoIP) in Airport/Terminal

Stakeholders: • ANSPs	FOC: <u>12/2023</u> Estimated achievement: Beyond 2023
SESAR Solutions:	No corresponding Solution
Status:	Planned delay
ICAO ASBU:	No corresponding ASBU
OI Steps:	CTE-C05a, CTE-C05b
Network Strategy Plan:	SO8/4
Expected benefits:	 Safety  Capacity  Cost efficiency

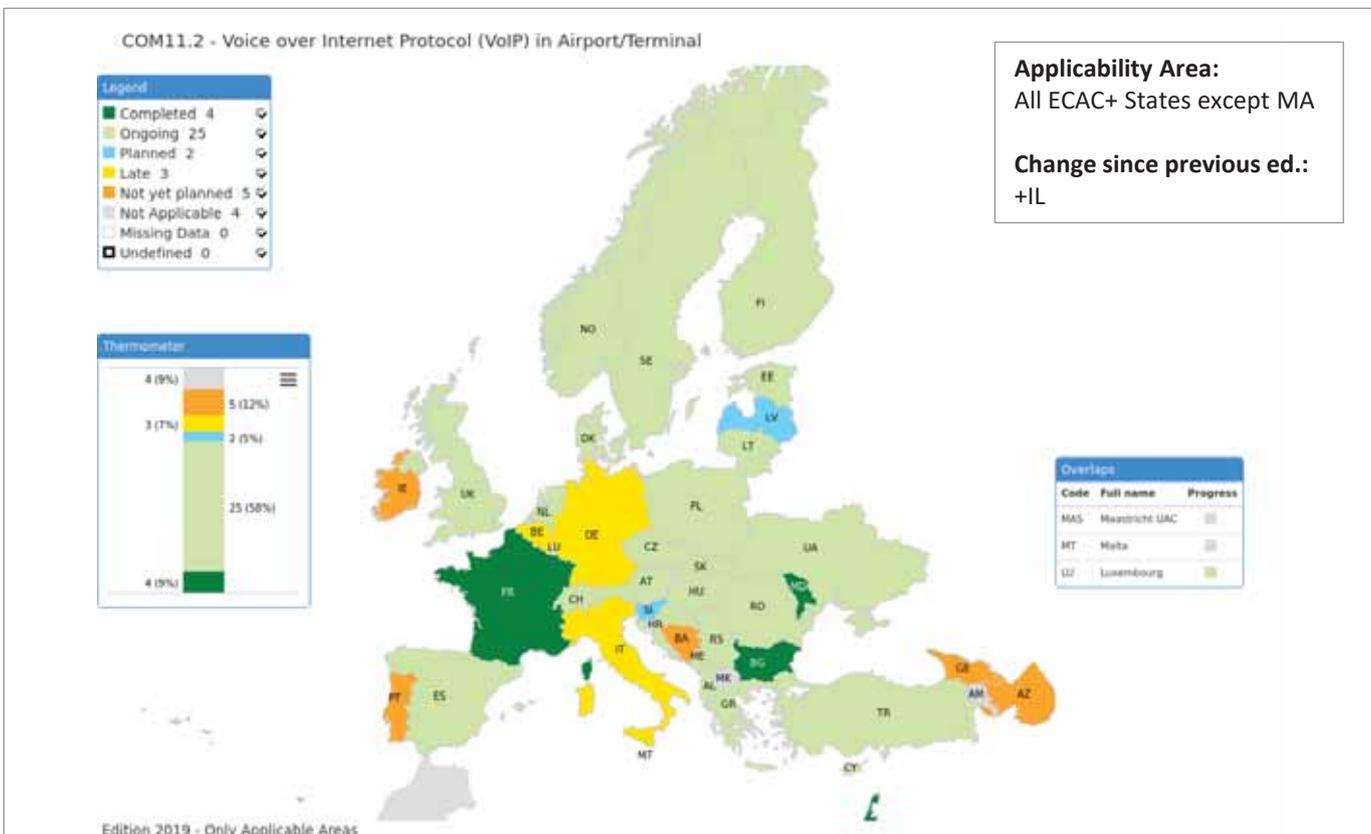


Main 2019 developments:

The old objective COM11 of the previous cycle was split in two new objectives: COM11.1 - harmonized VoIP implementation in the En-Route environment (FOC in 12/2021), and COM11.2 - covering Airport and Terminal Operating Environments (FOC in 12/2023), both objectives having inherited the applicability area of COM11.

In this first year of implementation for COM11.2 the monitoring results show that 4 States have completed the implementation, 2 are planned, 3 are late and 5 don't have any plan, while the remaining are ongoing.

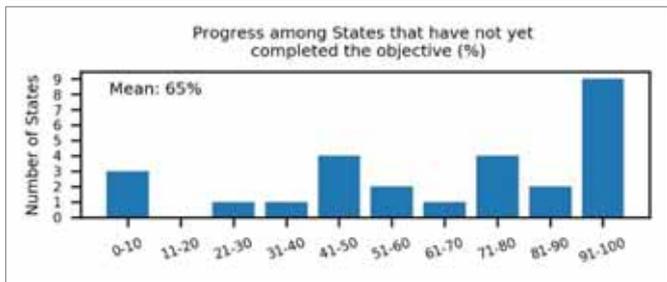
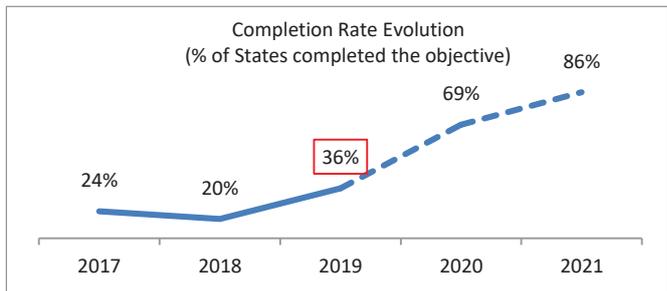
It should be noted that this is the continuation of implementation (for Airport/Terminal only) of the former objective COM11 that showed a slow completion rate evolution in previous cycles, with marginal improvements each year.



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ITY-ACID Aircraft identification

Stakeholders:	
<ul style="list-style-type: none"> ANSPs Airspace Users 	
FOC:	01/2020
Estimated achievement:	12/2021
SESAR Solutions:	No corresponding Solution
Status:	Late
ICAO ASBU:	No corresponding ASBU
OI Steps:	GSURV-0101
Network Strategy Plan:	SO8/2
Expected benefits:	



Main 2019 developments:

As the FOC date of the objective has passed, the risk of delay identified last year has been confirmed and the objective is now "Late". While the deployment of appropriate surveillance coverage is progressing well, in particular in the en-route airspace and around major airports in the core area of Europe, there are still substantial gaps at lower levels/altitudes and around smaller airports. It is observed that several States claiming compliance with the objective (among those shown in green on the map) have not yet declared to the NM the airspace where downlinked aircraft identification is used, as required by the objective and the underlying Regulation. Therefore full compliance is not yet achieved in these States, even if the technical infrastructure might be available. At the cut-off date of the Report (31.12.2019) only 5 States (AT, BE, HU, HR and RO) were **fully** compliant with the applicable requirements: capability to use the downlinked aircraft ID for all IFR/GAT traffic and the use of the conspicuity code. While an increase in completion rate is expected in 2020 it should be noted that full (100%) compliance across the applicability area will not happen before 2026.

ITY-ACID - Aircraft Identification

Legend

- Completed 15
- Ongoing 3
- Planned 0
- Late 24
- Not yet planned 0
- Not Applicable 0
- Missing Data 0
- Undefined 0

Thermometer

Applicability Area:
All ECAC+ States except MA and UA

Change since previous ed.:
+IL, TR

Overlaps

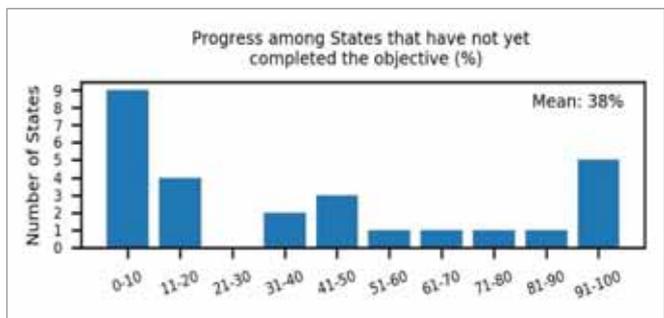
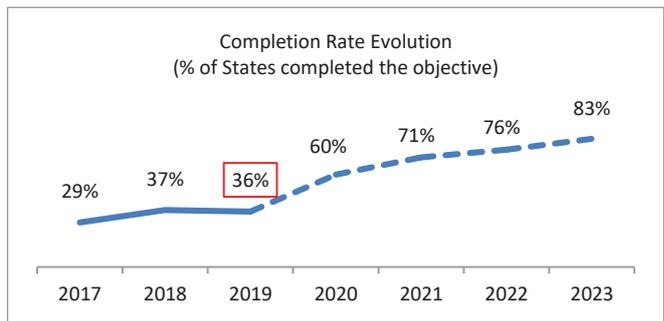
Code	Full name	Progress
MA	Maasticht SAC	
LU	Luxembourg	
MT	Malta	

Edition 2019 - Only Applicable Areas

EOC: CNS Infrastructure and Services

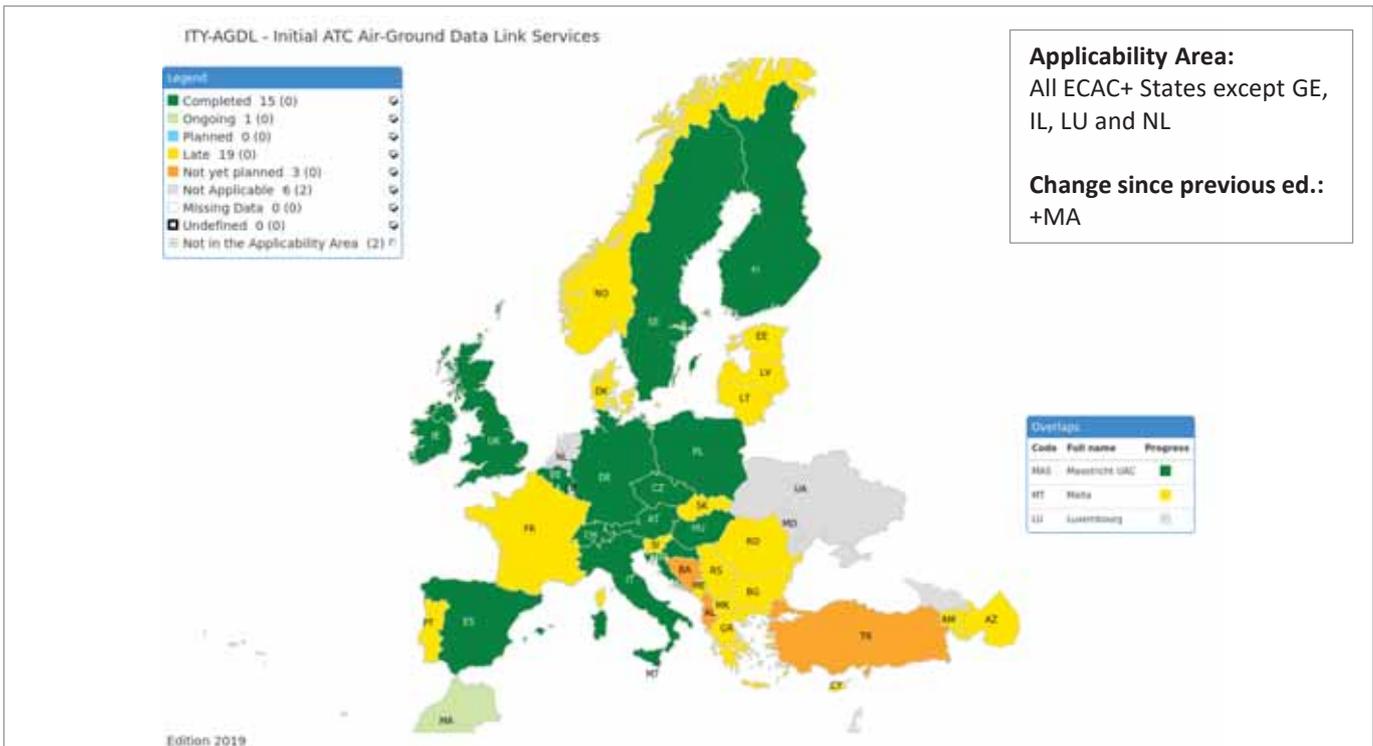
ITY-AGDL Initial ATC Air-Ground Data Link Services

Stakeholders: <ul style="list-style-type: none"> • ANSPs • Airspace Users • Regulators • Military 	ATS unit capability: 02/2018 Aircraft capability: 02/2020 Estimated achievement: 12/2023
SESAR Solutions: -	
Status:	Late
PCP Sub-Functionality:	-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
Expected benefits:	 



Main 2019 developments:

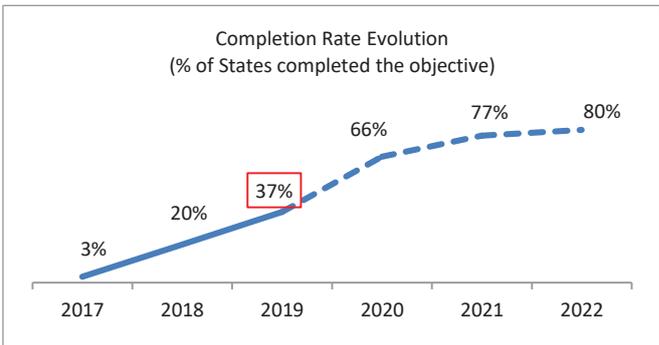
In 2016, the SESAR Deployment Manager has been mandated by the EC to act as Data Link Services (DLS) Implementation Project Manager and on this basis it developed a DLS Recovery Plan aiming to set a realistic path from today's DLS implementation status in Europe. However, for the year 2019, there has been no progress in deployment compared to 2018. As in the year 2018, for the year 2019, 15 States (36%) reported the status "Completed" for this objective. 1 non EU+ Member State (3%) reported the status "Ongoing" with a projected overall implementation date by February 2020. 19 States (50%) reported the status "Late" with the latest projected implementation date by December 2023. 3 States (8%) reported the status "Not yet planned" for this objective. 6 reported the status "Not Applicable" for this objective, either not being an EU+ Member State or not providing services above FL285. The main reason for delay is the late procurement of New ATM systems capable to handle DLS functionalities and required VDL Infrastructure. The overall achievement of this objective can be expected by December 2023.



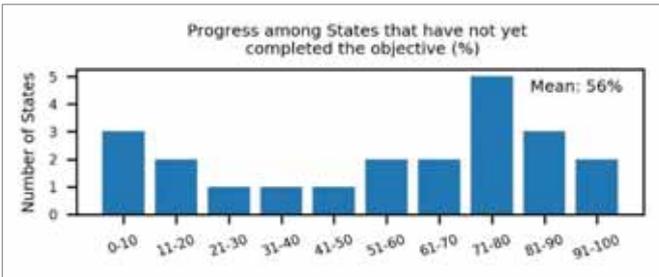
EOC: CNS Infrastructure and Services

ITY-AGVCS2 Implement AGVCS below FL195

Stakeholders: <ul style="list-style-type: none"> • ANSPs • Airspace Users • Military • Network Manager • Regulators • Airport Operators 	Radio equipment: 12/2017
	Freq. converted: 12/2018
	State Aircraft: 12/2020
	Est. achievement: 12/2022



SESAR Solutions: No corresponding Solution
Status: Late
ICAO ASBU: No corresponding ASBU
OI Steps: CTE-C01a
Network Strategy Plan: SO8/1
Expected benefits:



Main 2019 developments:

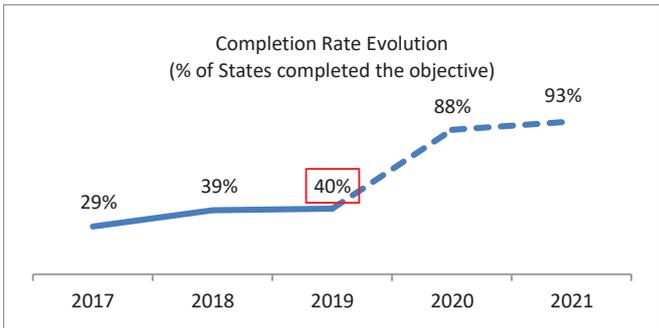
The number of States having reported completion has increased from 7 to 13 so the objective remains “Late”, with full completion expected for 2025. Out of roughly 9500 assignments (EU area), 5700 are already 8.33 kHz while approximately 3000 other assignments are scheduled for conversion between 2020 and 2025, with some marginal conversions expected for 2027/2028. These phased conversions are mostly caused by the deferred conversion of aerodrome assignments or of those used by the military stakeholders and are due to the high number of non-equipped aircraft, in particular General Aviation and State aircraft. Fortunately these assignments have a limited impact on the Network. EUROCONTROL NM, through the 8.33 VCS Implementation Support Group, takes a central role in the coordination of the implementation of 8.33kHz below FL195 and it is strongly recommended that all States and in particular ECAA, actively participate in the group.



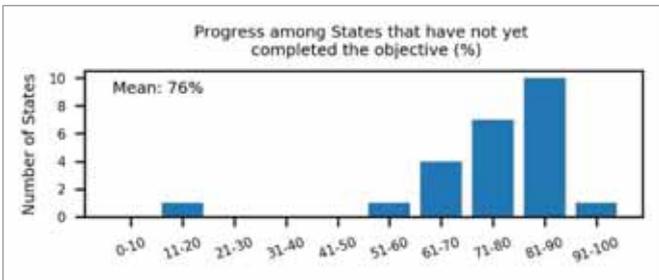
EOC: CNS Infrastructure and Services

ITY-SPI Surveillance Performance and Interoperability

Stakeholders: <ul style="list-style-type: none"> • ANSPs • Airspace Users • Military • Regulators 	FOC: <u>06/2020</u> Estimated achievement: 12/2020
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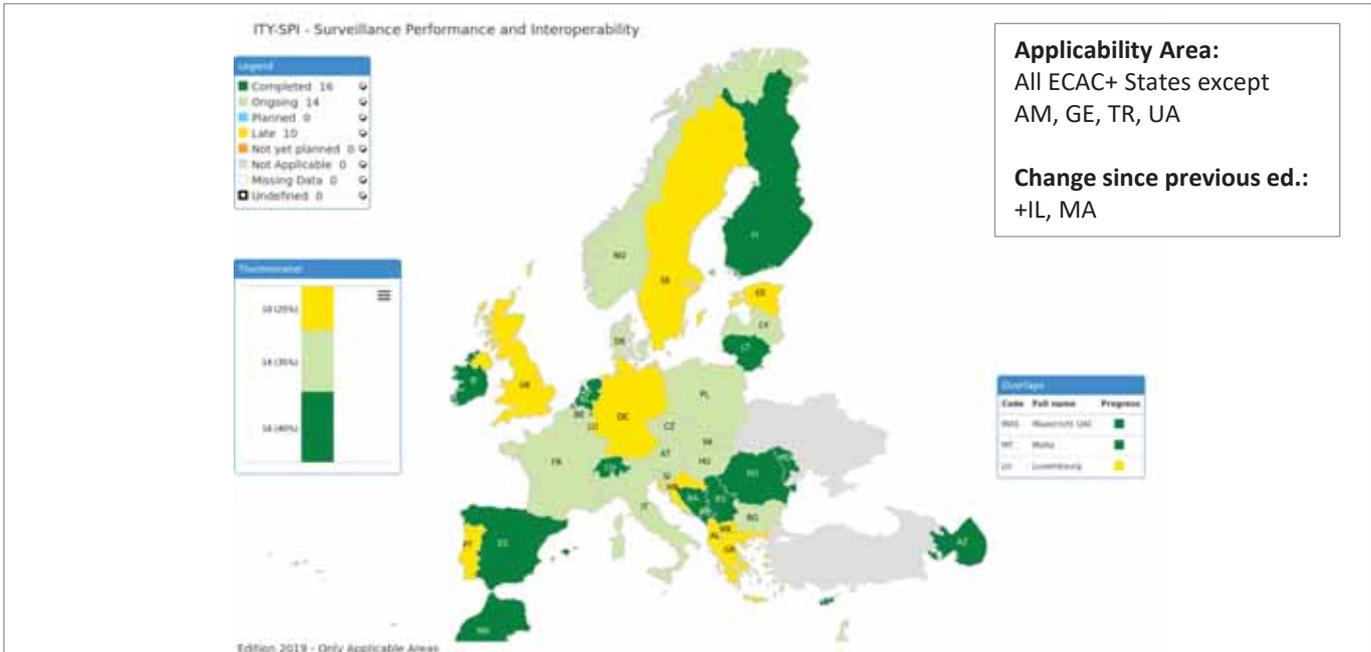


SESAR Solutions:	No corresponding Solution
Status	Risk of delay
ICAO ASBU:	BO-ASUR
OI Steps:	GSURV-0101
Network Strategy Plan:	SO8/3, SO8/4
Expected benefits:	



Main 2019 developments:

Within the applicability area, on the ANSP side the overall implementation progress is very good, with only 2 ANSPs in the EU States (GR, LU) having missed the 2015 implementation milestones. Based on the reported plans, it is expected that they will catch up by end 2020. There is also good visibility from the Military stakeholders with regard the equipage plans of their fleets. It is important to note 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 that multiple sources of information, in particular at State level, should be corroborated in order to obtain a complete picture of the implementation (e.g. the ANSP actions addressed by the objective are **limited** to interoperability, safety assessment and training). Regarding the airspace users capabilities, equipage monitoring performed by EUROCONTROL indicates that per end December 2019 around 62% of the mandated European Commercial Air Transport aircraft fleet was equipped with ADS-B v2. Based on surveys performed by the SDM the equipment rate is predicted to reach about 75% by June 2020 (the regulated compliance date). The equipment retrofit plans go beyond June 2020 and it is expected that about 85% of the mandated aircraft will be equipped by June 2021 and about 95% by December 2023. There is slower progress with regard State aircraft with 76% equipage to be reached by December 2025.



Applicability Area:

All ECAC+ States except AM, GE, TR, UA

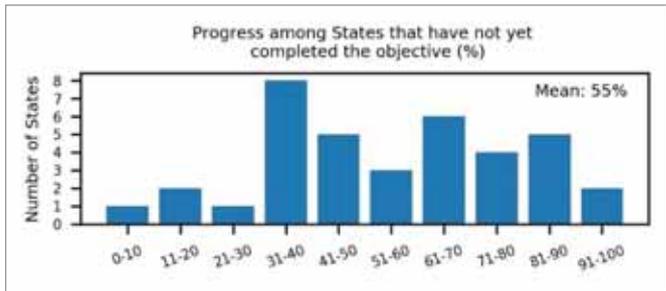
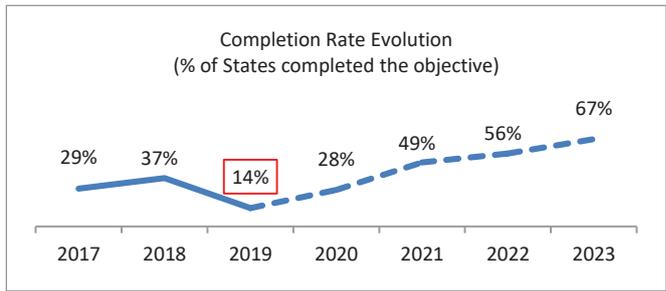
Change since previous ed.:

+IL, MA

EOC: CNS Infrastructure and Services

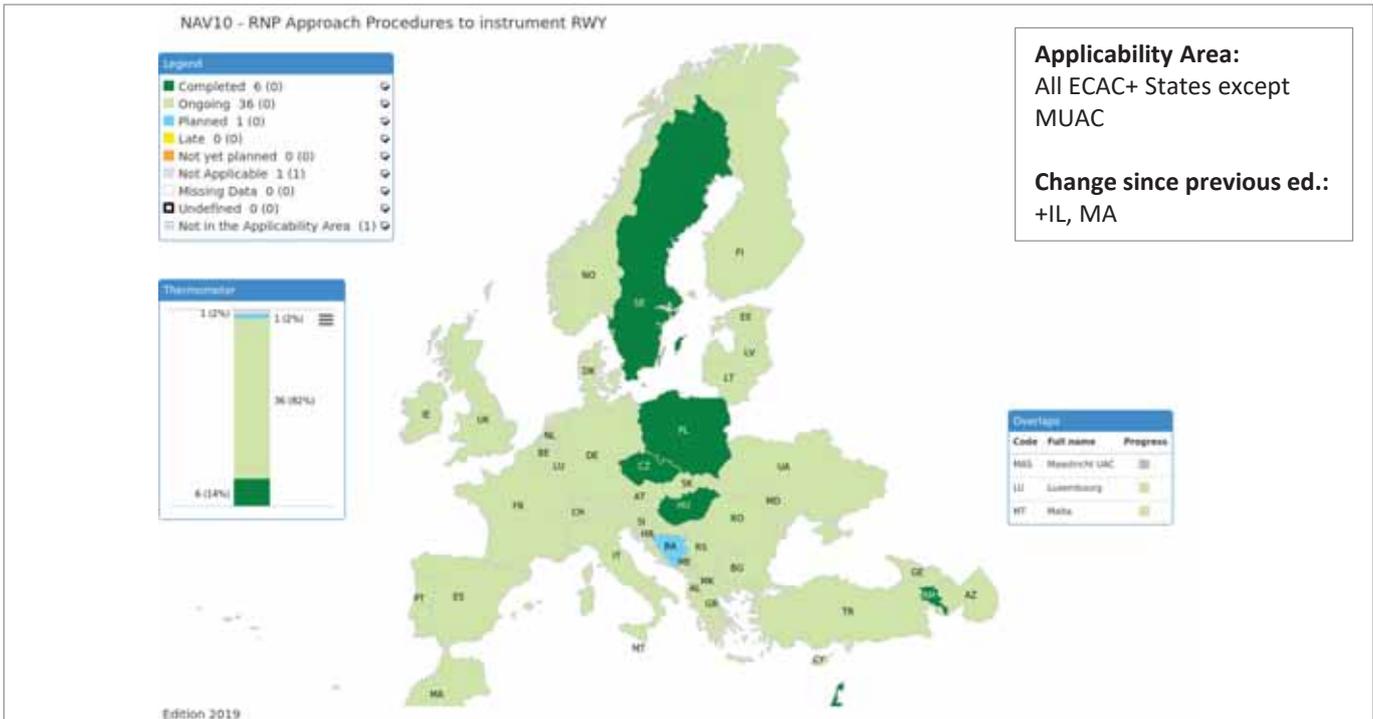
NAV10 APV procedures

Stakeholders:	FOC: <u>01/2024</u>
<ul style="list-style-type: none"> • ANSPs • Airspace Users • Regulators 	Estimated achievement: 2024
SESAR Solutions:	Solution #103
Status:	On time
PCP	Pre-requisite for S-AF1.2 Enhanced
Sub-Functionality:	TMA Using RNP-Based Operations
ICAO ASBU:	B0-APTA
OI Steps:	AOM-0602, AOM-0604
Network Strategy Plan:	SO6/5
Expected benefits:	



Main 2019 developments:

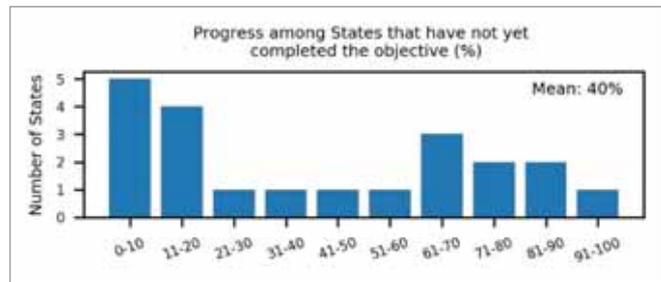
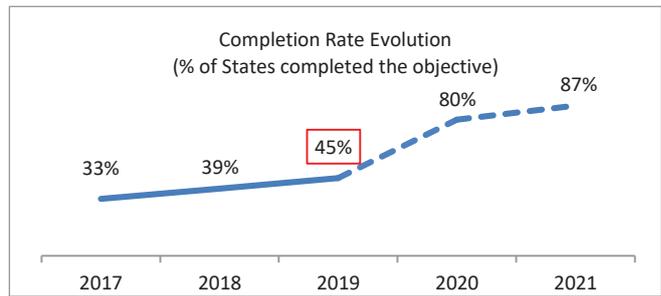
The current reporting cycle was the first one after the amendment of the objective in line with the PBN IR. This amendment led to a substantial reduction (-23%) of the completion rate, because of the need to reassess the objective in the light of the new requirements, making many States to revert the status of the objective from “Completed” to “Ongoing”. One of the main ongoing activities in a vast majority of States, is the drafting and verification of PBN Transition Plan, required by the PBN IR. This activity is expected to finish by 2021. About half of the states implementing RNP APCH at iRWY with PA do not have SBAS flown to LPV minima yet. About 1/3 of the states already implemented RNP APCH at iRWY without PA, while another 1/3 does not show any developments towards implementation. The same applies for NPA flown to LNAV, where about 1/3 of states already has it, while another 1/3 shows no developments yet. According to the EUROCONTROL CNS business intelligence based on ICAO FPL, in 2019 about 88% of the flights to ECAC airports were RNP APCH by any means capable, out of which 74% had LNAV/VNAV and 6% LPV capability. However it should be noted that the EGNOS Service area is not covering yet the entire ECAC area, neither all the EU states, potentially impeding the full deployment of the objective.



EOC: ATM Interconnected Network

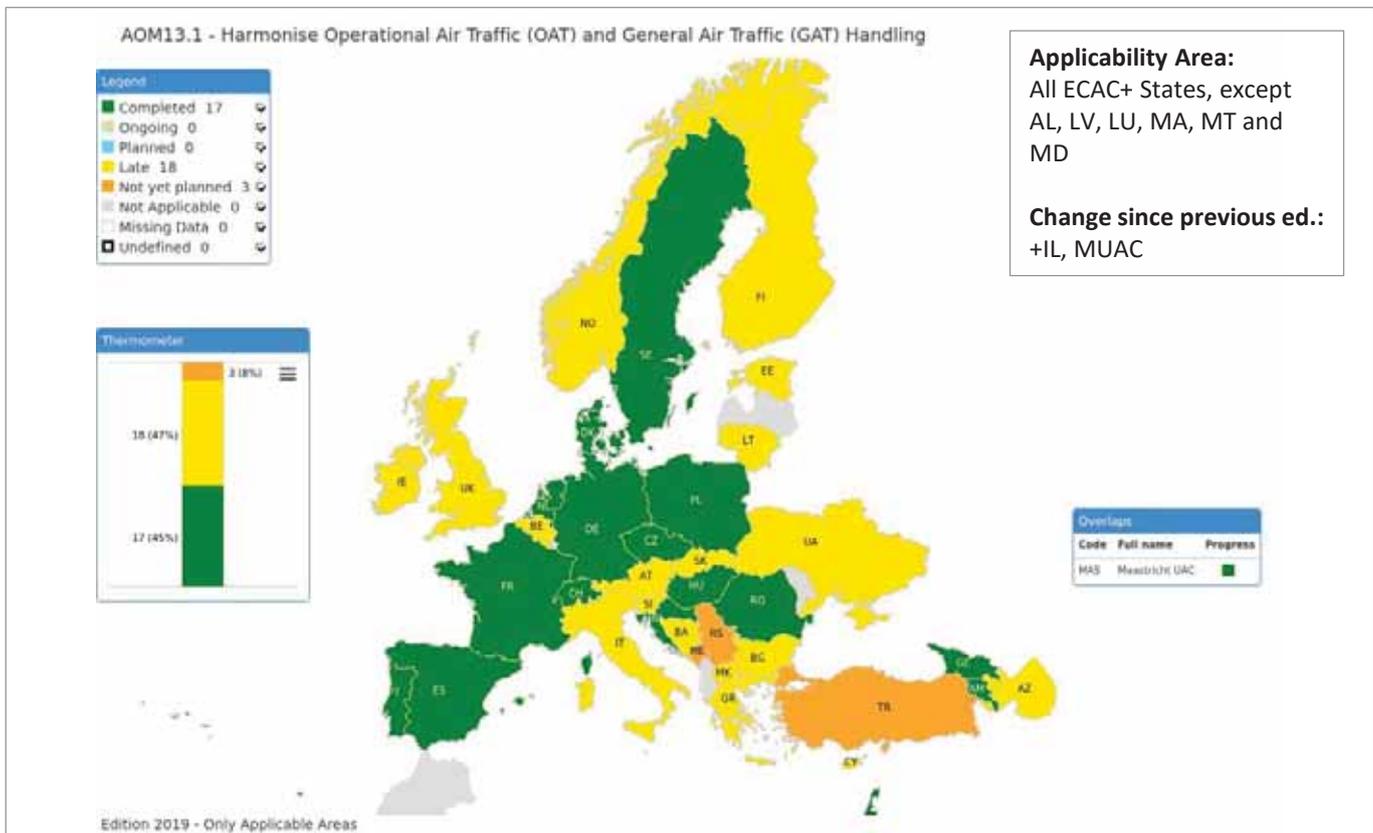
AOM13.1 Harmonise OAT and GAT handling

Stakeholders:	
<ul style="list-style-type: none"> • ANSPs • Military • Regulators 	
FOC:	12/2018
Estimated achievement:	12/2020
SESAR Solutions:	No corresponding Solution
Status:	Late
ICAO ASBU:	No corresponding ASBU
OI Steps:	AOM-0301, AAMS-10a, AIMS-19b
Network Strategy Plan:	SO6/2
Expected benefits:	  



Main 2019 developments:

Full Operation Capability deadline was reached in 2018. However, only 17 States within the applicability area declare this Objective as “completed” (3 more than in previous year: DK, IL, PL) which gives 45% of implementation rate. 18 States (47% of all applicable States) declare this Objective as “late” with the percentage of implementation varying between 0 and 88% and the planned implementation date between 2020-2025. The estimated 80% threshold of achievement for this Objective, following the States’ declarations, will be reached at the end of 2020. 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 (TR, RS, ME) the main reasons are legislative (lack of proper legislation passed) or are linked to lack of decision on implementation of EUROAT.

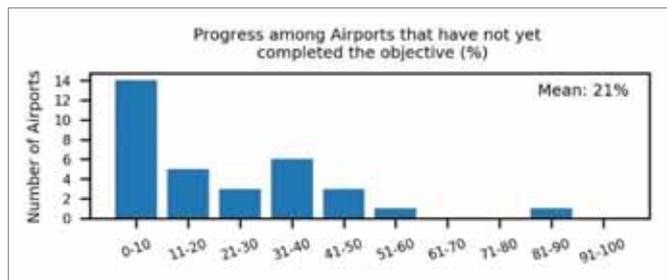
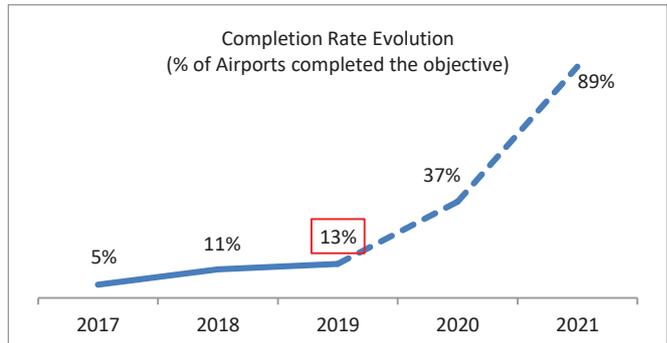


EOC: ATM Interconnected Network

AOP11 Initial Airport Operations Plan

Stakeholders: • ANSPs • Airspace Users • Airport Operators	FOC: 12/2021
	Estimated achievement: 12/2021

SESAR Solutions:	Solution #21
Status:	On time
PCP Sub-Functionality:	S-AF2.1 DMAN synchronised with pre-departure sequencing S-AF4.2 Collaborative NOP
ICAO ASBU:	B1-ACDM
OI Steps:	AO-0801-A
Network Strategy Plan:	SO6/2
Expected benefits:	



Main 2019 developments:

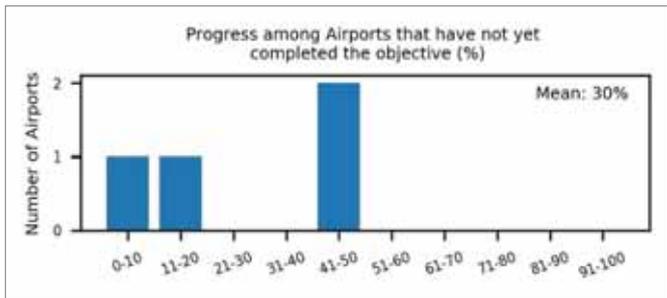
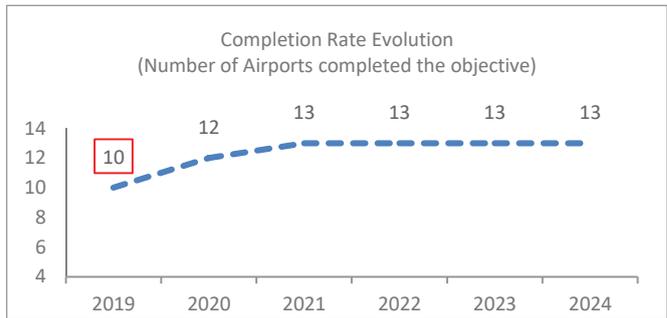
Two additional airports (Amsterdam EHAM, Nuremberg EDDN) completed the implementation in 2019, leading to a total of 5 airports with airport operations plan in place (one airport, Zurich LSZH, changed its implementation status from “Completed” to “Ongoing”). Completion covers 3 out of 24 PCP airports and 2 non-PCP airports. The ongoing implementation has increased within the applicability area from 26 to 27 airports (19 PCP and 8 non-PCP) with the implementation progress between 6-81%, with Copenhagen Airport being at 81%. Three airports (1 PCP and 2 non-PCP) report this objective as “planned”. In 2019, all (PCP and non PCP) airports having implementation plans aim to implement this Objective by the FOC date. Two airports, Prague LKPR (ongoing) and Sarajevo LQSA (Not yet planned), provide implementation progress without being in the applicability area of the objective so they do not appear on the Map. However they are counted among the overall 28 “Ongoing” implementations and 3 “NYP” shown in the Legend.



EOC: ATM Interconnected Network

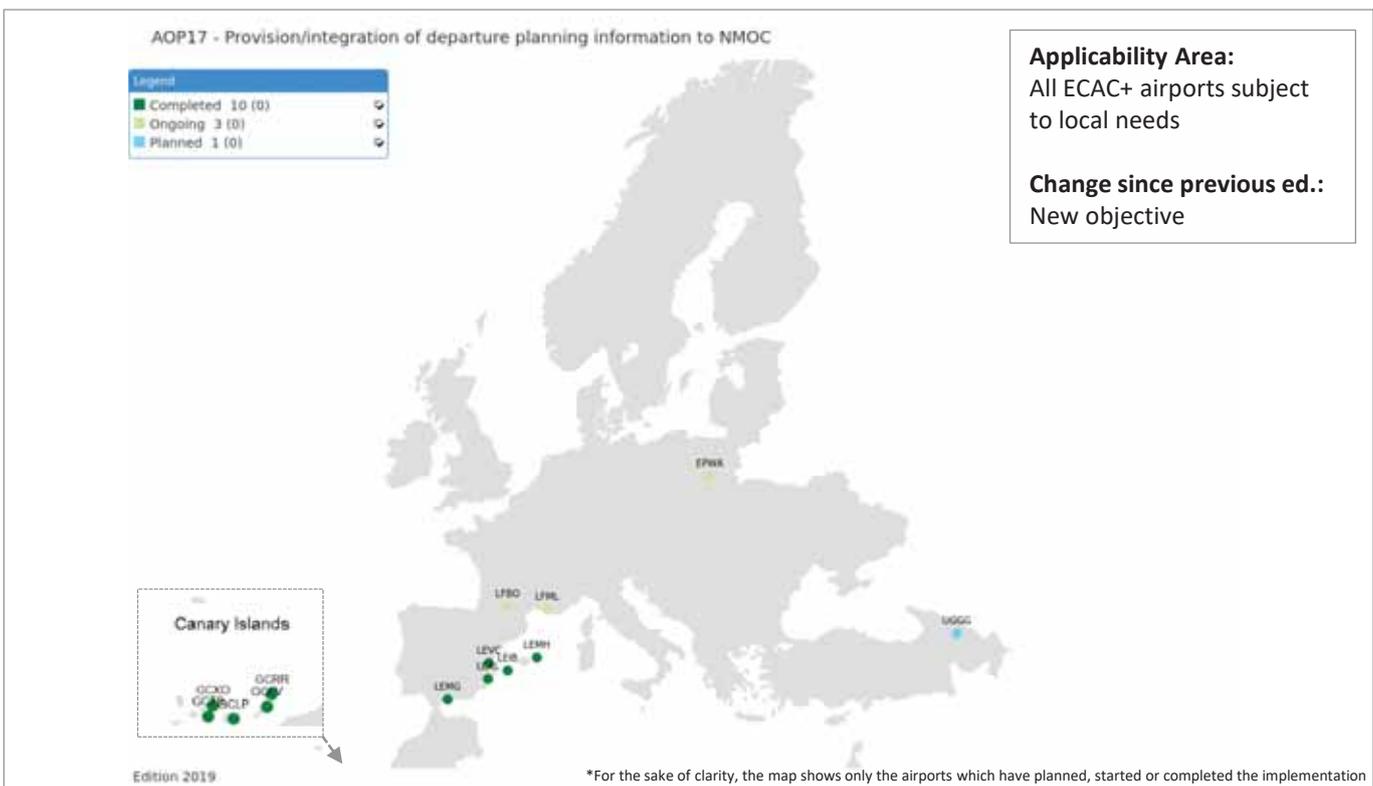
AOP17 Provision/integration of departure planning Information to NMOC [Local]

Stakeholders: <ul style="list-style-type: none"> ANSPs Network Manager 	FOC: n/a
	Estimated achievement: Not available
SESAR Solutions:	Solution #61
Status:	Not applicable
ICAO ASBU:	B1-ACDM, B1-NOPS
OI Steps:	DCB-0304
Network Strategy Plan:	No corresponding SO
Expected benefits:	



Main 2019 developments:

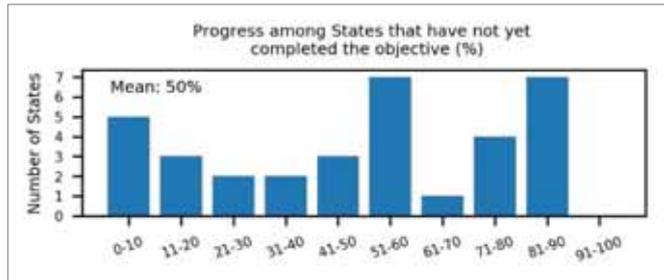
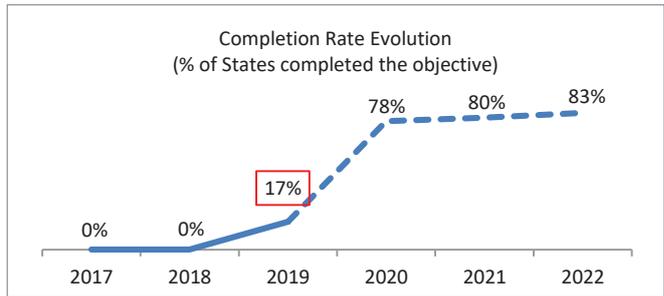
This objective was monitored for the first time in 2019, so no comprehensive assessment of the progress can be done. It should be noted that AOP17 should be considered as not applicable for the airports that already deployed A-CDM or intend to deploy A-CDM in near future, which explains the large number of airports that reported this objective as not applicable (26). Ten (Advanced ATC Tower) airports in Continental Spain and on Canary Islands reported it as “completed”. Three more airports started implementation (EPWA by 12/2026, LFBO & LFML by 06/2020), while UGGG has planned to implement it by 12/2021. The remaining airports have not yet planned the implementation of this objective or consider it as “Not applicable”.



EOC: ATM Interconnected Network

COM12 NewPENS

Stakeholders:	33 ANSPs : 31/12/2020
<ul style="list-style-type: none"> ANSPs Airport Operators Airspace Users Network Manager 	Other stakeholders : 31/12/2024
	Estimated achievement: 12/2022
SESAR Solutions:	No corresponding Solution
Status:	On time
PCP Sub-Functionality	Enabler for AF5 Initial SWIM
ICAO ASBU:	B1-SWIM
OI Steps:	CTE-C06b
Network Strategy Plan:	SO2/3, SO2/4, SO8/3, SO8/4
Expected benefits:	



Main 2019 developments:

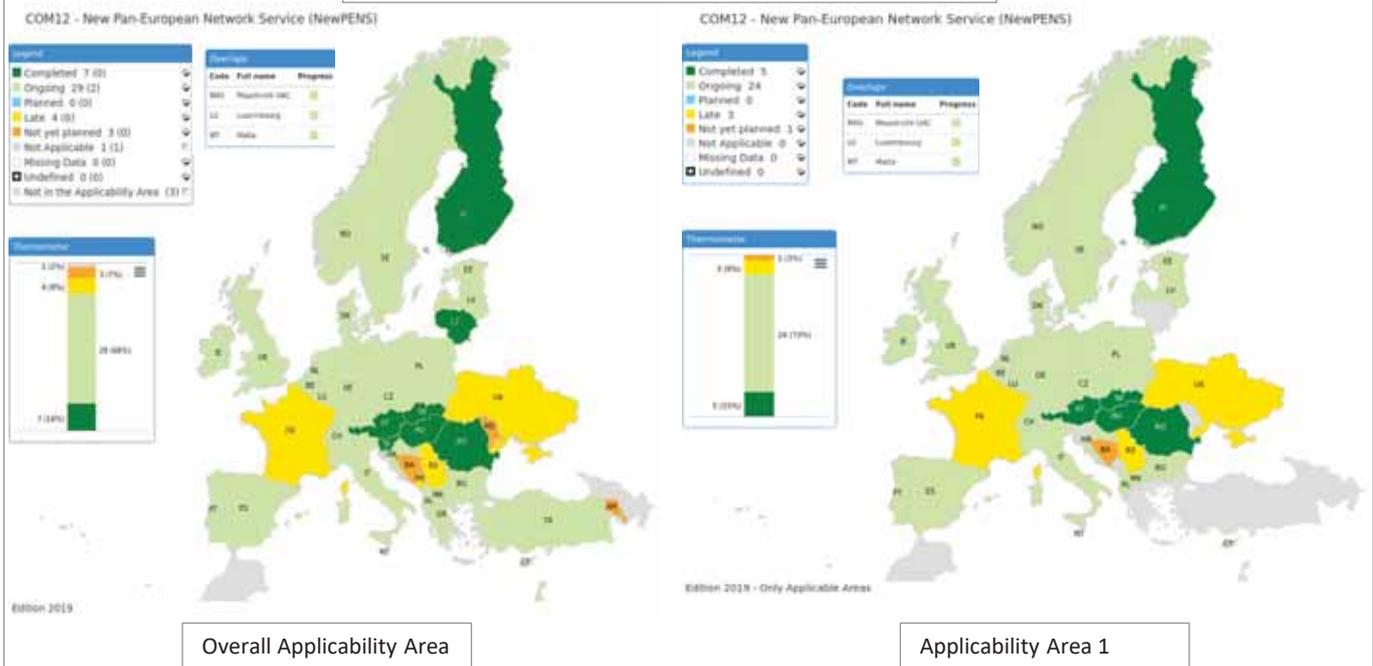
This is the third cycle when the monitoring of Objective COM12 was performed. It should be noted that 33 ANSPs have signed a NewPENS Common Procurement Agreement with EUROCONTROL and thus their implementation date is expected to be the same (31.12.2020). This group of ANSPs corresponds to Applicability Area 1. For those ANSPs, with FOC date by the end of 2020, 5 are completed, 3 are late and 1 not yet planned. The remaining ones are ongoing. 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, 2 have completed, 3 are ongoing, 1 is late and 2 are not yet planned.

Applicability Area:

- Area 1 (signatories ANSPs): 33 ANSPs
- Area 2: ECAC+ Stakeholders not part of Area 1, except MA

Change since previous ed.:

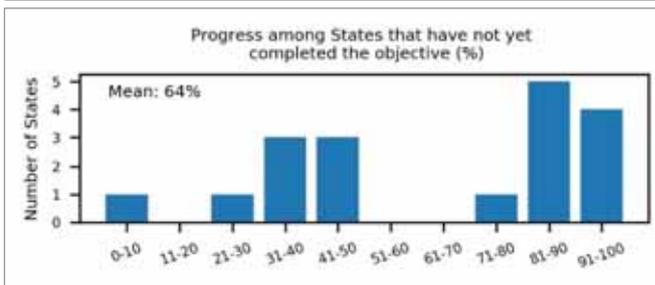
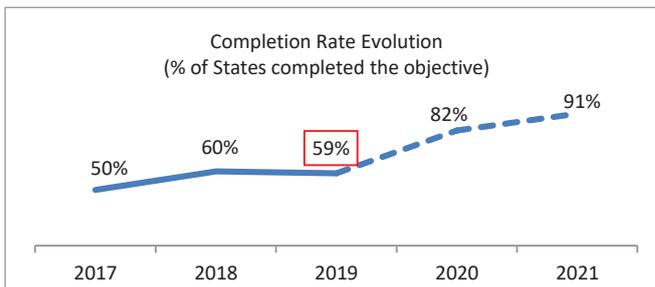
+IL



EOC: ATM Interconnected Network

FCM03 Collaborative Flight Planning

Stakeholders:	FOC: 12/2017
<ul style="list-style-type: none"> ANSPs Network Manager 	Estimated achievement: 12/2020
SESAR Solutions:	No corresponding Solution
Status:	Late
PCP Sub-Functionality:	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
Expected benefits:	



Main 2019 developments:

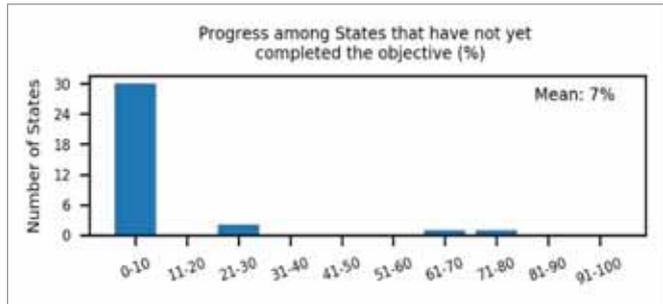
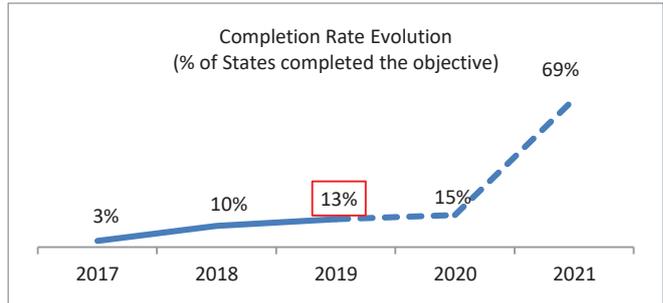
Implementation continues to stagnate, with only 1 State (FI) having reported completion in 2019. Overall, 59% of the States (the reduction of the completion rate being caused by the enlargement of the applicability area) have declared completion which could be considered as low, taking into account that the objective was introduced in 2002 (the first FOC was end 2005, followed by several postponements). The expected completion in 2019 has been missed and a substantial increase in completion rate (from 59% to more than 80%) is now provisionally expected for 2020, supported by an ongoing clarification of the AFP requirements. The full implementation of the objective requires not only the capability of the local ANSP systems to generate and transmit AFP messages, but also a testing and validation with the NM before the operational integration within the NM systems. It is therefore important to follow the detailed NM specifications in the implementation process and to use the AFPs only for the scope for which they are currently designed for (i.e. update of flight intent). Also, only automatic AFPs need to be considered as the manual AFPs are not part of NM integration/validation. It is observed that for several States having reported completion (DE, UK, RS, ME, LU), the integration within NM has not yet been tested for all centers (or the tests have failed), therefore the AFP messages are not yet integrated in the NM system, or the automation requirement is not implemented yet, or the implementation addresses only a small subset of the objective and does not include the AFP generation. Therefore the real completion rate, reported by NM following the AFP integration, is substantially lower than the one reported by the States.



EOC: ATM Interconnected Network

FCM04.2 STAM phase 2

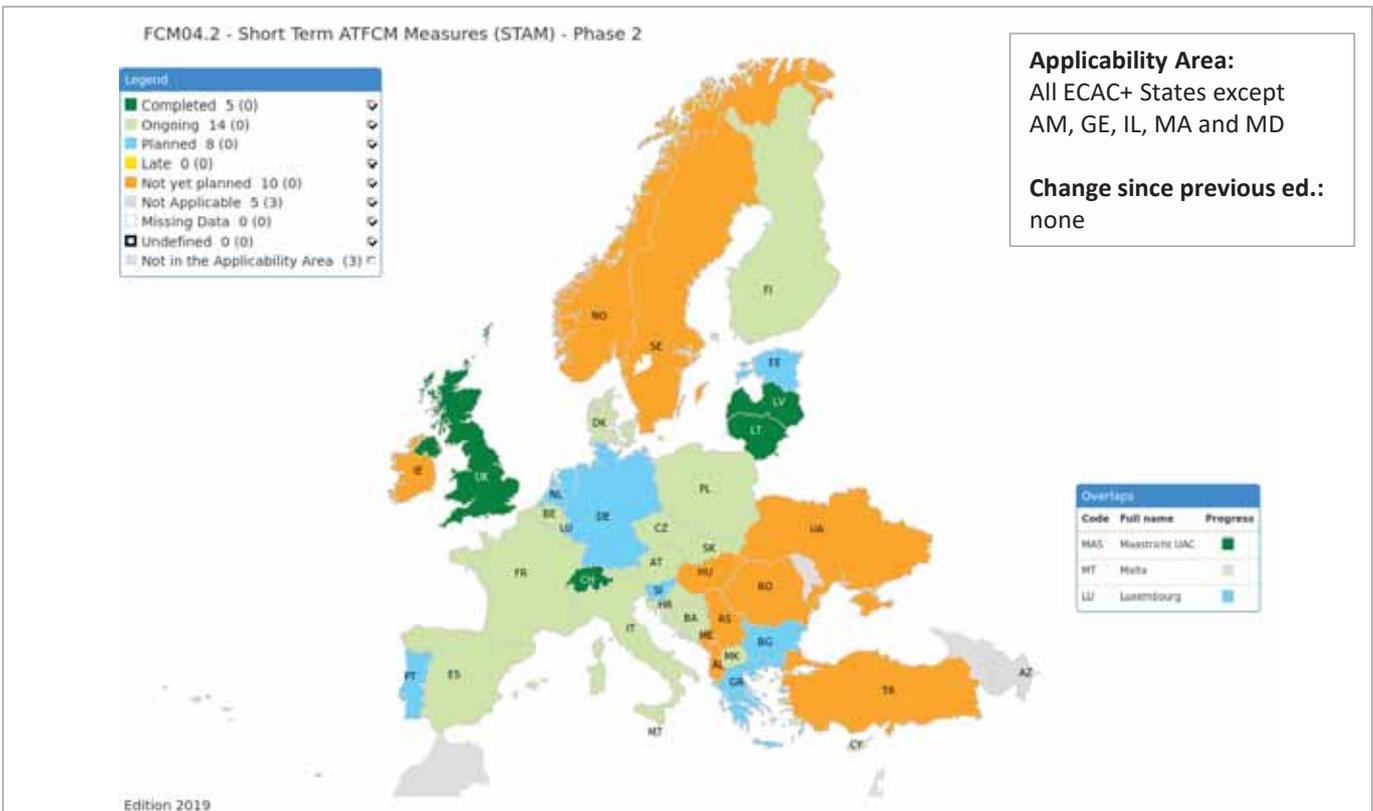
Stakeholders:	FOC: 12/2021
<ul style="list-style-type: none"> ANSPs Airspace Users Network Manager 	Estimated achievement: Beyond 2021
SESAR Solutions:	Solution #17
Status:	Risk of delay
PCP Sub-Functionality:	S-AF4.1 Enhanced Short Term ATFCM Measures
ICAO ASBU:	No corresponding ASBU
OI Steps:	DCB-0308, ER APP ATC 17
Network Strategy Plan:	SO4/3, SO5/4
Expected benefits:	



Main 2019 developments:

This objective was introduced in the plan in 2016, reflecting the PCP requirements as well as SDM’s Deployment Programme. Only 4 States have declared implementation of STAM Phase 2 as completed so far (+ MUAC), with 14 more on-going and 8 planned. 11 ANSPs (BE, BG, CY, CZ, DE, DK, EE, FI, MK, PT, SI) clearly indicated their plan to make use of EUROCONTROL NM STAM application, while fewer (8) ANSPs (BA, ES, FR, GR, IT, NL, PL, SK) intend to develop their own local tool instead.

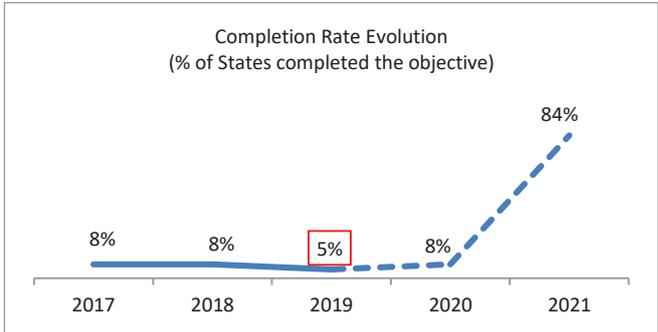
At this moment it is difficult to come up with a reliable estimated achievement date, however a significant improvement is expected after 2021, since in most ANSPs the implementation of this objective is constrained by the finalisation of the n-Connect project by Network Manager.



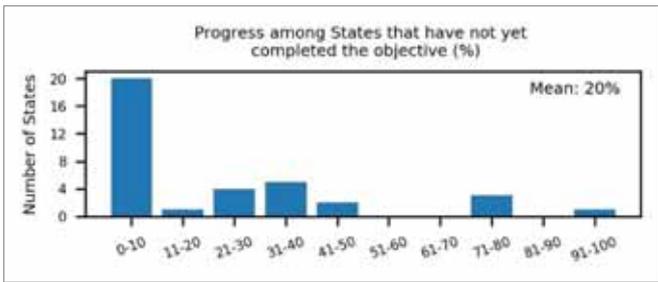
EOC: ATM Interconnected Network

FCM05 Interactive rolling NOP

Stakeholders: <ul style="list-style-type: none"> • ANSPs • Airspace Users • Airport Operators • Network Manager 	FOC: <u>12/2021</u>
	Estimated achievement: 12/2021

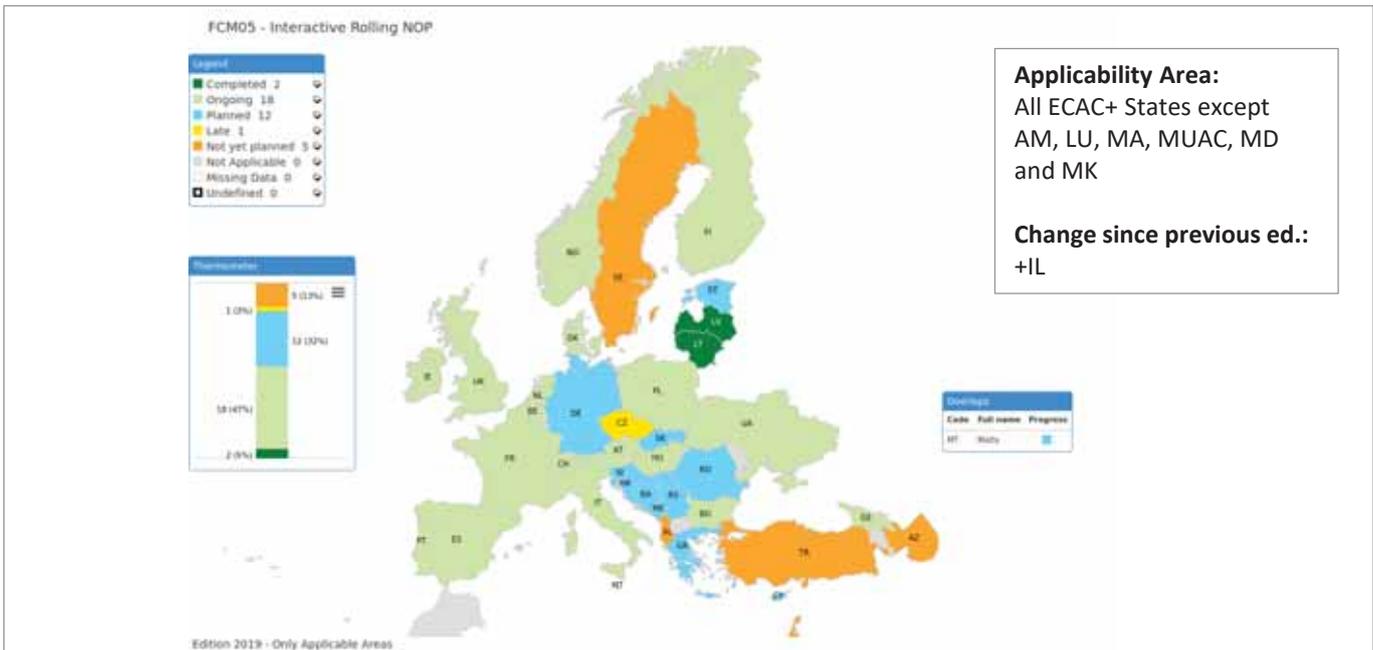


SESAR Solutions: Solutions #20 & #21
Status: On time
PCP Sub-Functionality: S-AF4.2 Collaborative NOP
ICAO ASBU: B0-NOPS, B1-NOPS
OI Steps: DCB-0102, DCB-0103-A
Network Strategy Plan: SO2/1, SO2/2, SO2/3, SO2/4
Expected benefits: <div style="display: flex; justify-content: space-around; align-items: center; margin-top: 5px;"> <div style="text-align: center;">  <p>Cost efficiency</p> </div> <div style="text-align: center;">  <p>Capacity</p> </div> <div style="text-align: center;">  <p>Safety</p> </div> </div>



Main 2019 developments:

The scope of this Implementation Objective is addressing the interactive rolling NOP functionality as envisaged by the PCP IR. Most of interactive rolling NOP components are implemented and made available by the NM. However, the interactive rolling NOP is evolving and the existing/new functionalities are planned to be integrated within the new platform. The final goal would be a migration to a new platform with enhanced functional capabilities. Some modules of new NM platform (n-Connect) are already deployed, while the complete migration is planned for the end of 2021. 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 (However 1 State – CH – changed its completion status from “Completed” to “Ongoing”, therefore the reduction of the Completion Rate on top of the reduction caused by the enlargement of the Applicability Area). 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). Out of these 12, eight have already been implemented while the remaining 4 are progressing according to the plans and will be sequentially deployed by 2021.

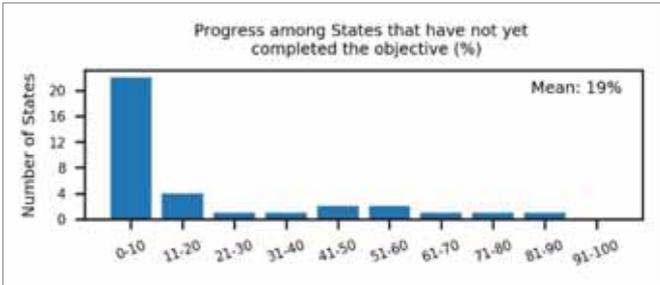
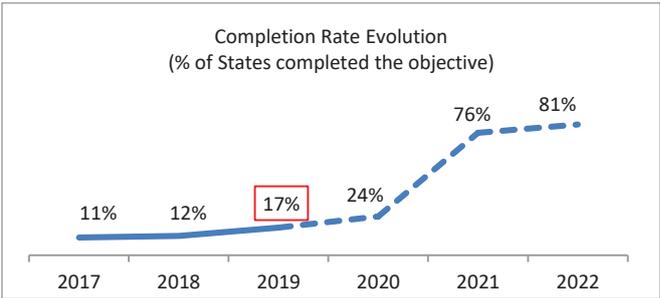


EOC: ATM Interconnected Network

FCM06 Traffic Complexity Assessment

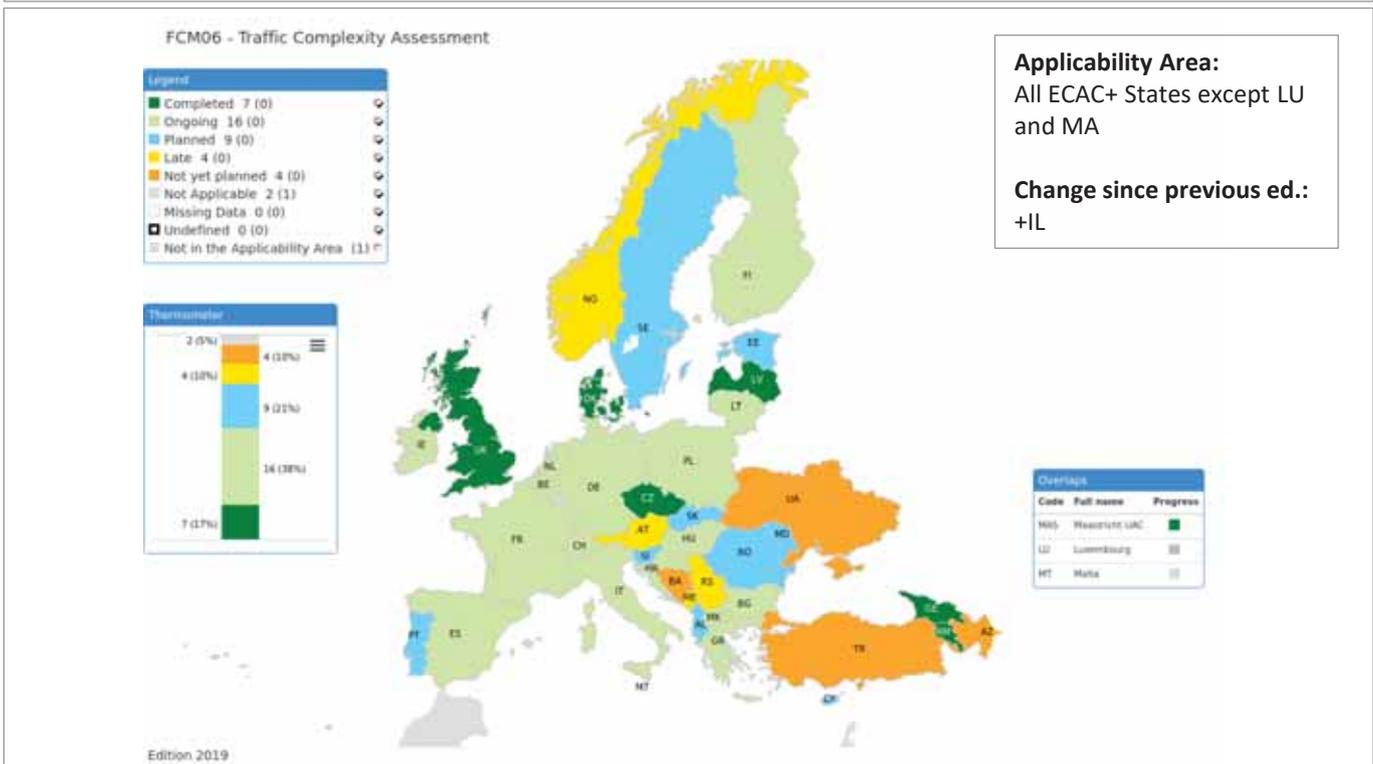
Stakeholders: <ul style="list-style-type: none"> ANSPs Network Manager 	FOC: 12/2021
	Estimated achievement: 12/2022

SESAR Solutions:	Solution #19
Status:	Risk of delay
PCP	S-AF4.4 Automated Support for Traffic Complexity Assessment
Sub-Functionality:	Complexity Assessment
ICAO ASBU:	B1-NOPS
OI Steps:	CM-0101, CM-0103-A, NIMS-20
Network Strategy Plan:	SO4/3, SO5/4
Expected benefits:	 Safety  Operational efficiency



Main 2019 developments:

Two more States have declared completion of this objective in 2019 (CZ and LV), bringing the total number of implementers to 7 (including MUAC). The implementation is ongoing in 16 States, while 4 States already anticipate a delay in implementation. Although there are still two more years until the FOC date (12/2021), it is very unlikely that this objective will be widely implemented by that time. Most of the States are still in the early stage of implementation, as seen in the chart above. One of the reasons for such a modest completion rate among States is a lack of commonly agreed methodology for the complexity assessment. A number of States (including those who declared the implementation as completed) consider traffic load monitoring as sufficient and/or apply quite simplistic and largely qualitative complexity assessment metrics. Some of the ATFCM tools currently being developed in ANSPs which will also be used to assess traffic complexity are SALTO (FR), CRYSTAL (CH) and IMPACT (ES).

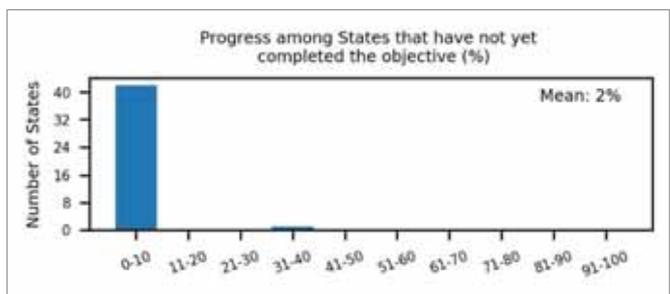
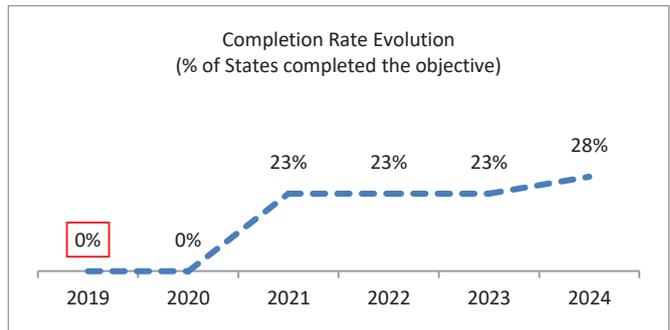


EOC: ATM Interconnected Network

FCM08 Extended Flight Plan

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

Stakeholders:	FOC: 12/2021
<ul style="list-style-type: none"> ANSPs Network Manager Airspace Users 	Estimated achievement: Beyond 2024
SESAR Solutions:	Solution #37
Status:	Risk of delay
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
Expected benefits:	 



Main 2019 developments:

NM deployed EFPL in 2017. There is no partner to exchange flight plan in a form of EFPL. Some trials have been made with some CFSPs. The majority of States (25) have not yet established concrete implementation plans, while 5 States are in very initial planning stages. Seven (7) States already expect to be Late. This apparent lack of progress is caused by the fact the PCP's EFPL is being replaced by ICAO's FF-ICE1. Conceptually the EFPL and the FF-ICE1 are similar, both addressing the enrichment of flight plan data with 4D trajectory and with flight performance data. However they are based on 2 different technical solutions. The PCP's EFPL has been implemented by NM based on a proprietary format whereas the FF-ICE1 will have global applicability using FIXM format. As the EFPL solution is effectively overtaken by FF-ICE1, it is doubtful that airspace users or ANSPs will deploy EFPL. It is also proposed that in the context of the PCP review (CP1), the EFPL to be replaced by FF-ICE1. It is therefore needed to refocus the implementation objective on the FF-ICE1 together with a corresponding review of its FOC date. This objective should therefore be deleted and replaced in due time by one addressing FF-ICE1 and the CP1 content.

As far as the ICAO SARPs are concerned, the drafts are already available. They will be reviewed by the ANC early 2020 followed by State consultation during 2020, then second ANC review early 2021. Final publication is expected Q4 2021. The implementation guidance from ICAO is also expected before the end of 2020.

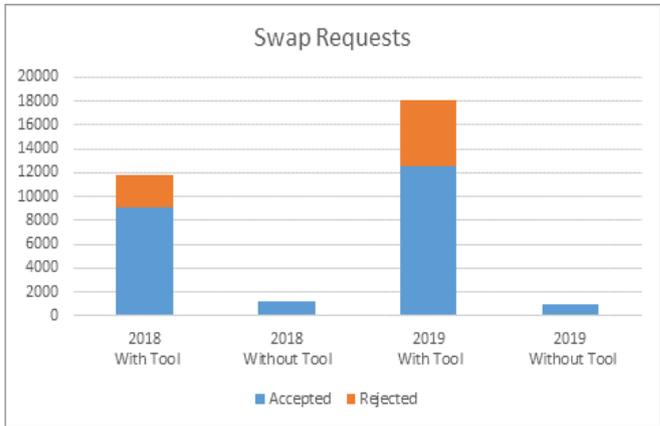


EOC: ATM Interconnected Network

FCM09 Enhanced ATFM Slot swapping

Stakeholders <ul style="list-style-type: none"> • Network Manager • Airspace Users 	FOC <u>12/2021</u> Estimated achievement 12/2021	Implementation progress (Average % of progress for States not Completed yet) - Not Applicable – Objective only relevant for the NM and Airspace Users
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SESAR Solutions:	Solution #56
Status:	On time
ICAO ASBU:	B1-NOPS
OI Steps:	AUO-0101-A
Network Strategy Plan:	SO6/1
Expected benefits:	 



Main 2019 developments

This objective 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.

This objective can be considered as finalised by NM, while AUs and more particular CFSPs need to adapt their systems and operating procedures for the full implementation of the objective. NM continued the trial concerning the multi-swap capability and some procedures have been updated, but multi-swap was considered as further alignment with SESAR activities, outside of the scope of FCM09. Further improvements concerning NM multi-swap capabilities are in the pipeline mainly related to the update of the NM Operations Manual, the improvements of NM B2B services and interfaces between ETFMS and E-help desk. Further automation on CFSPs side is needed as the current procedures mainly relies on manual intervention.

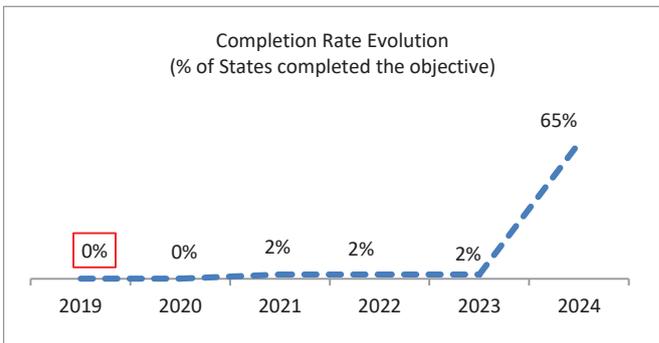
Map not relevant for this objective

EOC: ATM Interconnected Network

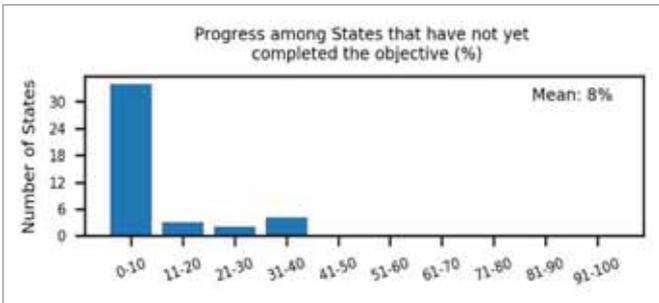
INF08.1 Inf. exchanges using the SWIM yellow TI profile

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

Stakeholders: <ul style="list-style-type: none"> • ANSPs • Military Authorities • Airport Operators • Airspace Users • Network Manager 	FOC: <u>12/2024</u> Estimated achievement: Not available
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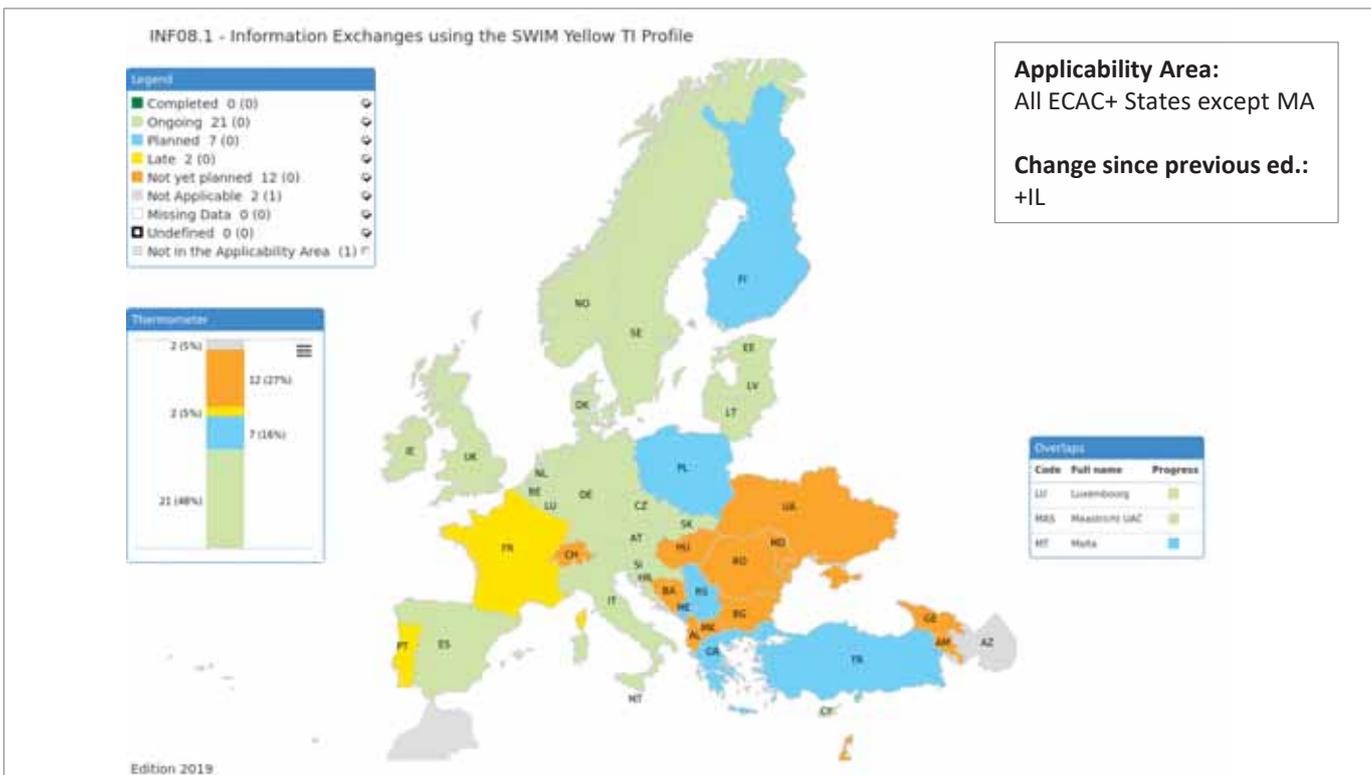


SESAR Solutions:	Solutions #35 & #46
Status:	Not available
PCP Sub-Functionality:	AF5 Initial SWIM
ICAO ASBU:	B1-DATM, B1-SWIM
OI Steps:	IS-0901-A, MET-0101
Network Strategy Plan:	SO2/4, SO2/5, SO5/2, SO5/5
Expected benefits:	Depends on the application using SWIM



Main 2019 developments:

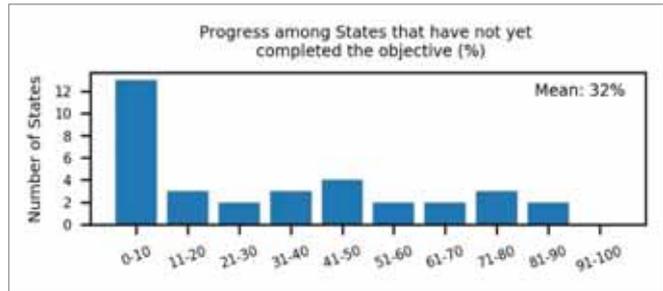
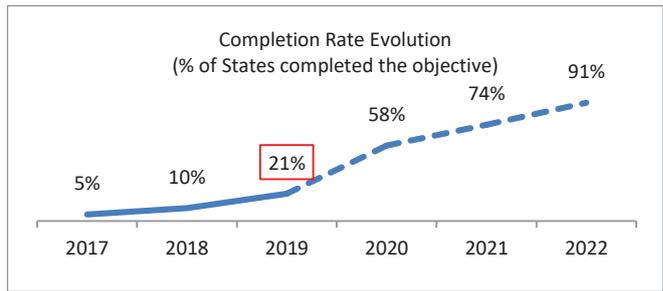
This is the second cycle where the objective has been monitored and a positive evolution has been noticed. Among the States in ECAC+ applicability area, 21 reported “ongoing” status (2 more compared to 2018), 7 “planned” (3 more) and 12 “not yet planned” (6 less). Two States have already declared being “late”. These results may be considered encouraging since for EU States the FOC is 31/12/2024 and more than 80% completion rate is expected to be reached by that date in the regulated area (but still, no 100% completion). Many States have already initiated implementation projects and have concluded a few intermediate steps and tasks.



EOC: Digital AIM and MET Services

INF07 Electronic Terrain and Obstacle Data (e-TOD)

Stakeholders:	FOC: 05/2018
<ul style="list-style-type: none"> ANSPs Airport Operators Regulators 	Estimated achievement: 12/2022
SESAR Solutions:	No corresponding Solution
Status:	Late
ICAO ASBU:	No corresponding ASBU
OI Steps:	AIMS-16
Network Strategy Plan:	SO2/5
Expected benefits:	 Safety

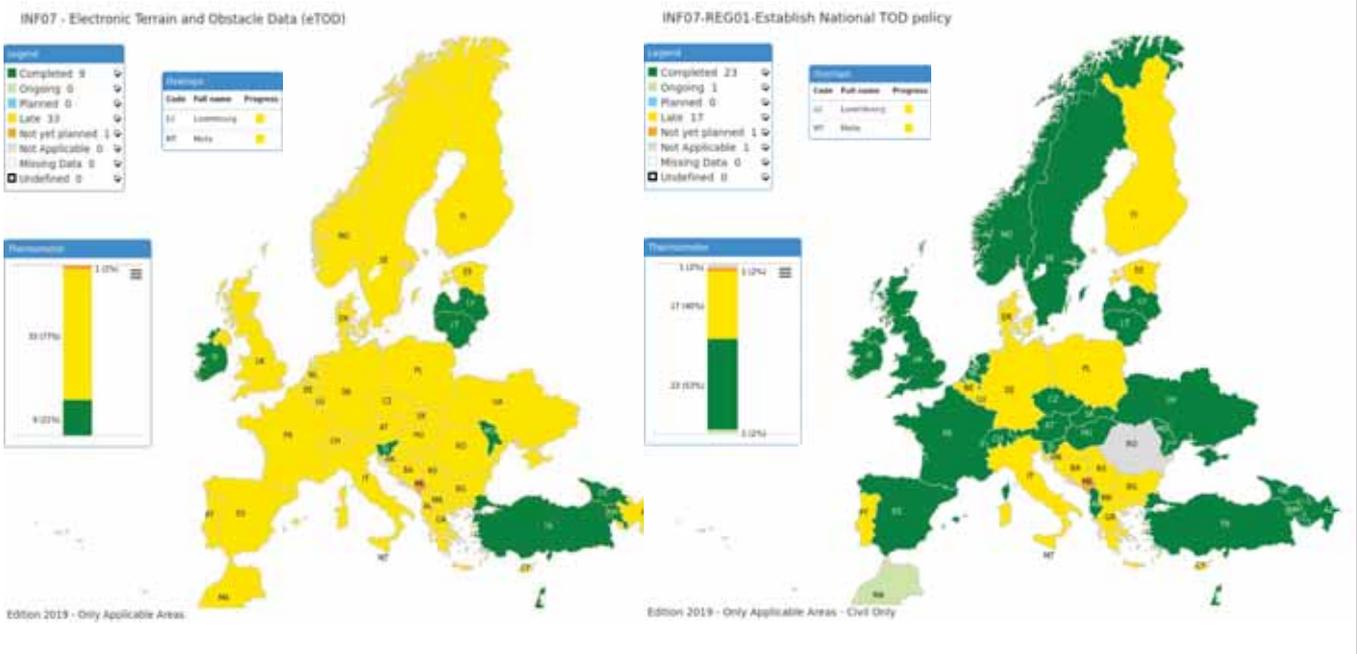


Main 2019 developments:

Four additional States completed the objective during the cycle, raising the total number to 9. As the FOC date was reached in 05/2018, there is a significant amount of States that declared being “late”, a total of 33 States. REG01 entails a cornerstone activity for TOD implementation - “Establish National TOD Policy” which defines the roles and responsibilities for all TOD stakeholders in a State. Other REG, ASP and APO SLoAs depend on its availability to further progress and conclusion of their implementation activities. Only 23 States have completed REG 01, three more than in the previous cycle and it is expected that the follow-up REG, ASP and APO SLoA completion will follow in these States. For ASP01 (17 completed) and APO01 (24 completed), the situation is equally serious as they are dependent on the completion of REG01.

Applicability Area:
All ECAC+ States except MUAC

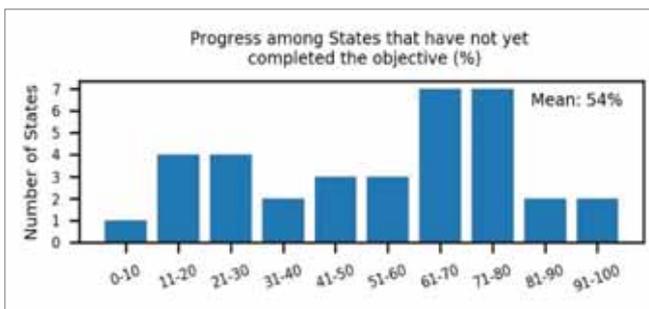
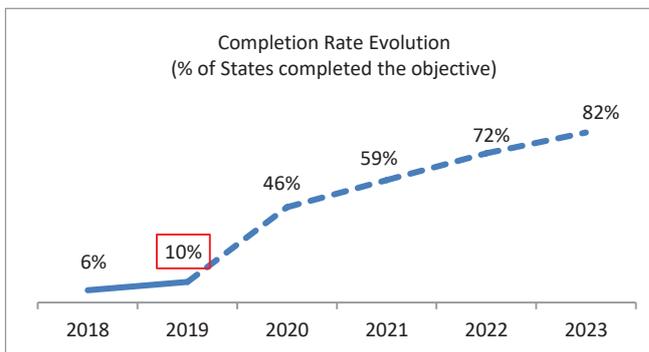
Change since previous ed.:
+IL, MA



EOC: Digital AIM and MET Services

ITY-ADQ Ensure Quality of Aeronautical Data and Aeronautical Information

Stakeholders: <ul style="list-style-type: none"> • ANSPs • Airport Operators • Regulators • Industry 	FOC: <u>06/2017</u> Estimated achievement: 12/2023
SESAR Solutions: No corresponding Solution	
Status: Late	
PCP Sub-Functionality: 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	
Expected benefits:  	



Main 2019 developments:

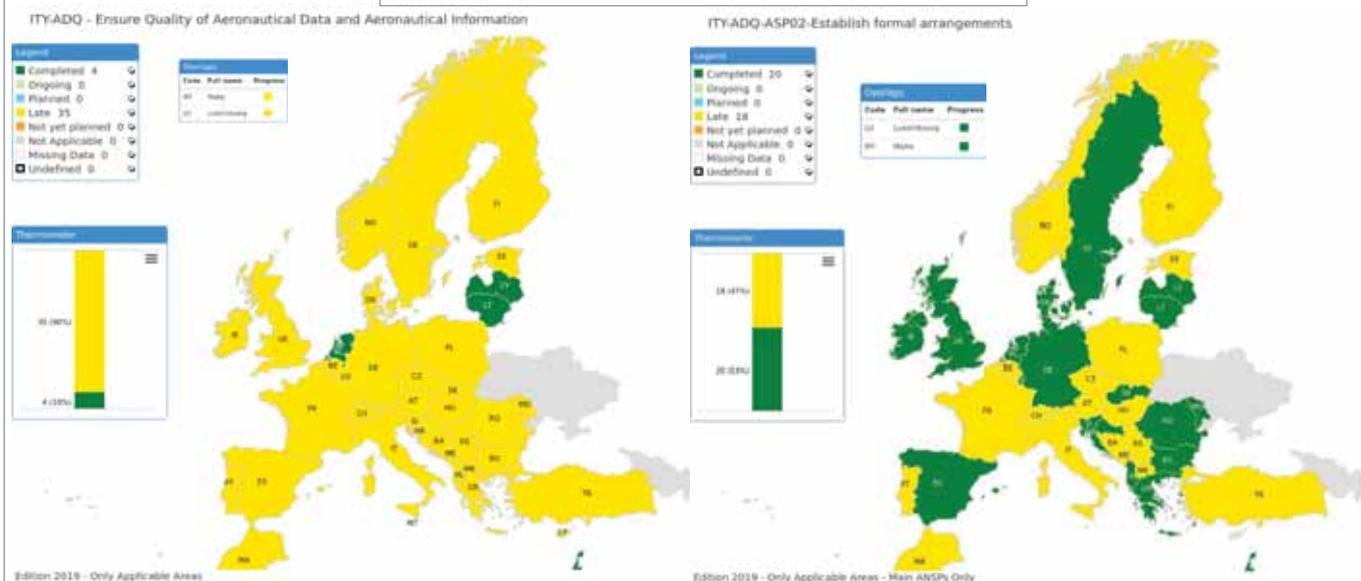
This is the third cycle after the FOC (06/2017) date was reached. Three States have declared completion – NL, LV and LT. This poor progress was expected taking into account the high number of States that declared being Late during the last cycles. Some SLoAs which are on the critical path for ADQ implementation, such as Formal Arrangements (ASP02), did show good progress with 20 ANSPs declaring “Completed”. It needs to be recognised that a lot of individual progress has been made by many stakeholders, mostly ANSP and Regulators, nevertheless overall compliance is disappointing. This is notably due to strong dependencies on a very wide range of data originators, process automation and related procurement, or a lack of resources. States are strongly urged to recover existing delays, since only adequate ADQ compliance will provide the optimum baseline for future certification in accordance with the upcoming EASA rule Part-AIS (amendment to 2017/373) with an envisaged applicability date of 27 Jan 2022.

Applicability Area:

All EU+ States plus IL, MA and TR, except GE, and MUAC

Change since previous ed.:

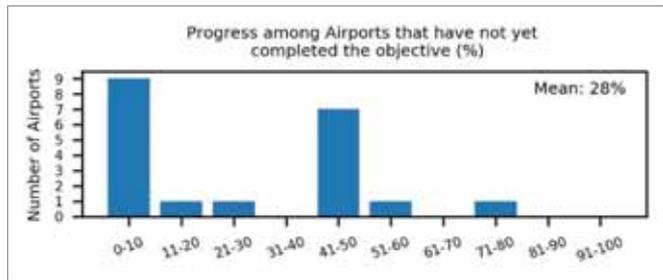
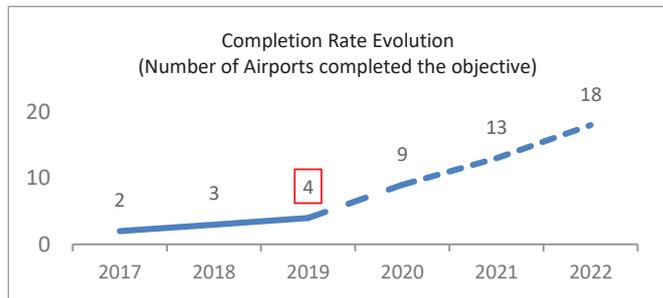
+IL, MA, TR



EOC: Virtualisation of Service Provision

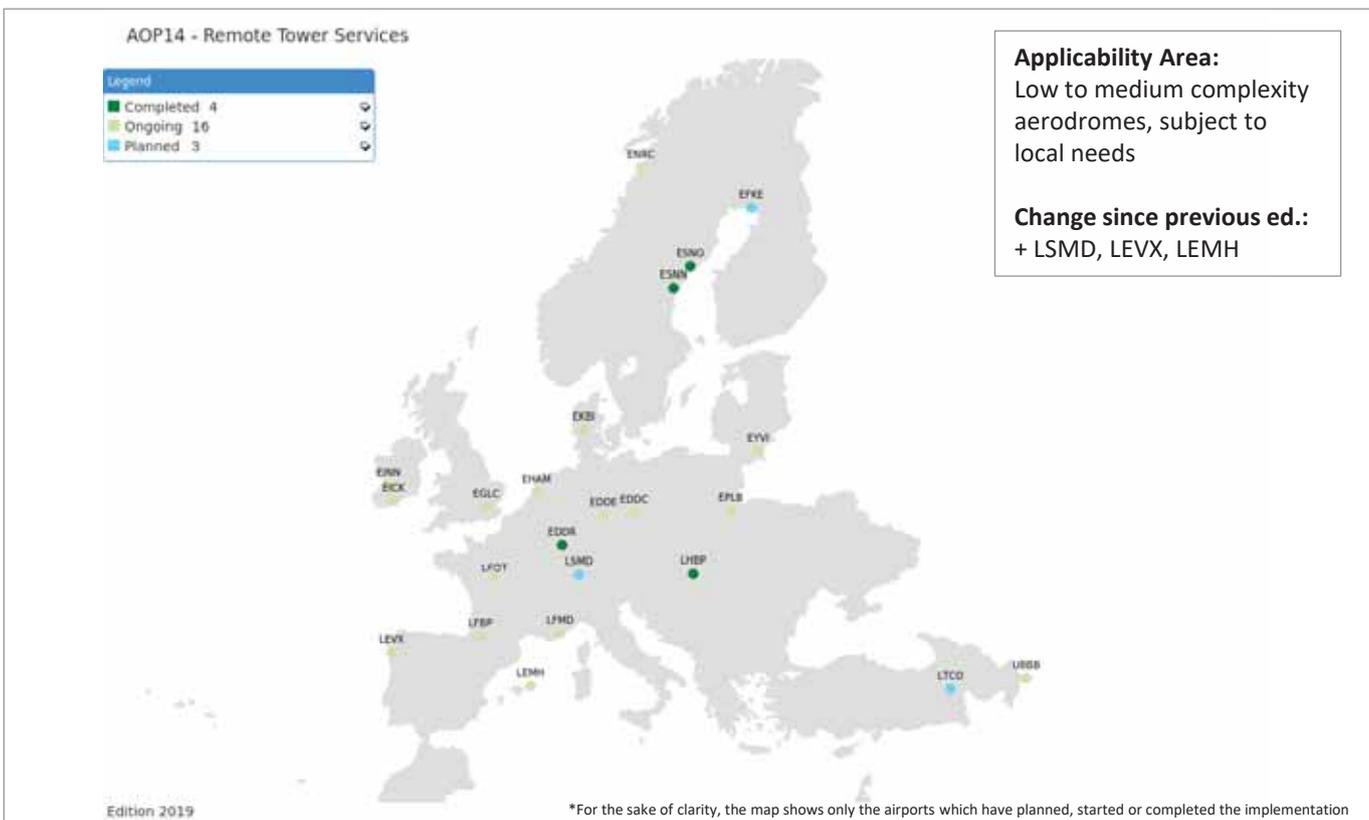
AOP14 Remote Tower Services [Local]

Stakeholders:	
<ul style="list-style-type: none"> • ANSPs • Regulators • Airport Operators 	
FOC:	Not applicable
Estimated achievement:	Not available
SESAR Solutions:	Solutions #12 & #71 (one aerodrome), #52 (two aerodromes), #13 (contingency)
Status:	Not applicable
ICAO ASBU:	B1-RATS
OI Steps:	SDM-0201, SDM-0204, SDM-0205
Network Strategy Plan:	-
Expected benefits:	 



Main 2019 developments:

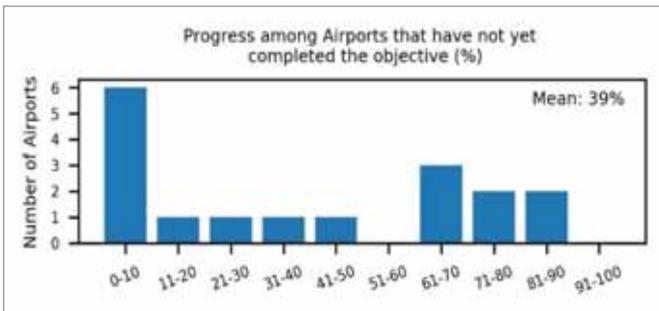
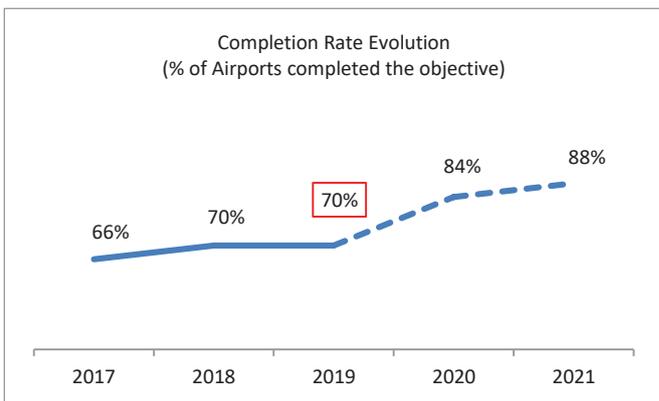
In the third year of monitoring for this local Objective 4 Airports have completed the implementation: EDDR – Saarbrücken, ESNN – Sundsvall, ESNO – Ornskoldsvik and, new for 2019, LHBP – Budapest. In the latter case, the Remote Tower services implemented as contingency for Budapest Liszt Ferenc International Airport are in place and available for operational use. Four more States (AZ, DK, ES and FR) reported this Objective as “on-going”, which increased the overall number of airports where the implementation is ongoing from 12 in 2018 to 16 in 2019. The implementation progress for them varies between 10% and 75%. Another 4 States (CH, FI, TR, IT) reported plans to implement this Objective at the following airports: LSMD – Dubendorf, EFKE – Kemi – Tornio, LTCO – Agri and some Italian low traffic airports (not identified). The planned dates of implementation vary between 2021-2028.



EOC: Airport and TMA performance

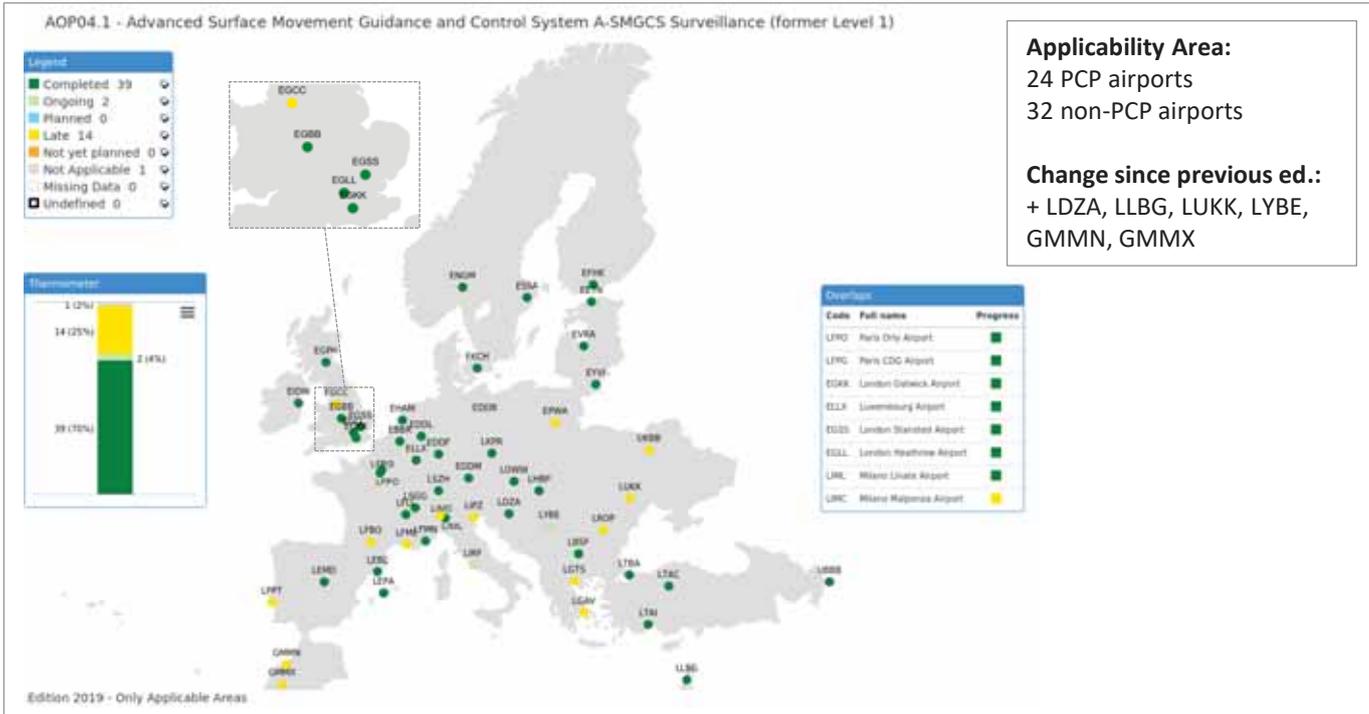
AOP04.1 A-SMGCS Surveillance (former Level 1)

Stakeholders:	FOC: 12/2011
<ul style="list-style-type: none"> ANSPs Airport Operators Airspace Users Regulators 	Estimated achievement: 12/2020
SESAR Solutions:	Solution #70
Status:	Late
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)
ICAO ASBU:	B0-SURF
OI Steps:	AO-0201, CTE-S02b, CTE-S03b, CTE-S04b
Network Strategy Plan:	SO6/6
Expected benefits:	



Main 2019 developments:

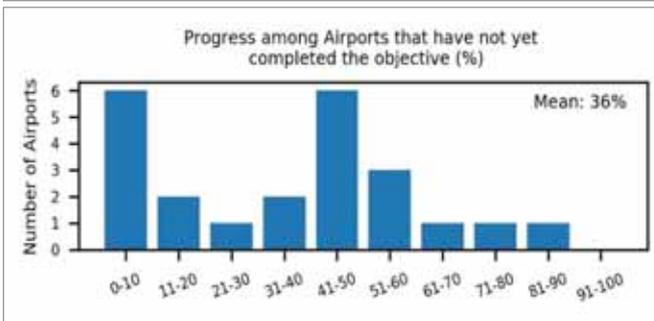
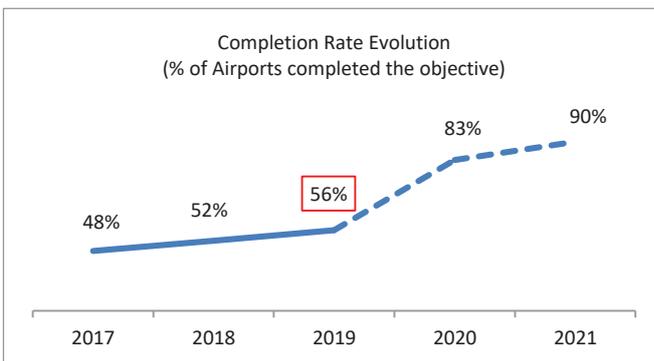
Although according to the ATM Master Plan Level 3 Report 2019, this Objective was estimated to be achieved by the end of 2019, this was not the case. This can partially be explained by the effect of several new airports added in the applicability area (even if some of these airports, e.g. LDZA, LLBG have joined with a “Completed” status, achieved in the previous years) . By the end of 2019, 70% of the airports in the applicability area have completed the objective. In 2019, two airports have completed the A-SMGCS surveillance project (EDDL ad EGLL). There are still 4 PCP airports that have not fully completed this objective yet: EDDB (N/A until the opening of BER Airport in 12/2020), LIMC (44%), LIRF (64%) and EGCC (63%). There is an impression that A-SMGCS surveillance is a part of PCP. However, Regulation (EU) 716/2014 specifies that A-SMGCS Surveillance is a pre-requisite and must be implemented before the other Services. It should also be mentioned that one PCP airport reported an ongoing status instead of late (LIRF).



EOC: Airport and TMA performance

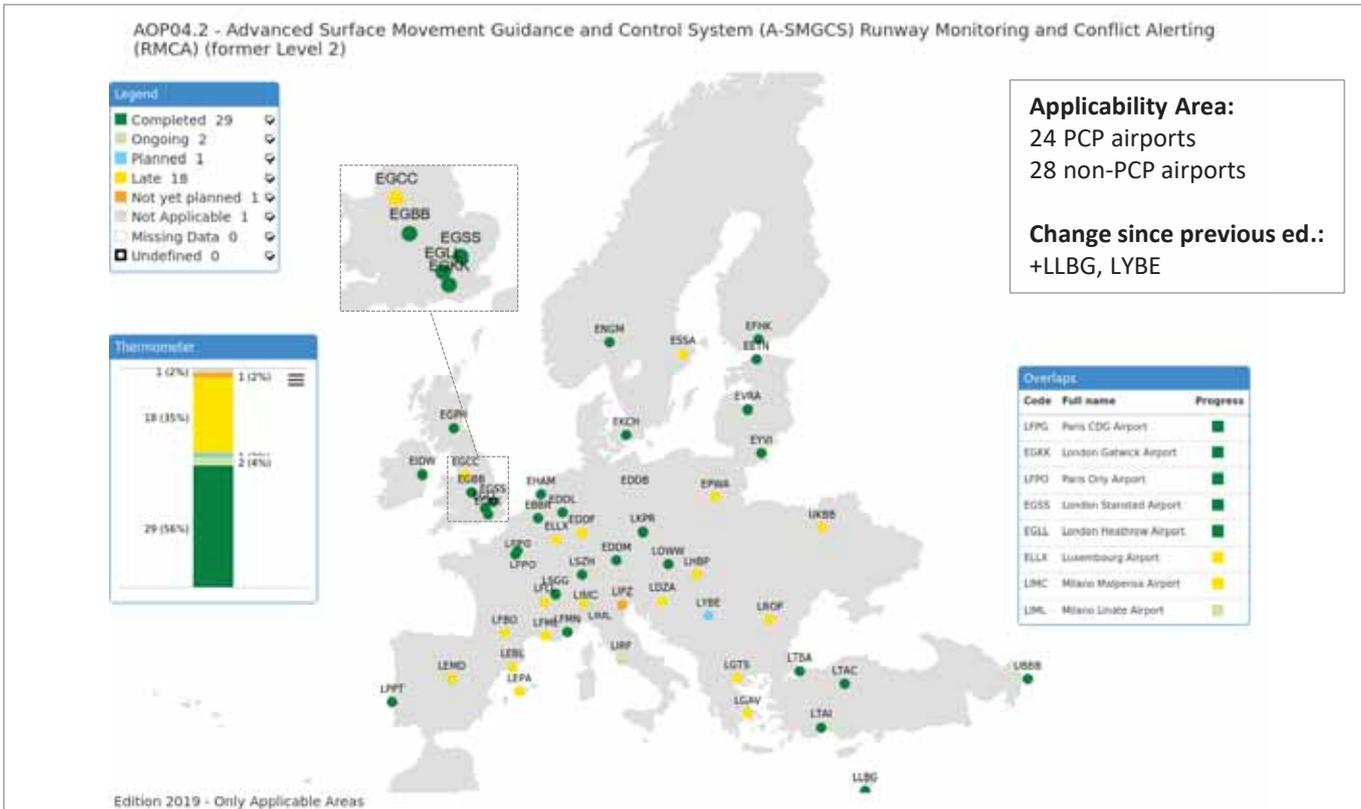
AOP04.2 A-SMGCS RMCA (former Level 2)

Stakeholders:	FOC: 12/2017
<ul style="list-style-type: none"> ANSPs Airport Operators 	Estimated achievement: 12/2020
SESAR Solutions:	No corresponding Solution
Status:	Late
PCP Sub-Functionality:	Pre-requisite for: <ul style="list-style-type: none"> S-AF2.2 DMAN Int. Surface Management Constraints (PCP) S-AF2.4 Automated Assistance to Controller for Surf. Movement (PCP) Planning and Routing (PCP)
ICAO ASBU:	B0-SURF
OI Steps:	AO-0102, AO-0201, CTE-S02b, CTE-S03b, CTE-S04b
Network Strategy Plan:	SO6/6
Expected benefits:	 



Main 2019 developments:

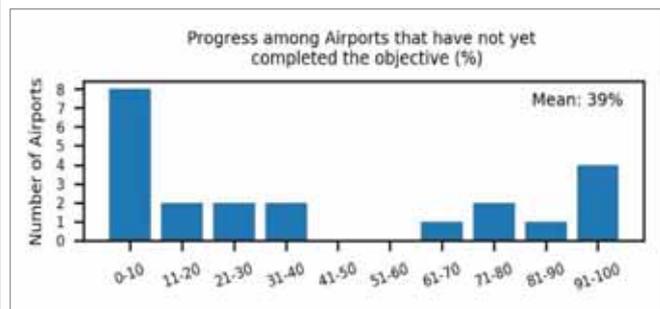
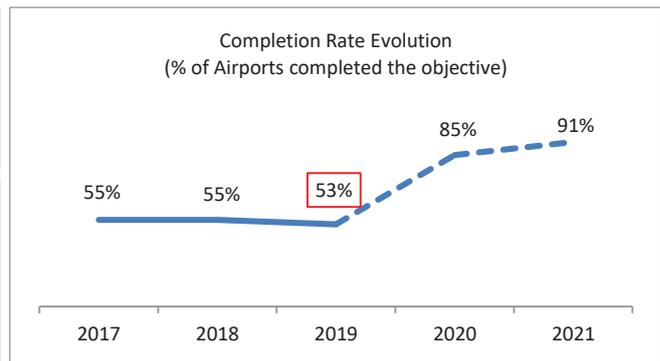
A-SMGCS RMCA implementation builds on the implementation of AOP04.1. Since 2015, the risks of delayed implementation of this objective have been reported and notified, mainly due to AOP04.1 delays. In 2019, two PCP airports fully achieved the objective (EDDL, EGLL), leading to a total of 29 airports having this functionality operational. Nine of the 24 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 PCP AF2 functionalities. It should also be mentioned that one PCP airport reported an ongoing status instead of late (LIRF).



EOC: Airport and TMA performance

AOP05 Airport CDM

Stakeholders:	
<ul style="list-style-type: none"> • ANSPs • Airspace Users • Airport Operators • Network Manager 	
	FOC: 12/2016
	Estimated achievement: 12/2020
SESAR Solutions:	Solution #106
Status:	Late
PCP Sub-Functionality:	Pre-requisite for: - S-AF2.1. DMAN synchronised with pre-departure sequencing
ICAO ASBU:	B0-ACDM, B0-RSEQ
OI Steps:	AO-0501, AO-0601, AO-0602, AO-0603, TS-0201
Network Strategy Plan:	SO6/4
Expected benefits:	



Main 2019 developments:

No new completions were recorded in 2019, compared to 2018. Dublin airport went from “Completed” in 2018 to “Late” in 2019, as A-CDM is locally implemented at EIDW, but final full implementation is expected to be completed by end Q3 2020. Regarding the PCP airports, out of 24 airports mentioned in the PCP-IR, 18 have implemented A-CDM and are connected to the Network Manager Operational Centre (NMOC). The remaining PCP airports are planning to complete implementation by 12/2020.

The implementation is late at another 18 airports where the implementation rate varies between 0-96% and the planned implementation date is estimated between 2019-2023 with majority of the airports planning to implement A-CDM in 2020.

AOP05 - Airport Collaborative Decision Making (A-CDM)

Legend

- Completed 25
- Ongoing 2
- Planned 0
- Late 18
- Not yet planned 1
- Not Applicable 1
- Missing Data 0
- Undefined 0

Thermometer

Applicability Area:
24 PCP airports
23 non-PCP airports

Change since previous ed.:
+LLBG
-LIRN

Overlaps

Code	Full name	Progress
LFRQ	Paris CDG Airport	Completed
EDDK	London Gatwick Airport	Completed
EGLL	London Heathrow Airport	Completed
LFPQ	Paris Orly Airport	Completed
LIMC	Milano Malpensa Airport	Completed
LIRN	Milano Linate Airport	Ongoing
EGSS	London Stansted Airport	Late
EGGW	London Luton Airport	Late

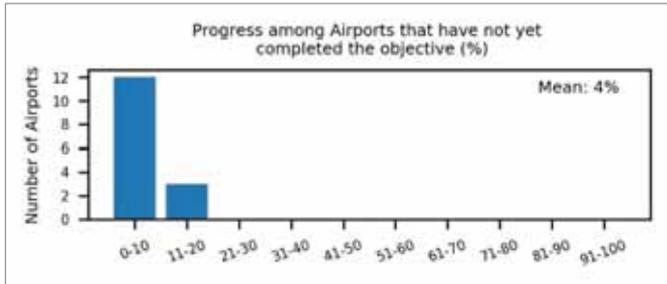
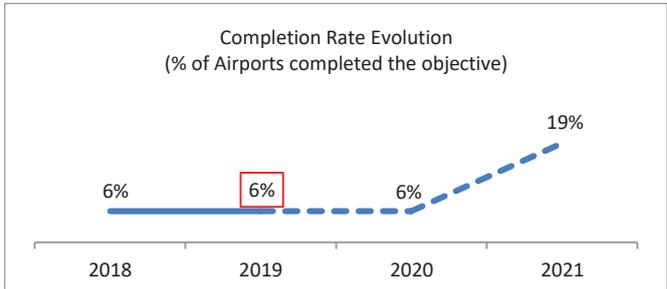
Edition 2019 - Only Applicable Areas

EOC: Airport and TMA performance

AOP10 Time Based Separation

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

Stakeholders:	FOC: <u>12/2023</u>
<ul style="list-style-type: none"> • ANSPs • Airspace Users • Regulators 	Estimated achievement: Not available
SESAR Solutions:	Solution #64
Status:	Not available
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
Expected benefits:	



Main 2019 developments:

The objective is currently implemented only at London Heathrow Airport (EGLL). Six airports have worked on the implementation in 2019. Vienna Schwechat (LOWW) and Frankfurt Airport (EDDF) started in 2018 with the planned implementation date by April 2023 and by end of 2023 respectively. In 2019, Amsterdam Airport (EHAM) also started with the planned implementation date foreseen by April 2021, Dublin Airport (EIDW) by end of 2021, Paris CDG Airport (LFPG) and London Gatwick Airport (EGKK) by end of 2023. Copenhagen Kastrup Airport (EKCH), Madrid Barajas (LEMD), Zurich Airport (LSZH) and Manchester Airport (EGCC) have planned the implementation of this objective also for end of 2023. By the FOC date (12/2023), only 11 out of 16 airports identified in the PCP IR will have the objective completed, according to currently reported plans. Five airports have not yet established concrete implementation plans. Overall, the objective has started or planned to progress towards implementation for the majority of the airports concerned.

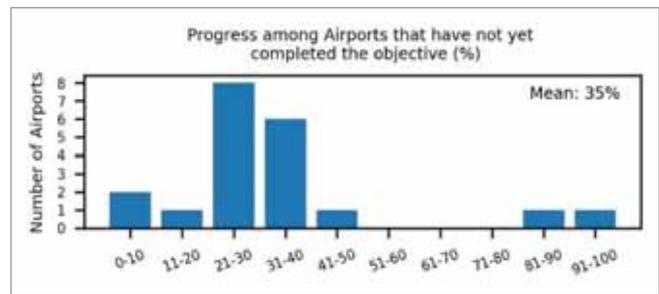
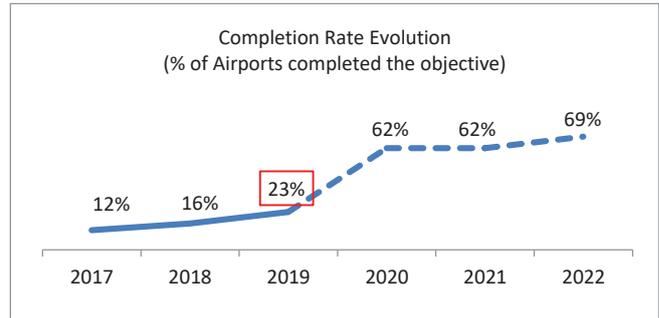


EOC: Airport and TMA performance

AOP12 Improve RWY safety with CATC and CMAC

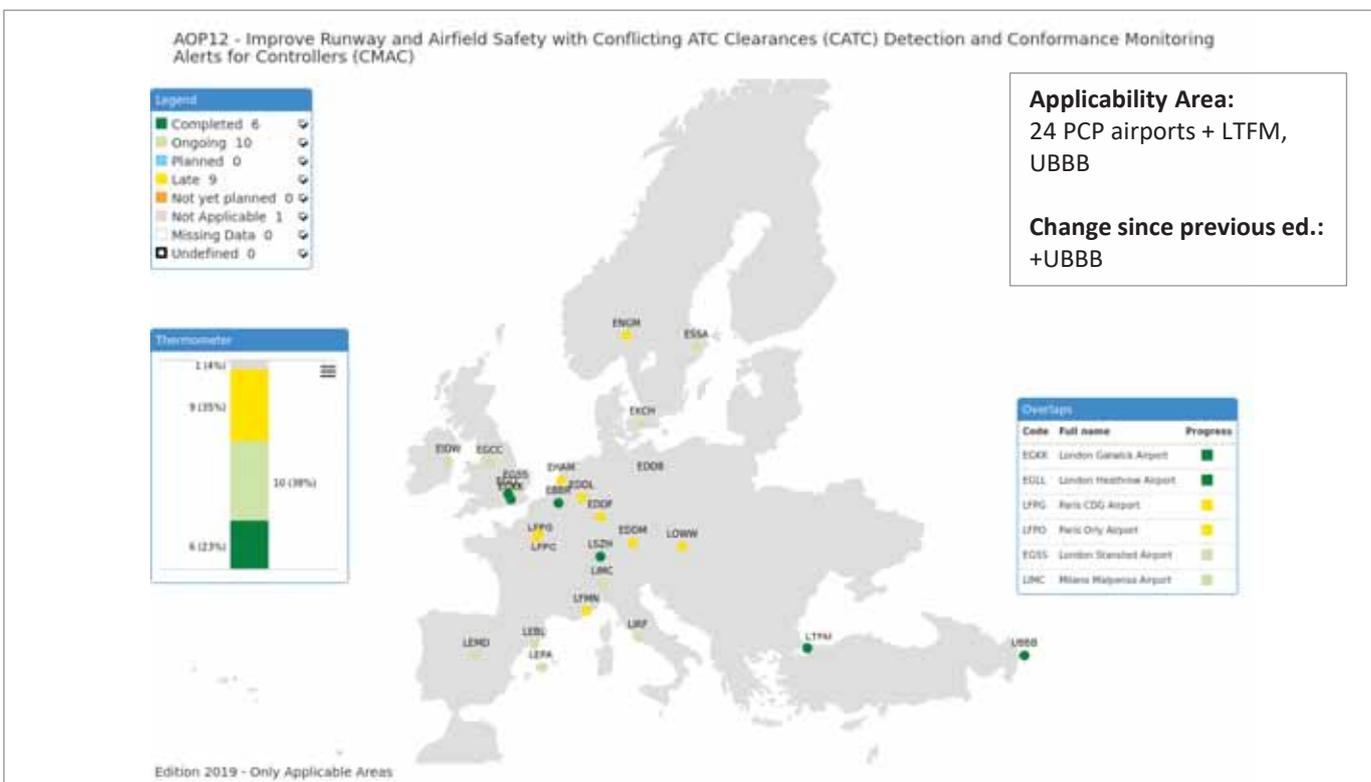
Stakeholders:	FOC: 12/2020
<ul style="list-style-type: none"> • ANSPs • Airspace Users • Airport Operators 	Estimated achievement: 12/2024

SESAR Solutions:	Solution #02
Status:	Planned delay
PCP Sub-Functionality:	S-AF2.1 DMAN synchronised with pre-departure sequencing S-AF2.5 Airport Safety Nets
ICAO ASBU:	B2-SURF
OI Steps:	AO-0104-A
Network Strategy Plan:	SO6/6
Expected benefits:	 Safety



Main 2019 developments:

Among the 24 airports in the PCP applicability area, Zurich (LSZH) completed implementation in 2019. Implementation in Dublin (EIDW) is reported as “ongoing” (at 94%), in view of the transfer of Tower operations to a new Tower at IAA Dublin Operations. In Milan Malpensa (LIMC) the progress is “ongoing” at 81%. Another 8 PCP airports report the progress as “ongoing” (compared to 17 in 2018), with progresses at or below 50%. The number of airports with “late” status grew from 3 in 2018 to 9 in 2019, with 5 having plans for 2024 (LOWW, EDDF, EDDL, EDDM and ENGM) and 2 for 2023. French airports Nice, Paris Charles de Gaulle and Orly (LFMN, LFPG and LFPO) are linked to the introduction of their new SYSAT system that is planned for 2022-23. Outside the PCP, Istanbul New Airport and Baku airport declared the objective as “completed”.



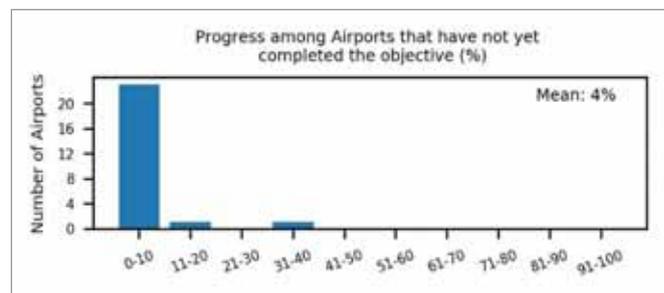
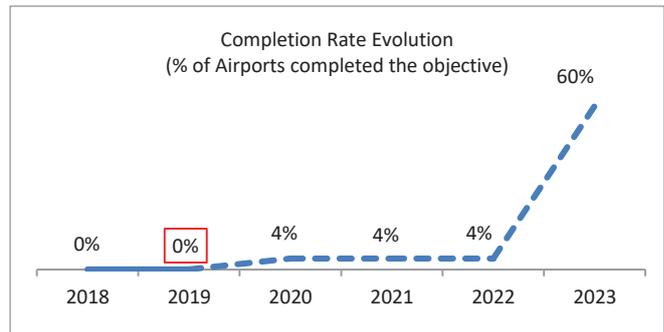
EOC: Airport and TMA performance

AOP13 Automated assistance to controller for surface movement planning and routing

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

Stakeholders:	FOC: <u>12/2023</u>
<ul style="list-style-type: none"> ANSPs Regulators 	Estimated achievement: Not available

SESAR Solutions:	Solution #22 & #53
Status:	Not available
PCP Sub-Functionality:	S-AF2.4 Automated assistance to controller for surface movement planning and routing
ICAO ASBU:	B1-RSEQ, B1-ACDM, B2-SURF
OI Steps:	AO-0205, TS-0202
Network Strategy Plan:	SO6/6
Expected benefits:	



Main 2019 developments:

In the fourth year of monitoring of this implementation objective, this functionality shows an extremely low level of progress and no reliable estimate can be made on whether it will indeed be implemented in the majority of the applicable PCP airports. Seven airports have not yet defined any concrete implementation plans (compared to 8 in 2018). Another 7 airports have defined the plans, but have not yet started the implementation. Eight airports have started the implementation (as in 2018), but most of them are currently at a very initial stages of the implementation with less than 10% of implementation progress. Two airports (Zurich LSZH and Vienna LOWW) have already reported this Objective as “late”, with the implementation date of 12/2025 and 12/2027 respectively.

AOP13 - Automated Assistance to Controller for Surface Movement Planning and Routing

Legend

- Completed 0
- Ongoing 8
- Planned 7
- Late 2
- Not yet planned 7
- Not Applicable 1
- Missing Data 0
- Undefined 0

Thermometer

Overlaps

Code	Full name	Progress
EGEX	London Gatwick Airport	Not yet planned
EGSS	London Stansted Airport	Not yet planned
LIMC	Milano Malpensa Airport	Not yet planned
EGLL	London Heathrow Airport	Ongoing
LFPG	Paris CDG Airport	Ongoing
LFPO	Paris Orly Airport	Ongoing

Applicability Area:
24 PCP airports + LTFM

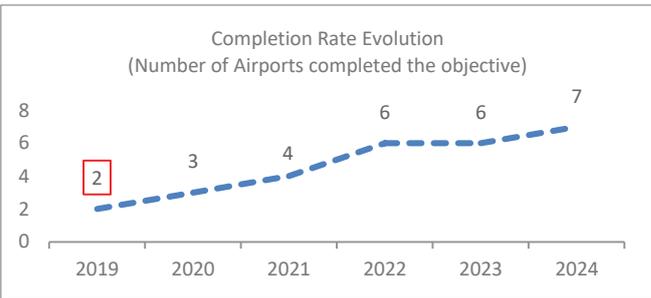
Change since previous ed.:
none

Edition 2019 - Only Applicable Areas

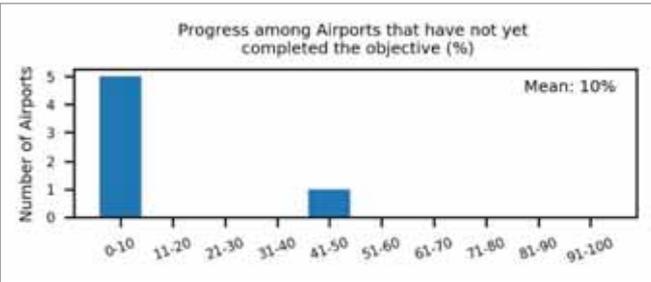
EOC: Airport and TMA performance

AOP15 Safety Nets for vehicle drivers [Local]

Stakeholders: <ul style="list-style-type: none"> Regulators Int. Organisations Airport Operators 	FOC: Not applicable
	Estimated achievement: Not available

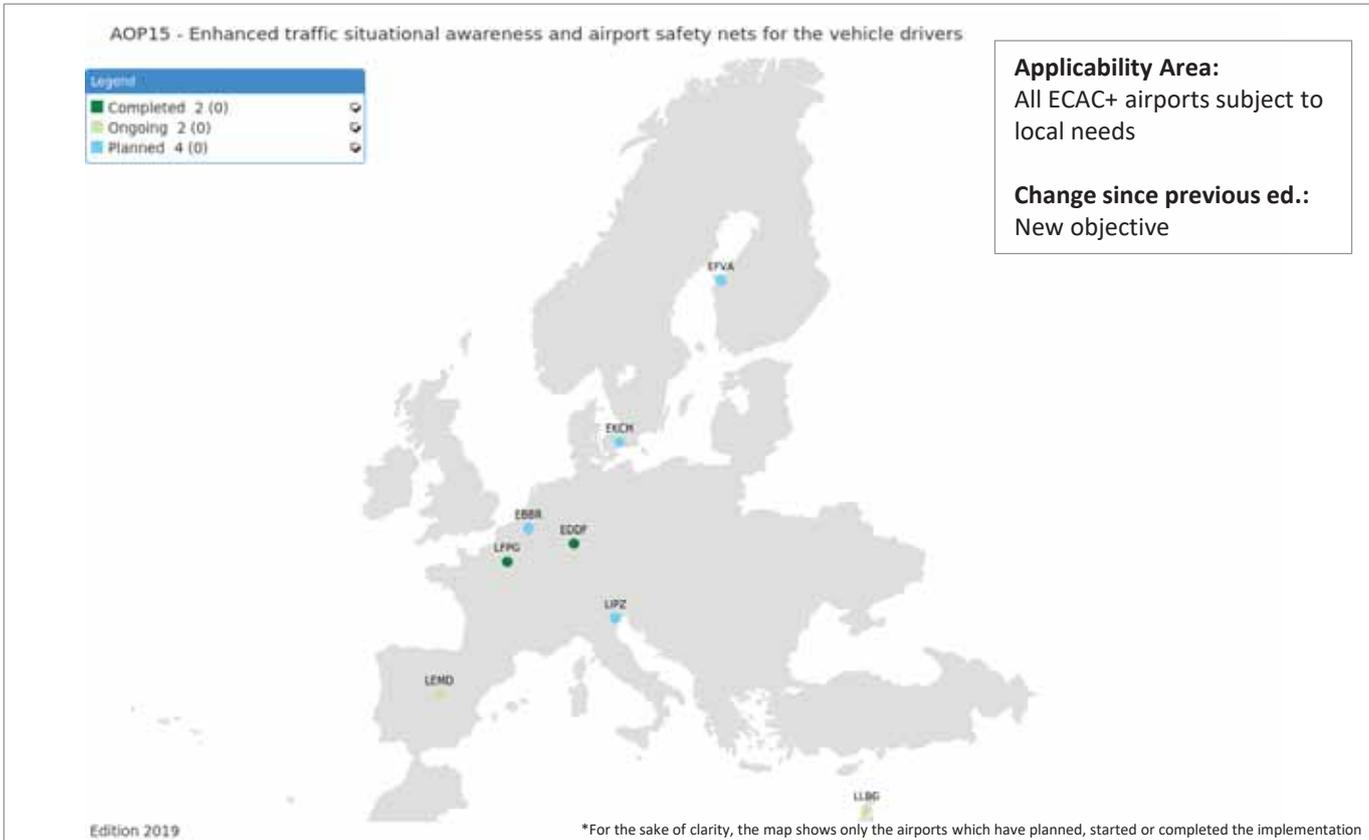


SESAR Solutions:	Solution #04
Status:	Not applicable
ICAO ASBU:	B2-SURF
OI Steps:	AO-0105, AO-0204
Network Strategy Plan:	No corresponding SO
Expected benefits:	Safety



Main 2019 developments:

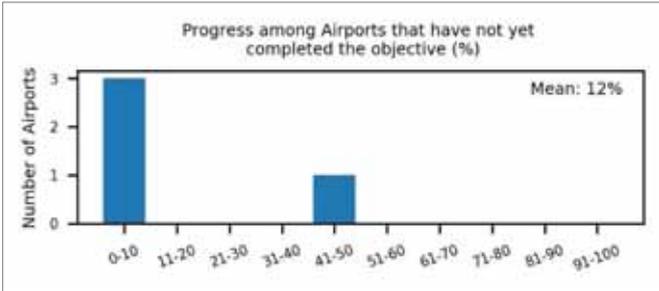
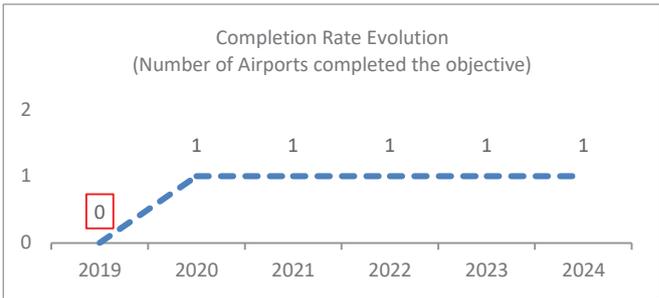
This objective was monitored for the first time in 2019, so no comprehensive assessment of the progress can be done. While the objective is still not yet planned for most of the airports (29), two (2) airports reported it as “completed” (LFPG and EDDF). Two more airports (LEMD and LLBG) started implementation, while 4 airports have planned to implement it (EBBR by 12/2022, EKCH by 12/2020, EFVA by 12/2024, LPZ by 12/2021). The remaining airports reported this objective as “not applicable”.



EOC: Airport and TMA performance

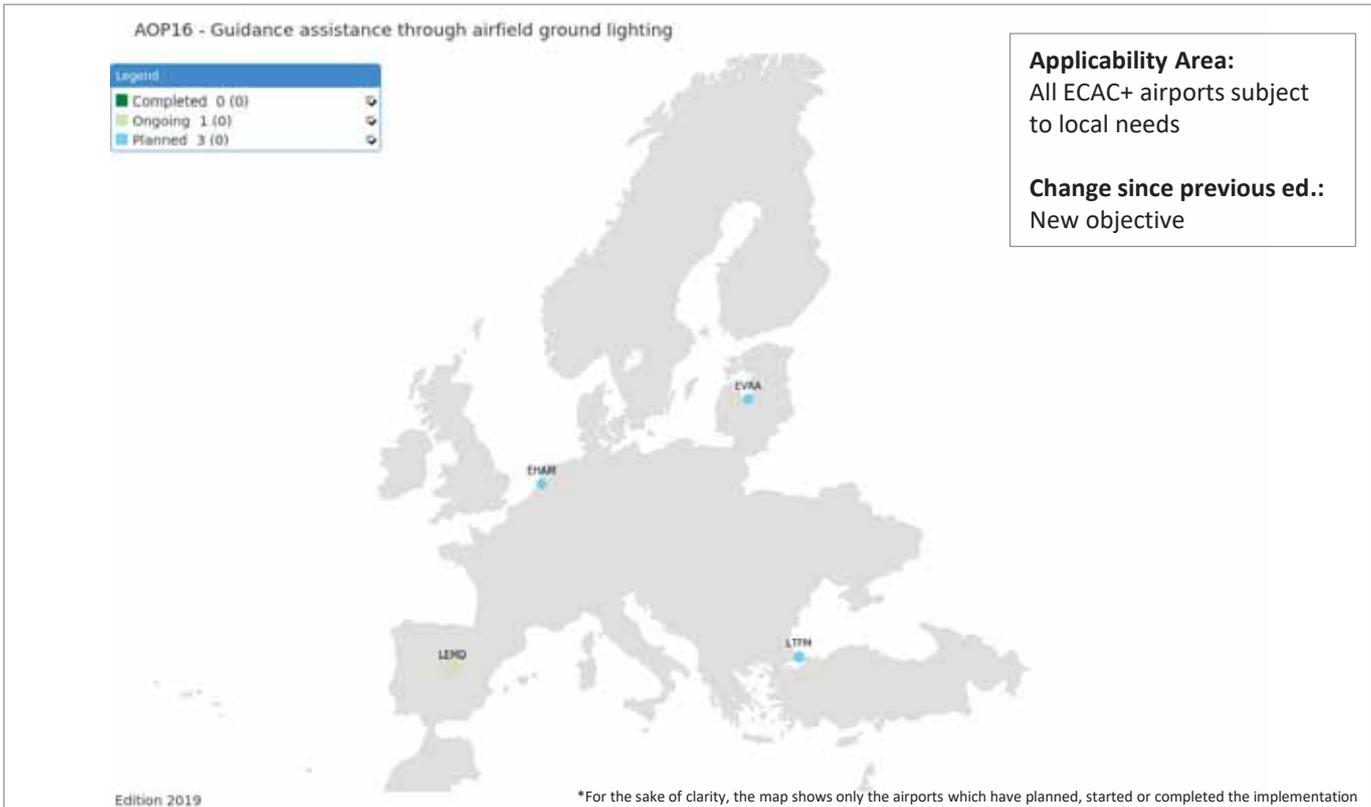
AOP16 Guidance assistance through airfield ground lighting (AGL) [Local]

Stakeholders: <ul style="list-style-type: none"> • Int. Organisations • ANSPs • Airport Operators • Airspace Users 	FOC: Not applicable Estimated achievement: Not available
SESAR Solutions:	Solution #47
Status:	Not applicable
ICAO ASBU:	B1-RSEQ, B2-SURF
OI Steps:	AO-0222-A
Network Strategy Plan:	No corresponding SO
Expected benefits:	



Main 2019 developments:

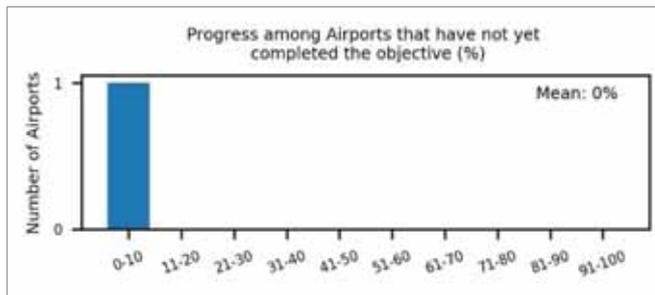
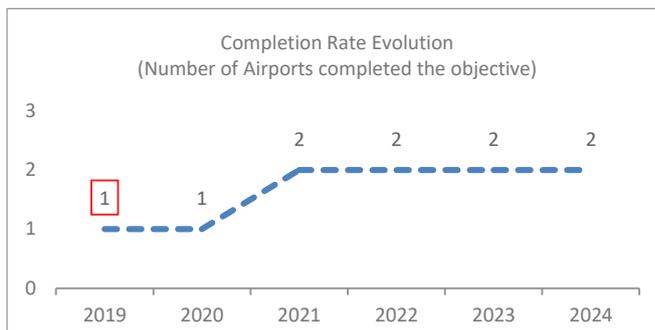
This objective was monitored for the first time in 2019, so no comprehensive assessment of the progress can be done. Most of the airports have not yet planned any implementation of this objective (27) or have declared it as “not applicable (20). Only one airport started implementation (LEMD), while 3 more have plans to implement it (EHAM, EVRA and LTFM). None of the airports have currently implemented the objective.



EOC: Airport and TMA performance

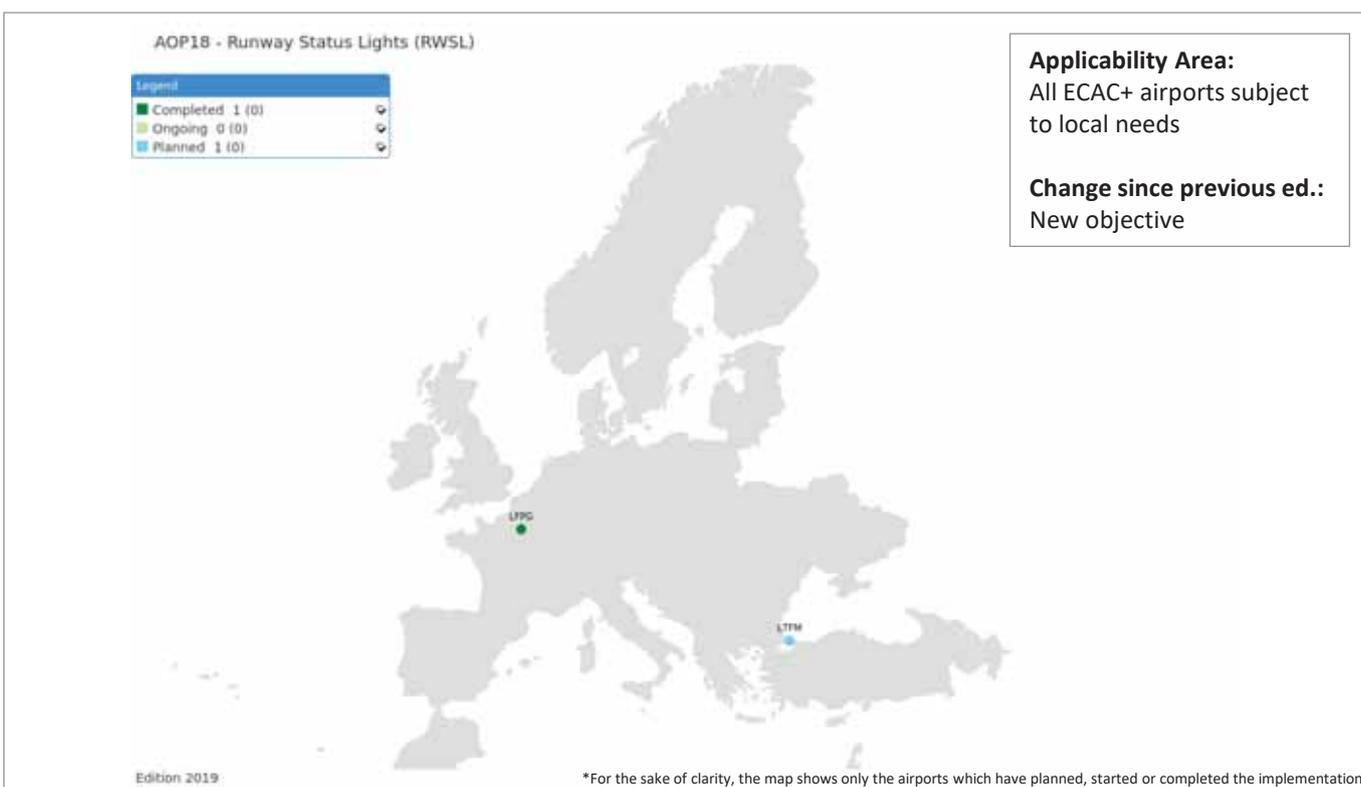
AOP18 Runway Status Lights [Local]

Stakeholders: <ul style="list-style-type: none"> Regulators Int. Organisations ANSPs Airport Operators Airspace Users 	FOC: Not applicable <hr/> Estimated achievement: Not available
SESAR Solutions: Solution #01	
Status: Not applicable	
ICAO ASBU: B2-SURF	
OI Steps: AO-0209	
Network Strategy Plan: No corresponding SO	
Expected benefits:  Safety	



Main 2019 developments:

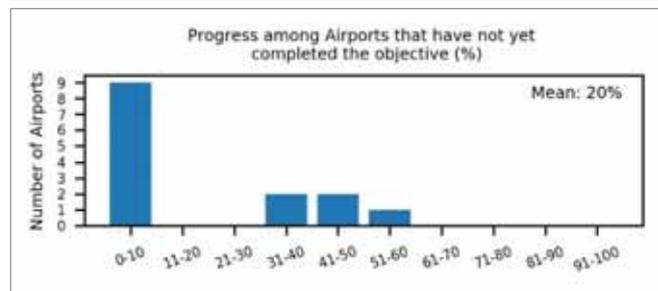
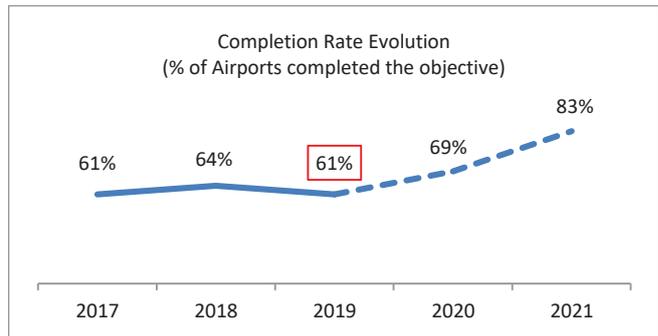
Runway Status Lights (RWSL) system is an automatic independent system based on aerodrome surveillance data that is used to inform the flight crews/vehicle drivers about the instantaneous runway usage, irrespective of ATC clearances. Since this objective was monitored for the first time in 2019, no comprehensive assessment of the progress can be done. While most of the airports reported it as “not yet planned” (31) or “not applicable” (16), only 1 airport reported it as “completed” so far (LFPG) while another 1 (LTFM) has reported plans for 12/2021. No other airports expect to complete their implementation by the end of 2024. Among the reasons for such a lack of implementation plans are low traffic complexity, non-complex airport layouts, recent/planned changes in airport operator impacting planning activities etc.



EOC: Airport and TMA performance

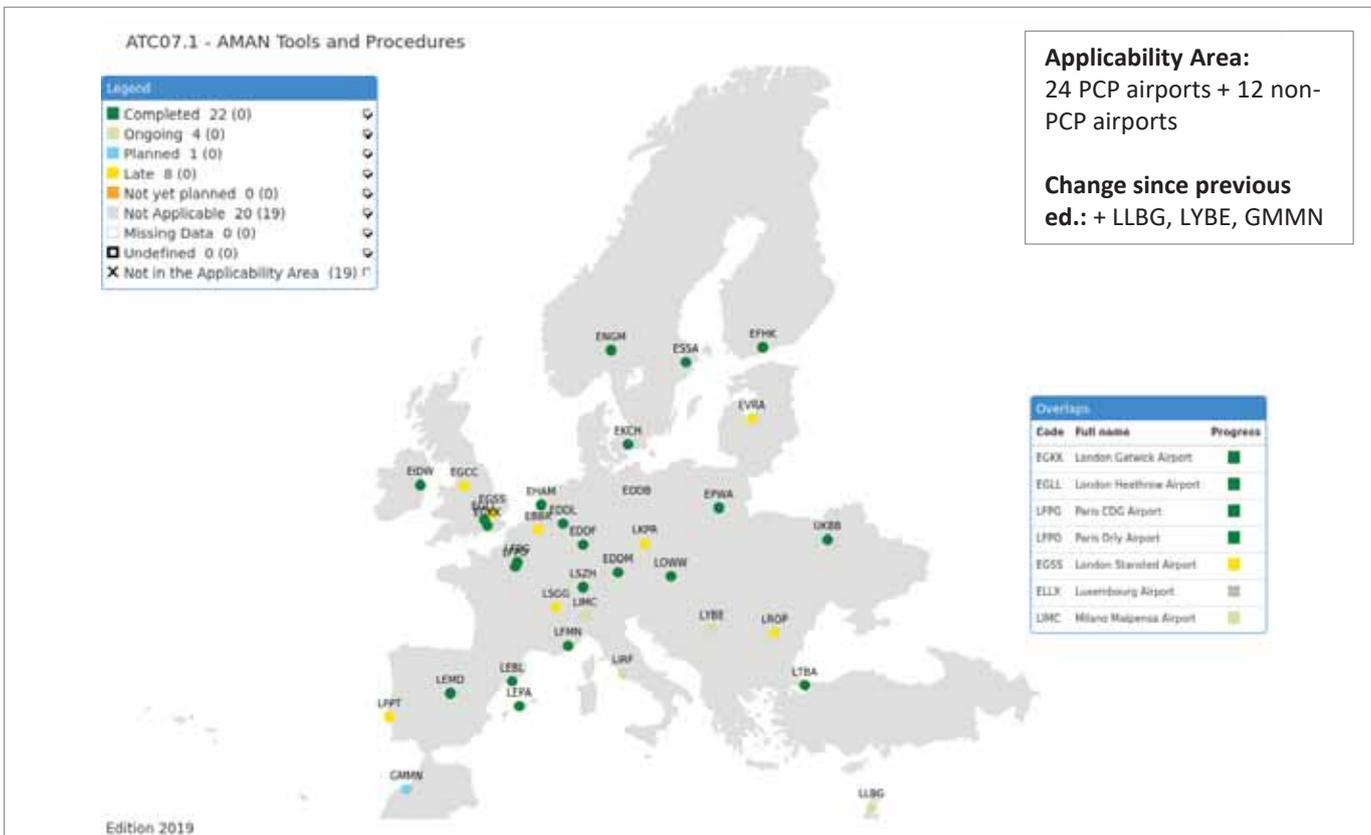
ATC07.1 AMAN tools and procedures

Stakeholders: • ANSPs	FOC: 12/2019 Estimated achievement: 12/2021
SESAR Solutions:	No corresponding Solution
Status:	Late
PCP Sub-Functionality:	Facilitator for: - S-AF1.1 AMAN Extended to En-Route Airspace (PCP)
ICAO ASBU:	B0-RSEQ
OI Steps:	TS-0102
Network Strategy Plan:	SO4/1
Expected benefits:	



Main 2019 developments:

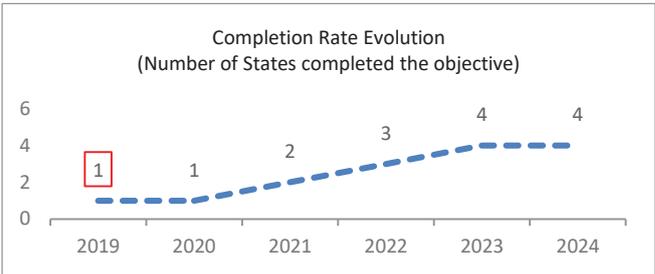
There are 22 airports having completed, and another 13 undergoing or planning the implementation of this objective (+EDDB, which even if in the applicability area, for the time being declares a “Not applicable” status as the airport is not yet operational), compared to 21 and 12 respectively in 2018. Implementation of basic AMAN continues to progress, with one additional operational introduction (Warsaw airport) with respect to 2018. Three locations plan to finish implementation by 2020 (Lisbon, Riga and Rome), another 4 by 2021 (London Stansted, Manchester, Belgrade and Casablanca) and 2 more airports (Bucharest and Geneva) have plans to complete the implementation in 2022. Finally, Brussels, Prague and Tel Aviv airports plan to implement initial AMAN in 2023.



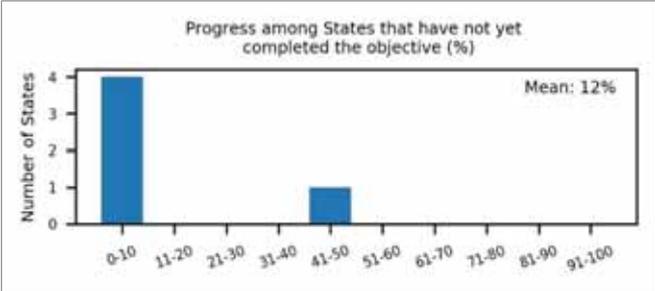
EOC: Airport and TMA performance

ATC19 Enhanced AMAN-DMAN integration [Local]

Stakeholders: <ul style="list-style-type: none"> • Int. Organisations • ANSPs 	FOC: <u>Not applicable</u> Estimated achievement: <u>Not available</u>
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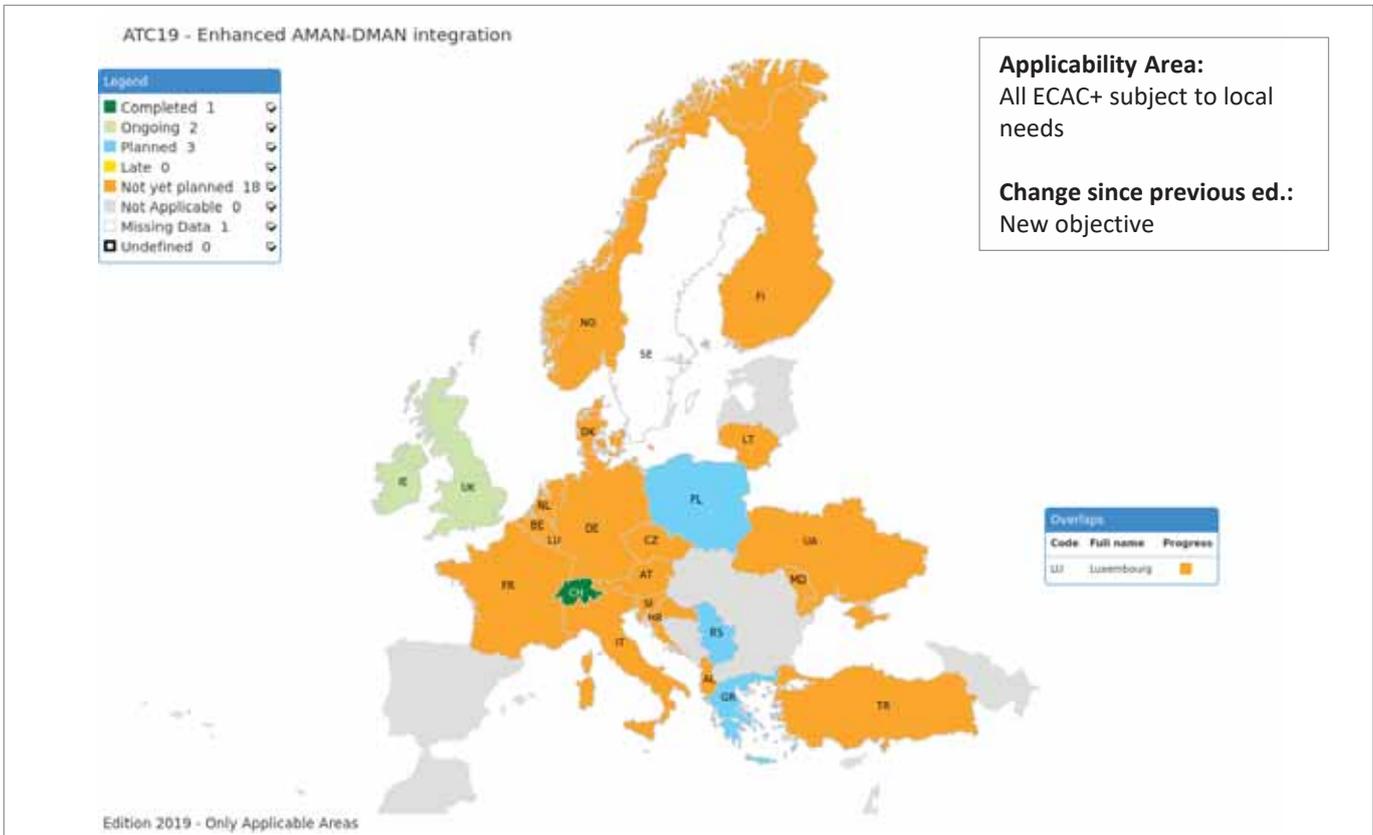
SESAR Solutions:	Solution #54
Status:	Not available
ICAO ASBU:	B2-RSEQ
OI Steps:	TS-0308
Network Strategy Plan:	SO6/5, SO4/1
Expected benefits:	 



Main 2019 developments:

This is a “Local” objective and it has no associated pre-defined applicability area, nor a common FOC date for reference. As new objective in the Level 3 Implementation Plan 2019, this was its first year of monitoring. It was reported as “completed” by CH (“completed” for LSZH and scheduled for LSGG for 2030 to 2034). Two more States reported it as “ongoing” (IE having associated it to their deployment of ATC15.1 and ATC15.2, and UK).

Three States (GR, PL and RS) reported plans for implementing it between 2021 and 2025. Eighteen (18) reported not to have yet plans for implementation, while another 19 considered the objective as “not applicable”. No information was available on possible implementation plans from SE. The numbers above show that there is currently a limited interest in implementing this functionality.



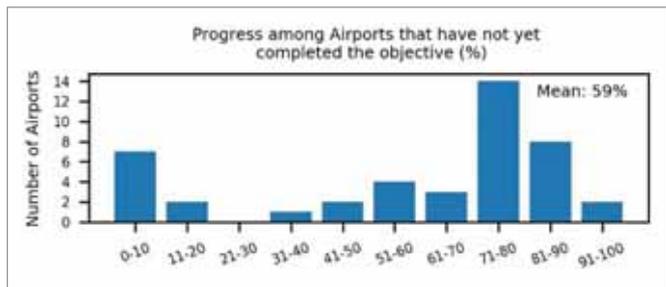
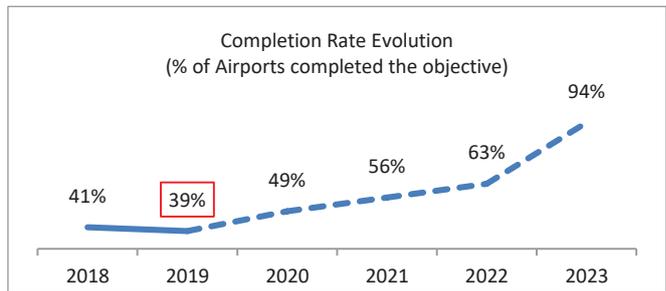
Applicability Area:
All ECAC+ subject to local needs

Change since previous ed.:
New objective

EOC: Airport and TMA performance

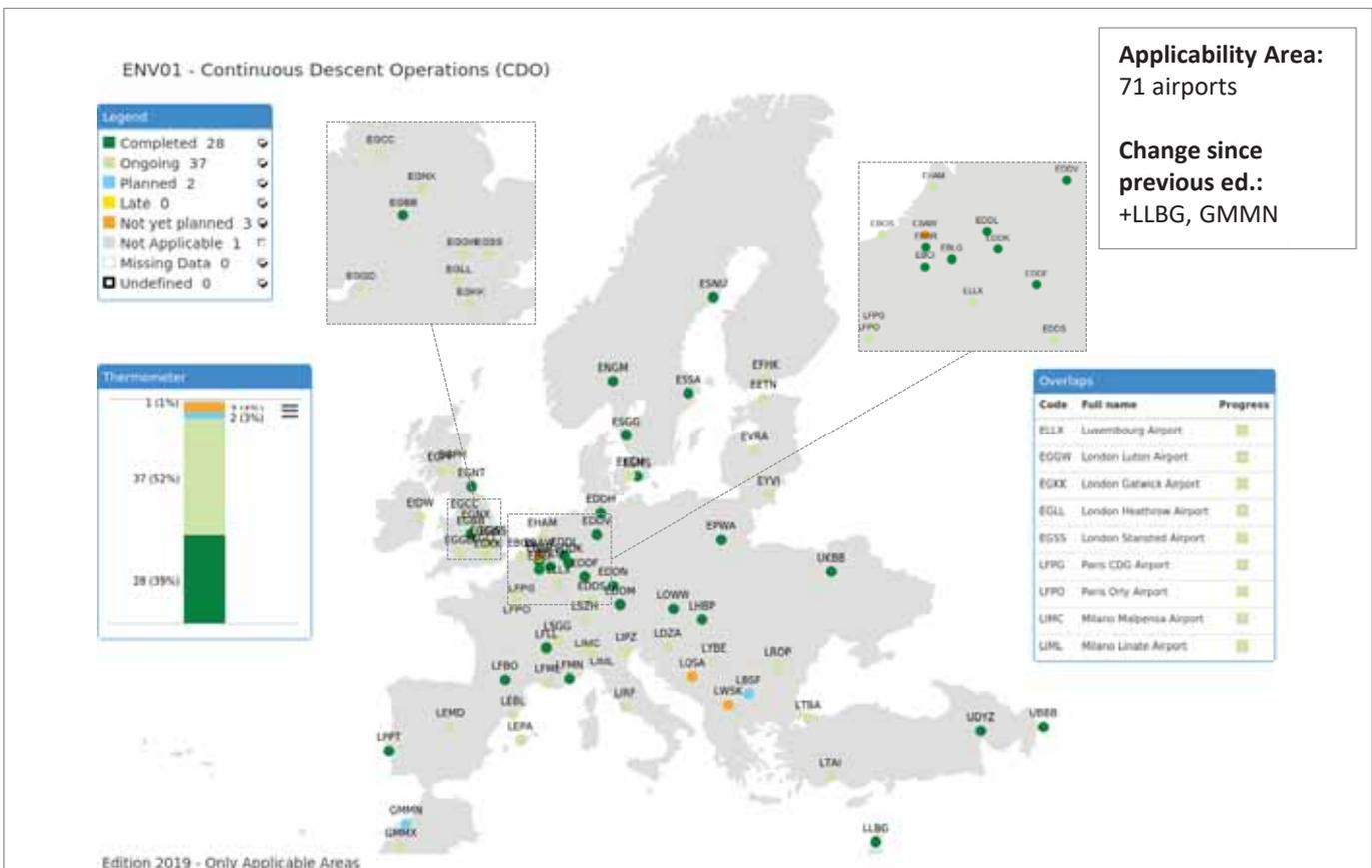
ENV01 Continuous Descent Operations (CDO)

Stakeholders:	FOC: 12/2023
<ul style="list-style-type: none"> ANSPs Airspace Users Airport Operators 	Estimated achievement: 12/2023
SESAR Solutions:	No corresponding Solution
Status:	On time
ICAO ASBU:	B0-CDO, B1-CDO
OI Steps:	AOM-0701, AOM0702-A
Network Strategy Plan:	SO6/5
Expected benefits:	 



Main 2019 developments:

This objective was modified to align it with the ICAO ASBU Block 0/1 elements on CDO. In 2019, one more airport implemented the objective (EGNT), bringing the total number of implementers to 28 (39%). The implementation is currently ongoing at 37 airports (54%). Two airports (GMMN and LBSF) have planned the implementation, whereby three more (LQSA, LWSK and EBAW) reported that they have not yet planned the implementation of CDO. It seems that actions related to monitoring 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. The achievement of this objective can be expected by December 2023.



EOC: Airport and TMA performance

ENV02 Airport Collaborative Environmental Management [Local]

Stakeholders: <ul style="list-style-type: none"> ANSPs Airspace Users Airport Operators EUROCONTROL 	FOC: <u>Not applicable</u> Estimated achievement: Not available	
SESAR Solutions: No corresponding Solution	Status: Not applicable	
ICAO ASBU: No corresponding ASBU	OI Steps: AO-0703, AO-0705, AO-0706	
Network Strategy Plan: No corresponding SO	Expected benefits: <div style="display: flex; justify-content: space-around; align-items: center;"> </div>	

Main 2019 developments:

This is a “local” objective, with implementation on a voluntary basis, subject to local needs and complexity and without a full operational capability (FOC) date. Completion rate has increased by 2 airports compared to 2018, with a total number of 46 airports having this objective “completed” by the end of 2019. Three airports reported for 2019 that the implementation is still ongoing and one more has planned the implementation by the end of 2020. Four airports reported having not yet planned the implementation of this Objective. The issues that cause delay 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.

ENV02 - Airport Collaborative Environmental Management

Legend
■ Completed 46 (0)
■ Ongoing 3 (0)
■ Planned 1 (0)

Overlaps

Code	Full name	Progress
LFPG	Paris CDG Airport	■
EGSS	London Stansted Airport	■
LFPO	Paris Orly Airport	■
EGLL	London Heathrow Airport	■
EGGW	London Luton Airport	■
EGUC	London City Airport	■
LIMC	Milano Malpensa Airport	■
LIML	Milano Linate Airport	■
EGKK	London Gatwick Airport	■
ELLX	Luxembourg Airport	■

Applicability Area:
All ECAC+ airports subject to local needs

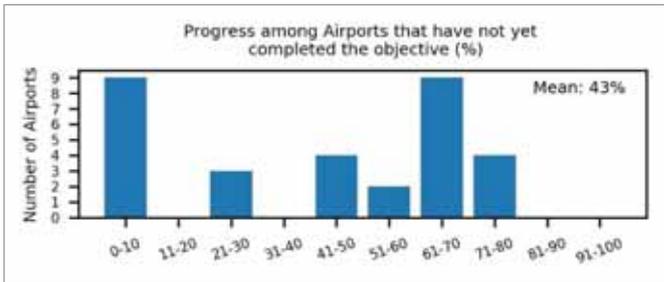
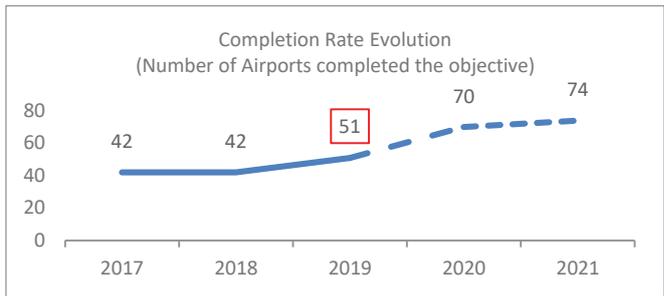
Change since previous ed.:
+LLBG

*For the sake of clarity, the map shows only the airports which have planned, started or completed the implementation

EOC: Airport and TMA performance

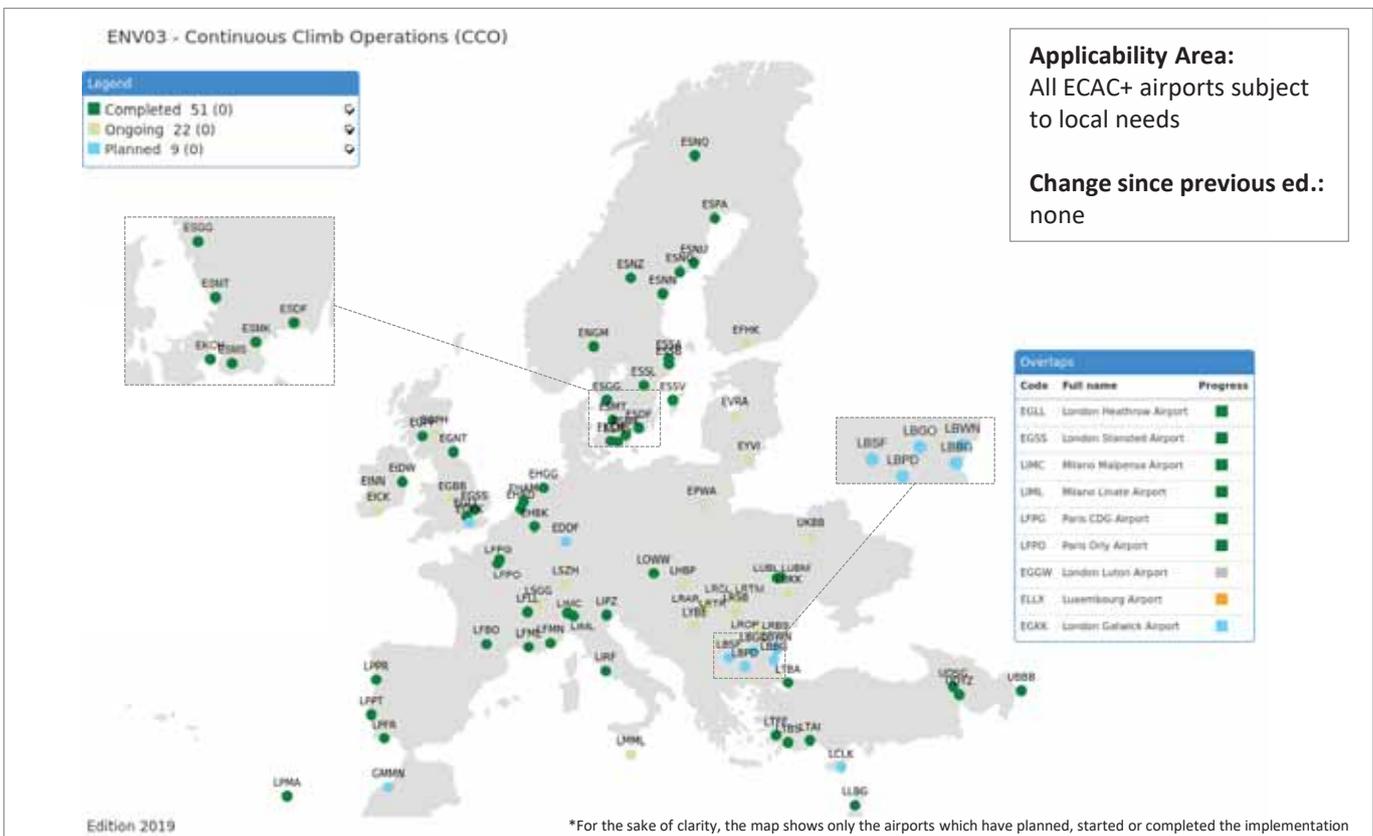
ENV03 Continuous Climb Operations (CCO) [Local]

Stakeholders:	FOC: Not applicable
<ul style="list-style-type: none"> • ANSPs • Airspace Users • Airport Operators 	Estimated achievement: Not available
SESAR Solutions:	No corresponding Solution
Status:	Not applicable
ICAO ASBU:	B0-CCO
OI Steps:	AOM-0703
Network Strategy Plan:	SO6/5
Expected benefits:	 



Main 2019 developments:

This is a Local Objective, with implementation on a voluntary basis, subject to local need and complexity and without a full operational capability (FOC) date. However, this objective should be considered in the same perspective as ENV01-Continuous Descent Operations. By the end of 2019, 51 airports reported the objective as “completed”, compared to 42 airports in 2018. Another 22 airports reported that the implementation is ongoing and 9 airports reported that the implementation is planned with the latest projected implementation date for EGKK-London Gatwick being December 2024. Additionally, 13 airports reported that the implementation of this objective is not yet planned.



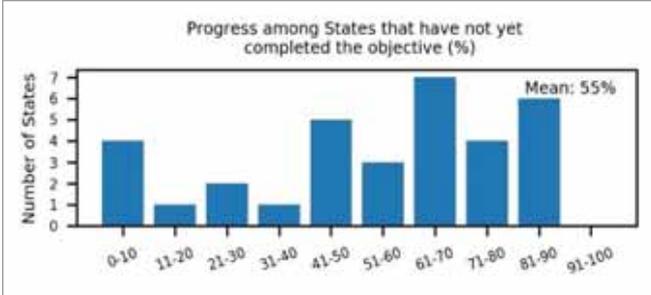
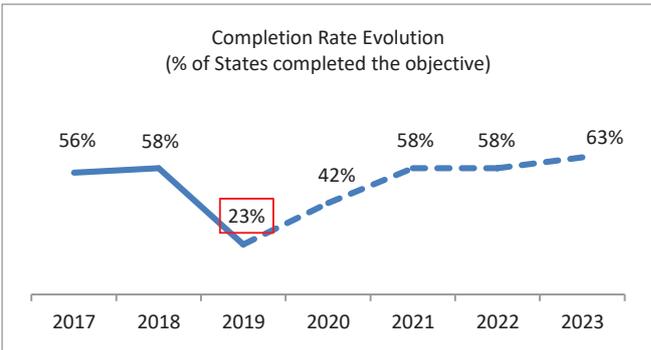
Applicability Area:
All ECAC+ airports subject to local needs

Change since previous ed.:
none

EOC: Airport and TMA performance

NAV03.1 RNAV 1 in TMA Operations

Stakeholders: <ul style="list-style-type: none"> • ANSPs • Airspace Users • Regulators 	FOC: <u>06/2030</u> Estimated achievement: 2030
SESAR Solutions: Solution #62	
Status: On time	
PCP Sub-Functionality: <ul style="list-style-type: none"> - Introduction of P-RNAV - Predecessor of S-AF1.2 Enhanced TMA using RNP-based operations 	
ICAO ASBU: B0-CDO, B0-CCO, B1-RSEQ	
OI Steps: AOM-0601, CTE-N08	
Network Strategy Plan: SO6/5	
Expected benefits: <div style="display: flex; justify-content: space-around; align-items: center;"> Safety Operational efficiency Environment </div>	



Main 2019 developments:
 The current reporting cycle was the first one after the amendment of the objective in line with the PBN IR. This amendment led to a substantial reduction (-35%) of the completion rate, because of the need to reassess the objective in the light of the new requirements, making many States to revert the status of the objective from “Completed” to “Ongoing”. It should be noted that (IR) on PBN (EU) 2018/1048 gives choice to the stakeholders, except those regulated by PCP regulation, to decide on the need for SID and STAR, and on applicable specifications RNAV1 or RNP1. A big bulk of those having reported “completed” at major aerodromes and TMAs, have plans for further implementation at smaller aerodromes too. Only BA reported “no plan yet”, and ME reported “not applicable” due to lack of surveillance coverage in TMA. Eleven states still work on establishing appropriate DME/DME infrastructure. One of the main ongoing activities in big majority of all states is drafting and verification of PBN Transition Plan expected to finish by 2021. According to the EUROCONTROL CNS business intelligence based on ICAO FPL, in 2019 about 93% of the flights to ECAC airports had RNAV1 capability, out of which 3% were “Non-GNSS” equipped.

NAV03.1 - RNAV 1 in TMA Operations

Legend

- Completed: 30 (0)
- Ongoing: 31 (0)
- Planned: 0 (0)
- Late: 0 (0)
- Not yet planned: 1 (0)
- Not Applicable: 2 (1)
- Missing Data: 0 (0)
- Undefined: 0 (0)
- Not in the Applicability Area: 11

Thermometer

Overlaps

Code	Full name	Progress
HR	Hrvatska UAC	0%
LU	Luxembourg	100%
MT	Malta	100%

Applicability Area:
 All ECAC+ States except MUAC

Change since previous ed.:
 +IL, MA

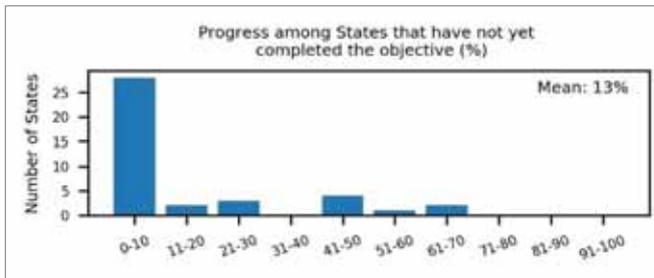
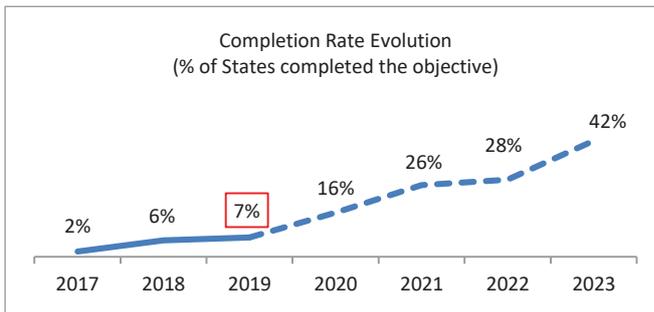
Edition 2019

EOC: Airport and TMA performance

NAV03.2 RNP 1 in TMA Operations

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

Stakeholders:	FOC: <u>06/2030</u>
<ul style="list-style-type: none"> • ANSPs • Airspace Users • Regulators 	Estimated achievement: Not available
SESAR Solutions:	Solutions #09 & #51
Status:	Not available
PCP Sub-Functionality:	S-AF1.2 Enhanced TMA using RNP-Based Operations
ICAO ASBU:	B1-RSEQ
OI Steps:	AOM-0603, AOM-0605
Network Strategy Plan:	SO6/5
Expected benefits:	

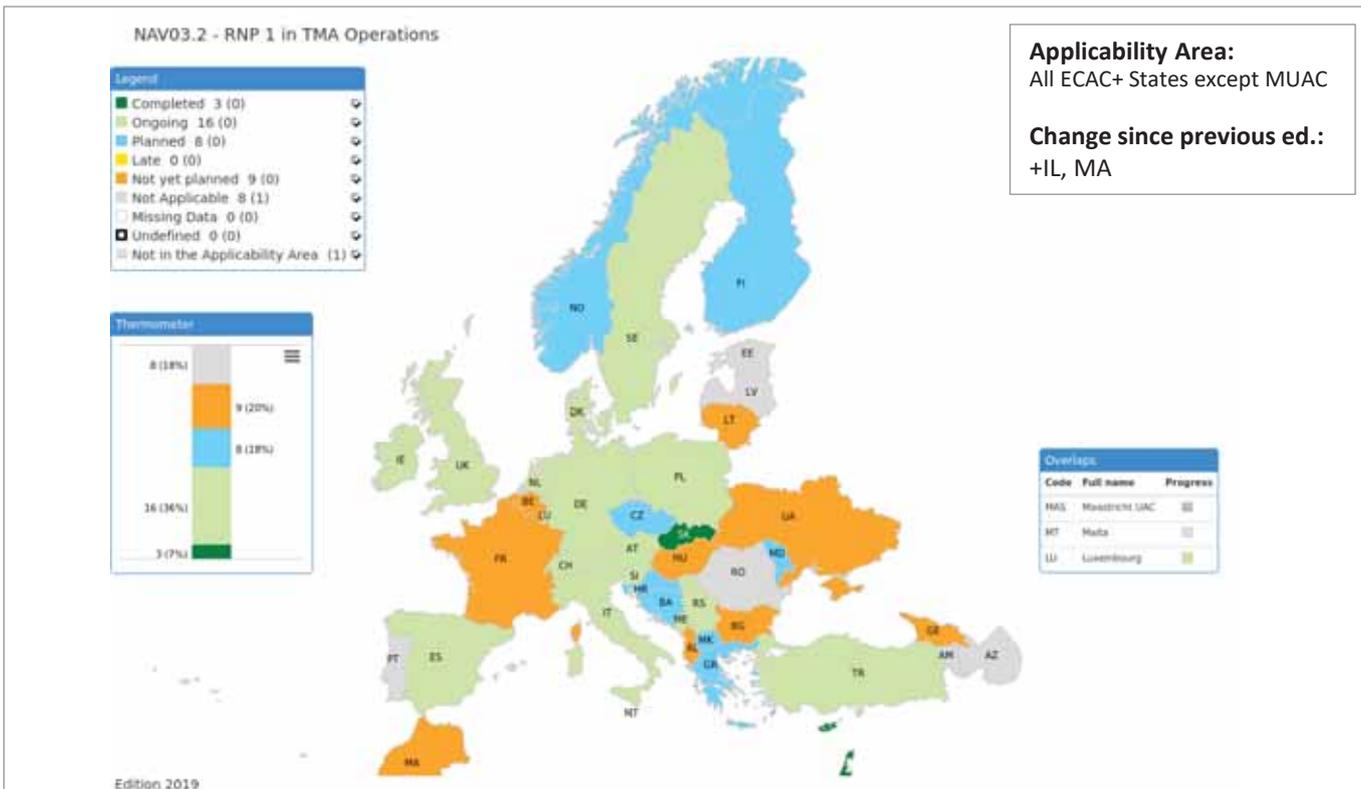


Main 2019 developments:

The current reporting cycle was the first one after the amendment of the objective in line with the PBN IR. It should be noted that (IR) on PBN (EU) 2018/1048 gives choice to the stakeholders, except those regulated by PCP regulation, to decide on the need for SID and STAR, and on applicable specifications RNP1 or RNAV1. Fifteen states indicated lack of business (operational) need for RNP1 implementation. One of the main ongoing activities in big majority of all states is drafting and verification of PBN Transition Plan expected to finish by 2021. Eleven states still work on establishing appropriate DME/DME infrastructure.

The importance of establishment and performance of appropriate infrastructure supporting the reversion in case of GNSS failure, is highlighted as very important.

According to the EUROCONTROL CNS business intelligence based on ICAO FPL, in 2019 about 73% of the flights to ECAC airports had RNP1 capability.

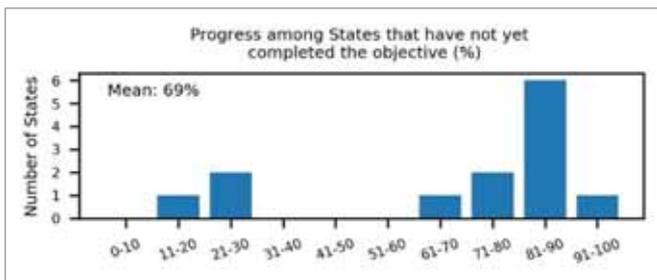
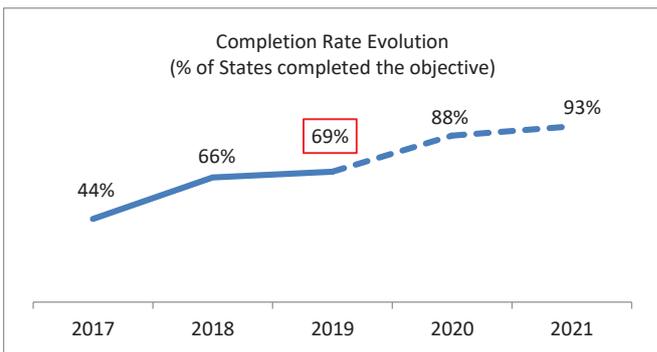


EOC: Airport and TMA performance

SAF11 Prevent Runway Excursions

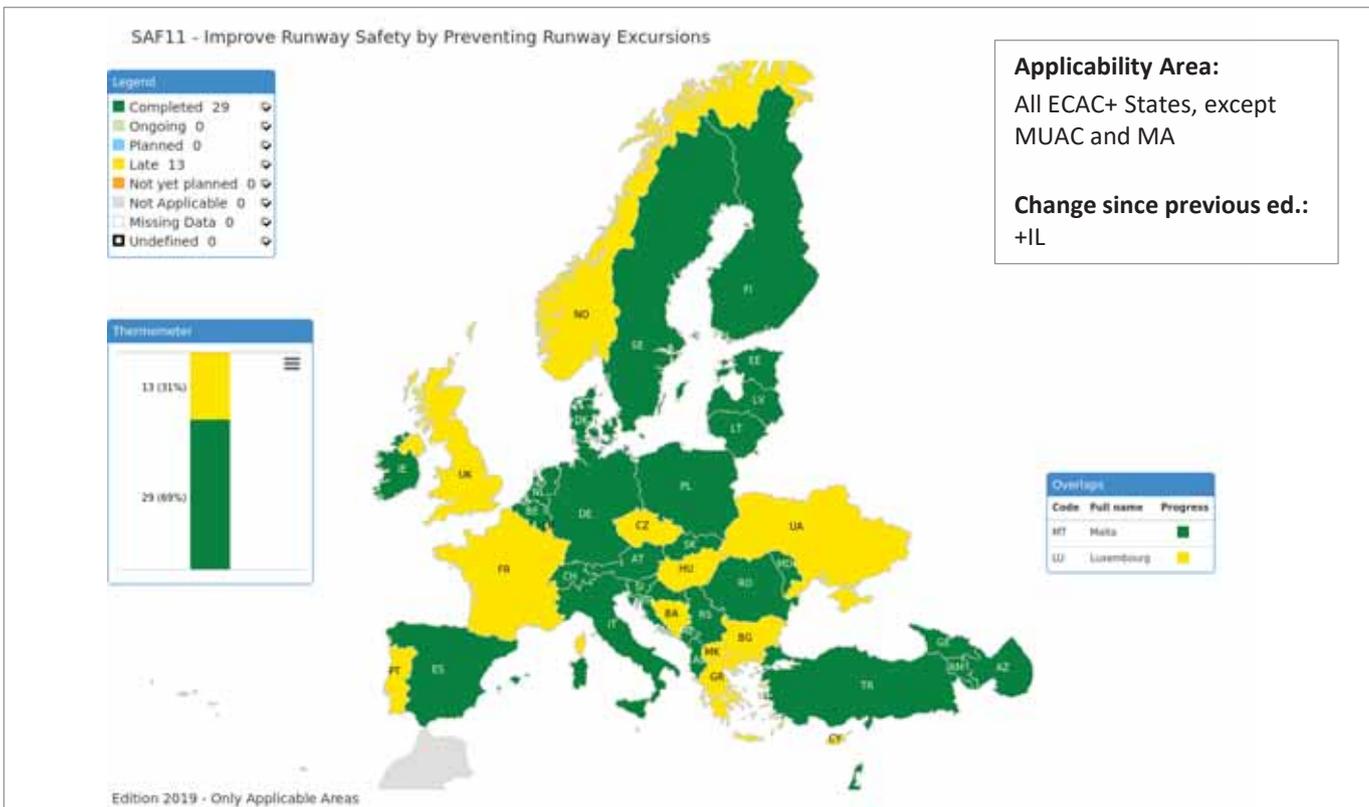
Stakeholders:	
<ul style="list-style-type: none"> • ANSPs • Airspace Users • Airport Operators • Network Manager • Regulators 	
FOC:	01/2018
Estimated achievement:	12/2020

SESAR Solutions:	No corresponding Solution
Status:	Late
ICAO ASBU:	No corresponding ASBU
OI Steps:	PRO-006a
Network Strategy Plan:	No corresponding SO
Expected benefits:	



Main 2019 developments:

Compared to 2018, only slow progress has been made in 2019 with 2 additional States (IL, RO) having completed this objective, bringing the total number of States which reported the status “completed” to 29. Thirteen States reported the status “late”, with 8 States expected to implement this objective by the end of 2020. Two more States foresee the implementation by the end of 2021 and 3 States foresee the implementation by the end of 2024. Full achievement of this objective by all States in the Applicability Area is expected by December 2024, implying an overall delay of 6 years.

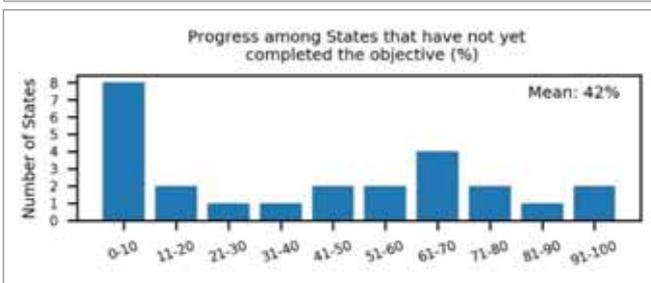
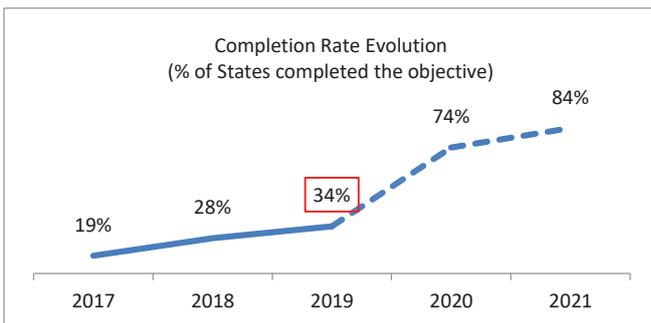


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AOM19.1 ASM tools to support A-FUA

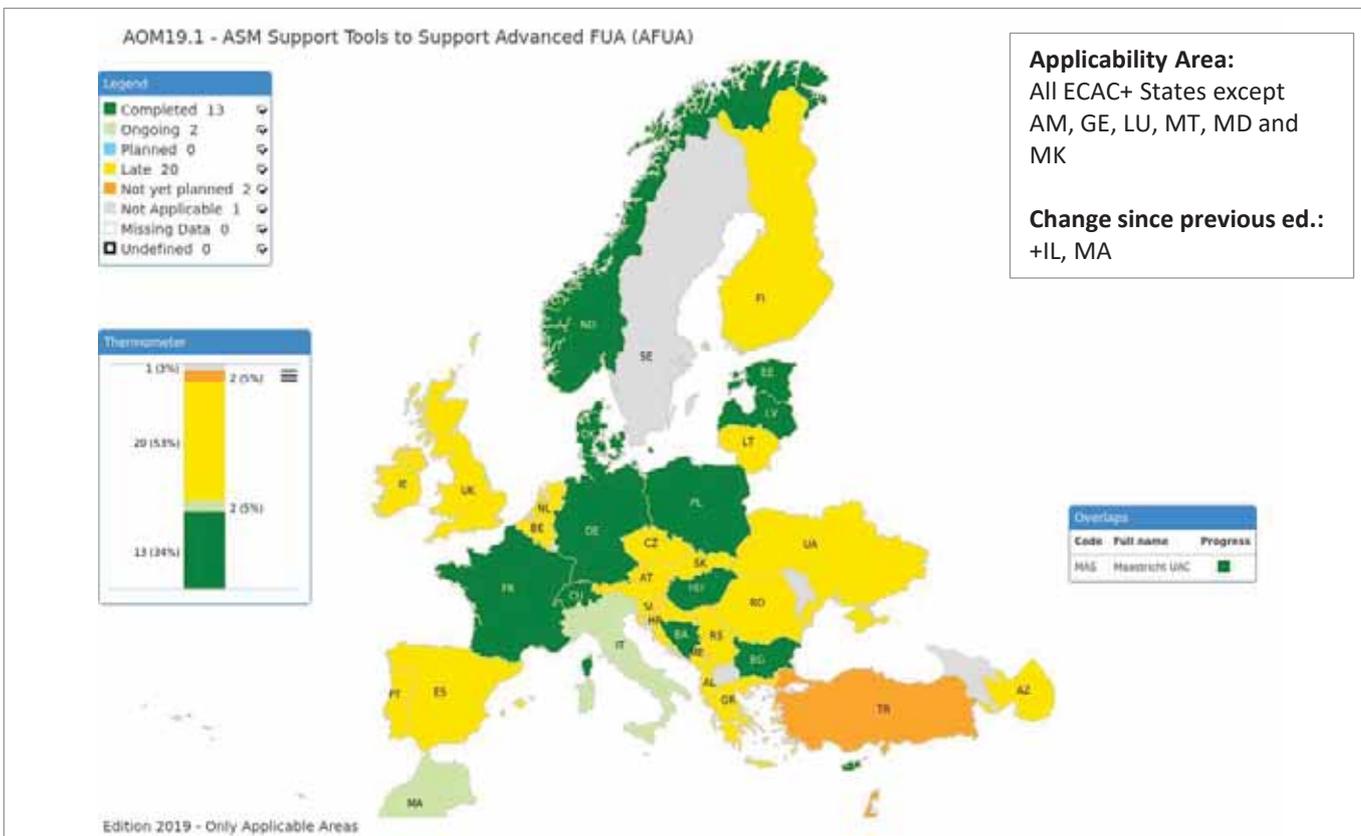
Stakeholders: <ul style="list-style-type: none"> ANSPs Network Manager 	FOC: <u>12/2018</u>
	Estimated achievement: 12/2021

SESAR Solutions:	Solution #31
Status:	Late
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
Expected benefits:	



Main 2019 developments:

The objective is an important enabler for the PCP sub-functionality 3.1. Several States (13) including Maastricht UAC have completed it, while other 22 States report plans beyond the deadline of 12/2018, three less than last year. SE reports that there is no operational need for an automated ASM tool, while GE and TR are considering its implementation at a later stage of their FUA upgrade projects. 22 States including Maastricht UAC have implemented local ASM tools (AOM19.1-ASP01); some are local solutions but a majority of them (15) rely on LARA (Local and sub-Regional ASM Support System).



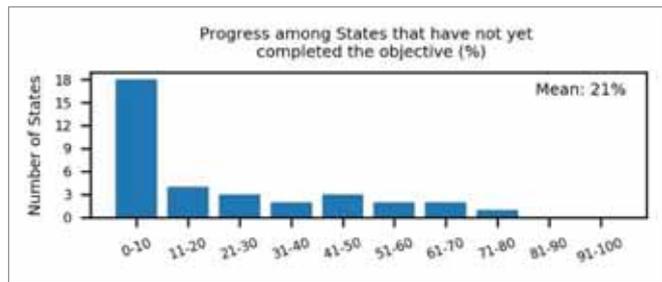
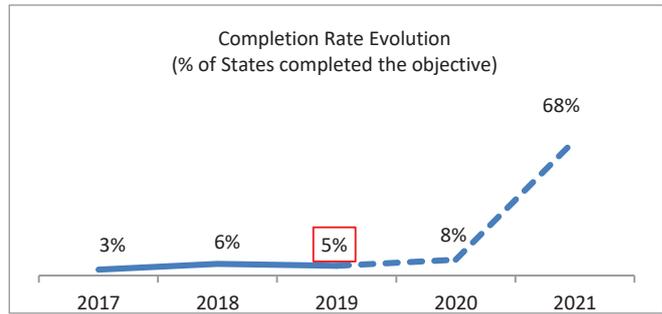
EOC: Fully Dynamic and Optimised Airspace Organisation

AOM19.2 ASM management of real-time airspace data

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

Stakeholders:	FOC: 12/2021
<ul style="list-style-type: none"> • ANSPs • Airspace Users • Network Manager 	Estimated achievement: Not available

SESAR Solutions:	Solution #31
Status:	Not available
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
Expected benefits:	

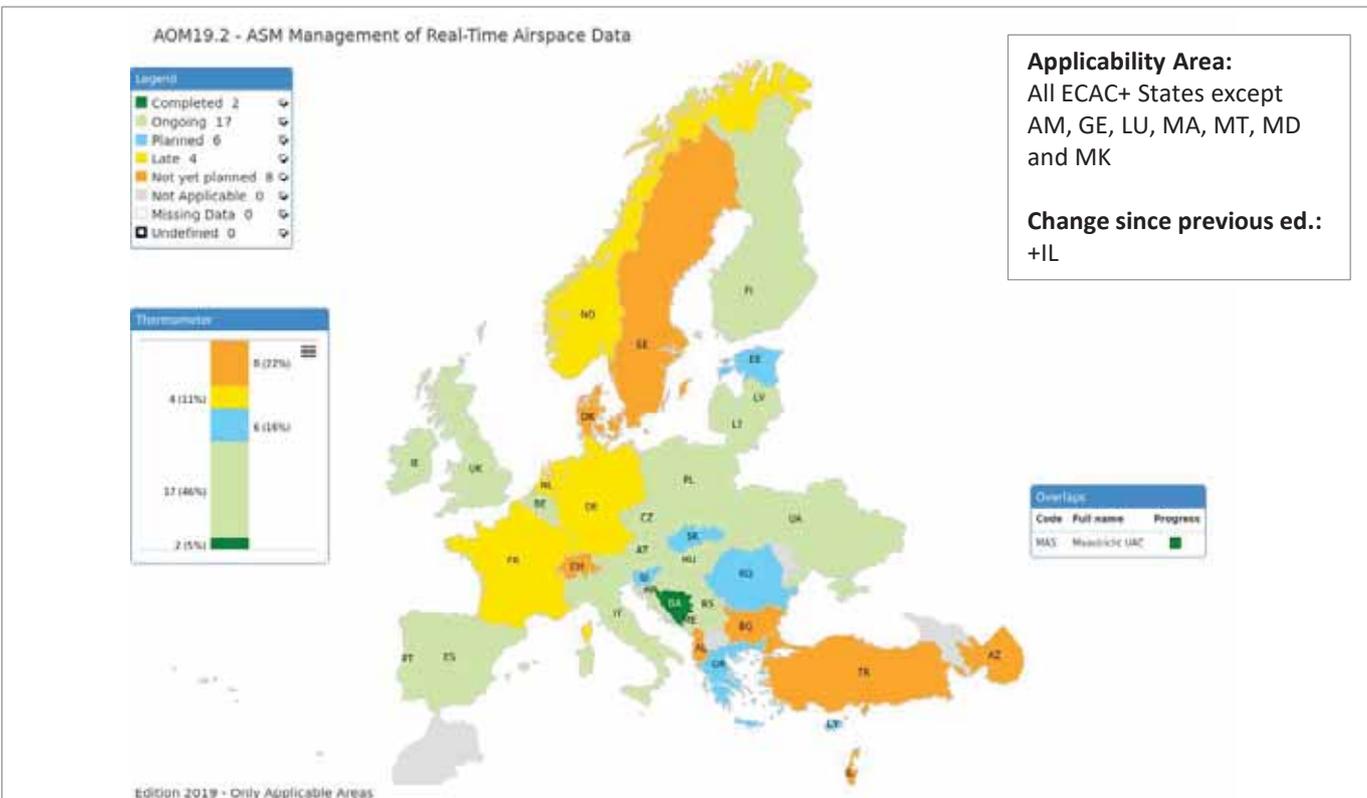


Main 2019 developments:

Although the number of States reporting ongoing activities increased to 17, the level of implementation of this objective remains low, with no new completed implementations in 2019.

In addition to FR, DE and NO, also NL reported the objective “late”, planning to complete it by 2024.

No estimated achievement date can still be calculated, in particular due to the States having no implementation plans yet. 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.

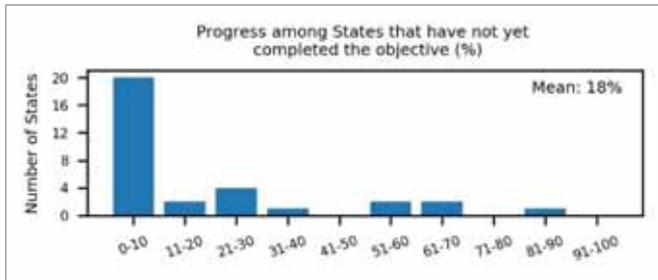
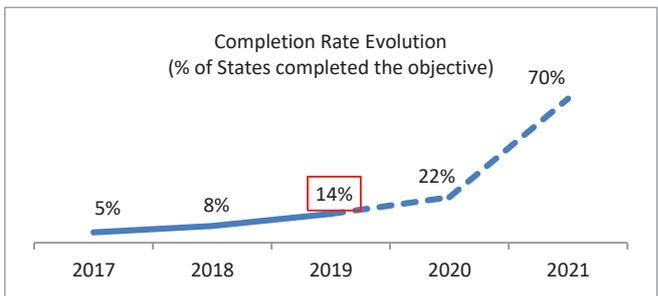


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AOM19.3 Full rolling ASM/ATFCM process and ASM information sharing

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

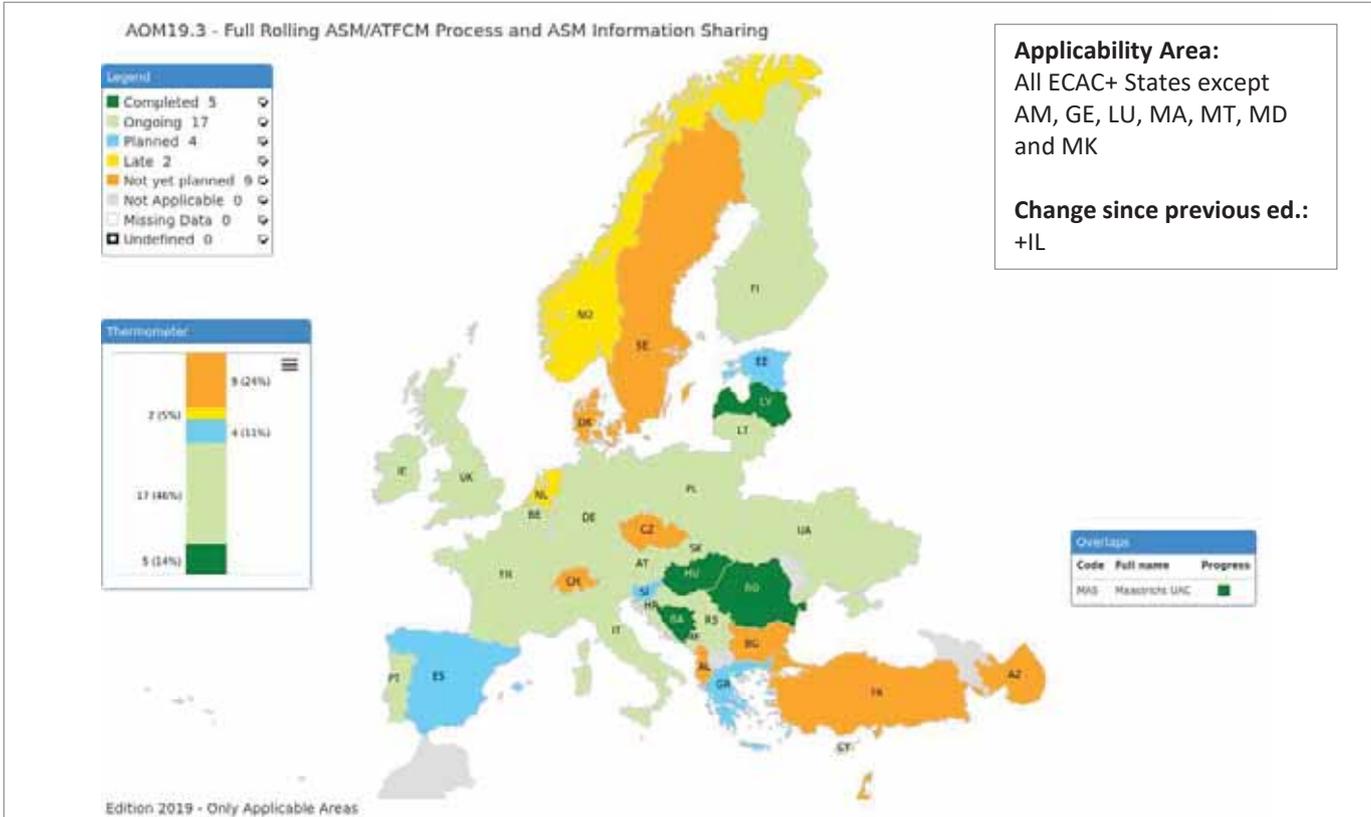
Stakeholders:	FOC: 12/2021
<ul style="list-style-type: none"> ANSPs Airspace Users Network Manager 	Estimated achievement: Not available
SESAR Solutions:	Solution #31
Status:	Not available
PCP Sub-Functionality:	S-AF3.1 ASM and Advanced FUA
ICAO ASBU:	B1-FRTO, B1-NOPS, B2-NOPS
OI Steps:	AOM-0202, AOM-0202-A
Network Strategy Plan:	SO3/2, SO3/3
Expected benefits:	



Main 2019 developments:

Stakeholders are activating their implementation plans with slight progress since last year (implementation reported “completed” by LV and RO).

There might 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 are still in the very early implementation stages. No estimated achievement date can still be calculated, in particular due to the States having no implementation plans yet. 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.



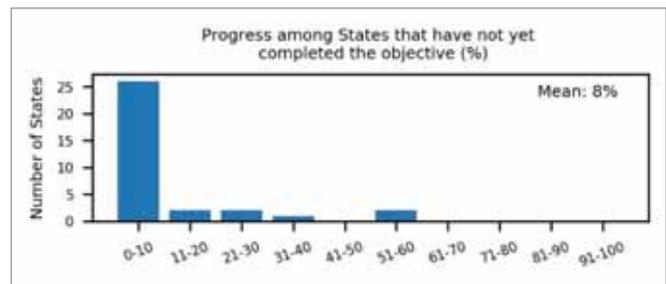
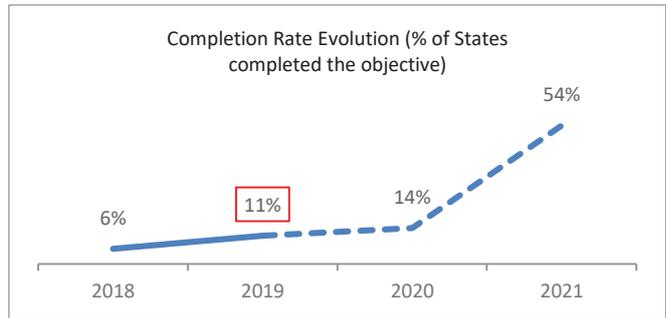
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AOM19.4 Pre-defined airspace configurations

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

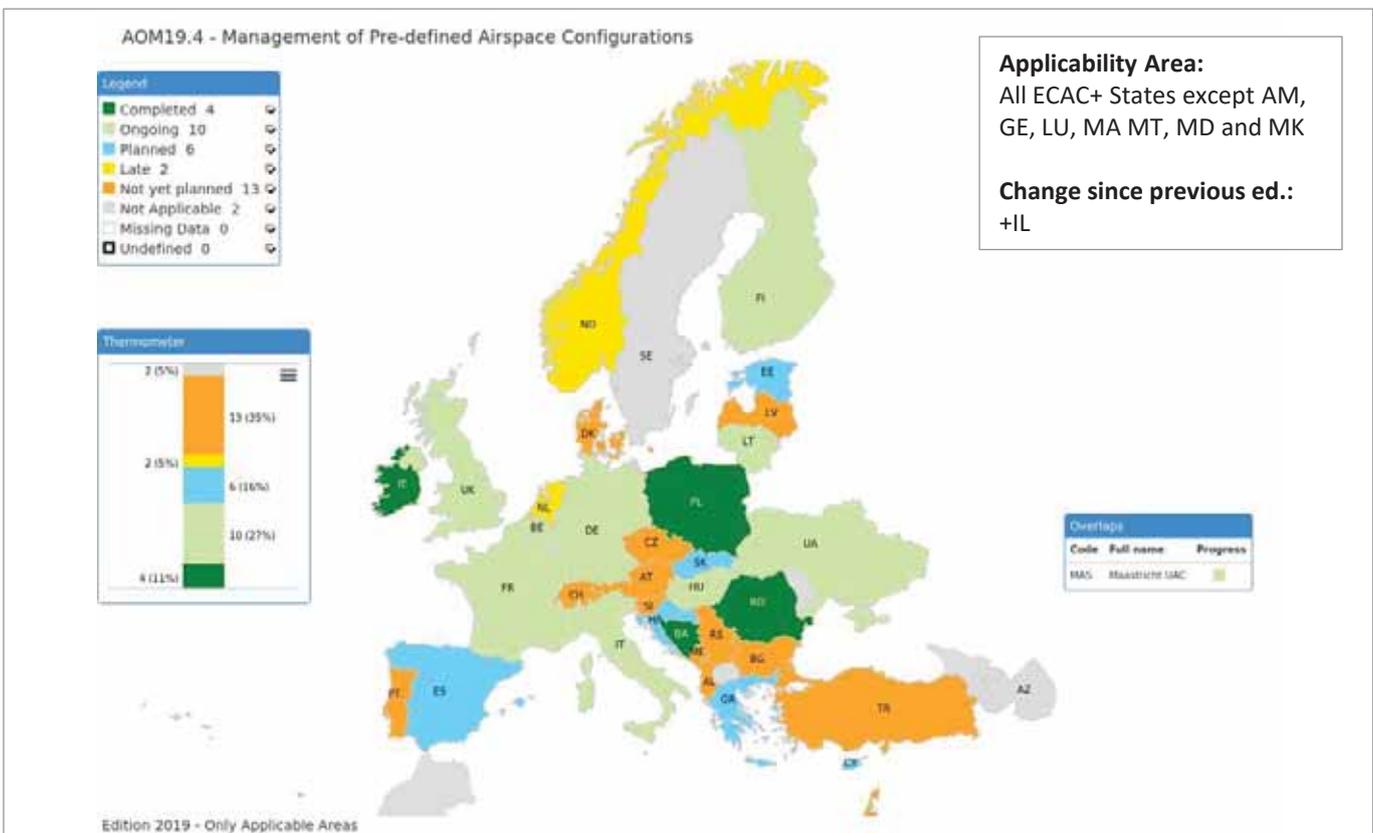
Stakeholders: <ul style="list-style-type: none"> • ANSPs • Network Manager 	FOC: <u>12/2021</u> Estimated achievement: Not available
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SESAR Solutions:	Solution #31
Status:	Not available
PCP Sub-Functionality:	S-AF3.1 ASM and Advanced FUA
ICAO ASBU:	B1-FRTO, B1-NOPS
OI Steps:	Under definition
Network Strategy Plan:	SO3/2, SO3/3
Expected benefits:	



Main 2019 developments:

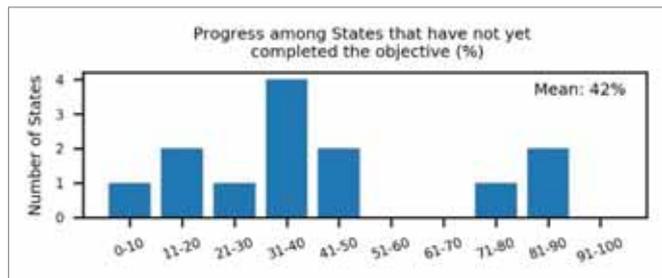
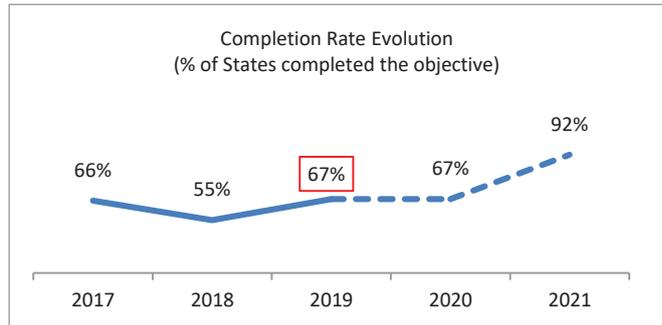
This objective was monitored for the first time in 2018. Since then 4 States (i.e. BA, IE, PL, RO) reported it as “completed”. While 13 States have not yet planned any implementation of this objective, two more (i.e. BE, UA) activated their plans. On the other hand, 6 States plan to complete their implementation by the end of 2021, while NO and NL expects to implement it by Q1 2023 and Q4 2024 respectively. Overall, no estimated achievement date can still be calculated, in particular due to the States having no implementation plans yet.



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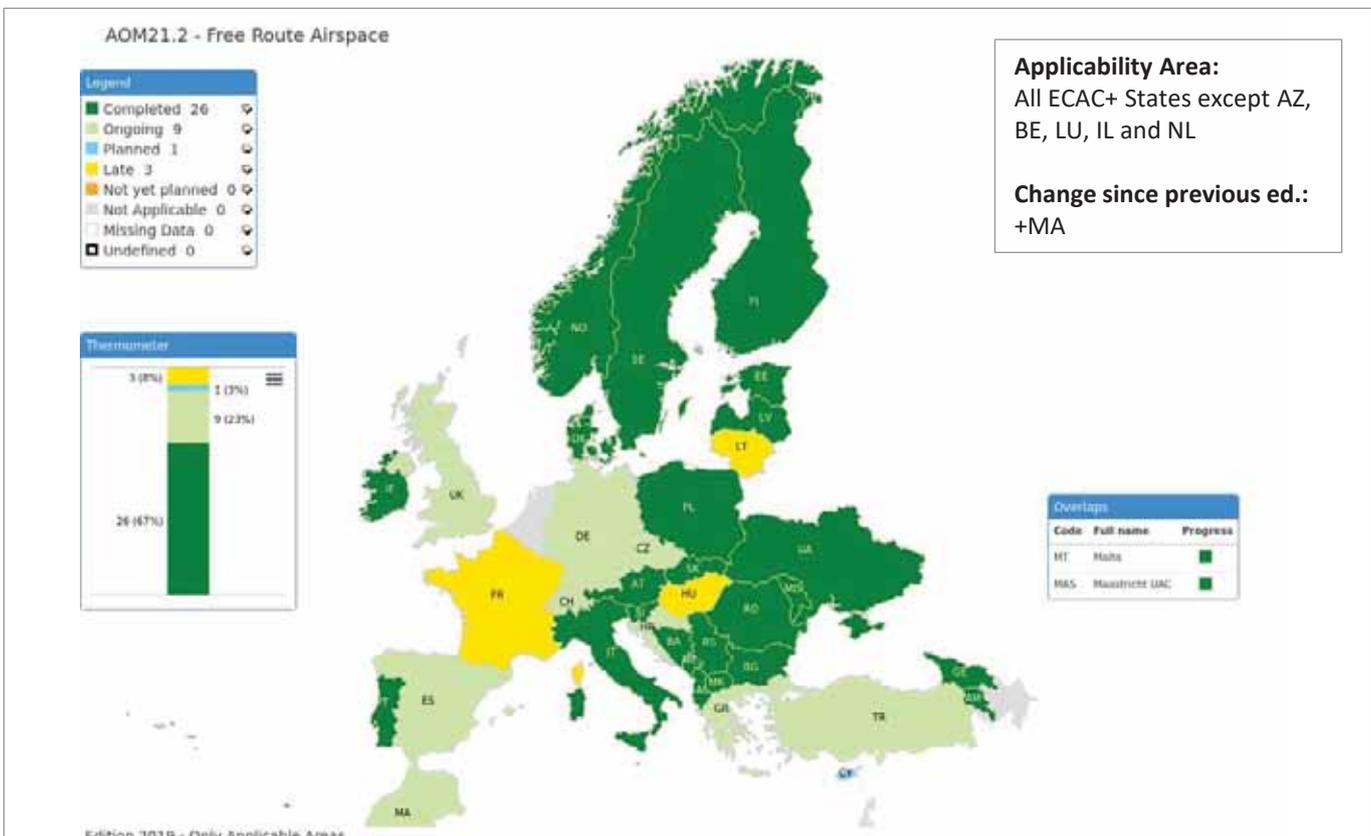
AOM21.2 Free Route Airspace

Stakeholders:	FOC: 12/2021
<ul style="list-style-type: none"> ANSPs Airspace Users Network Manager 	Estimated achievement: 12/2021
SESAR Solutions:	Solutions #33 & #66
Status:	On time
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
Expected benefits:	



Main 2019 developments:

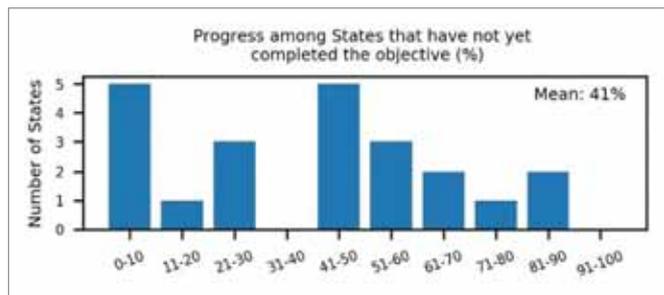
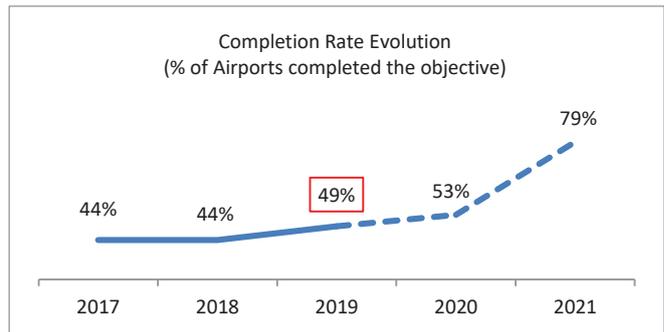
After a reduction in the completion rate occurred last year due to the introduction of a new SLoA addressing the specific implementation of dynamic sectorisation, the number of States reporting the objective as “completed” increased by 5 (i.e. GE, MA, MUAC, PL, SK). It should be noted that in some of the States reporting “Late” implementation (HU, LT) the Free Route functionality is already implemented, however some system support (e.g. automatic support of dynamic sectorisation) is not yet available. The implementation of this Objective is progressing well and no delay is expected. The estimated achievement is still expected by the end of 2021.



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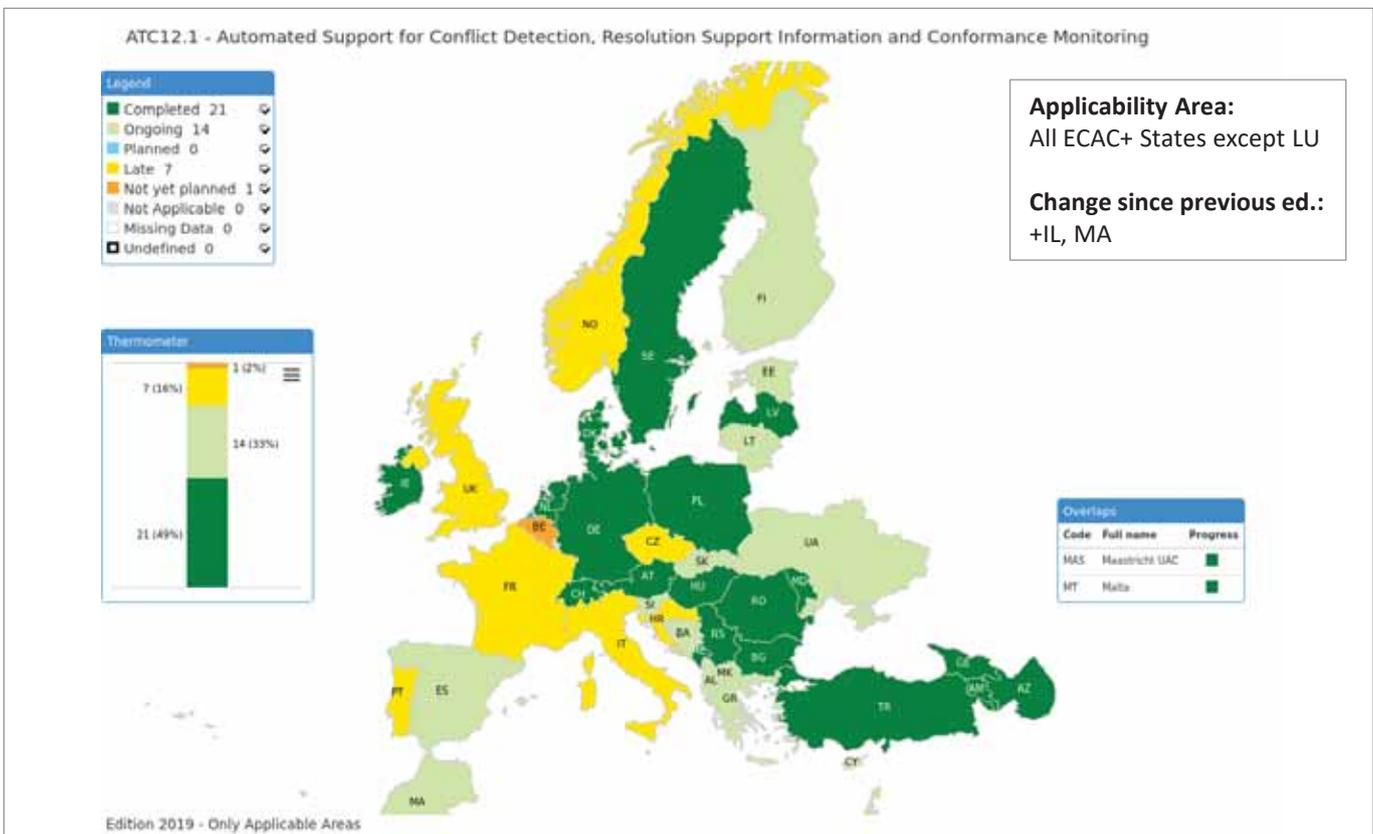
ATC12.1 MONA, TCT and MTCD

Stakeholders: • ANSPs	FOC: 12/2021 Estimated achievement: 12/2022
SESAR Solutions:	Solutions #27 & #104
Status:	Planned delay
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
Expected benefits:	 Safety  Capacity



Main 2019 developments:

MTCD in 2019 was declared “completed” by 21 States, 3 more than in 2018. The number of ANSPs progressing on time (i.e. “Ongoing”) decreased to 14, from 17 in 2018. Implementation of MTCD is completed in 34 ACCs (30 in 2018), representing 53% of the applicable area. Tactical Controller Tool, an optional feature, has been reported “completed” so far in 9 ACCs (7 in 2018). Twenty ACCs consider TCT as “Not Applicable”. Conformance monitoring function is the most deployed feature, reported “completed” in 37 ACCs (36 in 2018). Resolution support function is implemented in 19 ACCs (18 in 2018). Overall the objective is progressing at a relatively fast pace and the completion criteria (80% completion rate) is expected to be reached not before 2022, one year later than the FOC date of the objective.

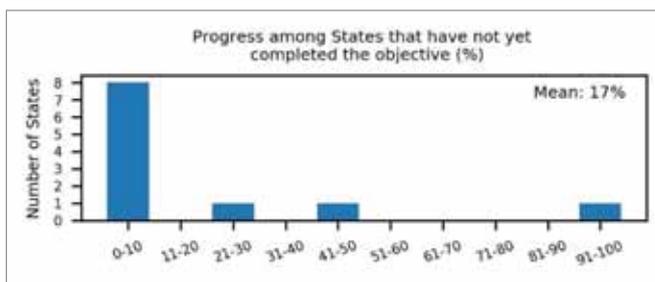
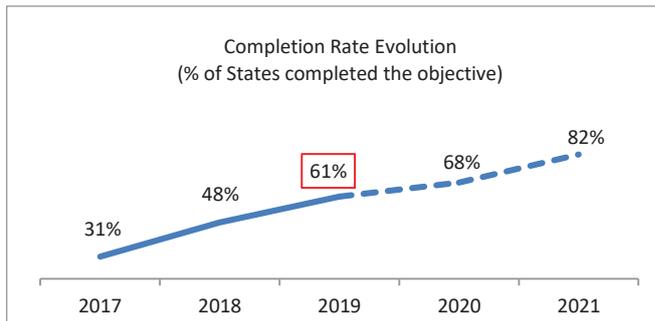


EOC: Fully Dynamic and Optimised Airspace Organisation

ATC15.1 Implement, in en-route operations, information exchange mechanisms, tools and procedures in support of basic AMAN

Stakeholders: • ANSPs	FOC: 12/2019 Estimated achievement: 12/2021
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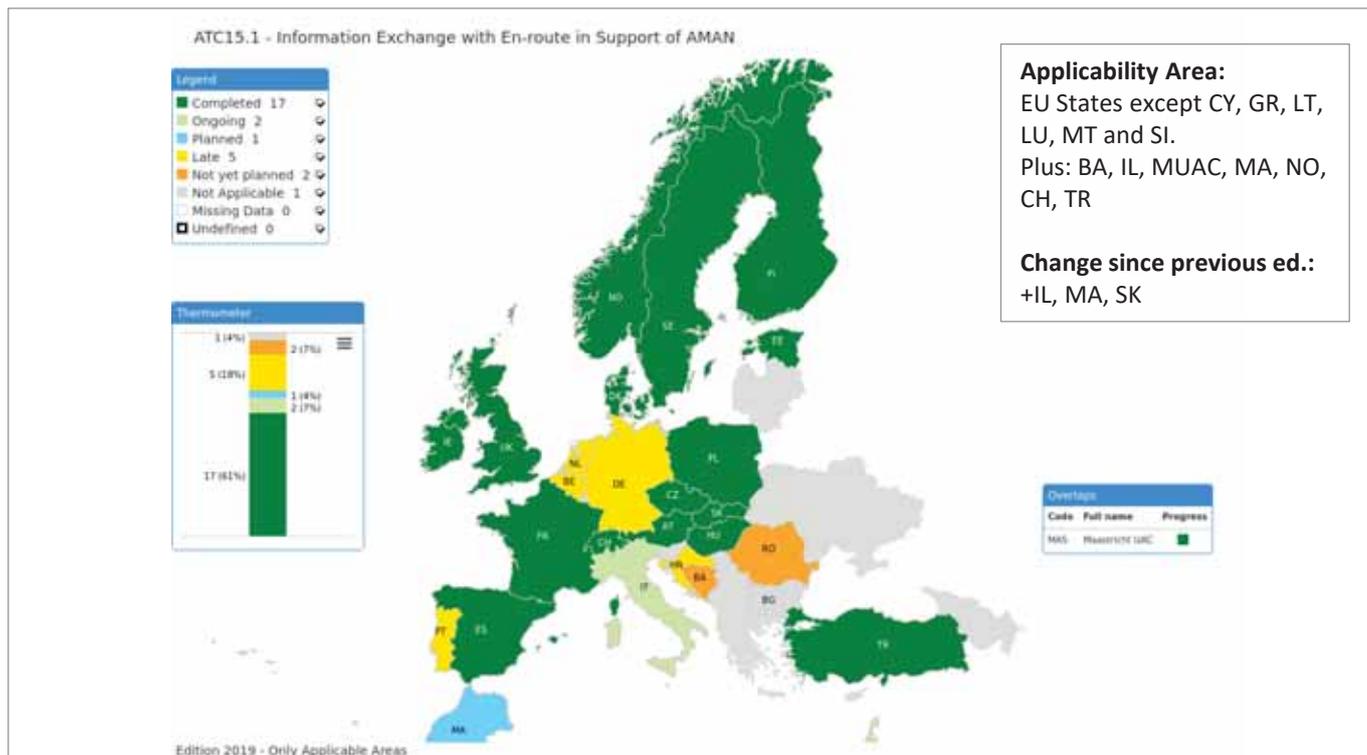
SESAR Solution:	No corresponding Solution
Status:	Late
PCP Sub-Functionality:	Predecessor of S-AF1.1 AMAN extended to En-Route Airspace
ICAO ASBU:	B1-RSEQ
OI Steps:	TS-0305
Network Strategy Plan:	SO4/1
Expected benefits:	



Main 2019 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. This objective builds on ATC07.1 and its FOC date was changed in 2018 to match the one of ATC07.1.

In 2019, 17 ANSPs declared it “completed”, against 12 in 2018 and 8 in 2017. This shows an extremely positive implementation trend and completion currently represents 61% of the applicability area. Only 2 States still report not to have yet firm plans for implementation, another 2 are “ongoing” and 5 are “late”. Of these, Germany shows a 94% completion rate, awaiting the opening of BER airport for its full implementation; The Netherlands are at 50% progress. Both these States plan to complete implementation by end of 2020. The forecast completion for the objective is estimated for the end of 2021, with a one-year shift compared to the 2018 forecast. This objective is a pre-requisite for those centres subject to PCP Regulation and expected to implement extended AMAN (ATC15.2).

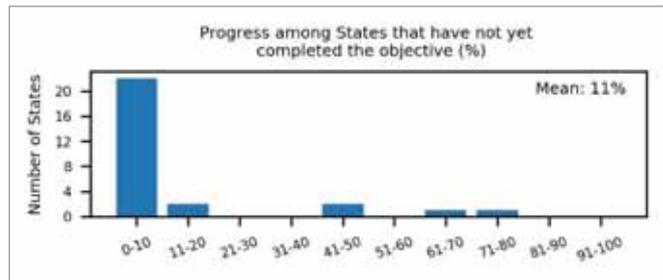
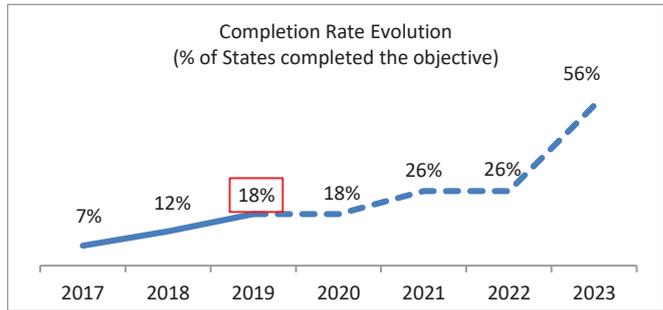


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ATC15.2 Arrival Management extended to en-route airspace

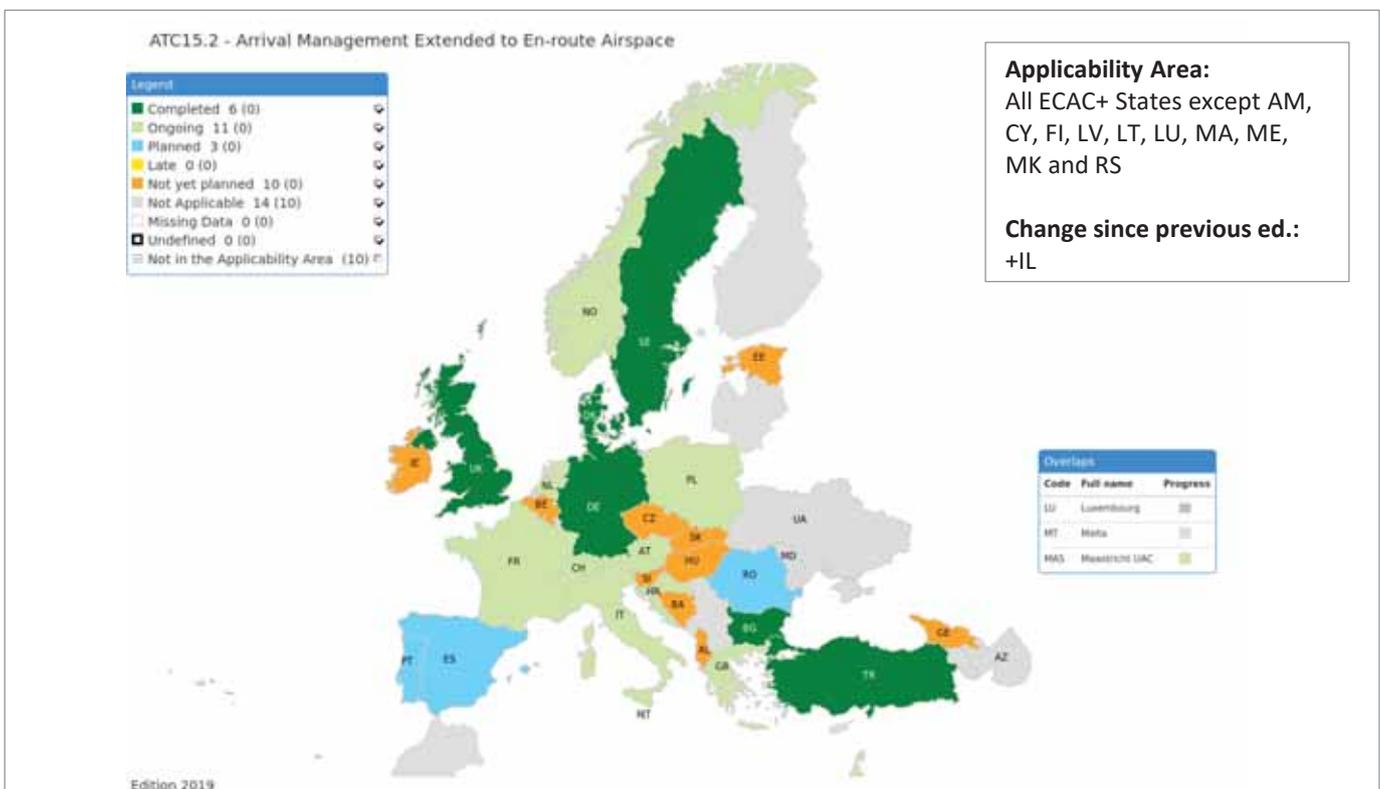
A reliable estimated achievement date can not be defined at this time.

Stakeholders:	FOC: <u>12/2023</u>
<ul style="list-style-type: none"> ANSPs Network Manager 	Estimated achievement: Not available
SESAR Solutions:	Solution #05
Status:	Not available
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
Expected benefits:	  



Main 2019 developments:

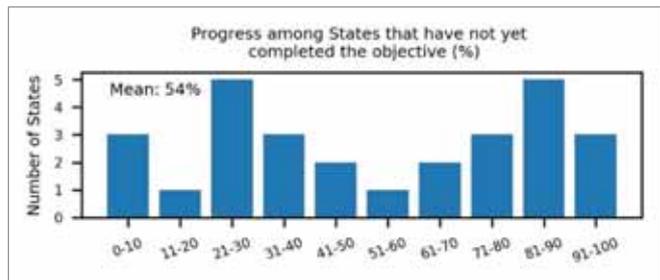
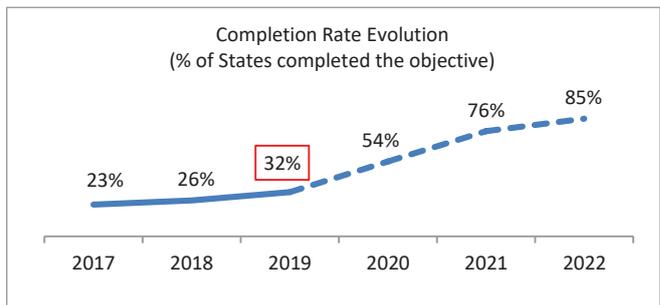
This objective stems from PCP Regulation 716/2014. It builds upon ATC15.1 with the extension of AMAN to 180-200 nautical miles. For many ANSPs its implementation will require coordination with neighboring countries. Within the PCP regulated applicability area of this objective, 5 report it as “completed” (3 in 2018), 10 “ongoing” (11 in 2018), 7 “not yet planned” (as in 2018) and 3 as “planned” (5 in 2018). MT reported it as “not applicable”. Of the ANSPs progressing towards its implementation, CH has completed it in Zurich but a second phase within FABEC, whereby XMAN information is sent to Munich, Langen & Reims for operational use, keeps the project ongoing (49% progress). MUAC and FR have reported as well a significant progress (47% and 78% respectively). Outside the PCP area, Turkey has also reported the objective as “Completed” (since 2018). The high number of “not yet planned” prevents estimating a possible achievement date for this objective. By the end date of 12/2023, the forecast implementation shows a 56% completion rate.



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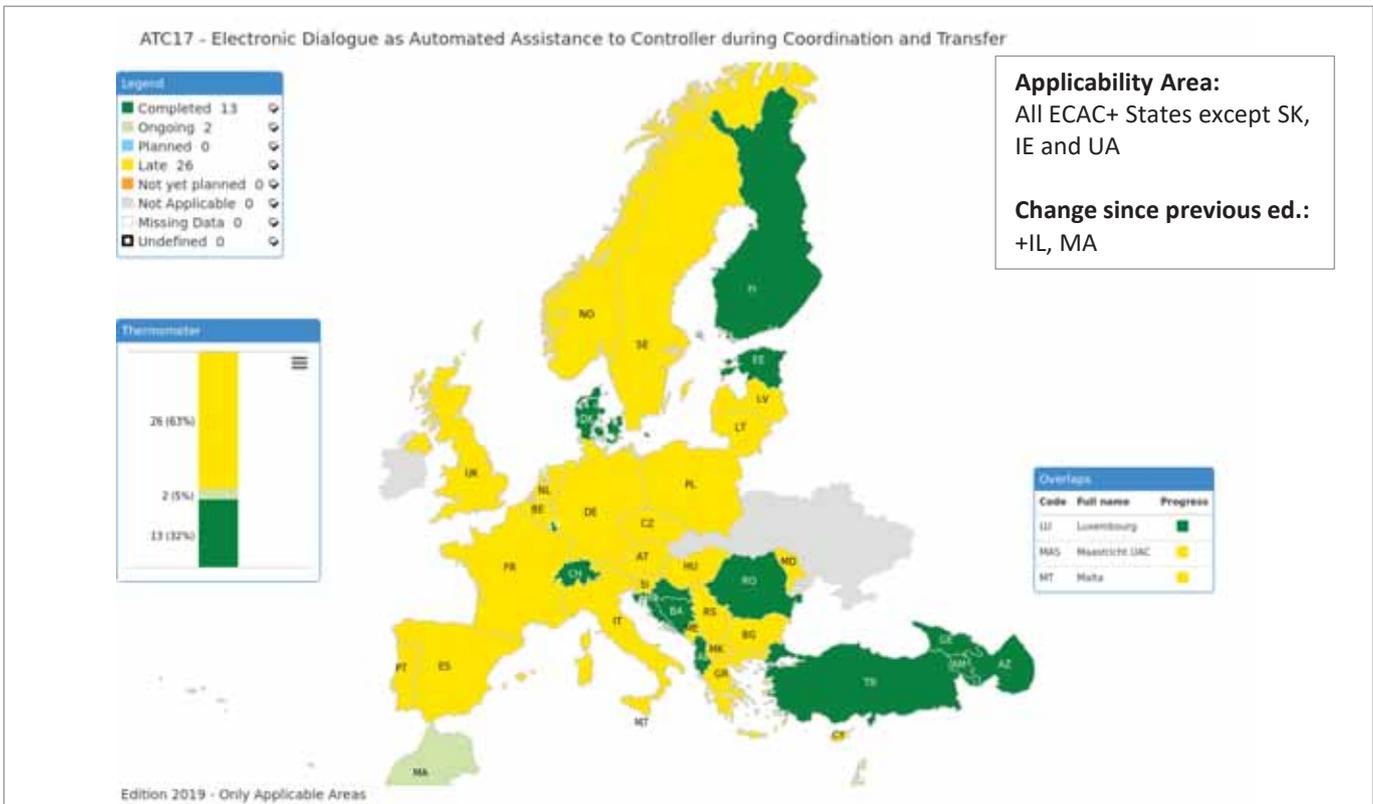
ATC17 Electronic Dialogue supporting COTR

Stakeholders: • ANSPs	FOC: 12/2018 Estimated achievement: 12/2022
SESAR Solutions:	No corresponding Solution
Status:	Late
PCP Sub-Functionality:	Enabler for S-AF3.2 Free Route
ICAO ASBU:	No corresponding ASBU
OI Steps:	CM-0201
Network Strategy Plan:	SO3/1, SO4/1
Expected benefits:	  



Main 2019 developments:

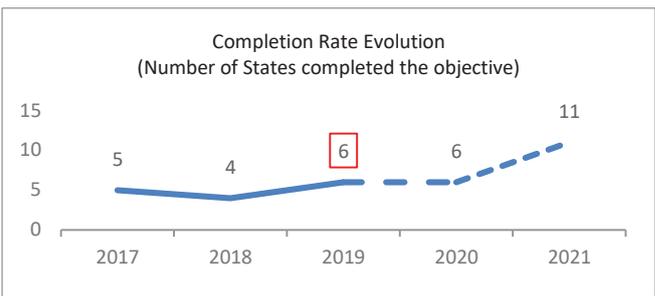
This objective complements the services implemented with ITY-COTR, a regulated provision based on IR. Achievement of this objective is delayed, compared to last year reports, with an estimated achievement date (i.e. at least 80% of the States having completed the objective) of 2022 (it was 2021 last year and 2019 two years ago). Completion in 2019 was declared by 13 States (10 in 2018) , 2 declared it as “ongoing” and 27 declared the objective as “late” (they were 28 in 2018). In a good number of cases, this follows the scheduled implementation of new ATM systems. Most OLDI messages are already available in many ATM systems across the applicability area but often their operational introduction is pending on the signing of an agreement between neighbouring ACCs.



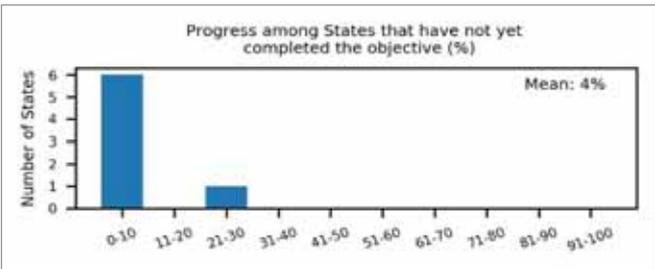
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ATC18 Multi Sector Planning En-route – 1P2T [Local]

Stakeholders: • ANSPs	FOC: <u>Not applicable</u> Estimated achievement: Not available
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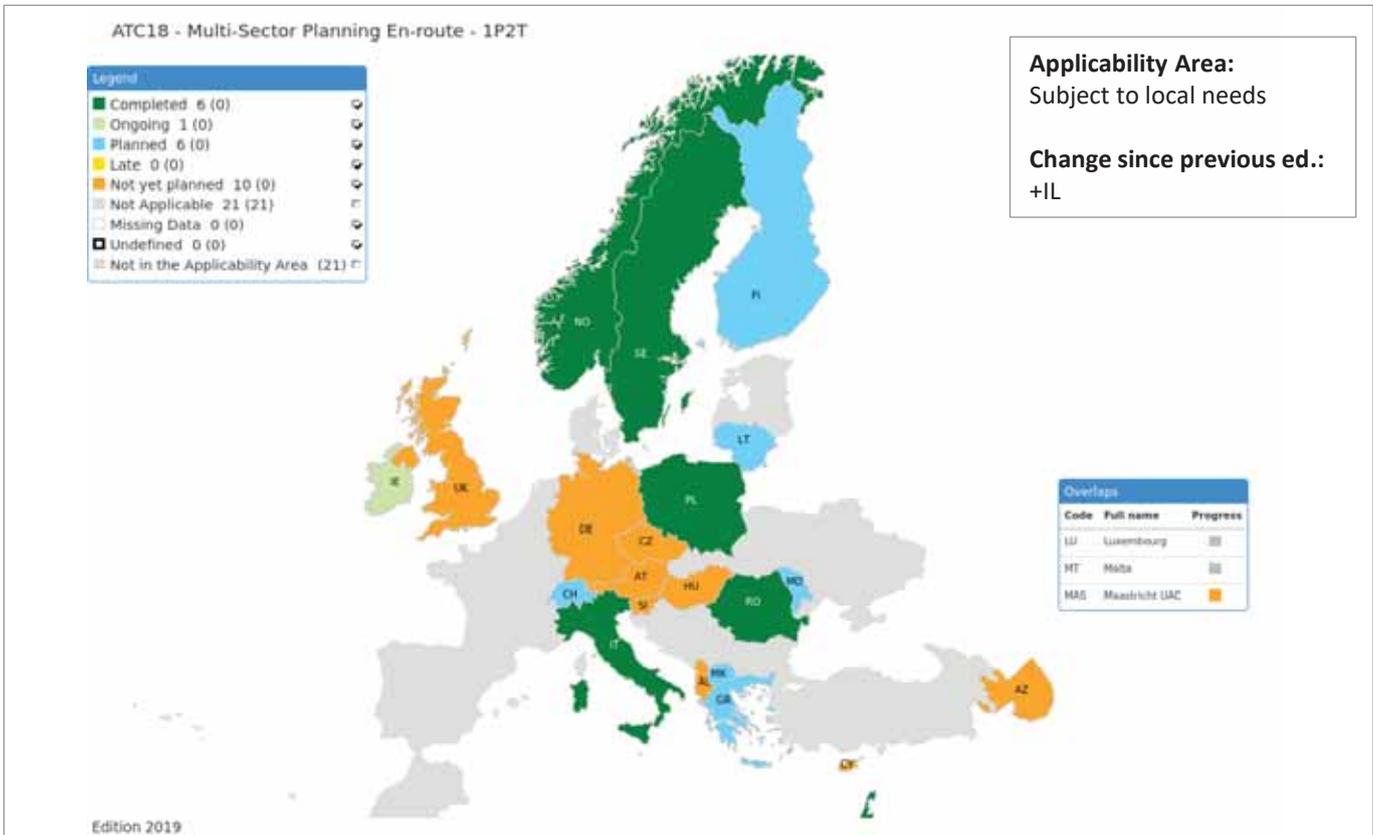


SESAR Solutions:	Solution #63
Status:	Not applicable
ICAO ASBU:	No corresponding ASBU
OI Steps:	CM-0301
Network Strategy Plan:	SO4/1
Expected benefits:	 Cost efficiency  Capacity



Main 2019 developments:

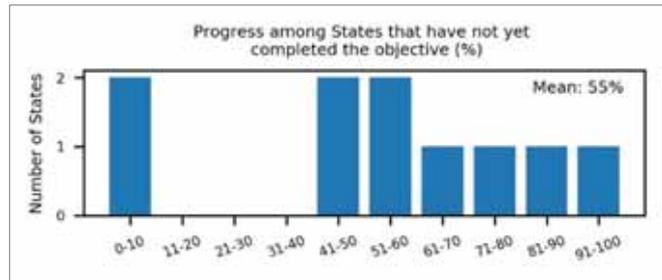
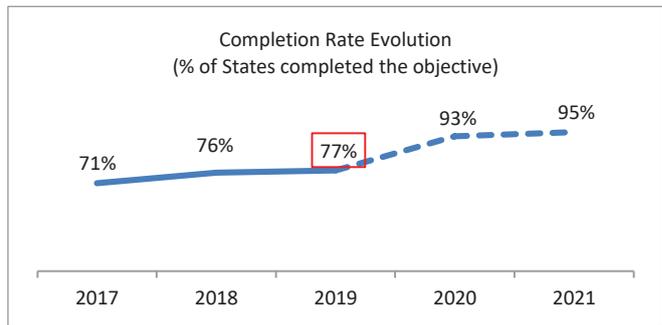
This is a “Local” objective and it has no associated pre-defined applicability area, nor a common FOC date for reference. In its third year of monitoring, 6 ANSPs have declared Multi-sector planning already implemented (IL, IT, NO, PL, RO and SE), 2 more than in 2018, IL and PL. Another 1 declared it as “ongoing” (IE). Finally, 6 reported plans to implement it in the incoming future (CH, FI, GR, LT, MK and MD). Ten administrations reported having no (current) plans for its implementation. Another 21 declared it as “not applicable”. For some this is either due to their current sectors number and/or configuration, current ATM system ability, or lack of perceived benefits compared to their current operations.



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ITY-FMTP Common Flight Message Transfer Protocol

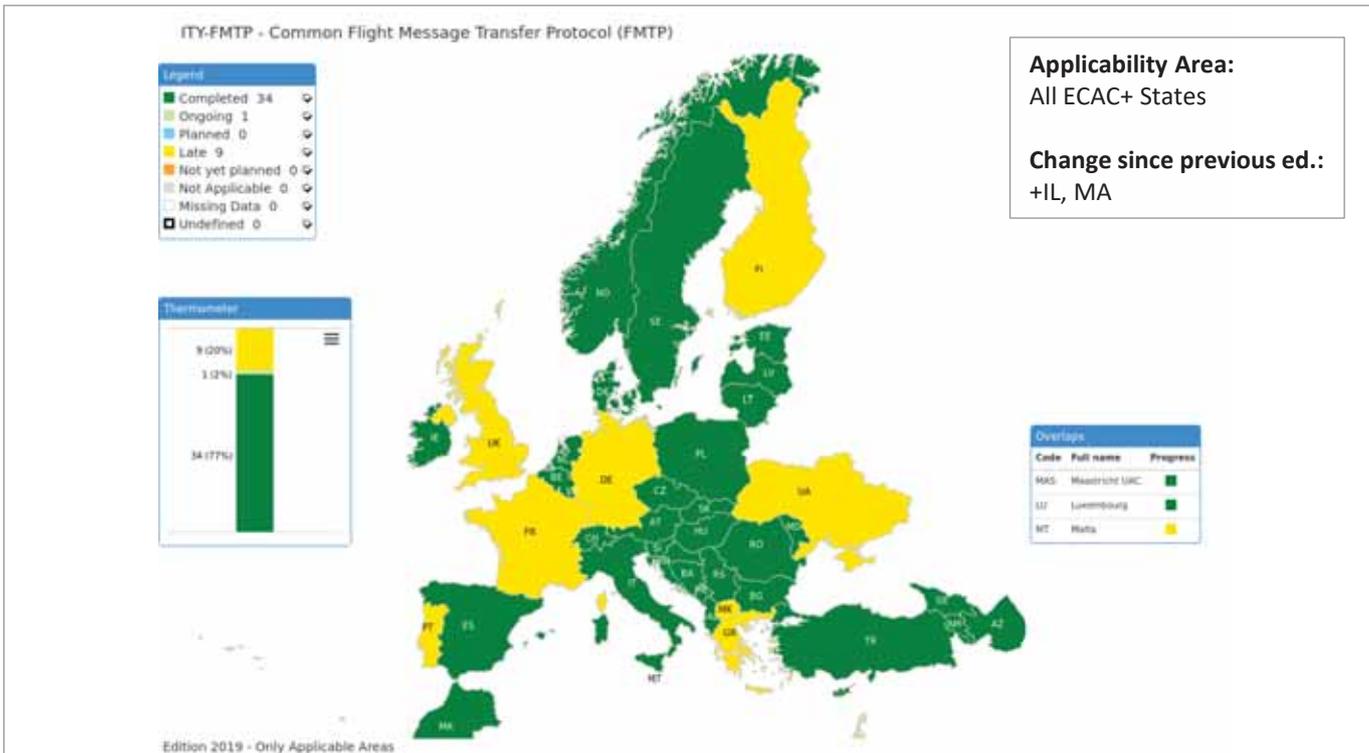
Stakeholders:	FOC: 12/2014
<ul style="list-style-type: none"> ANSPs Military 	Estimated achievement: 12/2020
SESAR Solutions:	No corresponding Solution
Status:	Late
PCP Sub-Functionality:	-IP Network -Pre-requisite for SWIM-related operational changes and PCP AF5
ICAO ASBU:	B0-FICE, B1-FICE
OI Steps:	CTE-C06
Network Strategy Plan:	SO8/3
Expected benefits:	



Main 2019 developments:

Implementation continues to progress, albeit with an accumulated delay of 6 years w.r.t. its original target implementation date. The expected full 100% completion rate across the applicability area will be achieved only in 2022 (the 80% threshold will be reached in 2020). BA completed this objective in 2019. Moreover MA, a new State in the LSSIP monitoring exercise since 2019, completed this objective in 2017. Nine States reported the objective “late”. IL, also joining the LSSIP monitoring exercise in 2019, reported the objective as “ongoing”, with a planned completion date of 2024 (IL is not part of the mandated applicability area of the FMTP Regulation).

The main problems for delay are slow migration from IPv4 to IPv6, foreseen implementation during next major system upgrades and especially the ability of neighbouring ACC’s to support FMTP. Delay also occurs due to the planned introduction of new ATM Systems.



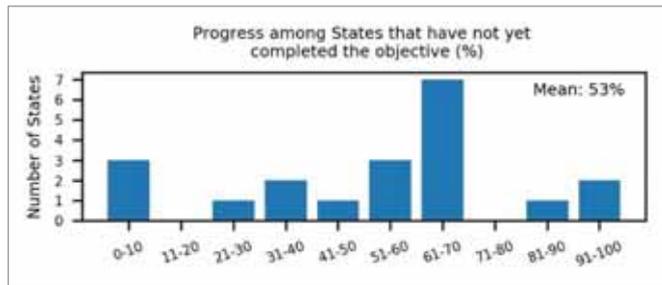
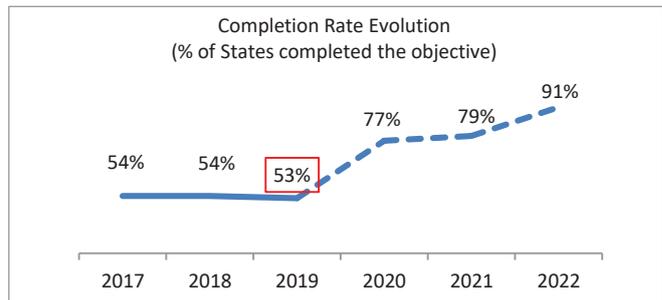
Applicability Area:
All ECAC+ States

Change since previous ed.:
+IL, MA

EOC: Trajectory Based Operations

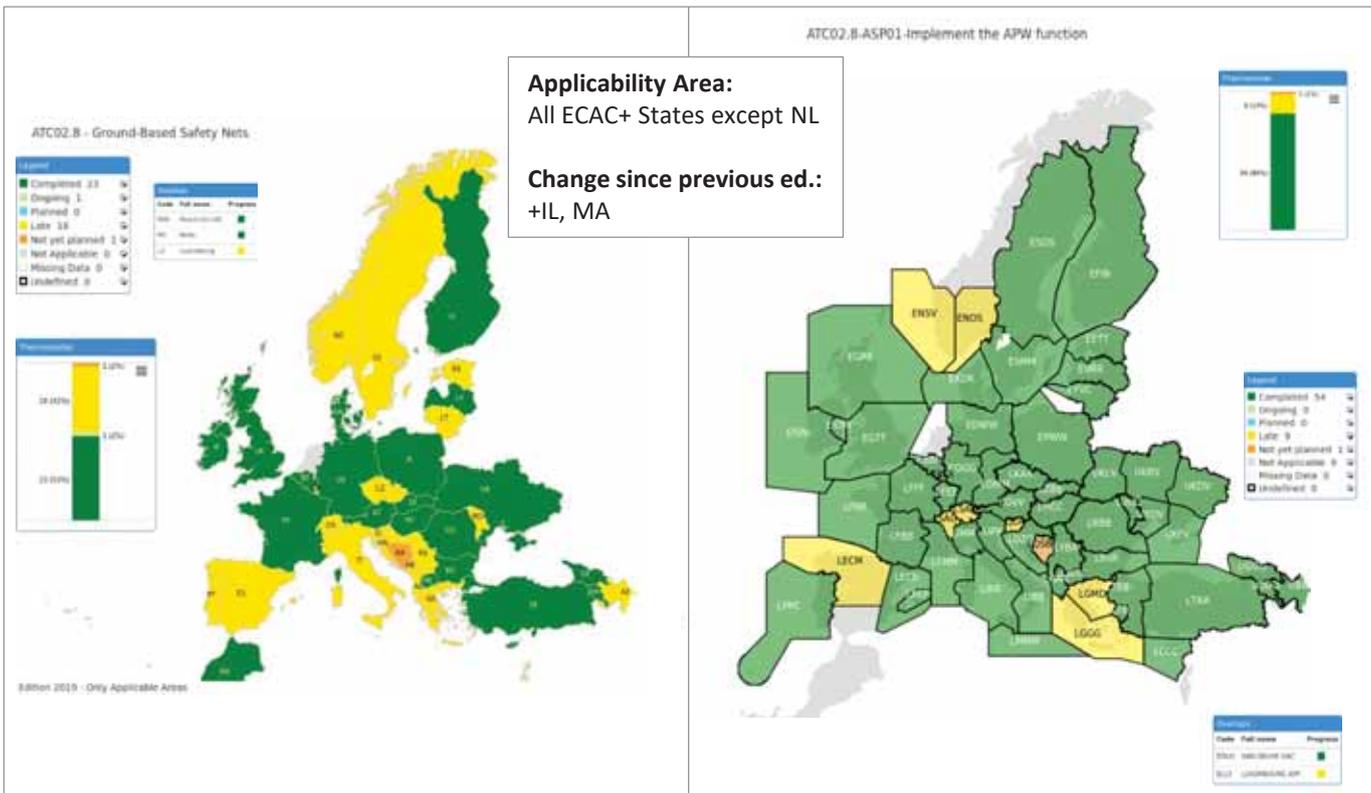
ATC02.8 Ground-based Safety Nets

Stakeholders: • ANSPs	FOC: 12/2016 Estimated achievement: 12/2022
SESAR Solutions:	No corresponding Solution
Status:	Late
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
Expected benefits:	 Safety



Main 2019 developments:

The number of States having completed the implementation of the full objective reached 23, one more than in 2018 (corresponding to 53% of the applicability area). Two States reported completion (IL and RO) while another one (BA) switched from “completed” to “not yet planned”. Despite the increase in the completion absolute number, the slight completion rate % decrease compared to 2018 is due to the enlargement of the applicability area of the objective. Implementation of Area Proximity Warning (APW) is virtually achieved at 84% of completion rate (54 ACCs). Minimum Safe Altitude Warning (MSAW) functionality has been achieved in 47 centres, with a significant improvement (41 in 2018) for a total of 72% having implemented it (62% in 2018). Where applicable, Approach Path Monitoring (APM) has been completed in 39 centres (36 in 2018; 31 in 2017), corresponding to a 57% completion rate. Reported delay are mostly due to alignment with major upgrades, or replacement of the ATM system. The overall objective completion is now expected by end 2021, with a one year shift compared to the estimates of last year.

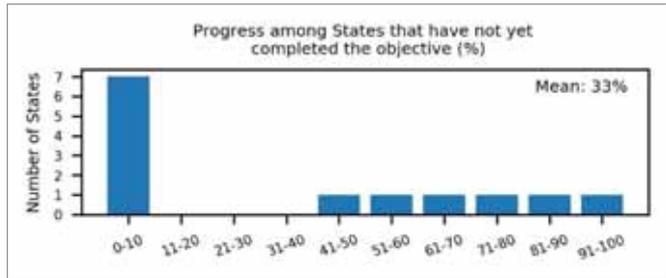
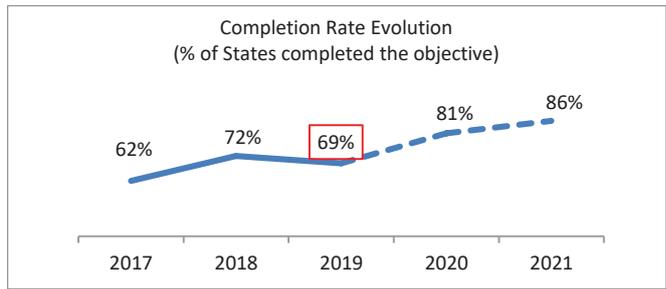


EOC: Trajectory Based Operations

ATC02.9 STCA for TMAs

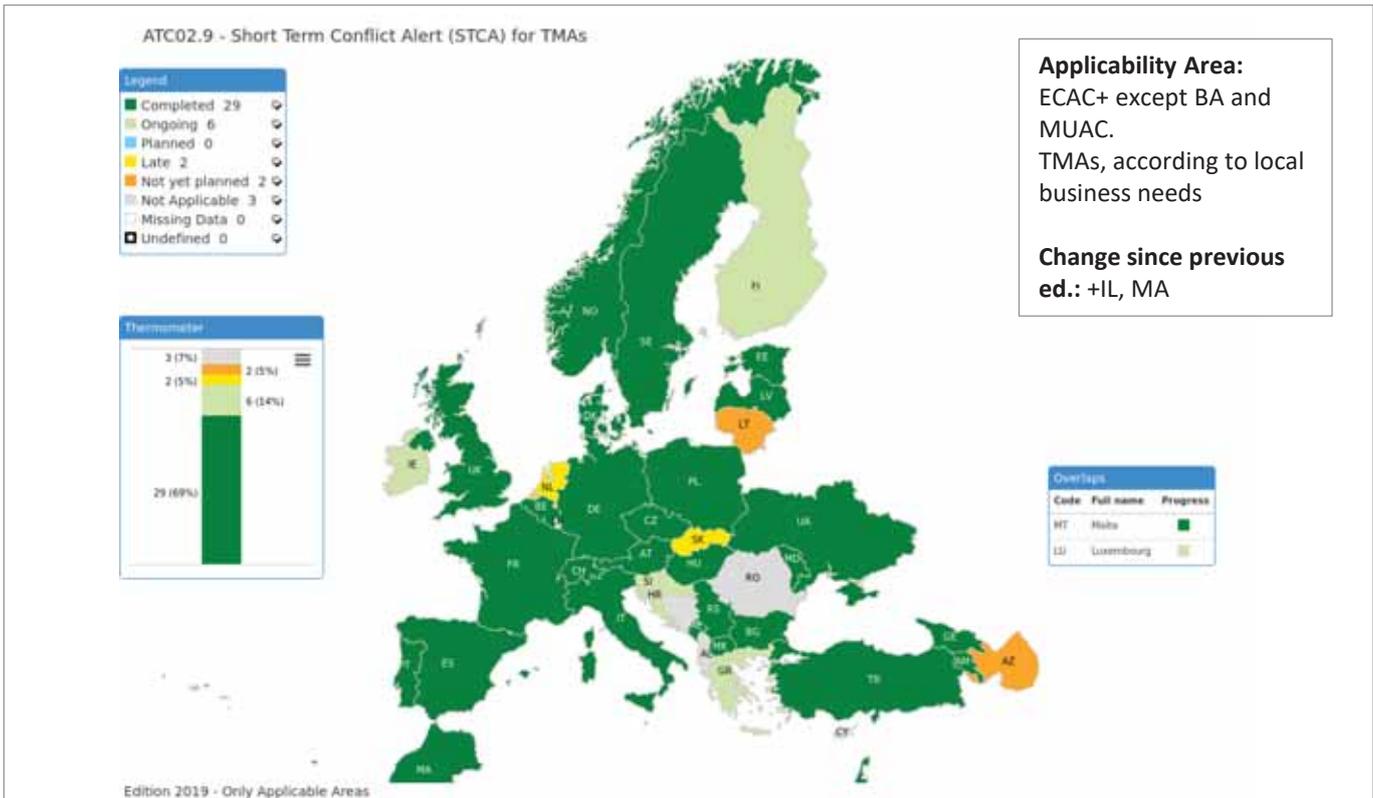
Stakeholders:	FOC: <u>12/2020</u>
• ANSPs	Estimated achievement: 12/2020

SESAR Solutions:	Solution #60
Status:	On time
ICAO ASBU:	B0-SNET, B1-SNET
OI Steps:	CM-0801, CM-0811
Network Strategy Plan:	SO4/1
Expected benefits:	



Main 2019 developments:

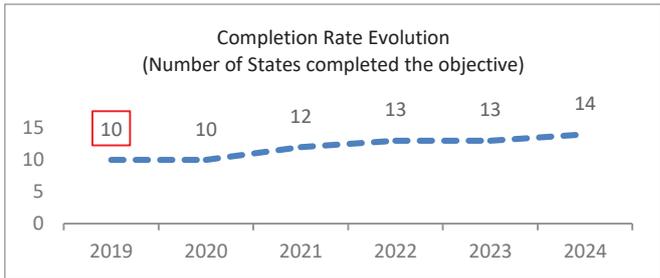
This objective addresses the implementation of Short Term Conflict Alert (STCA) in TMAs in general, as well as, where necessary, (e.g. complex TMAs) the deployment of more advanced functionalities (e.g. multi-hypothesis algorithms or other technical solutions) aiming at further reducing the rate of false alerts and make the STCA more efficient in comparison to more traditional STCA technology. Due to the level of traffic and TMA configuration, most of the ANSPs, use the En-route algorithm also for their TMAs. Some, on the other hand, have implemented, or plan to implement enhanced functionalities, including the so-called multi-trajectory functionality. Twenty-nine ANSPs declared the objective “completed” in 2019, against 28 in 2018. This accounts for 69% of the 2019 applicable area (the reduction in the completion rate % is due to the enlargement of the applicability area). Another 5 expect to complete their works by 2020, in line with the planned FOC date of the objective. Note though that GR only reported a progress of 5% in 2019 against a planned completion on 12/2020, linked to the implementation of a new DPS/ATM system.



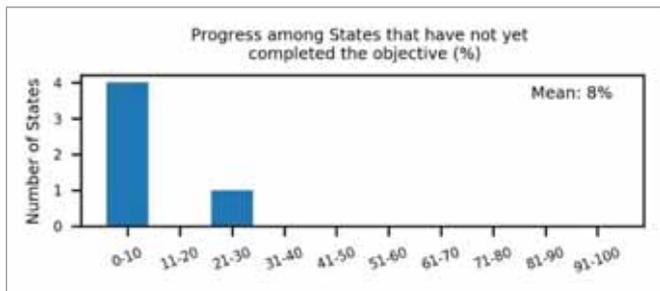
EOC: Trajectory Based Operations

ATC20 Enhanced STCA with down-linked parameters via Mode S EHS [Local]

Stakeholders:	FOC: Not applicable
<ul style="list-style-type: none"> Regulators ANSPs 	Estimated achievement: Not available



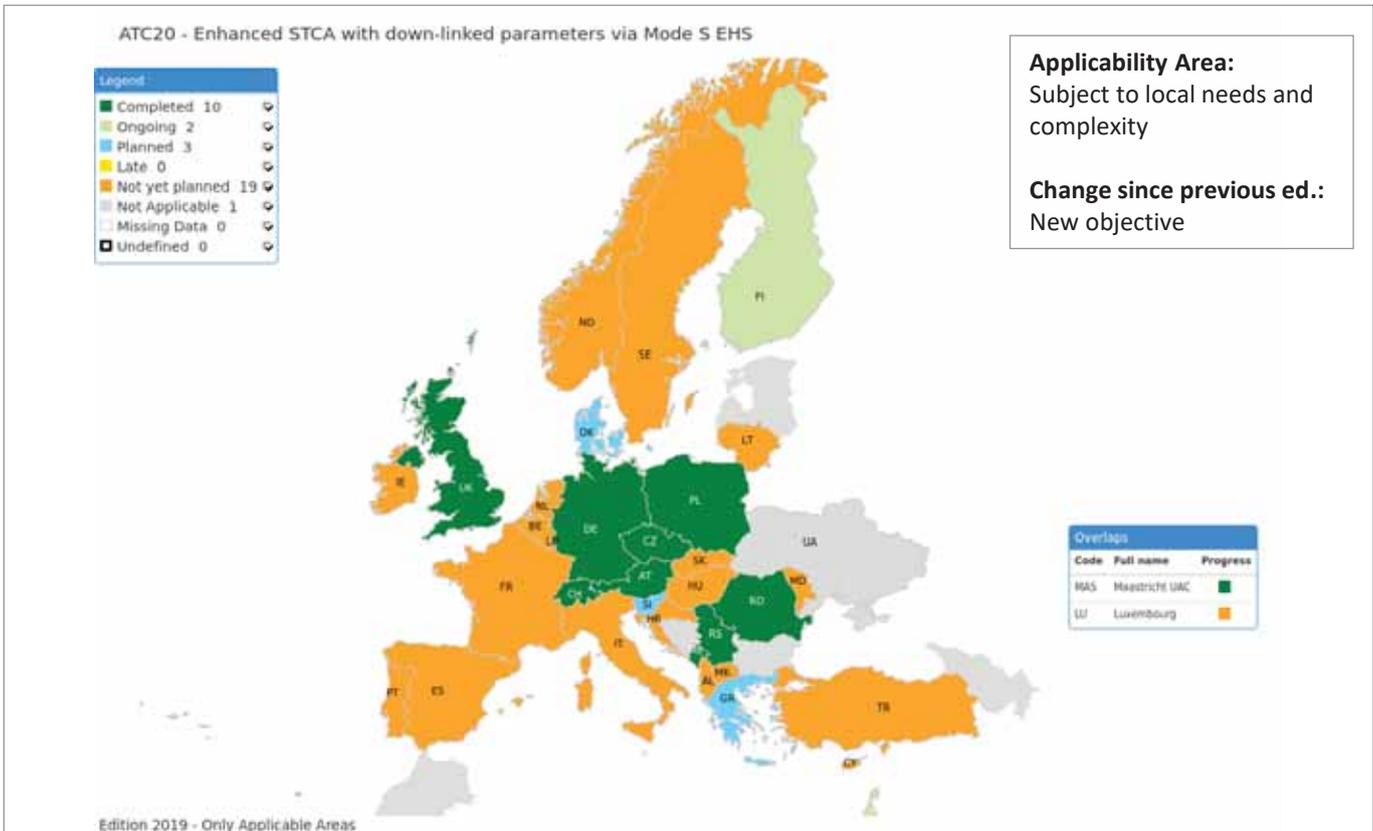
SESAR Solutions:	Solution #69
Status:	Not applicable
ICAO ASBU:	B1-SNET
OI Steps:	CM-0807-A
Network Strategy Plan:	SO7/2
Expected benefits:	Safety



Main 2019 developments:

This is a “Local” objective and it has no associated pre-defined applicability area, nor a common FOC date for reference. As new objective in the Level 3 Implementation Plan 2019, this was its first year of monitoring. It was reported as “completed” by 10 States/ANSPs. For another 2 States, implementation is “ongoing”, albeit at a relatively early stage: FI with a progress at 30% and an estimated completion by 12/2021; IL with a progress at 10% and an estimated completion in 2024.

Three States, while not having started yet its implementation, reported firm plans for it: DK, GR and SI. For GR and SI this was linked to the purchase of new systems. DK reported the functionality as already available in their systems, but not currently in use. Another 19 States declared not to have yet firm plans for its introduction, awaiting in some cases for a feasibility study to be performed/completed.

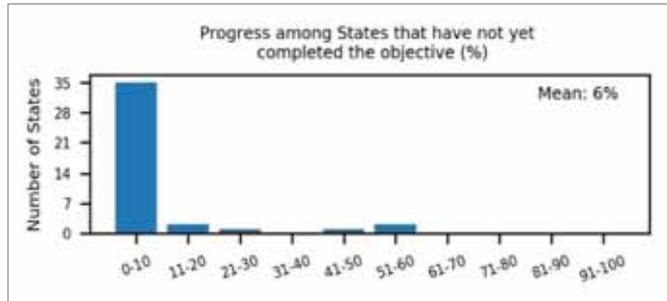
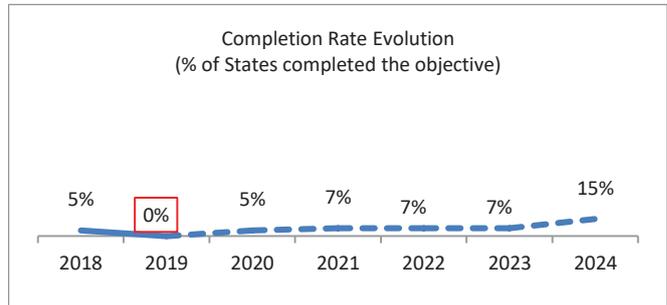


EOC: Multimodal Mobility and integration of all airspace users

NAV12 Optimised Low-Level IFR Routes in TMA for Rotorcraft

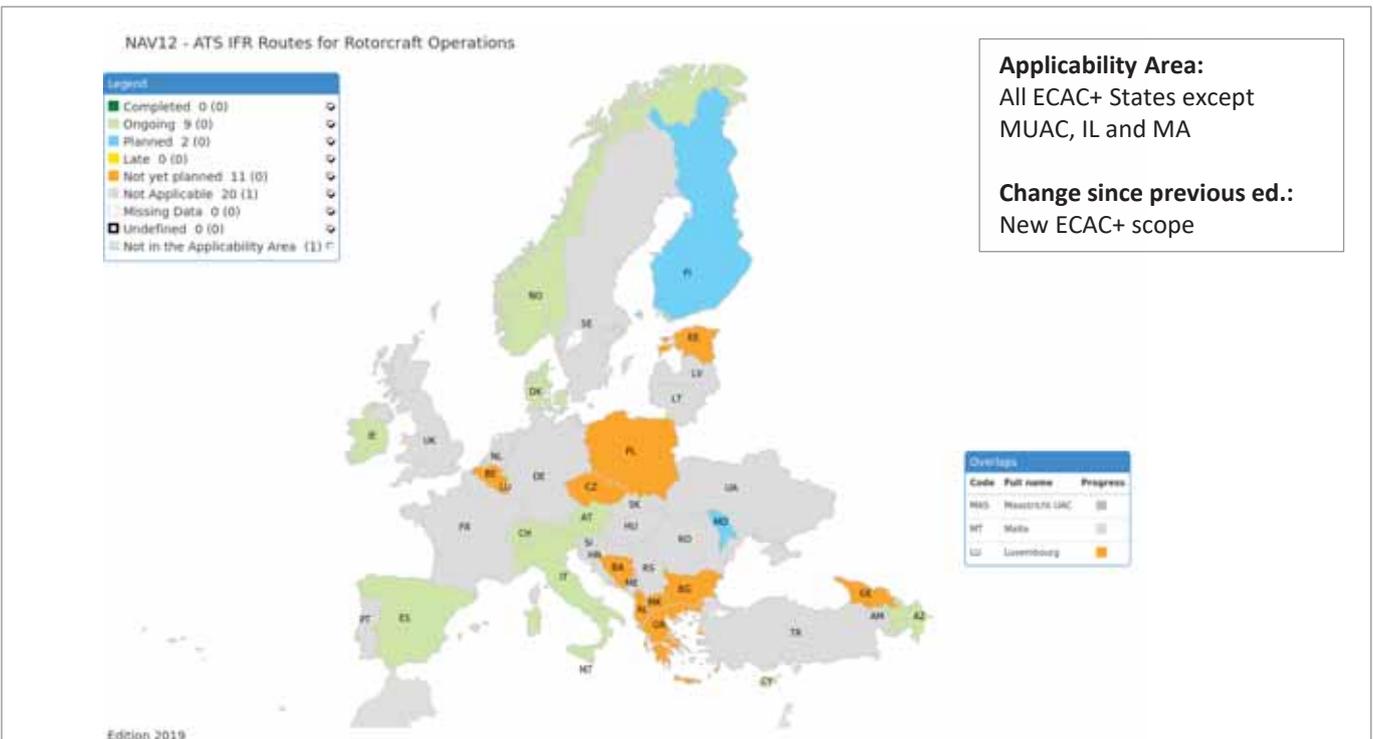
Stakeholders:	FOC: <u>06/2030</u>
<ul style="list-style-type: none"> • ANSPs • Airspace Users • Regulators 	Estimated achievement: Not available

SESAR Solutions:	Solution #113
Status:	Not available
ICAO ASBU:	B1-APTA
OI Steps:	AOM-0810
Network Strategy Plan:	SO6/5
Expected benefits:	



Main 2019 developments:

The current reporting cycle was the first one after the amendment of the objective in line with the PBN IR as well the change of its scope from “Local” to “ECAC+”. It should be noted that (IR) on PBN (EU) 2018/1048 gives choice to the stakeholders, to decide on the need for SID/STAR, ATS route, and LLR IFR for rotorcraft implementation, and on applicable specifications RNP0.3, RNP1 or RNAV1. Two states (CH and NO) completed implementation of LLR IFR and ATS routes below FL150 for rotorcrafts. However, because of the need to comply with the newly introduced requirements (e.g. development and acceptance of a PBN Transition Plan) both States have changed the status from “Completed” to “Ongoing” therefore the reduction of the completion rate %. The first PinS and LLRs were implemented in AT, IT, AZ and CY in 2019. The interest seems to be less for dedicated SID/STAR to iRWY for rotorcraft. Almost all other States, except DK, do not consider implementing NAV12 due to lack of business needs and characteristics of their operational environment. One of the main ongoing activities in big majority of all states is drafting and verification of PBN Transition Plan expected to finish by 2021.



4 ANNEXES

Annex A

Relevant mappings of the Level 3

Mapping of the L3 active Objectives to corresponding SESAR Essential Operational Changes, SESAR Solutions, Deployment Program families, ICAO ASBU, EASA EPAS, the Network Strategy Plan, the Airspace Architecture Study Transition Plan (AAS TP) Milestones and the SESAR Key Features.

EOC	Level 3 Implementation Objectives	SESAR Sol.	DP family	ICAO ASBUs	EPAS	NSP	AAS TP	KF
CNS Infra. and Services	COM10 - Migration from AFTN to AMHS	-	-	-	-	-	-	EAI
	COM11.1 - Voice over Internet Protocol (VoIP) in En-Route	-	3.1.4 3.2.1	-	-	SO8/4	AM-1.3	EAI
	COM11.2 - Voice over Internet Protocol (VoIP) in Airport/Terminal	-	-	-	-	SO8/4	-	EAI
	ITY-ACID - Aircraft identification	-	-	-	-	SO8/2	-	EAI
	ITY-AGDL - Initial ATC air-ground data link services	-	6.1.1 6.1.3 6.1.4	B0-TBO	RMT.0524	SO4/1 SO8/3	AM-1.1	EAI
	ITY-AGVCS2 – 8.33 kHz Air-Ground Voice Channel Spacing below FL195	-	-	-	-	SO8/1	-	EAI
	ITY-SPI - Surveillance performance and interoperability	-	-	B0-ASUR	RMT.0679 RMT.0519	SO8/3 SO8/4	-	EAI
	NAV10 - RNP Approach Procedures to instrument RWY	#103	1.2.1 1.2.2	B0-APTA	RMT.0639 RMT.0445	SO6/5	-	AATS
ATM Interconnected Network	AOM13.1 - Harmonise OAT and GAT handling	-	-	-	-	SO6/2	-	OANS
	AOP11 - Initial Airport Operations Plan	#21	2.1.4	B1-ACDM	-	SO6/2	-	HPOA
	AOP17 – Provision/integration of DPI to NMOC	#61	-	B1-ACDM B1-NOPS	-	-	-	HPOA
	COM12 - NewPENS	-	5.1.2 5.2.1	B1-SWIM	-	SO2/3 SO2/4 SO8/3 SO8/4	-	EAI
	FCM03 - Collaborative flight planning	-	4.2.3	B0-NOPS	-	SO4/2 SO5/1 SO5/6	AM-1.14	OANS
	FCM04.2 - STAM phase 2	#17	4.1.2	-	-	SO4/3 SO5/4	AM-1.11	OANS
	FCM05 - Interactive rolling NOP	#20, #21	4.2.2 4.2.4	B1-ACDM B1-NOPS	-	SO2/1 SO2/2 SO2/3 SO2/4	AM-1.12	OANS
	FCM06 - Traffic Complexity Assessment	#19	4.4.2	B1-NOPS	-	SO4/3 SO5/4	AM-1.13	OANS

	FCM08 – Extended Flight Plan	#37	4.2.3	B1-FICE	-	SO5/1 SO5/6	AM-1.4	EAI
	FCM09 - Enhanced ATFM Slot swapping	#56	-	B1-NOPS	-	SO6/1	-	OANS
	INF08.1 - Information Exchanges using the SWIM Yellow TI Profile	#35, #46	5.1.3, 5.1.4, 5.2.1, 5.2.2, 5.2.3, 5.3.1, 5.4.1, 5.5.1, 5.6.1	B1-DATM B1-SWIM	-	SO2/4 SO2/5 SO5/2 SO5/5	AM-1.5	EAI
Digital AIM and MET Services	INF07 - Electronic Terrain and Obstacle Data (e-TOD)	-	1.2.2	-	RMT.0703 RMT.0722	SO2/5	-	EAI
	ITY-ADQ - Ensure quality of aeronautical data and aeronautical information	-	1.2.2	B0-DATM	RMT.0722 RMT.0477	SO2/5	-	EAI
U-space Services	-	-	-	-	-	-	-	-
Virtualisation of Service Provision	AOP14 – Remote Tower Services	#12, #71, #52, #13	-	B1-RATS	RMT.0624	-	-	HPAO
Airport and TMA performance	AOP04.1 - A-SMGCS Surveillance (former Level 1)	#70	2.2.1	B0-SURF	MST.029	SO6/6	-	HPAO
	AOP04.2 - A-SMGCS RMCA (former Level 2)	-	2.2.1	B0-SURF	MST.029	SO6/6	-	HPAO
	AOP05 - Airport CDM	#106	2.1.1 2.1.3	B0-ACDM B0-RSEQ	-	SO6/4	-	HPAO
	AOP10 - Time Based Separation	#64	2.3.1	B1-RSEQ B2-WAKE	-	SO6/5	-	HPAO
	AOP12 - Improve RWY and Airfield safety with CATC detection and CMAC	#02	2.1.2 2.5.1	B2-SURF	MST.029	SP6/6	-	HPAO
	AOP13 - Automated assistance to Controller for Surface Movement planning and routing	#22 #53	2.4.1	B1-ACDM B1-RSEQ B2-SURF	MST.029	SO6/6	-	HPAO
	AOP15 - Safety Nets for vehicle drivers	#04	-	B2-SURF	MST.029	-	-	HPAO
	AOP16 - Guidance assistance through airfield lighting	#47	-	B1-RSEQ B2-SURF	MST.029	-	-	HPAO
	AOP18 - Runway Status Lights	#01	-	B2-SURF	MST.029	-	-	HPAO
	ATC07.1 - Arrival management tools	-	1.1.1	B0-RSEQ	-	SO4/1	-	AATS
	ATC19 - Enhanced AMAN-DMAN integration	#54	-	B2-RSEQ	-	SO6/5 SO4/1	-	AATS
	ENV01 – Continuous Descent Operations	-	-	B0-CDO B1-CDO	-	SO6/5	-	AATS

	ENV02 – Airport Collaborative Environmental Management	-	-	-	-	-	-	HPAO
	ENV03 – Continuous Climb Operations	-	-	B0-CCO	-	SO6/5	-	AATS
	NAV03.1 – RNAV1 in TMA Operations	#62	-	B0-CDO B0-CCO B1-RSEQ	RMT.0639 RMT.0445	SO6/5	-	AATS
	NAV03.2 – RNP1 in TMA Operations	#09, #51	1.2.3 1.2.4	B1-RSEQ	RMT.0639 RMT.0445	SO6/5	-	AATS
	SAF11 - Improve runway safety by preventing runway excursions	-	-	-	MST.007 RMT.0570 RMT.0703	-	-	HPAO
Fully Dynamic and Optimised Airspace Organisation	AOM19.1 - ASM tools to support A-FUA	#31	3.1.1	B1-FRTO B1-NOPS	-	SO3/2 SO3/3	AM-1.8	OANS
	AOM19.2 - ASM management of real-time airspace data	#31	3.1.2	B1-FRTO B1-NOPS	-	SO3/2 SO3/3	AM-1.8	OANS
	AOM19.3 - Full rolling ASM/ATFCM process and ASM information sharing	#31	3.1.3	B1-FRTO B1-NOPS B2-NOPS	-	SO3/2 SO3/3	AM-1.8	OANS
	AOM19.4 – Management of Pre-defined Airspace Configurations	#31	3.1.4	B1-FRTO B1-NOPS	-	SO3/2 SO3/3	-	OANS
	AOM21.2 - Free Route Airspace	#33, #66	3.2.1 3.2.4	B1-FRTO	-	SO3/1 SO3/4	AM-1.6 AM-1.10 AM-5.1	AATS
	ATC12.1 - MONA, TCT and MTC D	#27, #104	3.2.1	B1-FRTO	-	SO3/1 SO4/1	AM-1.15 AM-5.1	AATS
	ATC15.1 - Initial extension of AMAN to En-route	-	1.1.2	B1-RSEQ	-	SO4/1	-	AATS
	ATC15.2 - Extension of AMAN to En-route	#05	1.1.2	B1-RSEQ	-	SO4/1	AM-1.3	AATS
	ATC17 - Electronic Dialog supporting COTR	-	3.2.1	-	-	SO3/1 SO4/1	AM-1.3	AATS
	ATC18 - Multi Sector Planning En-route – 1P2T	#63	-	-	-	SO4/1	AM-4.3 AM-5.1	AATS
	ITY-FMTP - Apply a common flight message transfer protocol (FMTP)	-	-	B0-FICE B1-FICE	-	SO8/3	AM-1.3	EAI
Trajectory Based Operations	ATC02.8 - Ground based safety nets	-	3.2.1	B0-SNET B1-SNET	-	SO4/1	-	AATS
	ATC02.9 - STCA for TMAs	#60	-	B0-SNET B1-SNET	MST.030	SO4/1	-	AATS
	ATC20 – Enhanced STCA with down-linked parameters via Mode S EHS	#60	-	B1-SNET	-	SO7/2	-	AATS
Multimodal Mobility and integration of all airspace users	NAV12 – ATS IFR Routes for Rotorcraft Operations	#113	-	B1-APTA	MST.031	SO6/5	-	AATS

Annex B

Consolidated progress and implementation status

Consolidated progress of implementation in 2019 and the implementation status at the end of 2019 of all monitored, active implementation objectives.

Implementation Objective	SESAR Solution ref.	Change in the number of States/ Airports completed the objective (2019 vs. 2018)	State/Airport+2s completed the objective in 2019	Progress evolution in 2019 (Completion rate)	Number of States /Airports completed the objective (Total number in Applicability area)	FOC	Implementation Status	Estimated achievement
AOM13.1	-	+2	DK, IL, PL (-MK)	+6% (45%)	17 (38)	12/2018	Late	12/2020
AOM19.1	#31	+3	BA, LV, NO	+6% (34%)	13 (38)	12/2018	Late	12/2021
AOM19.2	#31	0	None	-1% (5%)	2 (37)	12/2021	N/A	N/A
AOM19.3	#31	+2	LV, RO	+6% (14%)	5 (37)	12/2021	N/A	N/A
AOM19.4	#31	+2	BA, RO	+5% (11%)	4 (37)	12/2021	N/A	N/A
AOM21.2	#33, #66	+5	GE, MUAC, MT, PL, SK	+12% (67%)	26 (39)	12/2021	On time	12/2021
AOP04.1	-	+2	EDDL, EGGL	0 (70%)	39 (56)	12/2011	Late	12/2020
AOP04.2	-	+2	EDDL, EGGL	+4% (56%)	29 (52)	12/2017	Late	12/2020
AOP05	-	-1	-EIDW	-2% (53%)	25 (47)	12/2016	Late	12/2020
AOP10	#64	0	None	0 (6%)	1 (16)	12/2023	N/A	N/A
AOP11	#21	+1	EHAM, EDDL (-LSZH)	+2% (13%)	5 (38)	12/2021	On time	12/2021
AOP12	#02	+1	LSZH	+7% (23%)	6 (26)	12/2020	Planned delay	12/2024
AOP13	#22, #53	0	None	0 (0%)	0 (25)	12/2023	N/A	N/A
AOP14	#12, #13, #52, #71	+1	LHBP	-	4 (Local Obj)	N/A	N/A	N/A
AOP15*	#04	+1	EDDF	-	2 (Local Obj)	N/A	N/A	N/A
AOP16*	#47	0	None	-	0 (Local Obj)	N/A	N/A	N/A
AOP17*	#61	+2	GCR, GCFV	-	10 (Local Obj)	N/A	N/A	N/A
AOP18*	#01	0	None	-	1 (Local Obj)	N/A	N/A	N/A
ATC02.8	-	0	RO (-BA)	-1% (53%)	23 (43)	12/2016	Late	12/2022
ATC02.9	#60	+1	GE, IT (-IE, FI, SI)	-3% (69%)	29 (42)	12/2020	On time	12/2020
ATC07.1	-	+1	EPWA	-3% (61%)	22 (36)	12/2019	Late	12/2021
ATC12.1	#27	+3	HU, MT, RO	+5% (49%)	21 (43)	12/2021	Planned delay	12/2022
ATC15.1	-	+5	HU, FR, PL, SK, TR	+13% (61%)	17 (28)	12/2019	Late	12/2021
ATC15.2	#05	+2	BG, SE	+6% (18%)	6 (34)	12.2023	N/A	N/A
ATC17	-	+3	AM, GE, RO	+6% (32%)	13 (41)	12/2018	Late	12/2022
ATC18	#63	+1	PL	-	6 (Local Obj)	N/A	N/A	N/A
ATC19*	#54	0	None	-	1 (Local Obj)	N/A	N/A	N/A

ATC20*	#69	-	RO, DE	-	10 (Local Obj)	N/A	N/A	N/A
COM10	-	+4	HR, ME, RS, UA	+9% (64%)	28 (44)	12/2018	Late	12/2020
COM11.1**	-	+2	BG, ES	/ (11%)	5 (44)	12/2021	Planned delay	12/2022
COM11.2**	-	+2	BG, FR	/ (9%)	4 (44)	12/2023	Planned delay	>2023
COM12	-	+6	AT, FI, HU, LT, RO, SI, SK	+17% (17%)	6 (43)	12/2024	On time	12/2020
ENV01	-	+1	EGNT	-2% (39%)	28 (71)	12/2023	On time	12/2023
ENV02	-	+2	EGKK, LSGG	-	46 (Local Obj)	N/A	N/A	N/A
ENV03	-	+9	UBBB, LFPO, LFBO, LFML, LFMN, LFPG, LFLL, EGNT, EGPF	-	51 (Local Obj)	N/A	N/A	N/A
FCM03	-	+1	FI	-1% (59%)	26 (44)	12/2017	Late	12/2020
FCM04.2	#17	+1	LV	+3% (13%)	5 (39)	12/2021	Risk of delay	N/A
FCM05	#20	-1	(-CH)	-3% (5%)	2 (38)	12/2021	On time	12/2021
FCM06	#19	+2	CZ, LV	+5% (17%)	7 (42)	12/2021	Risk of delay	12/2022
FCM08	#37	0	None	0% (0%)	0 (43)	12/2021	Risk of delay	N/A
FCM09***	#56	-	-	-	-	12/2021	On time	12/2021
INF07	-	+5	GE, IL, LT, LV, TR	+11% (21%)	5 (43)	05/2018	Late	12/2022
INF08.1	#35, #46	0	None	0% (0%)	0 (43)	12/2024	N/A	N/A
ITY-ACID	-	+7	AT, BA, GE, HR, LT, PL, RO	+16% (36%)	15 (42)	01/2020	Late	12/2021
ITY-ADQ	-	+2	LT, LV, IL (-MD)	+4% (10%)	4 (39)	06/2017	Late	12/2023
ITY-AGDL	-	0	None	0 (36%)	15 (42)	02/2018	Late	12/2023
ITY-AGVCS2	-	+5	AT, CH, EE, LT, RO	+17% (37%)	13 (35)	12/2018	Late	12/2022
ITY-FMTP	-	+1	BA	+1% (77%)	34 (44)	12/2014	Late	12/2020
ITY-SPI	-	0	BA, CY, ES (-EE, HR, LV)	0 (40%)	16 (40)	06/2020	Risk of delay	12/2020
NAV03.1	-	-14	AZ (-AT, BG, DK, EE, ES, FI, FR, HU, IT, LT, NL, NO, PT, RS, SI)	-35% (23%)	10 (42)	06/2030	On time	06/2030
NAV03.2	#09, #51	+1	SK	+1% (7%)	3 (43)	06/2030	N/A	N/A
NAV10	#103	-10	PL (-AT, BG, CH, DE, FI, IE, IT, MT, PT, TR, UK)	-23% (14%)	6 (43)	01/2024	On time	01/2024
NAV12****	#113	-	None	-5% (0%)	0 (41)	06/2030	N/A	N/A
SAF11	-	+2	IL, RO	+3% (69%)	29 (43)	01/2018	Late	12/2020

* new objective

** new objective derived from former COM11

*** FCM09 is only applicable to the Network Manager and to Airspace Users therefore there is no progress to be monitored at State/Airport level

**** objective substantially changed in light of the PBN Implementing Regulation 2018/1048

Annex C

SESAR 1 Solutions

The SESAR Solutions not covered yet in the MPL3 were subject to a specific questionnaire integrated within the LSSIP 2019 cycle. The consolidated results are summarized in the tables below, under the heading “Others, non committed (i.e. non MPL3) Solutions”.

MPL3 SESAR 1 Solutions distribution (per EOC)

CNS Infrastructure and Services

Committed MPL3, PCP-related Solutions (and the associated MPL3 objective)

Sol #103	Approach Procedures with vertical guidance	(NAV10)
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Committed MPL3, non PCP-related Solutions (and the associated MPL3 objective)

Sol #55	Precision approach using GBAS Category II/III	(NAV11*)
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(*) initial¹ objective

Non committed (i.e. non MPL3) Solutions

Sol #102	Aeronautical mobile airport communication system (AeroMACS)	0 0	Not yet implemented nor planned in any state
Sol #109	Air traffic services (ATS) datalink using Iris Precursor	0 3	Not yet implemented in any state Planned in 3 States (ES; FR; PT)
Sol #110**	ADS-B surveillance of aircraft in flight and on the surface	3 11	Implemented in 3 States, 2 locations indicated (DE – NUE; FR – AJA; HU) Planned in 11 States, 2 locations indicated (AT; DE; EE; ES; FR - BOD, BIA; HU; IT; LV; MT; NO; SK)
Sol #114	Composite Surveillance ADS-B / WAM	1 11	Implemented in one State (AT) Planned in 11 States (AT; CH; CZ; DE; EE; FR; IT; LT; NO; PL; SK)

(**) The same function, without specifying through ADS-B, is covered in MPL3 ed. 2019 (Impl. Obj. AOP04.1)

ATM Interconnected Network

Committed MPL3, PCP-related Solutions (and the associated MPL3 objective)

Sol #17	Advanced short-term ATFCM measures-STAMs	(FCM04.2)
Sol #18	Calculated take-off time (CTOT) and target time of arrival (TTA)	(FCM07*)
Sol #19	Automated support for traffic complexity detection and resolution	(FCM06)
Sol #20	Initial collaborative network operations plan (NOP)	(FCM05)
Sol #21	Airport operations plan (AOP) and its seamless integration with the network operations plan (NOP)	(AOP11, FCM05)
Sol #35	Meteorological information exchange	(INF08.1)

¹ Initial objectives provide advance notice to stakeholders. However, some of their aspects require further validations therefore these objectives are not monitored yet.

Sol #37	Extended flight plan	(FCM08)
Sol #46	Initial system-wide information management (SWIM) technology solution	(INF08.1)

(*) Initial objective

Committed MPL3, non PCP-related Solutions (and the associated MPL3 objective)

Sol #61	A low-cost and simple departure data entry panel for the airport controller working position	(AOP17)
Sol #56	Enhanced ATFCM slot swapping	(FCM09)

Non committed (i.e. non MPL3) Solutions

Sol #57	User-driven prioritisation process (UDPP) – departure	3	Implemented in 3 States, 8 locations indicated (CH; DE – DRS, FRA, HAM, MUC, NUE, STR, SXF; FR – CDG)
		4	Planned implementation in 4 States (AT; CH; PL; PT)
Sol #67	AOC data increasing trajectory prediction accuracy	0	Not yet implemented in any State
		3	Planned in 3 States (AT; CH; FR)

Digital AIM and MET services

Committed MPL3, non PCP-related Solutions (and the associated MPL3 objective)

Sol #34	Digital integrated briefing	(INF09*)
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(*) initial objective

Virtualisation of service provision

Committed MPL3, non PCP-related Solutions (and the associated MPL3 objective)

Sol #12, #13, #52 & #71	Remote TWR	(AOP14)
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Airport and TMA performance

Committed MPL3, PCP-related Solutions (and the associated MPL3 objective)

Sol #02	Airport safety nets for controllers: conformance monitoring alerts and detection of conflicting ATC clearances	(AOP12)
Sol #09	Enhanced terminal operations with automatic RNP transition to ILS/GLS	(NAV03.2)
Sol #22	Automated assistance to controllers for surface movement planning and routing	(AOP13)
Sol #51	Enhanced terminal operations with LPV procedures	(NAV03.2)
Sol #53	Pre-departure sequencing supported by route planning	(AOP13-ASP02)
Sol #64	Time-based separation	(AOP10)

Committed MPL3, non PCP-related Solutions (and the associated MPL3 objective)

Sol #01	Runway status lights	(AOP18)
Sol #04	Enhanced traffic situational awareness and airport safety nets for vehicle drivers	(AOP15)
Sol #47	Guidance assistance through airfield ground lighting	(AOP16)
Sol #54	Flow based integration of arrival and departure management	(ATC19)

Sol#62	P-RNAV in a complex TMA	(NAV03.1)
Sol#70	Enhanced ground controller awareness in all weather conditions	(AOP04.1)
Sol#106	DMAN Baseline for integrated AMAN DMAN	(AOP05)

Non committed (i.e. non MPL3) Solutions

Sol #23	D-TAXI service for controller-pilot datalink communications (CPDLC) application	1 3	Implemented in one State (LT) Planned in 3 States, 8 locations indicated (AT; CH; PL-GDN, KRK, KTW, POZ, RZE, WAW, WMI, WRO)
Sol #48	Virtual block control in low visibility procedures (LVPs)	0 1	Not yet implemented in any State Planned in one State, one location indicated (PL - GDN)
Sol #116	De-icing management tool	4 8	Implemented in 4 States, 2 locations indicated (AT - VIE; DE; DK; FR - CDG) Planned in 8 States, 5 locations indicated (AT; BE - BRU; CH - ZRH; CZ; EE - TLL; HU - BUD; PL - WAW; SE)
Sol #117	Reducing Landing Minima in Low Visibility Conditions using Enhanced Flight Vision Systems (EFVS)	1 1	Implemented in one State, one location indicated (FR - LBG) Planned in one State, one location indicated (BE- ANR)
Sol #11	Continuous descent operations (CDO) using point merge	4 4	Implemented in 4 States, 3 locations indicated (AT, FR - CDG; HU - BUD; LT - VNO) Planned in 4 States, 2 locations indicated (IE; IT - BGY; LT; NO - OSL)
Sol #107	Point merge in complex terminal airspace	6 3	Implemented in 6 States, 5 locations indicated (AT-VIE; ES - LPA; HU - BUD; IE; LV - RIX; NO - OSL) Planned in 3 States, 2 locations indicated (IT - BGY; NO - OSL; PT)
Sol #108	Arrival Management (AMAN) and Point Merge	3 1	Implemented in 3 States, 2 locations indicated (FR - CDG; IE; NO - OSL) Planned implementation in one State, 2 locations indicated (ES - AGP, TFS)

Fully dynamic and optimized airspace

Committed MPL3, PCP-related Solutions (and the associated MPL3 objective)

Sol #05	Extended arrival management (AMAN) horizon	(ATC15.2)
Sol #31	Variable profile military reserved areas and enhanced civil-military collaboration	(AOM19.1, AOM19.2, AOM19.3, AOM19.4)
Sol #32	Free Route through the use of Direct Routing	(AOM21.1***)
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	(AOM21.2)
Sol #65	User Preferred Routing	(AOM21.1***)
Sol #66	Automated support for dynamic sectorisation	(AOM21.2-ASP03)

(***) objective achieved in 2018

Committed MPL3, non PCP-related Solutions (and the associated MPL3 objective)

Sol #27	Enhanced tactical conflict detection & resolution (CD&R) services and conformance monitoring tools for en-route	(ATC12.1)
Sol #63	Multi-Sector Planning	(ATC18)

Sol #104	Sector Team Operations – En-Route Air Traffic Organiser	(ATC12.1)
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Non committed (i.e. non MPL3) Solutions

Sol #10	Optimised route network using advanced RNP	0	Not yet implemented in any State
		3	Planned in 3 States, 3 locations indicated (IE; IT - BGY, FCO, MXP; PT)
Sol #118	Basic EAP (Extended ATC Planning) function	3	Implemented in 3 States (BE; CH; FR)
		3	Planned in 3 States, one location indicated (CH - GVA; MAS; SK)

Trajectory Based Operations

Committed MPL3, PCP-related Solutions (and the associated MPL3 objective)

Sol #115	Extended projected profile (EPP) availability on ground	(-)
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Committed MPL3, non PCP-related Solutions (and the associated MPL3 objective)

Sol #60	Enhanced STCA for TMA specific operations	(ATC02.9)
Sol #69	Enhanced STCA with down-linked parameters	(ATC20)

Non committed (i.e. non MPL3) Solutions

Sol #06	Controlled time of arrival (CTA) in medium-density/medium-complexity environments	2	Implemented in 2 States, one location indicated (AT; FI - HEL)
		2	Planned in 2 States, 2 locations indicated (AT; PL - WAW, WMI)
Sol #08	Arrival management into multiple airports	1	Implemented in one State, 2 locations indicated (DE - DUS, CGN)
		1	Planned in one State (CH)
Sol #105	Enhanced airborne collision avoidance system (ACAS) operations using the autoflight system	0	Not yet implemented in any State
		3	Planned in 3 States (LT; PT; CZ)
Sol #100	ACAS Ground Monitoring and Presentation System	3	Implemented in 3 States, one location indicated (AT; CZ; HU - BUD)
		2	Planned in 2 States (LT; SI)
Sol #101	Extended hybrid surveillance	0	Not yet implemented or planned in any State
		0	

Multimodal Mobility and Integration of all Airspace Users

Committed MPL3, non PCP-related Solutions (and the associated MPL3 objective)

Sol #113	Optimised Low Level IFR routes for rotorcraft	(NAV12)
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Annex D

Acronyms

A	
AAS TP	Airspace Architecture Study Transition Plan
AATS	Advanced Air Traffic Services
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
AOP	Airport Operations Programme
APOC	Airport Operations Centre
APM	Approach Path Monitor
APT	Airport
APV	Approach with Vertical Guidance
APW	Area 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 Approach
CEM	Collaborative Environmental Management
CFSP	Computerised Flight Plan Service Provider
CH	Switzerland
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	
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	

EAI	Enabling aviation infrastructure
EC	European Commission
ECAC	European Civil Aviation Conference
EE	Estonia
EGNOS	European Geostationary Navigation Overlay Service
ENV	Environment
EOC	Essential Operational Change
EPAS	European Plan for Aviation Safety
ERNIP	European Route Network Improvement Plan
ES	Spain
eTOD	Electronic Terrain and Obstacle Data
EU	European Union
F	
FAB	Functional Airspace Block
FCM	Flow and Capacity Management
FI	Finland
FIR	Flight Information Region
FIS	Flight Information Services
FL	Flight Level
FMTP	Flight Message Transfer Protocol
FOC	Full Operational Capability
FPL	Flight Plan
FR	France
FRA	Free Route Airspace
FRQ	Frequencies
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	
HPAO	High-performing airport operations
HR	Croatia
HU	Hungary
I	
ICAO	International Civil Aviation Organisation
IE	Ireland
IFPS	Initial Flight Plan Processing System
IFR	Instrument Flight Rules
IL	Israel
IND	Industry
INF	Information Management
IP	Internet Protocol

IR	Implementing Rule
ISRM	Information Service Reference Model
IT	Italy
ITY	Interoperability
J	
K	
KF	Key Feature
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	
MA	Morocco
MD	Moldova
ME	Montenegro
MHz	Megahertz
MIL	Military Authorities
MK	Republic of North 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
NL	Netherlands
NM	Network Manager
NMOC	Network Manager Operations Centre
NO	Norway
NOP	Network Operations Plan
NSP	Network Strategy Plan
O	
OANS	Optimised ATM network services
OAT	Operational Air Traffic
OC	Operational Change
OI	Operational improvements
OLDI	On Line Data Interchange
P	

PBN	Performance Based Navigation
PCP	Pilot Common Project
PENS	Pan-European Network Services
PL	Poland
PRISME	Pan-European Repository of Information Supporting the Management of EATM
P-RNAV	Precision RNAV
PT	Portugal
R	
REG	Regulatory Authorities
RNAV	Area Navigation
RNP	Required Navigation Performance
RO	Romania
RP	Reference Period
RPAS	Remotely Piloted Aircraft Systems
RS	Serbia
RWY	Runway
S	
SAF	Safety
SBAS	Satellite Based Augmentation System
SDM	SESAR Deployment Manager
SE	Sweden
SES	Single European Sky
SESAR	Single European Sky ATM Research
SI	Slovenia
SJU	SESAR Joint Undertaking
SK	Slovak Republic
SLoA	Stakeholder Line of Action
SO	Strategic Objective
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
W	
WAM	Wide Area Multilateration
WP	Work Package



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