

# EUROPEAN ATM MASTER PLAN

Digitalising  
Europe's  
Aviation  
Infrastructure

Implementation view



**Progress report 2021**  
Reference year 2020

founding members



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*The Master Plan Level 3 implementation report 2021 has been officially delivered to the SJU and is pending acceptance*

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# **EXECUTIVE SUMMARY**

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

The European ATM Master Plan (MP) Level 3 Implementation Report provides a holistic view of the implementation of commonly agreed actions to be taken by ECAC+ States, in the context of the implementation of SESAR. These actions are consolidated in the form of “Implementation Objectives” that set out the operational, technical and institutional improvements that have to be applied to the European ATM network. 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 2021 Level 3 Report (reference year 2020) is based on the Master Plan Level 3 Implementation Plan edition 2020, that includes 53 active (i.e. monitored at network/national/local level) implementation objectives as well as on the LSSIP 2020 reports submitted by the EUROCONTROL States (and Maastricht UAC). As in the previous editions of the Plan, in order to reflect to the largest extent the results of SESAR and its mature and performing SESAR Solutions, the 2020 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 53 active implementation objectives included in the 2020 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

Despite the catastrophic effects of the COVID-19 pandemic on aviation, the implementation progress of the Master Plan Level 3 is steady, with advances in implementation recorded all across the ECAC area. For 32 objectives (excluding local ones) at least one State/Airport has reported completion in 2020. The table below shows the top performers of the current cycle (excluding the “Local” objectives):

Implementation Objective	SESAR Solution reference	Change in the number of States completed the objective (2020 vs. 2019)	States completed the objective in 2020	Progress evolution in 2020 (Completion rate)	Number of States completed the objective (Total number in Applicability area)
COM12 (NewPENS)	-	+21	AZ, BE, CH, CY, CZ, DE, DK, EE, ES, FR, HR, IE, IL, LV, MUAC, NL, NO, PL, PT, SE, TR	+48% (65%)	28 (43)
ITY-SPI (Surveillance Performance and Interoperability)	-	+10	BE, BG, DK, GE, HR, HU, IT, LU, LV, SK	+20% (60%)	26 (43)
COM10 (Migration to AMHS)	-	+6	BA, CH, EE, GR, LT, PL	+13% (77%)	34 (44)
ATC02.9 (STCA in TMAs)	#60	+5	AZ, FI, IE, LU, RO	+16% (85%)	34 (40)

In terms of the overall cumulative completion rate (percentage of States/Airports within the applicability area which have finalised implementation), 15 objectives (3 more than in the previous edition of the Report) have a rate above 50%, the top performers being the following ones<sup>1</sup>:

Implementation Objective	SESAR Solution reference	Change in the number of States/Airports completed the objective (2020 vs. 2019)	States/Airports completed the objective in 2020	Progress evolution in 2020 (Completion rate)	Number of States/Airports completed the objective (Total number in Applicability area)
ATC02.9 (STCA in TMAs)	#60	+5	AZ, FI, IE, LU, RO	+16% (85%)	34 (40)
ITY-FMTP (Flight Message Transfer Protocol)	-	+1	FI	+3% (80%)	35 (44)
COM10 (Migration to AMHS)	-	+6	BA, CH, EE, GR, LT, PL	+13% (77%)	34 (44)
SAF11 (Prevention of runway excursions)	-	+3	DE, NO, PT	+7% (76%)	32 (42)
AOP04.1 (Advanced Surface Movement Guidance and Control – Surveillance)	-	+3	EDDB, LTFM, LUKK	+4% (74%)	42 (57)

It has to be acknowledged that the progress achieved in 2020 is substantially better than expected, taking into account the COVID-19 impact and the unavailability of resources, therefore the tremendous efforts made by the implementing stakeholders need to be fully appreciated and recognised. The COVID-19 crisis being the main justification reported by stakeholders for implementation delays, with 1 to 3 years shifts in the expected deployment, compared with the pre-COVID-19 plans. However, the good progress achieved in 2020, in particular on infrastructure projects, is a strong indication that the European ATM will build back better and will be ready when the increase in air traffic will require.

The charts below indicate the current status of the implementation objectives as captured in the LSSIP 2020 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 below<sup>2</sup>.

The implementation status of an objective is indicated by the colour of its designator<sup>3</sup>:

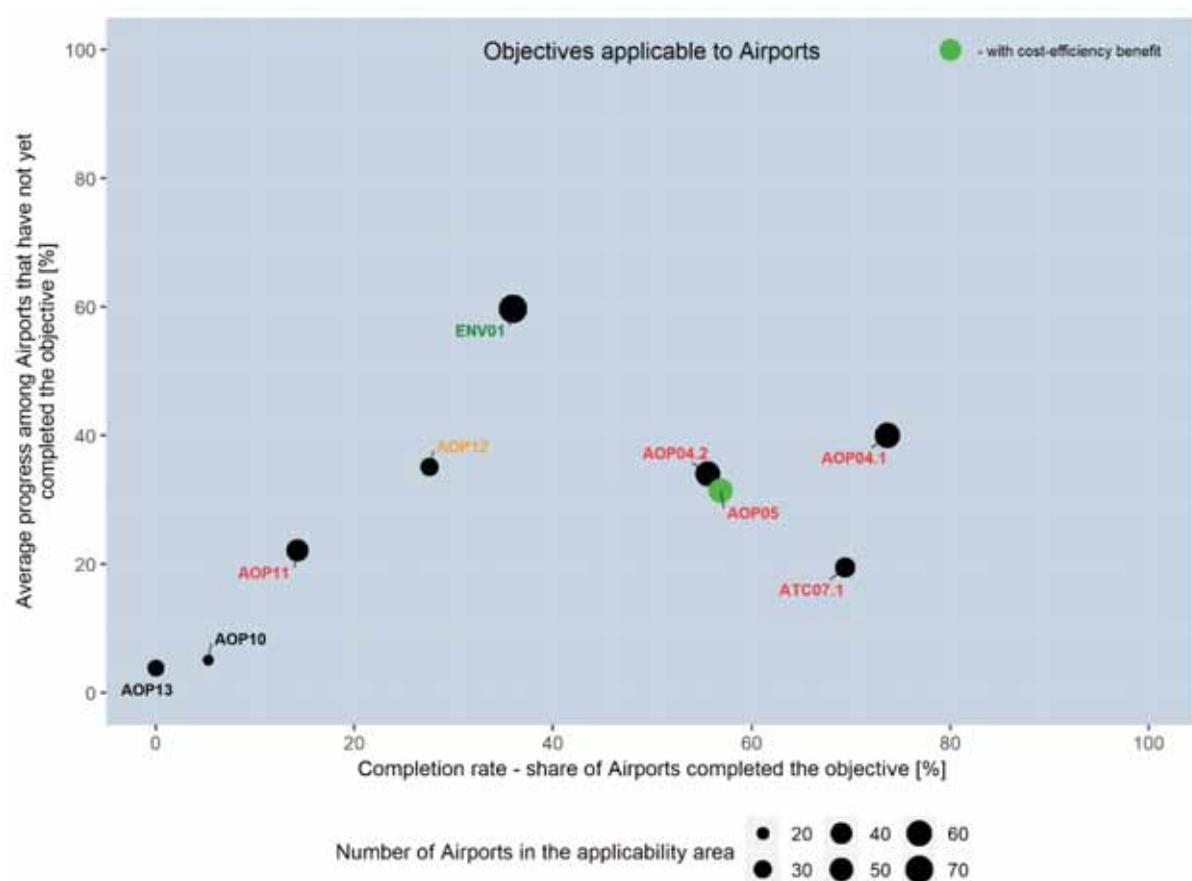
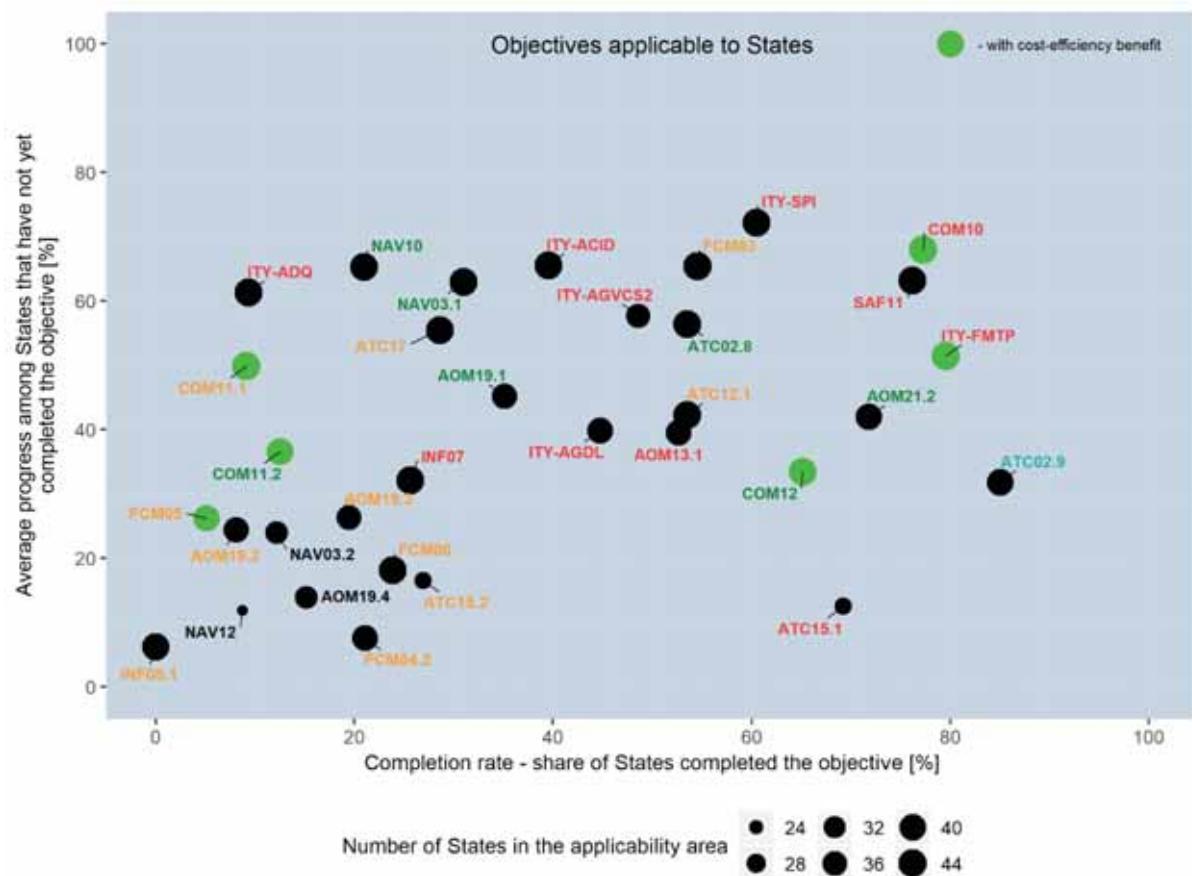
- **Achieved**
- **On time**
- **Risk of delay**
- **Planned delay**
- **Late**
- **Estimated achievement date not available yet**

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<sup>1</sup> A consolidated table showing the progress in 2020 as well as the implementation status for all monitored implementation objectives is available in Annex C.

<sup>2</sup> 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 2020 Implementation Plan.

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



Compared with the previous edition of the Report, there is a sensible increase (from 4 to 12) in the number of objectives for which there is “Planned delay” (meaning that the Full Operational Capability – FOC date has not been reached yet but that the current plans indicate that the completion will be reached after the FOC date). This increase is justified by the shift in deployment plans caused by the COVID19 pandemic crisis, but also (to a lesser extent) by the fact that several stakeholders have already adapted their implementation plans to the requirements of the CP1 Regulation (116/2021) while the FOCs were still reflecting the PCP imposed dates.

## **What are the most important implementation evolutions per SESAR Essential Operational Change (EOC)<sup>4</sup>?**

### **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 two exceptions (VoIP in Airport/Terminal - COM11.2 and APV procedures - NAV10), all the other 6 objectives are either already late or planned to be delayed. This might be explained by the fact that these implementations are usually complex, lengthy and costly. However, it is observed that implementation has progressed in 2020 within the EOC with increases in the completion rate percentage for up to 20%. Moreover, even if some objectives are late overall, they have already delivered substantial improvements across the Network (e.g. COM10 for which AMHS is already implemented by all but one State, while the Extended AMHS is still ongoing, or ITY-AGVCS2 addressing the deployment of 8.33 kHz voice communications, for which more than 2/3 of the assignments used in Europe, the most beneficial, are already 8.33 kHz). 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 (10 within the EOC), the progress is quite uneven, with 5 objectives already having a planned delay. However, this status is versus the PCP dates therefore the delay will be absorbed once the FOC dates at objective level are realigned with the CP1 dates (in the MPL3 Plan 2021). This evolution will be reflected in the next edition of the Report. In terms of completion rate, the most advanced objective is now the one on NewPENS (COM12), which witnessed an impressive increase (from 7 to 28) of the number of States having reported the finalisation of implementation. It is followed by the one on “Collaborative Flight Planning” (FCM03) and the one on the harmonisation of OAT and GAT handling (AOM13.1), both having a completion rate above 50%, with good perspectives of completion in the near future.

### **c) Digital AIM and MET services**

For the time being, the EOC is relying on only 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 ecosystem, as well as by the broad scope of the objectives themselves. Similarly with the CNS EOC, even if the overall status at objective level is late, the good progress made by stakeholders in the implementation of specific key actions (e.g. the setting up of formal arrangements for the exchange of aeronautical data/information) is very much recognised and appreciated.

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<sup>4</sup> The assignment of individual implementation objectives to EOCs is shown in the individual Deployment Views and consolidated in Annex B

#### **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 4 SESAR Solutions. It is encouraging to notice that more and more airports across Europe, 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 quintuple by the end of 2023, going from the current 4 locations where RTS are provided, to more than 20. 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.

#### **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. It also contains the highest number (6) of local objectives among the EOCs. 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, all having completion rates of more than 50%, some of them (e.g. SAF11, AOP04.1) being very close to completion). The more recent objectives, addressing advanced and more complex functionalities, are in earlier deployment phases, with completion rates of around 25%. Also, the applicability areas of the implementation objectives differ, with substantially more airports interested in the deployment of basic functionalities (e.g. A-SMGCS Surveillance) while the interest in the deployment of advanced features is somehow limited to complex and high traffic airports. Within the EOC, 6 objectives are of “local” nature, and for which a widespread and coordinated commitment for implementation has not been expressed yet. Among them, 4 are quite recent, having been monitored for the first time in the previous cycle. It is therefore expected for them to still raise quite a low interest for deployment, in particular in the context of the substantial downturn in traffic caused by the COVID-19 pandemic. 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 54 have already finalised implementation, 3 more than in the previous Report. With regard the Navigation related objectives (in particular the one on RNAV 1 in TMAs - NAV03.1), following the substantial drop in the completion rates of the previous year, caused by the realignment with the PBN Regulation, they have now resumed growth and are back on track for a successful implementation.

#### **g) Fully dynamic and optimized airspace**

The EOC relates mostly to implementation objectives addressing airspace management as well controller support tools. Within the EOC, 2 implementation objectives are very close to achievement, having completion rates above 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 objective 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 6 States as well as planned or in implementation in another 7 States. With no doubt, the deployment of Free Route Airspace is the flagship of this EOC, with constant progress every year, with the focus on the deployment in cross-border areas. It should be noted that even within the States which have not yet reported full completion of the objective, free route is already offered in portions of the airspace or during specific periods of the day.

#### **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 86% completion. This functionality is followed closely by the Minimum Safe Altitude Warning functionality, with 73% completion. The deployment of Short Term Conflict Alert in TMAs has continued its progress and has reached the threshold to be considered as “Achieved”. This implementation performance addresses the deployment of standard algorithms (same as en-route) as well as enhanced ones (e.g. multi-hypothesis) customised for specific, demanding environments (e.g. complex TMA). However it is observed that the more advanced algorithms are less attractive at ECAC level as less than half of the reporting States consider having an operational need.

### 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 still low (only 2 States have reported completion), in particular due to the lack of business/operational needs, with only 1 State expecting to implement it by end 2021 and none in 2022/2023. The low interest in deployment is justified by most of the States by the lack of business needs and characteristics of their operational environment.

## PCP and CP1 Regulations

The current edition of the Report is based on the implementation objectives listed in the Master Plan Level 3 Implementation Plan 2020, when the PCP Regulation (716/2014) was still applicable. Therefore, the FOC dates of the objectives, as the dates versus which the implementation progress was assessed were still the PCP imposed dates. In the meantime, the PCP Regulation has been repealed by the CP1 Regulation (116/2021) published in February 2021, imposing new compliance dates as well as changes to the mandated functionalities. These changes, to be inserted in the MPL3 Plan of 2021, will only be reflected in the next edition of the Report. However, even if formally the Report still refers to the PCP, the CP1 is extensively mentioned in the body of the document, as many stakeholders, in anticipation of the CP1 changes, have already adapted their implementation plans. Another possible impact brought by CP1, to be assessed in the future edition of the Report, could be the assignment of lower implementation priority to the functionalities which used to be part of the PCP, but have not been taken over by the CP1 (e.g. Automated assistance to controller for surface movement planning and routing – AOP13, or Time Based Separation – AOP10). Taking into account the current downturn in traffic and the reprioritisation needs, it is not excluded that, as these functionalities are not mandated anymore, the interest in deployment to be negatively impacted.

## SESAR Solutions

This edition of the Report continues on the path already opened by the previous editions towards a more SESAR Solutions centric approach, by giving more prominence to the links between implementation objectives and SESAR Solutions<sup>5</sup> and by providing a strategic, high level view of the level of implementation of all validated SESAR Solutions (SESAR 1 and for the first time, SESAR2020 Wave 1). The majority of the SESAR 1 Solutions are already covered by implementation objectives (so called “SESAR committed solutions<sup>6</sup>”), therefore their evolution is derived from the evolution of the associated implementation objectives and described in the corresponding Deployment Views. The other SESAR Solutions which have not yet evolved into implementation objectives are labelled as “non-committed” as they are implemented in a voluntary way without coordination at European level and are not yet included in the ATM MP L3. For this latest category, which includes the remaining SESAR 1 Solutions as well as all the validated SESAR2020 Wave 1 Solutions, the implementation

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<sup>5</sup> 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 B

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

situation and plans have been captured through a specific questionnaire<sup>7</sup> included in the LSSIP 2020 process, with a synoptic view provided in each individual EOC analysis of this report as well as consolidated in the Annex.

## Impact of COVID-19

The Report covers the implementation activities of 2020, with a cut-off date of 31/12/2020. This period overlaps with the worst crisis in the history of European commercial aviation, brought by the COVID-19 pandemic. The dramatic and unprecedented downturn in traffic has led many stakeholders to drastically reprioritise the implementation activities and this is reflected in the pages of the Report.

Based on the feedback received from States and local stakeholders during the LSSIP 2020 cycle, it can be noted that COVID-19 pandemic has impacted deployment activities in several ways:

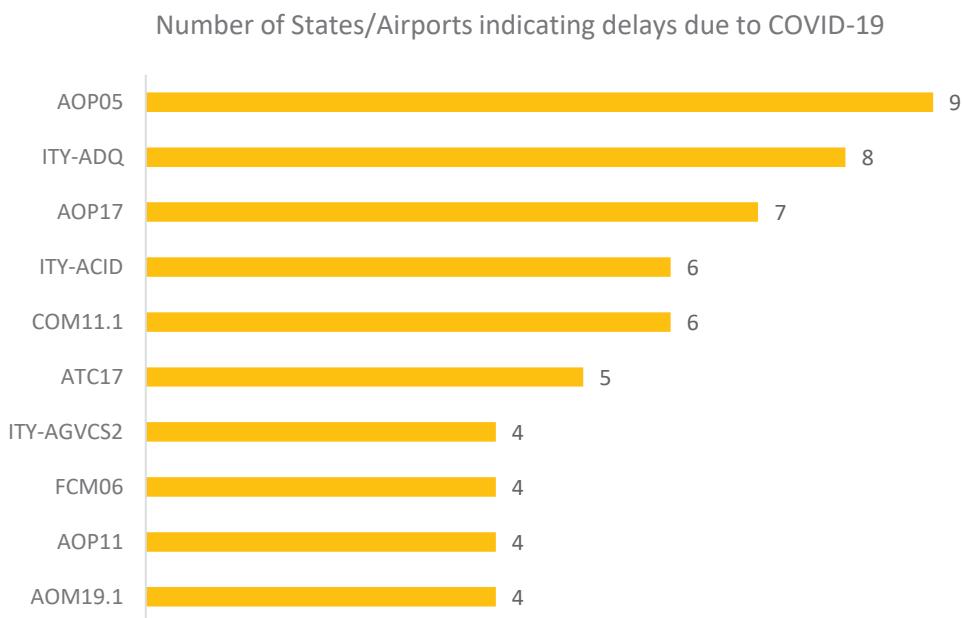
**financial aspect**: due to a significant reduction in traffic levels, vast majority of stakeholders had to implement cost-cutting measures, including the postponement or even cancellation of procurements of new equipment (cornerstone for many infrastructure-related objectives). Moreover, staff layoffs and reprioritisation of tasks have led to a reduction in workforce available for modernisation activities;

**organisational aspect**: health protection measures (physical distancing, teleworking, virtual meetings etc.) have greatly complicated the necessary coordination of work, slowing down implementation progress especially in the case of certain objectives involving many stakeholders;

**business environment aspect**: apart from a negative financial impact, traffic reduction has also caused a number of stakeholders to reconsider their local needs (at least in short term) and revise implementation plans for some objectives, especially those expected to bring most benefits in high traffic scenarios.

It should be noted that not all States have thoroughly reported on their local situation and expected implications of COVID-19 pandemic crisis. This can be explained by the fact that some stakeholders are still assessing the impact and revising their implementation plans and projects, which is further complicated by the current uncertainty in the timing and extent of traffic recovery in the years to come. However, for 42 implementation objectives, at least one State/Airport has explicitly referred to the COVID-19 pandemic as one of the reasons for delaying implementation.

Figure below shows the objectives which appear to be most affected by COVID-19 pandemic crisis, according to currently available information from States.



<sup>7</sup> The questionnaire on “non-committed” Solutions has only addressed the 27 EU Member States, Norway, Switzerland, UK as well as Maastricht UAC.

In most of the cases, a combination of factors (financial/organisational/business) is mentioned. However, prime among them was the need for urgent and steep cost savings, leading either to cancelations, freezing or postponement of ongoing or planned projects. When it comes to airport-related objectives (accounting for 3 of the top 10 objectives in terms of the number of States/Airports reporting COVID-19 induced delays), the substantial reduction in traffic, therefore the disappearance of the potential short-term operational benefits, is also consistently mentioned across the reporting stakeholders, justifying the postponement of implementation till the moment the increase in traffic will provide a positive CBA. When the deployment of the implementation objectives relies on major upgrades or on the procurement of new ATM systems (e.g. for some of the infrastructure-related objectives), in addition to the ANSP difficulties mentioned above, the COVID-19 impact on the equipment suppliers is also indicated as one of the reasons for delay.

However, taking the above into account, many implementation objectives have unexpectedly progressed in 2020, some of them recording an impressive spike in the completion rate. This was observed in particular for the objectives related to infrastructure, the ones addressing NewPENS, Surveillance interoperability and (Enhanced) AMHS showing the highest increases in completion rates during 2020. Despite the COVID-19 pandemic crisis, the progress achieved in 2020 shows the resilience of the European ATM and gives confidence that the European ATM system will certainly build back better.

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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](http://www.atmmasterplan.eu)); the Level 3 “Implementation view” contains the Implementation Plan enriched with elements from the Implementation Report fed by elements coming from reporting processes, such as the LSSIP<sup>1</sup> (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+<sup>2</sup> wide implementation monitoring and planning of the Master Plan.



**Figure 1. Master Plan Level 3 yearly cycle**

## **Master Plan Level 3 2021 Implementation Report**

The structure of 2021 Master Plan Level 3 Report (reference year 2020) 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 2020, 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 having been validated by SESAR 1 as well as by SESAR2020 Wave1.

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

<sup>2</sup> 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 as well as a summary of the terminology used in the document. It also provides an insight into the standardisation and regulatory needs associated to the SESAR Solutions.

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 2020 Implementation Plan, reflecting the implementation status as well as the implementation plans on 31<sup>st</sup> December 2020.

The implementation progress in this report is assessed against the implementation dates set in the Master Plan Level 3 2020 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). However, as the baseline for the Report was the 2020 edition of the Plan, the FOC dates for the “regulated” objectives are still the ones defined by the PCP Regulation which has been repealed in the meantime and replaced by the CP1 Regulation. The new CP1 dates and overall context will be reflected in the next edition of the Report. Still, even if the formal links presented in the current edition of the Report are with the PCP, the CP1 initial impact is already addressed throughout the document.

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.

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 and 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 Solutions<sup>1</sup> 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 2020 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. The information presented (see Annex D for further details) shows the links between the implementation objectives and the functionally related SESAR Solutions (where applicable). This information is further refined up to the level of EOCs. Within each EOC, the Solutions are split between

#### **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.

<sup>1</sup> The Level 3 Implementation Report 2021 covers SESAR Solutions that were validated by SESAR 1 as well as by SESAR2020 Wave 1

**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)<sup>2</sup>. The Solutions within the scope of this Report are those listed in Annex 3 “MPL3 Plan Roadmap” of the MPL3 Plan 2020, supplemented, for the first time with the SESAR2020 Wave 1 Solutions. The evolution of the committed Solutions (therefore related to implementation objectives) can be derived from the evolution of the objective themselves (see the individual Deployment Views in Part 3 of this Report). The information on the non-committed Solutions has been collected with the help of a dedicated questionnaire included in the LSSIP process<sup>3</sup>, aiming to find out if a Solution has been implemented or if there are plans for implementation. All but one of the 30 States (+MUAC) have provided replies to the questionnaire, however several States have not been able to provide information on all Solutions, therefore in order to remove ambiguities, only the explicit

implementations/plans have been taken into account. Overall, this Report covers 42 committed Solutions (covered by Regulations and/or MPL3 implementation objectives) and 55 non-committed Solutions (22 SESAR 1 as well as 33 SESAR2020 Wave 1 Solutions).

### 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.

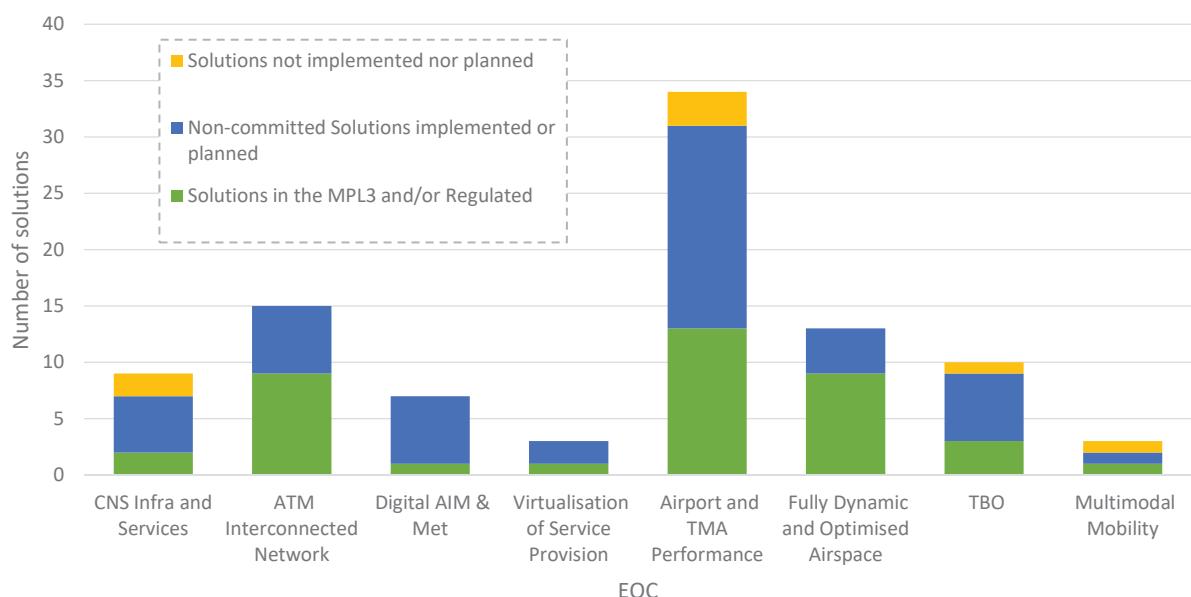
### Trajectory-based operations

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

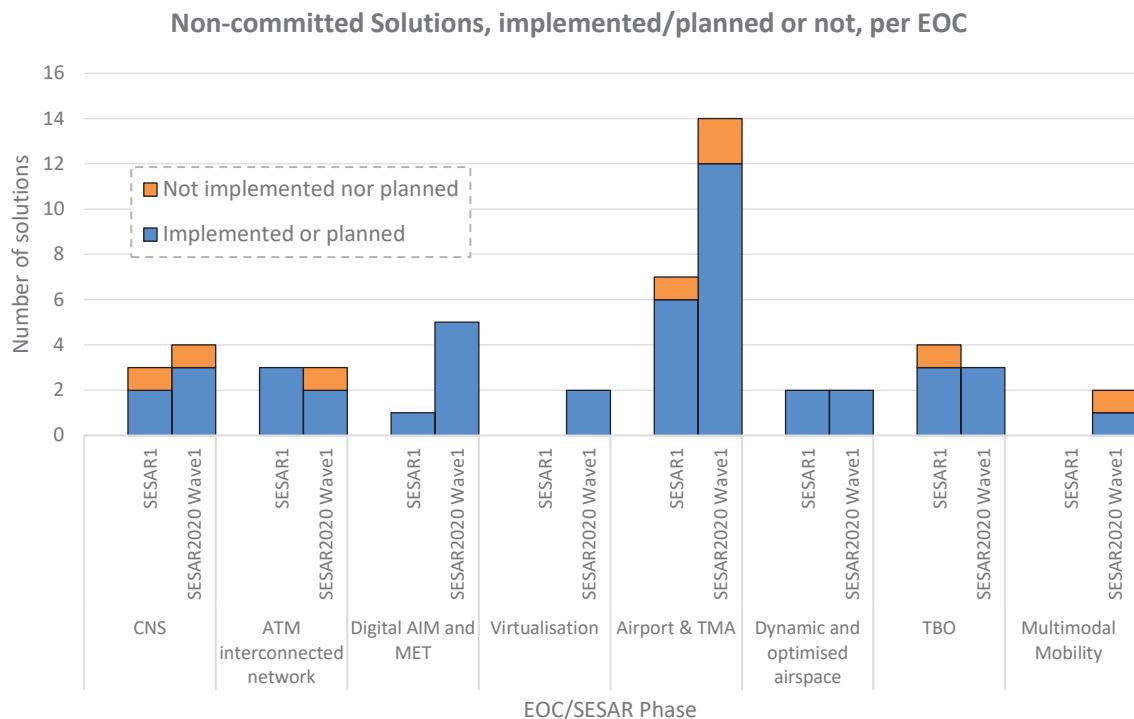
Mobility as a service will take intermodality to the next level, connecting numerous modes of transport, for people and goods, in seamless door-to-door services. Various modes of transport, such as car, train, helicopter, drone and aircraft, for different segments of a trip will be seamlessly combined.

**Distribution of SESAR Solutions per EOC and committed/non-committed status**

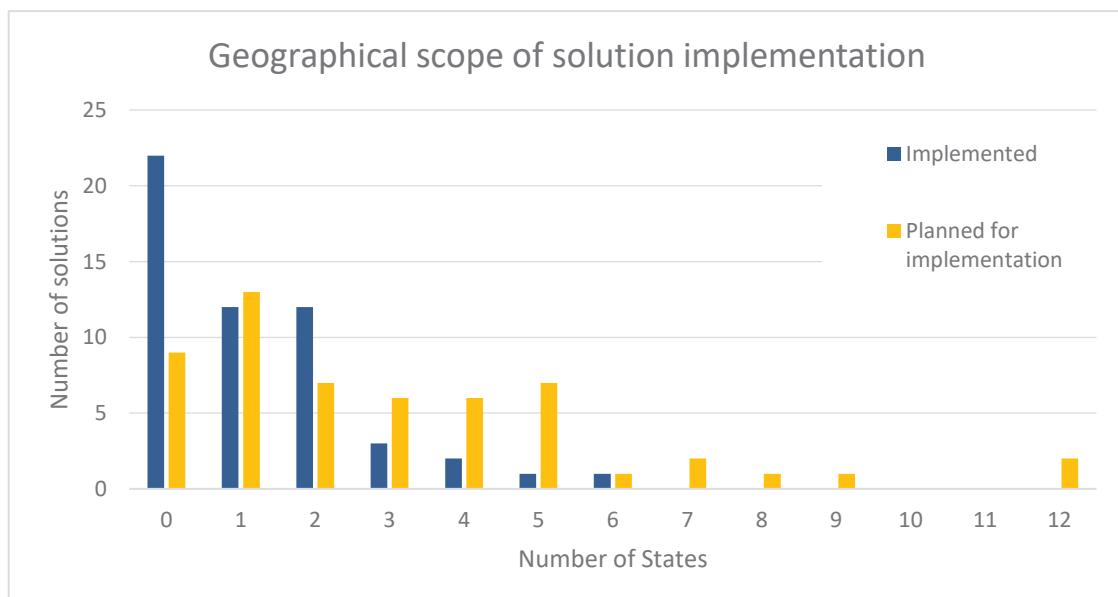


<sup>2</sup> The mapping of the full list of SESAR Solutions to the EOCs and the split between PCP-related, MPL3 (non-PCP) related and non-committed Solutions as well as the links to implementation objectives (where available) is detailed in Annex D.

<sup>3</sup> While the overall scope of the Report is ECAC+, the questionnaire on “non-committed” Solutions has only addressed the 27 EU Member States, Norway, Switzerland, UK as well as Maastricht UAC.



It is observed that the number of Solutions is quite unevenly distributed across the EOCs, with the majority belonging to the “Airport and TMA Performance” EOC, both in terms of “committed” Solutions (solutions which are already covered by an implementation objective in the MPL3 or by regulatory requirements) as well as “non-committed” Solutions, which have not been included yet in the MPL3. The above information indicates an apparent interest in the deployment (or planning for deployment) of SESAR Solutions. However it should be noted that for the time being the geographical spread is limited, with the majority of the Solutions being implemented or planned to be implemented by up to 2-3 States, indicating a very scarce appetite for deployment as well as the still very local and limited appeal of the Solutions.



## Allocation of Implementation Objectives per EOC<sup>4</sup>

EOC	Pre-SESAR	PCP	SESAR 1
CNS	<ul style="list-style-type: none"> <li>COM10-Basic and enhanced AMHS</li> <li>ITY-ACID-Aircraft Identification</li> <li>ITY-AGDL/A/G Data-link</li> <li>ITY-AGVCs2-8,33KHz below FL195</li> <li>ITY-SPI-Surveillance perf and interop</li> </ul> <p>(*) Not mandated by the PCP Regulation but enabling some SESAR 1 operational changes</p>	<ul style="list-style-type: none"> <li>COM11.1-Voice over IP (*)</li> <li>COM11.2-Voice over IP in Airport/Terminal</li> <li>NAV10-RNP Approach to instrument RWY</li> </ul>	<ul style="list-style-type: none"> <li>NAV11-Precision approaches using GBAS Cat II/III – initial objective</li> </ul>
IN	<ul style="list-style-type: none"> <li>AOM13.1-Harmonise OAT / GAT handling</li> <li>FCM03-Collaborative flight planning</li> </ul>	<ul style="list-style-type: none"> <li>AOP11-Initial Airport Operations Plan</li> <li>COM12-NewPENS</li> <li>FCM04.2-STAM Phase 2</li> <li>FCM05-Interactive Rolling NDP</li> <li>FCM06-Traffic complexity assessment</li> <li>FCM07-CTOT to TTA for ATFCM purposes - initial objective</li> <li>INFO8.1-iSWIM Yellow TI Profile</li> <li>INFO8.2-iSWIM Blue TI Profile - initial objective</li> </ul>	<ul style="list-style-type: none"> <li>FCM09-Enhanced AIFM Slot Swapping</li> </ul>
dS	<ul style="list-style-type: none"> <li>INFO7-eTOD</li> <li>ITY-ADQ-Aeronautical Data Quality</li> </ul>	-	<ul style="list-style-type: none"> <li>INFO9 - Digital Integrated Briefing – initial objective</li> </ul>
U-S	-	-	-
vS	-	-	<ul style="list-style-type: none"> <li>AOP14-Remote Tower Services</li> </ul>
ATP	<ul style="list-style-type: none"> <li>AOP04.1-A-SMGCS Surveillance</li> <li>AOP04.2-A-SMGCS Runway Monitoring and Conflict Alerting (RMCA)</li> <li>AOP05-Airport CDM</li> <li>ATC07.1-AMAN</li> <li>ENV01-Continuous Descent Operations</li> <li>ENV02-Collaborative Environmental Management</li> <li>ENV03-Continuous Climb Operations</li> <li>SAF11-Prevent Runway Excursions</li> <li>NAV03.1-RNAV-1 in TMAs</li> </ul>	<ul style="list-style-type: none"> <li>AOP10-Time based separation</li> <li>AOP12-Improve RWY safety with ATC clearance monitoring</li> <li>AOP13-Automated Assistance to Controller for Surface Movement Planning and Routing</li> <li>NAV03.2-RNP1 in TMAs</li> </ul>	<ul style="list-style-type: none"> <li>AOP15-SNET for vehicle drivers</li> <li>AOP16-Guidance via AGL</li> <li>AOP18-RWY status lights</li> <li>ATC19-Enhanced AMAN DMAN integration</li> </ul>
DA	<ul style="list-style-type: none"> <li>ATC15.1-Initial extension of AMAN to En-Route</li> <li>ATC17-Electronic Dialog supporting COTR</li> <li>ITY-FMTP-FMTP over IPv6</li> </ul>	<ul style="list-style-type: none"> <li>AOM19.1-ASM support tools</li> <li>AOM19.2-ASM Management of real time airspace data</li> <li>AOM19.3-Full rolling ASM/ATFCM process</li> <li>AOM19.4-Management of Pre-defined Airspace Configurations</li> <li>AOM21.2-Free Route Airspace</li> <li>ATC12.1-MONA, TCT and MTCO</li> <li>ATC15.2-Extension of AMAN to En-route</li> </ul>	<ul style="list-style-type: none"> <li>ATC18-Multi Sector Planning</li> </ul>
TBOE	<ul style="list-style-type: none"> <li>ATC02.8-Ground based safety nets</li> </ul>	-	<ul style="list-style-type: none"> <li>ATC02.9-STCA for TMAs</li> <li>ATC20-STCA with Mode S DAP</li> </ul>
M <sup>3</sup>	-	-	<ul style="list-style-type: none"> <li>NAV12 - ATS IFR Routes for Rotorcraft Operations</li> </ul>

<sup>4</sup> The complete allocation of objectives to EOCs is also available in Annex B

## 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 data reported during the LSSIP 2020 cycle, reflecting the implementation status at 31<sup>st</sup> December 2020. The Views are structured per Essential Operational Change (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.

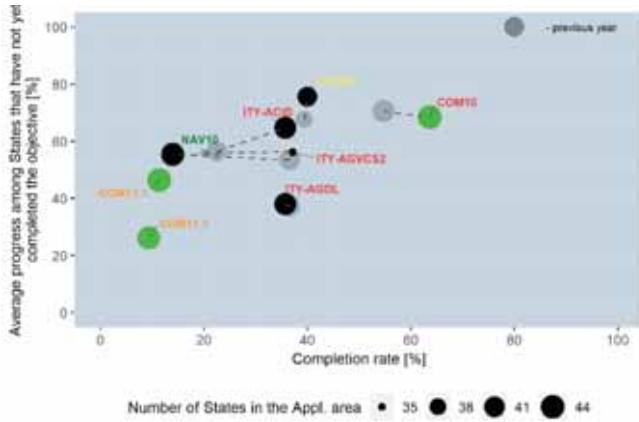
The implementation status table shows the consolidated evolution of the objectives within the EOC in 2020.

Implementation Objective	SESAR Solution ref.	Change in the number of States/Airports completed the objective (2020 vs. 2019)	States/Airports completed the objective in 2020	Progress evolution in 2020 (Completion rate)	Number of States /Airports completed the objective (Total number in Applicability area)	FOC	Implementation Status	Estimated achievement
AOM19.1	#31	0	None	+1% (35%)	13 (37)	01/2022	On time	01/2022
AOM19.2	#31	+1	LV	+3% (8%)	3 (37)	01/2022	Planned delay	12/2025

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 2020 (compared with 2019);
  - The States/Airports that have completed the objective in 2020. Minus (-) means that a particular State/Airport reviewed its status from “Completed” to any other status.
- Note:** When such reversion happens, it is further addressed/explained in the Deployment View at individual objective level;
- The evolution of the completion rate in 2020 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 2020;
  - 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 2020 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 reflects the taxonomy of the progress assessment as defined in the Deployment Views section of this document.

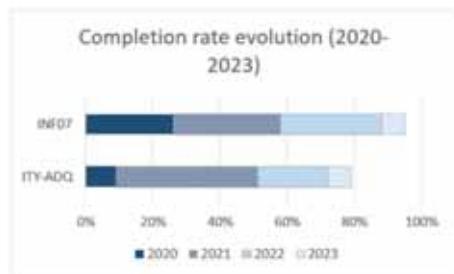


Scatter plots provide information on the Completion Rate of the Objectives (the number of States/Airports which have finalised implementation as a percentage of the overall number of States/Airports in the applicability area of the Objective) – X axis, as well as on the average progress among States/Airports 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, EDDS, EDDB; FR – LFPG)	4 States (AT; CH; PL; PT)
#67	Not yet implemented in any State	4 States (AT; CH; FR; UK)

These tables show the number of implementation instances or implementation plans of SESAR Solutions (SESAR 1 and SESAR2020 Wave1), 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:

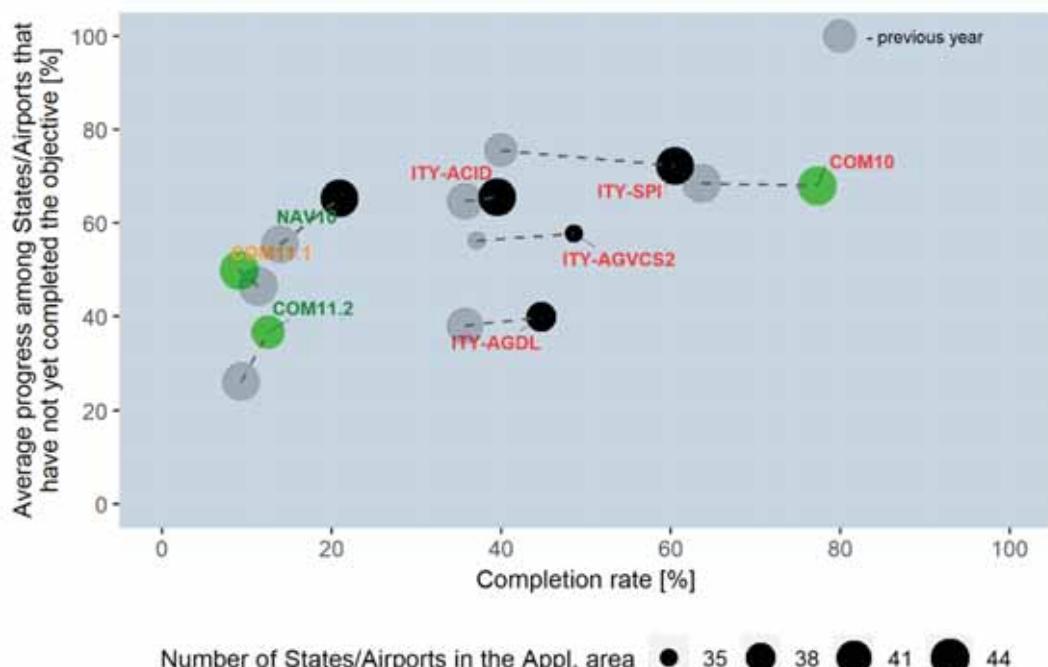
- **COM10** on migration from Aeronautical Fixed Telecommunication Network (AFTN) to ATS Message Handling Service (AMHS)
- **COM11.1** and **COM11.2** on Voice over Internet Protocol (VoIP) in En-Route (COM11.1) and in Airport/Terminal (COM11.2) environments
- **ITY-ACID** on the capability of the ANSPs 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 2020

Implementation Objective	SESAR Solution ref.	Change in the number of States completed the objective (2020 vs. 2019)	States completed the objective in 2020	Progress evolution in 2020 (Completion rate)	Number of States completed the objective (Total number in Applicability area)	FOC	Implementation Status	Estimated achievement
COM10	-	+6	BA, CH, EE, GR, LT, PL	+13% (77%)	34 (44)	12/2018	Late	12/2021
COM11.1	-	-1	-ES	-2% / (9%)	4 (44)	01/2022	Planned delay	12/2023
COM11.2	-	+1	MA	+4/ (13%)	5 (40)	12/2023	On time	12/2023
ITY-ACID	-	+2	BE, SI, SK (-BA)	+4% (40%)	17 (43)	01/2020	Late	12/2022
ITY-AGDL	-	+2	RO, SI	+9% (45%)	17 (38)	02/2018	Late	12/2022
ITY-AGVCS2	-	+4	BG, HR, IE, SK	+12% (49%)	17 (35)	12/2018	Late	12/2023
ITY-SPI	-	+10	BE, BG, DK, GE, HR, HU, IT, LU, LV, SK	+20% (60%)	26 (43)	06/2020	Late	12/2022
NAV10	#103	+3	HR, LU, ME	+7% (21%)	9 (43)	01/2024	On time	01/2024

The Essential Operational Change is grouping objectives across the Communication, Navigation and Surveillance domains, all of them showing a positive implementation progress (the slight reduction of the completion rate for COM11.1 is caused by a change in the reporting methodology and not by an actual reduction in the centres having implemented the objective). The progress of **COM10** objective is confirming its growth (from 40% to 77% completion rate in 3 years) with the remaining States quite advanced in the process of Extended AMHS implementation. It should be noted that the objective is addressing the deployment of both AMHS and Extended AMHS functionalities. From an AMHS perspective, the functionality is already implemented, with 43 States having already reported completion. Based on the current planning data, the Extended AMHS part is expected to achieve full implementation by the end of 2021. The 2 Objectives addressing the deployment of VoIP (**COM11.1** and **COM11.2**) are addressing 2 different operating environments (En-route and Airport/TMA), each with its own FOC. Both objectives have still a low completion rate as they are only in the second monitoring year and their progress is quite slow. This is also confirmed by the reported implementation plans, which already

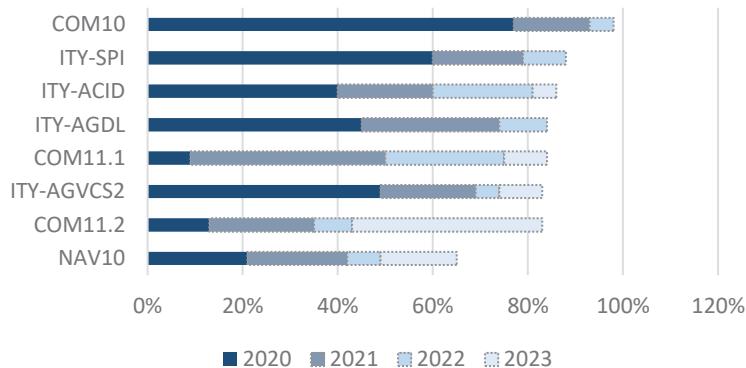
indicate minor delays with regard the agreed FOC date for the deployment of VoIP in en-route (COM11.1). Among the 2 objectives, the one addressing the deployment of VoIP en-route should have higher priority with the implementers, as it is the one being the most beneficial at network level. Within the Communication domain, there are also 2 Objectives derived from SES legislation: ITY-AGDL and ITY-AGVCS2. Both Objectives are late but the completion rate is progressing and almost half of the States in the applicability area have finalised the implementation. Based on the current plans, the one addressing the deployment of initial data link communication will be achieved 2022, one year earlier than the estimation provided in the previous Report (still much later than the initially regulated dates of 2013/2015). The situation is better with regard the deployment of 8.33 kHz channel spacing. Even if the overall implementation is late, many conversions have already been achieved (roughly 6300 out of the 9700 assignments in the EU, CH and NO are already 8.33 kHz), while the remaining ones are scheduled mostly between 2020/2021 and 2025. It is noteworthy that virtually all ACC assignments, which are the one bringing most of the network benefits are now 8.33 kHz. The 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, while the objective is late and the completion rate is still low for an objective subject to SES legislation, substantial progress has been made with regard the deployment of appropriate technical capabilities (in particular surveillance coverage) in the en-route airspace and around the major airports of the reporting States. As far as the en-route environment is concerned it can be considered that the technical capability has been deployed everywhere in the applicability area, which goes way beyond the EU States. The focus should move now to the capability gaps in some TMAs and around smaller airports as well as to the airspace declarations to be submitted to EUROCONTROL NM. Even if the implementation is late, the deployment 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 2021/2022. In particular the interoperability Stakeholder Line of Action has been implemented in all but one State in the applicability area. The late status at objective level is mainly induced by the longer time needed for the equipage of State aircraft. These delays are caused by the specificities of State aircraft fleets, in particular large sizes, limited budgets and longer procurement cycles. The Navigation domain is represented by Objective NAV10. While not a recent Objective, its completion rate suffered a substantial dip (-23%) in the previous edition of the Report because of the need to re-assess the Objective to accommodate the requirements of the PBN Implementing Rule. Since, the completion rate started to recover, having increased by 7% during the latest reporting cycle. In 2020, significant progress has been observed in the establishment and verification PBN Transition Plan, with almost all States having completed this task. It can therefore be considered that the objective is back on track and on time for an expected completion by early 2024.



## 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. This has been confirmed in 2020 as despite the COVID19 pandemic crisis, all objectives have recorded steady implementation progress. These objectives also have the potential to bring cost efficiency gains once implemented, 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 the current implementation levels and plans, their closeness to completion as well as, in particular, their potential cost-efficiency contributions, it is expected that COM10 (the Extended AMHS elements as AMHS deployment is already completed) and COM11.1/11.2 will progress with priority in the near term, as possible means to achieve the savings imposed by the COVID19 pandemic crisis. A special observation is to be made on the need to finalise the deployment of ITY-AGDL, not only to reap its immediate benefits (capacity, safety) but also to unlock and build the foundation of the more advanced features like i4D.

Completion rate evolution (2020-2023)



## SESAR Solutions

Seven SESAR Solutions belong to this EOC, without being yet subject to an implementation objective in the Level 3 of the Master Plan:

- #55 Precision approach using GBAS Category II/III
- #102 Aeronautical mobile airport communication system (AeroMACS)
- #109 Air traffic services (ATS) datalink using Iris Precursor
- #110 ADS-B surveillance of aircraft in flight and on the surface
- #114 Composite Surveillance ADS-B / WAM
- PJ.14-02-06 AeroMACs integrated with ATN, Digital Voice and Multilink
- PJ.14-03-04 RNP1 reversion based on DME-DME.

Solution	Number of States implemented the solution	Number of States planning to implement the solution
#55	Not yet implemented in any State	6 States, 6 locations indicated (CH-LSZH; DE- EDDW, EDDF; ES-LEMD; FR-LFPG; NL; PL-CPK)
#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	4 States, 3 locations indicated (DE-EDDN; FR-LFKJ; HU-LHBP; UK)	12 States, 4 locations indicated (AT; CH-LSGG, LSZH; DE; ES; FR-LFKB, LFBD; HU; IT; MT; NL; NO; PT; SK)
#114	2 States (UK; AT-partly)	12 States, 1 location indicated (AT; CH; CZ; DE; EE; FR-LFLB; HU; IT; LT; NL; NO; SK)
PJ.14-02-06	Not yet implemented in any State	Not yet planned in any State
PJ.14-03-04	2 States (LT; PL)	7 States, 1 location indicated (AT; CH-LSZH; EE; HR; LT; PL; SI)

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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
- **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)
- **INFO8.1** on Information exchanged using the SWIM yellow TI profile

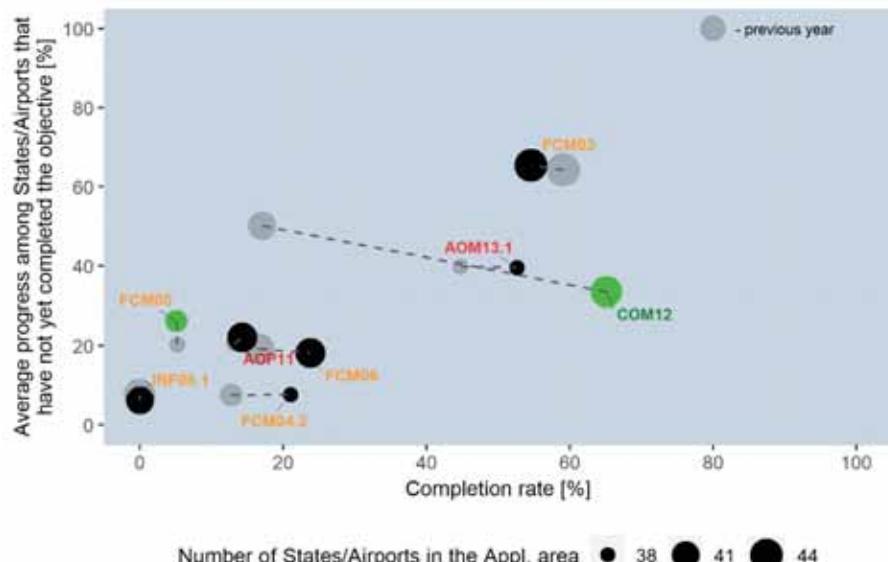
### Implementation status at the end of 2020<sup>1</sup>

Implementation Objective	SESAR Solution ref.	Change in the number of States /Airports completed the objective (2020 vs. 2019)	States completed the objective in 2020	Progress evolution in 2020 (Completion rate)	Number of States/Airports completed the objective (Total number in Applicability area)	FOC	Implementation Status	Estimated achievement
AOM13.1	-	+3	BE, IE, UA	+8% (53%)	20 (38)	12/2018	Late	12/2021
AOP11	#21	+1	EDDB	+1% (14%)	6 (38)	01/2021	Late	12/2023
AOP17	#61	+6	EDDC, EDDE, EDDG, EDDR, EDDW, LEZL	-	16 (Local Obj)	N/A	N/A	N/A
COM12	-	+21	AZ, BE, CH, CY, CZ, DE, DK, EE, ES, FR, HR, IE, IL, LV, MUAC, NL, NO, PL, PT, SE, TR	48% (65%)	28 (43)	12/2024	On time	12/2022
FCM03	-	-2	(-LU, UK)	-4% (55%)	24 (44)	01/2022	Planned delay	12/2022
FCM04.2	#17	+3	BA, CZ, FR	+5% (18%)	8 (37)	01/2022	Planned delay	12/2022
FCM05	#20	0	None	0% (5%)	2 (39)	12/2021	Planned delay	12/2023
FCM06	#19	+3	BG, CH, TR	+7% (24%)	10 (41)	12/2021	Planned delay	>2022
INFO8.1	#35, #46	0	None	0% (0%)	0 (41)	01/2025	Planned delay	12/2025

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. This might be explained by the reprioritisation needs brought by the COVID19 pandemic crisis as well as by the fact that many stakeholders have already adapted their implementation plans to the dates prescribed in the new CP1 Regulation (EU 116/2021), irrespective of the FOC dates of the objectives. However, irrespective of these planned delays and despite the COVID19 crisis, almost all objectives have recorded progress in 2020 with an undisputed surge in the completion rate of **COM12** for which half of the States in the applicability area have finalised implementation during the year, making this objective the closest to completion within the EOC. The

<sup>1</sup> FCM09 is only applicable to the Network Manager and to Airspace Users therefore there is no progress to be monitored at State/Airport level

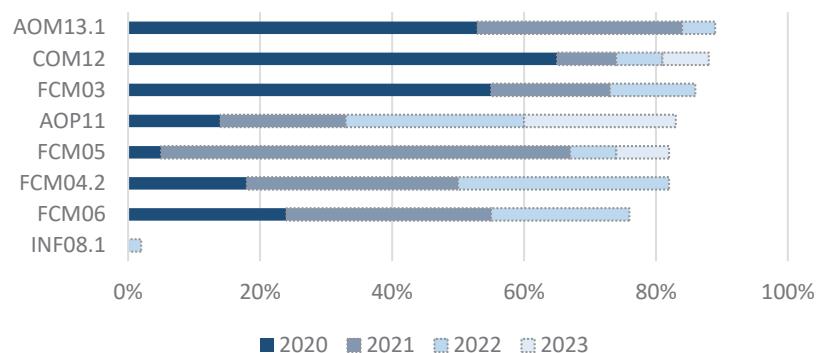
oldest objective in the EOC (as well as in the MPL3 Plan), having been created almost 20 years ago, **FCM03**, has missed the completion which was anticipated in the previous edition of the Report. However, it is expected that with the clarifications brought by the IFPS User Manual in summer 2020, the level of implementation will see a steep revival after years of slow progress. Objective **FCM04.2** confirmed its previous implementation trend. Given the new deadline introduced by CP1, it is expected that most of States will finish the implementation of STAM Phase 2 by end 2022, when the new NM HMI is expected to be ready for operational use. In terms of practical deployment, a substantial number of States (15) clearly indicated their intention to make use of EUROCONTROL NM HMI in the deployment process. **FCM05**, mostly driven by NM, is progressing well. 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 being a migration to a new platform with enhanced functional capabilities, fully compliant with the CP1 Regulation. Some modules of the new NM platform are already deployed, while the complete migration is planned by the mid 2022. The vast majority of States have started implementation or have set-up concrete implementation plans, however these plans have slipped in 2020 and currently, completion is not expected before the end of 2023. Traffic complexity assessment, **FCM06**, remains part of the CP1 Regulation therefore many States have already adapted their implementation plans to the new deadline (12/2022). It should be noted that a number of States (including those who declared the implementation as completed) consider traffic load monitoring as sufficient to fulfil the requirements of this objective. A significant improvement in completion rate is expected over the next two years, however, the ongoing COVID crisis and declining traffic levels might negatively impact the implementation progress of this objective. The Slot Swapping addressed by **FCM09** is one of EUROCONTROL NM's priorities. The ATFM 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 HMI and a B2B interface to request these to NM. This objective can be considered as finalised by NM, while AUs and more particular CFSPs need to adapt their systems and operating procedures for a full implementation of the objective. NM has deployed the multi-swap capability procedures, but multi-swap automation is considered outside of the scope of FCM09. Advanced functionalities concerning NM automated responses and automated multi-swap capabilities are in the pipeline and are mostly related to improvements of NM B2B services and interfaces between ETFMS IDAP and E-help desk. A 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. Sixteen airports have already implemented the Objective, while three others are expected to join 2021. With regard the underlying infrastructure, in 2020 the deployment of NewPENS, **COM12**, witnessed an impressive surge, with half of the States in the applicability area having completed the objective. The level of completion of the ANSPs is even better, with almost 80% providing NewPENS connectivity infrastructure while there is a much lower interest for implementation by airports, which do not deem deployment as beneficial. As far as SWIM yellow TI Profile (**INFO8.1**) is concerned, many States have already initiated implementation projects and have concluded a few intermediate steps and tasks as 24 of them report implementation as ongoing. Still, the plans already indicate an alignment with the CP1 prescribed dates.



## Future evolution

The Objectives within the EOC have a quite uneven level of implementation, spreading from almost completion (COM12) to early implementation actions (INFO8.1). The Objectives having the potential to reach completion soon are AOM13.1, COM12 and FCM03, all of them having a completion rate of more than 50%. 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. Its evolution is constant, being driven by the periodic NM Releases. The implementation progress and pace of the Objectives within the EOC may suffer from the reprioritisation imposed on the implementers by the COVID19 pandemic crisis and will certainly be impacted by the realignment of the MPL3 Plan with the CP1 Regulation.

Completion rate evolution (2020-2023)



## SESAR Solutions

Six SESAR Solutions belong to this EOC, without being yet subject to an implementation objective in the Level 3 of the Master plan:

- #18 on Calculated take-off time (CTOT) and target time of arrival (TTA),
- #57 on User-driven prioritisation process (UDPP) – departure,
- #67 on AOC data increasing trajectory prediction accuracy,
- PJ.09-03-02 on Collaborative network management functions
- PJ.15-01 on Sub-regional Demand Capacity Balancing Service, and
- PJ.17-01 on SWIM TI purple profile for airground advisory information sharing

Solution	Number of States implemented the solution	Number of States planning to implement the solution
#18	3 States, 2 locations indicated (IE-EIDW; PL-EPWA; UK)	7 States, 4 locations indicated (AT; CH; FR-Paris ACC, LFPG, LFPO); HU; IE-EIDW; NL; SK)
#57	3 States, 9 locations indicated (CH; DE-EDDB, EDDF, EDDH, EDDL, EDDM, EDDN, EDDS, EDDV; FR-LFPG)	5 States, 2 locations indicated (AT; CH; EE-EETN; HU-LHBP; PT)
#67	Not yet implemented in any State	4 States (CH; FR; HU; UK)
PJ.09-03-02	2 States, 2 locations indicated (CZ-LKPR; IE-EIDW)	5 States, 7 locations indicated (AT; EE-EETN; FR-LFPG, LFPO, LFLL, LFMN; HU-LHBP; IE-EIDW)
PJ.15-01	Not yet implemented in any State	Not yet planned in any State
PJ.17-01	Not yet implemented in any State	2 States (IE, SK)

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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.

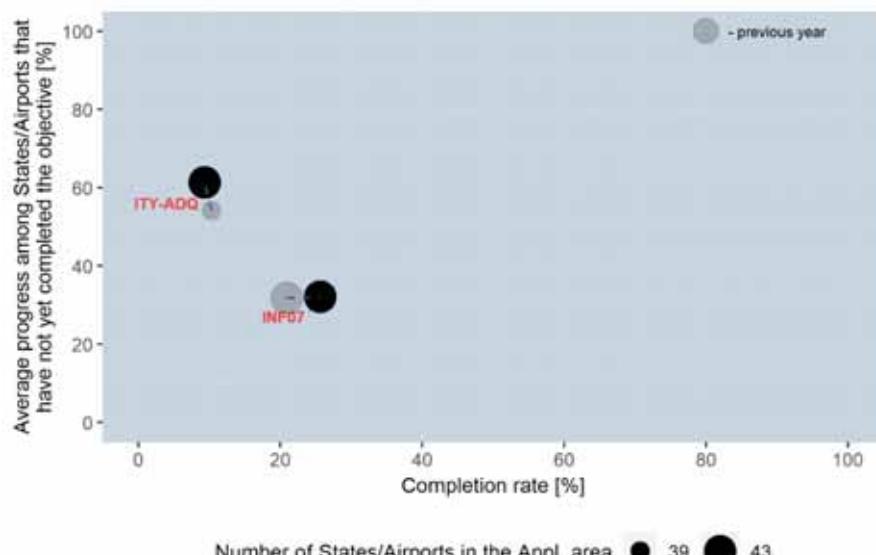
The Essential Operational Change relies on the following active implementation objectives:

- **INFO7** 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 2020

Implementation Objective	SESAR Solution ref.	Change in the number of States /Airports completed the objective (2020 vs. 2019)	States completed the objective in 2020	Progress evolution in 2020 (Completion rate)	Number of States/Airports completed the objective (Total number in Applicability area)	FOC	Implementation Status	Estimated achievement
INFO7	-	+2	AL, FR	+5% (26%)	11 (43)	01/2019	Late	12/2022
ITY-ADQ	-	0	None	-1% (9%)	4 (43)	06/2017	Late	12/2024

Even if the 2 Objectives within this 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 in implementation, sometimes from outside the usual ATM scope (e.g. government agencies). This is more relevant for **INFO7**, 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 has only been completed by slightly more (23) than half of States in the applicability area. Consequently, only a slight improvement since last year has been observed in the remaining activities associated with TOD implementation. The progress of **ITY-ADQ** is equally slow as no additional States have completed the objective in 2020 (the slight drop in the completion rate being caused by the expansion of the applicability area of the objective). 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 26 ANSPs having “Completed” the action, 6 more than in the previous cycle, unlocking the potential implementation of the remaining actions.

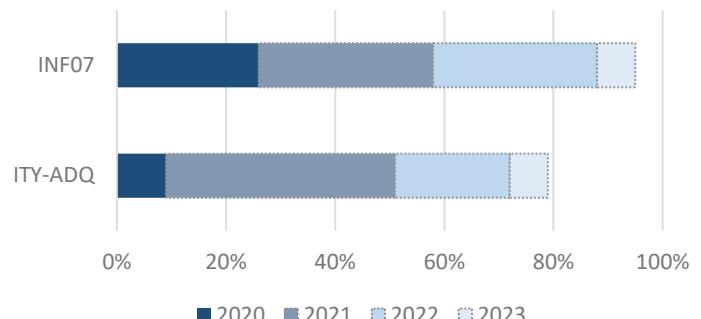


## Future evolution

Both Objectives within the EOC show a slow progress and their complete implementation is not foreseen in the near future. Moreover, as far as ITY-ADQ is concerned, the ADQ Regulation will be repealed shortly (January 2022), therefore stakeholders are expected to refocus their efforts on compliance with other Regulations in the field of AIM (e.g. the amended EU Reg. 2017/373 and the amended EU Reg. 139/2014).

Consequently, ITY-ADQ will be removed from the next 2021 edition of the MPL3 Implementation Plan and replaced in due time, as necessary. In the meantime it is important that the implementation of both eTOD and ADQ continues and is even accelerated as the associated functionalities are critical for the implementation of, amongst others, SWIM and of RNP operations which are very much expected by the airspace users.

Completion rate evolution (2020-2023)



## SESAR Solutions

Six SESAR Solutions belong to this EOC, without being yet subject to an implementation objective in the Level 3 of the Master Plan:

- #34 on Digital integrated briefing,
- PJ.15-10 on Static aeronautical data service,
- PJ.15-11 on Aeronautical digital map service,
- PJ.18-04a on Aeronautical information management (AIM) information,
- PJ.18-04b-01 on Meteorological (MET) information-GWMS, and
- PJ.18-04b-02 on Meteorological information (MET) services-Cb-global

Solution	Number of States implemented the solution	Number of States planning to implement the solution
#34	1 State (LV-partly)	8 States (CH; CZ; DK; EE; ES; LT; LV; SK)
PJ.15-10	1 State (LV)	4 States (EE; FR; LT; SK)
PJ.15-11	2 States (LV-partly; SK)	5 States (EE; ES; FR; LV; SK)
PJ.18-04a	2 States (LV-partly; SK)	9 States (DK; EE; ES-partly; FR; LT; LU; LV; SK; SI)
PJ.18-04b-01	2 States (AT, IE)	1 State (IE)
PJ.18-04b-02	1 State (IE)	2 States (IE; MUAC)

## 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

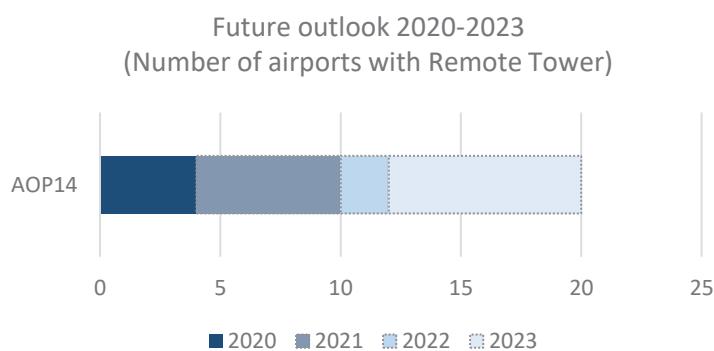
### Implementation status at the end of 2020

Implementation Objective	SESAR Solution ref.	Change in the number of States /Airports completed the objective (2020 vs. 2019)	Airports completed the objective in 2020	Progress evolution in 2020 (Completion rate)	Number of States/Airports completed the objective (Total number in Applicability area)	FOC	Implementation Status	Estimated achievement
AOP14	#12, #13, #52, #71	0	None	-	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 Remote Tower services are implemented either for the provision of services or as a contingency facility in 3 States (4 locations), and reported as planned or as implementation ongoing in another 19 locations. Even if no new implementation has been achieved in 2020, one new location started the implementation process, confirming the growing interest in the deployment of Remote Towers.

### Future evolution

Based on the current plans, the number of Remote Tower implementations is expected to quintuple by the end of 2023. 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 fallouts of the COVID19 pandemic crisis, it is advisable that more airports are considered as candidates for Remote Tower service provision.



## **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:

- PJ.05-02 on Multiple remote tower module, and
- PJ.16-03 on Enabling rationalisation of infrastructure using virtual centre based technology.

Solution	Number of States implemented the solution	Number of States planning to implement the solution
PJ.05-02	1 State (IE)	6 States (EE; ES; FR; IE; LT; NL)
PJ.16-03	Not yet implemented in any State	2 States (ES; FR-Paris ACC)

## 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:

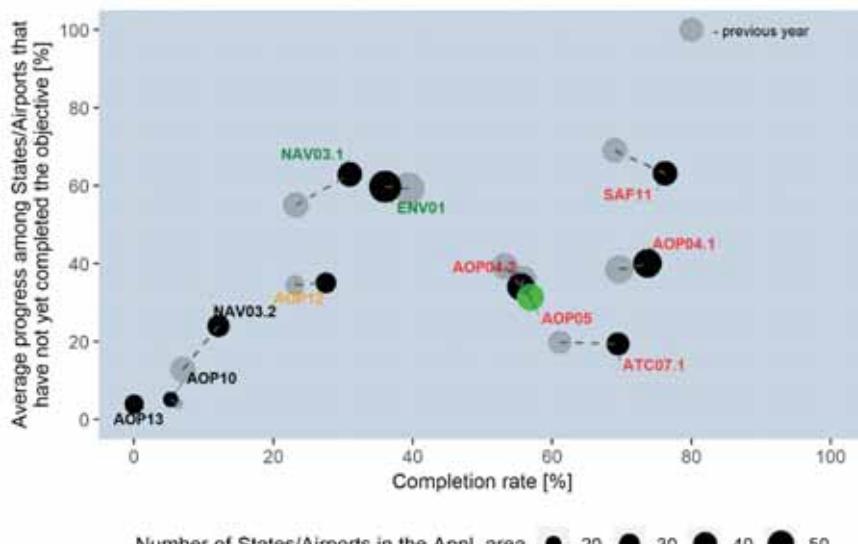
- [AOP04.1](#) on Airport Surface Movement Control and Guidance System (A-SMGCS) Surveillance (former Level 1) and [AOP04.2](#) on A-SMGCS RMCA (former Level 2)
- [AOP05](#) on Airport Collaborative Decision Making (CDM)
- [AOP10](#) addressing Time Based Separation
- [AOP12](#) on the Improvement of 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 2020

Implementation Objective	SESAR Solution ref.	Change in the number of States/Airports completed the objective (2020 vs. 2019)	State/Airports completed the objective in 2020	Progress evolution in 2020 (Completion rate)	Number of States /Airports completed the objective (Total number in Applicability area)	FOC	Implementation Status	Estimated achievement
AOP04.1	-	+3	EDDB, LTFM, LUKK	+4% (74%)	42 (57)	01/2021	Late	12/2021
AOP04.2	-	+1	LTFM	0 (56%)	30 (53)	01/2021	Late	12/2022
AOP05	#106	+4	EDDB, EPWA, LFMN, LPPT	+6% (59%)	29 (49)	01/2021	Late	12/2022
AOP10	#64	0	None	-1% (5%)	1 (19)	01/2024	N/A	N/A
AOP12	#02	+2	EIDW, LTFM	+5% (28%)	8 (29)	01/2021	Planned delay	12/2024
AOP13	#22, #53	0	None	0 (0%)	0 (26)	01/2024	N/A	N/A
AOP15	#04	-1	-LFGP	-	1 (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	-	+3	EBBR, EDDB, LTFM	+8% (69%)	25 (36)	01/2020	Late	12/2022
ATC19	#54	0	None	-	1 (Local Obj)	N/A	N/A	N/A
ENV01	-	-1	EDDN	-3% (36%)	27 (75)	12/2023	On time	12/2023

ENV02	-	0	None	-	46 (Local Obj)	N/A	N/A	N/A
ENV03	-	+3	EFHK, LHBP, LJU	-	54 (Local Obj)	N/A	N/A	N/A
NAV03.1	#62	+3	BG, DK, HU	+8% (31%)	13 (42)	06/2030	On time	06/2030
NAV03.2	#09, #51	+1	ME	+5% (12%)	4 (33)	06/2030	N/A	N/A
SAF11	-	+3	DE, NO, PT	+7% (76%)	32 (42)	01/2018	Late	12/2021

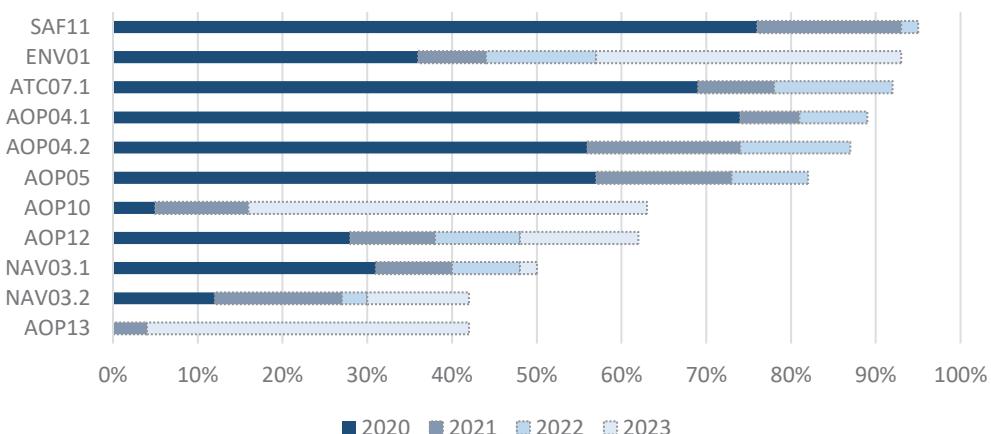
The content of the EOC is quite eclectic, combining pre-SESAR, baseline Objectives ([AOP4.1](#) and [AOP4.2](#)), objectives formerly regulated by the PCP (e.g. [AOP10](#), [AOP12](#), [AOP13](#)), covering functionalities some of which have been retained in CP1 (e.g. [AOP12](#)) as well as local objectives 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 ([AOP4.1](#)) and adds more complex features, up to automated assistance to controller for surface movement planning and routing ([AOP13](#)). Despite the COVID19 pandemic crisis, many objectives have continued their progress, in particular those establishing a solid foundation ([AOP04.1](#), [AOP04.2](#), [ATC07.1](#)) unlocking more advanced features driven by operational needs. Another positive aspect is that every year, more airports are joining the applicability areas of the objectives within the EOC (e.g. for AOP04.1 the applicability area grew from the initial 16 locations to currently 57). For the more advanced A-SMGCS features ([AOP12](#), [AOP13](#)) the implementation is slowly building up but it is still incipient (in particular for AOP13). Several local Objectives, derived from mature SESAR Solutions ([AOP15](#), [AOP16](#) and [AOP18](#)) are addressing in particular the airport safety and the increase in situational awareness. As they are very recent Objectives (have been introduced in the Plan in 2019), they have low completion numbers but depending on the operational needs and business priorities, they have potential for growth, even if for the time being and taking into account the downturn in traffic, their appeal seems to be modest. In terms of safety, they are complemented by [SAF11](#) addressing practical recommendations for the reduction of runway excursions. Concerning the latter, its implementation has seen a substantial boost over the last three years (completion rate increased from 44% to 76% since 2017) making the objective a prime candidate for completion in 2021. The Objectives related to environmental benefits ([ENV01](#), [ENV02](#) and [ENV03](#)) are all showing progresses over the recent years but to different extents. ENV03 achieved the highest increase among them, with 3 airports having reported completion in 2020 (after the completion by 9 airports 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 completion rate progress of ATC07.1 implementation resumed after a couple of years of stagnation, caused by subsequent increases of its applicability area. With regard the deployment of PBN in TMAs, the implementation of both objectives, NAV03.1 and NAV03.2, have resumed growth after the dip of the previous year caused by the realignment of the objective with the requirements of the PBN Implementing Rule and is expected to maintain the same pace over the next years.



## 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), the reprioritisation imposed by the COVID19 pandemic crisis as well as the evolution from PCP to CP1, it is expected that these differences will be reflected in the future evolution as well. An important factor in the evolution of completion rate values is also the fact 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 (e.g. almost all airports in the initial applicability area of AOP04.1/AOP04.2 have finalised implementation). The functionalities included in the CP1 Regulation are expected to pursue the implementation according with the new CP1 deadlines, as this evolution has already been perceived in 2020 and will certainly be confirmed in 2021. As the objectives addressing A-SMGCS surveillance and Safety (prevention of runway excursions) are quite advanced in terms of completion it is anticipated that they are the only ones within the EOC to be achieved in 2021.

Completion rate evolution (2020-2023)



## SESAR Solutions without implementation objectives

Twenty-one SESAR Solutions belong to this EOC, without being yet associated to implementation objectives in the Level 3 of the Master Plan:

- #11 on Continuous descent operations (CDO) using point merge,
- #23 on D-TAXI service for controller-pilot datalink communications (CPDLC) application,
- #48 on Virtual block control in low visibility procedures (LVPs),
- #107 on Point merge in complex terminal airspace,
- #108 on Arrival Management (AMAN) and Point Merge).
- #116 on De-icing management tool,
- #117 on Reducing Landing Minima in Low Visibility Conditions using Enhanced Flight Vision Systems (EFVS),
- PJ.02-01-04 on Wake Turbulence Separations (for Arrivals) based on Static Aircraft Characteristics,
- PJ.02-01-06 on Wake Turbulence Separations (for Departures) based on Static Aircraft Characteristics,
- PJ.02-03 on Minimum-Pair separations based on RSP,
- PJ.02-08-01 on Integrated Runway Sequence for full traffic Optimization on Single and Multiple Runway Airports,
- PJ.02-08-02 on Optimised use of runway configuration for multiple runway airports,
- PJ.02-01-01 on Optimised Runway Delivery on Final Approach,
- PJ.02-01-02 on Optimised Separation Delivery for Departure,
- PJ.02-01-03 on Weather-Dependent Reductions of Wake Turbulence Separations for Departures,
- PJ.02-01-05 on Weather-Dependent Reductions of Wake Turbulence Separations for Final Approach,
- PJ.02-01-07 on Wake Vortex Decay Enhancing Devices,

- PJ.02-08-03 on Increased Runway Throughput based on local ROT characterization (ROCAT),
- PJ.03a-04 on Enhanced visual operations,
- PJ.03b-05 on Traffic alerts for pilots for airport operations, and
- PJ.15-02 on E-AMAN Service.

Solution	Number of States implemented the solution	Number of States planning to implement the solution
#11	3 States, 2 locations indicated (AT-LOWW; FR – LFPG; UK)	4 States, 2 locations indicated (IE; IT - LIME; LT; NO - ENGM)
#23	Not yet implemented in any State	1 State (CH)
#48	Not yet implemented in any State	Not yet planned in any State
#107	4 States, 2 locations indicated (ES-Canary; IE; IT- LIME, UK)	1 State (PT)
#108	1 State, 1 location indicated (FR - LFPG)	Not yet planned in any State
#116	6 States, 3 locations indicated (AT-LOWW; BE- EBBR; CH-LSZH; DE; FR; IT)	4 States, 1 location indicated (CZ; EE; HU-LHBP; SE)
#117	2 States, 1 location indicated (FR-LFPB; SE)	1 State (FR)
PJ.02-01-04	Not yet implemented in any State	5 States, 1 location indicated (AT; CH; FR-LFPG; NL; UK)
PJ.02-01-06	Not yet implemented in any State	3 States, 1 location indicated (CH; FR-LFPG; NL)
PJ.02-03	Not yet implemented in any State	1 State (AT)
PJ.02-08-01	Not yet implemented in any State	2 States (AT; CH)
PJ.02-08-02	1 State, 1 location indicated (FR-LFPG)	Not yet planned in any State
PJ.02-01-01	1 State (UK)	3 States, 1 location indicated (AT; CH-LSGG; NL)
PJ.02-01-02	Not yet implemented in any State	2 States (ES; NL)
PJ.02-01-03	Not yet implemented in any State	1 State (CH)
PJ.02-01-05	Not yet implemented in any State	3 States (AT; CH; DE)
PJ.02-01-07	Not yet implemented in any State	Not yet planned in any State
PJ.02-08-03	2 States, 1 location indicated (CH; IE-EIDW)	4 States, 1 location indicated (AT; CH; IE-EIDW; NL)
PJ.03a-04	1 State (SE)	1 State (CH)
PJ.03b-05	Not yet implemented in any State	Not yet planned in any State
PJ.15-02	2 States (ES; FR)	4 States, 2 locations indicated (AT; DE; ES; FR-LFPG, LFPO)

## 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 (MTCD)
- [\*\*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 2020

Implementation Objective	SESAR Solution ref.	Change in the number of States/ Airports completed the objective (2020 vs. 2019)	States/Airports completed the objective in 2020	Progress evolution in 2020 (Completion rate)	Number of States /Airports completed the objective (Total number in Applicability area)	FOC	Implementation Status	Estimated achievement
AOM19.1	#31	0	None	+1% (35%)	13 (37)	01/2022	On time	01/2022
AOM19.2	#31	+1	LV	+3% (8%)	3 (37)	01/2022	Planned delay	12/2025
AOM19.3	#31	+2	DK, FR	+5% (19%)	7 (36)	12/2021	Planned delay	12/2022
AOM19.4	#31	+2	DK, MUAC	+4% (15%)	5 (33)	01/2022	N/A	N/A
AOM21.2	#33, #66	+2	HR, HU	+5% (72%)	28 (39)	01/2022	On time	01/2022
ATC12.1	#27, #104	+2	BA, HR	+4% (53%)	23 (43)	01/2022	Planned delay	12/2022
ATC15.1	-	+1	DE	+8% (69%)	18 (26)	12/2019	Late	12/2022
ATC15.2	#05	+1	CZ	+9% (27%)	7 (26)	01/2024	Planned delay	12/2024
ATC17	-	-1	RS, ME (-BA, HR, LU)	-3% (29%)	12 (42)	01/2022	Planned delay	12/2022
ATC18	#63	0	None	-	6 (Local Obj)	N/A	N/A	N/A
ITY-FMTP	-	+1	FI	+3% (80%)	35 (44)	12/2014	Late	12/2022

The greatest cumulative progress so far among all objectives belonging to this EOC has been recorded for the objective on Common Flight Message Transfer Protocol (**ITY-FMTP**), with the overall completion rate of 80% and one more State having finalized the implementation during 2020. Although the 80% threshold has been reached, the full 100% achievement of the objective is expected only by 2027. However, vast majority of remaining States intend to implement the objective by end 2022. The main problems for delay are the slow migration from IPv4 to IPv6, the implementation scheduled to take place together with next major system upgrades and especially the ability of neighbouring ACCs to support FMTP.

Another objective with high cumulative completion rate is Free Route Airspace (**AOM21.2**), implemented by 72% of States in the applicability area. It is one of the two objectives in this group being implemented on time, within the planned FOC date of 01/2022. The objective is already widely implemented in the eastern part of ECAC airspace, while the work is still ongoing in parts of the network with higher traffic density and complexity. Moreover, further activities related to the extension of FRA limits both horizontally (cross-border FRA) and vertically are expected in the years to come, with some cross-border FRA projects already being operational (e.g. NEFRA, SECSI FRA, SEE FRA etc.).

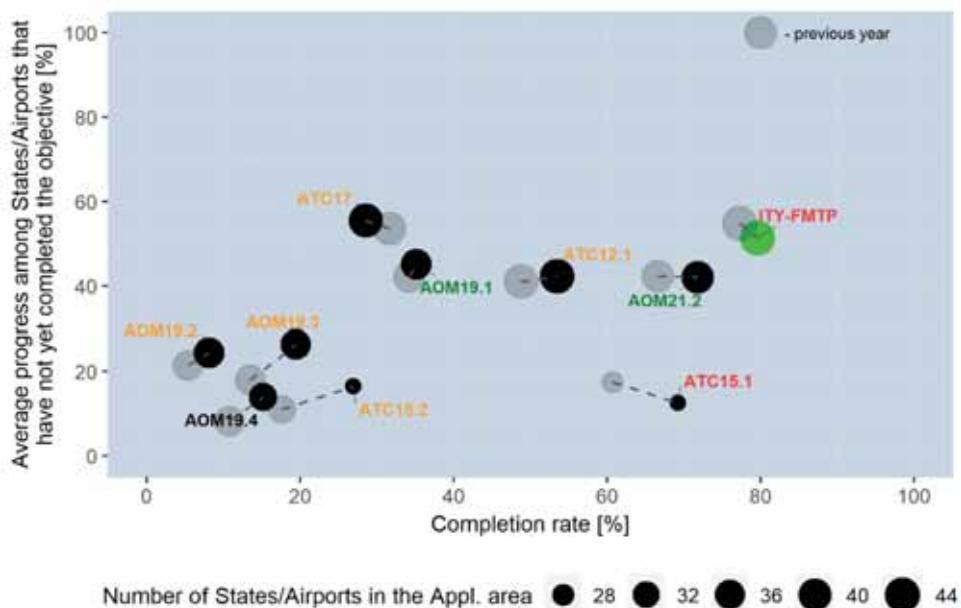
Within the Advanced FUA (A-FUA) group of objectives (**AOM19.X**), the deployment of ASM tools (**AOM19.1**) is now expected to be finalized on time, given the new FOC date of 01/01/2022. Many States (24) have already deployed automated ASM support systems (17 of which rely on LARA – Local and sub-Regional ASM Support System), while the integration with NM systems proves to be more challenging. Other A-FUA objectives, 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. Based on current plans, delay with respect to FOC is already expected for **AOM19.2** and **AOM19.3**, while the estimated achievement date for **AOM19.4** cannot be defined at this time and the FOC date is highly unlikely to be met.

The full implementation of MONA, TCT and MTCD (**ATC12.1**) has been achieved by 2 more States during 2020. Medium Term Conflict Detection (MTCD) has been deployed in 6 additional ACCs during 2020 and represents the most widely deployed function in the group (40 ACCs or 61% of the applicability area). Tactical Controller Tool (TCT) has been declared “not applicable” by a vast majority of implementers (23 ACCs), while conformance monitoring (MONA) functions are deployed at 37 ACCs. Despite the slight delay, the objective is progressing well and the 80% completion rate is expected to be reached by end 2022.

The two objectives addressing information exchange mechanisms, tools and procedures between AMAN in TMAs and respective en-route ATS units (**ATC15.1**) and subsequent AMAN extension to en route airspace (**ATC15.2**) have both recorded progress during 2020. With the opening of Berlin Brandenburg Airport (EDDB), AMAN is now operationally used also in Bremen ACC. The main difficulty in extending AMAN to en-route is the necessary coordination with neighbouring ANSPs. However, it should be noted that the FOC date for **ATC15.2** has been postponed by one year to 31/12/2024, giving more time to stakeholders to complete the necessary actions.

**ATC17** complements the services implemented with ITY-COTR and its implementation is still progressing relatively slowly. The estimated achievement date is end 2022, after several revisions in previous years. It should be noted that most ODLI 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, with no new implementers during 2020. 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.

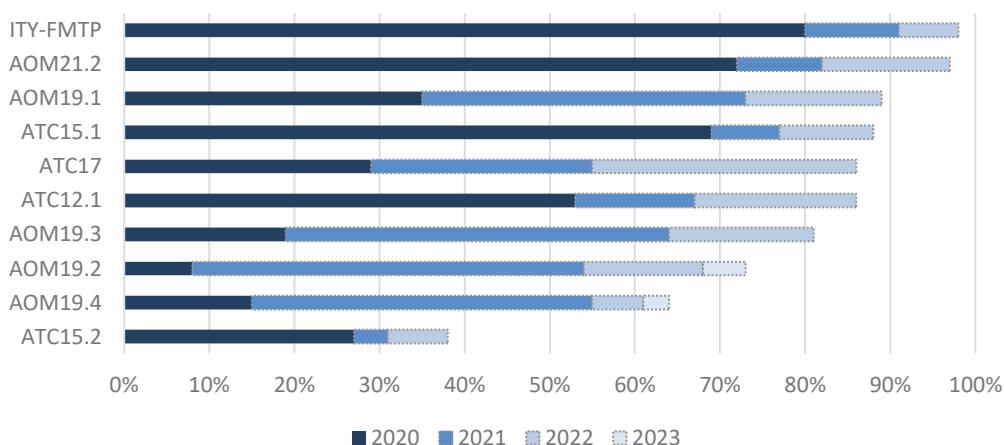


## Future evolution

Among the objectives within this EOC, the largest cumulative completion rate so far has been recorded for ITY-FMTP and AOM21.2, closely followed by ATC15.1. These objectives bring direct cost-efficiency benefits to ANSPs and airspace users and their steady implementation is expected to continue in the years to come. Objective ATC18 on multi-sector planner is also expected to bring cost-efficiency benefits through improved ATCO productivity and stakeholders are encouraged to consider its implementation whenever the operational and technical conditions allow.

According to planning dates reported by States, the greatest annual progress in implementation during 2021 is expected for the group of objectives addressing Advanced FUA (AOM19.x). This is explained by the fact that these objectives are required by regulation, as well as the approaching FOC date. However, a relatively low implementation progress achieved so far among the States that have not yet implemented these objectives suggests that yearly progress might be lower than anticipated.

Completion rate evolution (2020-2023)



## 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:

- #10 on Optimised route network using advanced RNP,
- #118 on Basic EAP (Extended ATC Planning) function,
- PJ.06-01 on Optimised traffic management to enable free routing in high and very high complexity environments, and
- PJ.10-01a1 on High Productivity Controller Team Organisation in En-Route (including eTMA) (1PC – 2ECs)

Solution	Number of States implemented the solution	Number of States planning to implement the solution
#10	1 State, 3 locations indicated (IT-LIRF, LIME, LIMC)	2 States (IE; PT)
#118	2 States (CH; FR)	5 States, (CH; ES; HR; MUAC; SK)
PJ.06-01	2 States (MUAC, PL)	5 States (CH, CZ, ES, FR, PL)
PJ.10-01a1	1 State (IE-partly)	3 States (AT-TMA; CH; IE)



## 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 2020

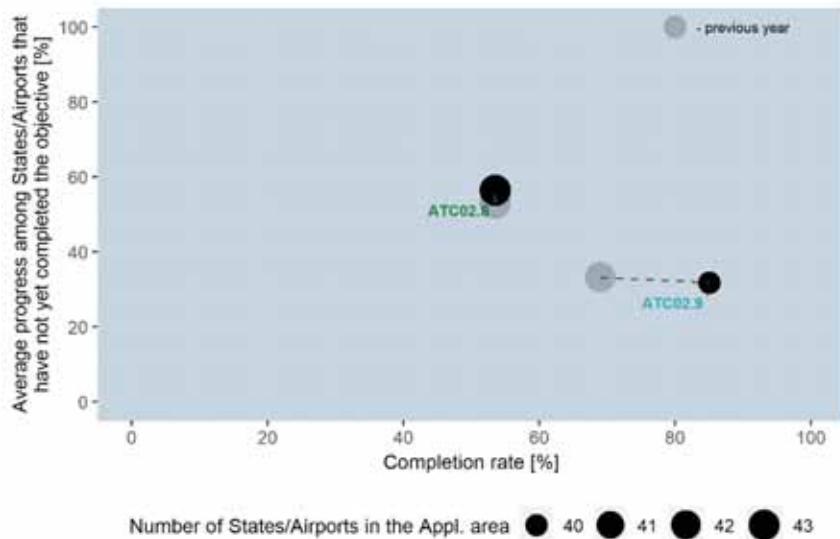
Implementation Objective	SESAR Solution ref.	Change in the number of States/Airports completed the objective (2020 vs. 2019)	State/Airports completed the objective in 2020	Progress evolution in 2020 (Completion rate)	Number of States /Airports completed the objective (Total number in Applicability area)	FOC	Implementation Status	Estimated achievement
ATC02.8	-	0	None	0 (53%)	23 (43)	01/2022	On time	01/2022
ATC02.9	#60	+5	AZ, FI, IE, LU, RO	+16% (85%)	34 (40)	12/2020	Achieved	12/2020
ATC20	#69	0	None	-	10 (Local Obj)	N/A	N/A	N/A

Due to the change of the FOC date of the objective on ground-based safety nets (**ATC02.8**) to 01/2022, the implementation is now on track, being expected for 2022 (the 80% threshold will be reached in Jan 2022). However, progress varies greatly between the different types of safety nets covered by the objective:

- Area Proximity Warning (APW) **86%**
- Minimum Safe Altitude Warning (MSAW) **73%**
- Approach Path Monitoring (APM) **57%**

The main reason for the slow implementation pace for an objective having a quite limited scope is the natural alignment of safety nets implementation with major upgrades or replacements of the ATM systems by ANSPs. However, the very good progress in the deployment of APW functionality, in support a.o. of Free Route deployment is very much appreciated. Despite the COVID19 pandemic crisis, the deployment of STCA for TMAs (**ATC02.9**) has recorded a substantial spike in implementation in 2020, having reached the achievement threshold, as anticipated in the previous edition of the Report. It should be noted that due to lower traffic complexity as well as due to the TMA configurations, many ANSPs use linear algorithms intended for en-route operations as they are considered as fit for purpose. Only half of the States in the applicability area of the objective consider that specific, improved functionalities are needed in their TMAs. Within this category, the implementation achievement threshold has been reached as well in 2020.

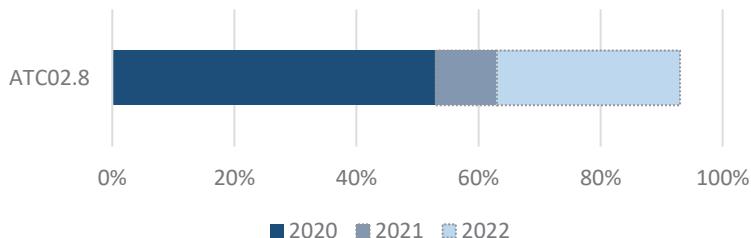
Enhanced STCA with down-linked parameters via Mode S EHS (**ATC20**) is a local objective that doesn't have a common FOC date and its implementation is subject to local needs and complexity. Currently it is implemented by 10 States, with 4 more having already started implementation (2 more than in the previous Report) while 3 States report plans for implementation. Another 15 States declared not to have yet firm plans, awaiting in some cases for a feasibility study to be performed.



## Future evolution

The achievement of ATC02.8 is expected for the end of 2022 with a slightly quicker deployment of the APW functionality which is already well advanced, while the future progress of ATC20 very much depends on the decisions of the States which currently report not having deployment plans yet.

Completion rate evolution (2020-2022)



## SESAR Solutions

Seven 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,
- #100 on ACAS Ground Monitoring and Presentation System,
- #101 on Extended hybrid surveillance),
- PJ.07-01-01 on AU Processes for Trajectory Definition,
- PJ.10-02a1 on Integrated tactical and medium Conflict Detection & Resolution (CD&R) services and Conformance Monitoring tools for En-Route and TMA, and
- PJ.18-02c on eFPL supporting SBT transition to RBT.

Solution	Number of States implemented the solution	Number of States planning to implement the solution
#06	1 State (AT)	1 State (AT)
#08	1 State, 2 locations indicated (DE - EDDL, EDDK)	1 State (CH)
#100	5 States (AT; CZ; DK; HU; UK-partly)	1 State (SI)
#101	Not yet implemented in any State	Not yet planned in any State

PJ.07-01-01	Not yet implemented in any State	1 State ( <i>MUAC</i> )
PJ.10-02a1	Not yet implemented in any State	5 States (DK; ES; FR; HU; <i>MUAC</i> )
PJ.18-02c	Not yet implemented in any State	2 States (FR, HU)

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## 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 2020

Implementation Objective	SESAR Solution ref.	Change in the number of States/ Airports completed the objective (2020 vs. 2019)	State/Airports completed the objective in 2020	Progress evolution in 2020 (Completion rate)	Number of States /Airports completed the objective (Total number in Applicability area)	FOC	Implementation Status	Estimated achievement
NAV12	#113	+2	CH, NO	+9% (9%)	2 (23)	06/2030	N/A	N/A

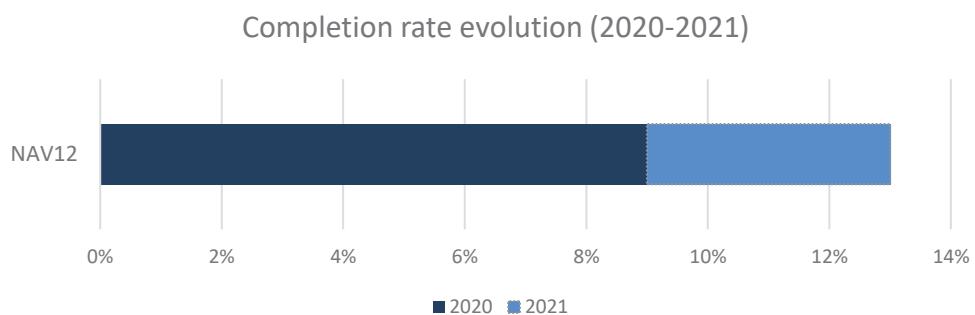
This EOC covers various modes of transport and categories of airspace users. However, only objective **NAV12** (IFR routes for rotorcraft operations) has reached the necessary maturity level for implementation so far. During 2020, only two States (CH and NO) have implemented low-level IFR routes for rotorcraft below FL150, with 7 other States reporting implementation as ongoing (AT, AZ, CY, DK, ES, IE, IT). Among those, several States have already published their first Point in Space (PinS) procedures and LLRs in national AIPs. The implementation is also planned by FI and MD. There is no interest for dedicated SID/STAR to instrument RWY for rotorcraft yet.

Following the adoption of the PBN Implementing Regulation (Commission Implementing Regulation 2018/1048), one of the main ongoing activities in vast majority of States is the drafting and verification of PBN Transition Plan, expected to finish by end 2021.

### Future evolution

As seen in the figure below, a very limited progress evolution for **NAV12** is expected during 2021, with only one more State expected to finalize implementation (IT), bringing the overall completion rate to 13%.

Vast majority of States throughout ECAC do not yet consider implementing this objective due to lack of business needs and characteristics of their operational environment.



### 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:

- PJ.02-05 on Independent rotorcraft operations at the airports, and
- PJ.01-06 on Enhanced rotorcraft operations and GA operations in the TMA.

Solution	Number of States implemented the solution	Number of States planning to implement the solution
PJ.02-05	2 States, 3 locations indicated (AT-LOAV, LODO; EE-EETN)	1 State (AT)
PJ.01-06	Not yet implemented in any State	Not yet planned in any State

### **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 2020 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 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
<b>On Time</b>	Implementation progress is on time. No delays expected.
<b>Risk of delay</b>	The estimated achievement date is in line with the FOC date, but there are risks which could jeopardise timely implementation of the implementation objective.
<b>Planned delay</b>	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.
<b>Late</b>	The estimated achievement date is beyond the FOC date and the FOC date is in the past.
<b>Achieved</b>	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.
<b>Closed</b>	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 2020 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 2020 Implementation Plan. The association of the icons to the KPA is as follows:

 Operational efficiency	 Capacity
 Security	 Environment
 Safety	 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.

**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 2020 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 2020 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 2020. The colour coding used in the map and its meaning are the following:

#### *Understanding LSSIP implementation progress as shown on the Map*

“Progress”	Definition
<b>Completed</b>	The development or improvement aimed by a SLoA is fulfilled in accordance with the MP L3 Plan Finalisation Criteria. For those Objectives where the implementation depends on adjacent countries, an SLoA can be reported “Completed” if the implementation is at least achieved with <b>one</b> adjacent country.

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

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## List of MP L3 implementation objectives

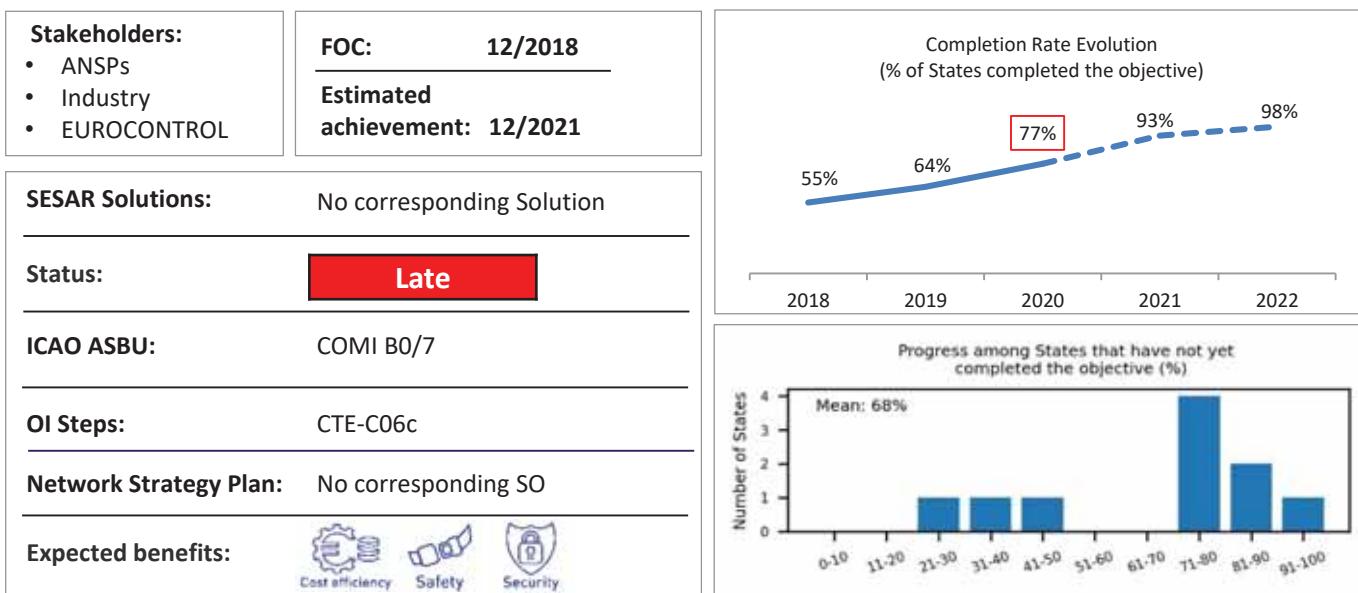
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# EOC: CNS Infrastructure and Services

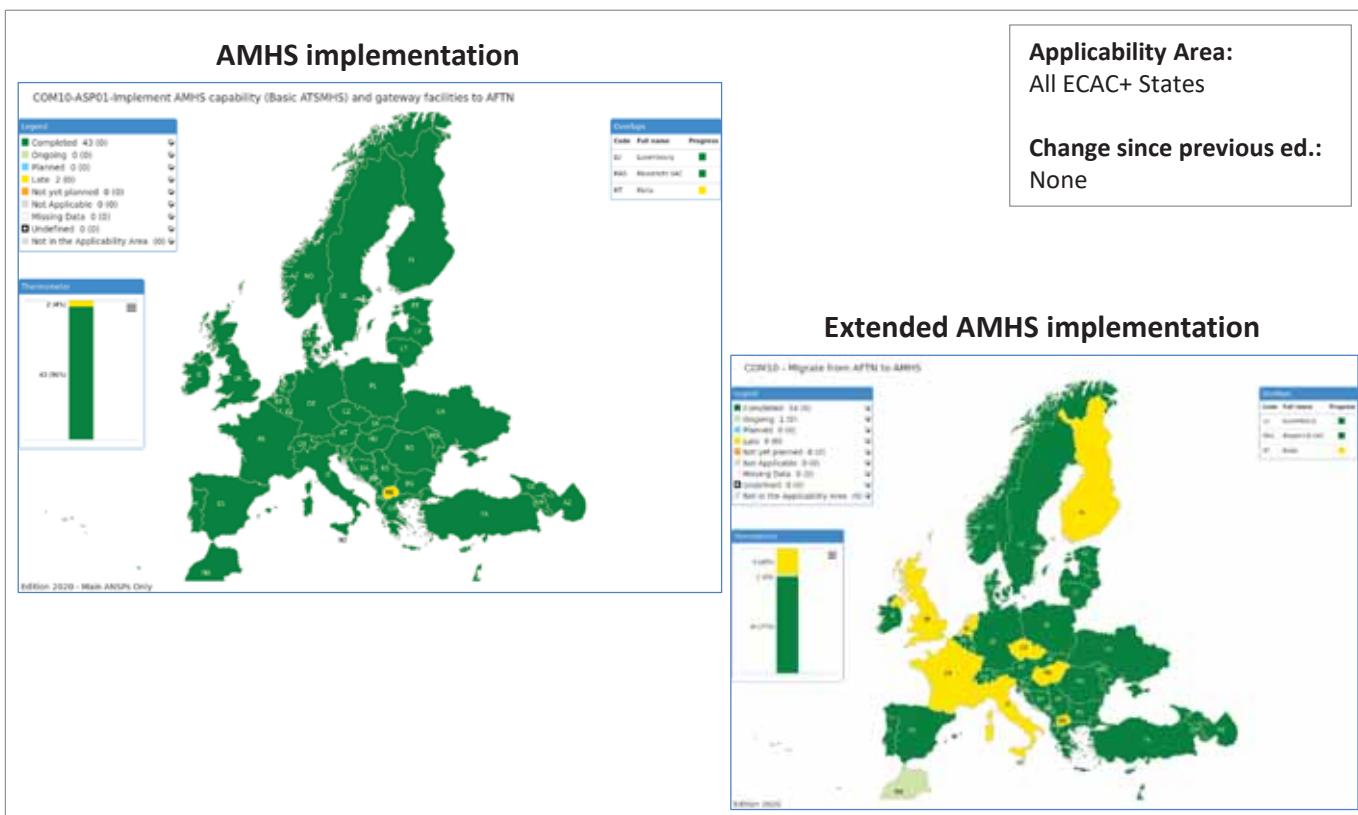
## COM10 Migrate from AFTN to AMHS



### Main 2020 developments:

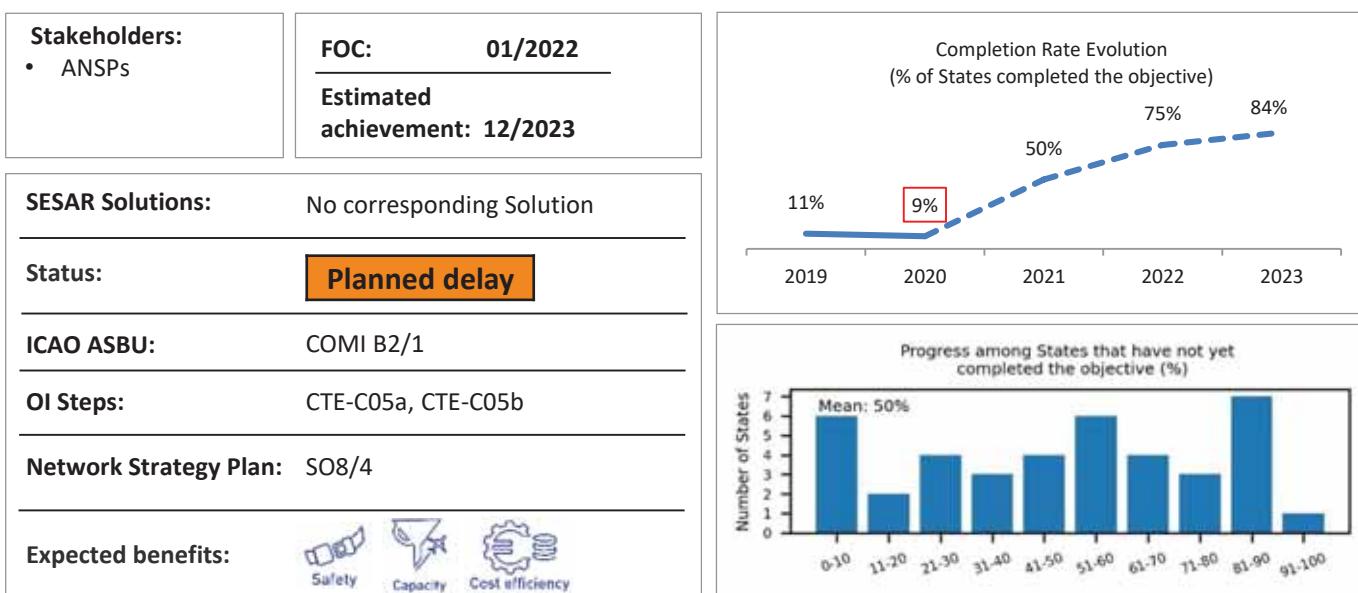
Objective COM10 covers both AMHS and Extended AMHS. The AMHS has been implemented in virtually all ANSPs throughout Europe (96%), except M-NAV (left map below), while the transition to Extended AMHS is still ongoing (77%) in FI, UK, NL, IT, HU, MT and MA. The “Late” status in remaining States (FR and CZ) is explained by delays in ensuring AMHS interoperability with military message handling systems.

Given the planned implementation dates reported by States, it is expected that Extended AMHS will also be fully achieved by vast majority until end 2021, with HU and NL having plans to implement the Extended AMHS until 2022 and 2024 respectively.



# EOC: CNS Infrastructure and Services

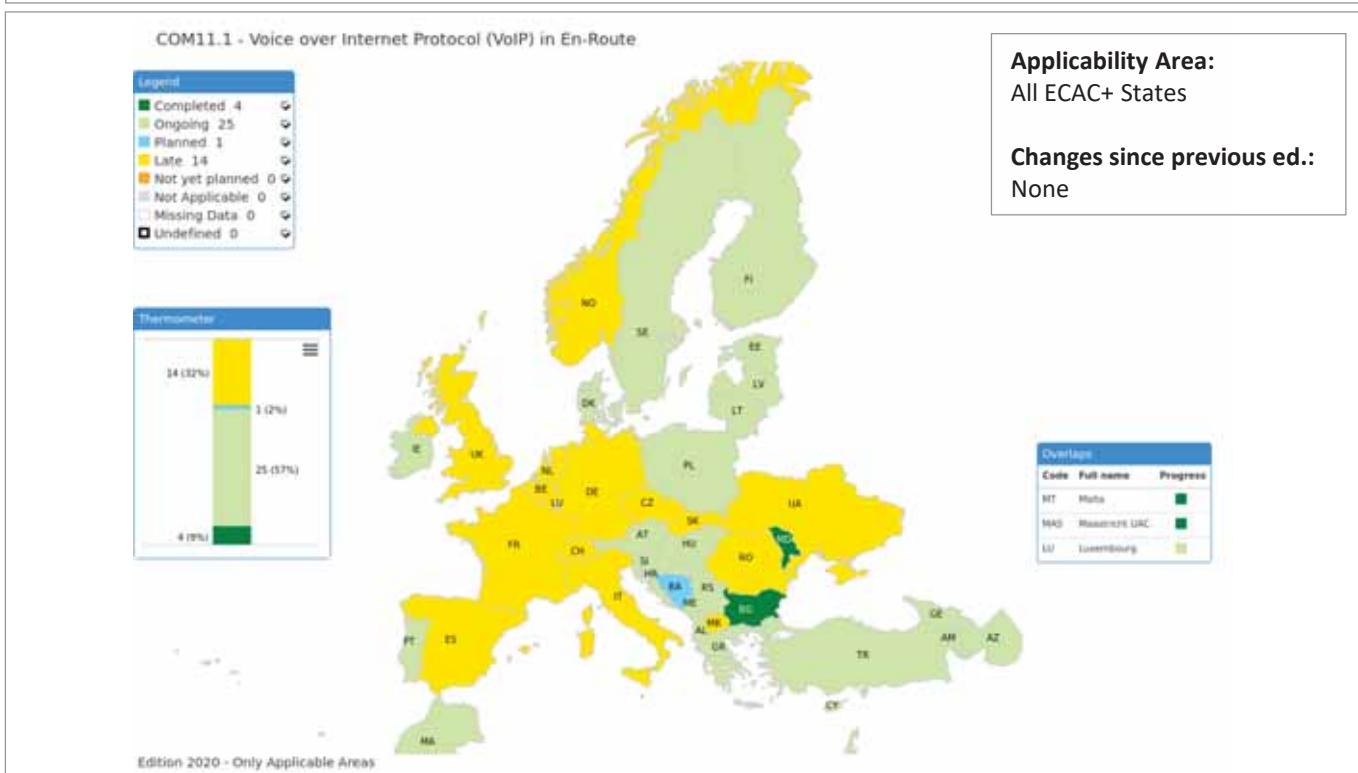
## COM11.1 Voice over Internet Protocol (VoIP) in En-Route



### Main 2020 developments:

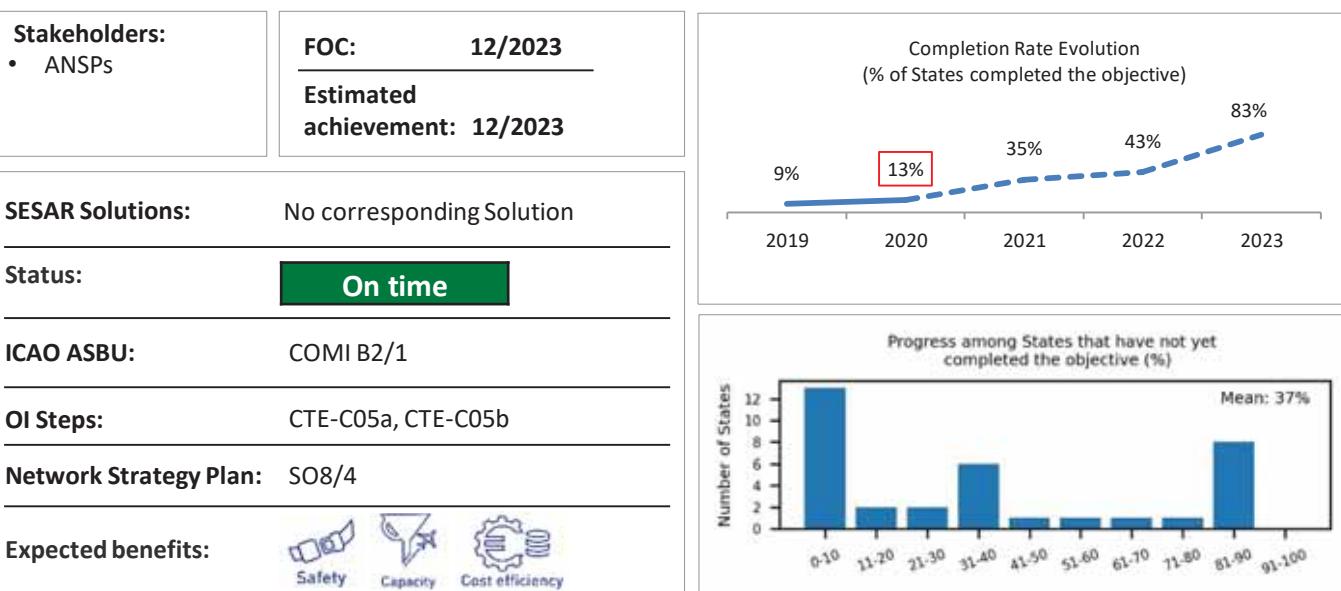
Implementation of VoIP in en-route environment has been monitored as a separate objective since 2019. No new implementers have reported completion during 2020, while ES reverted its status from "Completed" to "Late", given the fact that VoIP has not yet been implemented in all of ENAIRE's ACCs. This caused a minor drop in completion rate in 2020 compared to previous year (from 11% to 9%). It is notable that the number of States already anticipating delays in implementation (with respect to FOC date) has increased from 8 in 2019 to 14 in 2020. A number of such States have stated that local plans had to be revised due to ongoing COVID-19 crisis. In some States (e.g. FR) the implementation is still ongoing on the military side, while ANSPs have finalized their actions.

In general, the implementation of VoIP in en-route has a rather slow progress throughout ECAC, despite having a higher priority over terminal/airport operating environment due to larger expected benefits at network level. According to currently reported plans, significant surge in implementation progress is expected during 2021, with 18 more States aiming to finalize implementation.



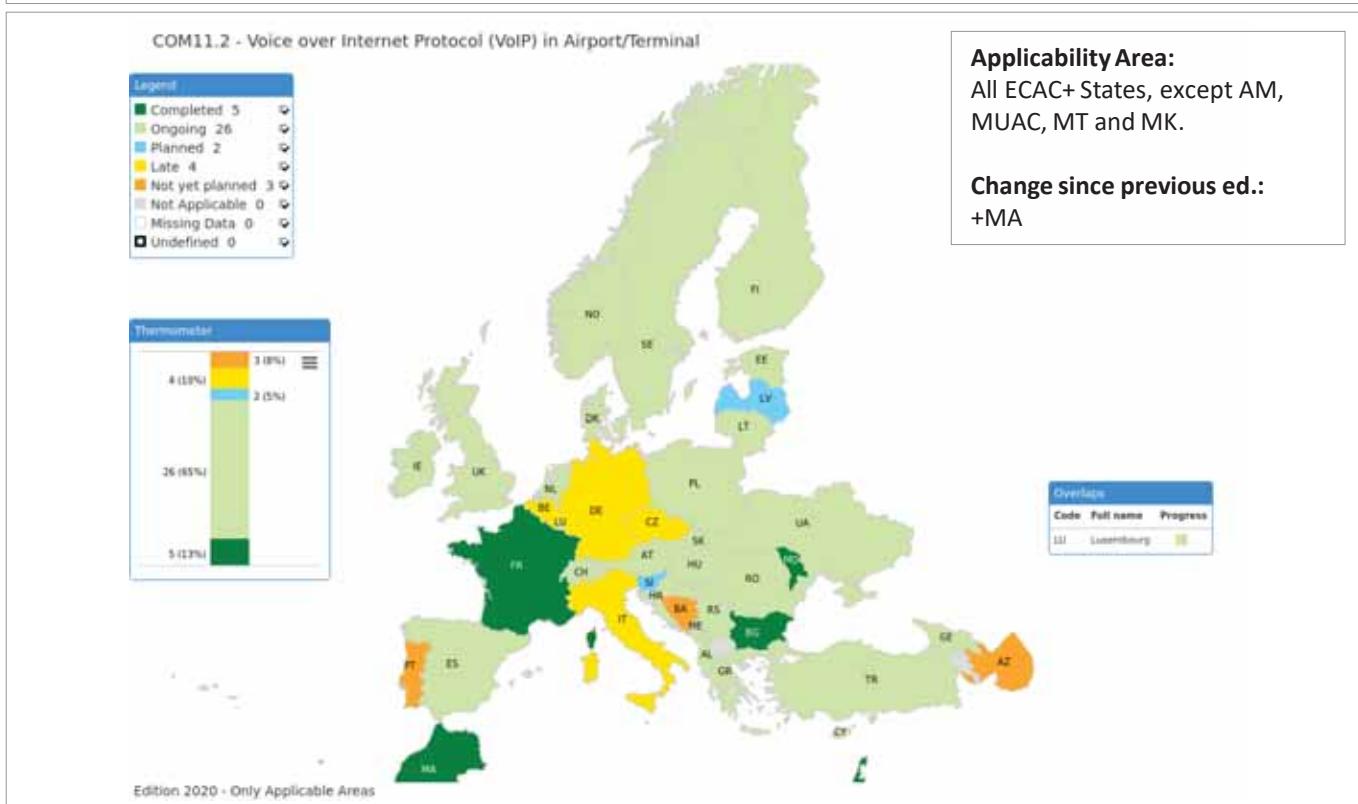
# EOC: CNS Infrastructure and Services

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



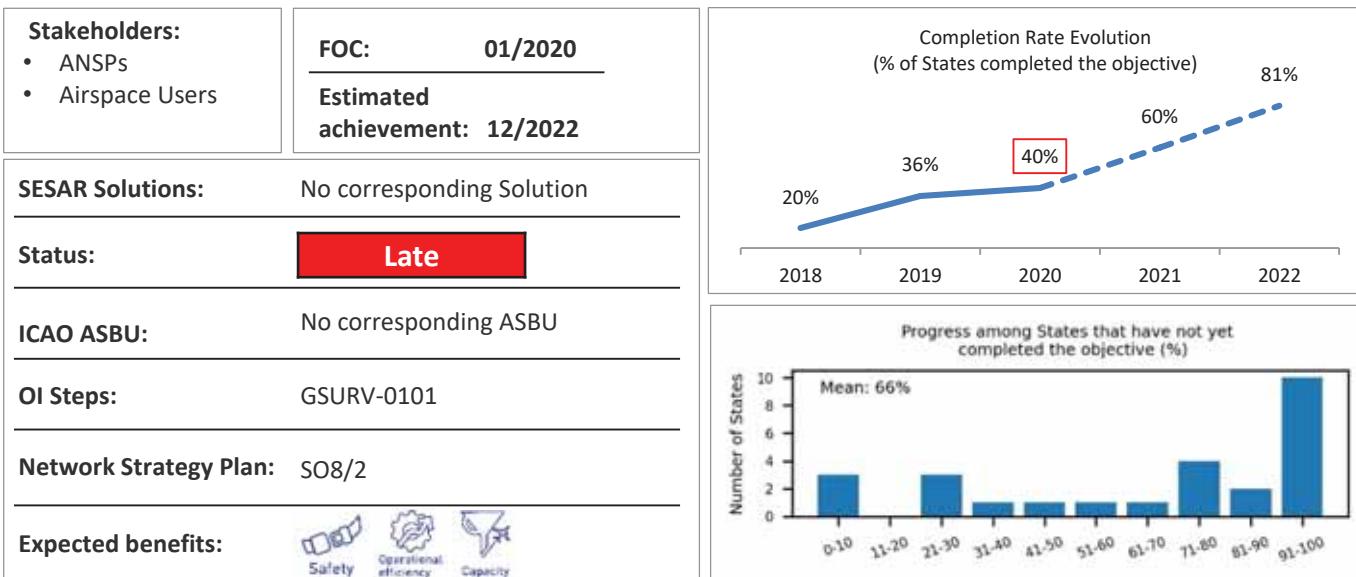
### Main 2020 developments:

VoIP implementation in airport/terminal operating environment has been monitored as a separate objective since 2019, while implementation in en-route is covered by COM11.1. One more State (MA) has implemented the objective during 2020, bringing the total number of implementers to 5 and raising the overall completion rate from 9% to 13%. It should be noted that Voice Communication Systems (VCS) that support VoIP inter-center telephony have also been installed in RO and PL, with the replacement of remaining radio stations without VoIP capability still ongoing. Two more States have started their activities towards VoIP implementation – IE and GE. In vast majority of States the implementation is already ongoing or planned, while in only three States (PT, BA and AZ) the deployment has not been planned yet. Two States (SK and UA) have reported that COVID-19 crisis might have a negative impact on their local implementation plans. According to planned implementation dates provided by States, it is expected that this objective will be fully achieved (by 80%+ States in the applicability area) by end 2023, in line with the FOC date.



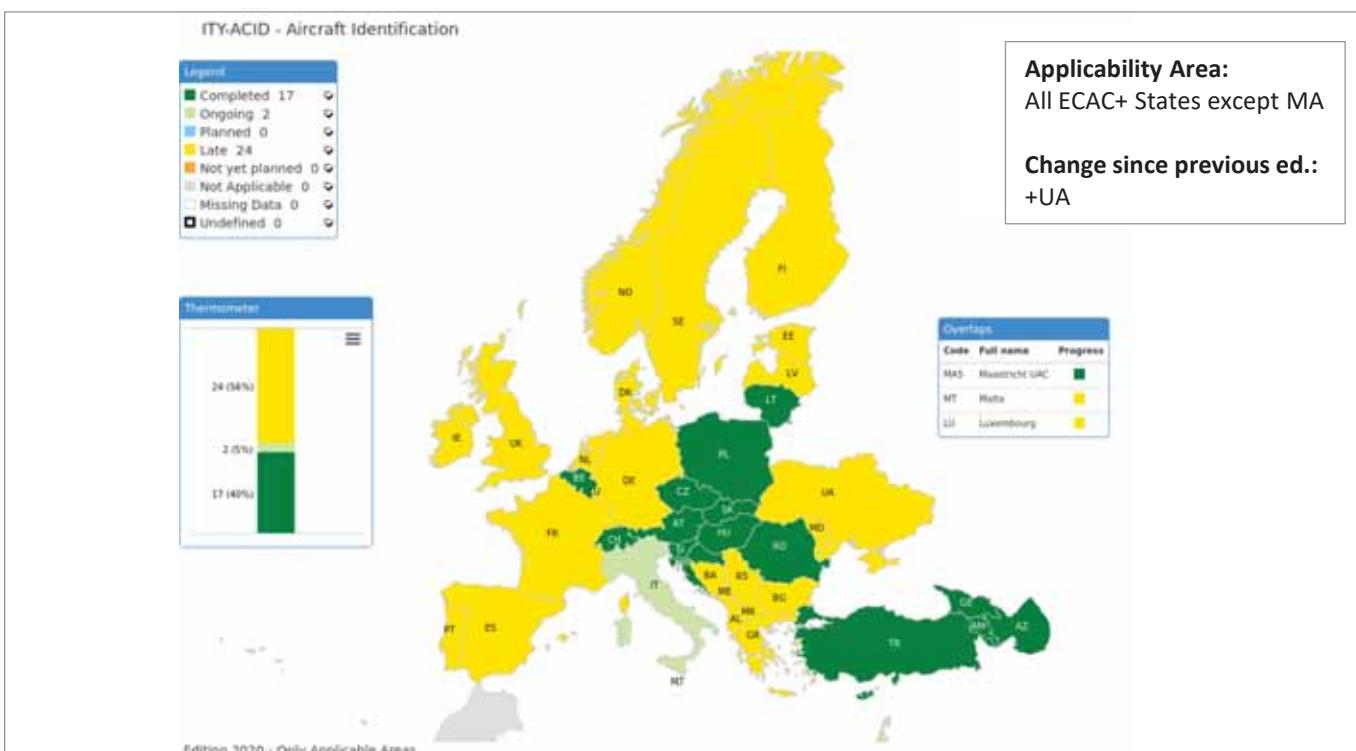
# EOC: CNS Infrastructure and Services

## ITY-ACID Aircraft identification



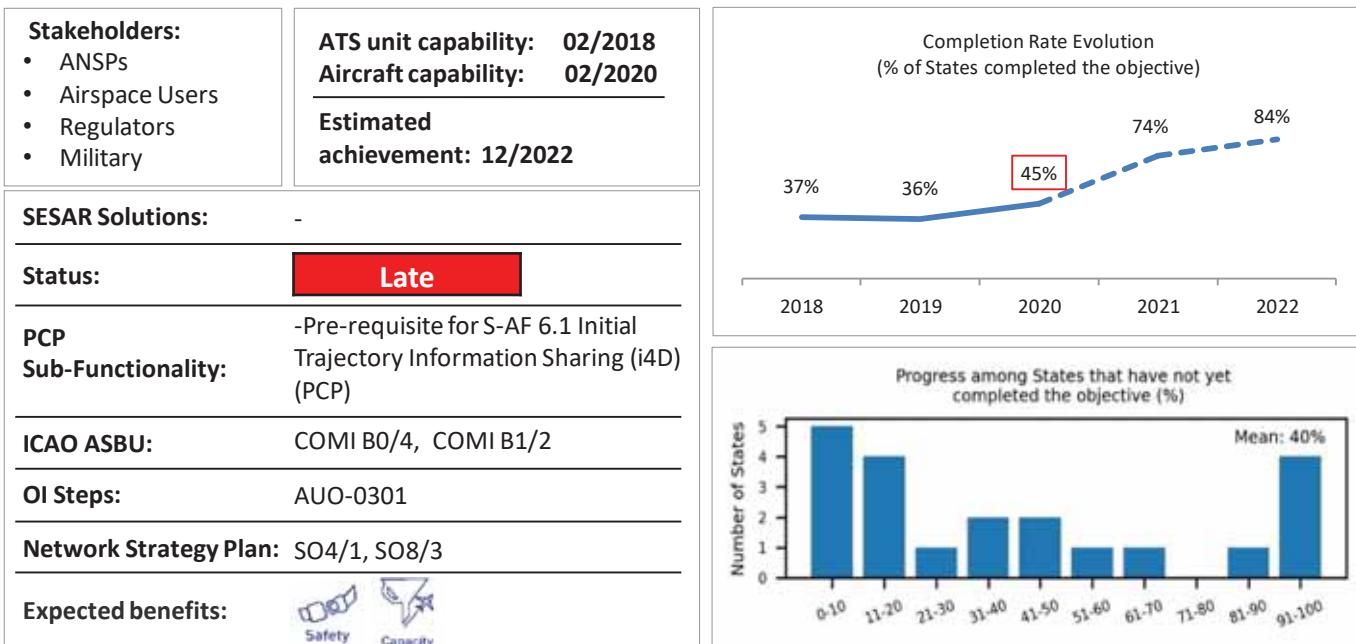
### Main 2020 developments:

While only 3 States have reported completion in 2020 (BE, SI and SK), substantial progress has been made with regard the deployment of appropriate technical capabilities (in particular surveillance coverage) in the en-route airspace and around the major airports of the reporting States. As far as the en-route environment is concerned it can be considered that the technical capability has been deployed everywhere in the applicability area. There are still gaps in some TMAs and around smaller airports, but these gaps are reducing every year. Also, for most of the States that have not yet fully completed the implementation, the majority of the traffic is already under ACID "coverage". However, 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 by the underlying Regulation. Therefore full compliance is not yet achieved in these States, even if the technical capability is available. At the cut-off date of the Report (31.12.2020) only 5 States (AT, BE, HU, HR, 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 the others are close to full completion). The increase in completion rate is expected to continue in 2021/2022, however full (100%) compliance across the applicability area will not happen before 2026.



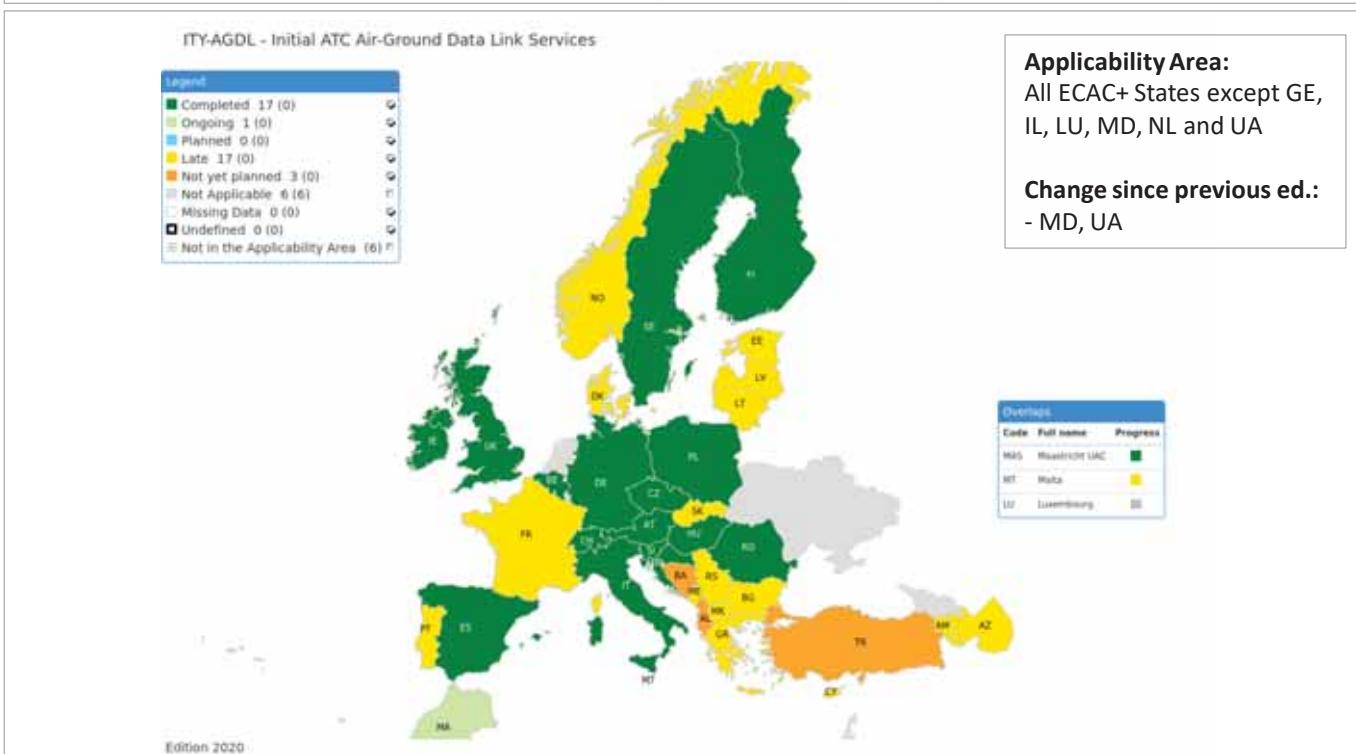
# EOC: CNS Infrastructure and Services

## ITY-AGDL Initial ATC Air-Ground Data Link Services



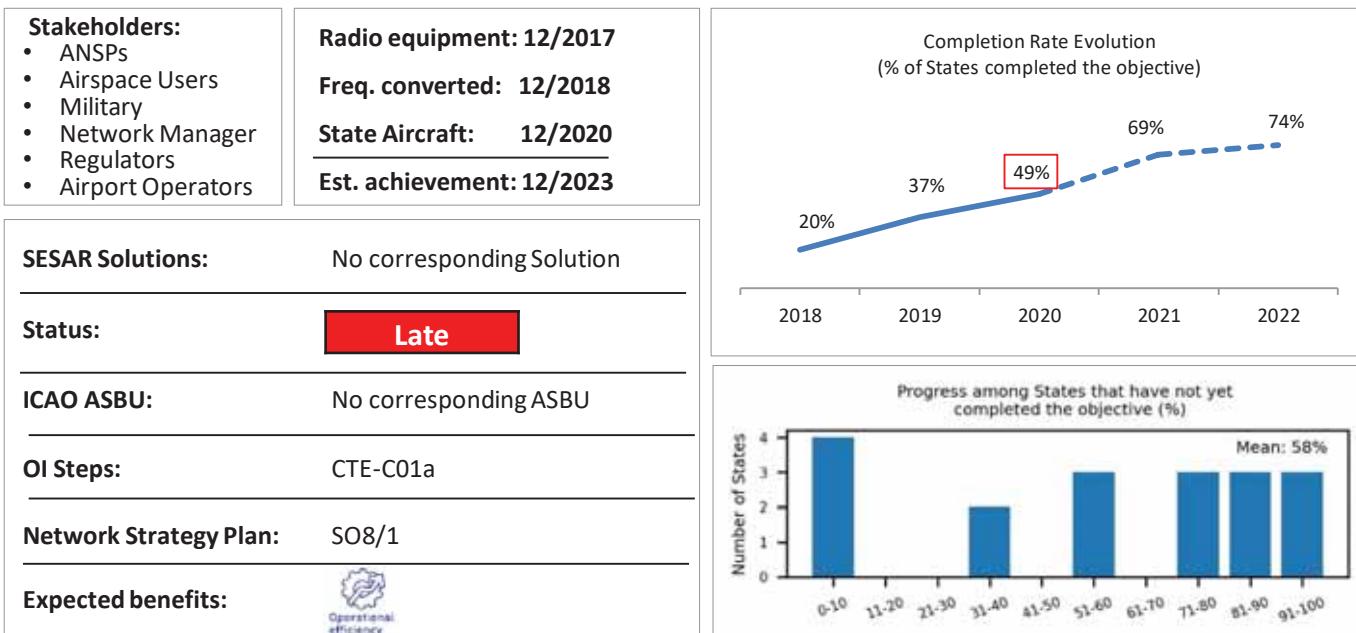
### Main 2020 developments:

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 2020, there has been only little progress in deployment compared to 2019. By the end of 2020, 17 States (45%) reported the status "Completed" for this objective - two more than in 2019. One non EU+ Member State reported the status "Ongoing" with an estimated implementation date by end of 2022. Seventeen (17) States reported the status "Late" with the latest implementation date by April 2024 (NO). Three more (3) States have not yet planned the implementation of this objective. Six (6) States reported the status "Not applicable" for this objective, either not being an EU+ Member State or not providing services above FL285 (LU & NL). The main reason for delay is the late procurement of new ATC systems capable to handle DLS functionalities and required VDL Infrastructure. The achievement (80% threshold) of this objective can be expected by end 2022.



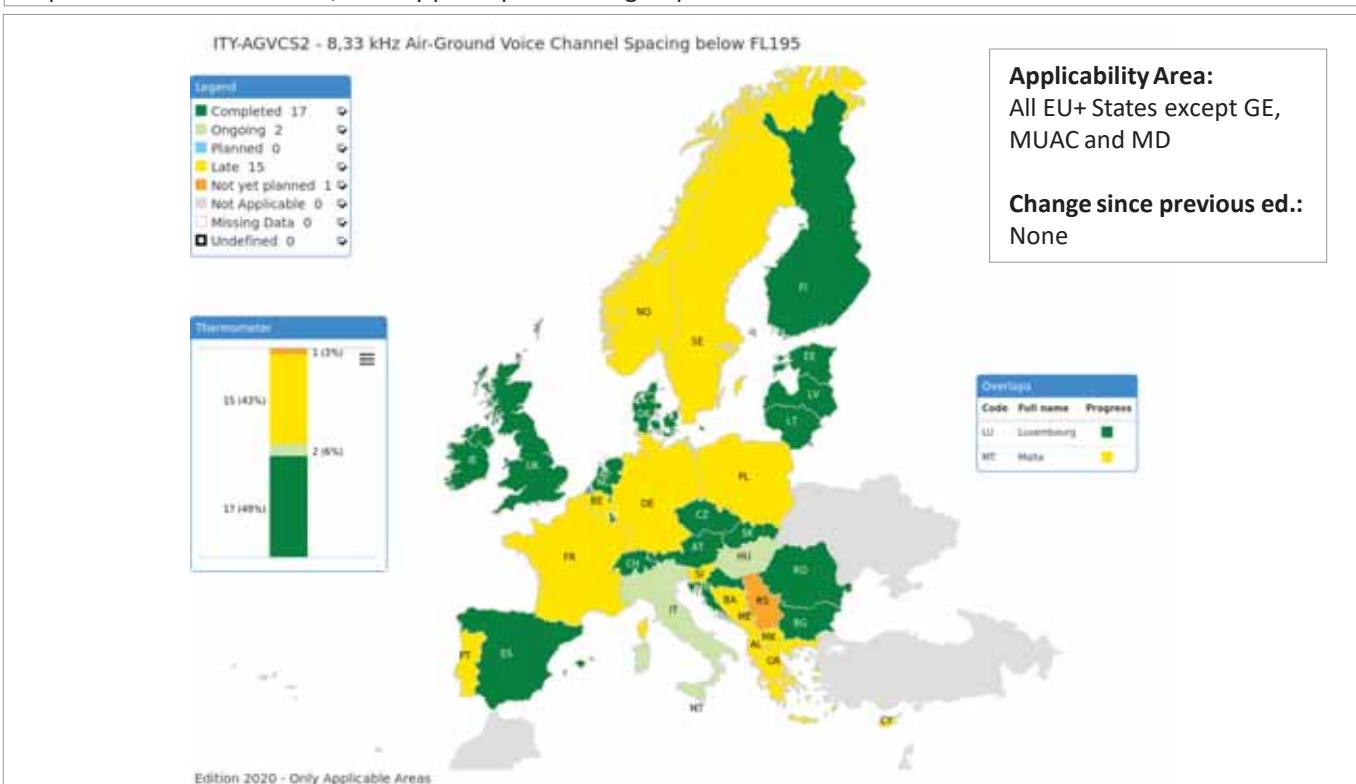
# EOC: CNS Infrastructure and Services

## ITY-AGVCS2 Implement AGVCS below FL195



### Main 2020 developments:

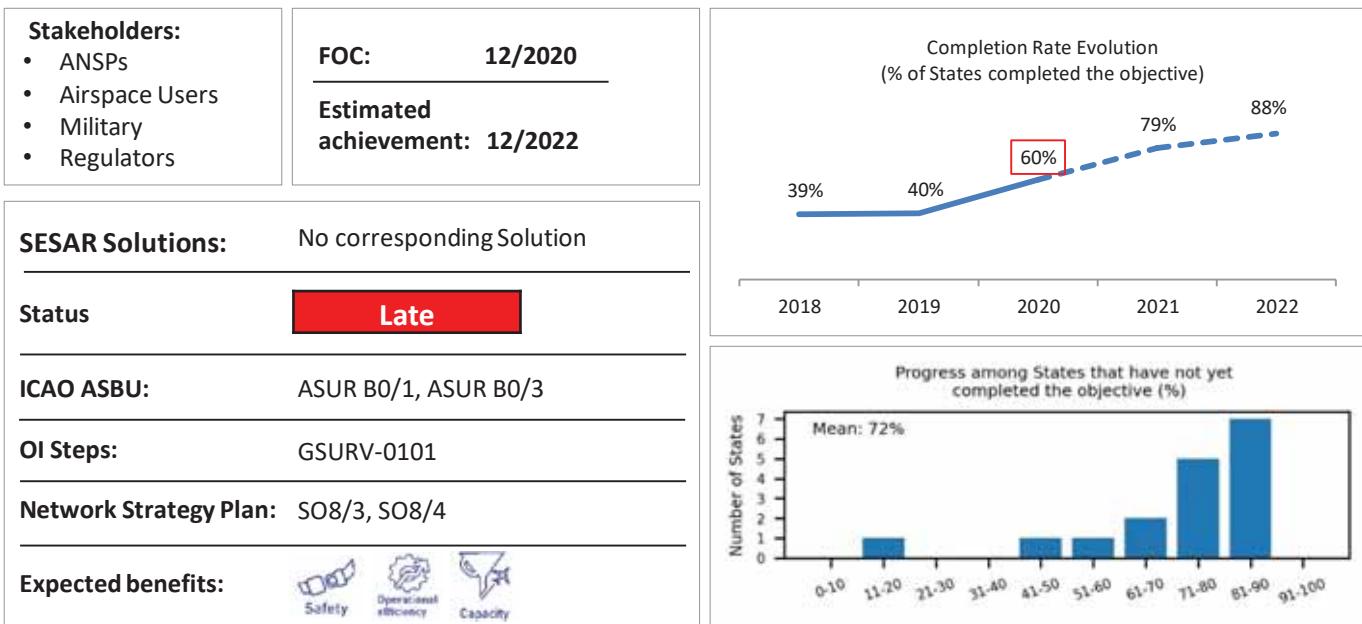
The number of States having reported completion has increased from 13 to 17, but the objective remains “Late”, with full completion expected for 2025. Out of roughly 9700 assignments (EU area, CH, NO), 6259 are already 8.33 kHz (compared with 5700 at the end of 2019), while approximately 2500 other assignments are scheduled for conversion between 2020 and 2025, with some very 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 the ECAA States, actively participate in the group.



Edition 2020 - Only Applicable Areas

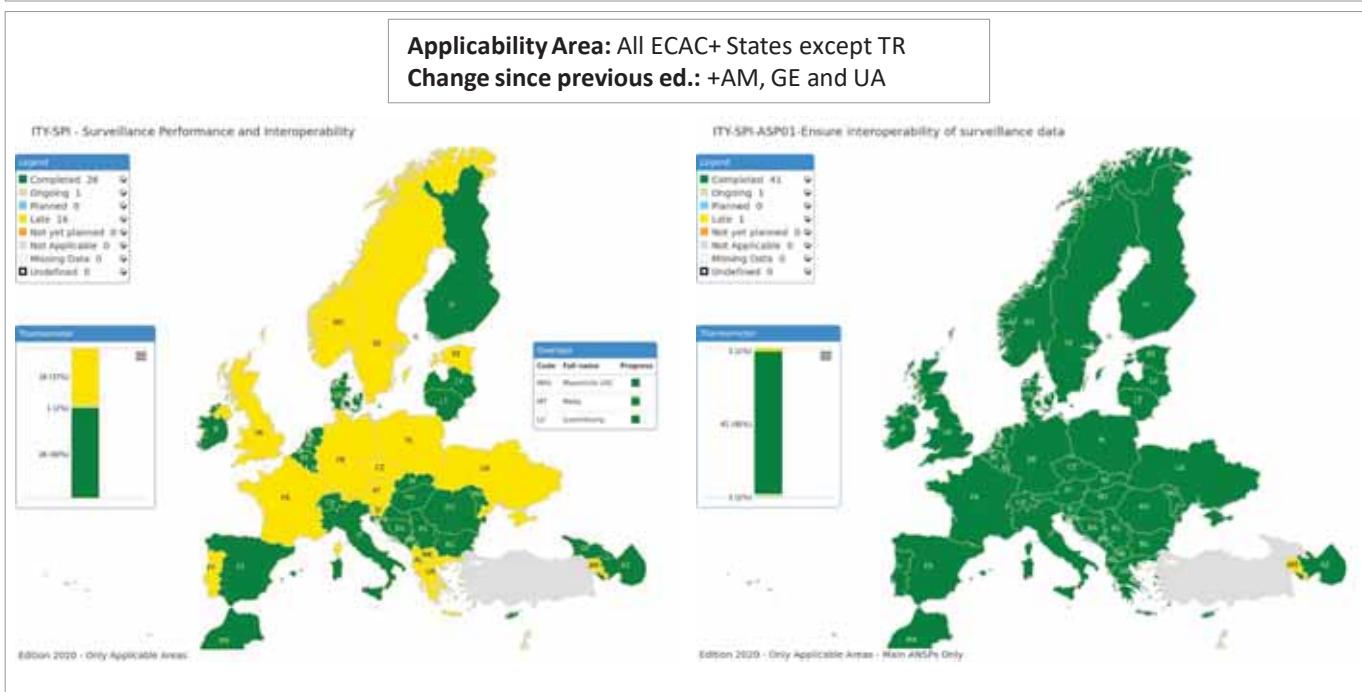
# EOC: CNS Infrastructure and Services

## ITY-SPI Surveillance Performance and Interoperability



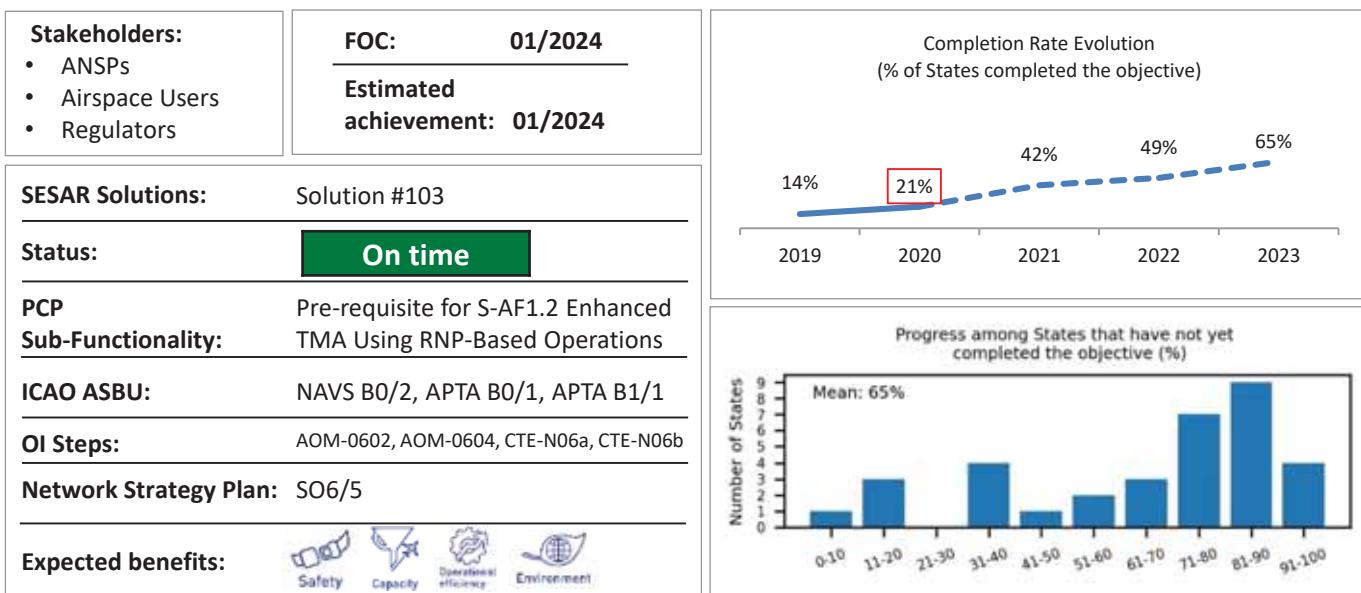
### Main 2020 developments:

Good progress happened in 2020 with 10 States having reported completion. The current “Late” status is caused by the longer time needed for the equipage of State aircraft. These delays are caused by the specificities of State aircraft fleets, in particular large sizes, limited budgets and longer procurement cycles. With regard the REG and ANSP stakeholders the implementation situation is much better and the objective is virtually completed (e.g. the SLoA on interoperability is implemented in 40 States + MUAC). From this perspective it is proposed to remove the objective from the MPL3. It is important to note that the level of implementation of the objective does provide only a partial 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 (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 2020 around 84% of the mandated European Commercial Air Transport aircraft fleet was equipped with ADS-B v2. Based on the retrofit plans it is expected that the equipage rate will reach about 95% by December 2023. On the other hand, slower progress is expected with regard State aircraft with 76% equipage to be reached by December 2025.



# EOC: CNS Infrastructure and Services

## NAV10 RNP Approach Procedures to instrument RWY

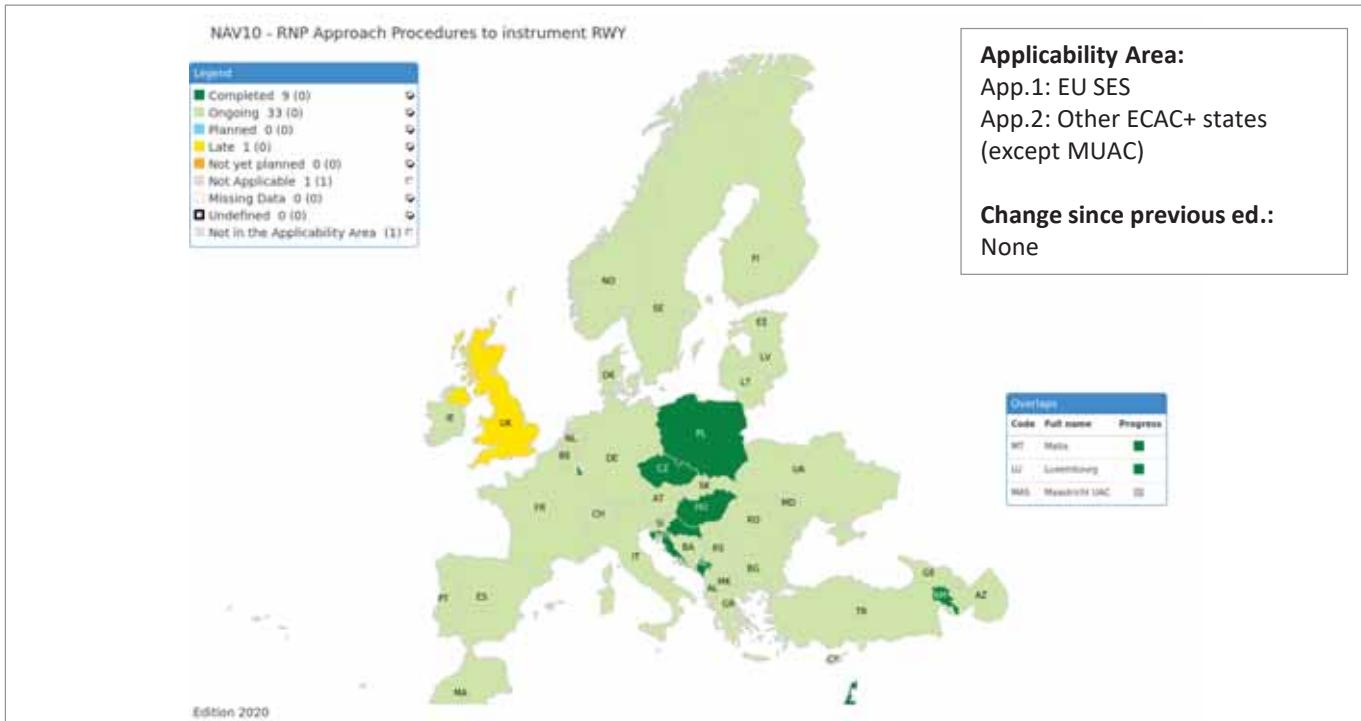


### Main 2020 developments:

This year the implementation data in LSSIP was collected through EUROCONTROL PBN Approach Map Tool information. Three additional states completed the implementation in 2020. Significant progress is seen in PBN Transition Plan establishment and verification during 2020, with almost all States completed this task. In about half of the States implementing RNP Approach Procedures at instrument RWY with Precision Approach, there are cases where LPV minima is not implemented yet. About half of the EU SES states completed implementation of RNP Approach at instrument RWYs without Precision Approach (it should be noted that one fifth of those States do not have iRWY without PA).

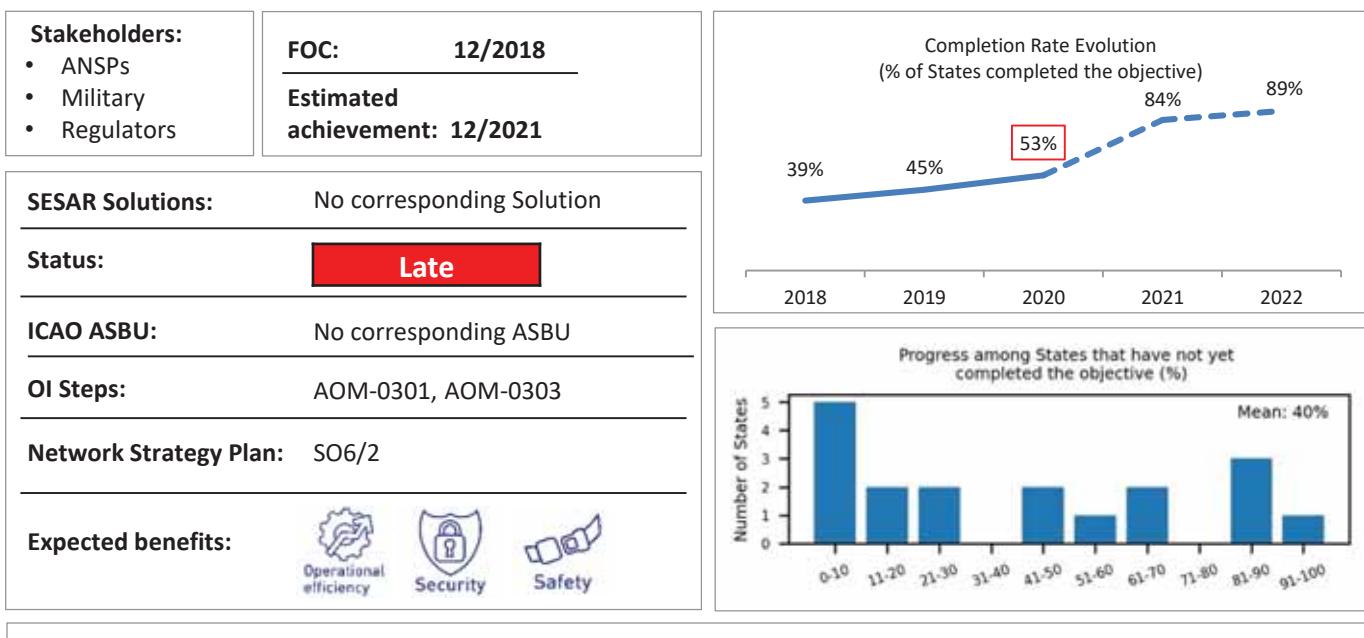
According to the EUROCONTROL CNS business intelligence based on ICAO FPL data, in 2020 about 88% of the flights (79% of the aircraft) to ECAC airports were RNP APCH by any means capable, out of which 69% of the flights had LNAV/VNAV and 11% of the flights - LPV capability.

It should be noted that full EGNOS Service area coverage of the entire ECAC airspace, including all the EU states, is a necessary prerequisite for the full deployment of this objective.



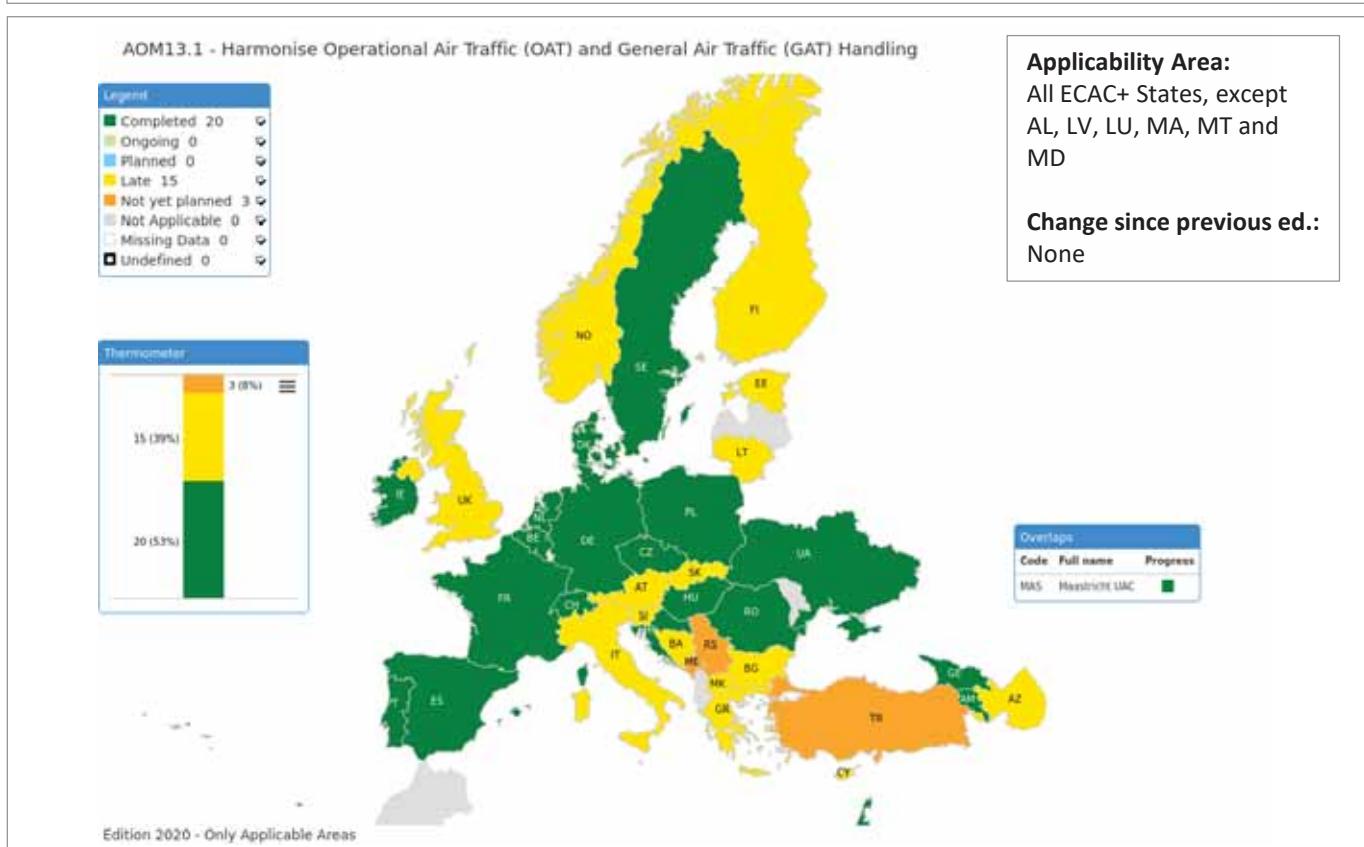
# EOC: ATM Interconnected Network

## AOM13.1 Harmonise OAT and GAT handling



### Main 2020 developments:

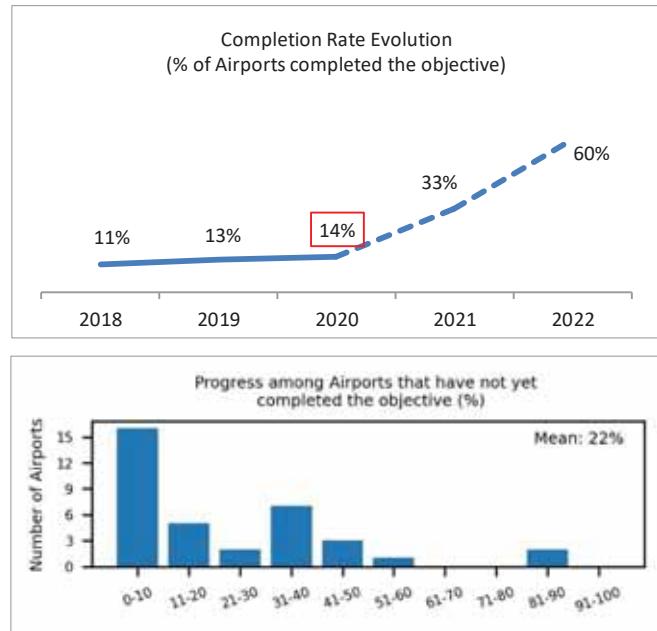
Full Operation Capability deadline was reached in 2018. Within the applicability area, 20 States declare this objective as "completed" (3 more than in previous year: IE, BE, UA) which gives 53% of implementation rate. 15 States (39% of all applicable States) declare this objective as "late" for which 80% indicates implementation by 31/12/2021. The estimated 80% threshold of achievement for this objective, following the States' declarations, will be reached at the end of 2021. 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 a lack of decision on the implementation of EUROAT.



# EOC: ATM Interconnected Network

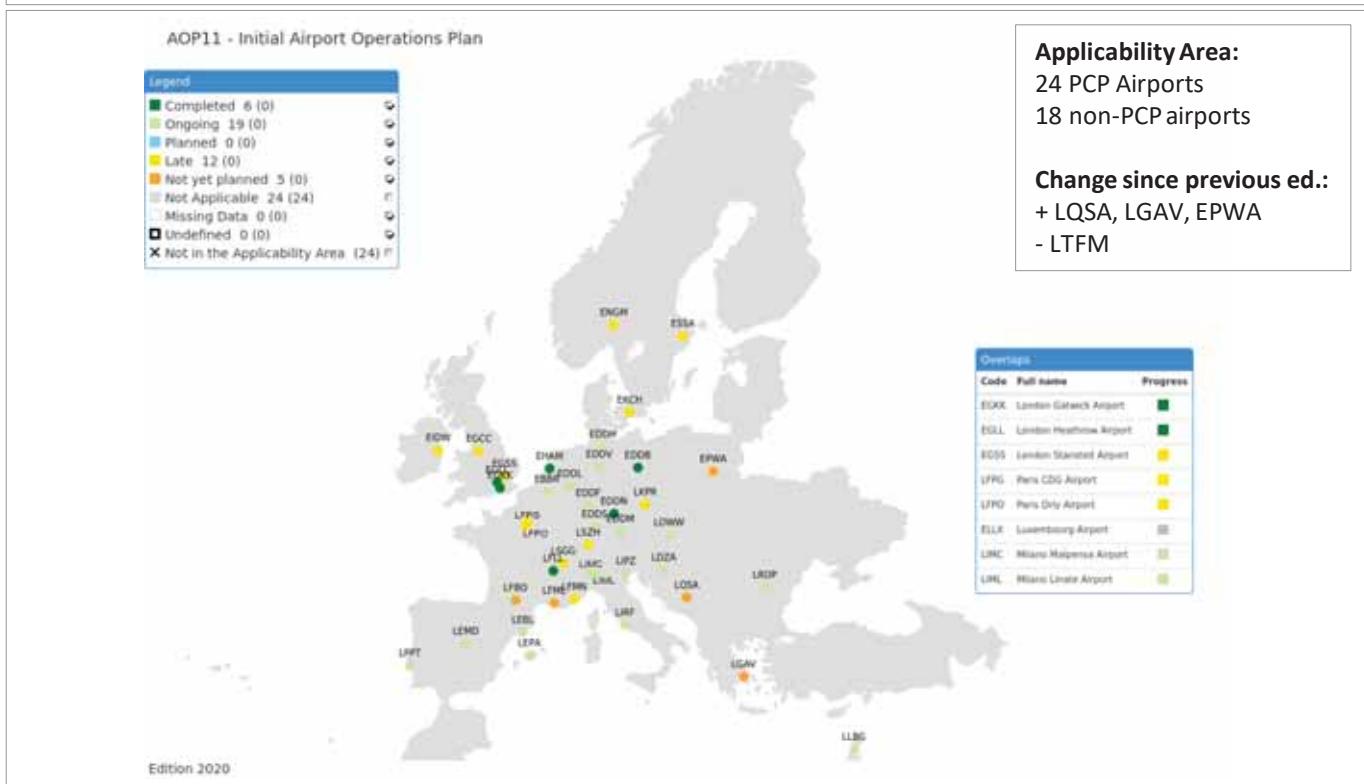
# AOP11 Initial Airport Operations Plan

<b>Stakeholders:</b>	<b>FOC:</b> <u>01/2021</u>
• ANSPs	
• Airspace Users	
• Airport Operators	
<b>SESAR Solutions:</b>	Solution #21
<b>Status:</b>	<b>Late</b>
<b>PCP Sub-Functionality:</b>	S-AF2.1 DMAN synchronised with pre-departure sequencing
<b>ICAO ASBU:</b>	NOPS B1/3
<b>OI Steps:</b>	AO-0801-A
<b>Network Strategy Plan:</b>	SO6/2
<b>Expected benefits:</b>	 Capacity  Operational efficiency  Environment



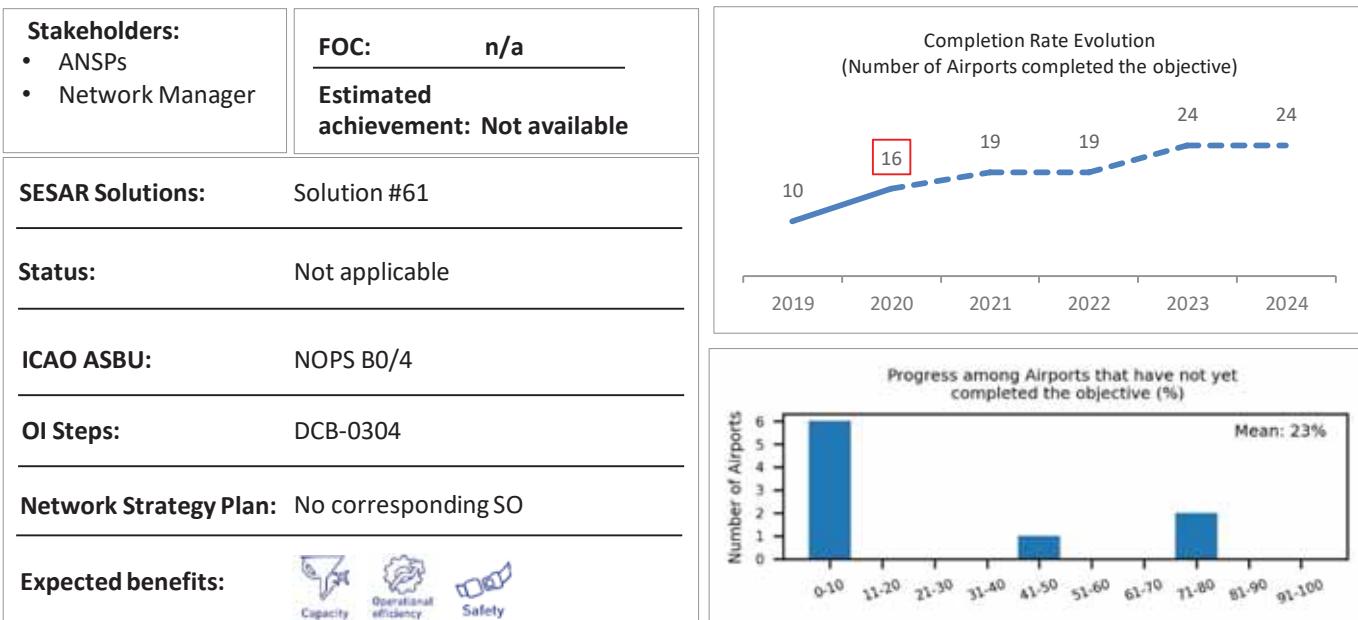
## Main 2020 developments:

For reporting period 2020, only Berlin (EDDB) has completed the implementation, leading to a total of 6 airports with initial AOP. Completion covers 4 out of 24 PCP airports and 2 non-PCP airports. Twelve (12) airports have reported a "Late" status (while there were none in 2019), partly because of the change of the FOC date which was brought forward by 12 months. Also, as this PCP functionality will also be taken into the CP1 Regulation (EU 116/2021), but with a later FOC (12/2023), the progress reported by some administrations has been adapted to reflect the new date. Overall, all airports reporting implementation plans aim to implement this objective by the end of 2023 (date consistent with CP1 requirements), except LKPR and LLBG, with plans to implement by 12/2024.



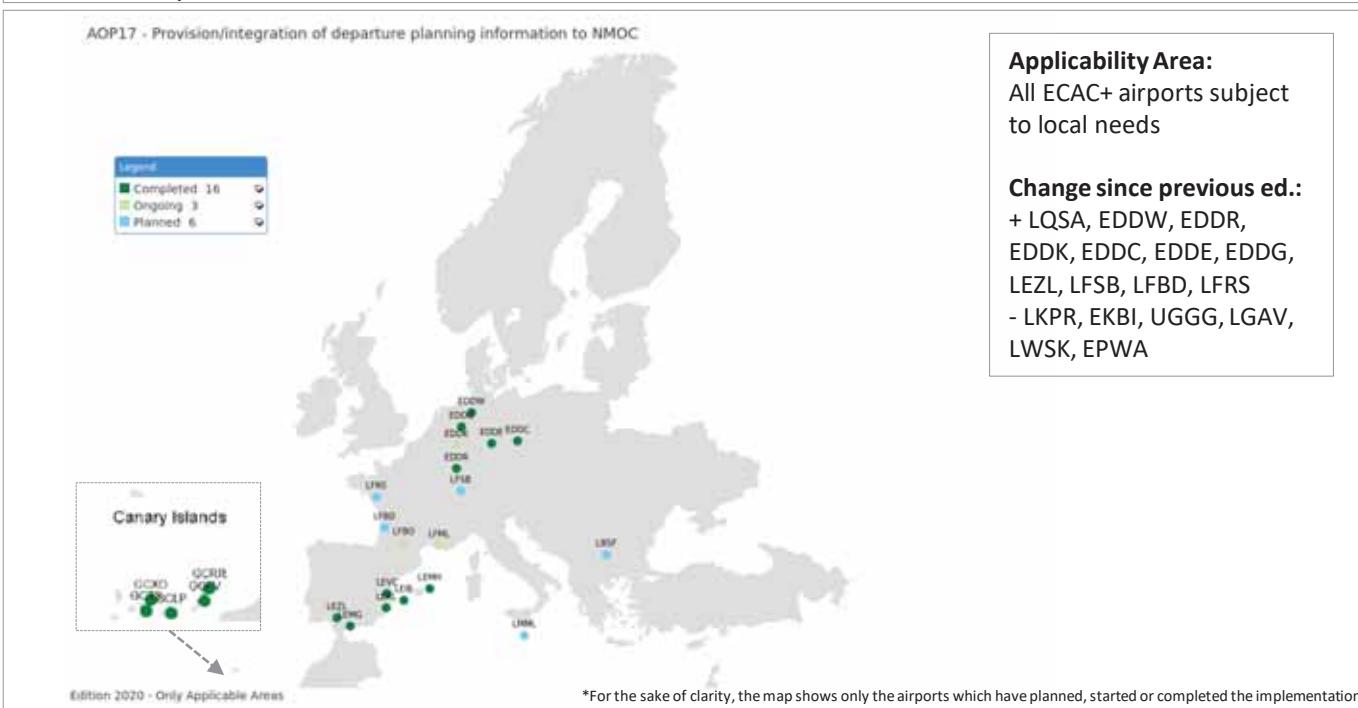
# EOC: ATM Interconnected Network

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



### Main 2020 developments:

This functionality aims to improve integration of departure estimates from medium or small-size airports when serving a complex airspace with dense traffic through improved availability of aircraft pre-departure information to the ATM Network, through the provision of accurate pre-departure information to the NM. 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 the near future, which explains the large number of airports that reported this objective as "not applicable" (26). During the reporting cycle, the objective witnessed a substantial update of its applicability area with many airports joining, or leaving, this area. This led to a reduction in the number of airports reporting "Not yet planned" from 17 to 11. In addition to the 10 Spanish airports which already reported it as "completed" in previous periods, in 2020 Germany reported the completion at 5 airports (EDDW, EDDR, EDDC, EDDE, EDDG), while Spain reported completion in Seville (LEZL). Several other States have also reported for the first time plans to implement (LFRS, LFBO, LFSB, LBSF, LMML and Italy – locations undisclosed therefore not shown on the map but counted in the Legend) leading to an expected deployment in at least 24 locations by 2023.



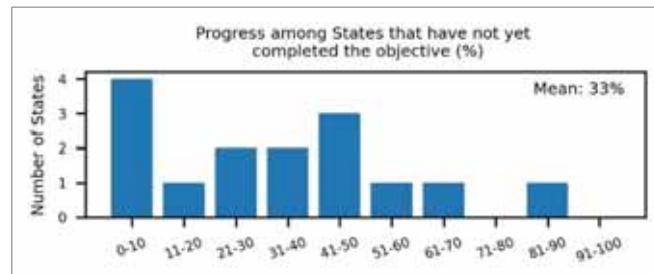
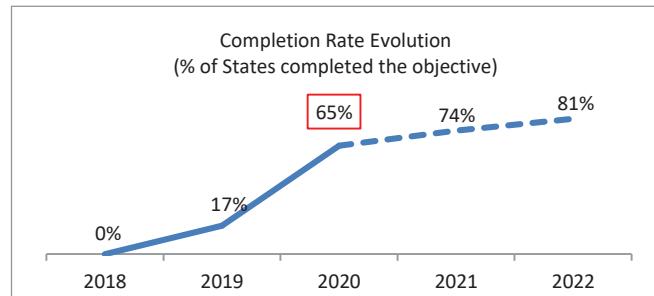
# EOC: ATM Interconnected Network

## COM12 NewPENS

<b>Stakeholders:</b>	
• ANSPs	
• Airport Operators	
• Airspace Users	
• Network Manager	

<b>FOC:</b>	<b>01/2025</b>
<b>Estimated achievement:</b>	<b>12/2022</b>

<b>SESAR Solutions:</b>	No corresponding Solution
<b>Status:</b>	<b>On time</b>
<b>PCP Sub-Functionality</b>	Enabler for AF5 Initial SWIM
<b>ICAO ASBU:</b>	COMI B1/1
<b>OI Steps:</b>	CTE-C06b
<b>Network Strategy Plan:</b>	SO2/3, SO2/4, SO8/3, SO8/4
<b>Expected benefits:</b>	 Cost efficiency  Security

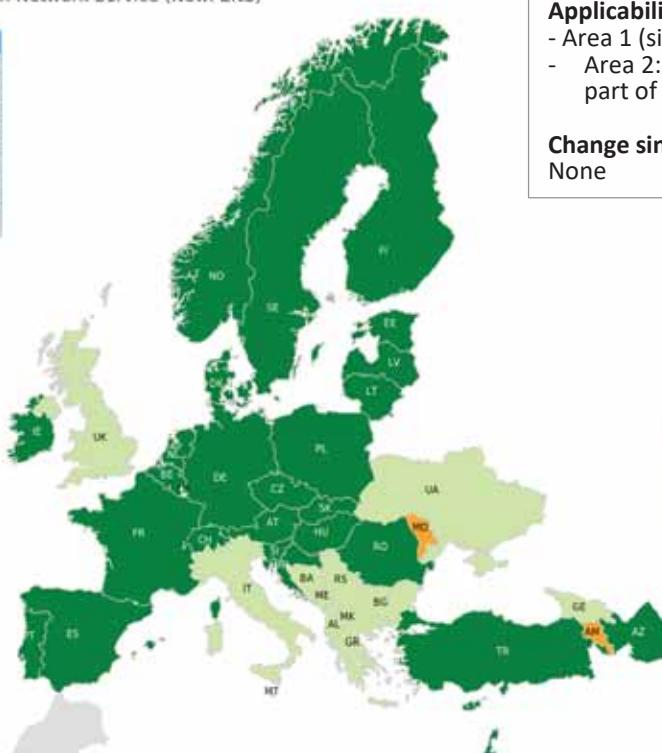


### Main 2020 developments:

After a NewPENS Common Procurement Agreement has been signed in 2018, this reporting year (2020) witnessed a surge in the objective completion rate (from 17% in 2019 to 65% in 2020). Among the NewPENS signatories, the overall progress is at 68%, while the connectivity infrastructure has been installed and put into service in 86% of States. Migration of services to NewPENS is still ongoing in a few ANSPs, while the major cause of delay for this objective is the connectivity at airports (e.g. IT and UK), which is not yet planned or considered not applicable in vast majority of States. Only one State (MK) so far has reported potential delay due to COVID-19 crisis. Among the remaining States, migration to NewPENS has been completed by 5 States (IL, TR, AZ, LT and SI), while the implementation is ongoing also in GR and GE. Two States have not yet planned to implement NewPENS (MD and AM). According to currently reported plans, most of States will fully migrate to NewPENS by 2022.

COM12 - New Pan-European Network Service (NewPENS)

Legend	
Completed	28 (0)
Ongoing	13 (0)
Planned	0 (0)
Late	0 (0)
Not yet planned	2 (0)
Not Applicable	1 (1)
Missing Data	0 (0)
Undefined	0 (0)
Not in the Applicability Area	1 (1)



### Applicability Area:

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

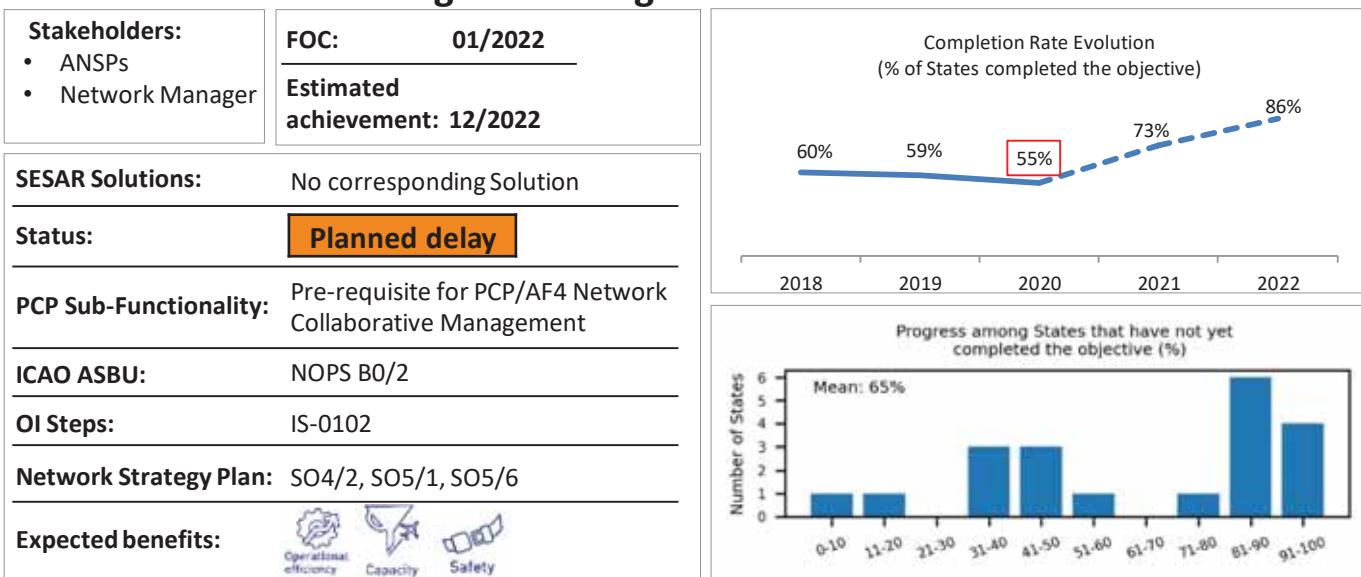
Change since previous ed.:  
None

Overlays		
Code	Full name	Progress
MAS	Maastricht UAC	■
LU	Luxembourg	■
MT	Malta	■

Edition 2020

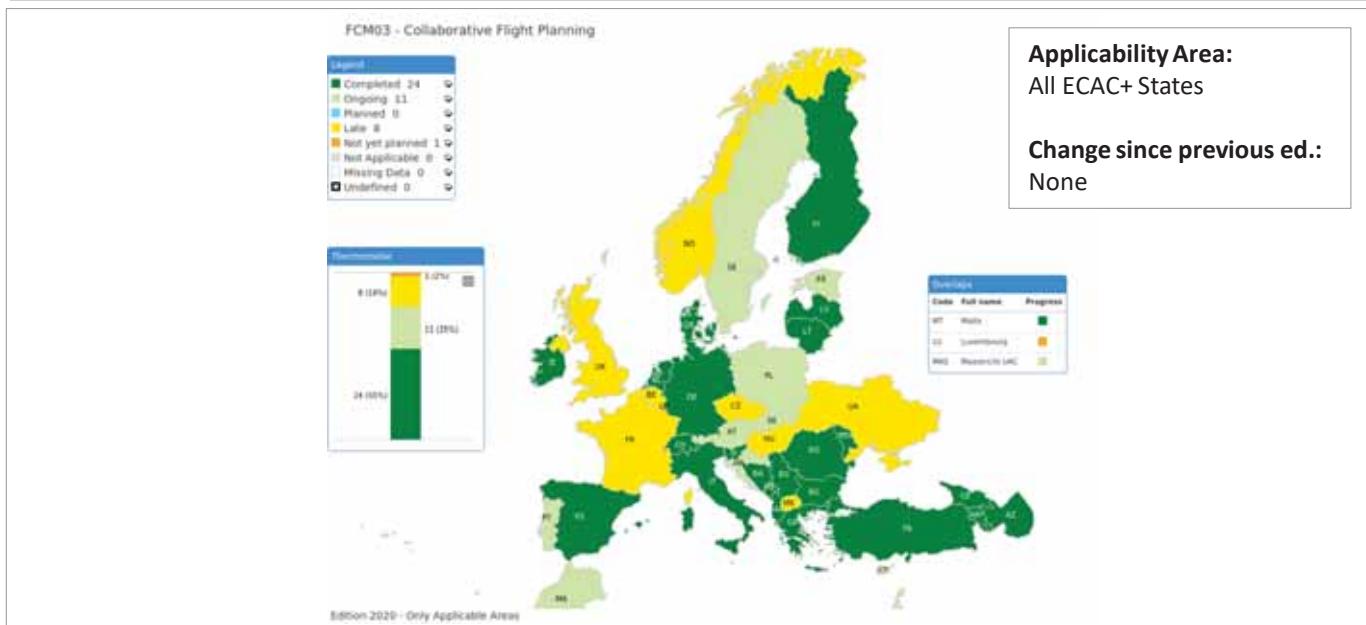
# EOC: ATM Interconnected Network

## FCM03 Collaborative Flight Planning



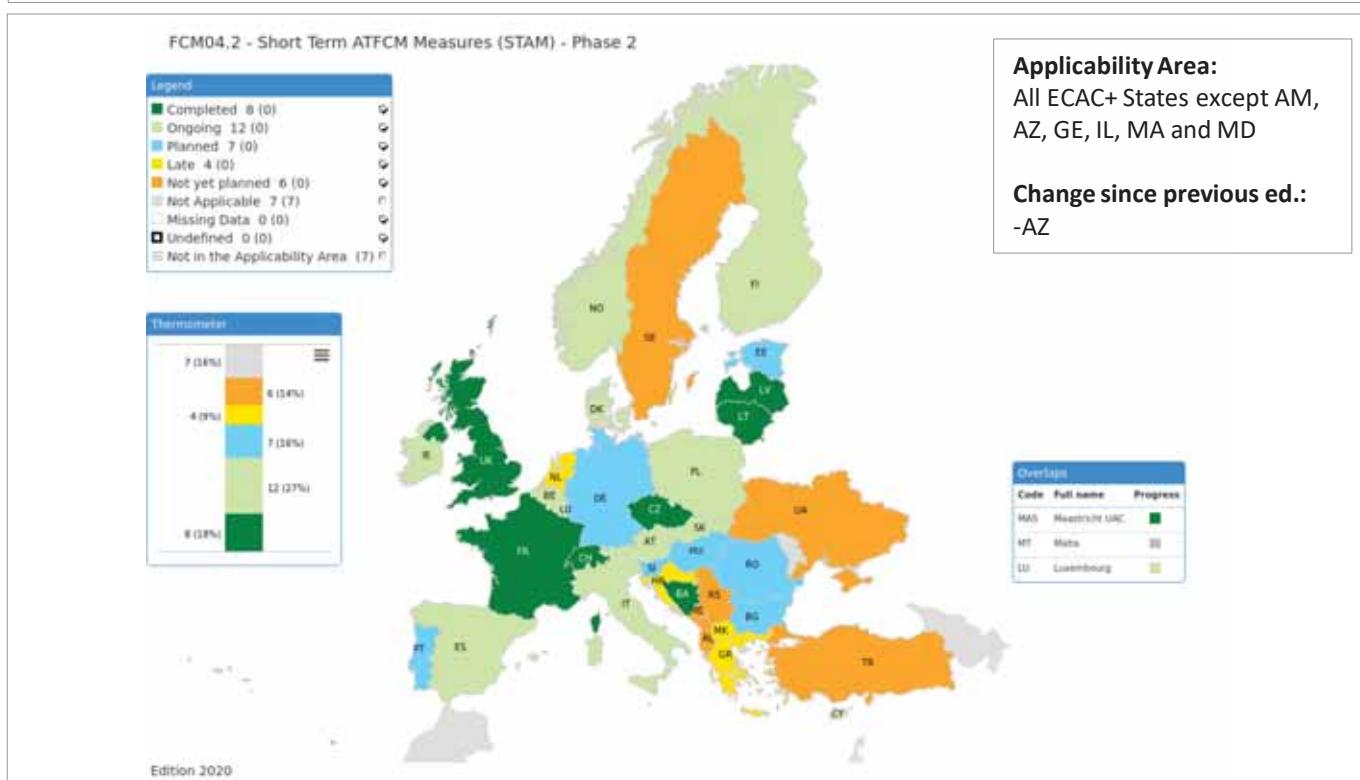
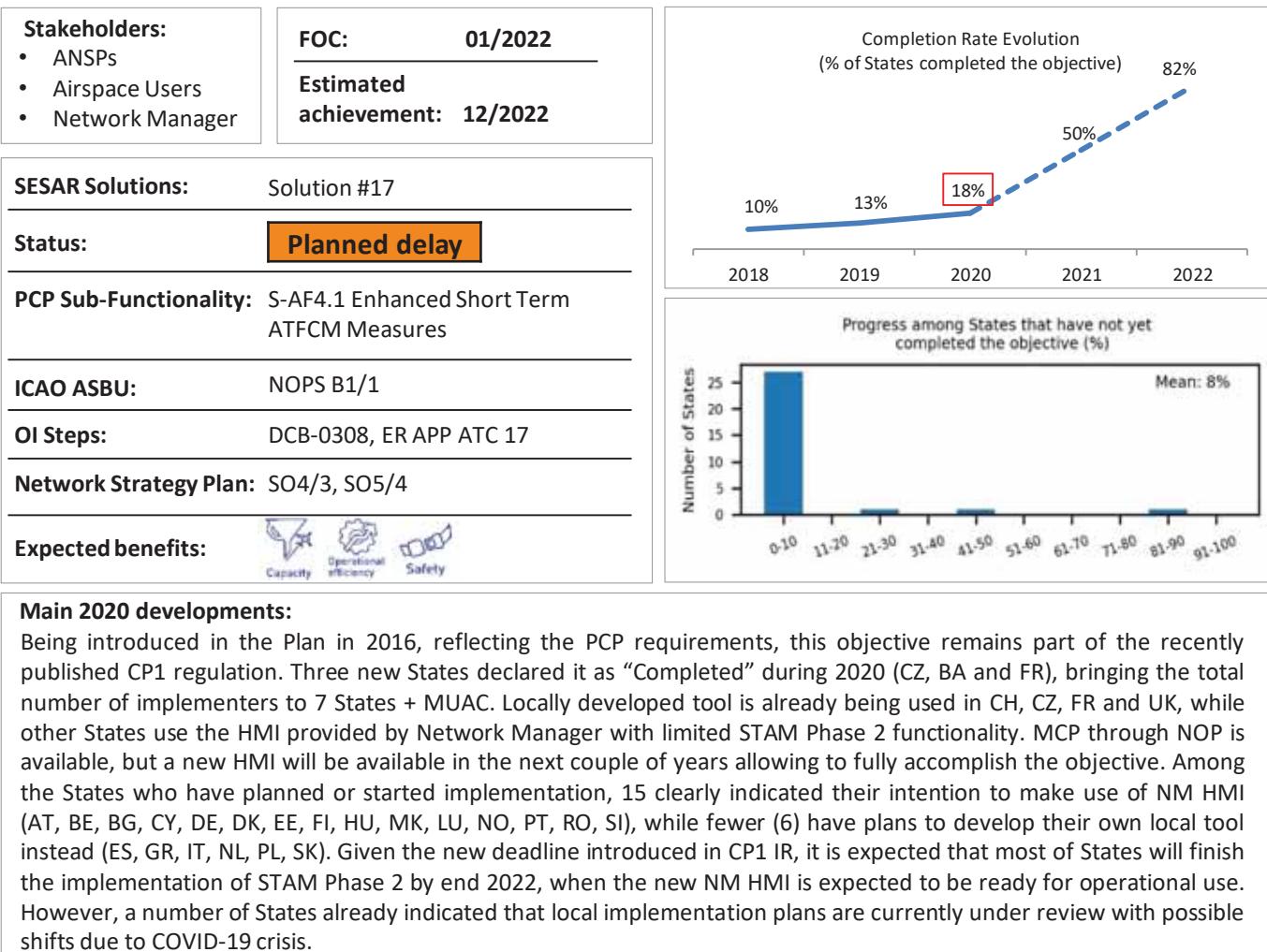
### Main 2020 developments:

Implementation continues to stagnate, while the increase in completion rate expected for 2020 and the achievement of the Objective not only that did not happen, but actually the completion rate decreased, as 2 States (UK, LU) reverted from “Completed” to “Late” or to “Not yet planned” (as previously not applicable SLoAs became of interest for implementation, but are not planned yet). The clarification of the SloA on the provision of the AFP message for change of route, reached within EUROCONTROL NM’s working arrangements, was expected to boost the implementation, however this has not happened. Certainly the COVID-19 situation had an impact on the lack of progress in 2020 and completion is now not expected before end of 2022. This will be 20 years after the introduction of the Objective (the initial FOC being 2005). On the positive side, some SLoAs show a better completion rate than the Objective (e.g. ASP05 on automatic provision of AFP for missing flight plans is at 72% completion). The full implementation of the objective requires not only the capability of the local systems to generate and transmit AFP messages, but also testing/validation with the NM before the operational integration. It is therefore important to follow the detailed NM specifications and to use the AFPs only for the scope for which they were 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, IT, RS, ME, BA, LT), the integration within NM has not yet been successfully tested for all centers, therefore the AFP messages are not yet be fully integrated in the NM system, or the automation is not implemented yet or they had to be disconnected from NM OPS following upgrades of the local systems. Therefore the completion rate, reported by NM based on the AFP integration, is below the one reported by the States.



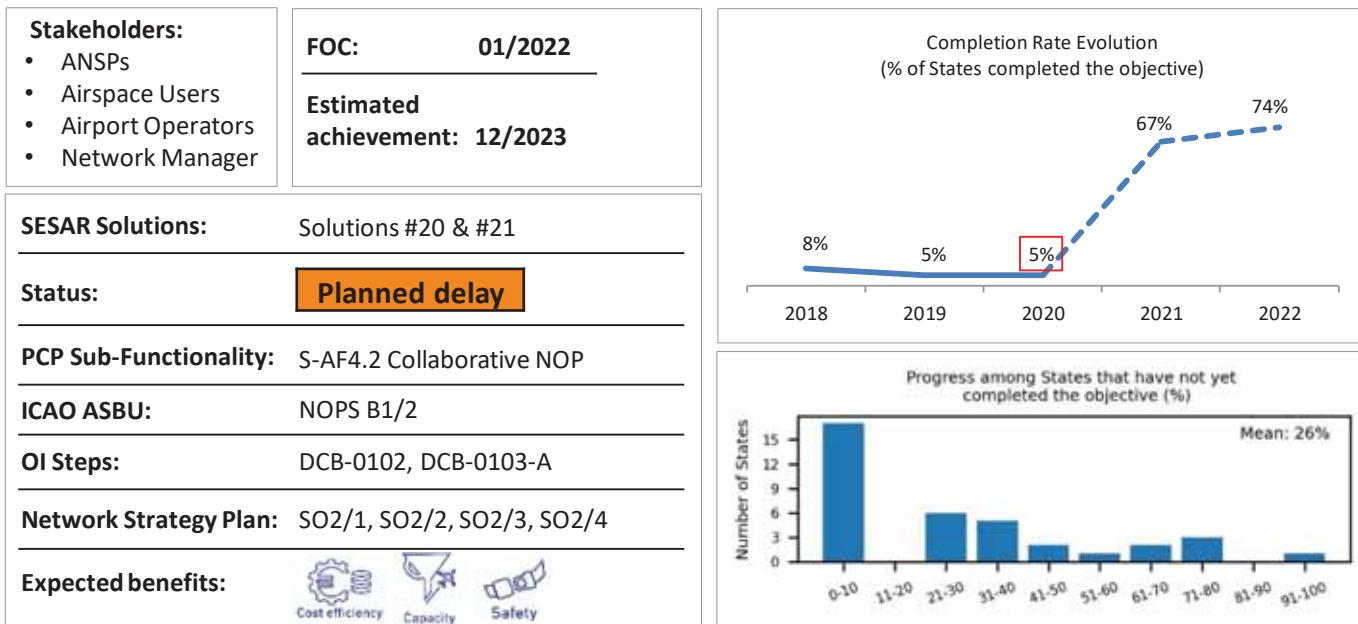
# EOC: ATM Interconnected Network

## FCM04.2 STAM phase 2



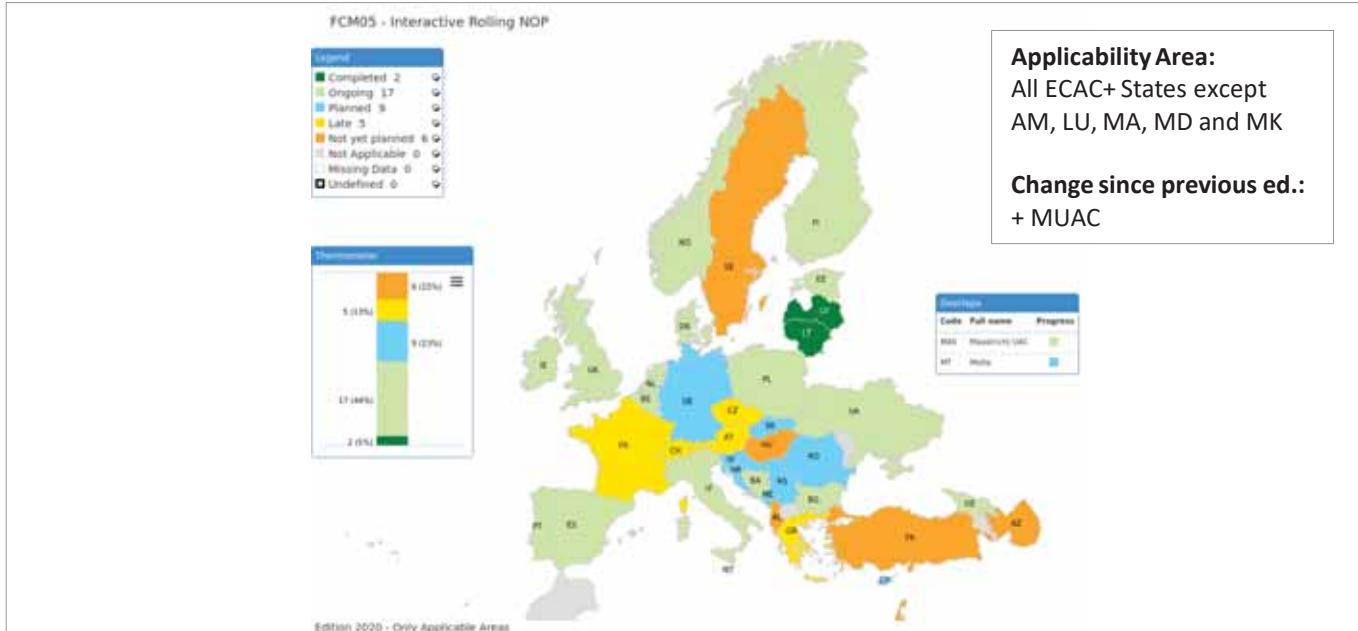
# EOC: ATM Interconnected Network

## FCM05 Interactive rolling NOP



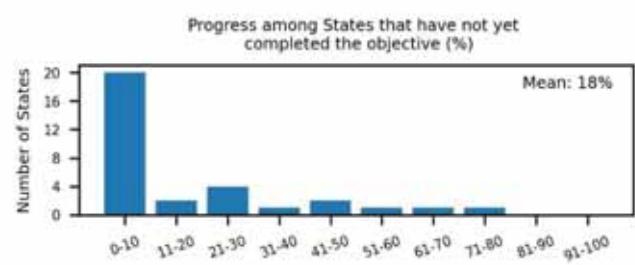
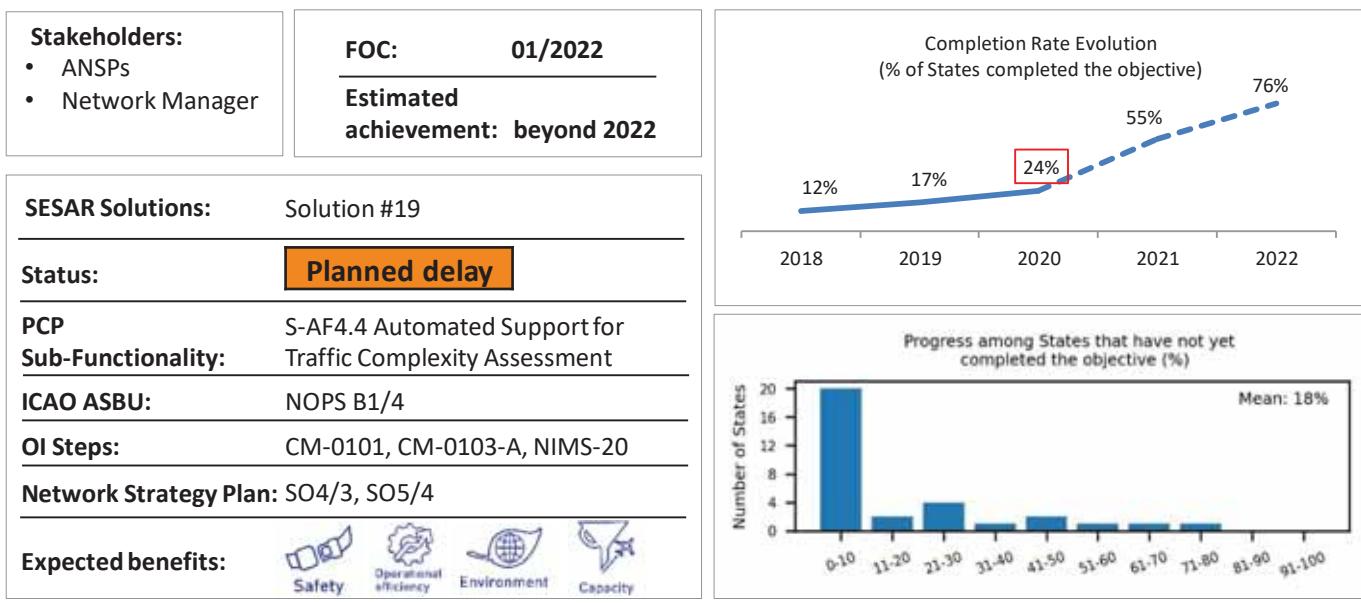
### Main 2020 developments:

The scope of this Implementation Objective is addressing the interactive rolling NOP functionality as envisaged by the PCP IR and subsequently by the recently published CP1 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, fully compliant with the CP1 Regulation. Some modules of the new NM platform are already deployed, while the complete migration is planned by the mid 2022. The vast majority of States have started implementation or have set-up concrete implementation plans, however these plans have slipped in 2020 and currently, completion is not expected before the end of 2023. This delay can be traced to the COVID-19 situation, but also to the change in the deployment plans in anticipation of the CP1 requirements and deadlines. The ANSPs 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 CP1 IR. While the NM part is almost completed, the COVID-19 crisis impacted the airport implementation planning. Overall, 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 2022.



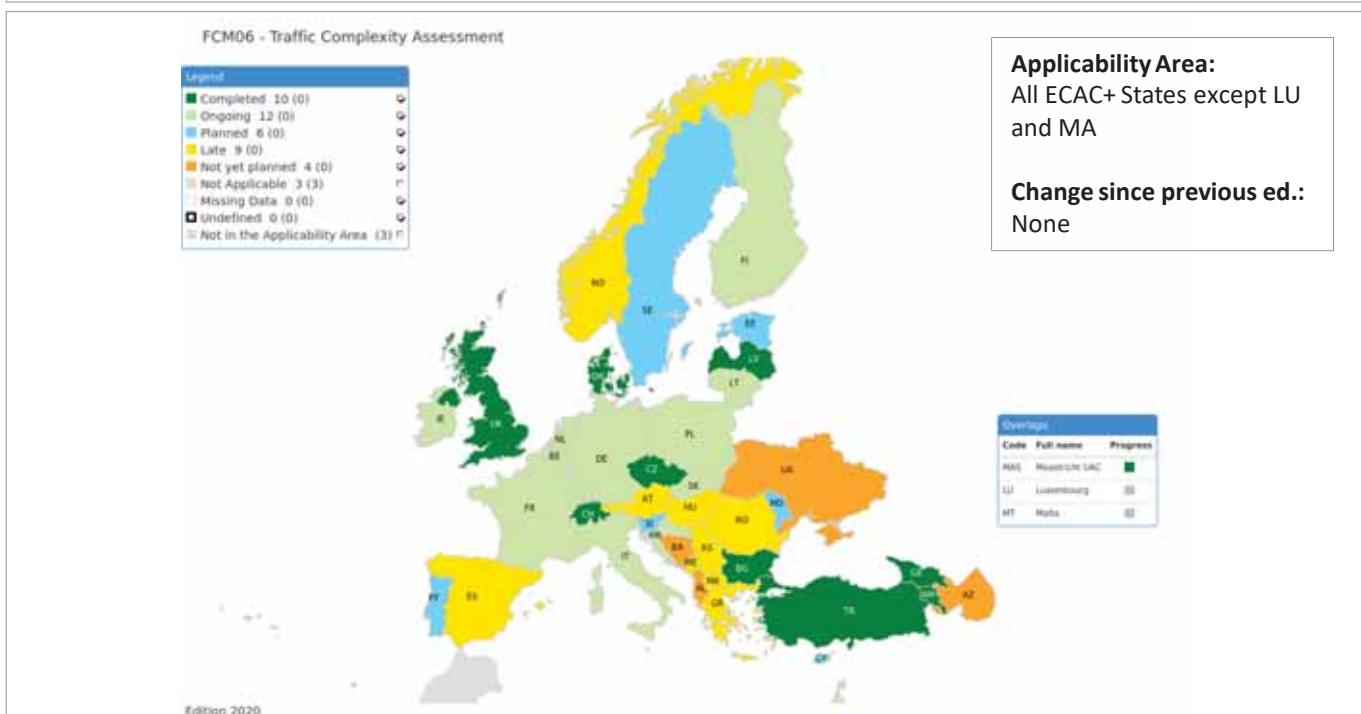
# EOC: ATM Interconnected Network

## FCM06 Traffic Complexity Assessment



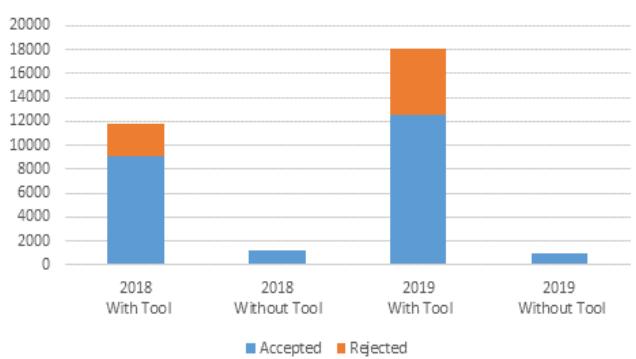
### Main 2020 developments:

Traffic complexity assessment remains part of the recently published CP1 regulation, with the requirements in associated Deployment Programme slightly amended to allow ANSPs to choose between using NM tool or a locally developed one. Three (3) more States have declared completion of this objective in 2020 (BG, CH and TR), bringing the total number of implementers to 10 (including MUAC). Some of the ATFCM tools currently being developed or used in ANSPs to assess traffic complexity are SALTO (FR), CRYSTAL (CH), IMPACT (ES) and tCAT (BG). It should be noted that a number of States (including those who declared the implementation as completed) consider traffic load monitoring as sufficient to fulfil the requirements of this objective. According to currently reported plans, a significant improvement in completion rate is expected over the next two years, given the new deadline introduced by CP1 regulation (31/12/2022). However, the ongoing COVID crisis and declining traffic levels are expected to negatively impact the implementation progress of this objective. Nine (9) States already anticipate a delay in implementation, compared to only 4 a year ago, while few other States are still going to revise their implementation plans during 2021.



# EOC: ATM Interconnected Network

## FCM09 Enhanced ATFM Slot swapping

<p><b>Stakeholders</b></p> <ul style="list-style-type: none"> <li>• Network Manager</li> <li>• Airspace Users</li> </ul>	<p><b>FOC</b> <u>12/2021</u></p> <p><b>Estimated achievement</b> <u>12/2021</u></p>	<p><b>Implementation progress</b> (Average % of progress for States not Completed yet)</p> <ul style="list-style-type: none"> <li>- Not Applicable – Objective only relevant for the NM and Airspace Users</li> </ul>														
<p><b>SESAR Solutions:</b> Solution #56</p> <hr/> <p><b>Status:</b> <span style="background-color: green; color: white; padding: 2px;">On time</span></p> <hr/> <p><b>ICAO ASBU:</b> NOPS B1/7</p> <hr/> <p><b>OI Steps:</b> AUO-0101-A</p> <hr/> <p><b>Network Strategy Plan:</b> SO6/1</p> <hr/> <p><b>Expected benefits:</b>  </p>																
<p><b>Swap Requests</b></p>  <table border="1"> <thead> <tr> <th>Category</th> <th>Accepted</th> <th>Rejected</th> </tr> </thead> <tbody> <tr> <td>2018 With Tool</td> <td>~10,000</td> <td>~1,000</td> </tr> <tr> <td>2018 Without Tool</td> <td>~1,000</td> <td>0</td> </tr> <tr> <td>2019 With Tool</td> <td>~12,000</td> <td>~4,000</td> </tr> <tr> <td>2019 Without Tool</td> <td>~1,000</td> <td>0</td> </tr> </tbody> </table>		Category	Accepted	Rejected	2018 With Tool	~10,000	~1,000	2018 Without Tool	~1,000	0	2019 With Tool	~12,000	~4,000	2019 Without Tool	~1,000	0
Category	Accepted	Rejected														
2018 With Tool	~10,000	~1,000														
2018 Without Tool	~1,000	0														
2019 With Tool	~12,000	~4,000														
2019 Without Tool	~1,000	0														

### Main 2020 developments

This objective involves the NM and the Airspace Users during ATFM constrained situations. The ATFM tactical phase facility offered by the NMOC was integrated into the NM system to provide airlines and airline groups with better visibility to identify slot-swap candidates; and an easier HMI and a B2B interface to request these to NMOC.

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.

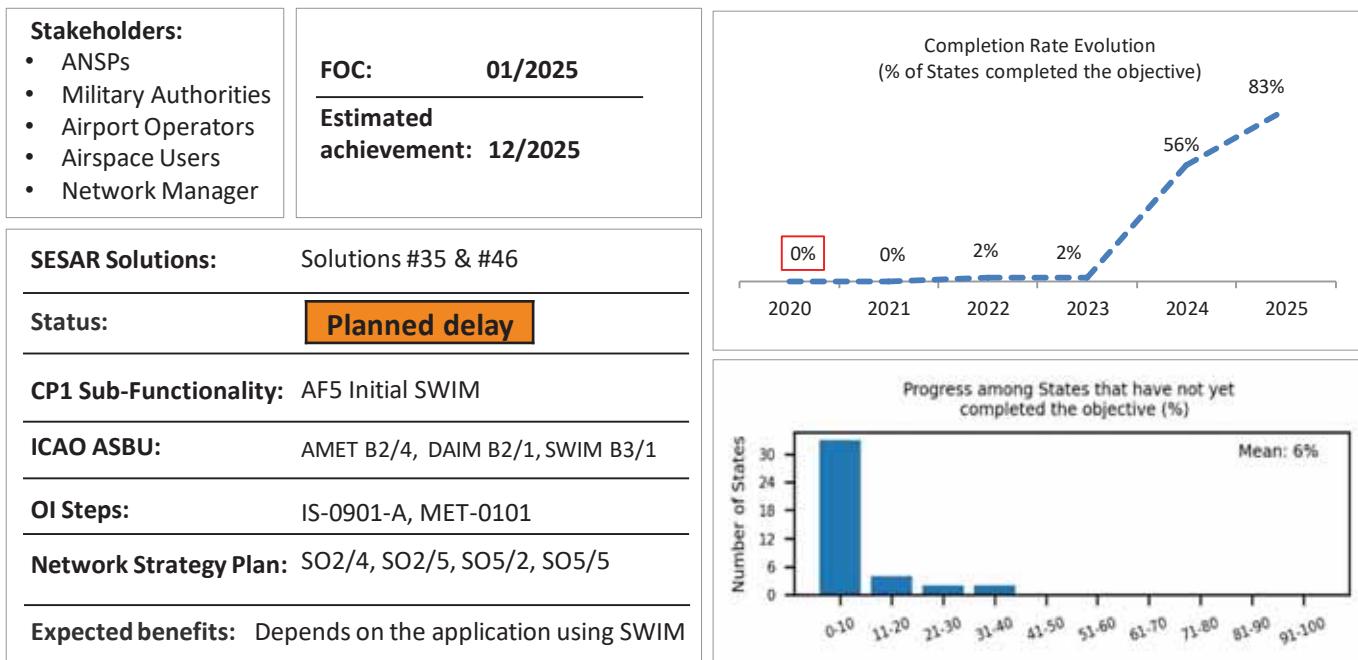
This basic objective can be considered as finalised by NM, while AUs and more particular CFSPs need to adapt their systems and operating procedures for a full implementation of the basic objective. NM has deployed the multi-swap capability procedures, but multi-swap automation is considered outside of the scope of FCM09.

Advanced objectives concerning NM automated responses and automated multi-swap capabilities are in the pipeline and are mostly related to improvements of NM B2B services and interfaces between ETFMS IDAP and E-help desk. Further automation on AU and CFSPs side will be recommended in due course.

Map not relevant for this objective

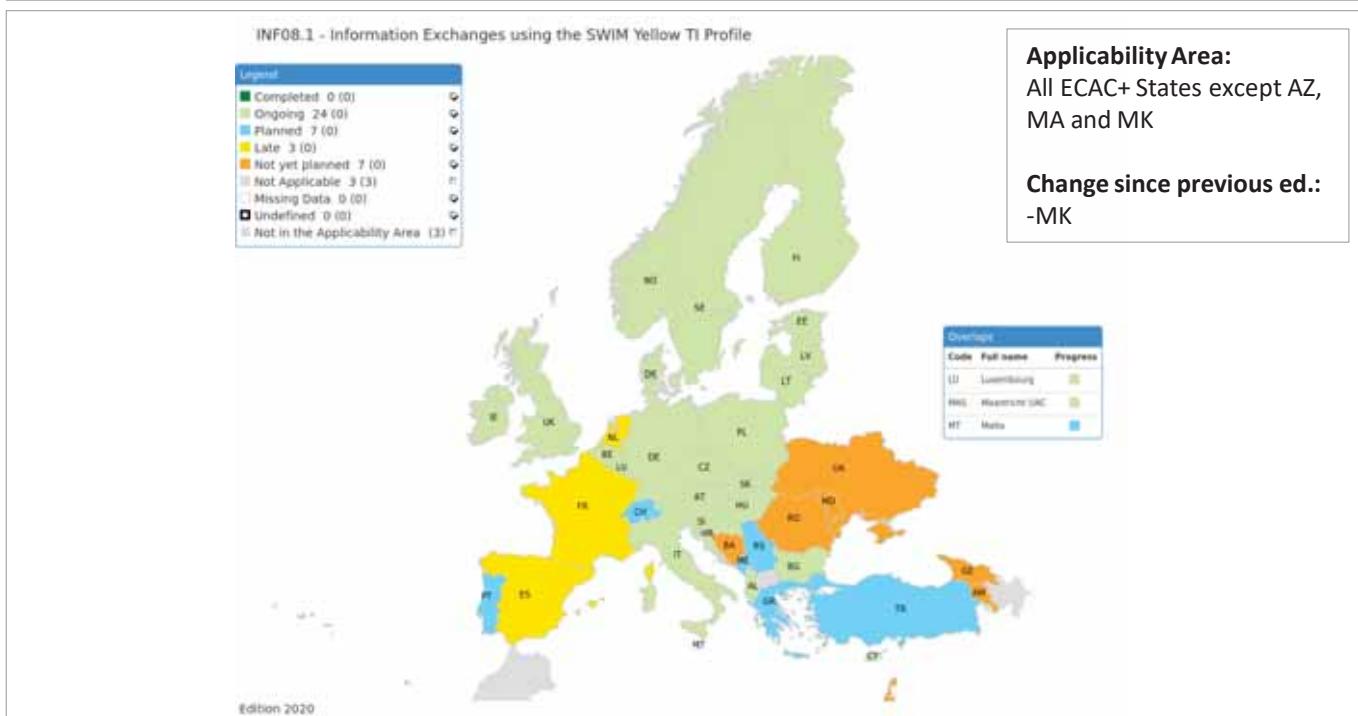
# EOC: ATM Interconnected Network

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



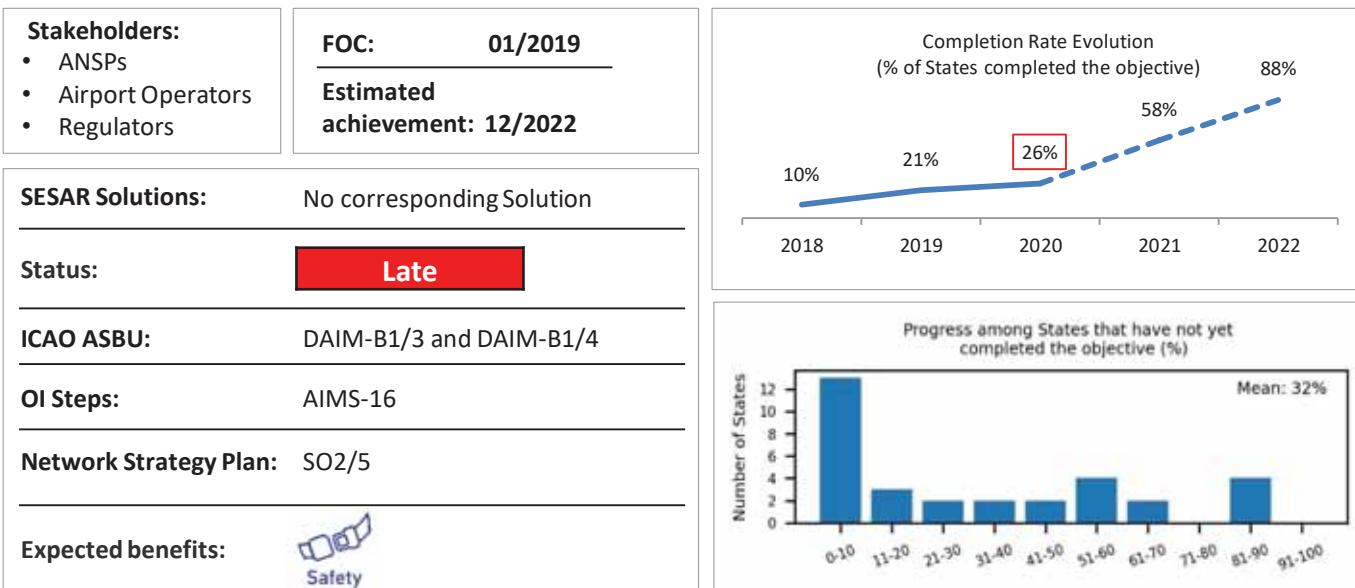
### Main 2020 developments:

INFO8.1 is a very recent objective, with 2020 being the third year in which it has been monitored. Up to this moment, no State has completed it. However, a slight progress in terms of status is observed, with 24 states reporting "Ongoing" (compared to 21 last year). Only 7 states still do not have concrete plans for deployment (compared to 12 last year), which shows a positive evolution. In terms of progress per stakeholder, there has been no improvement in the actions allocated to Military authorities, with a slight advancement on the Airport Operators and ANSPs side. It should be noted that new objectives on information exchanges via SWIM Yellow TI Profile will be added to MPL3 Implementation Plan in light of the recently published CP1 regulation. These new objectives will address different types of information exchanges separately. As a pre-requisite, Common SWIM Public Key Infrastructure (PKI) has to be operational, and stakeholders will need to decide whether to use the certificates offered by the common EU PKI or to implement their own PKI.



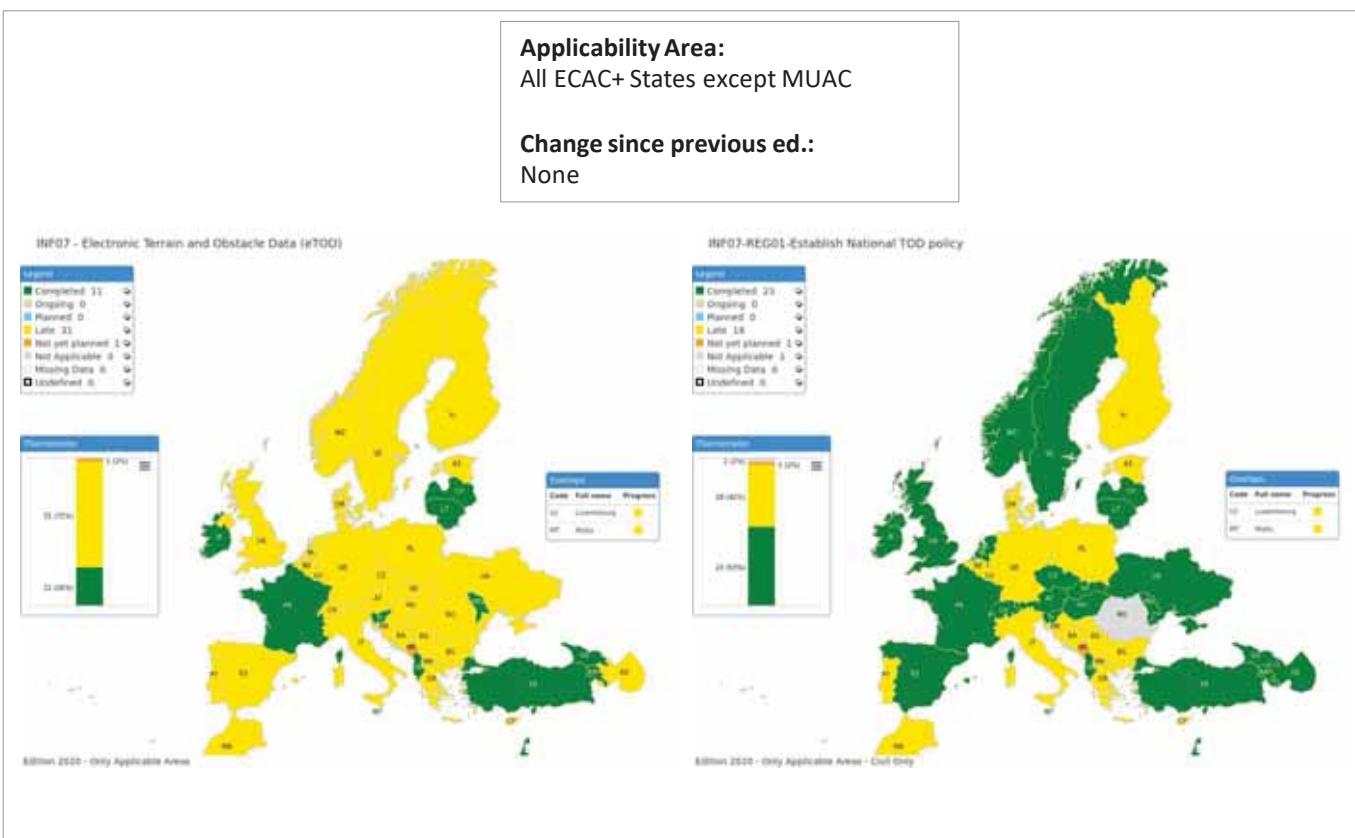
# EOC: Digital AIM and MET Services

## INF07 Electronic Terrain and Obstacle Data (e-TOD)



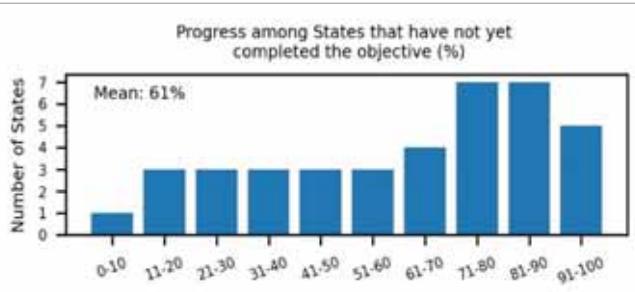
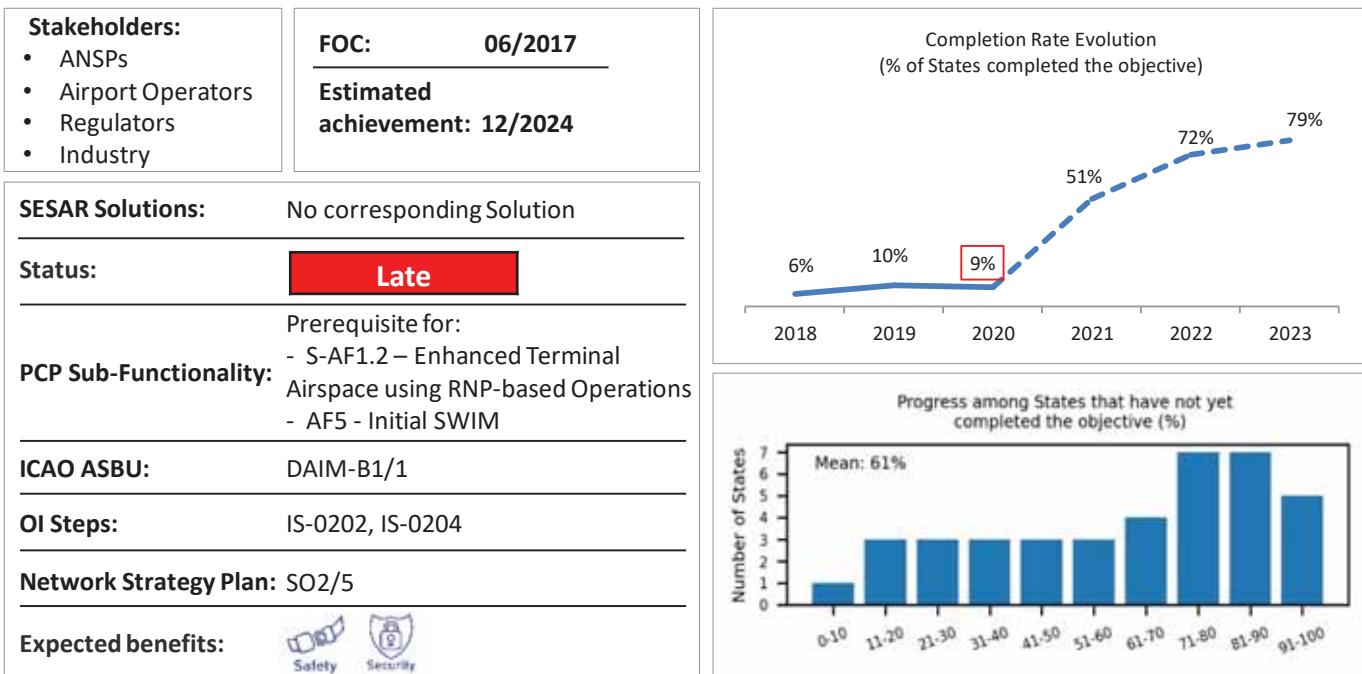
### Main 2020 developments:

Two additional States (AL and FR) have completed the objective during 2020, raising the total number of implementers to 11 and the overall completion rate to 26% (compared to last year's 21%). The FOC date for this objective has been prolonged up to 01/01/2019, however the overall status for this objective remains "Late". Although slightly more than half of States in the applicability area have reported finalization of the action REG01 "Establish National TOD policy" so far, no progress has been observed for it during 2020. It should be noted that this action represents a cornerstone in successful TOD implementation and other actions depend on its availability. Consequently, only a slight improvement since last year has been observed in the remaining activities associated with TOD implementation, leading to relatively low progress towards full completion in most of States (see histogram above).



# EOC: Digital AIM and MET Services

## ITY-ADQ Ensure Quality of Aeronautical Data and Aeronautical Information



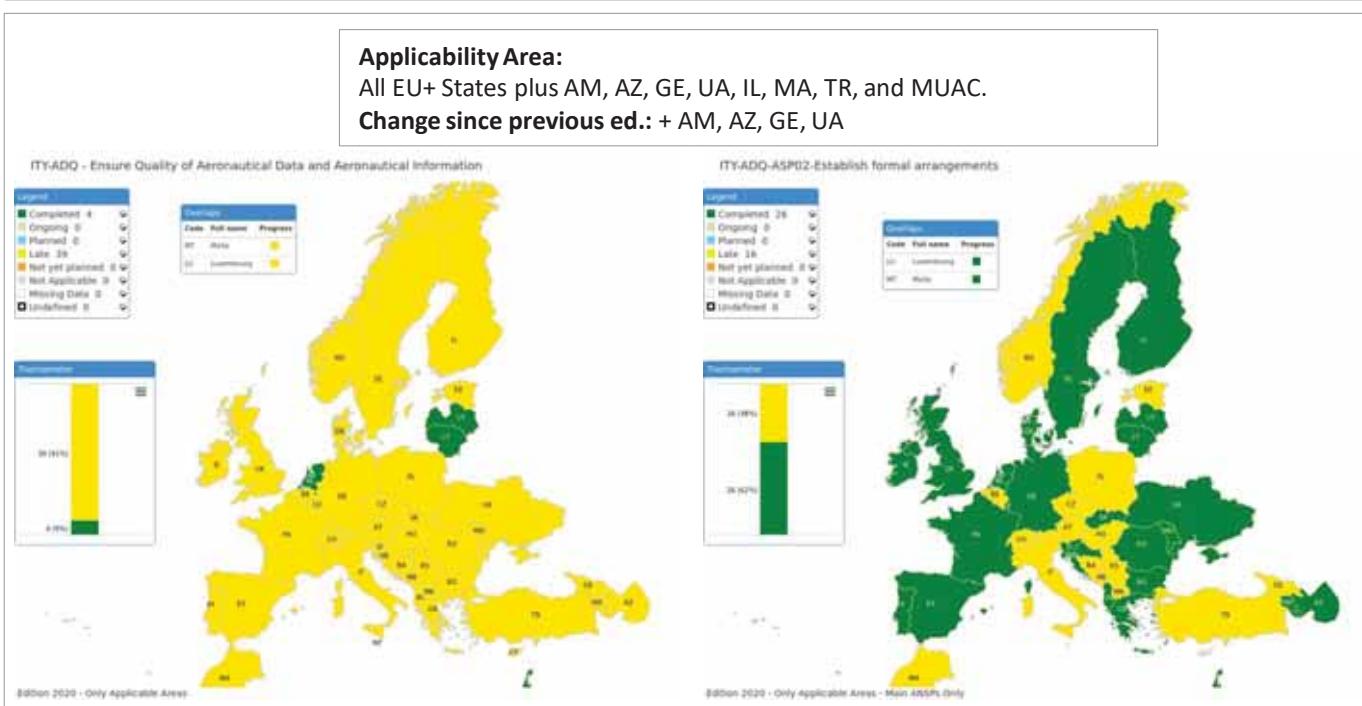
### Main 2020 developments:

In 2020, no additional State has completed this objective, so only four States have so far fully implemented ITY-ADQ, the same number as last year. The completion rate remains rather low (marginal reduction from 10% to 9% because of the extension of the applicability area), and the overall status for this objective is “Late”. In general, majority of ANSPs report either no progress or very low progress. Slightly better progress is achieved by airports and regulatory authorities. Stakeholders now need to start preparing with priority for conformance with:

- The amended Reg. 2017/373 (as amended by 2020/469 and 2020/1177). This concerns all AISPs and all Service Providers who originate data;
- The amended EU Reg 139/2014 (as amended by Reg. 2020/2148), for aerodromes originating data.

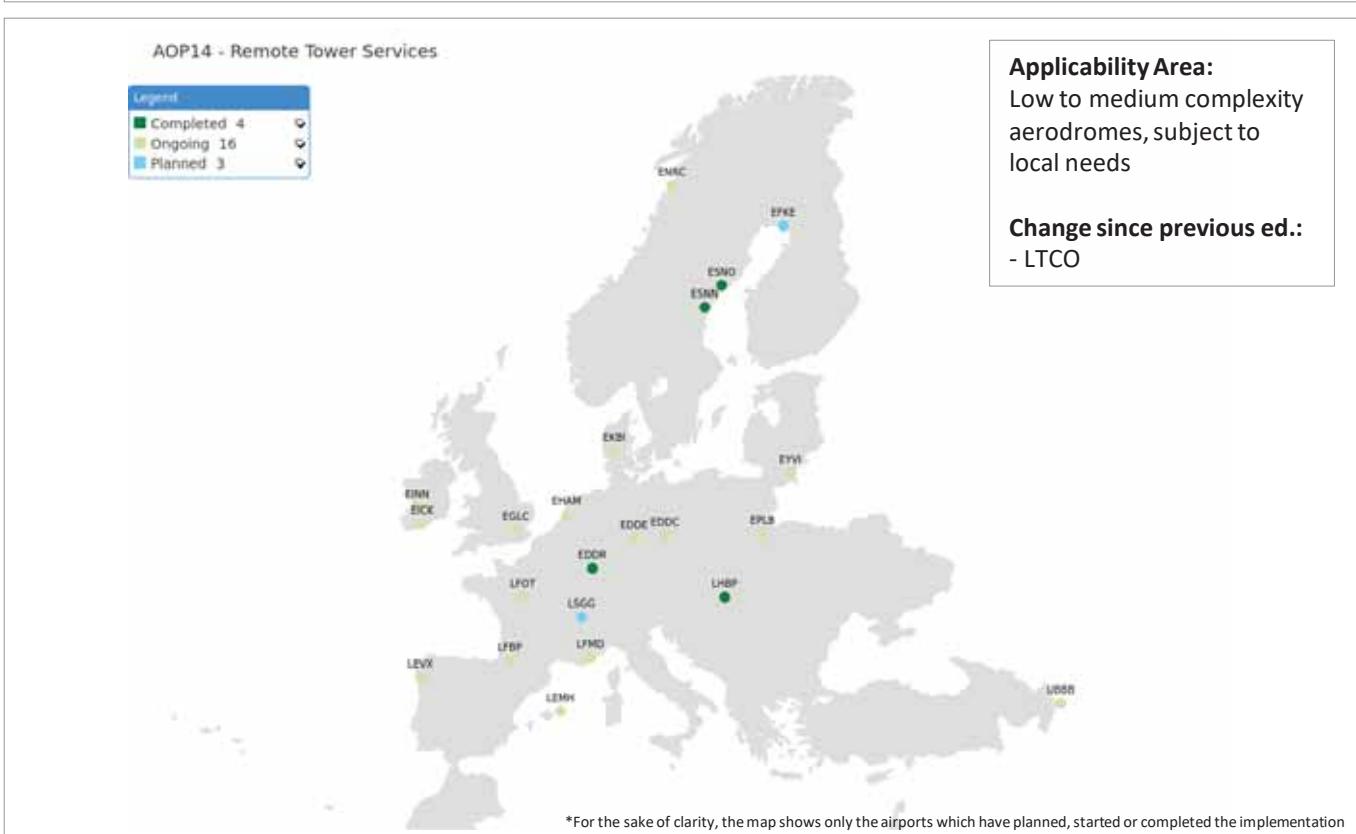
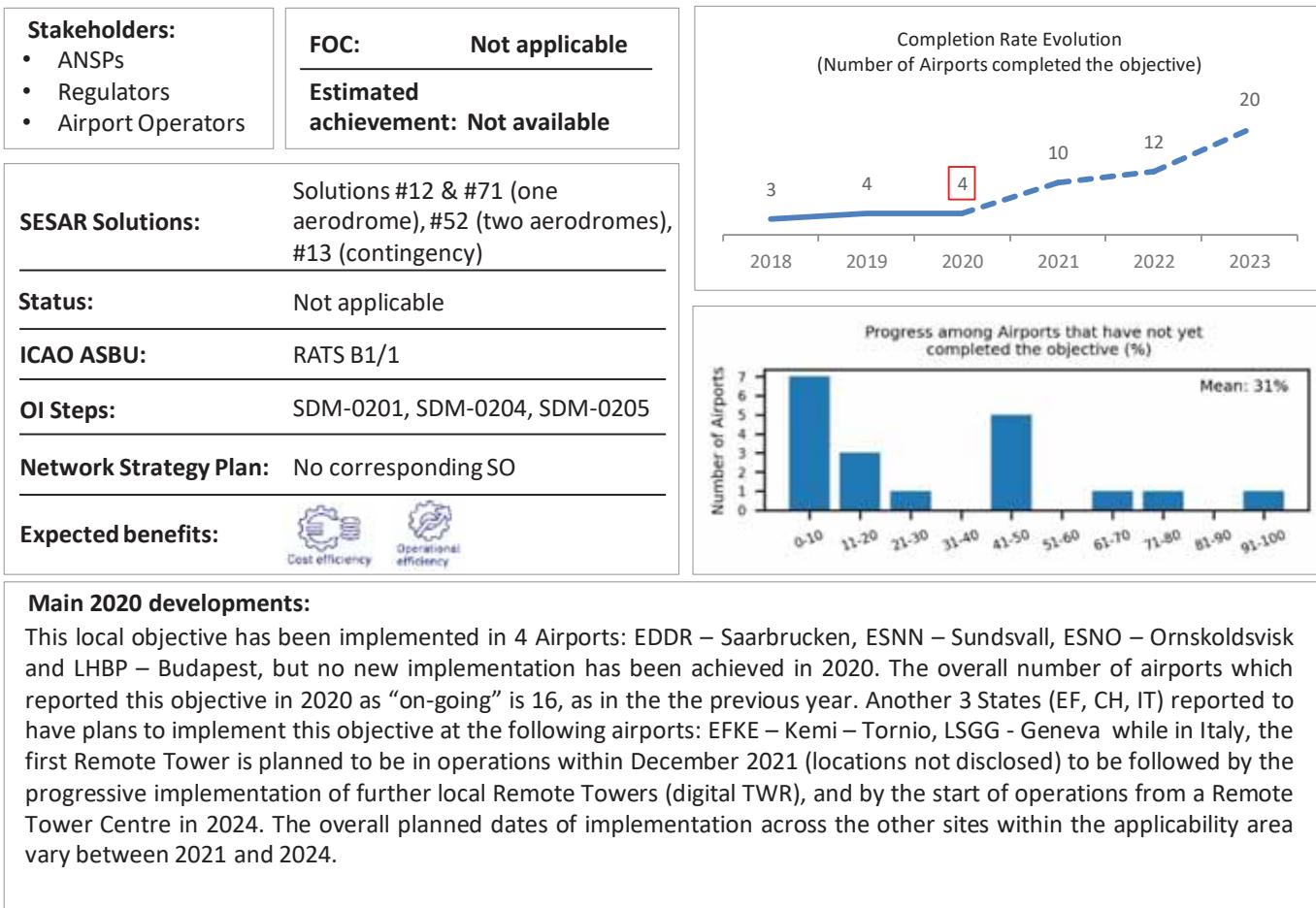
The applicability dates are defined for 27/01/2022 and at this date the ADQ-IR will be repealed.

Consequently, ITY-ADQ will be removed from the MPL3 Implementation Plan 2021, nevertheless, it will be monitored for one more year.



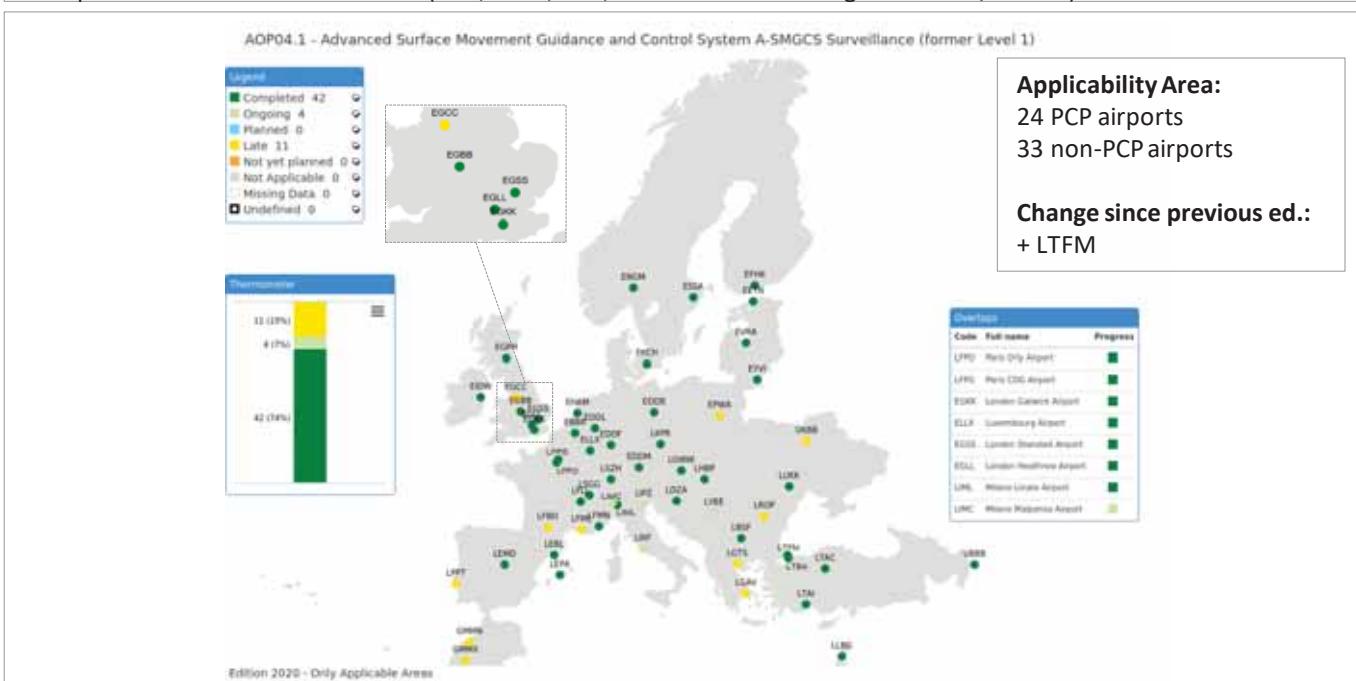
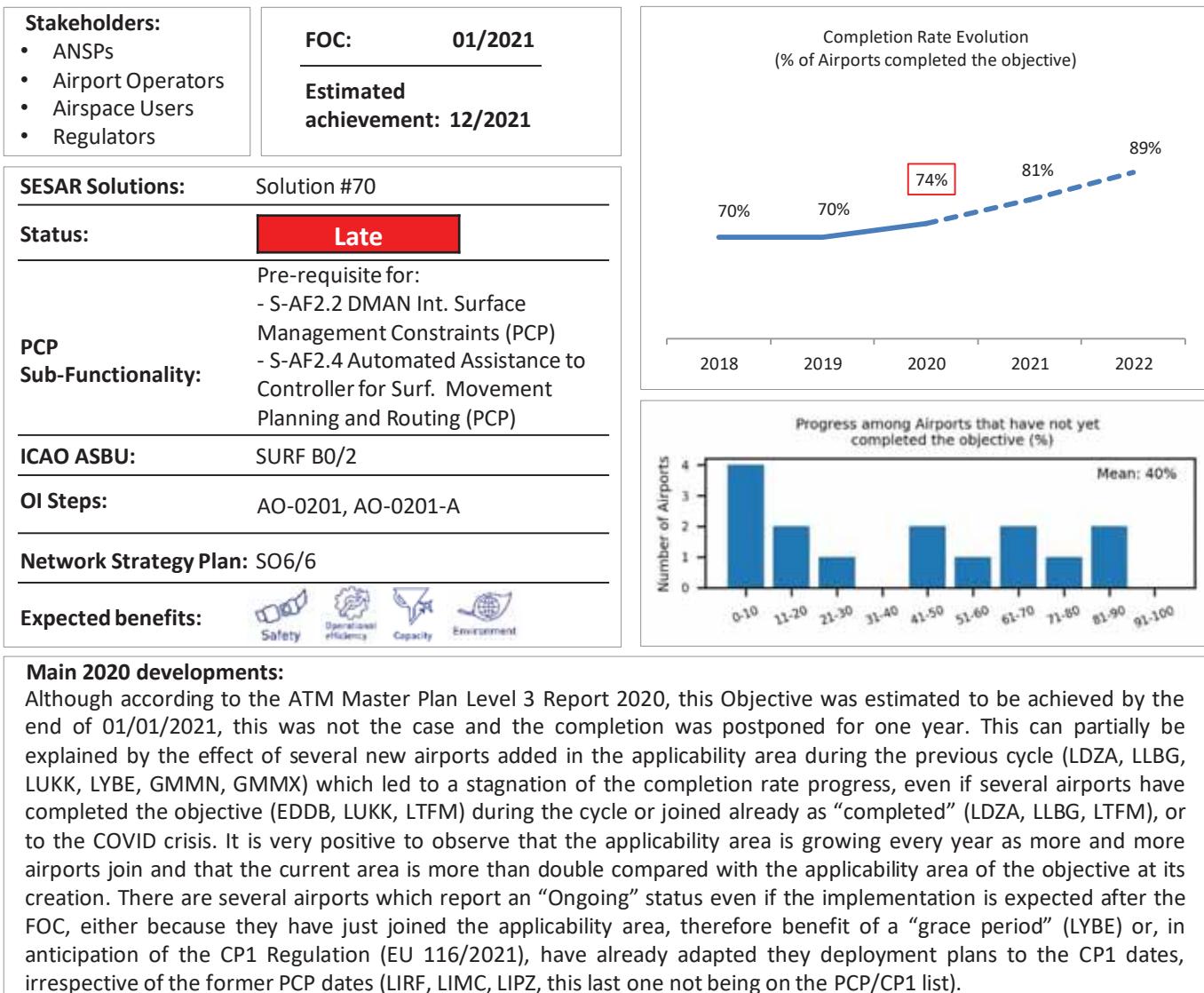
# EOC: Virtualisation of Service Provision

## AOP14 Remote Tower Services [Local]



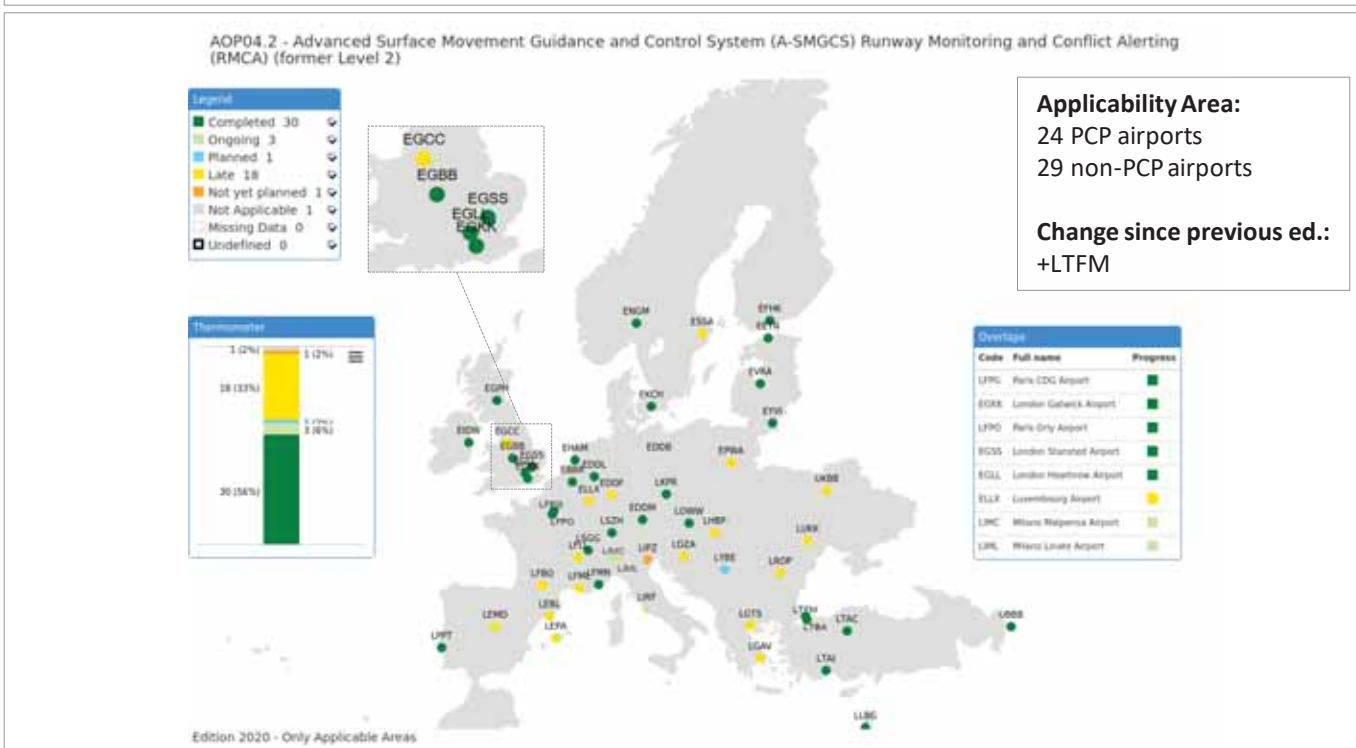
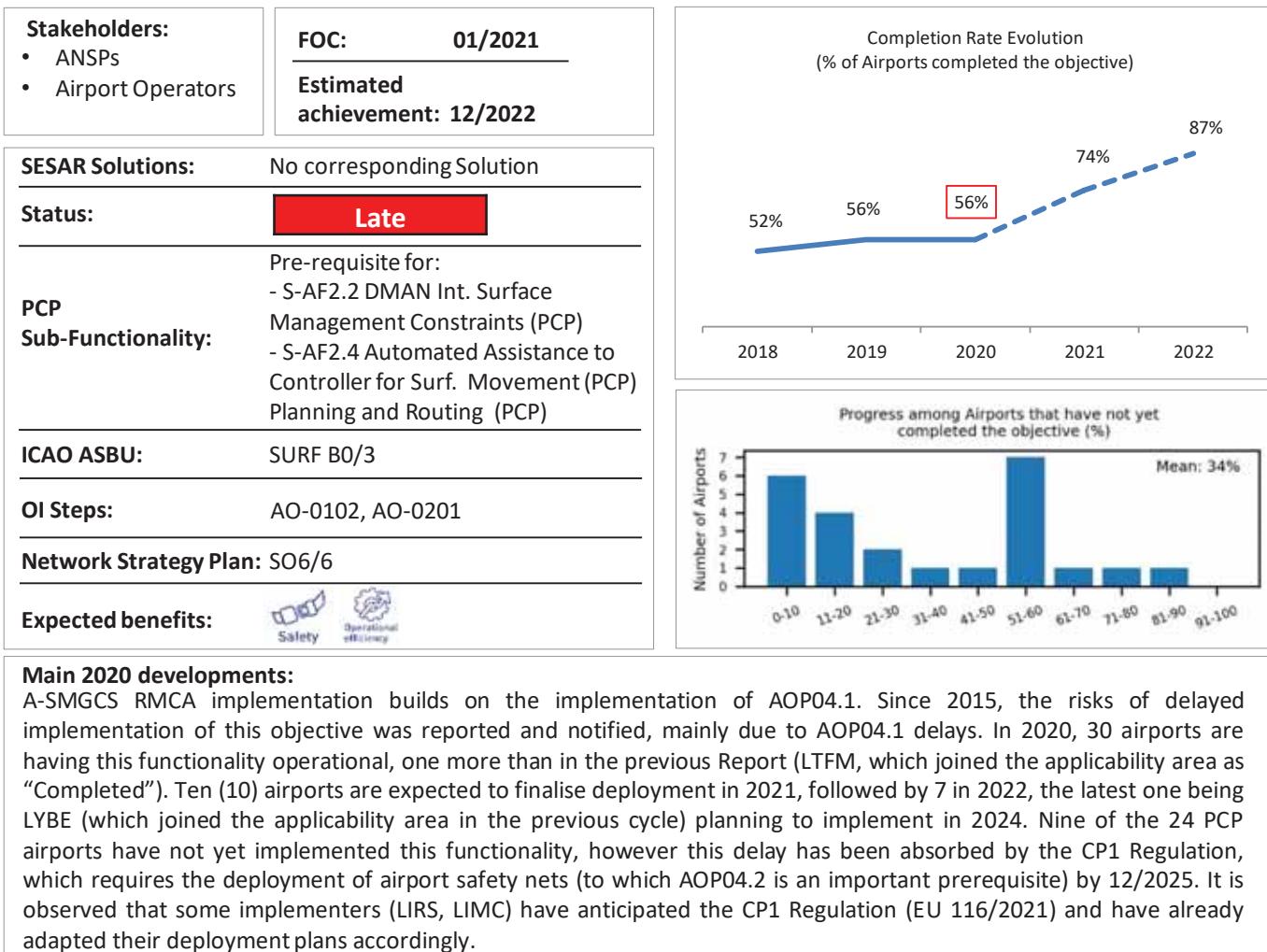
# EOC: Airport and TMA performance

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



# EOC: Airport and TMA performance

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



# EOC: Airport and TMA performance

## AOP05 Airport CDM

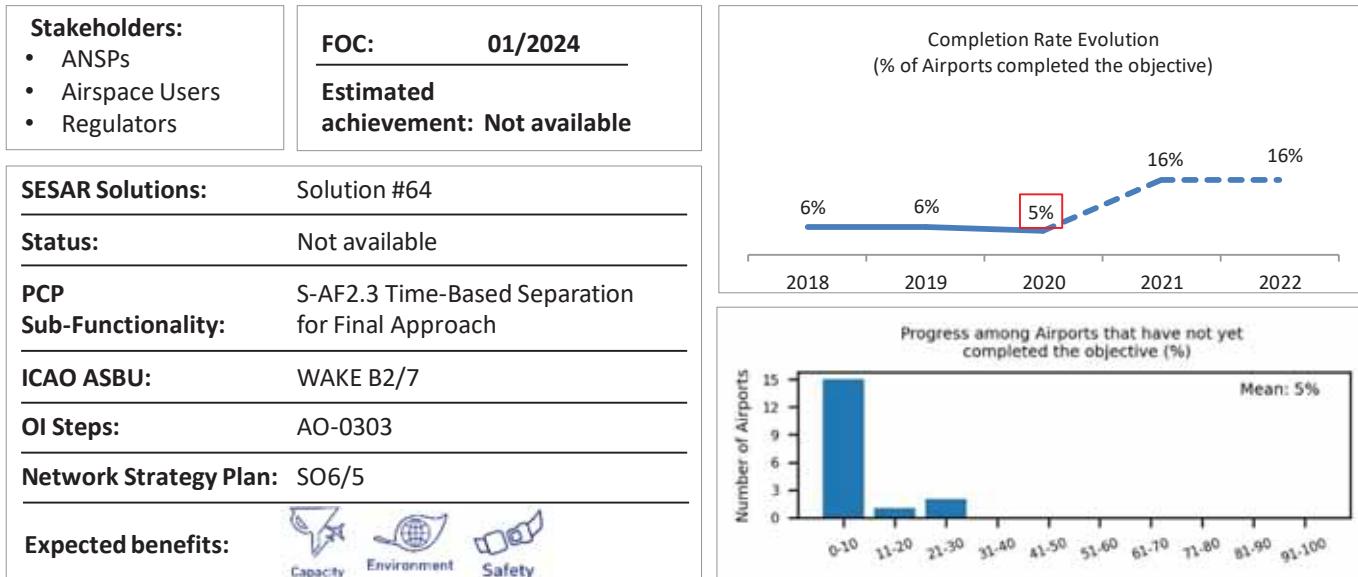
<b>Stakeholders:</b> <ul style="list-style-type: none"> <li>ANSPs</li> <li>Airspace Users</li> <li>Airport Operators</li> <li>Network Manager</li> </ul>	<b>FOC:</b> <u>01/2021</u> <b>Estimated achievement:</b> <u>12/2022</u>	<p>Completion Rate Evolution (% of Airports completed the objective)</p> <table border="1"> <thead> <tr> <th>Year</th> <th>Completion Rate (%)</th> </tr> </thead> <tbody> <tr> <td>2018</td> <td>55%</td> </tr> <tr> <td>2019</td> <td>53%</td> </tr> <tr> <td>2020</td> <td>59%</td> </tr> <tr> <td>2021</td> <td>76%</td> </tr> <tr> <td>2022</td> <td>86%</td> </tr> </tbody> </table>	Year	Completion Rate (%)	2018	55%	2019	53%	2020	59%	2021	76%	2022	86%															
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2021	76%																												
2022	86%																												
<b>SESAR Solutions:</b> Solution #106  <b>Status:</b> <span style="background-color: red; color: white; padding: 2px 10px;">Late</span>	<b>PCP Sub-Functionality:</b> Pre-requisite for: - S-AF2.1. DMAN synchronised with pre-departure sequencing  <b>ICAO ASBU:</b> ACDM B0/2, NOPS B0/4, RSEQ B0/2  <b>OI Steps:</b> AO-0501, AO-0601, AO-0602, AO-0603, TS-0201  <b>Network Strategy Plan:</b> SO6/4  <b>Expected benefits:</b> 	<p>Progress among Airports that have not yet completed the objective (%)</p> <table border="1"> <thead> <tr> <th>Range (%)</th> <th>Number of Airports</th> </tr> </thead> <tbody> <tr> <td>0-10</td> <td>10</td> </tr> <tr> <td>11-20</td> <td>3</td> </tr> <tr> <td>21-30</td> <td>2</td> </tr> <tr> <td>31-40</td> <td>2</td> </tr> <tr> <td>41-50</td> <td>1</td> </tr> <tr> <td>51-60</td> <td>1</td> </tr> <tr> <td>61-70</td> <td>2</td> </tr> <tr> <td>71-80</td> <td>1</td> </tr> <tr> <td>81-90</td> <td>1</td> </tr> <tr> <td>91-100</td> <td>3</td> </tr> </tbody> </table> <p>Mean: 31%</p>	Range (%)	Number of Airports	0-10	10	11-20	3	21-30	2	31-40	2	41-50	1	51-60	1	61-70	2	71-80	1	81-90	1	91-100	3					
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61-70	2																												
71-80	1																												
81-90	1																												
91-100	3																												
<b>Main 2020 developments:</b> In 2020, 4 airports (LPPT, LFMN, EDDB and EPWA) declared the implementation as completed. For EDDB, it was decided to implement the existing BER A-CDM to guarantee a seamless switch at the airport opening. Four (4) more airports (GMMN, GMMX, LTFM, LQSA) joined the applicability area of this objective, while 2 left (LGIR, LGRP) leading to only a slight increase of the completion rate. Eight (8) more Airports are expected to finalise implementation in 2021, while the 80% completion threshold will not be reached before 2022 when another 5 airports should finalise the implementation. It should be noted that in the context of the CP1 Regulation (EU 116/2021), A-CDM is facilitating the deployment of AF2 on Departure Management Synchronized with Pre-departure sequencing which is required by 12/2022.																													
<p><b>AOP05 - Airport Collaborative Decision Making (A-CDM)</b></p> <p><b>Applicability Area:</b> 24 PCP airports 25 non-PCP airports</p> <p><b>Change since previous ed.:</b> + LQSA, LTFM, GMMN, GMMX - LGIR, LGRP</p> <table border="1"> <thead> <tr> <th>Code</th> <th>Full name</th> <th>Progress</th> </tr> </thead> <tbody> <tr> <td>LPPT</td> <td>Parmi CDG Airport</td> <td>■</td> </tr> <tr> <td>EGKK</td> <td>London Gatwick Airport</td> <td>■</td> </tr> <tr> <td>EGLL</td> <td>London Heathrow Airport</td> <td>■</td> </tr> <tr> <td>LFPO</td> <td>Paris Orly Airport</td> <td>■</td> </tr> <tr> <td>LIMC</td> <td>Milano Malpensa Airport</td> <td>■</td> </tr> <tr> <td>LIRL</td> <td>Milano Linate Airport</td> <td>■</td> </tr> <tr> <td>EGSS</td> <td>London Stansted Airport</td> <td>■</td> </tr> <tr> <td>EGGW</td> <td>London Luton Airport</td> <td>■</td> </tr> </tbody> </table>			Code	Full name	Progress	LPPT	Parmi CDG Airport	■	EGKK	London Gatwick Airport	■	EGLL	London Heathrow Airport	■	LFPO	Paris Orly Airport	■	LIMC	Milano Malpensa Airport	■	LIRL	Milano Linate Airport	■	EGSS	London Stansted Airport	■	EGGW	London Luton Airport	■
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Edition 2020 - Only Applicable Areas

# EOC: Airport and TMA performance

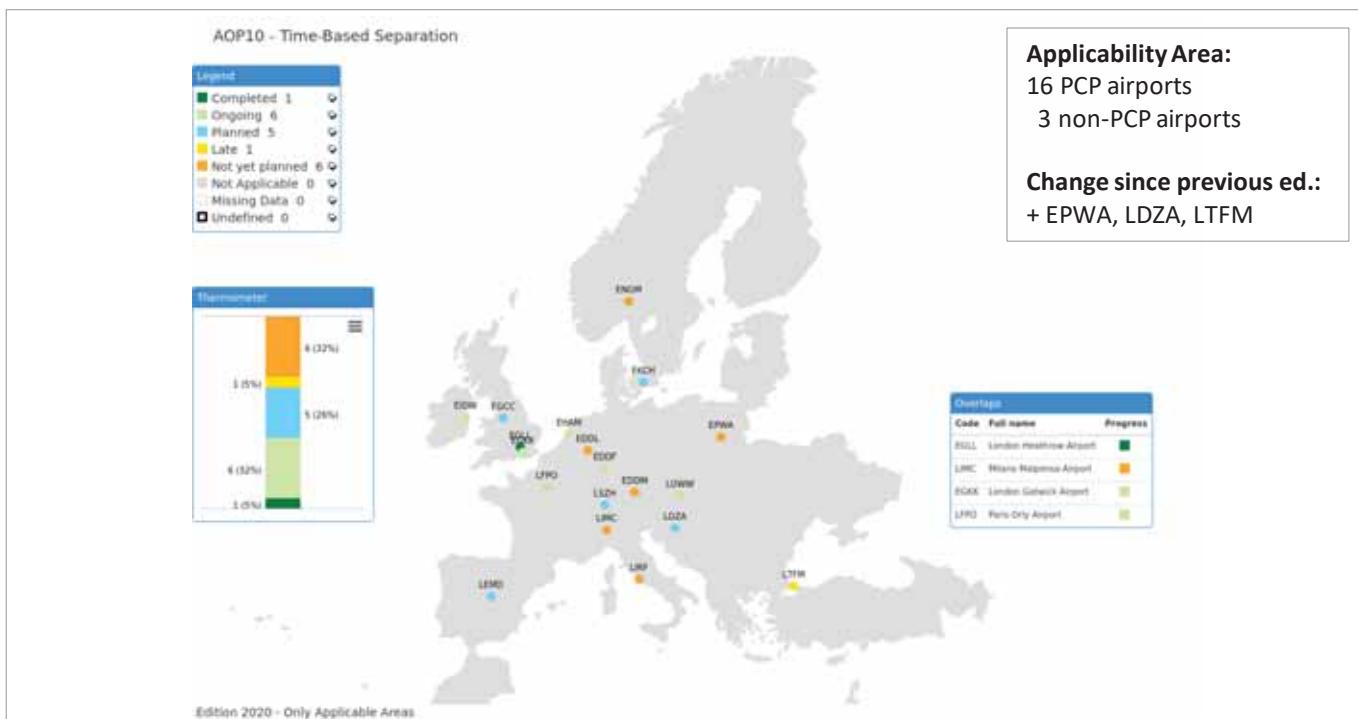
## AOP10 Time Based Separation

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



### Main 2020 developments:

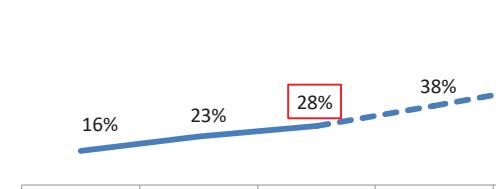
The objective is currently implemented only at London Heathrow (EGLL). Six airports have actively pursued implementation in 2020, while 3 airports (EPWA, LDZA, LTFM) have joined the applicability area, therefore the slight reduction in the completion rate. Overall, the objective has started or is planned to progress towards implementation for the majority of the airports concerned. However, based on what is reported in 2020, by the FOC date (01/01/2024), only 12 airports will reach completion. The current data indicates that next completion is planned at Amsterdam (EHAM) and Dublin (EIDW) by end of 2021, to be followed by Copenhagen (EKCH), Madrid Barajas (LEMD), Vienna (LOWW), Frankfurt (EDDF), Paris CDG (LFPG), Zurich (LSZH), London Gatwick (EGKK), Manchester (EGCC) and Zagreb (LDZA) in 2023. Still, because of the many airports reporting "Not yet planned" it is not yet possible to accurately estimate a completion date across the entire applicability area. The fact that this functionality is not addressed by the CP1 Regulation (EU 116/2021) anymore as well as the COVID crisis (LOWW and EHAM have already delayed their implementation date by a couple of months because of COVID) will very probably impact the implementation plans and the implementation pace for TBS over the next periods.



# EOC: Airport and TMA performance

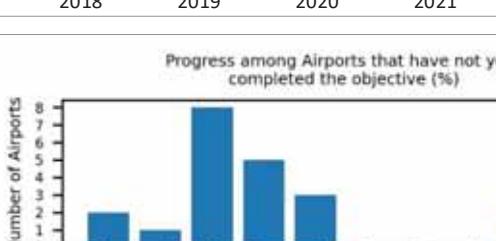
## AOP12 Improve RWY safety with CATC and CMAC

<b>Stakeholders:</b>	<b>FOC:</b> <u>01/2021</u>
• ANSPs	
• Airspace Users	
• Airport Operators	
<b>SESAR Solutions:</b>	Solution #02
<b>Status:</b>	<b>Planned delay</b>
<b>PCP Sub-Functionality:</b>	S-AF2.1 DMAN synchronised with pre-departure sequencing S-AF2.5 Airport Safety Nets
<b>ICAO ASBU:</b>	SURF B1/3
<b>OI Steps:</b>	AO-0104-A
<b>Network Strategy Plan:</b>	SO6/6
<b>Expected benefits:</b>	 Safety



Completion Rate Evolution  
(% of Airports completed the objective)

Year	Completion Rate (%)
2018	16%
2019	23%
2020	28%
2021	38%
2022	48%



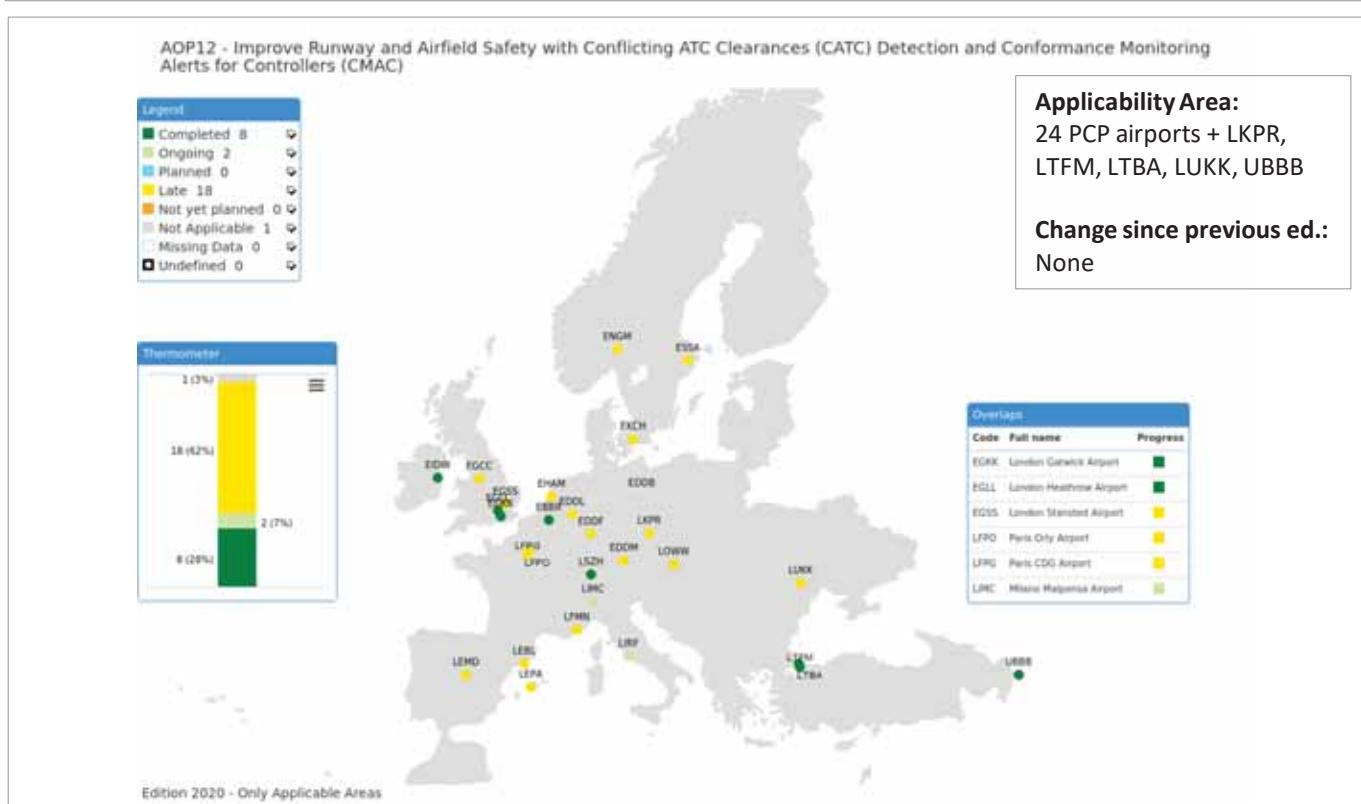
Progress among Airports that have not yet completed the objective (%)

Range	Number of Airports
0-10	2
11-20	1
21-30	7
31-40	4
41-50	3
51-60	0
61-70	0
71-80	0
81-90	1
91-100	0

Mean: 35%

## Main 2020 developments:

In 2020, 2 airports have completed the objective, Dublin (EIDW) and Istanbul (LTFM), which joined the applicability area in the previous reporting cycle. As the FOC of the objective has passed, the number of airports reporting a "Late" status increased from 9 to 18. In 2021, 3 airports (LKPR, ESSA and EGSS) expect to finalize completion while the 80% completion threshold is expected to be reached in 2024, with full implementation planned for 2025. This date is consistent with the requirements of the CP1 Regulation (EU 116/2021), which mandates the deployment of airport safety nets functionality by 12/2025. Therefore many airports have started to adapt their deployment plans based on the new date, while some (LIRF, LIMC) have already adapted the reported status to reflect the new deadlines.



# EOC: Airport and TMA performance

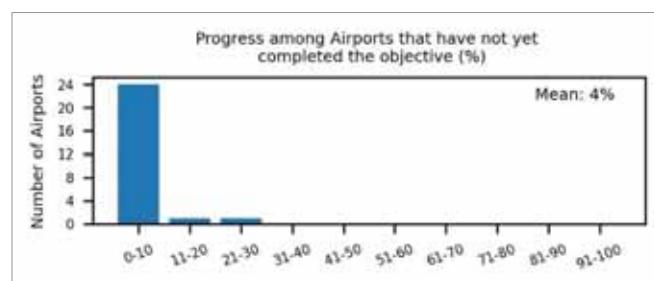
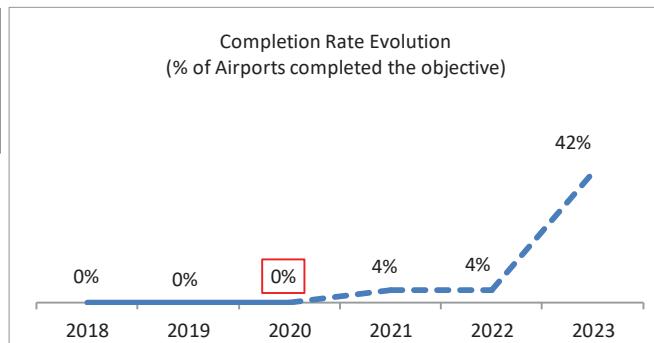
## AOP13 Automated assistance to controller for surface movement planning and routing

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

<b>Stakeholders:</b>
• ANSPs
• Regulators

<b>FOC:</b>	<b>01/2024</b>
<b>Estimated achievement:</b>	<b>Not available</b>

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

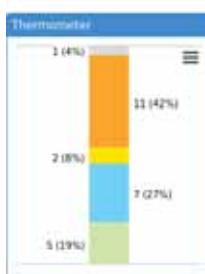


### Main 2020 developments:

This objective shows no progress and, due to high number of “Not yet planned” statuses, no reliable estimate can be made on whether it will indeed be implemented in the majority of the applicable airports by the FOC date of 2024. Compared with 2019, 11 airports have not yet defined any concrete implementation plans (2019 counted 7), as several airports (LTBA, LFPG, LFPO, LFMN) have reverted the status from “Ongoing” to “Not yet planned”, in particular due to the unproven operational benefits of the objective and lack of maturity. Another 7 airports report having defined plans, but not yet started the implementation. Even if the FOC date is still remote, the current implementation pace as well as the fact that this functionality has been removed from the scope of the CP1 Regulation (EU 116/2021) give strong indications that the objective will not be implemented on time.

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

Legend	
Completed: 0	■
Ongoing: 5	■
Planned: 7	■
Late: 2	■
Not yet planned: 11	■
Not Applicable: 1	■
Missing Data: 0	■
Undefined: 0	■



**Applicability Area:**  
24 PCP airports + LTBA,  
LTFM

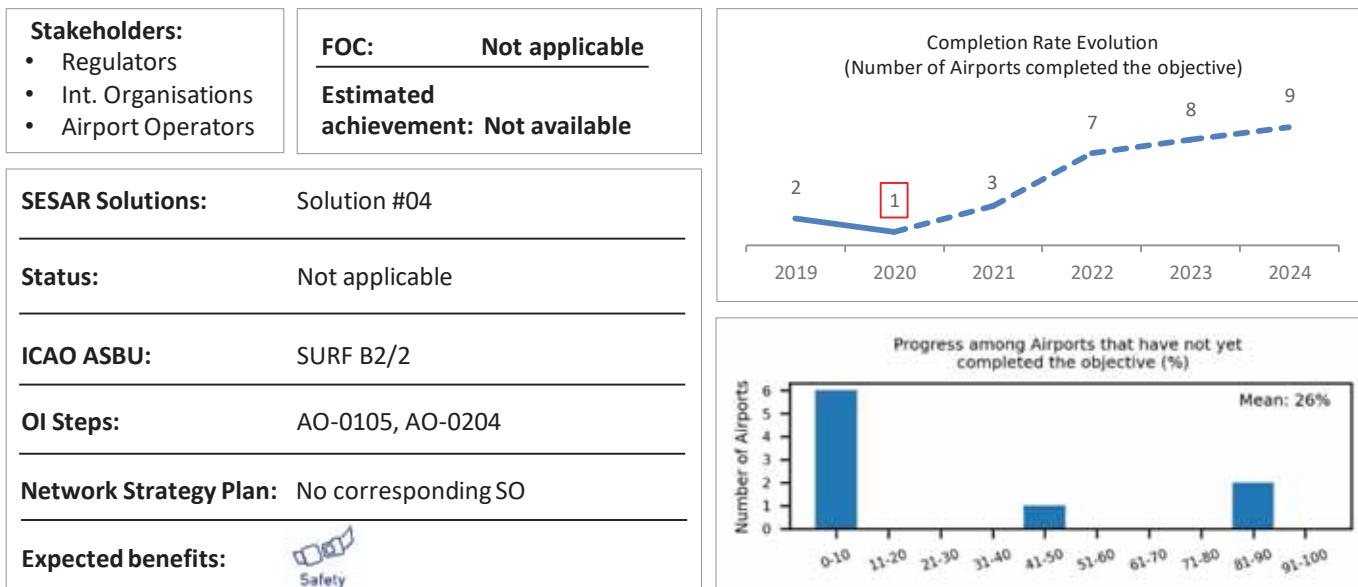
**Change since previous ed.:**  
None

Overview		
Code	Full name	Progress
EGKK	London Gatwick Airport	■
EGSS	London Stansted Airport	■
LFPG	Paris CDG Airport	■
LFPO	Paris Orly Airport	■
LFCM	Milan Malpensa Airport	■
LGII	London Heathrow Airport	■

Edition 2020 - Only Applicable Areas

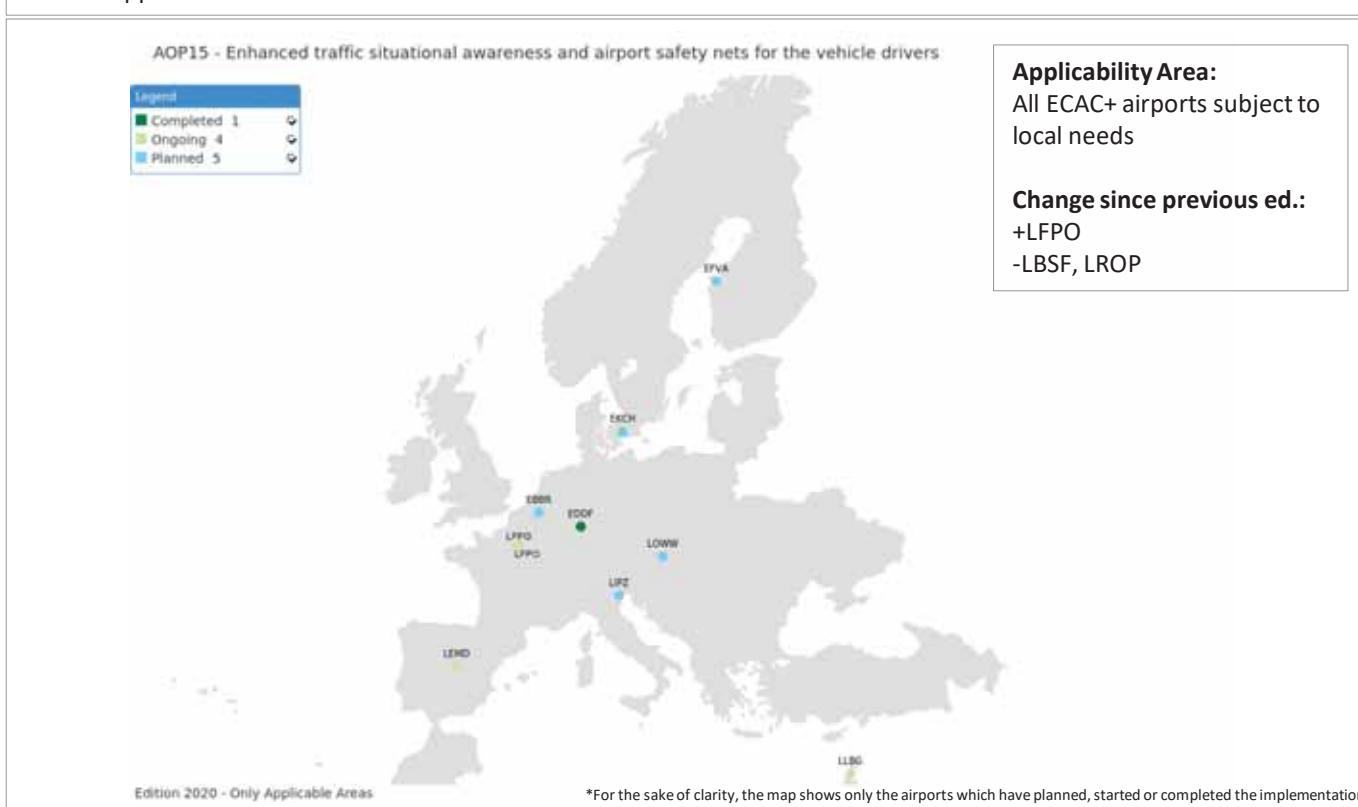
# EOC: Airport and TMA performance

## AOP15 Safety Nets for vehicle drivers [Local]



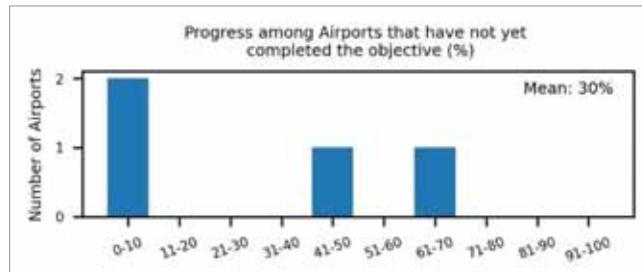
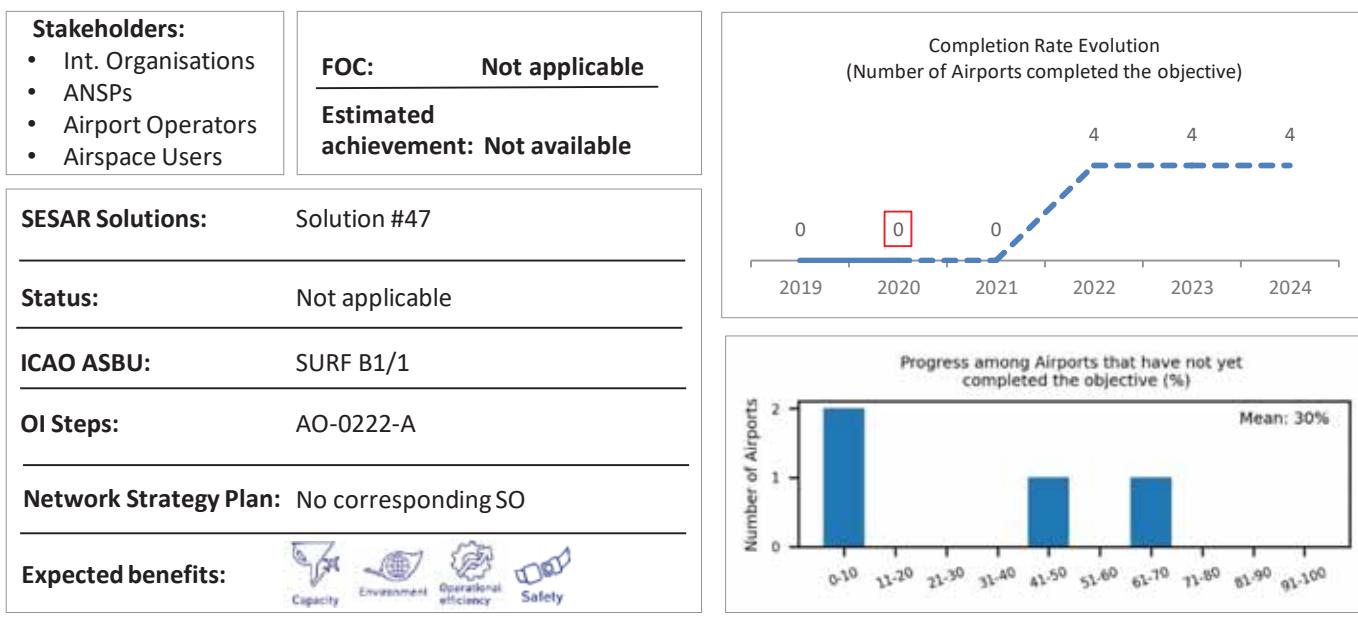
### Main 2020 developments:

While the “Enhanced traffic situational awareness and airport safety nets for the vehicle drivers” objective is still not yet planned for most of the airports (26), one airport has already implemented the objective (EDDF) in 2019. One airport (LFPG) went back from “Completed” in 2019 to “Ongoing” in 2020 as the current system (Capricorn) which only partly provides the functionality will be replaced by a fully compliant new system (Aquarius). In addition to the 3 airports (LEMD, LLBG and LFPG) which started the implementation already in 2019, LFPO started the implementation in 2020, while 5 airports have not yet started the implementation but report plans to implement it (EBBR by 12/2023, EKCH by 12/2022, EFVA by 12/2024, LIPZ by 12/2022, LOWW by 12/2025) – all but EFVA have postponed their implementation date as reported last year because of the COVID crisis. The remaining airports within ECAC+ area reported this objective as “not applicable”.



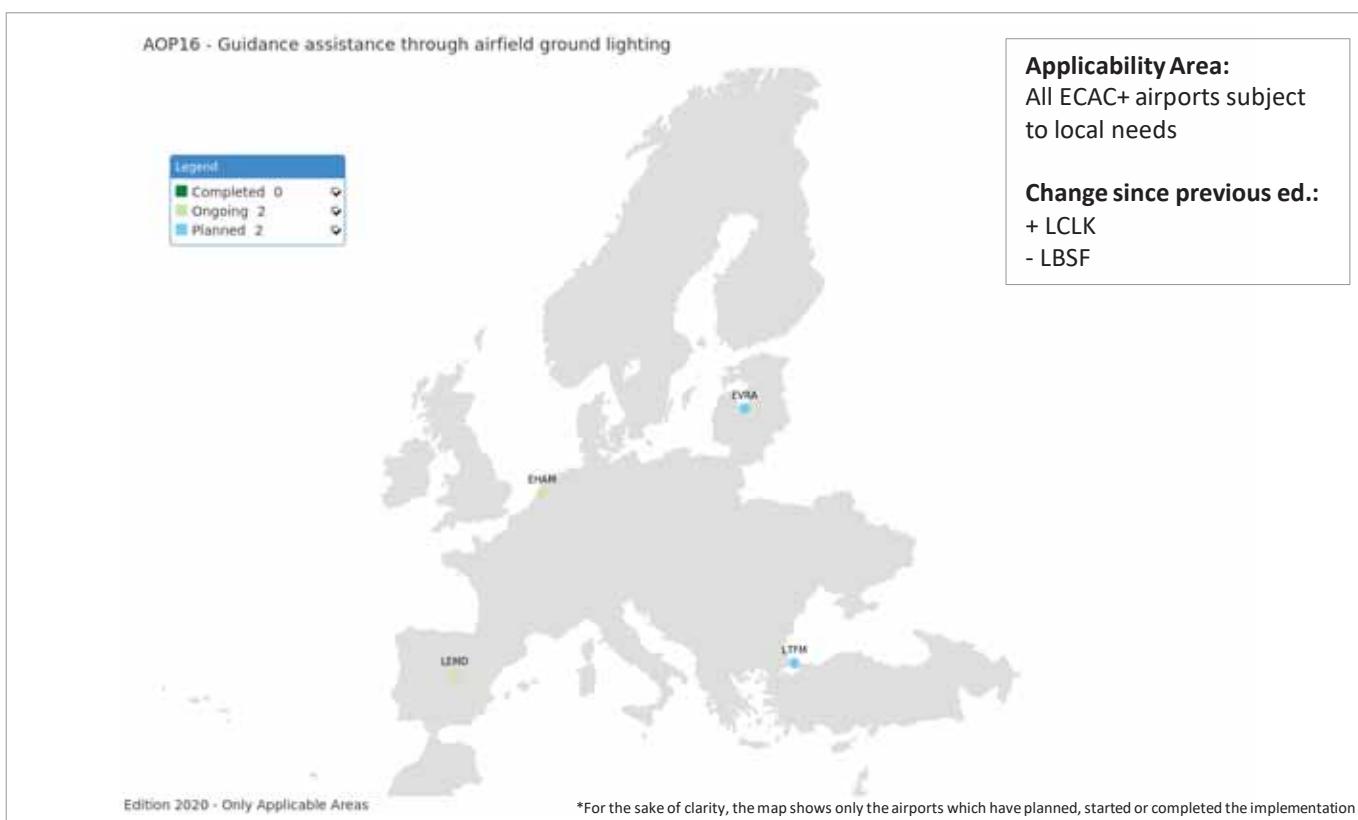
# EOC: Airport and TMA performance

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



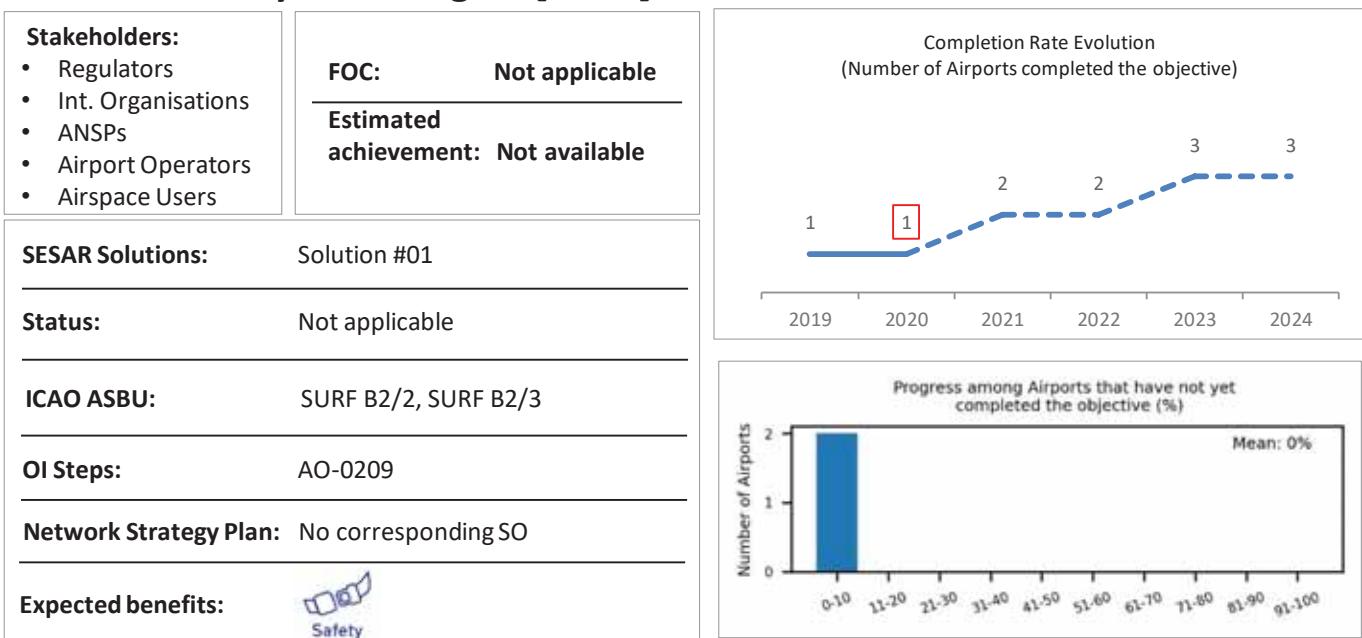
### Main 2020 developments:

Guidance assistance through airfield ground lighting (AGL) is intended for controllers, flight crews and vehicle drivers. It corresponds to the A-SMGCS Guidance function foreseen in ICAO's A-SMGCS Manual (Doc. 9830). It links aerodrome lighting infrastructure with the taxi route management system (Routing & Planning), thus providing an unambiguous route for the taxiing aircraft/vehicle to follow. Most of the airports have not yet planned any implementation of this objective (27), while the rest of the airports in ECAC+ area have declared it as "not applicable". Two airports (LEMD, EHAM) started the implementation, one of them in 2020 (EHAM) with completion expected in 2022, while 2 more have plans to implement it (EVRA and LTFM) by the same time. No airports have currently implemented the objective.



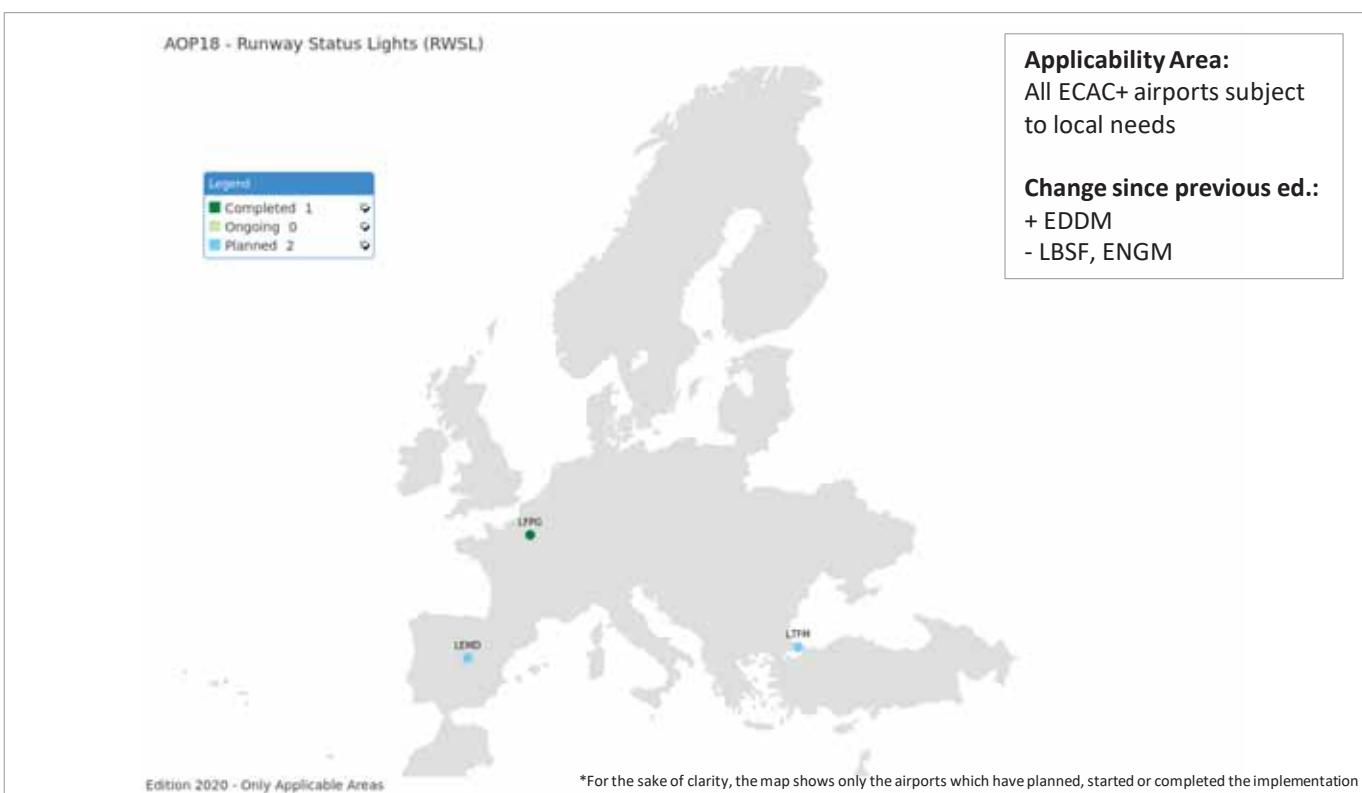
# EOC: Airport and TMA performance

## AOP18 Runway Status Lights [Local]



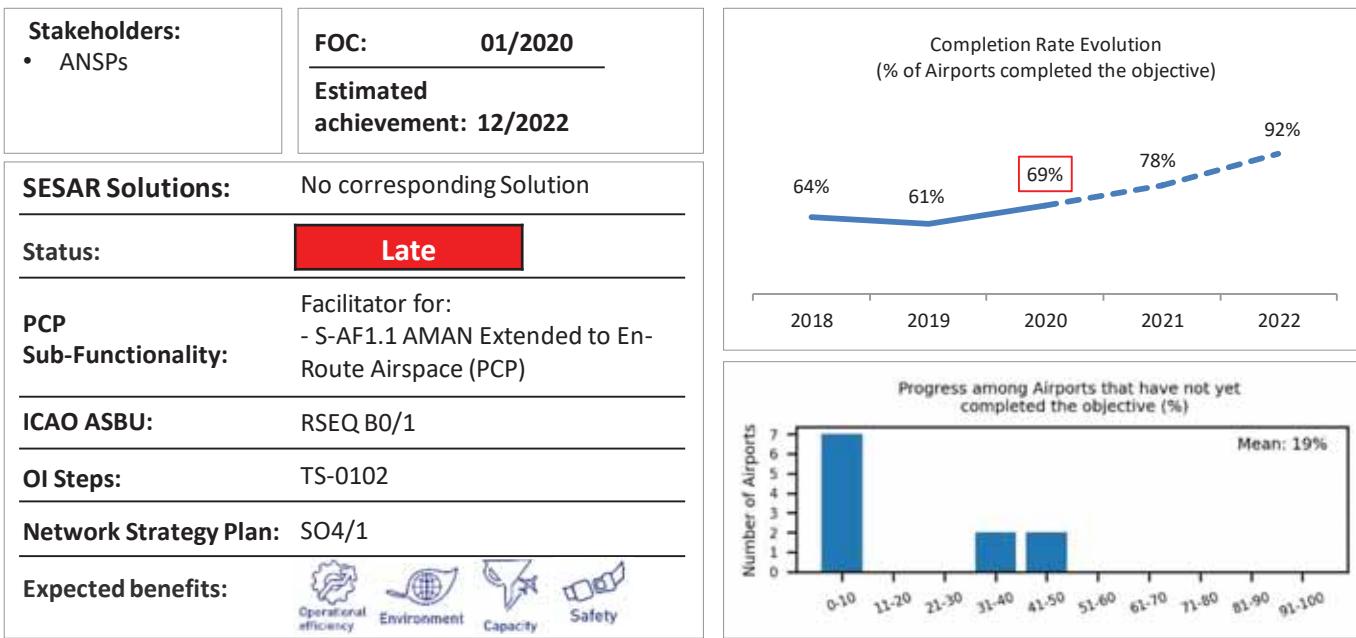
### Main 2020 developments:

Runway Status Lights (RWLS) system is an automatic independent system based on aerodrome surveillance data that is used as a safety net to inform the flight crews/vehicle drivers about the instantaneous runway usage, irrespective of ATC clearances, to increase safety and reduce the number of RWY incursions. While the vast majority of the airports in ECAC+ reported it as "not yet planned" (29) or "not applicable", only 1 airport reported it as "completed" so far (LFPG) while another 2 have reported plans for 12/2021 (LTFM) and for 12/2023 (LEMD). No other airports expect to complete their implementation by the end of 2024. This year, the reasons for such a lack of implementation plans are: the low traffic complexity, non-complex airport layouts, other airside priorities/budget, delays in assessing the situation because of the COVID crisis or already other guidance in place (LOWW: stop bars are permanently lighted and EGLL: 100% guidance for aircraft through manual switching of airfield ground lighting).



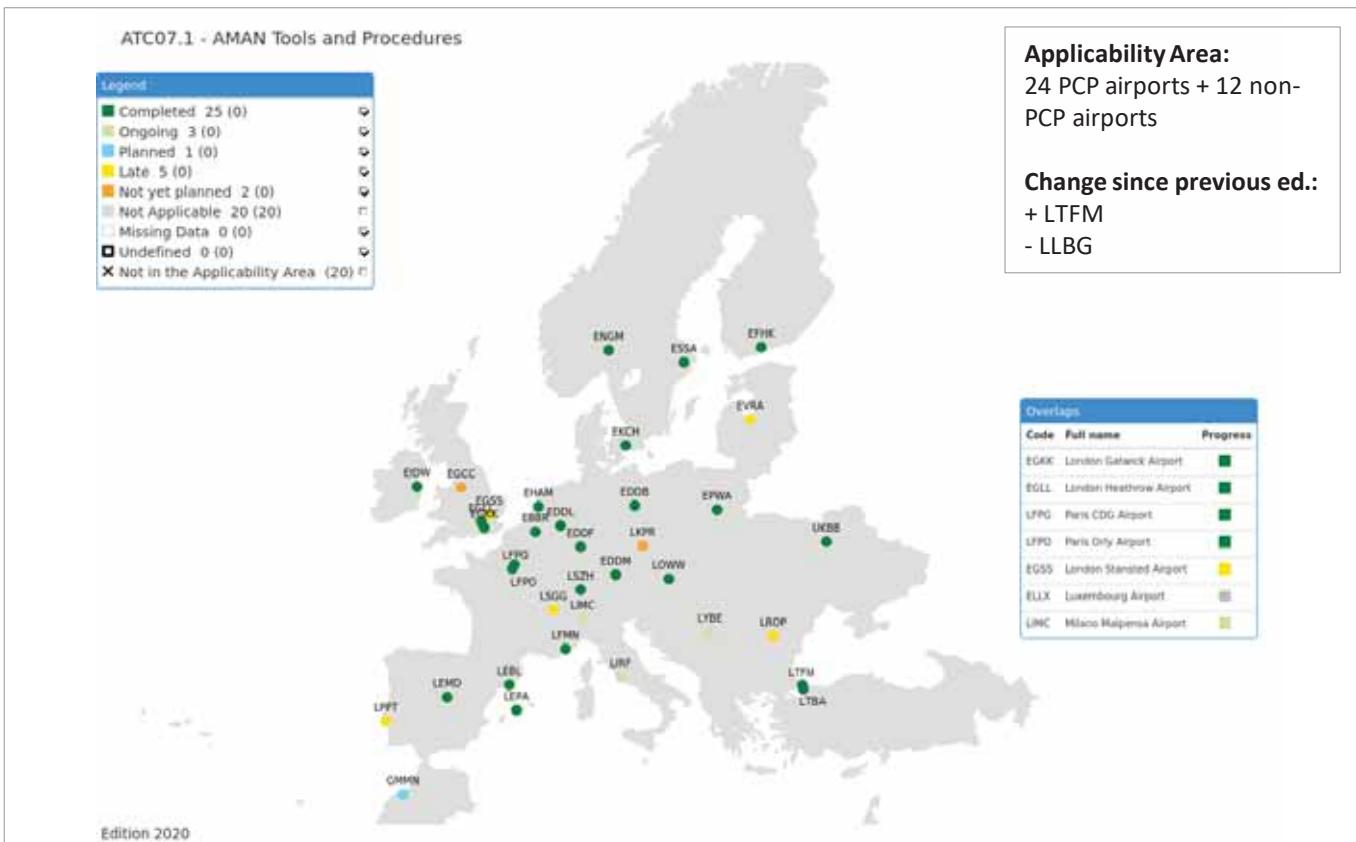
# EOC: Airport and TMA performance

## ATC07.1 AMAN tools and procedures



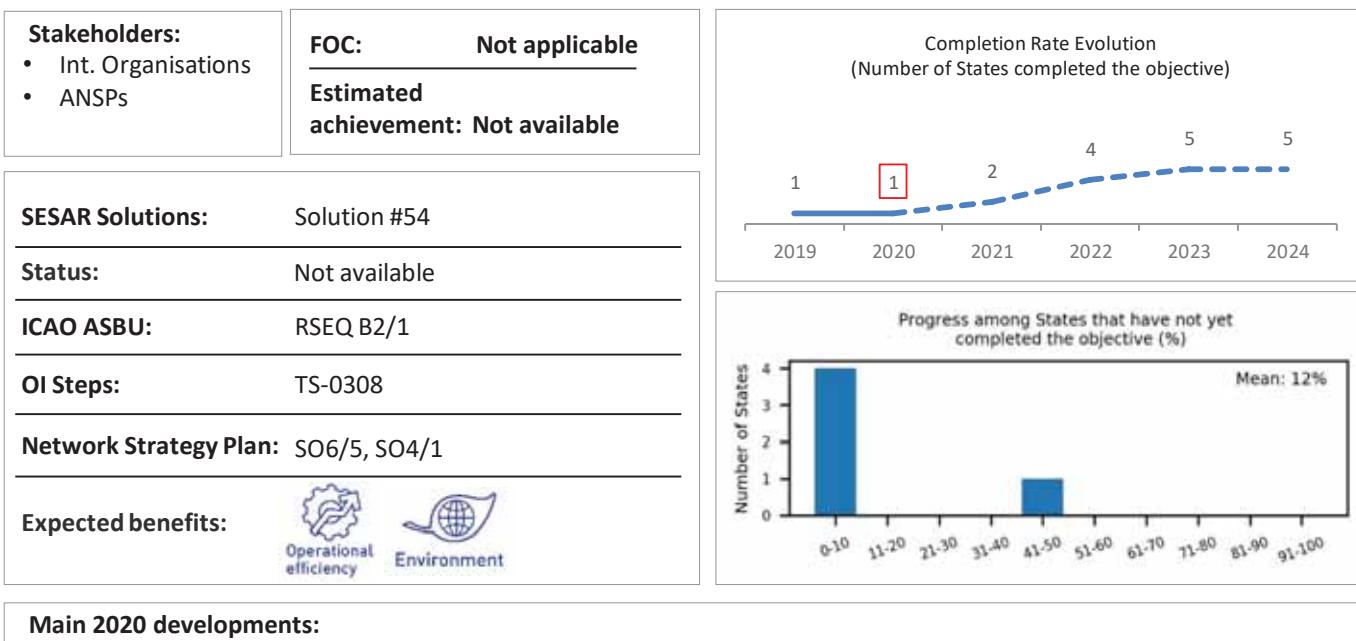
### Main 2020 developments:

There are 25 airports having completed this objective (70% of the airports within the applicability area), compared to 22 in 2019. In 2020 basic AMAN was operationally introduced in EBBR, EDDB and LTFM. Three locations plan to finish implementation by 2021 (LIMC, LIRF and EVRA). Belgrade, Bucharest, Casablanca, Geneva and Lisbon plan to complete implementation in 2022. Given the above and the very advanced status of deployment, this objective is expected to be Achieved (with a minimum of 80% of locations having reached operational introduction) by end of 2022.



# EOC: Airport and TMA performance

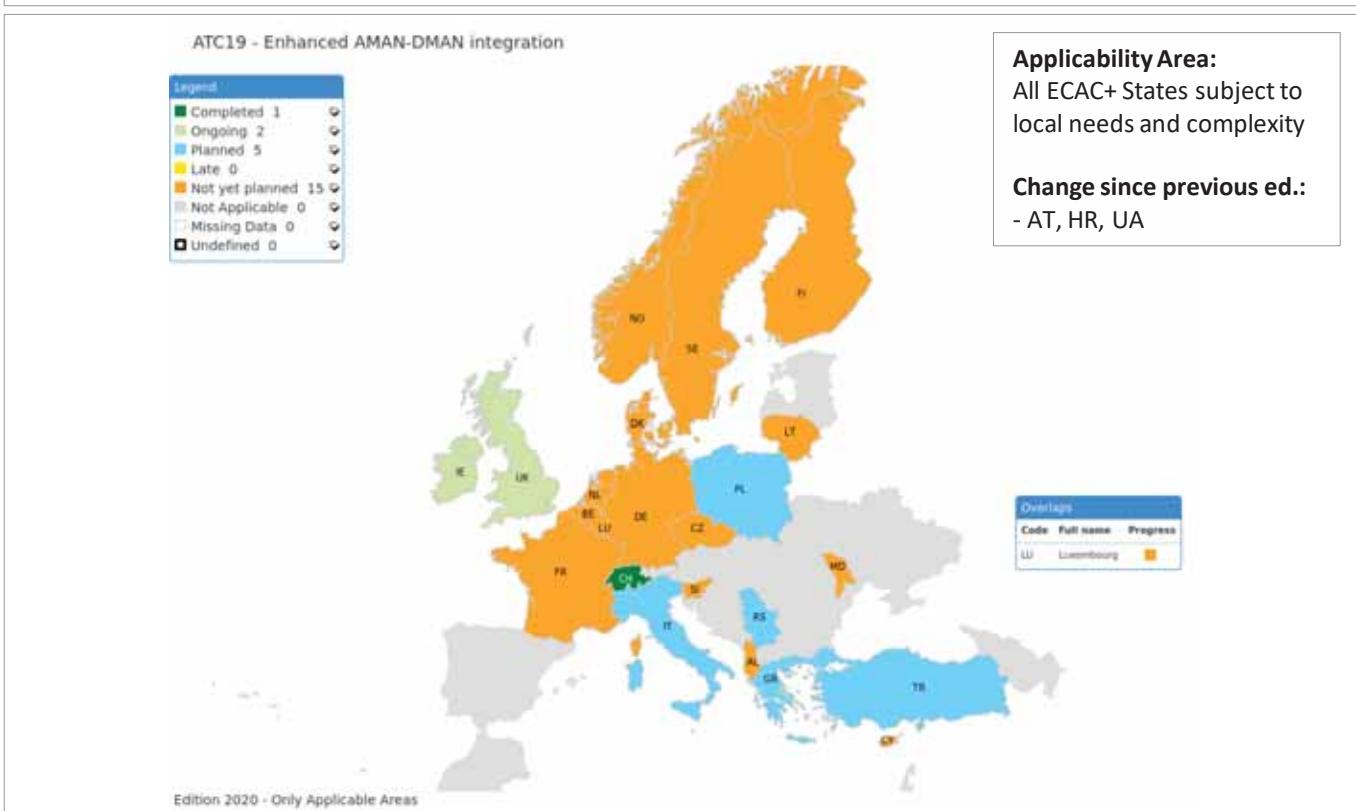
## ATC19 Enhanced AMAN-DMAN integration [Local]



### Main 2020 developments:

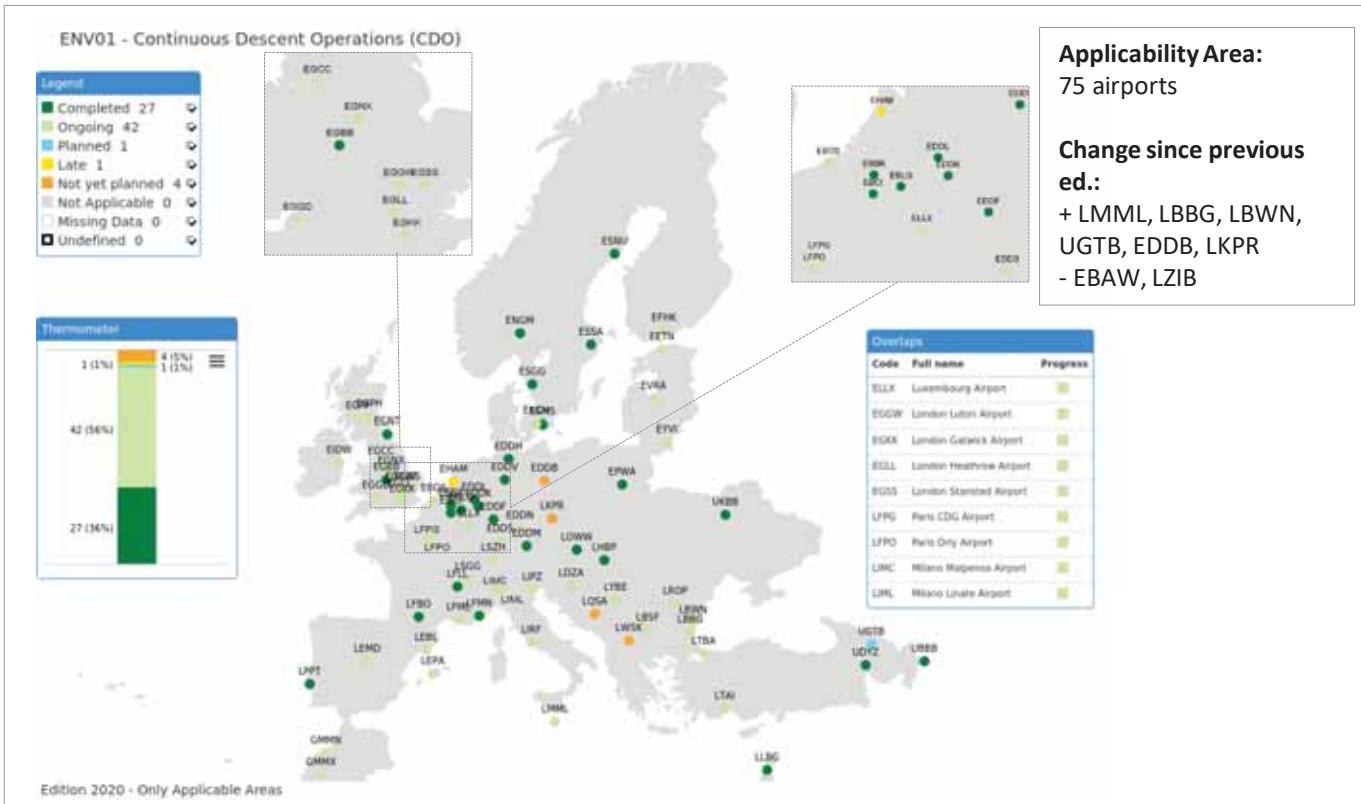
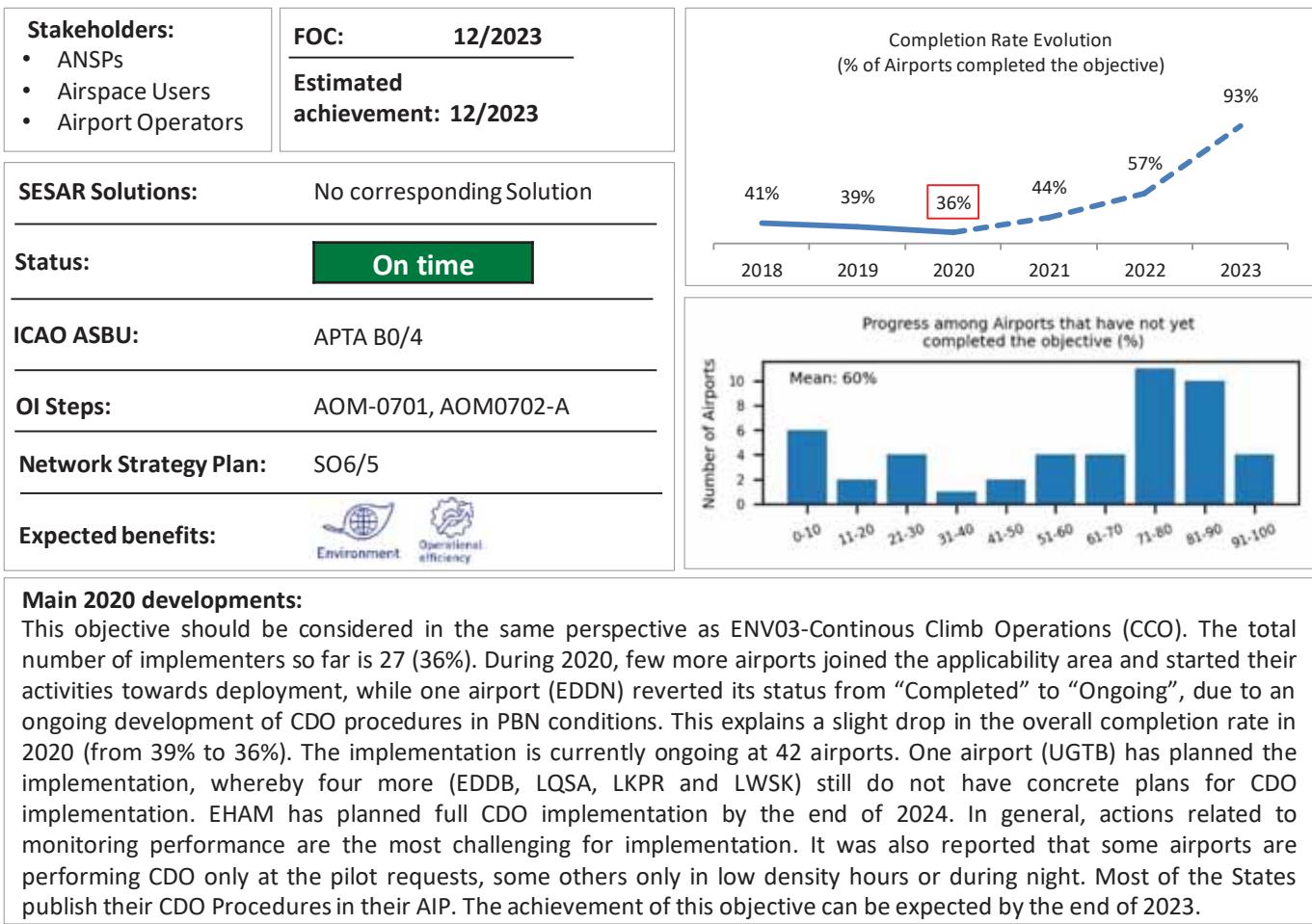
This is a “Local” objective with no associated pre-defined applicability area, nor a common FOC date for reference. At its second year of monitoring, it was reported as “completed” only by CH (deployed at LSZH and scheduled at LSGG for 2030 to 2034). Two more States reported it as “ongoing” (IE having associated it to their deployment of ATC15.1 and ATC15.2, and UK).

Five States (GR, IT, PL, RS and TK) reported plans for implementing AMAN-DMAN integration between 2021 and 2027. Fifteen (15) more States still do not have any concrete plans for implementation (compared to 18 in 2019). In other States the objective is considered “not applicable”, mostly due to low traffic levels and lack of operational need. It should be noted that AMAN-DMAN integration is part of the recently published EU Regulation (116/2021) “Common Project One” (repealing PCP Regulation 716/2014), and as such will be monitored as a “normal” objective from 2021 onwards.



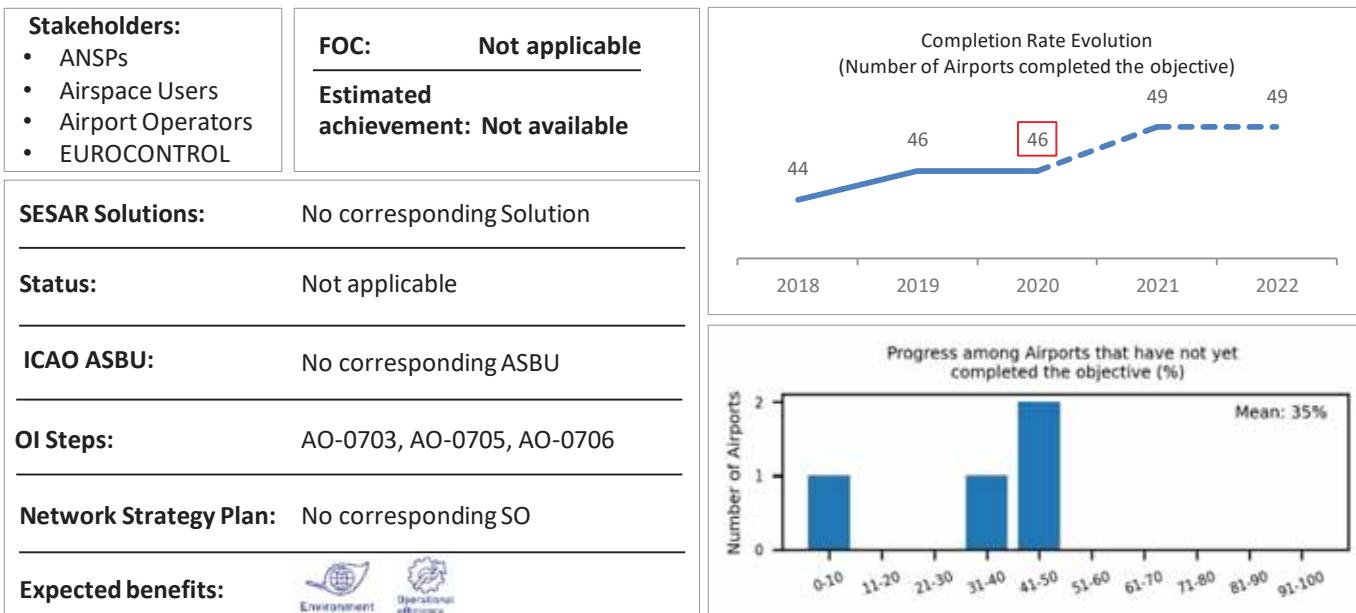
# EOC: Airport and TMA performance

## ENV01 Continuous Descent Operations (CDO)



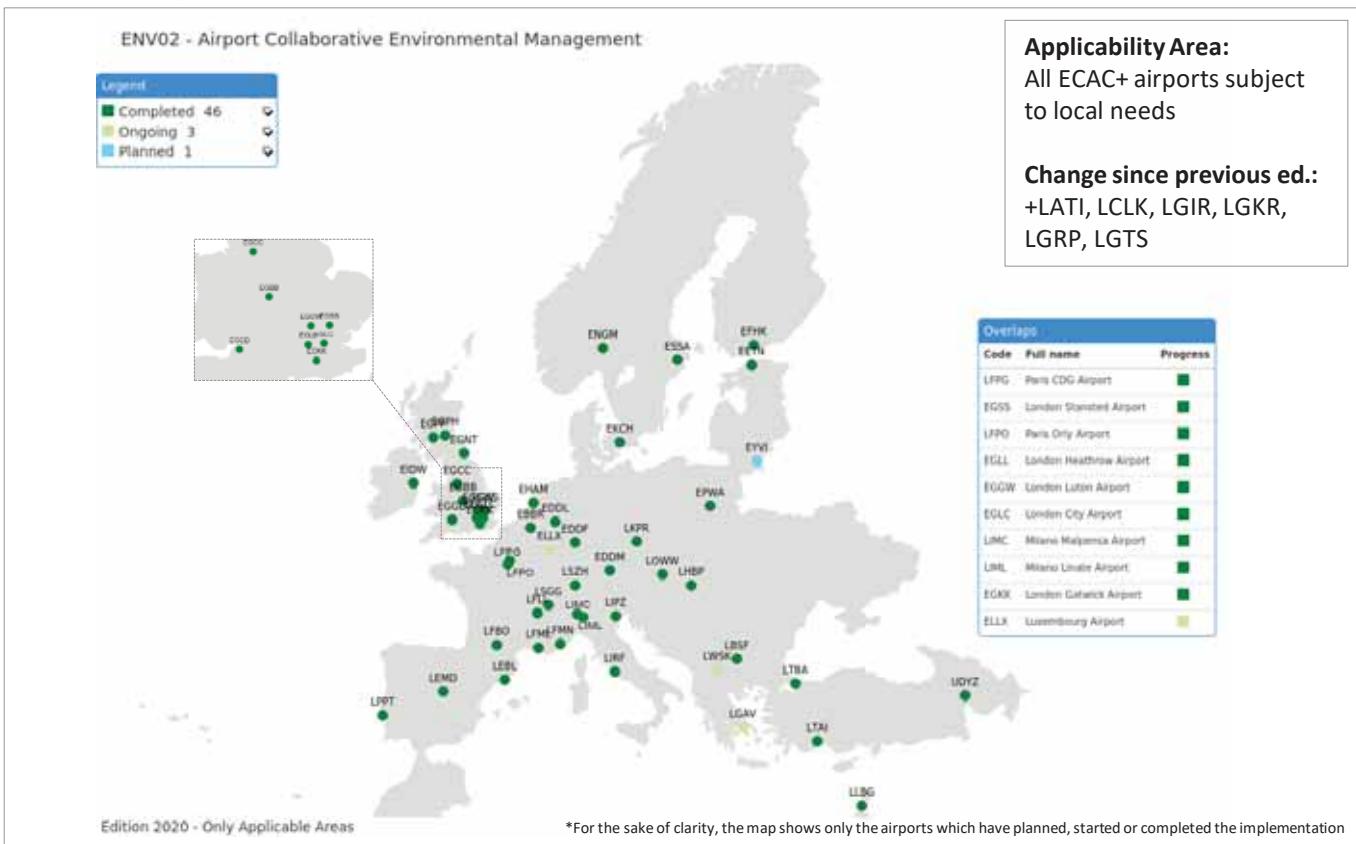
# EOC: Airport and TMA performance

## ENV02 Airport Collaborative Environmental Management [Local]



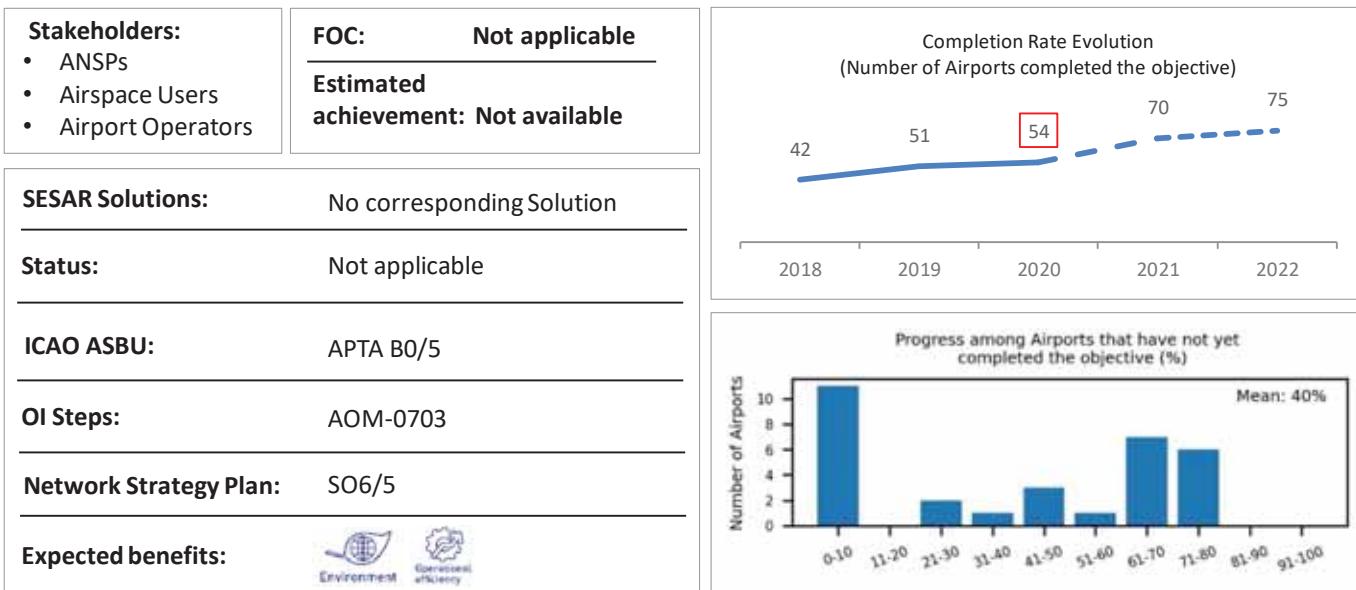
### Main 2020 developments:

This is a “Local” objective, with implementation on a voluntary basis and without a Full Operational Capability (FOC) date. Significant number of airports have shown interest in implementing Airport Collaborative Environmental Management so far, with 46 airports reported the objective as “Completed” by the end of 2020. Three more airports reported that the implementation is still ongoing with the latest projected implementation date by the end of 2024. One airport intends to implement this objective by the end of 2021. Six additional airports have not yet planned the implementation. The issues that cause delay in implementation seem to be related to the establishment of formal Partnership Agreements among Stakeholders, as well as Airport Policies and Procedures still to be developed related to pollution mitigation.



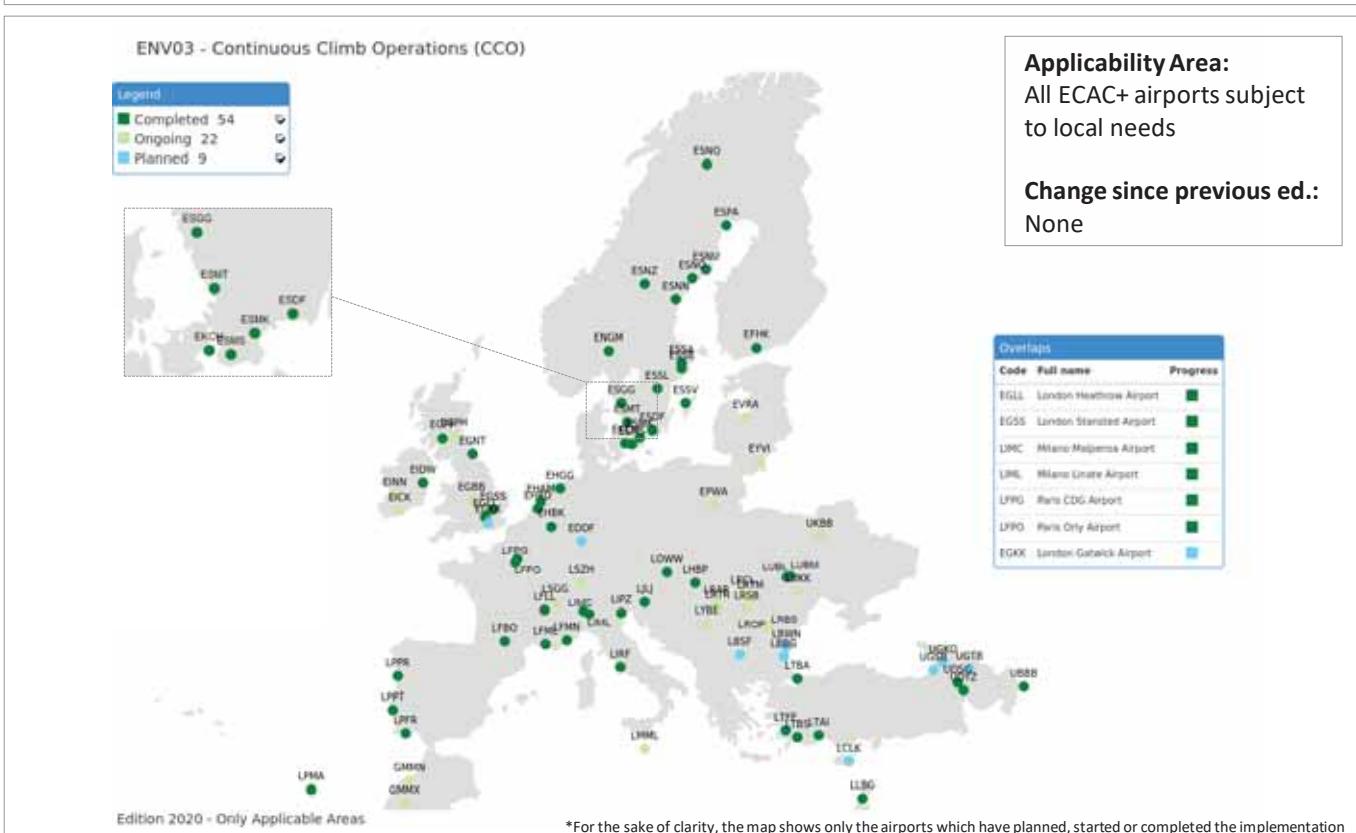
# EOC: Airport and TMA performance

## ENV03 Continuous Climb Operations (CCO) [Local]



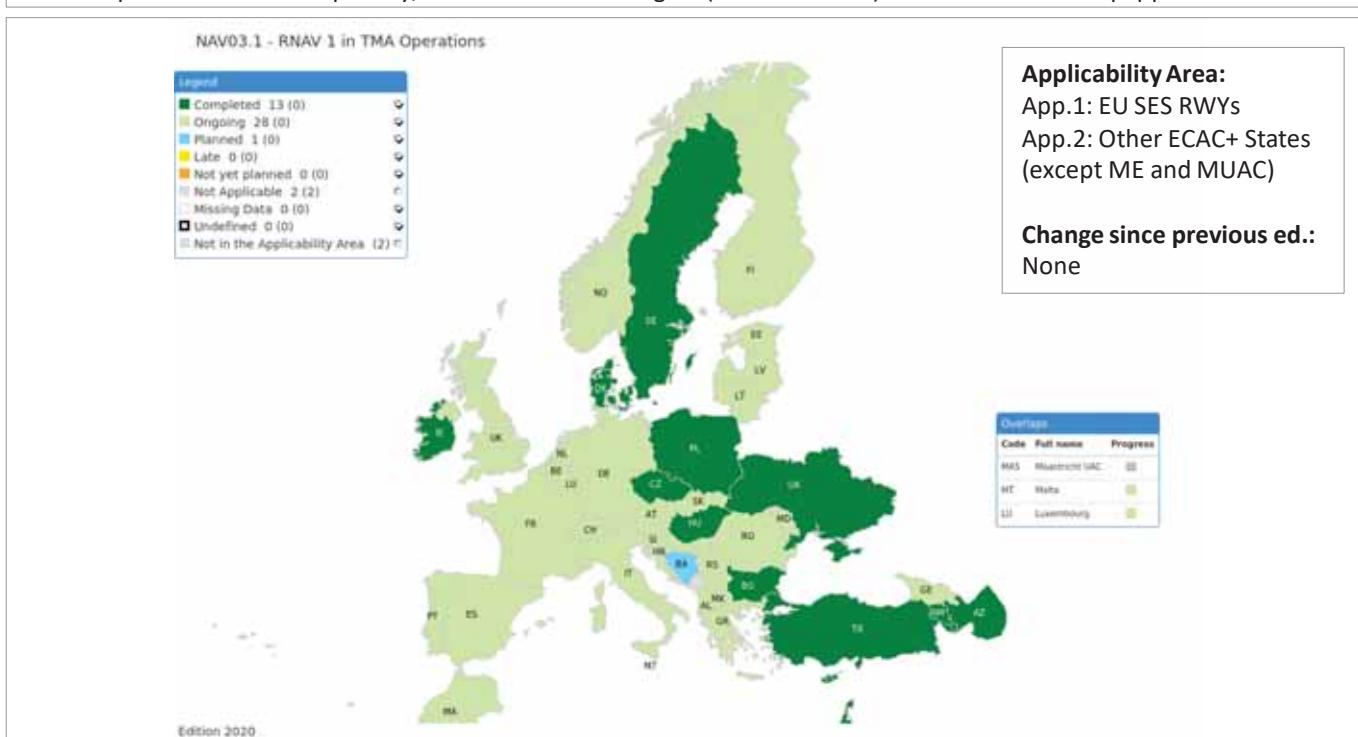
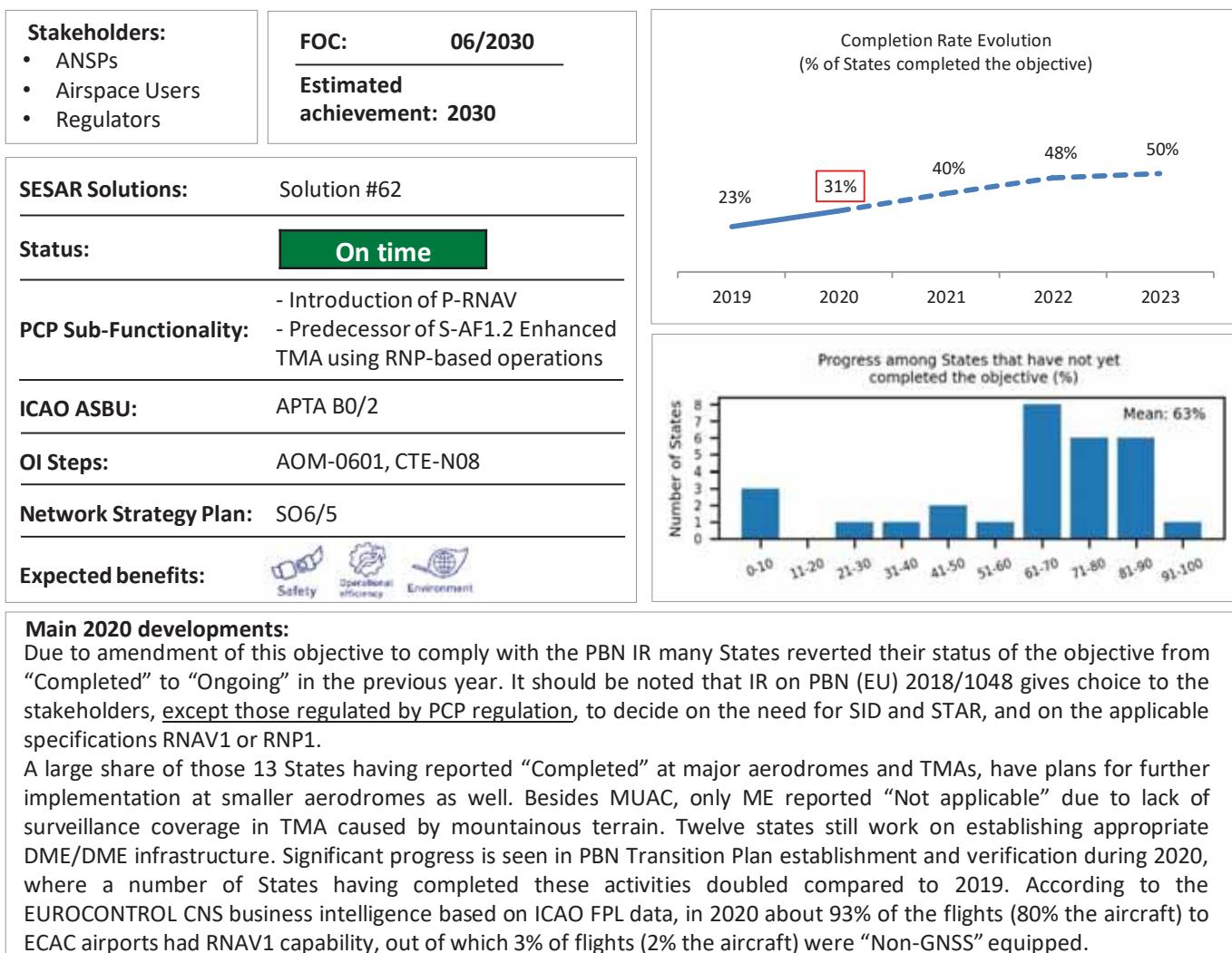
### Main 2020 developments:

This is a “Local” objective, with implementation on a voluntary basis and without the Full Operational Capability (FOC) date. However, this objective should be considered in the same perspective as ENV01-Continuous Descent Operations (CDO). For the year 2020, 97 airports were in the applicability area of this objective. Three more airports (EFHK, LHBP and LJLJ) have completed the implementation during 2020, bringing the total number of implementers to 54. Another 22 airports reported that the implementation is ongoing and 9 more airports have planned the necessary activities with the latest projected implementation date by the end of 2025. Additionally, the implementation of this objective has not yet been planned at 12 more airports. For many airports the introduction of CDO/CCO depends on identified operational benefits. Furthermore, for some airports CCO is introduced as part of an airspace re-organisation/revision project.



# EOC: Airport and TMA performance

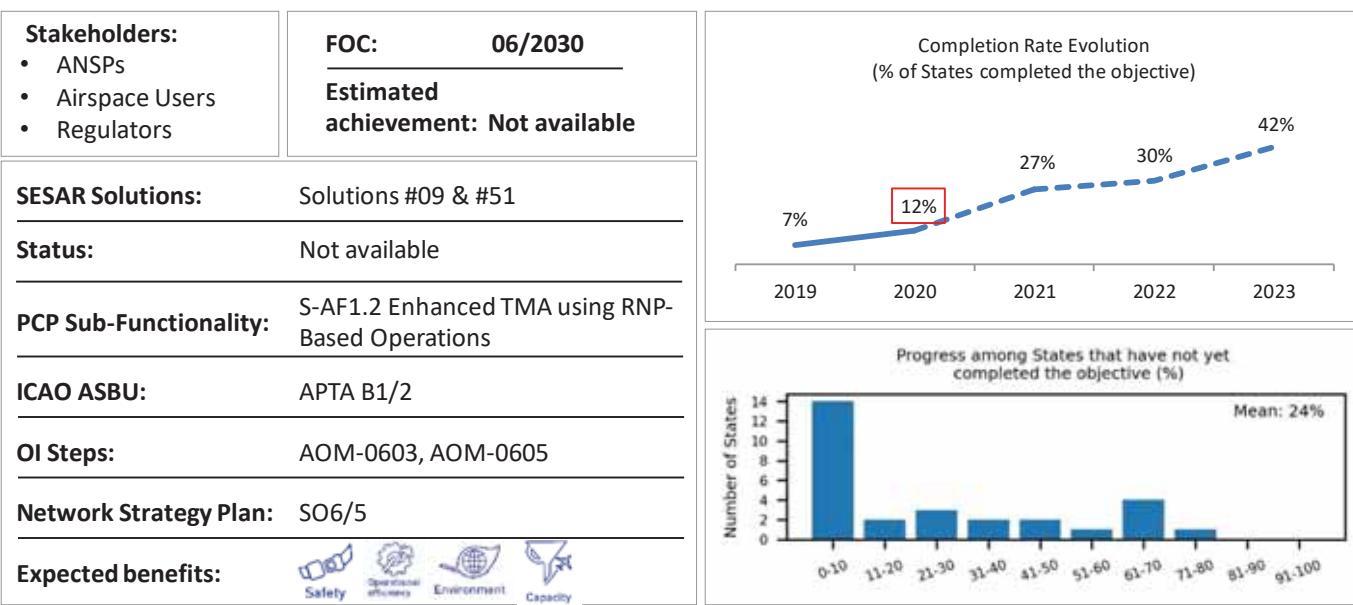
## NAV03.1 RNAV 1 in TMA Operations



# EOC: Airport and TMA performance

## NAV03.2 RNP 1 in TMA Operations

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



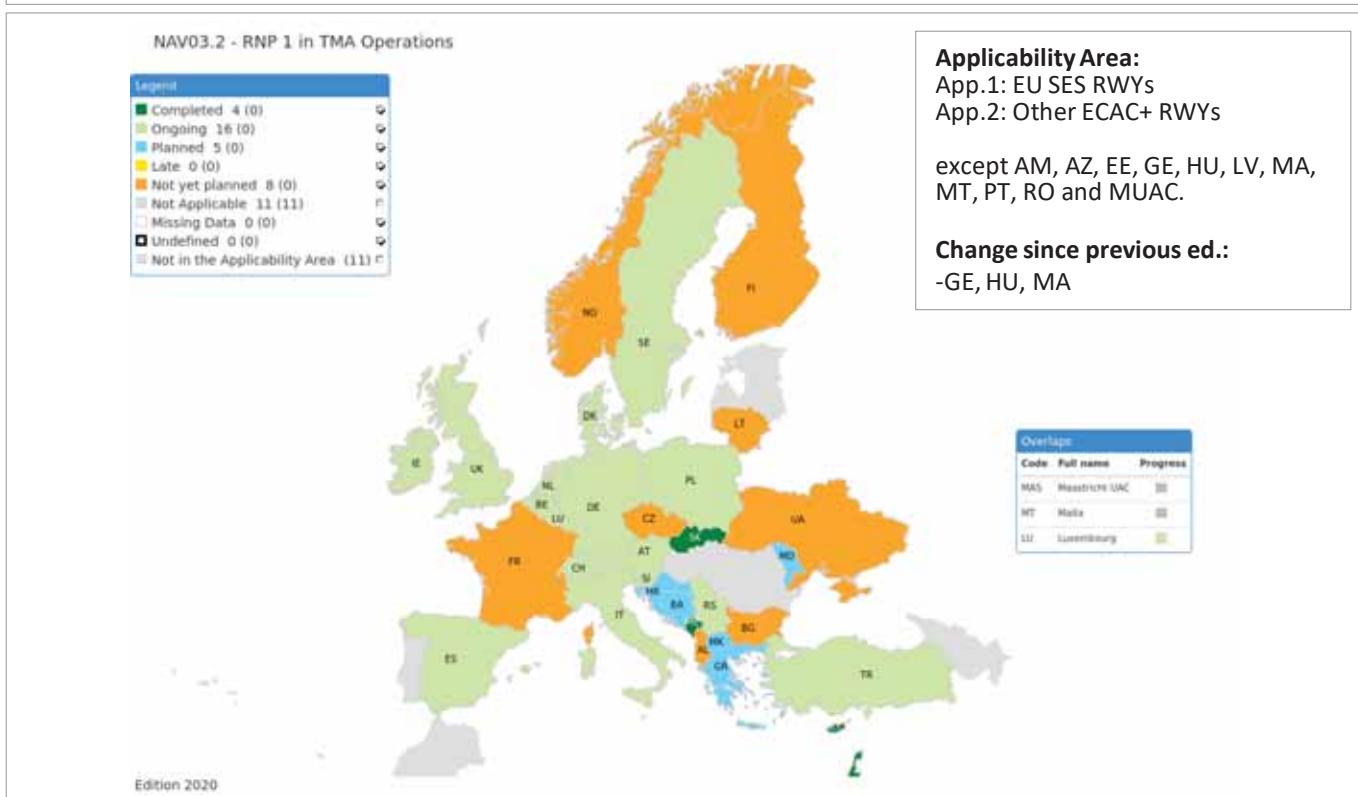
### Main 2020 developments:

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 the applicable specifications RNAV1 or RNP1.

About one third of the States indicated lack of business (operational) need for RNP1 implementation saying that RNAV1 is sufficient at the moment.

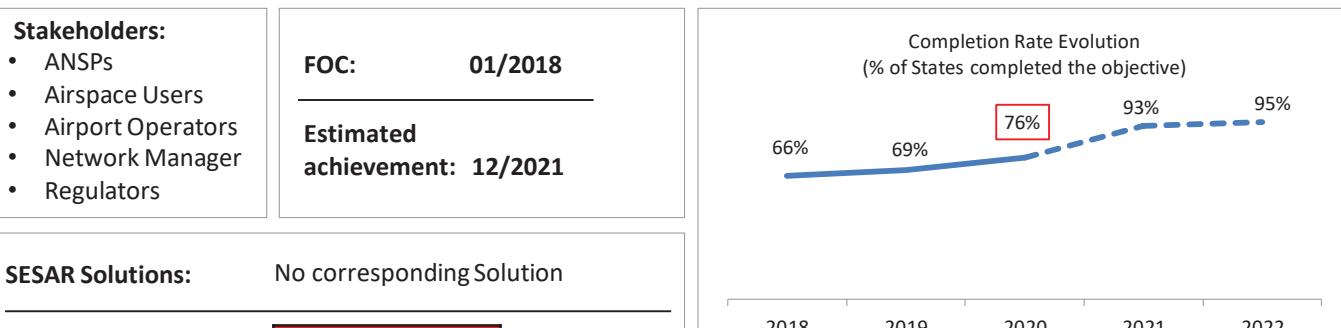
Another third of the States still work on establishing appropriate DME/DME infrastructure. The importance of establishment and performance of appropriate infrastructure, supporting the reversion in case of GNSS failure, is highlighted as a crucial factor for successful RNP1+RF deployment.

According to the EUROCONTROL CNS business intelligence based on ICAO FPL data, in 2020 about 75% of the flights (66% of the aircraft) to ECAC airports had RNP1 capability.

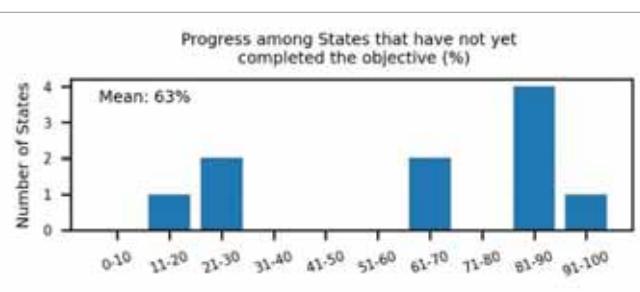


# EOC: Airport and TMA performance

## SAF11 Prevent Runway Excursions

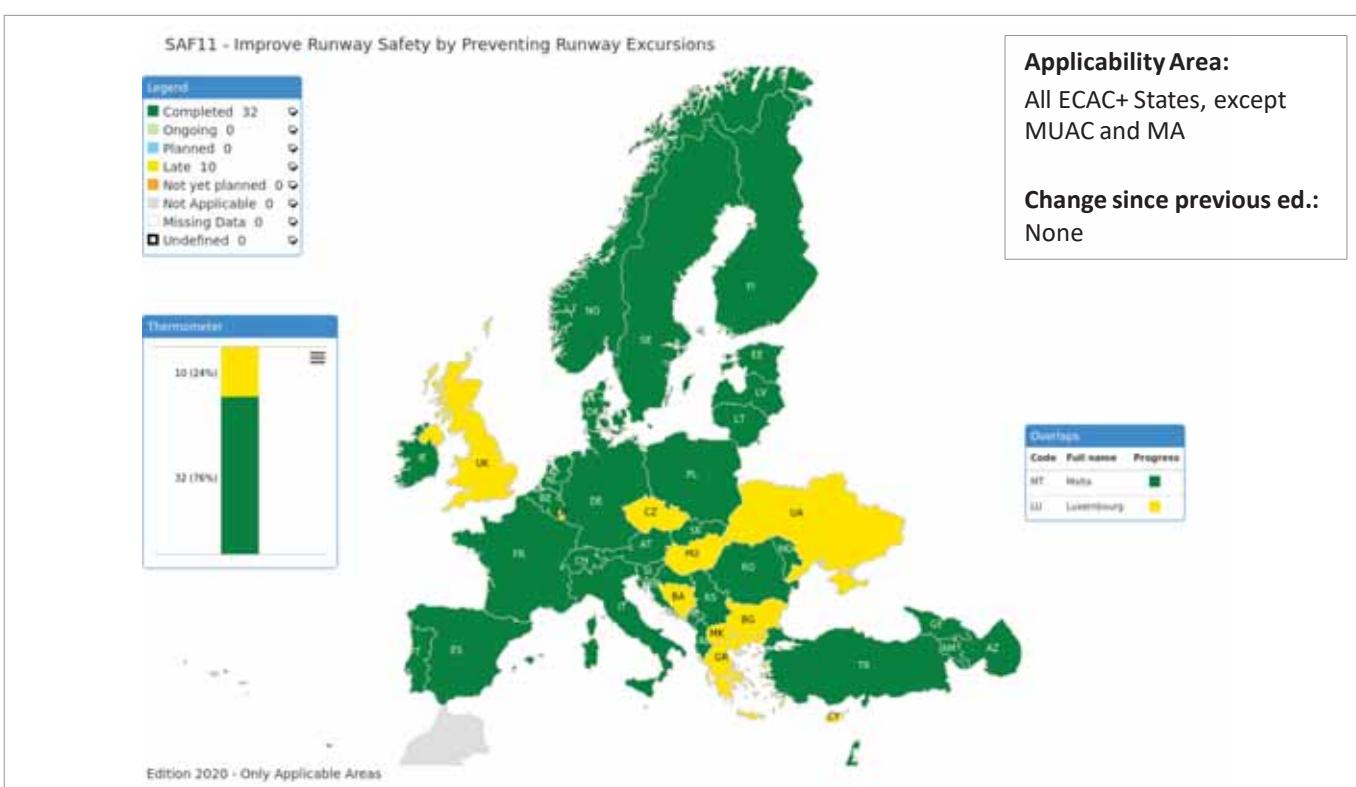


<b>SESAR Solutions:</b>	No corresponding Solution
<b>Status:</b>	<b>Late</b>
<b>ICAO ASBU:</b>	No corresponding ASBU
<b>OI Steps:</b>	PRO-006a
<b>Network Strategy Plan:</b>	No corresponding SO
<b>Expected benefits:</b>	 Safety



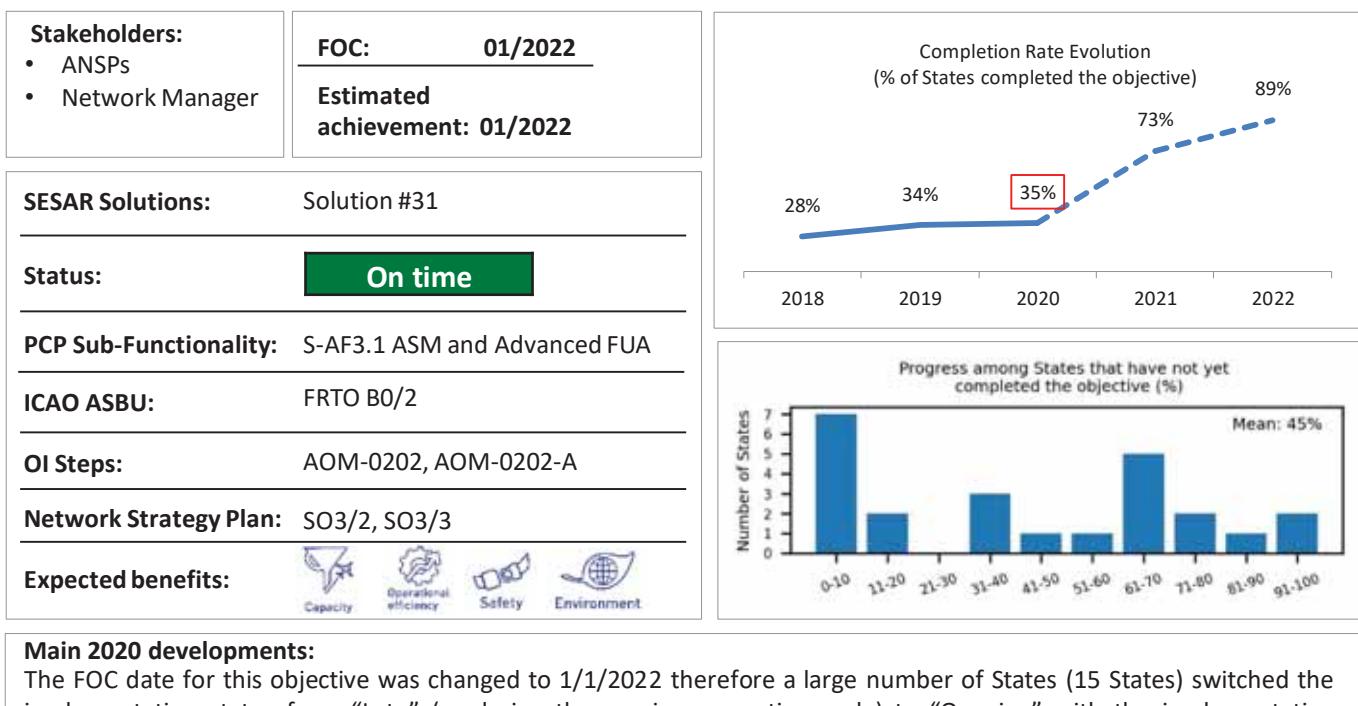
### Main 2020 developments:

Compared to 2019, only little progress has been made in 2020 with 3 additional States (DE, NO, PT) having completed this objective, bringing the total number of States which have reported the status "Completed" to 32 (76%). Ten States (24%) report delay in implementation, with the latest projected implementation date by the end of 2024. Out of these 10 States, most of them (7) foresee the implementation by the end of 2021, with only 2 States expecting completion by the end of 2024. Most of the actions listed in the "European Action Plan for the Prevention of Runway Excursions (EAPRE)" have been implemented in such States, but still not everything is finalised. For some States a re-certification process of the airports has been reported, as well as ongoing aviation English training for vehicle drivers. Only one State (BG) reports slight delay due to COVID-19. The achievement of this objective can be expected by the end of 2021.



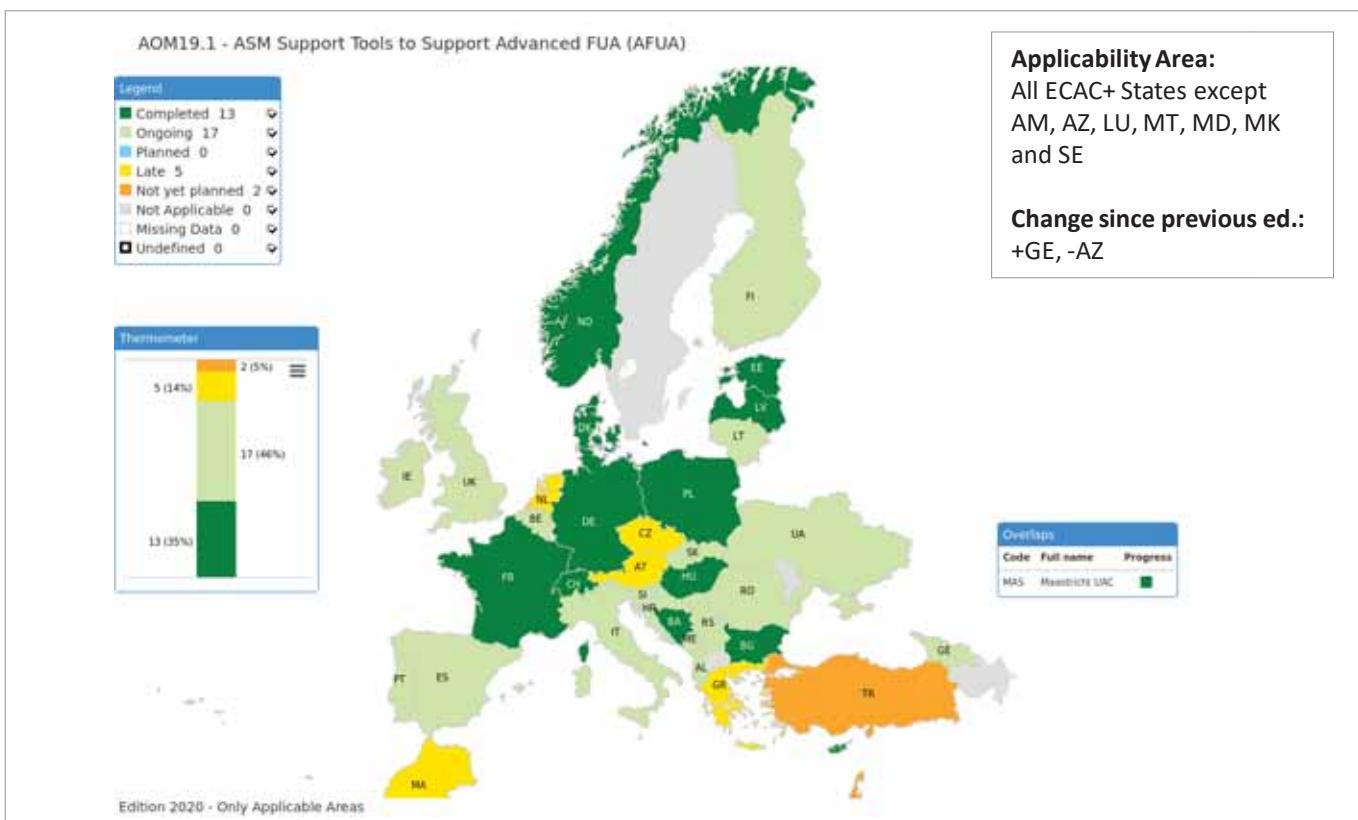
# EOC: Fully Dynamic and Optimised Airspace Organisation

## AOM19.1 ASM tools to support A-FUA



### Main 2020 developments:

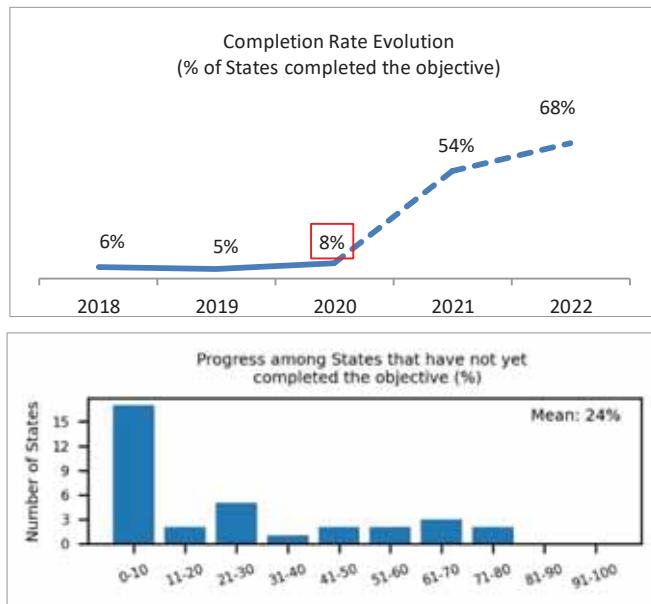
The FOC date for this objective was changed to 1/1/2022 therefore a large number of States (15 States) switched the implementation status from "Late" (as during the previous reporting cycle) to "Ongoing" with the implementation expected before the new FOC date, while MA went from "Ongoing" to "Late". TR will evaluate the objective for the next reporting cycle, while GE joined the applicability area this year reporting implementation plans by the FOC date. 24 States including Maastricht UAC (2 more than last year) have implemented local ASM tools (AOM19.1-ASP01); some are local solutions but a majority of them (17) rely on LARA (Local and sub-Regional ASM Support System). The widespread implementation of the objective is expected to be reached during 2022, date which is consistent with the provisions of the CP1 Regulation (EU 116/2021 - Sub-AF 3.1 on ASM and Advanced FUA) requiring the availability of this functionality by 12/2022.



# **EOC: Fully Dynamic and Optimised Airspace Organisation**

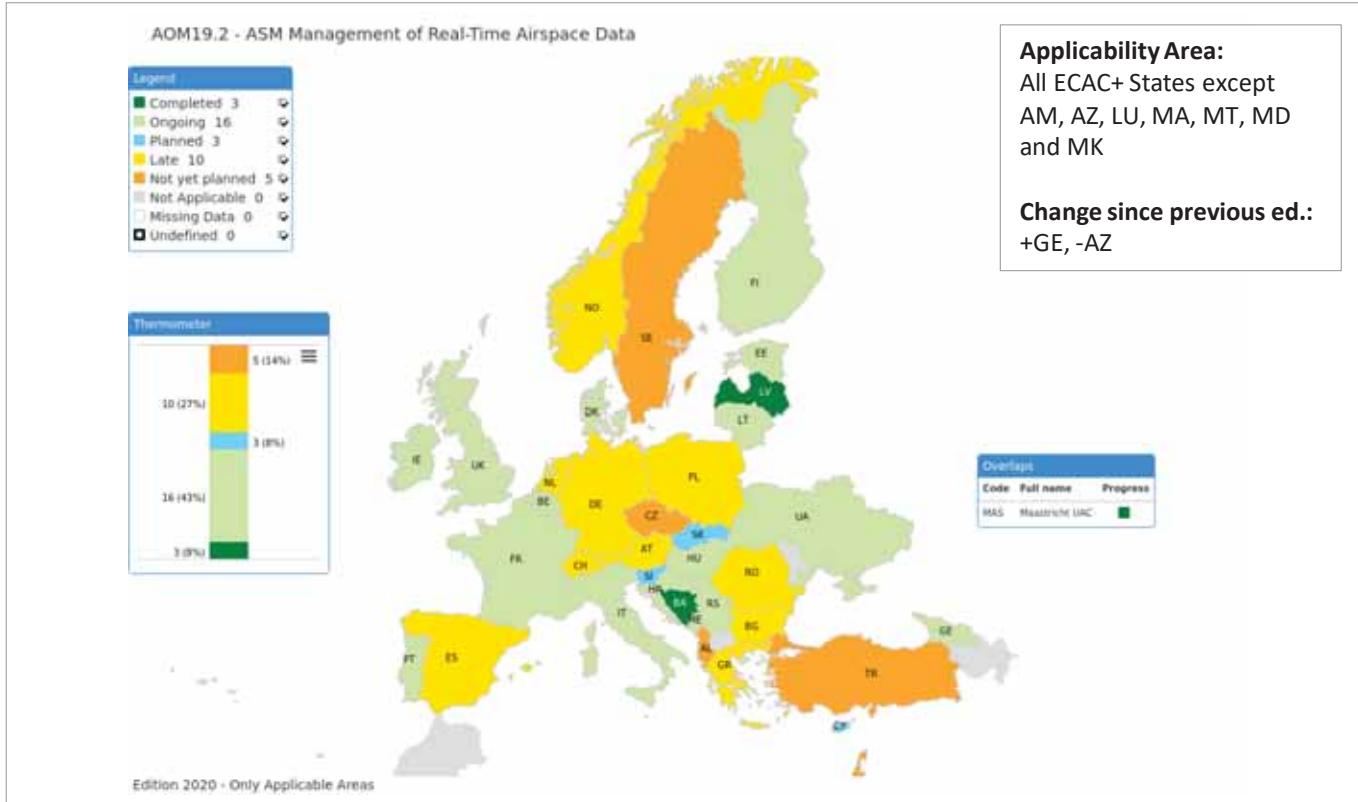
## **AOM19.2 ASM management of real-time airspace data**

<b>Stakeholders:</b>	<b>FOC:</b> 01/2022
<ul style="list-style-type: none"> <li>• ANSPs</li> <li>• Airspace Users</li> <li>• Network Manager</li> </ul>	<b>Estimated achievement:</b> 12/2025
<b>SESAR Solutions:</b>	Solution #31
<b>Status:</b>	<b>Planned delay</b>
<b>PCP Sub-Functionality:</b>	S-AF3.1 ASM and Advanced FUA
<b>ICAO ASBU:</b>	FRTO B1/3, NOPS B1/5
<b>OI Steps:</b>	AOM-0202-A, AOM-0206-A
<b>Network Strategy Plan:</b>	SO3/2, SO3/3
<b>Expected benefits:</b>	 Capacity
	 Operational efficiency
	 Safety
	 Environment



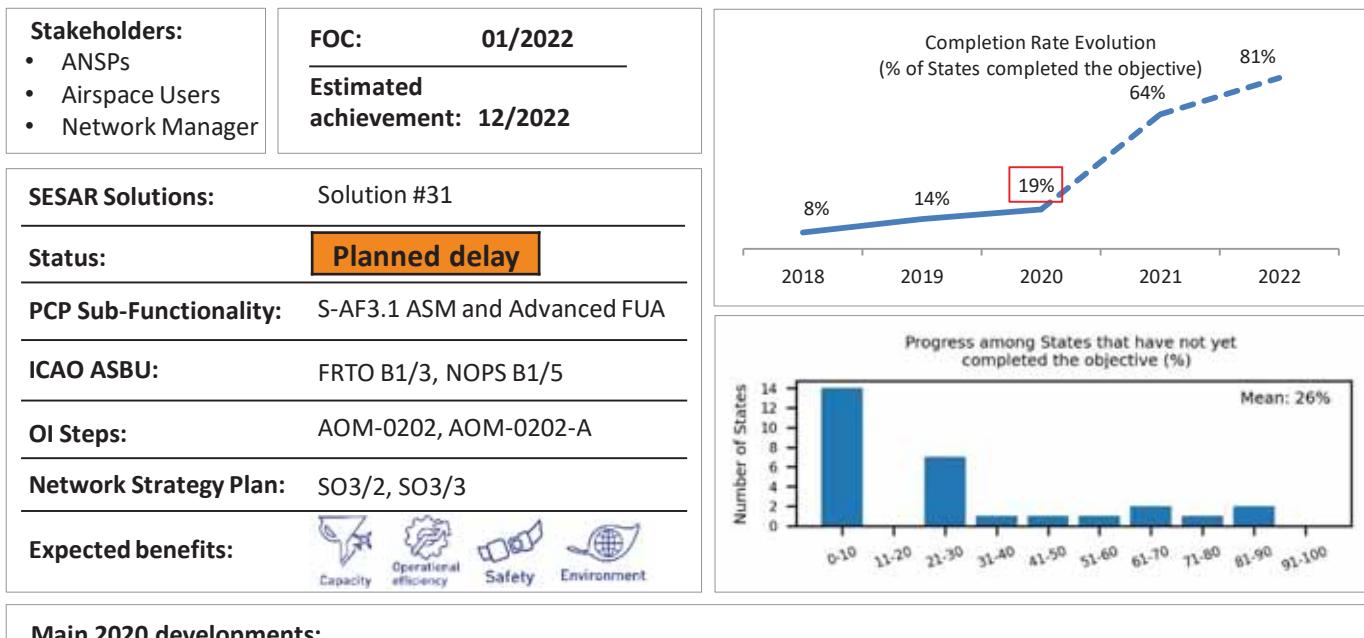
## Main 2020 developments:

The implementation of this objective is continuing with a slow rate with only 1 State (LV) having completed the implementation in 2020, while 1 State (CZ) reverted the status from "Ongoing" to "Not Yet Planned". There is also a slight increase in the number of States reporting implementation plans (from 29 to 32) allowing now the estimation of the completion date (12/2025 for 80% completion in the overall applicability area) which was not possible in the previous reporting cycles. Based on the reported plans, a substantial increase in the completion rate is expected in 2021/2022, in particular in the EU area, which is consistent with the provisions of the CP1 Regulation (EU 116/2021 - Sub-AF 3.1 on ASM and Advanced FUA) requiring the availability of this functionality by 12/2022. However, as the majority of the States are still in incipient implementations phases (less than 10% progress) the implementation pace needs to be increased in order to reach the expected completion rate.



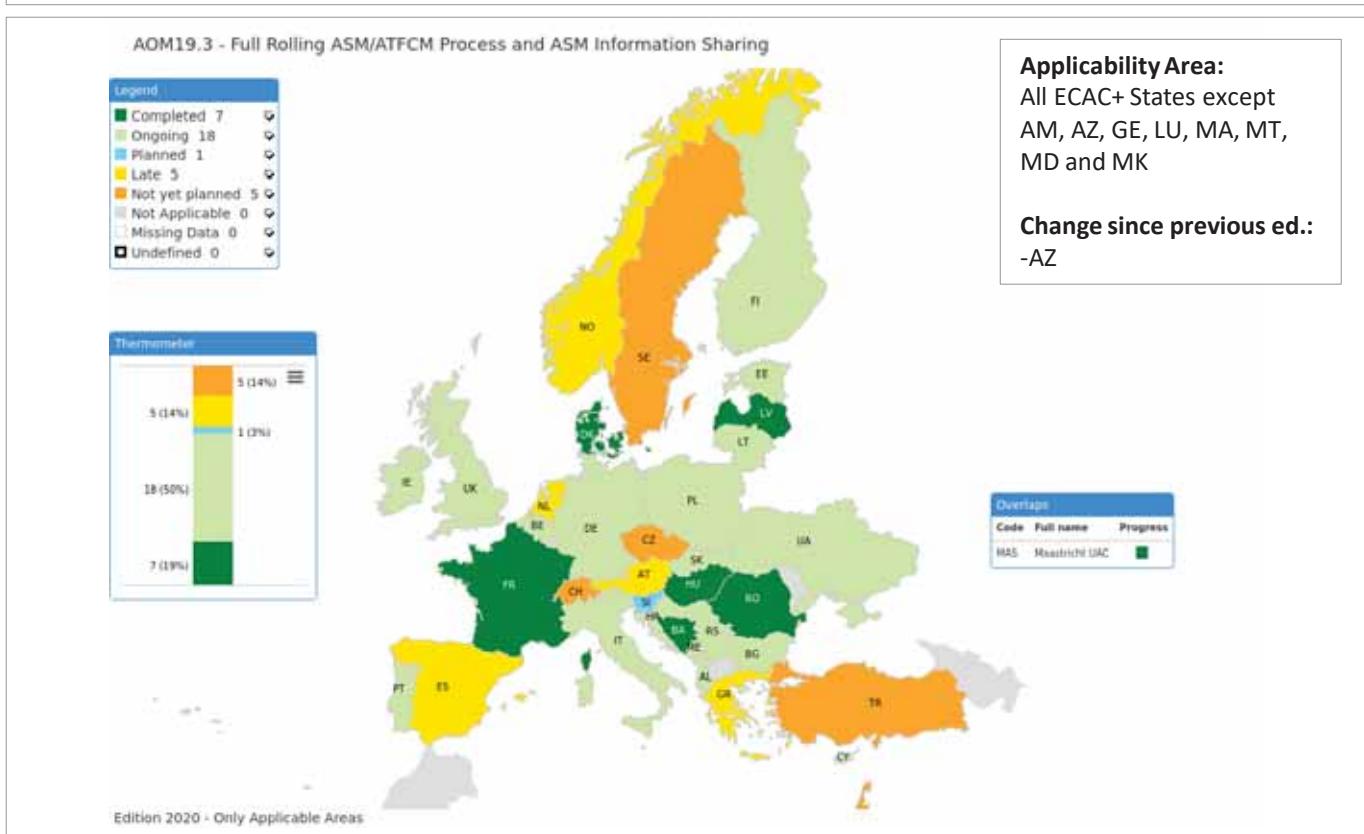
# EOC: Fully Dynamic and Optimised Airspace Organisation

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



### Main 2020 developments:

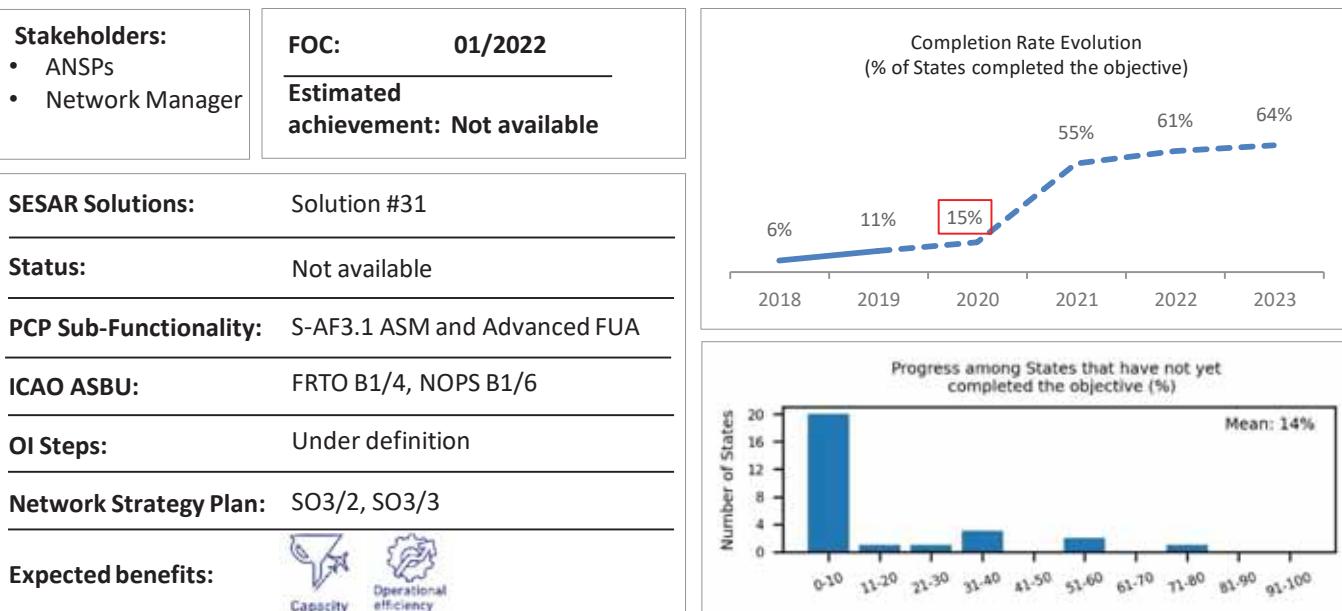
The implementation pace is stable with 2 States (DK, FR) having finalized implementation during the reporting year. Moreover the number of States which have started implementation has increased from 24 to 30, allowing the determination of an expected completion date (12/2022 for 80% completion in the overall applicability area) with a big surge already expected for 2021, when the completion rates should grow from 7 to 23 States. However, as many States are still at the beginning of implementation (less than 10% progress) the implementation pace needs to be substantially increased in order to reach the expected completion rate at the end of 2021. Overall, the implementation plans are very much consistent with the provisions of the CP1 Regulation (EU 116/2021 - Sub-AF 3.1 on ASM and Advanced FUA) requiring the availability of this functionality by 12/2022.



# EOC: Fully Dynamic and Optimised Airspace Organisation

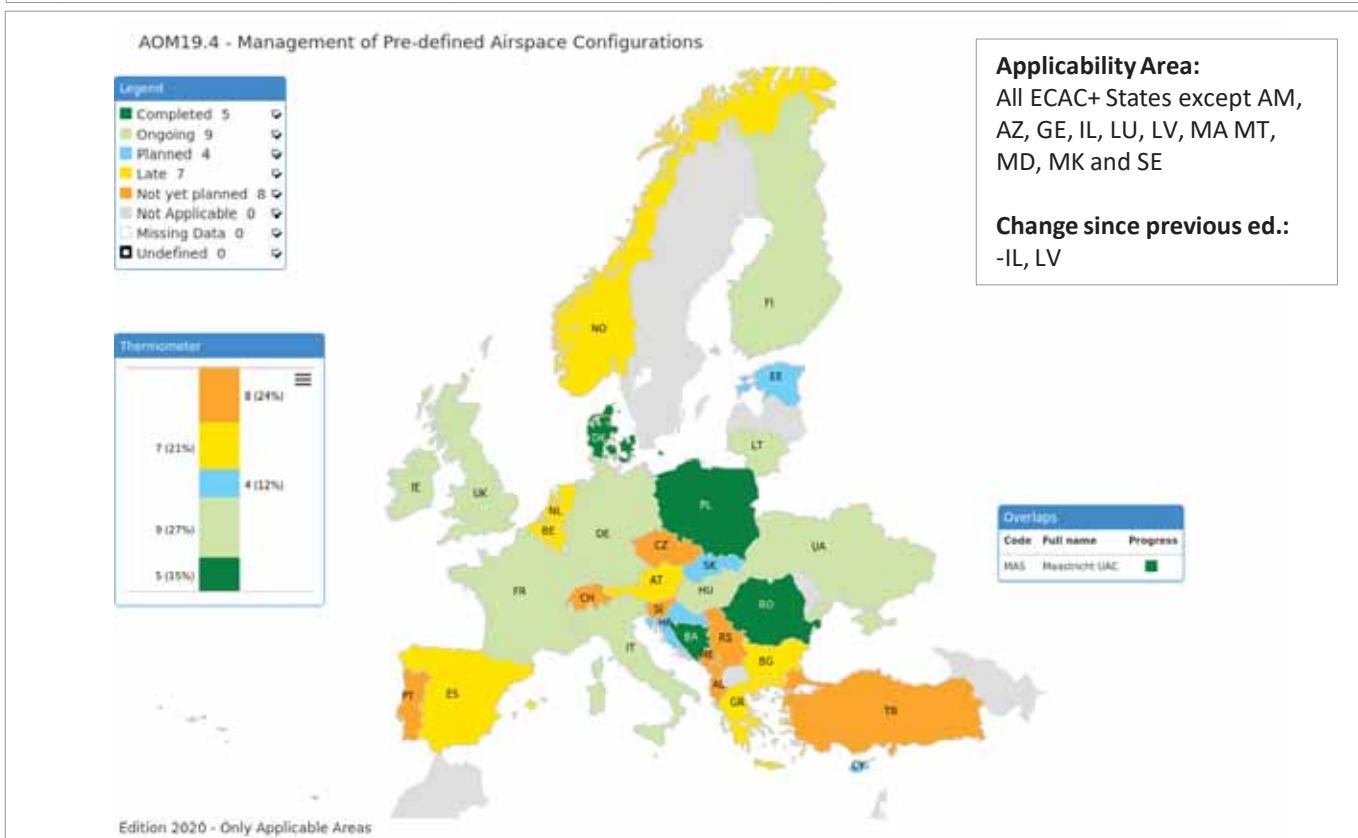
## AOM19.4 Pre-defined airspace configurations

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



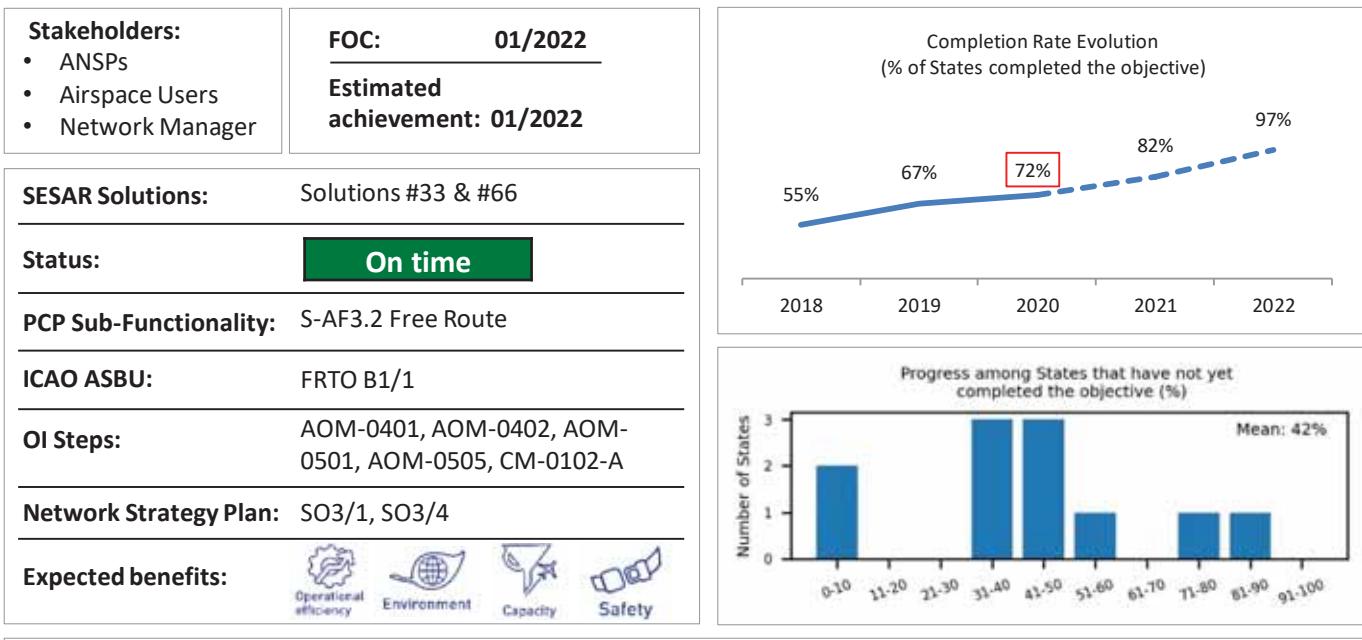
### Main 2020 developments:

Since the start of the monitoring of this objective (in 2018), 5 implementers have reported completion, two of them (DK, MUAC) in 2020. While the number of States which reported not having any implementation plans yet went down from 13 to 8 in the reporting year, there are still too many such statuses in order to allow the estimation of an overall expected completion date across the entire applicability area. Based on the reported plans, before the end of 2022, when this functionality is required by the CP1 Regulation (EU 116/2021 - Sub-AF 3.1 on ASM and Advanced FUA), 16 EU States (and 4 non-EU) expect to finalise the implementation. This number may still increase depending on the States which have not reported yet implementation plans. A surge in the completion rate is already expected for 2021 but taking into account the large number of States which report less than 10% implementation progress, the pace of implementation should be substantially increased in order to meet the expectations.



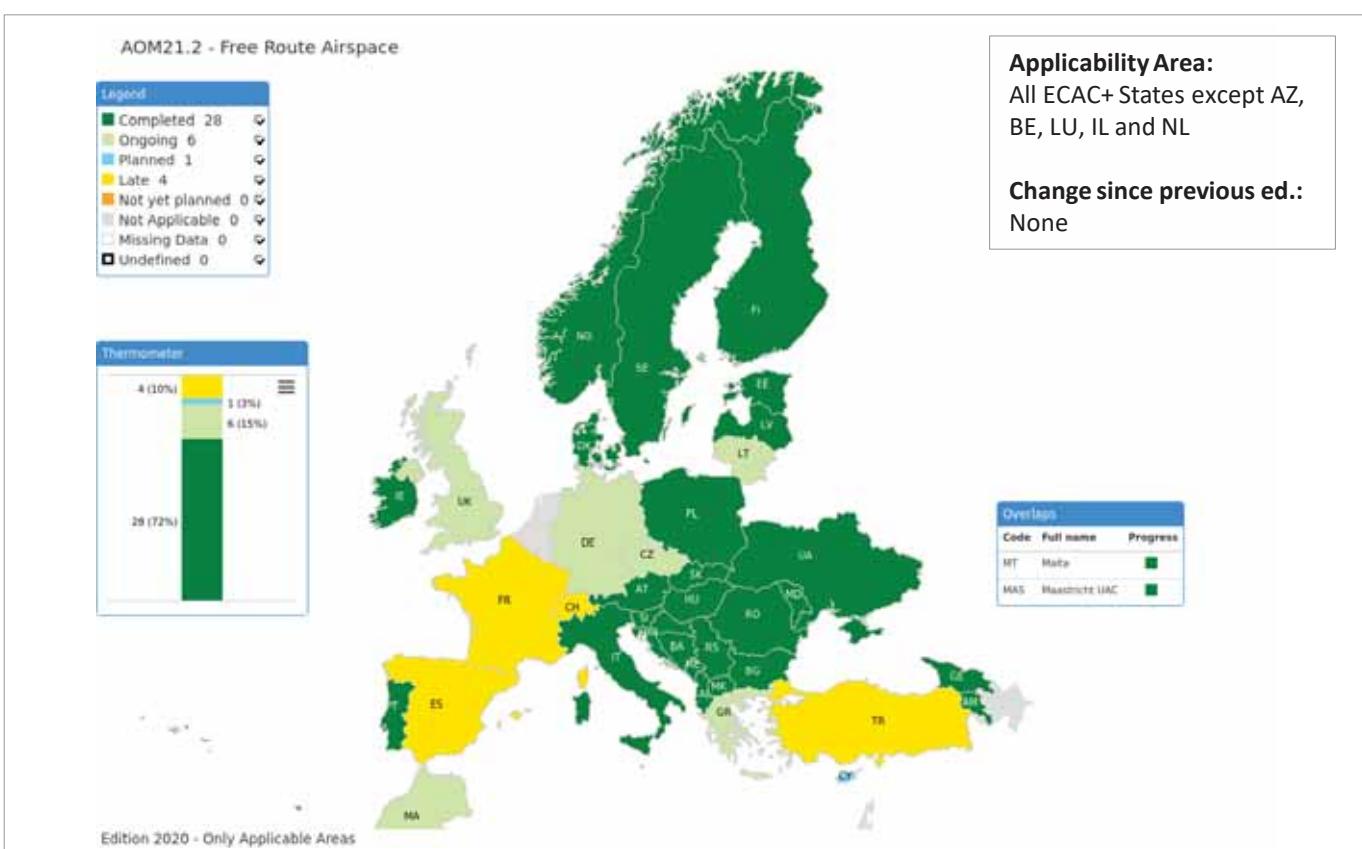
# EOC: Fully Dynamic and Optimised Airspace Organisation

## AOM21.2 Free Route Airspace



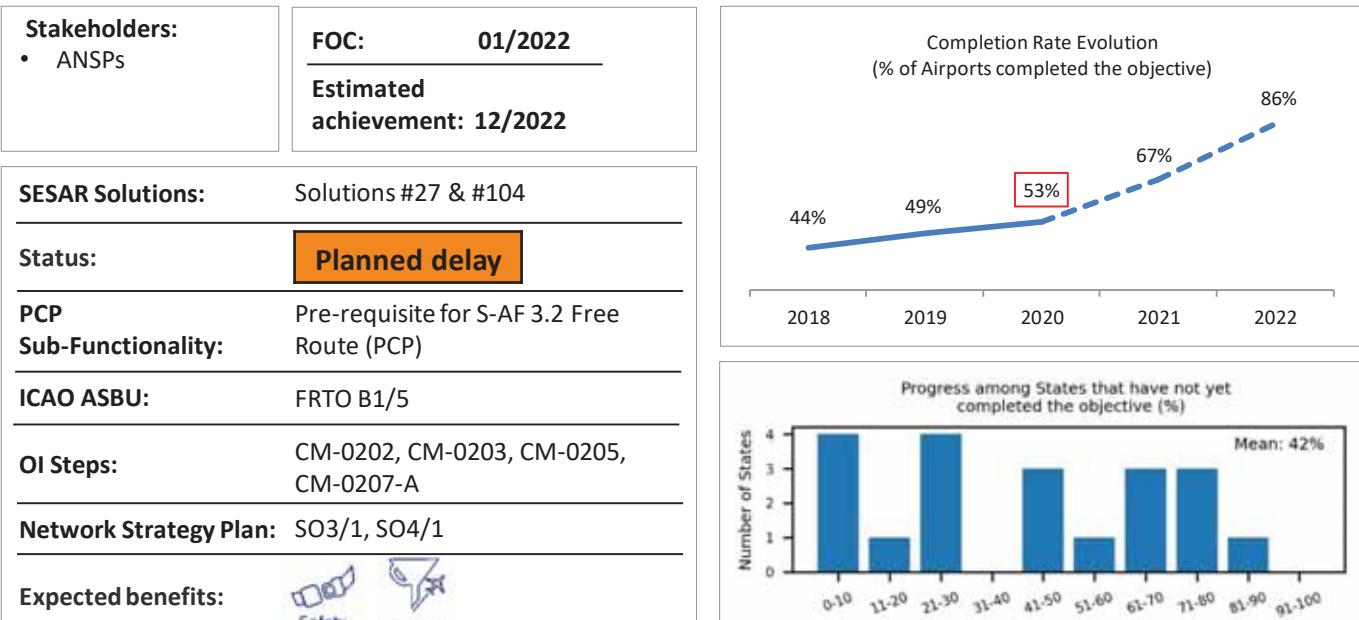
### Main 2020 developments:

The implementation of this objective is progressing well, and is quickly approaching completion. Within the applicability area 28 States have already finalised completion, many of them in cross-border areas. It should be noted that many of the States which have not yet reported completion (e.g. DE, ES, GR, LT), have already implemented FRA within some portions of the airspace or during specific timings, therefore the implementation is broader than shown. The implementation pace is sustained and it is expected that before the end of 2022 (the deadline required by the CP1 Regulation EU 116/2021 for the implementation of initial FRA) all the States within the applicability area (with the exception of FR which expects completion in 2024) to have finalised the implementation of FRA, at least within their own FIRs is not already in cross-border areas.



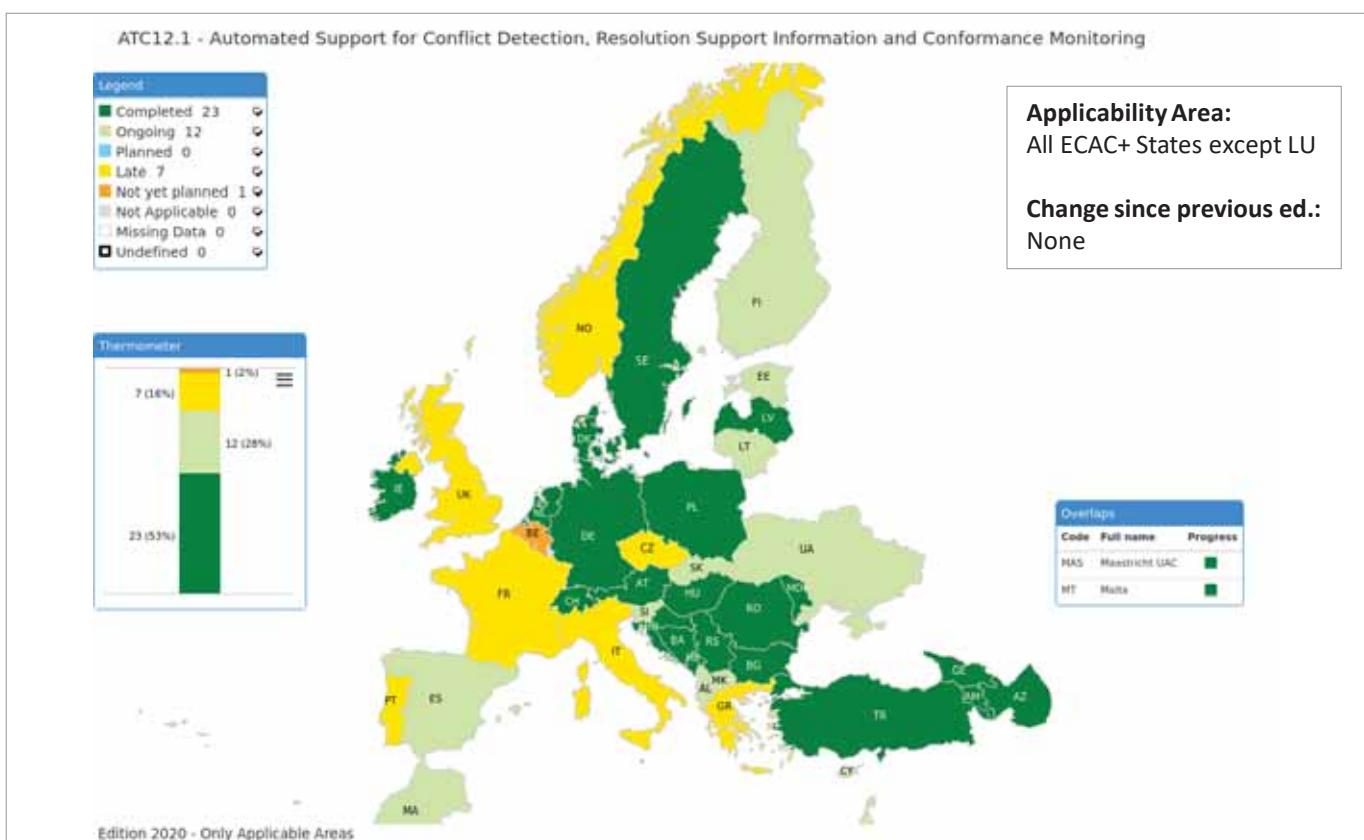
# EOC: Fully Dynamic and Optimised Airspace Organisation

## ATC12.1 MONA, TCT and MTCD



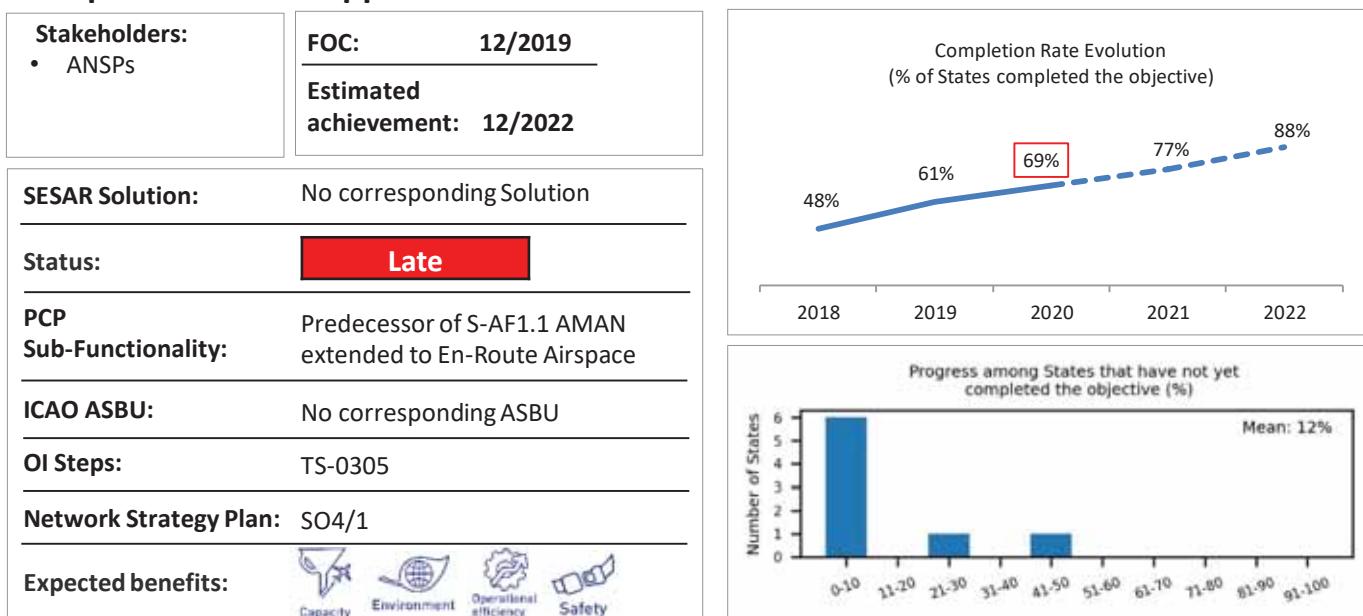
### Main 2020 developments:

MTCD functionality in 2020 was declared "Completed" by 23 States, 2 more than in 2019. The number of ANSPs progressing on time (i.e. "Ongoing") has decreased to 12, from 14 in 2019, in line with the achievement rate. Implementation of MTCD is completed in 40 ACCs (34 in 2019), marking a significant improvement and representing 61% of the applicable area. Tactical Controller Tool, an optional feature, has been reported "Completed" so far in 10 ACCs (9 in 2019). Twenty-three ACCs consider TCT as "Not Applicable". Conformance monitoring function is also well deployed, being reported "completed" in 37 ACCs (same in 2019). Resolution support function is implemented in 21 ACCs (19 in 2019). Overall the objective is progressing well, even if with a slight delay and the 80% completion rate is expected to be reached by end 2022.



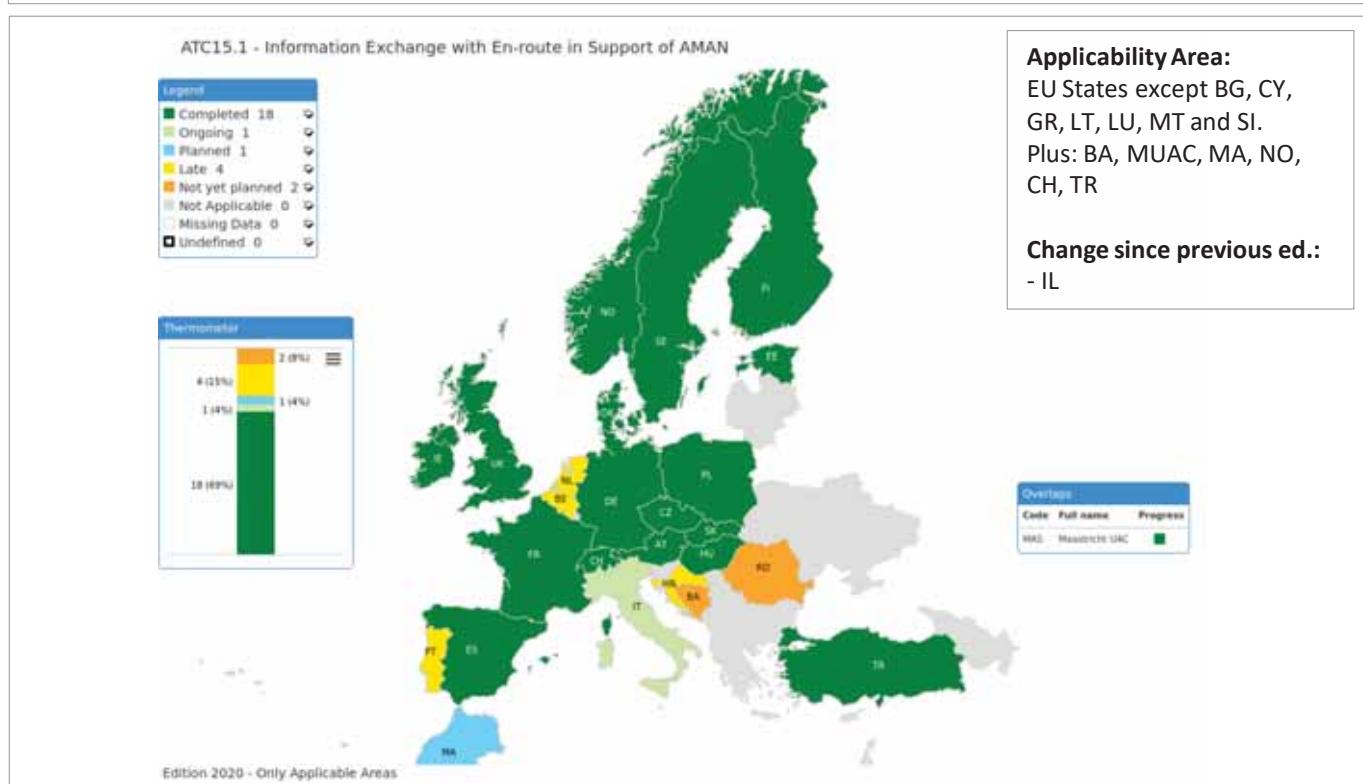
# EOC: Fully Dynamic and Optimised Airspace Organisation

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



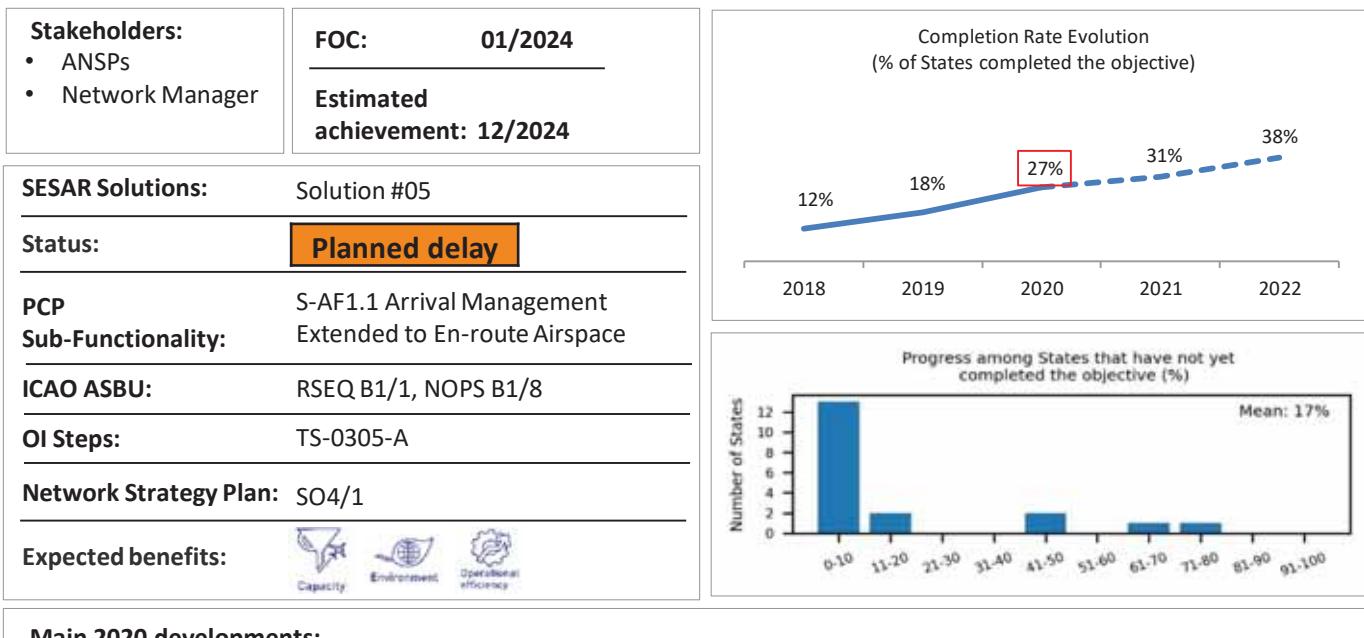
### Main 2020 developments:

This objective requires information exchange between AMAN systems supporting the respective TMAs and the first upstream ATS systems of the surrounding en-route control sectors. The objective builds on ATC07.1 which provides the basic AMAN functionality. In 2020, Germany has finalised the implementation, therefore 18 ANSPs are now "Completed", compared with 17 in 2019 and 12 in 2018, confirming so the positive implementation trend of the past years. This currently represents 69% of the applicability area. Only 2 States still report not to have yet firm plans for implementation, another one is "Ongoing" (MA, having joined the applicability area recently benefits of a "grace period" and expects completion by end 2022) and 4 are "Late". Of these, NL which expects finalisation also in 2022 shows the highest implementation progress, at 50%. The forecasted completion for the objective is estimated for the end of 2022, a one-year shift compared to the forecast of the previous year. This objective can be implemented as an intermediate step for those centres subject to PCP/CP1 Regulation and expected to implement extended AMAN.



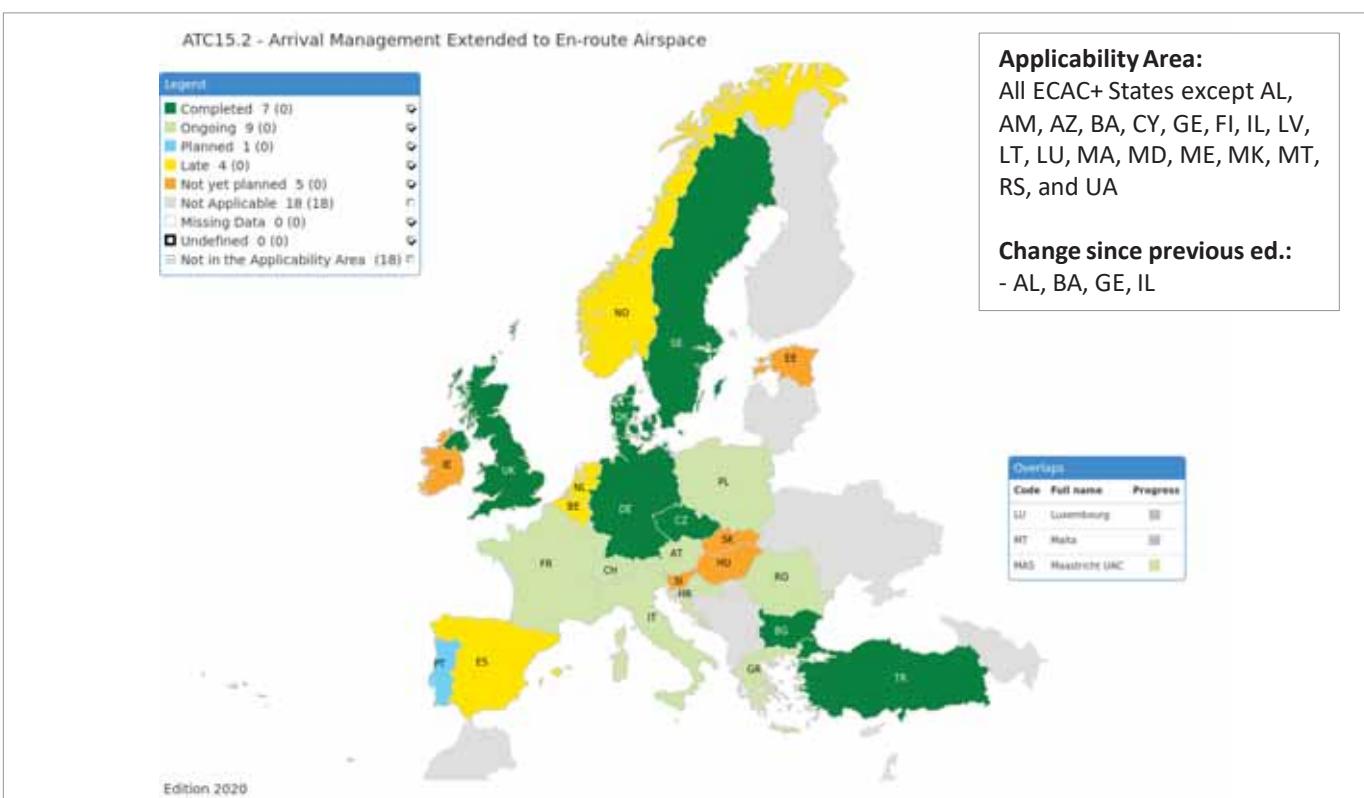
# EOC: Fully Dynamic and Optimised Airspace Organisation

## ATC15.2 Arrival Management extended to en-route airspace



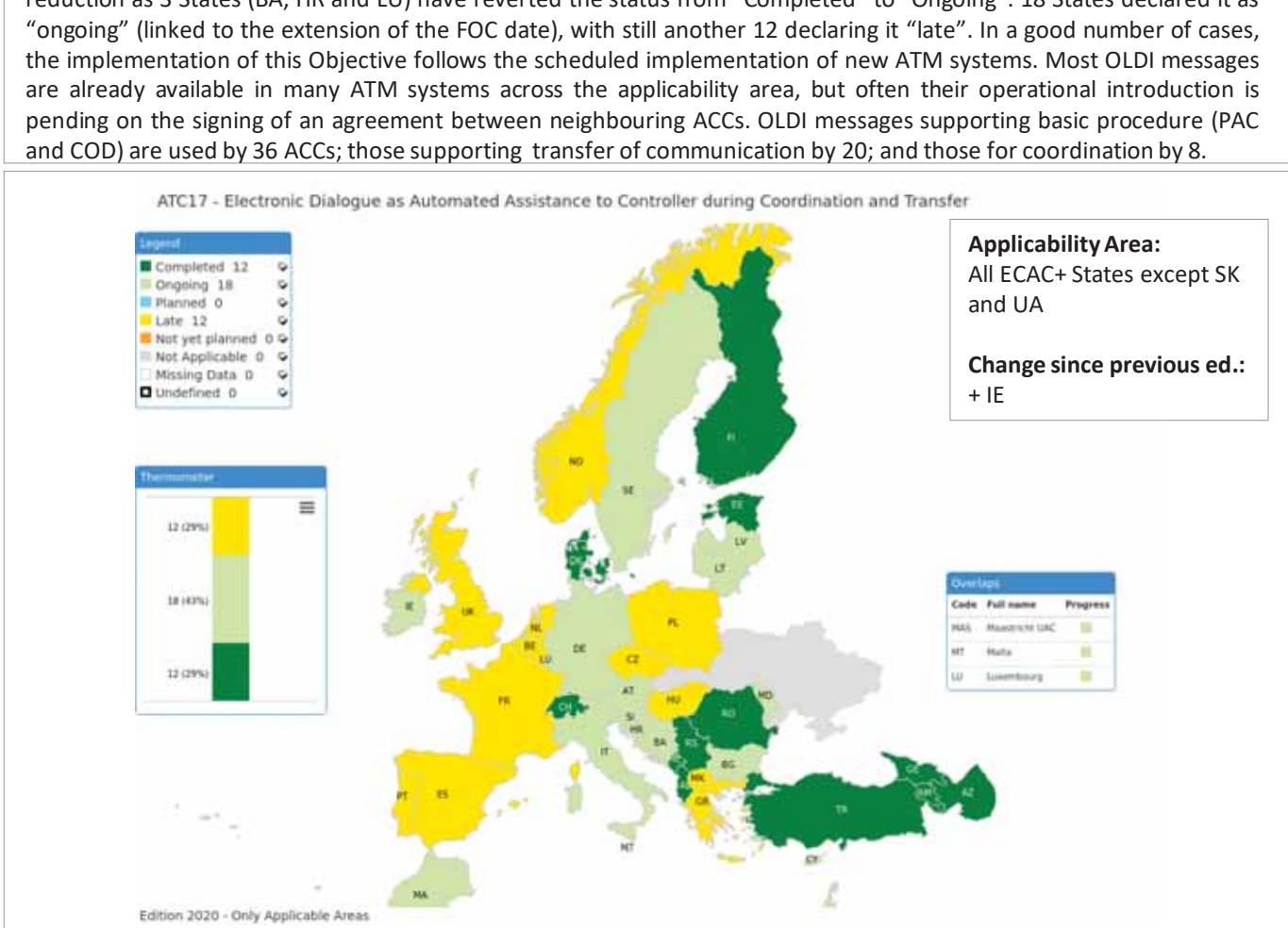
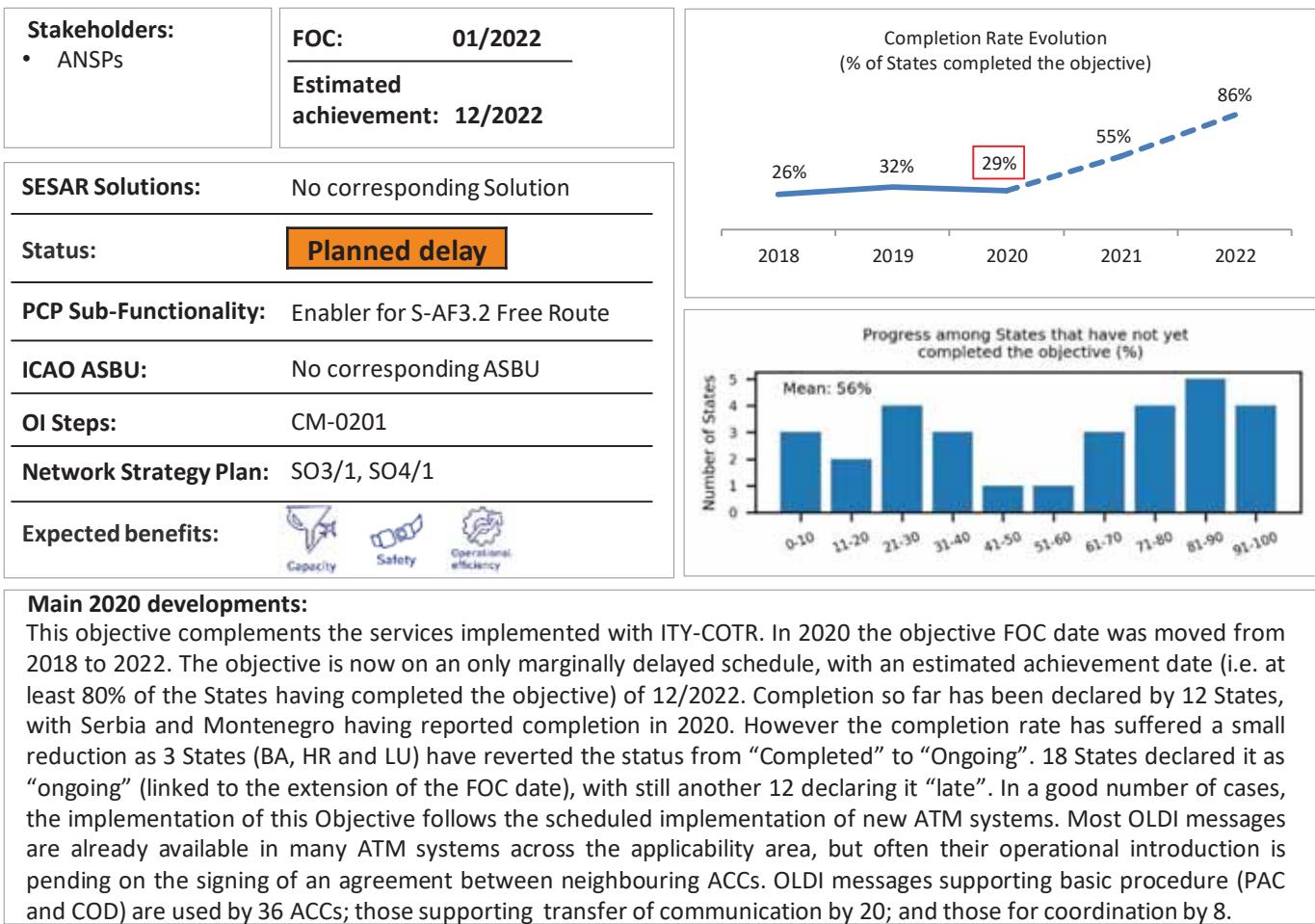
### Main 2020 developments:

This objective stems from PCP Regulation 716/2014. It extends AMAN to the en-route airspace for 180-200 nautical miles. For many ANSPs its implementation will require coordination with neighboring countries. Within the PCP regulated applicability area of this objective, 6 report it as "completed" (5 in 2019), 9 "ongoing" (10 in 2019), 5 "not yet planned" (7 in 2019) and 1 as "planned" (3 in 2019). Four ANSPs reported the implementation as "Late", with a planned completion by end of 2024. Outside the 2020 EU regulated area (pre-Brexit), Turkey has completed this objective since 2018. The still high number of "not yet planned" (5 States) brings some uncertainty on the likely achievement date for this objective, now estimated at 12/2024. It should be noted that this estimated completion date is fully consistent with the date required by the CP1 Regulation (EU 116/2021) for the deployment of extended AMAN functionality which is 12/2024.



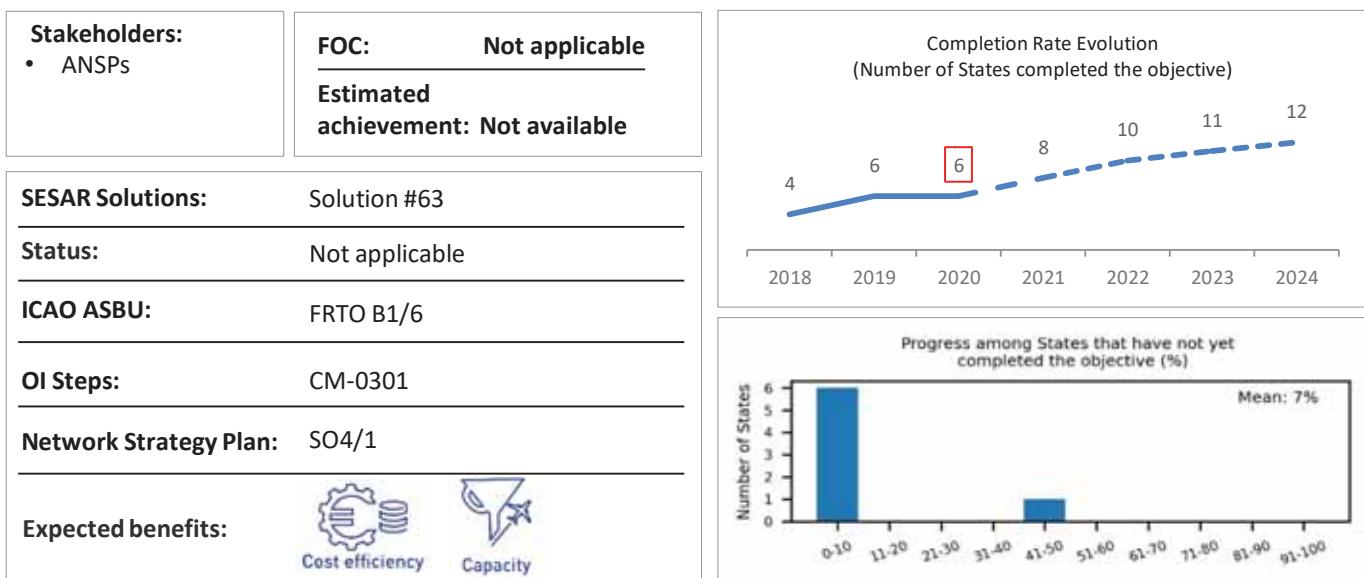
# EOC: Fully Dynamic and Optimised Airspace Organisation

## ATC17 Electronic Dialogue supporting COTR



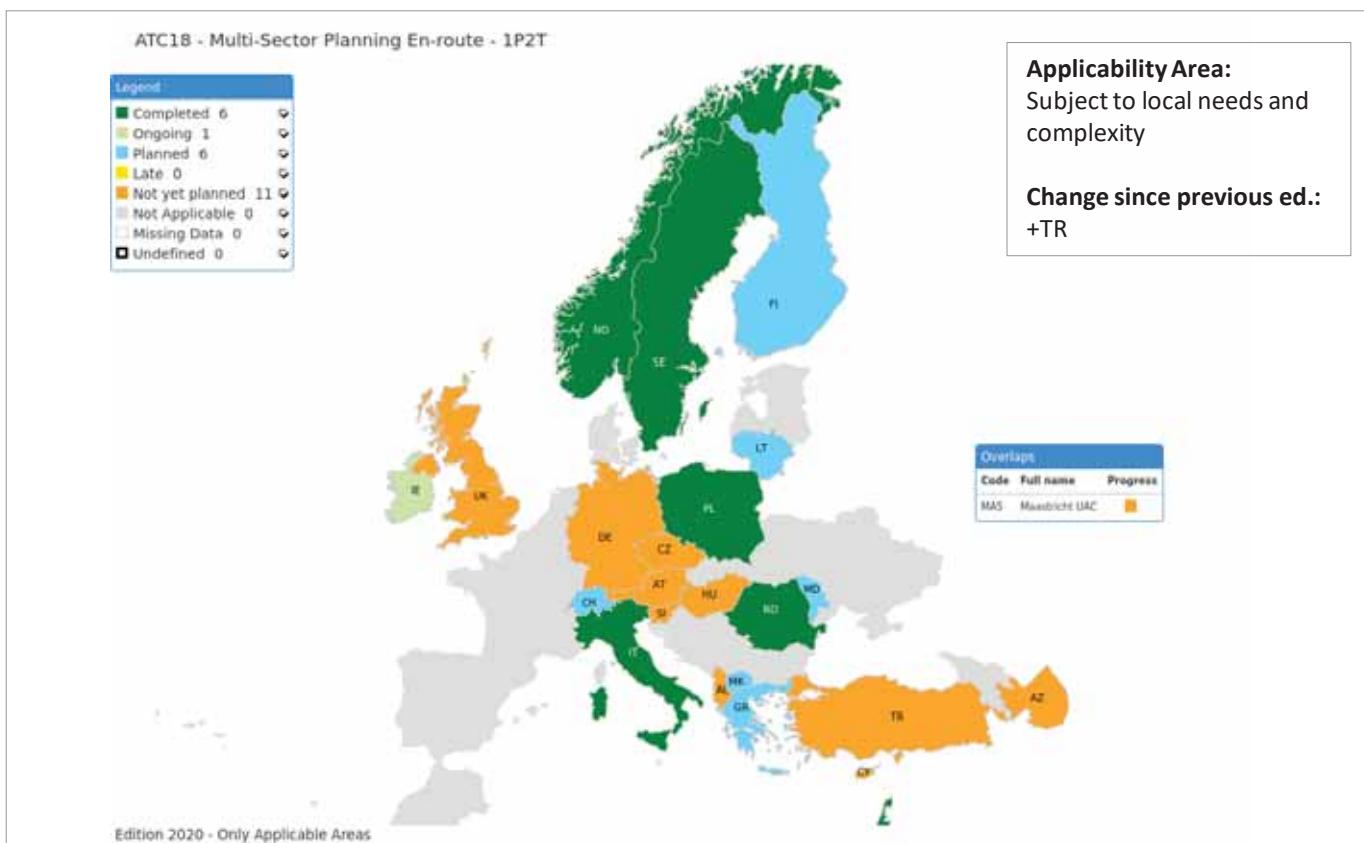
# EOC: Fully Dynamic and Optimised Airspace Organisation

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



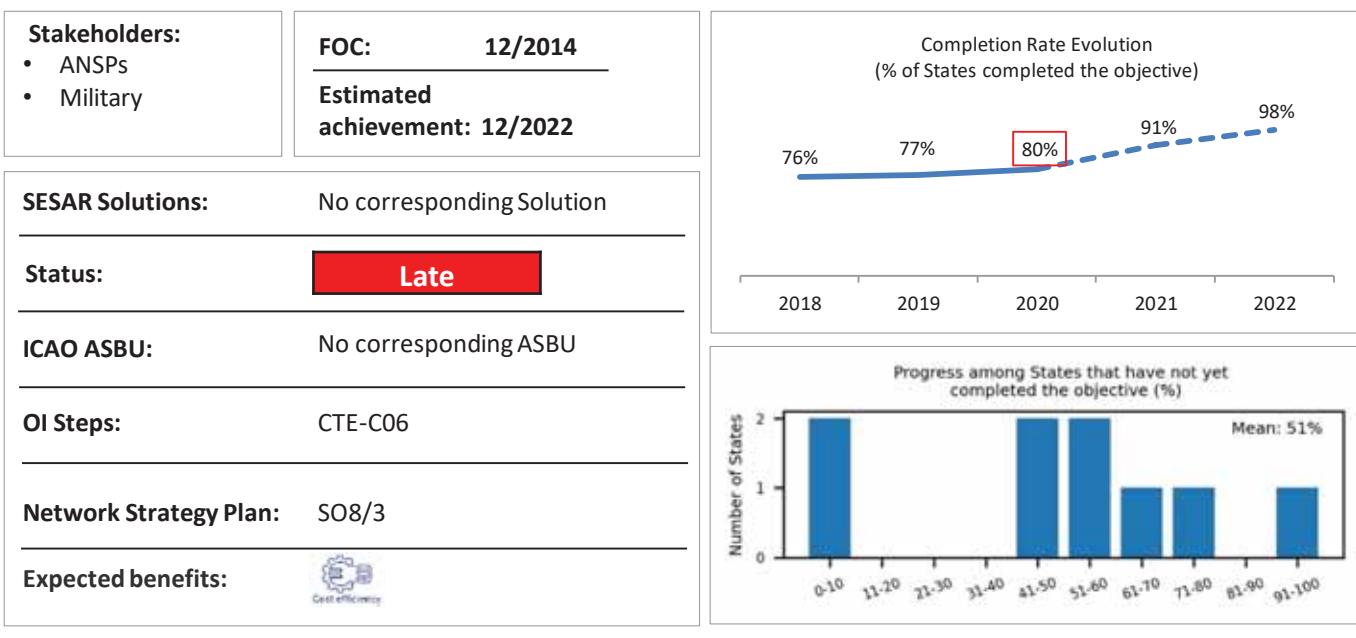
### Main 2020 developments:

This is a “Local” objective and it has no associated pre-defined applicability area, nor a common FOC date for reference. In its fourth year of monitoring, its implementation progress has marked a stop, with a deployment that is in all similar to the one of 2019: 6 ANSPs have already deployed multi-sector planning (IL, IT, NO, PL, RO and SE), while IE declared the implementation as “ongoing”. Six (6) States have concrete plans for implementation (CH, FI, GR, LT, MK and MD), with foreseen dates of completion ranging from 2021 to 2030. Finally, ten (10) States do not have firm plans for implementation. In most of States (21) the objective is declared as “not applicable”. For some of them this is either due to their current number of sectors and/or configuration, ATM system capabilities, or lack of perceived benefits compared to current operations. Nevertheless, according to current plans, it is expected that the number of ANSPs having implemented this objective will double by 2024.



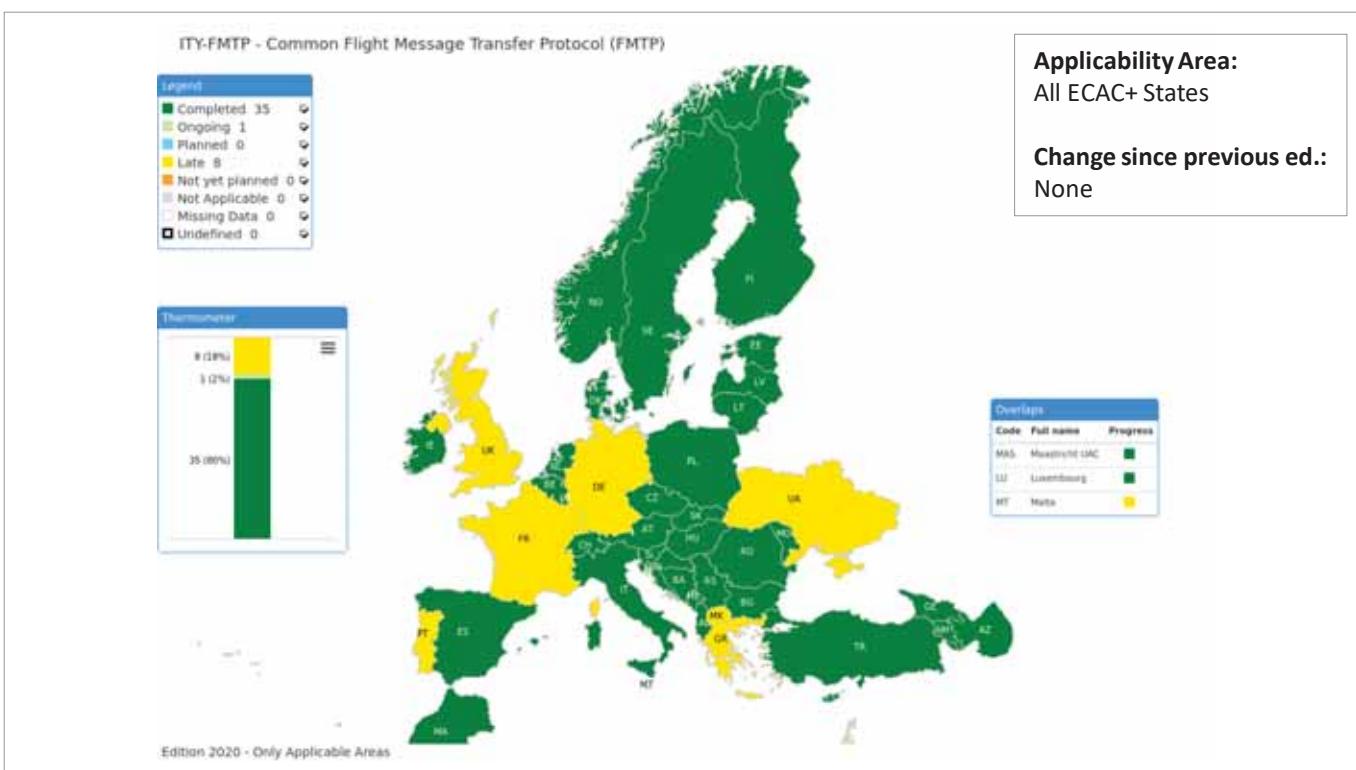
# EOC: Fully Dynamic and Optimised Airspace Organisation

## ITY-FMTP Common Flight Message Transfer Protocol



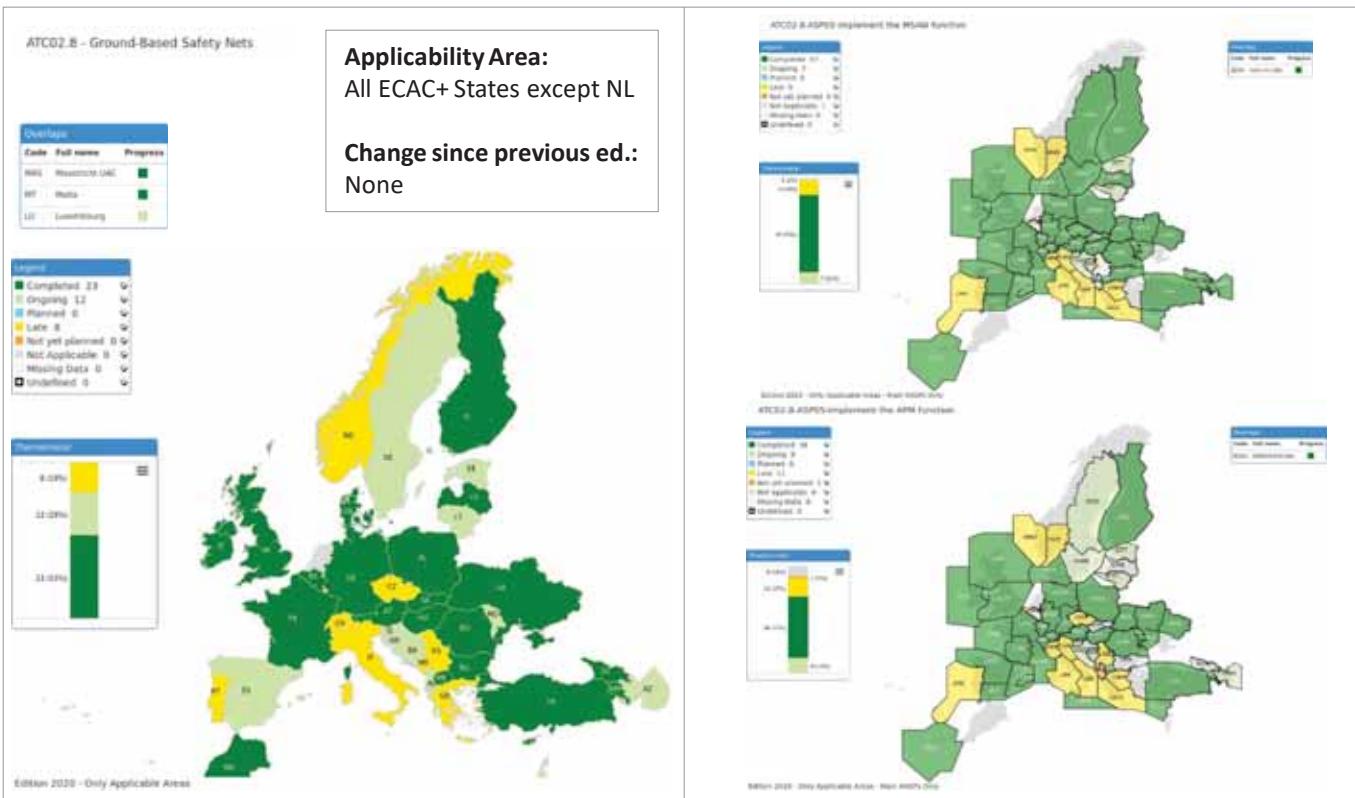
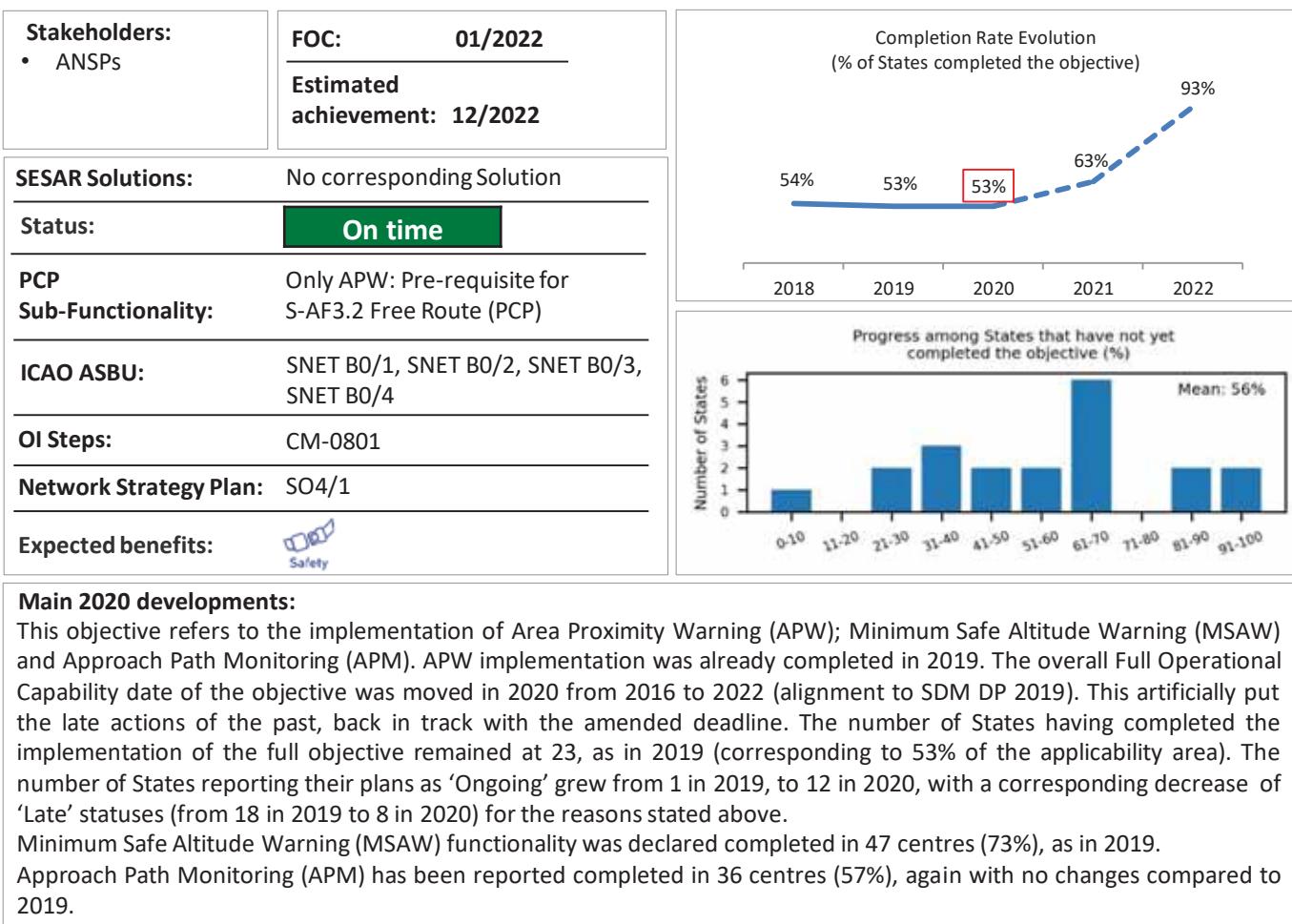
### Main 2020 developments:

Implementation continues to progress, with one more State (FI) having declared the objective as “Completed”. According to currently reported plans, the expected full 100% completion rate across the applicability area will be achieved only in 2027 (the 80% threshold has been reached in 2020). However, among the 8 States having declared a “Late” status, FR, GR, MT, PT and UK plan to complete their implementation in the course of 2021, while DE, MK and UA plan to complete the objective in 2022. Only IL intends to finalize implementation by 2027, as the project is delayed due to COVID-19. The main reasons for delay are slow migration from IPv4 to IPv6, foreseen implementation during next major system upgrades and especially the ability of neighbouring ACCs to support FMTP. Delay also occurs due to the planned introduction of new ATM Systems.



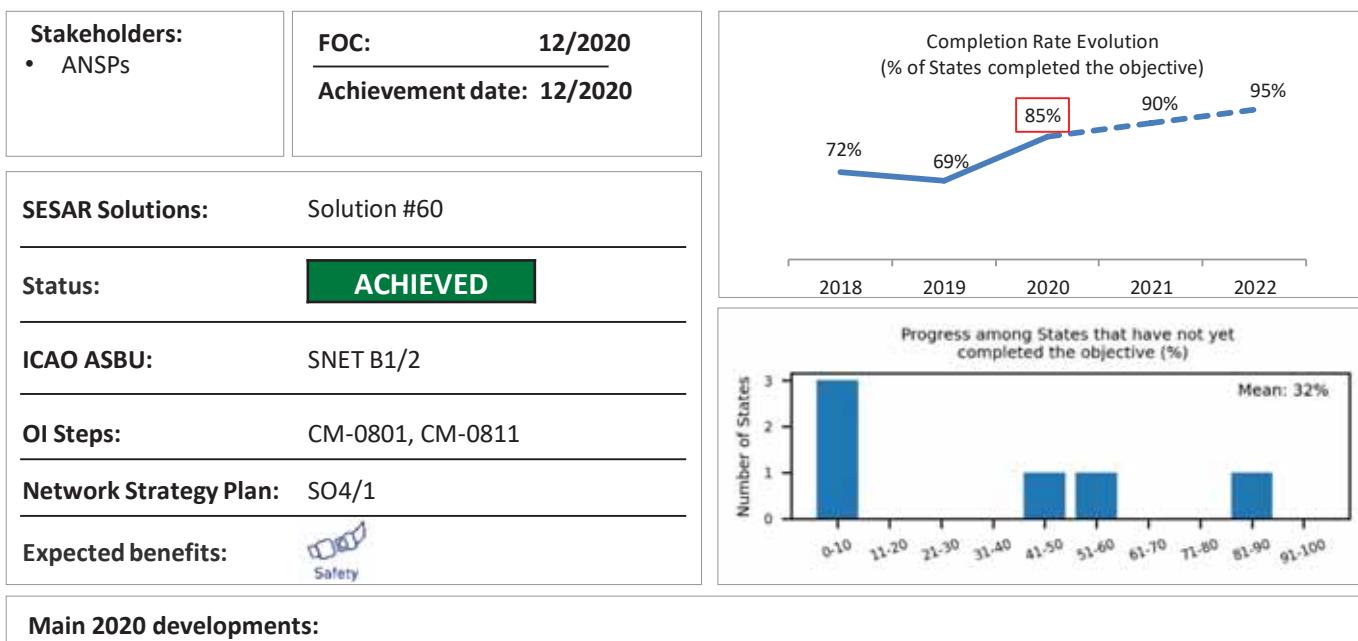
# EOC: Trajectory Based Operations

## ATC02.8 Ground-based Safety Nets



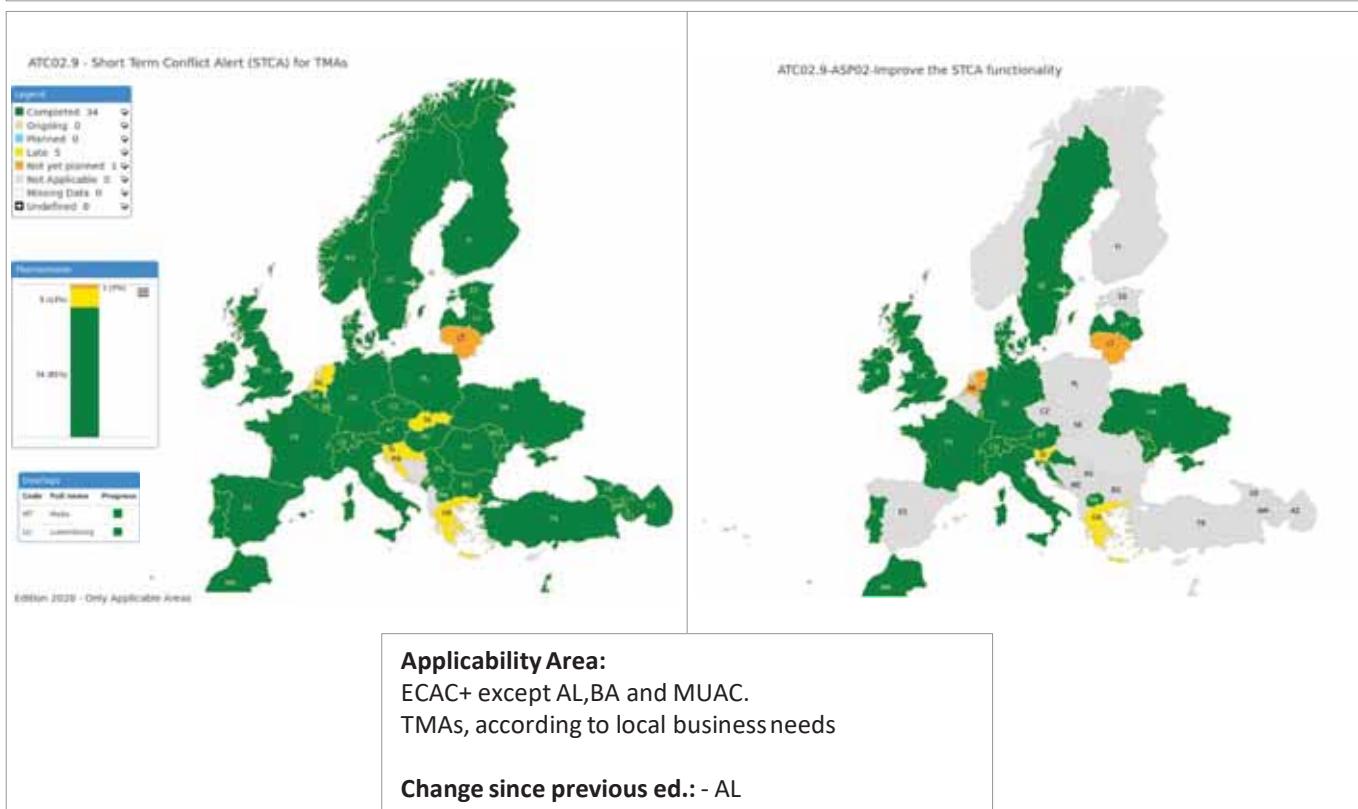
# EOC: Trajectory Based Operations

## ATC02.9 STCA for TMAs



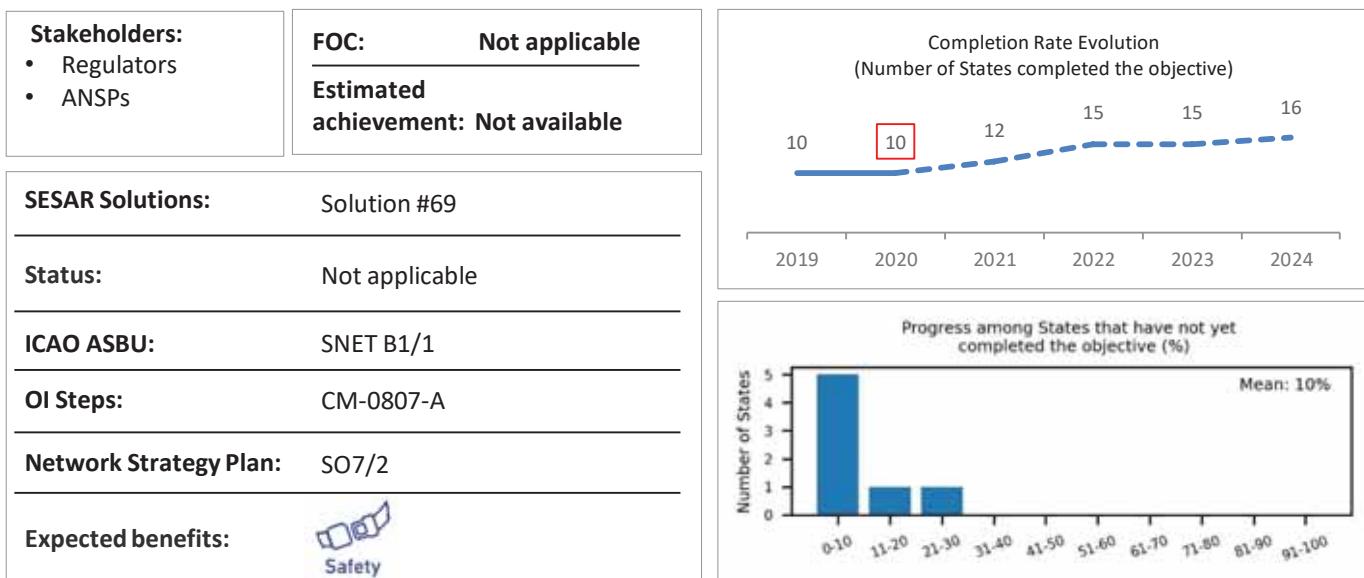
### Main 2020 developments:

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. Most of the ANSPs, use the En-route algorithm also for their TMAs. Some, on the other hand, have implemented enhanced functionalities, including the so-called multi-trajectory functionality. The objective was achieved in 2020, both for the basic and enhanced functionalities (see maps). Thirty-four ANSPs declared the objective “completed” in 2020, against 29 in 2019. This accounts for 85% of the applicable area (34 out of 40 ANSPs). The enhanced STCA functionality was declared completed by 82% of the applicable area (18 out of 22 ANSPs).



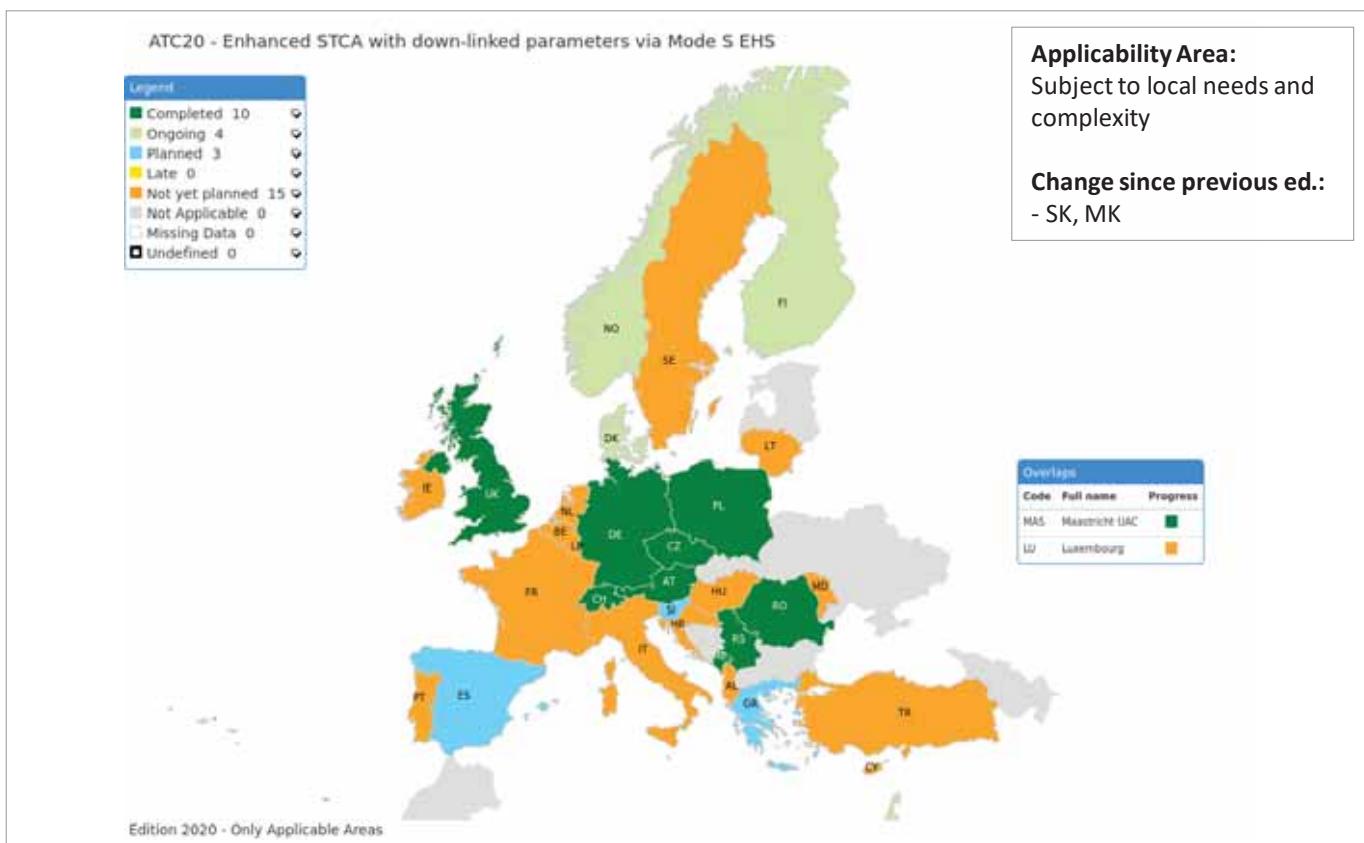
# EOC: Trajectory Based Operations

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



### Main 2020 developments:

ATC20 is a “Local” objective with no associated pre-defined applicability area, nor a common FOC date for reference. This was its second year of monitoring. So far, enhanced STCA with down-linked parameters via Mode S EHS was reported as “completed” by 10 States/ANSPs. Implementation is “ongoing” in another 4 States, albeit at a relatively early stage: FI with a progress at 30% and an estimated completion by 12/2021; NO with a progress of 20% (by 2024) and IL with a progress at 10% (by 2027). DK (also “ongoing”) reported the functionality as used in a buffer-area just outside the FIR, with the expectation to use it inside the FIR by end 2021. Three States, while not having started yet the implementation, reported firm plans for it: ES, GR and SI. In GR and SI this is linked to the procurement and installation of new systems. Two States (SI and IL) anticipate delays due to COVID-19 crisis. Another 15 States declared not to have yet firm plans for its introduction.



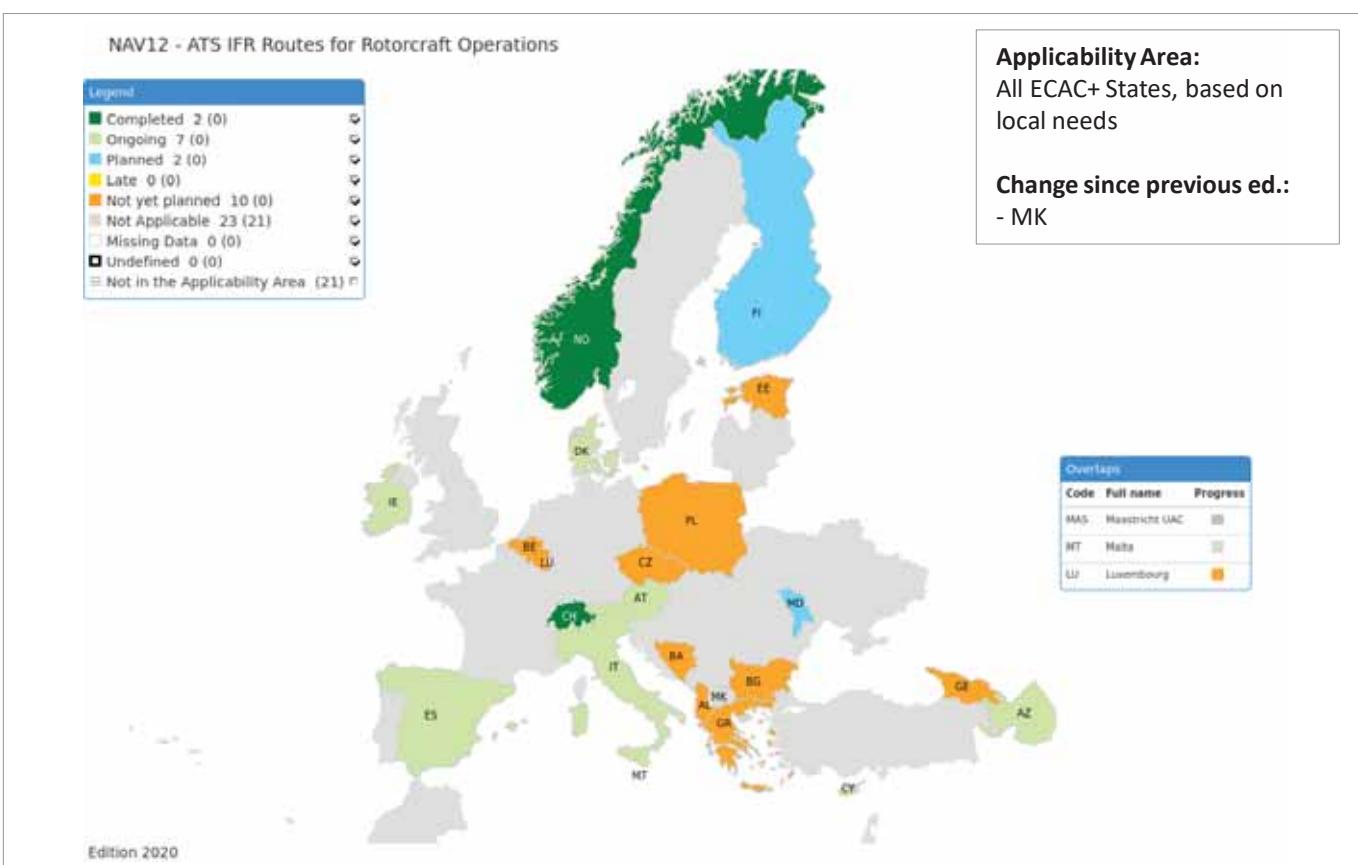
# **EOC: Multimodal Mobility and integration of all airspace users**

## **NAV12 Optimised Low-Level IFR Routes in TMA for Rotorcraft**

<b>Stakeholders:</b>	<b>FOC:</b> 06/2030	<b>Completion Rate Evolution</b> (% of States completed the objective)
<ul style="list-style-type: none"> <li>• ANSPs</li> <li>• Airspace Users</li> <li>• Regulators</li> </ul>	<b>Estimated achievement:</b> Not available	
<b>SESAR Solutions:</b>	Solution #113	
<b>Status:</b>	Not available	
<b>ICAO ASBU:</b>	APTA B0/6	
<b>OI Steps:</b>	AOM-0810	
<b>Network Strategy Plan:</b>	SO6/5	
<b>Expected benefits:</b>	 Safety  Capacity  Operational efficiency  Environment	

## Main 2020 developments:

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 routes, and LLR IFR for rotorcraft implementation, and on applicable specifications RNPO.3, RNP1 or RNAV1. Two states (CH and NO) completed implementation of LLR IFR and ATS routes below FL150 for rotorcraft. The first PinS and LLRs were implemented in AT, IT, AZ and CY. There is no interest for dedicated SID/STAR to instrument RWY for rotorcraft yet. Almost all other States, except DK, do not consider implementing NAV12 due to lack of business needs and characteristics of their operational environment.



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## **4 ANNEXES**

### **Annex A**

#### **The main definitions of the terminology used in Master Plan Level 3 Report**

This Annex provides a summary of the terminology and designators used across the Master Plan Level 3 (MPL3) Report. It is consistent with and complements the one used in the Master Plan Level 3 Plan.

The following stakeholder group designators are used:

<b>REG</b> – State Authorities	<b>INT</b> – International Organisations and Regional Bodies
<b>ASP</b> – Air Navigation Service Providers (Civil & Military providing services to GAT)	<b>IND</b> – Aeronautics Industry
<b>APO</b> – Airport Operators	<b>AGY</b> - EUROCONTROL Agency (non-Network Manager)
<b>USE</b> – Airspace Users	<b>NM</b> – EUROCONTROL Network Manager

The Key Performance Areas (KPAs) listed in this document are in line with those defined in Chapter 3 ('Performance View') of the Level 1 of the European ATM Master Plan Edition 2020.

The graphical designator indicates the EOC and is fully consistent with the corresponding designator from the Level 1 of the European ATM Master Plan Edition 2020.

The implementation objective designators consist of acronym identifying one of the designated ATM areas of work and a serial number for the objective within the area of work it covers.

<b>AOM</b> = Airspace Organisation and Management	<b>HUM</b> = Human Factors
<b>AOP</b> = Airport Operations	<b>INF</b> = Information Management
<b>ATC</b> = Air Traffic Control	<b>ITY</b> = Interoperability
<b>COM</b> = Communications	<b>NAV</b> = Navigation
<b>ENV</b> = Environment	<b>SAF</b> = Safety Management
<b>FCM</b> = Flow and Capacity Management	

The **Implementation Objectives** (IOs) set out the operational, technical and institutional improvements which contribute to meet the performance requirements in the KPAs of cost-efficiency, operational efficiency, capacity, environment, safety and security, as defined in the ATM Master Plan Level 1.

Implementation Objectives describe Stakeholder Lines of Action (SLoAs) applicable to ANS Providers, National Regulators, Airport Operators, Military Authorities, Airspace Users that address the deployment and operational introduction aspects of the functionalities described in the IO.

The implementation objectives may have one of the following statuses:

- **Active** - objective in the L3 Plan fully ready for implementation and monitored in LSSIP being therefore **included** in the MPL3 Report;
- **Initial** - objective introduced in MPL3 Plan, but some elements still require validation/commitment and therefore it is not monitored in LSSIP yet, so it **does not** appear in the MPL3 Report.

From a commitment perspective, the implementation objectives are classified as being "Regulated", "Committed" or "Local". These terms have the following meaning in the context of the implementation decision making:

- **Regulated**: There is a legal act (usually EU IR) mandating the stakeholders concerned to implement a specified functionality by a predefined date within a predefined applicability area (EU Member States);
- **Committed**: The stakeholders committed through EUROCONTROL Provisional Council to implement a functionality by agreed date within agreed applicability area in a coordinated manner, while there is no law act regulating these elements;

- **Local:** There is no commonly agreed pan-European implementation plan. An individual stakeholder decides if and when to implement a functionality. Such objectives do not have a predefined Applicability Area nor a Full Operational Capability (FOC) date. They are subject to local business decisions by any stakeholder concerned.

The classification on regulated, committed or local is without prejudice to the existing SES regulatory framework in ATM (e.g. common requirements, safety, conformity assessment, etc.). Any implementation including purely local ones has to be performed taking fully into account the entire applicable regulatory framework.

The implementation objectives present in the MPL3 Report may have one of the following applicability area(s) defined as follows:

- **ECAC:** Refers to the States members of the European Civil Aviation Conference + Maastricht UAC.
- **ECAC+:** Refers to all ECAC states plus the states signed Comprehensive Agreement with EUROCONTROL, i.e. Israel and Morocco.
- **EU+:** Refers to the States members of the European Union (including Maastricht UAC) + the states signatory to the European Common Aviation Area Agreement (ECAA), Albania, Bosnia and Herzegovina, North Macedonia, Georgia, Montenegro, Serbia and Moldova, + NO and CH.
- **EU SES:** Refers to the States members of the European Union (including Maastricht UAC) + Norway and Switzerland who have signed agreements with the EU contractual commitment to implement the SES legislation.
- **EU:** Refers to the States members of the European Union.
- **25 PCP Airports:** Refers to the airports identified in ATM Functionality 2 of the PCP Regulation as the Geographical Scope for all its sub-functionalities except 'Time-Based Separation'. The 25 airports are: London-Heathrow, Paris-CDG, London-Gatwick, Paris-Orly, London-Stansted, Milan-Malpensa, Frankfurt International, Madrid-Barajas, Amsterdam Schiphol, Munich Franz Josef Strauss, Rome-Fiumicino, Barcelona El Prat, Zurich Kloten, Düsseldorf International, Brussels National, Oslo Gardermoen, Stockholm-Arlanda, Berlin Brandenburg Airport, Manchester Ringway, Palma De Mallorca Son San Juan, Copenhagen Kastrup, Vienna Schwechat, Dublin, and Nice Cote d'Azur and Istanbul Ataturk Airport.
- **17 PCP Airports:** Refers to the airports identified in ATM Functionality 2 of the PCP Regulation as the Geographical Scope for the sub-functionality 'Time-Based Separation'. The 17 airports are: London-Heathrow, London-Gatwick, Paris-Orly, Milan-Malpensa, Frankfurt International, Madrid-Barajas, Amsterdam-Schiphol, Munich Franz Josef Strauss, Rome-Fiumicino, Zurich Kloten, Düsseldorf International, Oslo Gardermoen, Manchester Ringway, Copenhagen Kastrup, Vienna Schwechat, Dublin and Istanbul Ataturk Airport.

The **SESAR solutions** represent a deployable output of the SESAR development phase introducing new or improved standardised and interoperable operational procedures or technologies. Similarly with the implementation objectives, from the perspective of the MPL3 Report, these solutions fall within the following categories:

- **Regulated:** The functionality related to a Solution is included in an EU Regulation (as well as in the MPL3 Plan);
- **Committed:** The functionality related to a Solution is not regulated, however it is addressed by a MPL3 implementation objective reflecting the stakeholder commitment to implement the functionality by an agreed date within an agreed applicability area in a coordinated manner. This commitment is expressed through the approval of the implementation objectives by the EUROCONTROL Provisional Council and of the MPL3 Plan by the SJU Admin Board;

**Non-committed Solutions:** Validated Solutions which may be implemented in a voluntary way, without coordination at European level and which are not yet included in the MPL3 Plan therefore are not associated to an implementation objective.

## Annex B

### Relevant mappings of the Level 3<sup>1</sup>

Mapping of the L3 active Objectives to corresponding SESAR Essential Operational Changes, SESAR Solutions, Deployment Program families (PCP), 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	-	-	COMI B0/7	-	-	-	EAI
	COM11.1 - Voice over Internet Protocol (VoIP) in En-Route	-	3.1.4 3.2.1	COMI B2/1	-	SO8/4	AM-1.3	EAI
	COM11.2 - Voice over Internet Protocol (VoIP) in Airport/Terminal	-	-	COMI B2/1	-	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	COMI B0/4 COMI B1/2	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	-	-	ASUR B0/1 ASUR B0/3	RMT.0679 RMT.0519	SO8/3 SO8/4	-	EAI
	NAV10 - RNP Approach Procedures to instrument RWY	#103	1.2.1 1.2.2	NAVS B0/2 APTA B0/1 APTA B1/1	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	NOPS B1/3	-	SO6/2	-	HPAO
	AOP17 – Provision/integration of DPI to NMOC	#61	-	NOPS B0/4	-	-	-	HPAO
	COM12 - NewPENS	-	5.1.2 5.2.1	COMI B1/1	-	SO2/3 SO2/4 SO8/3 SO8/4	-	EAI
	FCM03 - Collaborative flight planning	-	4.2.3	NOPS B0/2	-	SO4/2 SO5/1 SO5/6	AM-1.14	OANS
	FCM04.2 - STAM phase 2	#17	4.1.2	NOPS B1/1	-	SO4/3 SO5/4	AM-1.11	OANS
	FCM05 - Interactive rolling NOP	#20, #21	4.2.2 4.2.4	NOPS B1/2	-	SO2/1 SO2/2 SO2/3 SO2/4	AM-1.12	OANS
	FCM06 - Traffic Complexity Assessment	#19	4.4.2	NOPS B1/4	-	SO4/3 SO5/4	AM-1.13	OANS

<sup>1</sup> A complete mapping between the architectural objects relevant to the implementation objectives is available in the European ATM working Portal (<https://eatmportal.eu/>)

	FCM09 - Enhanced ATFM Slot swapping	#56	-	NOPS B1/7	-	SO6/1	-	OANS
	INFO8.1 - 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	AMET B2/4 DAIM B2/1 SWIM B3/1	-	SO2/4 SO2/5 SO5/2 SO5/5	AM-1.5	EAI
Digital AIM and MET Services	INFO7 - Electronic Terrain and Obstacle Data (e-TOD)	-	1.2.2	DAIM B1/3 DAIM B1/4	RMT.0703 RMT.0722	SO2/5	-	EAI
	ITY-ADQ - Ensure quality of aeronautical data and aeronautical information	-	1.2.2	DAIM B1/1	RMT.0722 RMT.0477	SO2/5	-	EAI
U-space Services	-	-	-	-	-	-	-	-
Virtualisation of Service Provision	AOP14 – Remote Tower Services	#12, #71, #52, #13	-	RATS B1/1	RMT.0624	SO6/5	-	HPAO
Airport and TMA performance	AOP04.1 - A-SMGCS Surveillance (former Level 1)	#70	2.2.1	SURF B0/2	MST.029	SO6/6	-	HPAO
	AOP04.2 - A-SMGCS RMCA (former Level 2)	-	2.2.1	SURF B0/3	MST.029	SO6/6	-	HPAO
	AOP05 - Airport CDM	#106	2.1.1 2.1.3	ACDM B0/2 NOPS B0/4 RSEQ B0/2	-	SO6/4	-	HPAO
	AOP10 - Time Based Separation	#64	2.3.1	WAKE B2/7	-	SO6/5	-	HPAO
	AOP12 - Improve RWY and Airfield safety with CATC detection and CMAC	#02	2.1.2 2.5.1	SURF B1/3	MST.029	SO6/6	-	HPAO
	AOP13 - Automated assistance to Controller for Surface Movement planning and routing	#22 #53	2.4.1	SURF B1/4	MST.029	SO6/6	-	HPAO
	AOP15 - Safety Nets for vehicle drivers	#04	-	SURF B2/2	MST.029	-	-	HPAO
	AOP16 - Guidance assistance through airfield lighting	#47	-	SURF B1/1	MST.029	-	-	HPAO
	AOP18 - Runway Status Lights	#01	-	SURF B2/2	MST.029	-	-	HPAO
	ATC07.1 - Arrival management tools	-	1.1.1	RSEQ B0/1	-	SO4/1	-	AATS
	ATC19 - Enhanced AMAN-DMAN integration	#54	-	RSEQ B2/1	-	SO6/5 SO4/1	-	AATS
	ENV01 – Continuous Descent Operations	-	-	APTA B0/4	-	SO6/5	-	AATS
	ENV02 – Airport Collaborative	-	-	-	-	-	-	HPAO

	Environmental Management							
	ENV03 – Continuous Climb Operations	-	-	APTA B0/5	-	SO6/5	-	AATS
	NAV03.1 – RNAV1 in TMA Operations	#62	-	APTA B0/2	RMT.0639 RMT.0445	SO6/5	-	AATS
	NAV03.2 – RNP1 in TMA Operations	#09, #51	1.2.3 1.2.4	APTA B1/2	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	FRT0 B0/2	-	SO3/2 SO3/3	AM-1.8	OANS
	AOM19.2 - ASM management of real-time airspace data	#31	3.1.2	FRT0 B1/3 NOPS B1/5	-	SO3/2 SO3/3	AM-1.8	OANS
	AOM19.3 - Full rolling ASM/ATFCM process and ASM information sharing	#31	3.1.3	FRT0 B1/3 NOPS B1/5	-	SO3/2 SO3/3	AM-1.8	OANS
	AOM19.4 – Management of Pre-defined Airspace Configurations	#31	3.1.4	FRT0 B1/4 NOPS B1/6	-	SO3/2 SO3/3	-	OANS
	AOM21.2 - Free Route Airspace	#33, #66	3.2.1 3.2.4	FRT0 B1/1	-	SO3/1 SO3/4	AM-1.6 AM-1.10 AM-5.1	AATS
	ATC12.1 - MONA, TCT and MTCD	#27, #104	3.2.1	FRT0 B1/5	-	SO3/1 SO4/1	AM-1.15 AM-5.1	AATS
	ATC15.1 - Initial extension of AMAN to En-route	-	1.1.2	-	-	SO4/1	-	AATS
	ATC15.2 - Extension of AMAN to En-route	#05	1.1.2	RSEQ B1/1 NOPS B1/8	-	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	-	FRT0 B1/6	-	SO4/1	AM-4.3 AM-5.1	AATS
	ITY-FMTP - Apply a common flight message transfer protocol (FMTP)	-	-	-	-	SO8/3	AM-1.3	EAI
Trajectory Based Operations	ATC02.8 - Ground based safety nets	-	3.2.1	SNET B0/1 SNET B0/2 SNET B0/3 SNET B0/4	-	SO4/1	-	AATS
	ATC02.9 - STCA for TMAs	#60	-	SNET B1/2	MST.030	SO4/1	-	AATS
	ATC20 – Enhanced STCA with down-linked parameters via Mode S EHS	#69	-	SNET B1/1	-	SO7/2	-	AATS
Multimodal Mobility and integration of all airspace users	NAV12 – ATS IFR Routes for Rotorcraft Operations	#113	-	APTA B0/6	MST.031	SO6/5	-	AATS

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## Annex C

### Consolidated progress and implementation status

Consolidated progress of implementation in 2020 and the implementation status at the end of 2020 of all monitored, active implementation objectives.

Implementation Objective	SESAR Solution ref.	Change in the number of States/Airports completed the objective (2020 vs. 2019)	State/Airport+2s completed the objective in 2020	Progress evolution in 2020 (Completion rate)	Number of States/Airports completed the objective (Total number in Applicability area)	FOC	Implementation Status	Estimated achievement
AOM13.1	-	+3	BE, IE, UA	+8% (53%)	20 (38)	12/2018	Late	12/2021
AOM19.1	#31	0	None	+1% (35%)	13 (37)	01/2022	On time	01/2022
AOM19.2	#31	+1	LV	+3% (8%)	3 (37)	01/2022	Planned delay	12/2025
AOM19.3	#31	+2	DK, FR	+5% (19%)	7 (36)	12/2021	Planned delay	12/2022
AOM19.4	#31	+1	DK, MUAC (-IE)	+4% (15%)	5 (33)	01/2022	N/A	N/A
AOM21.2	#33, #66	+2	HR, HU	+5% (72%)	28 (39)	01/2022	On time	01/2022
AOP04.1	-	+3	EDDB, LTFM, LUKK	+4% (74%)	42 (57)	01/2021	Late	12/2021
AOP04.2	-	+1	LTFM	0 (56%)	30 (53)	01/2021	Late	12/2022
AOP05	#106	+4	EDDB, EPWA, LFMN, LPPT	+6% (59%)	29 (49)	01/2021	Late	12/2022
AOP10	#64	0	None	-1% (5%)	1 (19)	01/2024	N/A	N/A
AOP11	#21	+1	EDDB	+1% (14%)	6 (38)	01/2021	Late	12/2023
AOP12	#02	+2	EIDW, LTFM	+5% (28%)	8 (29)	01/2021	Planned delay	12/2024
AOP13	#22, #53	0	None	0 (0%)	0 (26)	01/2024	N/A	N/A
AOP14	#12, #13, #52, #71	0	None	-	4 (Local Obj)	N/A	N/A	N/A
AOP15	#04	-1	-LFPG	-	1 (Local Obj)	N/A	N/A	N/A
AOP16	#47	0	None	-	0 (Local Obj)	N/A	N/A	N/A
AOP17	#61	+6	EDDC, EDDE, EDDG, EDDR, EDDW, LEZL	-	16 (Local Obj)	N/A	N/A	N/A
AOP18	#01	0	None	-	1 (Local Obj)	N/A	N/A	N/A
ATC02.8	-	0	None	0 (53%)	23 (43)	01/2022	On time	01/2022
ATC02.9	#60	+5	AZ, FI, IE, LU, RO	+16% (85%)	34 (40)	12/2020	Achieved	12/2020
ATC07.1	-	+3	EBBR, EDDB, LTFM	+8% (69%)	25 (36)	01/2020	Late	12/2022
ATC12.1	#27, #104	+2	BA, HR	+4% (53%)	23 (43)	01/2022	Planned delay	12/2022
ATC15.1	-	+1	DE	+8% (69%)	18 (26)	12/2019	Late	12/2022
ATC15.2	#05	+1	CZ	+9% (27%)	7 (26)	01/2024	Planned delay	12/2024
ATC17	-	-1	RS, ME (-BA, HR, LU)	-3% (29%)	12 (42)	01/2022	Planned delay	12/2022
ATC18	#63	0	None	-	6 (Local Obj)	N/A	N/A	N/A
ATC19	#54	0	None	-	1 (Local Obj)	N/A	N/A	N/A
ATC20	#69	0	None	-	10 (Local Obj)	N/A	N/A	N/A

COM10	-	+6	BA, CH, EE, GR, LT, PL	+13% (77%)	34 (44)	12/2018	Late	12/2021
COM11.1	-	-1	-ES	-2% (9%)	4 (44)	01/2022	Planned delay	12/2023
COM11.2	-	+1	MA	+4% (13%)	5 (40)	12/2023	On time	12/2023
COM12	-	+21	AZ, BE, CH, CY, CZ, DE, DK, EE, ES, FR, HR, IE, IL, LV, MUAC, NL, NO, PL, PT, SE, TR	48% (65%)	28 (43)	12/2024	On time	12/2022
ENV01	-	-1	EDDN	-3% (36%)	27 (75)	12/2023	On time	12/2023
ENV02	-	0	None	-	46 (Local Obj)	N/A	N/A	N/A
ENV03	-	+3	EFHK, LHBP, LJLJ	-	54 (Local Obj)	N/A	N/A	N/A
FCM03	-	-2	(-LU, UK)	-4% (55%)	24 (44)	01/2022	Planned delay	12/2022
FCM04.2	#17	+3	BA, CZ, FR	+5% (18%)	8 (37)	01/2022	Planned delay	12/2022
FCM05	#20	0	None	0% (5%)	2 (39)	12/2021	Planned delay	12/2023
FCM06	#19	+3	BG, CH, TR	+7% (24%)	10 (41)	12/2021	Planned delay	>2022
FCM09*	#56	-	-	-	-	12/2021	On time	12/2021
INF07	-	+2	AL, FR	+5% (26%)	11 (43)	01/2019	Late	12/2022
INF08.1	#35, #46	0	None	0% (0%)	0 (41)	01/2025	Planned delay	12/2025
ITY-ACID	-	+2	BE, SI, SK (-BA)	+4% (40%)	17 (43)	01/2020	Late	12/2022
ITY-ADQ	-	0	None	-1% (9%)	4 (43)	06/2017	Late	12/2024
ITY-AGDL	-	+2	RO, SI	+9% (45%)	17 (38)	02/2018	Late	12/2022
ITY-AGVCS2	-	+4	BG, HR, IE, SK	+12% (49%)	17 (35)	12/2018	Late	12/2023
ITY-FMTP	-	+1	FI	+3% (80%)	35 (44)	12/2014	Late	12/2022
ITY-SPI	-	+10	BE, BG, DK, GE, HR, HU, IT, LU, LV, SK	+20% (60%)	26 (43)	06/2020	Late	12/2022
NAV03.1	#62	+3	BG, DK, HU	+8% (31%)	13 (42)	06/2030	On time	06/2030
NAV03.2	#09, #51	+1	ME	+5% (12%)	4 (33)	06/2030	N/A	N/A
NAV10	#103	+3	HR, LU, ME	+7% (21%)	9 (43)	01/2024	On time	01/2024
NAV12	#113	+2	CH, NO	+9% (9%)	2 (23)	06/2030	N/A	N/A
SAF11	-	+3	DE, NO, PT	+7% (76%)	32 (42)	01/2018	Late	12/2021

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

## Annex D

### SESAR 1 Solutions

The SESAR Solutions not covered yet in the MPL3 were subject to a specific questionnaire integrated within the LSSIP 2020 cycle. For the first time, the survey has also included the Solutions delivered by SESAR2020 Wave 1. 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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(\*) initial<sup>2</sup> objective

##### Non committed (i.e. non MPL3) Solutions

Sol #55	Precision approach using GBAS Category II/III	0	Not yet implemented in any State
		3	Planned in 6 States, 6 locations indicated (CH-LSZH; DE- EDDW, EDDF; ES-LEMD; FR-LFPG; NL; PL-CPK)
Sol #102	Aeronautical mobile airport communication system (AeroMACS)	0	Not yet implemented nor planned in any State
		0	
Sol #109	Air traffic services (ATS) datalink using Iris Precursor	0	Not yet implemented in any State
		3	Planned in 3 States (ES; FR; PT)
Sol #110**	ADS-B surveillance of aircraft in flight and on the surface	4	Implemented in 4 States, 3 locations indicated (DE- EDDN; FR-LFKJ; HU-LHBP; UK)
		12	Planned in 12 States, 4 locations indicated (AT; CH- LS GG, LSZH; DE; ES; FR-LFKB, LFBD; HU; IT; MT; NL; NO; PT; SK)
Sol #114	Composite Surveillance ADS-B / WAM	2	Implemented in 2 States (AT-partly; UK)
		12	Planned in 12 States, 1 location indicated (AT; CH; CZ; DE; EE; FR-LFLB; HU; IT; LT; NL; NO; SK)
PJ.14-02-06	AeroMACs integrated with ATN, Digital Voice and Multilink	0	Not yet implemented nor planned in any State
		0	
PJ.14-03-04	RNP1 reversion based on DME-DME	2	Implemented in 2 States (LT; PL)
		7	Planned in 7 States, 1 location indicated (AT; CH-LSZH; EE; HR; LT; PL; SI)

(\*\*) The same function, without specifying ADS-B, is covered in MPL3 ed. 2020 (Impl. Obj. AOP04.1)

##### ATM Interconnected Network

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

<sup>2</sup> Initial objectives provide advance notice to stakeholders. However, some of their aspects require further validations therefore these objectives are not monitored yet through the MPL3 monitoring mechanism. In order to fill this gap, the corresponding solutions have been included in the survey of non-committed solutions therefore they appear in that category as well (*in italics*).

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	(INFO8.1)
Sol #46	Initial system-wide information management (SWIM) technology solution	(INFO8.1)

(\*) 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 #18	Calculated take-off time (CTOT) and target time of arrival (TTA)	3 7	Implemented in <b>3</b> States, <b>2</b> locations indicated (IE-EIDW; PL-EPWA; UK) Planned <b>7</b> States, <b>4</b> locations indicated (AT; CH; FR-Paris ACC, LFPG, LFPO); HU; IE-EIDW; NL; SK)
Sol #57	User-driven prioritisation process (UDPP) – departure	3 5	Implemented in <b>3</b> States, <b>9</b> locations indicated (CH; DE-EDDB, EDDF, EDDH, EDDL, EDDM, EDDN, EDDS, EDDV; FR-LFPG) Planned <b>5</b> States, <b>2</b> locations indicated (AT; CH; EE-EETN; HU-LHBP; PT)
Sol #67	AOC data increasing trajectory prediction accuracy	0 4	Not yet implemented in any State Planned in <b>4</b> States (CH; FR; HU; UK)
PJ.09-03-02	Collaborative network management functions	2 5	Implemented in <b>2</b> States, <b>2</b> locations indicated (CZ-LKPR; IE-EIDW) Planned <b>5</b> States, <b>7</b> locations indicated (AT; EE-EETN; FR-LFPG, LFPO, LFLL, LFMN; HU-LHBP; IE-EIDW)
PJ.15-01	Sub-regional Demand Capacity Balancing Service	0 0	Not yet implemented nor planned in any State
PJ.17-01	SWIM TI purple profile for airground advisory information sharing	0 2	Not yet implemented in any State Planned in <b>2</b> States (IE; SK)

#### Digital AIM and MET services

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

Sol #34	Digital integrated briefing	(INFO9*)
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(\*) initial objective

#### Non committed (i.e. non MPL3) Solutions

Sol #34	Digital integrated briefing	1 8	Implemented in <b>1</b> State (LV-partly) Planned <b>8</b> States (CH; CZ; DK; EE; ES; LT; LV; SK)
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PJ.15-10	Static aeronautical data service	<span style="background-color: #666; color: white; padding: 2px;">1</span>	Implemented in <b>1</b> State (LV)
		<span style="background-color: #009688; color: white; padding: 2px;">4</span>	Planned <b>4</b> States (EE; FR; LT; SK)
PJ.15-11	Aeronautical digital map service	<span style="background-color: #666; color: white; padding: 2px;">2</span>	Implemented in <b>2</b> States (LV-partly; SK)
		<span style="background-color: #009688; color: white; padding: 2px;">5</span>	Planned <b>5</b> States (EE; ES; FR; LV; SK)
PJ.18-04a	Aeronautical information management (AIM) information	<span style="background-color: #666; color: white; padding: 2px;">2</span>	Implemented in <b>2</b> States (LV-partly; SK)
		<span style="background-color: #009688; color: white; padding: 2px;">9</span>	Planned <b>9</b> States (DK; EE; ES-partly; FR; LT; LU; LV; SK; SI)
PJ.18-04b-01	Meteorological (MET) information-GWMS	<span style="background-color: #666; color: white; padding: 2px;">2</span>	Implemented in <b>2</b> States (AT, IE)
		<span style="background-color: #009688; color: white; padding: 2px;">1</span>	Planned <b>1</b> State (IE)
PJ.18-04b-02	Meteorological information (MET) services-Cb-global	<span style="background-color: #666; color: white; padding: 2px;">1</span>	Implemented in <b>1</b> State (IE)
		<span style="background-color: #009688; color: white; padding: 2px;">2</span>	Planned <b>2</b> States (IE, MUAC)

## 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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### Non committed (i.e. non MPL3) Solutions

PJ.05-02	Multiple remote tower module	<span style="background-color: #666; color: white; padding: 2px;">1</span>	Implemented in <b>1</b> States (IE)
		<span style="background-color: #009688; color: white; padding: 2px;">6</span>	Planned <b>6</b> States (EE; ES; FR; IE; LT; NL)
PJ.16-03	Enabling rationalisation of infrastructure using virtual centre based technology	<span style="background-color: #666; color: white; padding: 2px;">0</span>	Not yet implemented in any State
		<span style="background-color: #009688; color: white; padding: 2px;">2</span>	Planned <b>2</b> States (ES; FR-Paris ACC)

## 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 #11	Continuous descent operations (CDO) using point merge	3 4	Implemented in 3 States, 2 locations indicated (AT-LOWW; FR – LFPG; UK) Planned in 4 States, 2 locations indicated (IE; IT - LIME; LT; NO - ENGM)
Sol #23	D-TAXI service for controller-pilot datalink communications (CPDLC) application	0 1	Not yet implemented in any State Planned in 1 State (CH)
Sol #48	Virtual block control in low visibility procedures (LVPs)	0 0	Not yet implemented or planned in any State
Sol #107	Point merge in complex terminal airspace	4 1	Implemented in 4 States, 2 locations indicated (ES-Canary; IE; IT-LIME, UK) Planned in 1 State (PT)
Sol #108	Arrival Management (AMAN) and Point Merge	2 0	Implemented in 1 State, 1 location indicated (FR - LFPG) Not yet planned in any State
Sol #116	De-icing management tool	6 4	Implemented in 6 States, 3 locations indicated (AT-LOWW; BE-EBBR; CH-LSZH; DE; FR; IT) Planned in 4 States, 1 location indicated (CZ; EE; HU-LHBP; SE)
Sol #117	Reducing Landing Minima in Low Visibility Conditions using Enhanced Flight Vision Systems (EFVS)	2 1	Implemented in 2 States, 1 location indicated (FR-LFPB; SE) Planned in 1 State (FR)
PJ.02-01-04	Wake Turbulence Separations (for Arrivals) based on Static Aircraft Characteristics	0 5	Not yet implemented in any State Planned in 5 States, 1 location indicated (AT; CH; FR-LFPG; NL; UK)
PJ.02-01-06	Wake Turbulence Separations (for Departures) based on Static Aircraft Characteristics	0 3	Not yet implemented in any State Planned in 3 States, 1 location indicated (CH; FR-LFPG; NL)
PJ.02-03	Minimum-Pair separations based on RSP	0 1	Not yet implemented in any State Planned in 1 State (AT)
PJ.02-08-01	Integrated Runway Sequence for full traffic Optimization on Single and Multiple Runway Airports	0 2	Not yet implemented in any State Planned in 2 States (AT, CH)
PJ.02-08-02	Optimised use of runway configuration for multiple runway airports	1 0	Implemented in 1 State, 1 location indicated (FR-LFPG) Not yet planned in any State
PJ.02-01-01	Optimised Runway Delivery on Final Approach	1 3	Implemented in 1 State (UK) Planned in 3 States, 1 location indicated (AT; CH-LSGG; NL)
PJ.02-01-02	Optimised Separation Delivery for Departure	0 2	Not yet implemented in any State Planned in 2 States (ES; NL)
PJ.02-01-03	Weather-Dependent Reductions of Wake Turbulence Separations for Departures	0 1	Not yet implemented in any State Planned in 1 State (CH)
PJ.02-01-05	Weather-Dependent Reductions of Wake Turbulence Separations for Final Approach	0 3	Not yet implemented in any State Planned in 3 States (AT; CH; DE)
PJ.02-01-07	Wake Vortex Decay Enhancing Devices	0 0	Not yet implemented or planned in any State

PJ.02-08-03	Increased Runway Throughput based on local ROT characterization (ROCAT)	2	Implemented in <b>2</b> States, <b>1</b> location indicated (CH; IE-EIDW)
		4	Planned in <b>4</b> States, <b>1</b> location indicated (AT; CH; IE-EIDW; NL)
PJ.03a-04	Enhanced visual operations	1	Implemented in <b>1</b> State (SE)
		1	Planned in <b>1</b> State (CH)
PJ.03b-05	Traffic alerts for pilots for airport operations	0	Not yet implemented or planned in any State
		0	
PJ.15-02	E-AMAN Service	2	Implemented in <b>2</b> States (ES; FR)
		4	Planned in <b>4</b> States, <b>2</b> locations indicated (AT; DE; ES; FR-LFPG, LFPO)

## 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)

## Non committed (i.e. non MPL3) Solutions

Sol #10	Optimised route network using advanced RNP	1	Implemented in <b>1</b> State, <b>3</b> locations indicated (IT-LIRF, LIME, LIMC)
		2	Planned in <b>2</b> States (IE; PT)
Sol #118	Basic EAP (Extended ATC Planning) function	2	Implemented in <b>2</b> States (CH; FR)
		5	Planned in <b>5</b> States (CH; ES; HR; MUAC; SK)
PJ.06-01	Optimised traffic management to enable free routing in high and very high complexity environments	2	Implemented in <b>2</b> States (MUAC; PL)
		5	Planned in <b>5</b> States (CH, CZ, ES, FR, PL)
PJ.10-01a1	High Productivity Controller Team Organisation in En-Route (including eTMA) (1PC – 2ECs)	1	Implemented in <b>1</b> State (IE-partly)
		3	Planned in <b>3</b> States (AT-TMA; CH; IE)

## 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	1 1	Implemented in <b>1</b> State (AT) Planned in <b>1</b> State (AT)
Sol #08	Arrival management into multiple airports	1 1	Implemented in <b>1</b> State, <b>2</b> locations indicated (DE - EDDL, EDDK) Planned in <b>1</b> State (CH)
Sol #100	ACAS Ground Monitoring and Presentation System	5 1	Implemented in <b>5</b> States (AT; CZ; DK; HU; UK-partly) Planned in <b>1</b> State (SI)
Sol #101	Extended hybrid surveillance	0 0	Not yet implemented or planned in any State
PJ.07-01-01	AU Processes for Trajectory Definition	0 1	Not yet implemented or planned in any State Planned in <b>1</b> State ( <i>MUAC</i> )
PJ.10-02a1	Integrated tactical and medium Conflict Detection & Resolution (CD&R) services and Conformance Monitoring tools for En-Route and TMA	0 5	Not yet implemented or planned in any State Planned in <b>5</b> States (DK; ES; FR; HU; <i>MUAC</i> )
PJ.18-02c	eFPL supporting SBT transition to RBT	0 2	Not yet implemented or planned in any State Planned in <b>2</b> States (FR, HU)

### 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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### Non committed (i.e. non MPL3) Solutions

PJ.02-05	Independent rotorcraft operations at the airports	2 1	Implemented in <b>2</b> States, <b>3</b> locations indicated (AT-LOAV, LODO; EE-EETN) Planned in <b>1</b> State (AT)
PJ.01-06	Enhanced rotorcraft operations and GA operations in the TMA	0 0	Not yet implemented or planned in any State

## Annex E

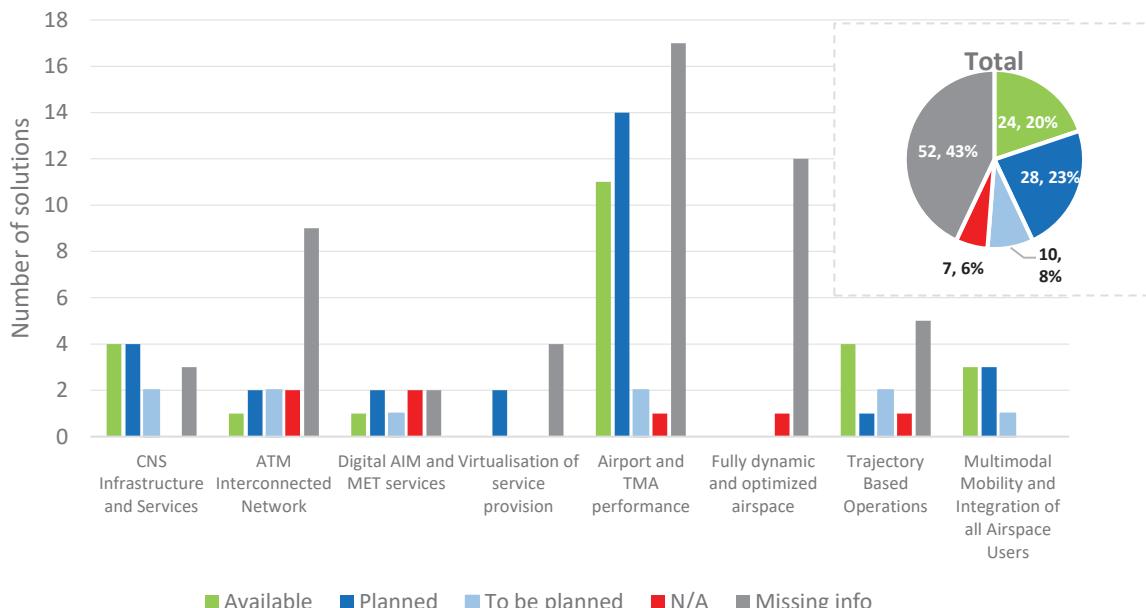
### Standardisation and Regulatory Needs

This Annex consolidates and summarises<sup>1</sup> the latest information on standardisation and regulatory needs and plans related to the SESAR Solutions addressed by the Report, grouped per Essential Operational Change (EOC). These needs may have the following 5 statuses:

- **Standard available** - The standard or regulation relevant and applicable for the deployment of the Solution has been published.
- **Standard planned** - A new standard or regulation or an update of an existing standard or regulation has been already listed in the planning of a standardisation or regulatory organisation and is identified in support of a SESAR Solution deployment. The activity still needs to be conducted and the planned date of publication defined by the standardisation or regulatory organisation is provided (when available).
- **Standard still to be planned** – the need for a new standard or regulation or for an update of an existing standard or regulation has been identified, but this activity is not yet in the planning of any standardisation or regulatory organisation. An action will need to be undertaken to identify a standardisation or regulatory organisation and/or initiate planning.
- **Not available (N/A)** – this status covers the following cases:
  - the need for a new standard or regulation or for an update of an existing standard or regulation has not been identified;
  - the analysis in R&D is still pending;
  - no standard or regulation is listed by the solution;
- **Missing info** - the information for a particular solution is not at all available in the “Yearly update of Standardisation and Regulatory Needs – edition April 2021” document. It is possible that the information exists in EATMA but the solutions were not included in the scope of the deliverable used to build this table.

The PCP-related SESAR Solutions were not in the scope of the “Yearly update of Standardisation and Regulatory Needs” document. This may be reviewed for the next edition of the document, where CP1-related SESAR Solutions may be included in the analysis.

Figure<sup>2</sup> below shows the number of solutions per corresponding status on the availability of standards and regulations, grouped by EOC. Overall summary per status is presented in the pie-chart in the top-right corner.



<sup>1</sup> The full details of the standardisation and regulatory needs are available in deliverable D3.2.001 “Yearly update of Standardisation and Regulatory Needs” developed by Project PJ.20-W2.

<sup>2</sup> Please note that a solution may have standards that are currently available, as well as others that are planned or to be planned at the same time, which is why the total number of items in the pie chart is greater than the number of solutions.

Detailed information per SESAR solution is presented in the following table.

The background colour in the “SESAR Solution” column has the following meaning:

Committed/Regulated
Committed/Non-Regulated
Non-committed

SESAR Solution	Solution title	MPL3 Objective	Standards and regulations				
			Available	Planned	To be planned	N/A	Missing info
<b>CNS Infrastructure and Services</b>							
#103	LPV approaches using SBAS as alternative to ILS CAT I	NAV10		✓	✓		
#55	Precision approaches using GBAS CAT II/III	NAV11	✓	✓ - 2022			
#102	Aeronautical mobile airport communication system (AeroMACS)						✓
#109	Air Traffic Services datalink using SatCom Class B		✓		✓		
#110	ADS-B surveillance of aircraft in flight and on the surface		✓	✓ - 2021			
#114	Composite Surveillance ADS-B/WAM						✓
PJ.14-02-06	AeroMACs integrated with ATN, Digital Voice and Multilink						✓
PJ.14-03-04	RNP-1 Reversion based on DME-DME		✓	✓ - 2021/2022			
<b>ATM Interconnected Network</b>							
#17	Advanced short-term ATFCM measures (STAMs)	FCM04.2					✓
#18	Calculated take-off time (CTOT) and target time of arrival (TTA)	FCM07					✓
#19	Automated support for traffic complexity detection and resolution	FCM06					✓
#20	Initial collaborative network operations plan (NOP)	FCM05					✓
#21	Airport operations plan (AOP) and its seamless integration with the network operations plan (NOP)	FCM05, AOP11		✓	✓		
#35	Meteorological information exchange	INFO8.1					✓
#46	Initial system-wide information management (SWIM) technology solution	INFO8.1					✓
#61	A low-cost and simple departure data entry panel for the airport controller working position	AOP17				✓	
#56	Enhanced air traffic flow management (ATFM) slot swapping	FCM09				✓	
#57	User-driven prioritisation process (UDPP) departure						✓
#67	AOC data increasing trajectory prediction accuracy						✓

SESAR Solution	Solution title	MPL3 Objective	Standards and regulations				
			Available	Planned	To be planned	N/A	Missing info
PJ.09-03-02	Collaborative network management functions		✓		✓		
PJ.15-01	Sub-regional Demand Capacity Balancing Service						✓
PJ.17-01	SWIM TI purple profile for air/ground advisory information sharing			✓-2027			
<b>Digital AIM and MET services</b>							
#34	Digital integrated briefing	INFO9	✓	✓-2024	✓		
PJ.15-10	Static aeronautical data service						✓
PJ.15-11	Aeronautical digital map service						✓
PJ.18-04a	Aeronautical information management (AIM) information			✓			
PJ.18-04b-01	Meteorological (MET) information-GWMS					✓	
PJ.18-04b-02	Meteorological information (MET) services-Cb-global					✓	
<b>Virtualisation of service provision</b>							
#12	Single remote tower operations for medium traffic volumes	AOP14					✓
#13	Remotely-provided air traffic services for contingency situations at aerodromes	AOP14					✓
#52	Remote tower for two low-density aerodromes	AOP14					✓
#71	ATC and AFIS service in a single low-density aerodrome from a remote controller working position (CWP)	AOP14					✓
PJ.05-02	Multiple remote tower module			✓			
PJ.16-03	Enabling rationalisation of infrastructure using virtual centre based technology			✓-2024			
<b>Airport and TMA performance</b>							
#02	Airport safety nets for controllers: conformance monitoring alerts and detection of conflicting ATC clearances	AOP12					✓
#09	Enhanced terminal operations with RNP transition to ILS/GLS	NAV03.2					✓
#22	Automated assistance to controllers for surface movement planning and routing	AOP13					✓
#51	Enhanced terminal operations with RNP transition to LPV	NAV03.2					✓
#53	Pre-departure sequencing supported by route planning	AOP13					✓
#64	Time-based separation	AOP10					✓
#04	Enhanced traffic situational awareness and airport safety nets for vehicle drivers	AOP15	✓	✓ - 2021	✓		
#47	Guidance assistance through airfield ground lighting	AOP16	✓	✓ - 2021/2024			

SESAR Solution	Solution title	MPL3 Objective	Standards and regulations				
			Available	Planned	To be planned	N/A	Missing info
#54	Flow-based integration of arrival and departure management	ATC19				✓	
#62	Precision area navigation (P-RNAV) in a complex terminal airspace	NAV03.1					✓
#70	Enhanced ground controller situational awareness in all weather conditions	AOP04.1					✓
#106	Departure manager (DMAN) baseline for integrated AMAN DMAN	AOP05					✓
#11	De-icing management tool						✓
#23	D-TAXI service for controller-pilot datalink communications (CPDLC) application						✓
#48	Virtual block control in low visibility procedures (LVPs)						✓
#107	Point merge in complex terminal airspace						✓
#108	Arrival Management (AMAN) and Point Merge						✓
#116	De-icing management tool						✓
#117	Reducing Landing Minima in Low Visibility Conditions using Enhanced Flight Vision Systems (EFVS)						✓
PJ.02-01-04	Wake Turbulence Separations (for Arrivals) based on Static Aircraft Characteristics		✓	✓ - 2023/2027			
PJ.02-01-06	Wake Turbulence Separations (for Departures) based on Static Aircraft Characteristics		✓	✓ - 2023/2027			
PJ.02-03	Minimum-pair separations based on required surveillance performance (RSP)		✓	✓-2027			
PJ.02-08-01	Trajectory based Integrated Runway Sequence			✓			
Pj.02-08-02	Runway Manager			✓			
PJ.02-01-01	Optimised Runway Delivery on Final Approach		✓	✓ - 2023/2027			
PJ.02-01-02	Optimised Separation Delivery for Departure		✓	✓ - 2023/2027			
PJ.02-01-03	Weather-Dependent Reductions of Wake Turbulence Separations for Departures		✓	✓ - 2023/2027			
PJ.02-01-05	Weather-Dependent Reductions of Wake Turbulence Separations for Final Approach		✓	✓ - 2023/2027			
PJ.02-01-07	Wake Vortex Decay Enhancing Devices		✓	✓ - 2023/2027			
PJ.02-08-03	Increased Runway Throughput based on local ROT characterization (ROCAT)			✓			

SESAR Solution	Solution title	MPL3 Objective	Standards and regulations				
			Available	Planned	To be planned	N/A	Missing info
PJ.03a-04	Enhanced visual operations				✓		
PJ.03b-05	Traffic alerts for pilots for airport operations		✓	✓			
PJ.15-02	E-AMAN Service						✓
<b>Fully dynamic and optimized airspace</b>							
#05	Extended arrival management (AMAN) horizon	ATC15.2					✓
#31	Variable profile military reserved areas and enhanced civil-military collaboration	AOM19.1					✓
#32	Free route through the use of direct routing for flights both in cruise and vertically evolving in cross ACC/FIR borders and in high complexity environments						✓
#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						✓
#65	User-preferred routing						✓
#66	Automated support for dynamic sectorisation						✓
#27	Enhanced tactical conflict detection & resolution (CD&R) services and conformance monitoring tools for en-route	ATC12.1					✓
#63	Multi-sector planning	ATC18					✓
#104	Sector team operations - en-route air traffic organiser	ATC12.1					✓
#10	Optimised route network using advanced required navigation performance (RNP)						✓
#118	Basic EAP (Extended ATC Planning) function						✓
PJ.06-01	Optimised traffic management to enable free routing in high and very high complexity environments						✓
PJ.10-01a1	High Productivity Controller Team Organisation in En-Route (including eTMA) (1PC – 2ECs)					✓	
<b>Trajectory Based Operations</b>							
#115	Extended projected profile (EPP) availability on the ground						✓
#60	Enhanced short-term conflict alert (STCA) for terminal manoeuvring areas (TMAs)	ATC02.9	✓				
#69	Enhanced short-term conflict alerts (STCA) with downlinked parameters	ATC20	✓				
#06	Controlled time of arrival (CTA) in medium-density/medium-complexity environments						✓

SESAR Solution	Solution title	MPL3 Objective	Standards and regulations				
			Available	Planned	To be planned	N/A	Missing info
#08	Arrival management into multiple airports						✓
#100	ACAS ground monitoring and presentation system						✓
#101	Extended hybrid surveillance						✓
PJ.07-01-01	AU Processes for Trajectory Definition					✓	
PJ.10-02a1	Integrated tactical and medium Conflict Detection & Resolution (CD&R) services and Conformance Monitoring tools for En-Route and TMA		✓	✓	✓		
PJ.18-02c	eFPL supporting SBT transition to RBT		✓		✓		
<b>Multimodal Mobility and Integration of all Airspace Users</b>							
#113	Optimised low-level instrument flight rules (IFR) routes for rotorcraft	NAV12	✓	✓-2021	✓		
PJ.02-05	Independent rotorcraft operations at the airports		✓	✓-2021			
PJ.01-06	Enhanced rotorcraft operations and GA operations in the TMA		✓	✓-2021			

## Annex F

### 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

<b>A</b>	Air Traffic Flow Management
ATFM	Air Traffic 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>B</b>	
BA	Bosnia Herzegovina
BE	Belgium
BG	Bulgaria
B2B	Business-to-Business
<b>C</b>	
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
CP1	Common Project 1 – Regulation 116/2021
CPDLC	Controller Pilot Data Link Communications
CTOT	Calculated Take Off Time
CY	Cyprus
CZ	Czech Republic
<b>D</b>	
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)

<b>E</b>	
EAI	Enabling aviation infrastructure
EATMA	European ATM Architecture
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
<b>F</b>	
FAB	Functional Airspace Block
FCM	Flow and Capacity Management
FI	Finland
FIR	Flight Information Region
FIS	Flight Information Services
FL	Flight Level
FMTCP	Flight Message Transfer Protocol
FOC	Full Operational Capability
FPL	Flight Plan
FR	France
FRA	Free Route Airspace
FRQ	Frequencies
FUA	Flexible Use of Airspace
<b>G</b>	
GAT	General Air Traffic
GBAS	Ground Based Augmentation System
GE	Georgia
GNSS	Global Navigation Satellite System
GR	Greece
<b>H</b>	
HPAO	High-performing airport operations
HR	Croatia
HU	Hungary
<b>I</b>	
ICAO	International Civil Aviation Organisation
IE	Ireland
IFPS	Initial Flight Plan Processing System
IFR	Instrument Flight Rules
IL	Israel
IND	Industry

<b>INF</b>	Information Management
IP	Internet Protocol
IR	Implementing Rule
ISRM	Information Service Reference Model
IT	Italy
ITY	Interoperability
<b>J</b>	
<b>K</b>	
KF	Key Feature
KPI	Key Performance Indicators
<b>L</b>	
LARA	Local And sub-Regional Airspace Management
LT	Lithuania
LSSIP	Local Single Sky ImPlementation
LU	Luxembourg
LV	Latvia
LVC	Low Visibility Conditions
<b>M</b>	
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)
<b>N</b>	
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
<b>O</b>	
OANS	Optimised ATM network services
OAT	Operational Air Traffic
OC	Operational Change
OI	Operational improvements

OLDI	On Line Data Interchange
<b>P</b>	
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
<b>R</b>	
REG	Regulatory Authorities
RNAV	Area Navigation
RNP	Required Navigation Performance
RO	Romania
RP	Reference Period
RPAS	Remotely Piloted Aircraft Systems
RS	Serbia
RWY	Runway
<b>S</b>	
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
<b>T</b>	
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
<b>U</b>	
UA	Ukraine

UDPP	Users Driven Prioritisation Process
UK	United Kingdom
UUP	Update Airspace Use Plan
<b>V</b>	
VCCS	Voice Communication and Control System
VoIP	Voice over Internet Protocol
<b>W</b>	
WAM	Wide Area Multilateration
WP	Work Package