EUROCONTROL

ASBU Implementation Monitoring Report

ICAO EUR States

Reference Period 2018

SUPPORTING EUROPEAN AVIATION IN PARTNERSHIP WITH

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Addressing Growth and Realizing the Promise of Twenty-first Century Air Traffic Management (ATM)

Air transport today plays a major role in driving sustainable economic and social development. It directly and indirectly supports the employment of 56.6 million people, contributes over $2.2 trillion to global Gross Domestic Product (GDP), and carries over 2.9 billion passengers and $5.3 trillion worth of cargo annually.

A fully harmonised global air navigation system built on modern performance-based procedures and technologies is a solution to the concerns of limited air traffic capacity and unnecessary gas emissions being deposited in the atmosphere.

The Global Air Navigation Plan (GANP) represents a rolling, 15-year strategic methodology which leverages existing technologies and anticipates future developments based on State/industry agreed operational objectives. The GANP's Aviation System Block Upgrades (ASBU) methodology is a programmatic and flexible global system's engineering approach that allows all Member States to advance their Air Navigation capacities based on their specific operational requirements. The Block Upgrades will enable aviation to realise the global harmonization, increased capacity, and improved environmental efficiency that modern air traffic growth now demands in every region around the world.

The GANP's Block Upgrades are organised in five-year time increments starting in 2013 and continuing through 2028 and beyond. The GANP ASBU planning approach also addresses airspace user needs, regulatory requirements and the needs of Air Navigation Service Providers and Airports. This ensures a single source for comprehensive planning. This structured approach provides a basis for sound investment strategies and will generate commitment from States, equipment manufacturers, operators and service providers. A first updated version of the GANP, with a new planning horizon from 2016 to 2030, was endorsed at the 39th ICAO Assembly in October 2016. The revised sixth edition of the GANP was presented at the 13th Air Navigation Conference in 2018 and had been endorsed at the 40th ICAO Assembly in September 2019.

The resultant framework is intended primarily to ensure that the aviation system will be maintained and enhanced, that ATM improvement programmes are effectively harmonised, and that barriers to future aviation efficiency and environmental gains can be removed at a reasonable cost. In this sense, the adoption of the ASBU methodology significantly clarifies how the ANSP and airspace users should plan for future equipage.

Although the GANP has a worldwide perspective, it is not intended that all Block Modules be required to be applied in every State and Region. Many of the Block Upgrade Modules contained in the GANP are specialised packages that should be applied only where the specific operational requirement exists or corresponding benefits can be realistically projected. The inherent flexibility in the ASBU methodology allows States to implement Modules based on their specific operational requirements. Using the GANP, Regional and State planners should identify those Modules which provide any needed operational improvements. Although the Block Upgrades do not dictate when or where a particular Module is to be implemented, this may change in the future should uneven progress hinder the passage of aircraft from one region of airspace to another.

The regular review of implementation progress and the analysis of potential impediments will ultimately ensure the harmonious transition from one region to another following major traffic flows, as well as ease the continuous evolution towards the GANP's performance targets.

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Abstract

The ICAO/EUROCONTROL ASBU monitoring report presents an overview of the deployment planning dates and implementation progress achieved for the ICAO ASBU Block 0 Modules within the ICAO EUR Region during the reporting year 2018. The region covers 55 States and all of them, provided monitoring information. The LSSIP mechanism was used to collect the data for 43 States, complemented with a dedicated questionnaire for the States outside that mechanism.

The dashboard for implementation progress of ASBU Block 0 modules indicates what has been achieved so far and the outlook for 2020 and 2021 gives the future perspective of implementation in accordance with planning dates reported by States.

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EDITION	DATE	REASON FOR CHANGE	SECTIONS PAGES AFFECTED
0.1	19/08/2019	First draft	All
0.2	09/09/2019	Incorporation comments from ICAO EUR	All
0.3	16/09/2019	Formatting of the document	All
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1.0	04/12/2019	Approval by EASPG	

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Executive Summary

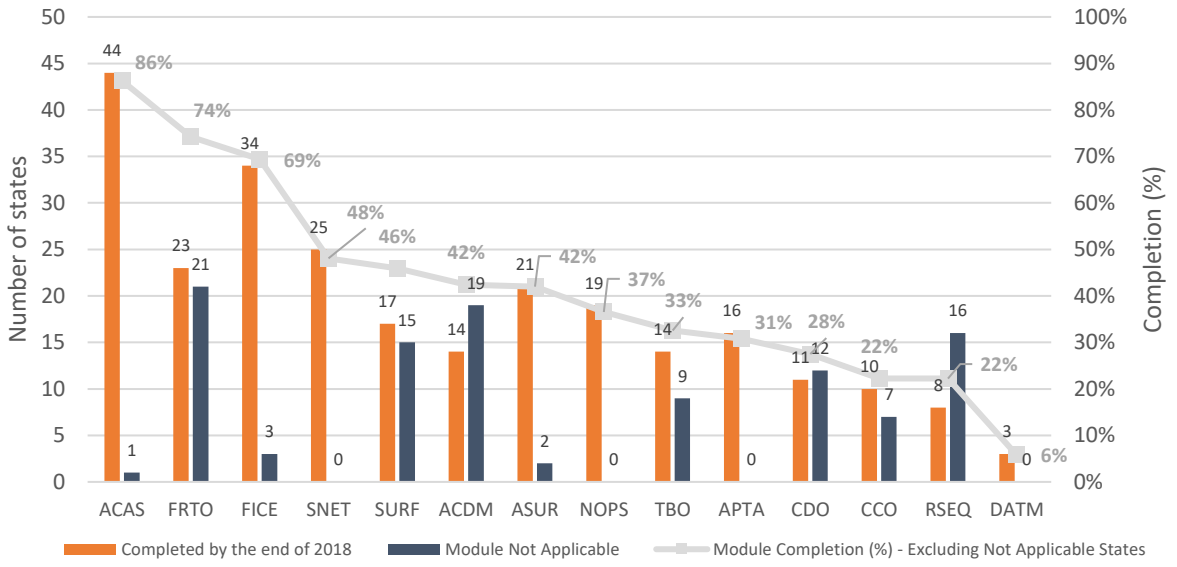
The fifth edition of the ICAO ASBU implementation monitoring report for the ICAO EUR Region (reference date December 2018) addresses the deployment of a selected number of ASBU Block 0 Modules and includes updated detailed progress and status implementation for all 55 States that are accredited to the ICAO EUR Region.

Two complementary processes are in place to collect the monitoring data. On one hand it reuses the information submitted by States participating in the LSSIP mechanism and on the other hand it collects data through the ASBU implementation monitoring questionnaires for the 9 States of the ICAO EUR Region that are outside the LSSIP reporting mechanism. It should be noted Israel (in 2017) and Morocco (in 2018) have joined the LSSIP mechanism and therefore that data is now used in this report.

The core of the document consists in two main chapters. Chapter 3 gives a consolidated view of the planning dates foreseen by States to finalise the implementation of each individual ASBU Block 0 module. This can be considered as a dashboard for ASBU Block 0 modules deployment in the ICAO EUR Region. Chapter 4 presents a global view on the implementation progress of the implementation Block 0 modules.

To summarise the implementation status and progress of ASBU Block 0 Modules, self-explanatory tables were developed, which are aimed at giving an overall and straightforward understanding of the ASBUs deployment so far.

The ASBU Block 0 Implementation Dashboard 2018 (below) presents the number of States that have achieved full implementation and gives the overall rate of "Completion" in % by the end of 2018. It excludes those States where the module is considered as "Not Applicable".



B0-AMET is not addressed in the tables and graphs because the data for 2018 cycle was not available when the report was prepared.

Due to the change in the reporting mapping, it was not possible to develop the implementation progress chart for the overall deployment and show the comparison with the previous years.

1 Introduction

1.1 Objective and intended audience of the report

The ICAO/EUROCONTROL ASBU implementation monitoring report presents an overview of the planning dates and implementation progress for the ICAO ASBU Block 0 Modules (and its detailed elements) within the entire ICAO EUR Region during the reporting year 2018.

The implementation progress information covers:

- Forty-three States, plus three States where the information is included in another State's implementation progress information, that are part of the LSSIP mechanism;
- Nine States within the ICAO EUR Region that reported their status and plans using a dedicated questionnaire, either included in their regular State Reports for the Air Navigation Services Implementation Support part of the ICAO EUR Region (ANSISG) meetings or during bilateral GANP ASBU implementation meetings.

It should be noted that in the context of a comprehensive agreement with EUROCONTROL, Israel (already in 2017) and Morocco have now joined the LSSIP process and reported their deployment situation in 2018 cycle using that mechanism.

Guided by the GANP, the regional national planning process should be aligned and used to identify those modules which best provide solutions to the operational needs identified. Depending on implementation parameters such as the complexity of the operating environment, the constraints and the resources available, regional and national implementation plans will be developed in alignment with the GANP. Such planning requires interaction between stakeholders including regulators, users of the aviation system, the air navigation service providers (ANSPs), aerodrome operators and supply industry, in order to obtain commitments to implementation.

Accordingly, deployments on a global, regional and sub-regional basis and ultimately at State level should be considered as an integral part of the global and regional planning process through the Planning and Implementation Regional Groups (PIRGs), which is for the ICAO EUR Region the newly established new European Aviation System Planning Group (EASPG) (successor to the ICAO European Air Navigation Planning Group (EANPG) after ICAO Council decision from September 2019). The PIRG process will further ensure that all required supporting procedures, regulatory approvals and training capabilities are set in place. These supporting requirements will be reflected in regional online Air Navigation Plans (eANPs) developed by the PIRGs, ensuring strategic transparency, coordinated progress and certainty of investment. In this way, deployment arrangements including applicability dates can also be agreed and collectively applied by all stakeholders involved in the Region.

The ICAO/EUROCONTROL ASBU implementation monitoring report, which contains all information on the implementation process of the ASBU modules, is the key document for the European Aviation System Planning Group (EASPG) to monitor and analyse the implementation within the Region.

Fig 1 – Regional Planning

1.2 Background

Following the discussions and recommendations from the Twelfth Air Navigation Conference (AN-Conf/12), the Fourth Edition of the Global GANP based on the Aviation Systems Block Upgrades (ASBU) approach was endorsed by the 38th Assembly of ICAO in October 2013. The Assembly Resolution 38-02 which agreed, amongst others, to call upon States, planning and implementation regional groups (PIRGs), and the aviation industry to provide timely information to ICAO (and to each other) regarding the implementation status of the GANP, including the lessons learned from the implementation of its provisions and to invite PIRGs to use ICAO standardised tools or adequate regional tools to monitor and (in collaboration with ICAO) analyse the implementation status of air navigation systems.

At EANPG meeting/55, which took place in November 2013, the EANPG agreed that in order to enable monitoring and reporting of the current priorities, a cooperative mechanism would be put in place between ICAO and EUROCONTROL. This mechanism would encompass the utilisation of the EUROCONTROL LSSIP process complemented by a specific ICAO EUR ASBU questionnaire. As a first step, this cooperative regional mechanism would address the initial high priority modules.

Pursuant to EANPG Conclusion 55/02a - the ASBU Block 0 Modules prioritisation table, as provided in Appendix G to EANPG/55 report, was endorsed as the initial version of the EUR ASBU Implementation Plan.

Pursuant to EANPG Conclusion 55/02b - the mechanism for monitoring and reporting the implementation status for ASBU of Priority 1 Modules, is using the combined efforts of EUROCONTROL LSSIP mechanism and the ICAO EUR questionnaire, in an effort to avoid duplication of reporting.

In response to the EANPG/55 conclusions, the regional monitoring of ASBU implementation was announced by a State Letter in September 2014, which invited States to take all necessary measures in order to ensure that a complete overview of the status of ASBU Block 0 implementation (especially on the six ASBU Block 0 modules which had been given the highest priority at EANPG/55, namely, B0-APTA, B0-SURF, B0-FICE, B0-DATM, B0- ACAS and B0-SNET) would become available within the entire ICAO EUR Region.

A first ASBU Implementation Monitoring Report was then prepared during the year 2015 for the reporting/reference period 2014. This report contained information/overviews on the implementation progress of ASBU Block 0 from the 41 ECAC States (direct information and reports through their 2014 LSSIP documents) and from 4 States in the EUR Region which used the specific State Report/questionnaires (in terms of information on the priorities, status of implementation and any relevant references to national documentation for all listed ASBU modules).

The 2014 ICAO/EUROCONTROL ASBU implementation monitoring report was presented, reviewed and endorsed, as the first report regarding the regional monitoring of ASBU implementation in response to EANPG Conclusion 55/03, at the EANPG/57 meeting in November 2015. In order to achieve the aim of a complete overview of the status of ASBU Block 0 implementation from all States within the complete ICAO EUR Region, the EANPG concluded to optimise the reporting process and also invited States to actively support the described ASBU implementation monitoring process, so that the number of responses could be increased and the quality of the reported information could be enhanced in the future.

A revised version of the ASBU implementation questionnaire was developed in 2016 which introduced more detailed guidance material, practical examples and specific explanations on the implementation activities/status that needed to be reported. This new questionnaire was then used for the development of the second report (reference period 2015) in order to increase the number of responses and enhance the quality of the reported information from those States that were not covered by the LSSIP mechanism.

At the 39th ICAO Assembly, the 5th edition of the GANP with updates on the ATM logical infrastructure, the introduction of a minimum path and the performance based implementation concept was endorsed in October 2016. The ICAO Assembly Resolution A39-12 calls upon States, planning and implementation regional groups (PIRGs), and the aviation industry to utilise the guidance provided in the GANP for planning and implementation activities which establish priorities, targets and indicators consistent with globally-harmonised objectives, taking into account operational needs. The 5th version of the GANP (2016-2030) included the obligation for States to map their national or regional programmes against the harmonised GANP, the requirement for active collaboration among States through the PIRGs in order to coordinate initiatives within applicable regional Air Navigation Plans, the provision of tools for States and Regions to develop comprehensive business case analyses as they seek to realise their specific operational improvements, as well as the vision of the evolution of the Global ATM system and the potential requirements for the aviation industry.

The 2015 ICAO/EUROCONTROL ASBU implementation monitoring report was presented at the EANPG/58 meeting in November 2016. The EANPG/58 noted that from the 11 States outside the LSSIP process, 8 States replied to the revised monitoring questionnaire with detailed explanations on their status of ASBU implementation. The EANPG/58 also appreciated that the number and quality of the replies received from the questionnaire represented a considerable improvement in relation to the information obtained on the previous year and did allow a considerable enhancement of the 2015 report. The EANPG/58 highlighted that, as the GANP requires States to report the status of their ASBU implementation, this report was a key document for the EANPG to monitor and analyse the ASBU implementation within the EUR Region. The EANPG/58 finally endorsed the 2015 ICAO/EUROCONTROL ASBU implementation monitoring report with Statement 58/01. The EANPG/58 noted that the endorsed ASBU implementation monitoring report would be forwarded as one of the contributions from the ICAO EUR Region to the annual ICAO Global Air Navigation Report and that relevant parts of the report had been used for the ICAO EUR eANP Vol III.

Following the EANPG Conclusion 55/03, the ASBU Block O modules B0-WAKE, B0-AMET, B0-ASEP, B-OFPL and B0-CCO were not included into the monitoring report mechanisms. As some of these modules especially B0-CCO, which had become one of the key ICAO GANP priorities and its implementation was successfully completed in some States, or B0-AMET which is implemented by a number of States in the Region under the METG work programme objectives, the proposed inclusion of those two B0 modules into the implementation monitoring mechanisms for the 2016 reference period was supported by the meeting with EANPG Conclusion 58/22.

At the combined EANPG/59-RASG/6 meeting which was held at the ICAO EUR/NAT Office in Paris in November 2017, the 2016 ICAO/EUROCONTROL ASBU implementation monitoring report was presented and reviewed. The Meeting noted, with satisfaction, that the 2016 version of the ASBU Implementation Monitoring Report included implementation status/data from all 55 States in the ICAO EUR Region. The support from all States was highly appreciated together with the improved quality of the information received. Based on the feedback received at the ATMGE meetings a new version of the ASBU questionnaire was prepared and endorsed at the EANPG/59. The Meeting noted as well, that as a follow up to the joint ICAO/Arab Civil Aviation Commission(ACAC) GANP ASBU Symposiums in Algiers (September 2016), and in Tunisia (March 2017), the ASBU questionnaires from Algeria, Morocco and Tunisia had been formally submitted before the end of May 2017. During these joint events, which also included participation of the ICAO MID Office and the WACAF Office, three dedicated sessions had been organised by ICAO and EUROCONTROL for the 3 North African States. The EANPG/59 appreciated the impressive collaboration, which is required to achieve the timely completion of the 2016 ICAO/EUROCONTROL ASBU implementation monitoring report, and is also avoiding any duplication of efforts.

Furthermore, the EANPG/59 noted that the endorsed ASBU implementation monitoring report would be again forwarded as one of the contributions from the ICAO EUR Region to the annual ICAO Global Air Navigation Report, that relevant parts of the report will be used for the ICAO EUR eANP Vol III and that data from the report will also be included into the Air Navigation Implementation App on the global ICAO iSTARS portal.

An updated version of the GANP was initially presented at the Thirteenth Air Navigation Conference (AN-Conf/13) in October 2018 and further details on the implementation of the new edition of the GANP as well as the new global GANP portal were expected to take place in preparation for the 40th ICAO Assembly.

At the combined EANPG/60-RASG/7 meeting which was held at the ICAO EUR/NAT Office in Paris from 26 to 30 November 2018, the 2017 ICAO/EUROCONTROL ASBU implementation monitoring report was presented and reviewed. The Meeting noted that the 2017 version of the ASBU Implementation Monitoring Report included implementation status/data from 54 of the 55 States in the ICAO EUR Region.

The meeting also noted that the 2017 report was again based on the information submitted by 42 States via the EUROCONTROL Local Single Sky Implementation (LSSIP) process and information reported through the ASBU Implementation Monitoring Questionnaires for the 10 (ten) States within the ICAO EUR Region that were outside the LSSIP reporting mechanism. In addition, the ICAO Meteorological Group (METG) tables were included for the implementation status on the B0-AMET module. The EANPG/60 was also presented with a revised reporting format (new xls file) that would give more detailed guidance in the implementation status. The meeting approved the 2017 ASBU implementation monitoring report with EANPG/60&RASG-EUR/07 Decision 08, endorsed the new questionnaire with EANPG/60&RASG-EUR/07 Conclusion 07 and appreciated the impressive collaboration, which is required to achieve the timely completion of the 2017 ICAO/EUROCONTROL ASBU implementation monitoring report and providing contributions to the annual ICAO Global Air Navigation Report, as well as updates of the ICAO EUR Air Navigation Plan (eANP) Vol III and the global ICAO iSTARS portal tools.

During the 40th ICAO Assembly the 6th edition of the GANP was endorsed in October 2019 and the Assembly Resolution A40-1 (ICAO global planning for safety and air navigation) outlines that the Assembly:

1. Instructs the Council to use the guidance in the Global Air Navigation Plan (GANP) to develop and prioritize the technical work programme of ICAO in the field of air navigation;

2. Urges the Council to provide States with a standardization roadmap, as announced in the GANP, as a basis for the work programme of ICAO;

3. Calls upon States, planning and implementation regional groups (PIRGs), and the aviation industry to utilize the guidance provided in the GANP for planning and implementation activities which establish priorities, targets and indicators consistent with globally-harmonized objectives, taking into account operational needs;

4. Calls upon States to take into consideration the GANP guidelines for the implementation of operational improvements as part of their national strategy to reduce the environmental impact, including CO2 emissions, from international aviation;

5. Calls upon States, PIRGs, and the aviation industry to provide timely information to ICAO, and to each other, regarding the implementation status of the GANP, including the lessons learned from the implementation of its provisions;

6. Invites PIRGs to use ICAO standardized tools or adequate regional tools to monitor and, in collaboration with ICAO, analyse the implementation status of air navigation systems;

7. Instructs the Council to publish the results of the analysis on the regional performance dashboards and in an annual global air navigation report including, as a minimum, the key implementation priorities and accrued environmental benefits associated with the implementation of the operational improvements outlined in the ASBU framework;

8. Urges States that are developing new air navigation plans, for their own air navigation modernization, to coordinate with ICAO and align their plans so as to ensure regional and global compatibility and harmonization; and

9. Instructs the Council to continue developing the GANP, keeping it current with evolving technology and operational requirements.

1.3 Scope of the report

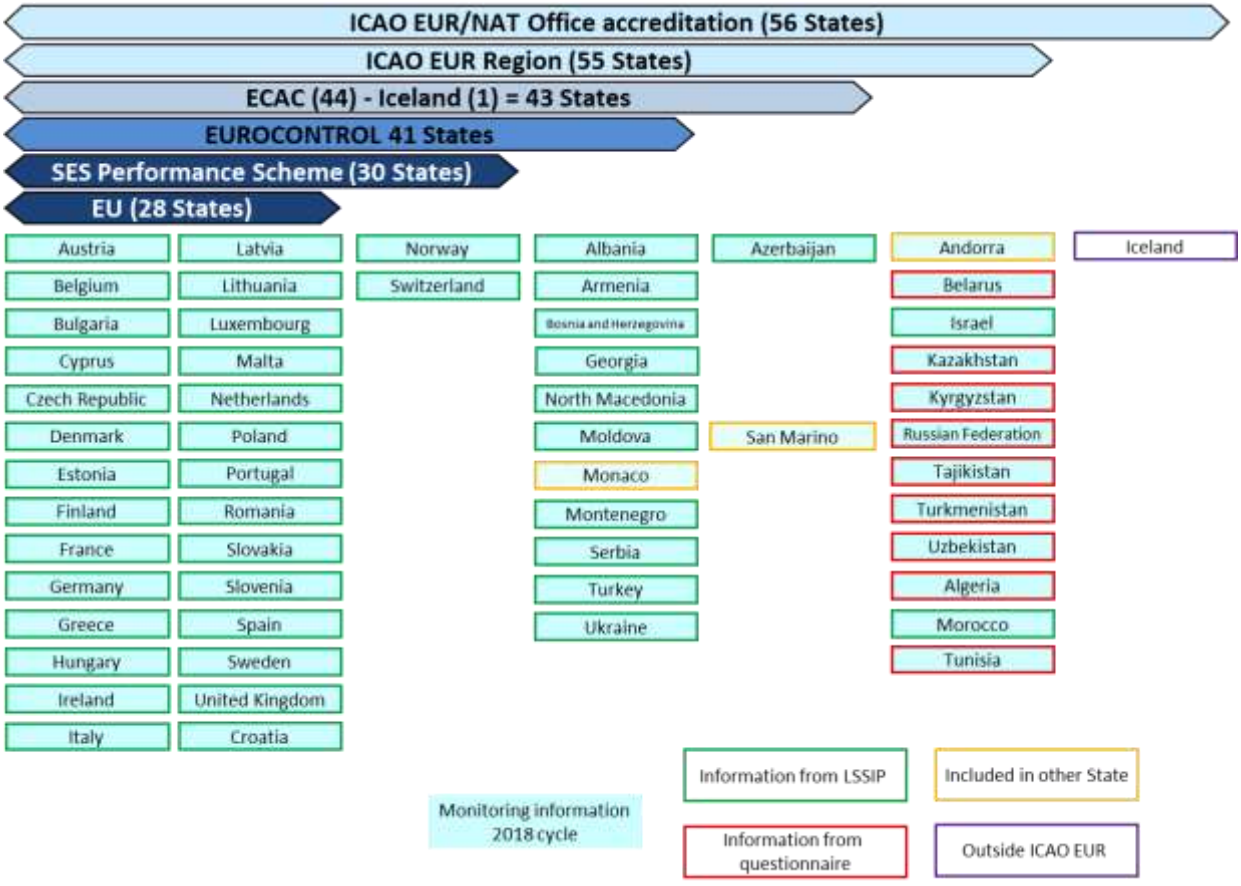
This report addresses the deployment status, with reference date December 2018, for the defined ASBU Block 0 Modules.

The report is based, on one hand, on the information submitted by the 43 States which are participating in the LSSIP mechanism and on the other hand from the data which is reported in the ASBU implementation monitoring questionnaires for the 9 States within the ICAO EUR Region that are outside the LSSIP reporting mechanism. It must also be noted that that Monaco, San Marino and Andorra are not addressed separately in this report, neither in related statistics, because for monitoring purposes they are included in other hosting States. Therefore there are 52 Member States considered individually in the statistics of the following chapters.

The questionnaire is fully aligned with the implementation objectives (formerly ESSIP objectives) and has been continuously updated and improved for every edition of the report.

In response to the EANPG/60 conclusions, 9 States submitted their ASBU implementation questionnaire to either, the RDGE/30, the ANSISG/01 meeting, or based on several bilateral discussions directly to the ICAO EUR/NAT Office before the end of June 2019.

It must be highlighted that this report includes again the updated progress/status of implementation of ASBU Block 0 modules (reference period 2018) **for 55 out of 55 States** that are accredited to the ICAO EUR Region.



2 Methodology for data collection and analysis

Two complementary processes are in place to collect the monitoring data required for the preparation of this report:

1. The EUROCONTROL LSSIP mechanism with 43 participating States.
2. A questionnaire specifically targeted and designed for the remaining 9 States that are accredited to the ICAO EUR Region.

Both processes are briefly described in the paragraphs below.

It must be noted that in the context of the SESAR Joint Undertaking (SJU) Programme a change in terminology was decided concerning some Master Plan related deliverables. The ESSIP Plan should now always be called "European ATM Master Plan Level 3 Implementation Plan" and the ESSIP Report changed to "Master Plan Level 3 Implementation Report". The scope and overall content of the deliverables remain the same.

Concerning the monitoring data related to B0-AMET, it should be noted that the information was prepared and endorsed by the ICAO Meteorology Group of the EANPG (METG).

2.1 EUROCONTROL LSSIP Process

EUROCONTROL LSSIP process is a robust mechanism to support Single European Sky (SES) and SESAR deployment planning and reporting. It covers now 43 States plus the EUROCONTROL Maastricht Upper Area Control Centre (MUAC). The process sits at the crossroads of multiple performance improvement initiatives synergising the planning and monitoring activities of all stakeholders involved: State civil and Military authorities, ANSPs and airport operators, all categories of airspace users. This cyclic process comprises three main components (see figure below):

1. Deployment planning: European ATM Master Plan Level 3 Implementation Plan Web site:

   https://www.eurocontrol.int/publication/european-atm-master-plan-implementation-plan-level-3-2019

2. Deployment reporting and monitoring at local (LSSIP documents) level Web site:

   https://www.eurocontrol.int/service/local-single-sky-implementation-monitoring

3. Deployment reporting and monitoring at European level: Master Plan Level 3 Implementation Report Web site:

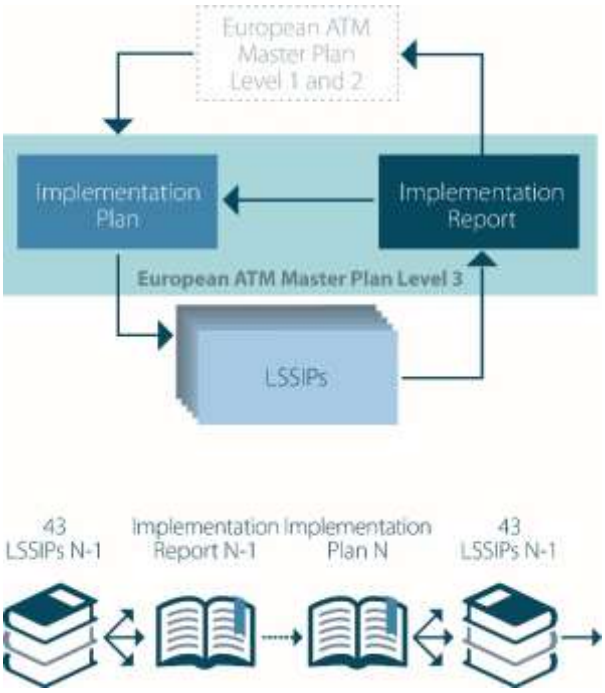
   https://www.eurocontrol.int/publication/european-atm-master-plan-implementation-report-level-3-2019

The European ATM Master Plan Level 3 Implementation Plan (formerly ESSIP Plan) and the Master Plan Level 3 Implementation Report (formerly ESSIP Report) together constitute the Level 3 of the ATM Master Plan as indicated in the picture.

The European ATM Master Plan Level 3 Implementation Plan contains the detailed implementation objectives and Stakeholder Lines of Action (SLoA) to be achieved within coordinated time scales. Its target audience includes planning staff from the various stakeholders participating in the process, both at European and National level. It is produced every year.

The Master Plan Level 3 Implementation Report assesses the level of success in the implementation progress of objectives at ECAC level for the benefit of all aviation stakeholders. For each of the objectives it highlights critical issues, main reasons for delays, (positive) progress and it proposes remedial actions at network level. It is based on information gathered from the Local Single Sky ImPlementation (LSSIP) documents and closes the loop between the monitoring and planning phases of the LSSIP yearly cycle.

Understanding what happened during the reporting period puts into perspective the investments and actions needed to achieve real benefits and enables to steer implementation results.



2.2 ICAO Questionnaire

With the objective to obtain monitoring information and facilitate the reporting activities required by the ICAO EUR Region States, outside the LSSIP mechanism, an ICAO ASBU Implementation Monitoring Questionnaire was first developed in 2014 and send out with the State Letter which launched the regional ASBU implementation reporting in September 2014.

After review of the first reports at the ATMGE/21 meeting, and together with the lessons learned/way forward, an updated and comprehensive version of the questionnaire was developed at the ATMGE/22 meeting in order to increase the number of responses and enhance the quality of the reported information. This version (v.3) was presented and endorsed at EANPG/57 so that States could use it for the 2015 reference period of the ASBU implementation monitoring report.

Following the discussions from the ATMGE/23 meeting, an updated version of the ASBU implementation questionnaire was developed which introduced more detailed guidance material, practical examples and specific explanations on the implementation activities/status that needed to be reported. The further revised ASBU implementation report questionnaire (v.4) was presented to the EANPG/58 that agreed the new version of the questionnaire would be attached to the ATMGE State Report format.

The EANPG/58 also recommended that the progress/status of implementation of ASBU Block 0 modules is reported, for monitoring purposes, by States regardless of their assigned priority in the EANPG/55 conclusions.

During the ATMGE/24 meeting another feedback discussion resulted in new/revised version of the ASBU implementation report questionnaire. The EANPG/59 approved an improved version of the questionnaire (v.5 from 20.10.2017), for the monitoring cycle 2017.

In order to better harmonize the calculation of the implementation percentages, as well as the level of granularity and details for non-ECAC States inputs with the LSSIP mechanism, discussions took place during the ATMGE/26 meeting where an updated version of the ICAO ASBU Implementation Monitoring Questionnaire in Excel format was presented and accepted by the ATMGE participants. This revised State Report format (as v.6 from 15.11.2018) presented, discussed and approved by the EANPG with EANPG/60&RASG-EUR/07 Conclusion 07 (ICAO ASBU Implementation Monitoring within the ICAO EUR Region) together with the updated mapping between ICAO ASBU modules and European ATM Master Plan Implementation Objectives has now been used for the monitoring of the 2018 cycle, which is covered in this report.

The following (updated) mapping of ASBU Block 0 modules and implementation objectives was used (in red changes to the 2017 report mapping):

2018 ICAO ASBU Monitoring	
ASBU Block 0 Modules	**ATM MP L3 Implementation Objective designator**
B0-ACAS	ATC16
B0-ACDM	AOP05
B0-APTA	NAV10 (- NAV03.1)
B0-ASUR	ITY-SPI
B0-CCO	ENV03
B0-CDO	ENV01
B0-DATM	ITY-ADQ (- INF04)
B0-FICE	ITY-COTR (- ATC17 and - ITY-FMTP)
B0-FRTO	AOM21.1 (-AOM19.1)
B0-NOPS	FCM01 + FCM03
B0-RSEQ	ATC07.1 + AOP05 (ASP05) (- ATC15.1)
B0-SNET	ATC02.2 + ATC02.8 + ATC02.9
B0-SURF	AOP04.1 + AOP04.2
B0-TBO	ITY-AGDL
B0-AMET	(none)

2.3 Data analysis methodology

The data collected through LSSIP and the questionnaire are analysed to reach the main goal of establishing and presenting for each ASBU Module and for each ICAO EUR State, the following:

- Deployment Planning view of the ASBU Module concerned; and
- Implementation progress view of the ASBU Module concerned.

The relationship of LSSIP "Implementation Objectives" and ASBU Modules is not always one to one. Thus an agreed convention and analysis method was applied to determine ASBU Module status, wherever multiple "Implementation Objectives " cover one ASBU Module concerned. They are indicated in the details below.

2.3.1 Deployment plan view assessment

ASBU Module planning date (i.e. year) indicated, is the one corresponding to the implementation of the last activity of the questionnaire or of the LSSIP "Implementation Objective(s)", required to fully complete the deployment of the related ASBU Module. In case a State has more than one airport in the applicability area, the planning date retained is the one corresponding to the latest airport implementing the activity. To note as well that in a few cases when some activities were indicated as "No Plan" the overall assessment date for the completion of the related ASBU module couldn't be done and therefore it had to be indicated overall as "No Plan".

2.3.2 Implementation progress view assessment

ASBU Module implementation progress is presented as the % of required implementation activities that have been reported as completed. In case a State has more than one airport in the applicability area, the % indicated is the one corresponding to the average amongst the airports. Where the ASBU Module is covered by more than one LSSIP "Implementation Objectives", the % indicated is the one corresponding to the average amongst the objectives. To note as well that "Implementation Objectives" or "Questionnaire answers" reported as Not Applicable are taken out of average % calculation. The activities which are reported as "No Plan yet", "Plan with no % progress" are calculated and indicated as 0% progress.

3 Deployment planning view

The ICAO Block Upgrades refer to the target availability timelines for a group of operational improvements (technologies and procedures) that will eventually realise a fully-harmonised global Air Navigation System. The technologies and procedures for each Block have been organised into unique Modules which have been determined and cross-referenced based on the specific Performance Improvement Area to which they relate.

Block 0 Modules are characterised by operational improvements which have already been developed and implemented in many parts of the world. It therefore has a near-term implementation period of 2013–2018, whereby 2013 refers to the availability of all components of its particular performance modules and 2018 refers to the target implementation date. ICAO will be working with its Member States to help each determine exactly which capabilities they should have in place based on their unique operational requirements.

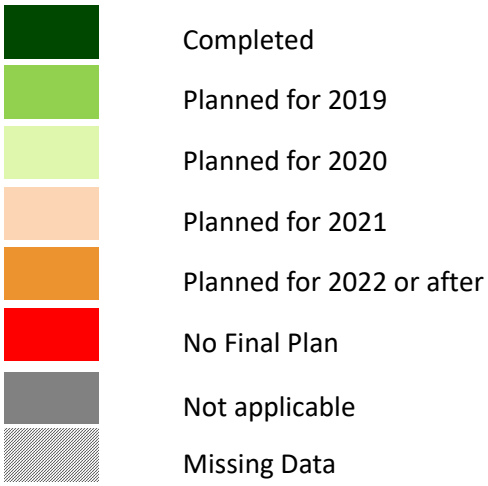
Based on the milestone framework established under the overall Block Upgrade strategy, ICAO Member States are encouraged to implement those Block 0 Modules applicable to their specific operational needs.

This chapter of the report gives an overview, mainly in the form of maps and statistics, of the dates when States plan to conclude, or have already completed, each of the ASBU Module Block 0.

The information contained in the maps was extracted from the reported implementation plans and progress taken from the LSSIP database and from the ASBU questionnaire of the State Report. The date indicated is the one corresponding to the implementation of the last activity of the questionnaire or of the implementation objective(s), required to fully complete the deployment of the ASBU. In case a State has more than one airport in the applicability area, the planning date retained is the one corresponding to the latest airport implementing the activity.

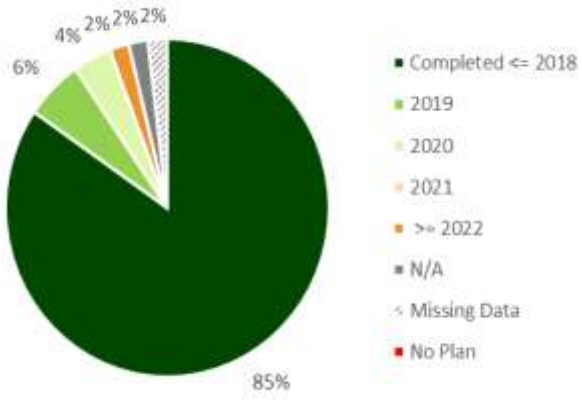
In a few cases, when some activities were indicated as “No Plan”, the overall assessment date for the completion of the related ASBU module could not be done and therefore it had to be considered as “No Plan”.

The following colour scheme is used for this edition of the report:

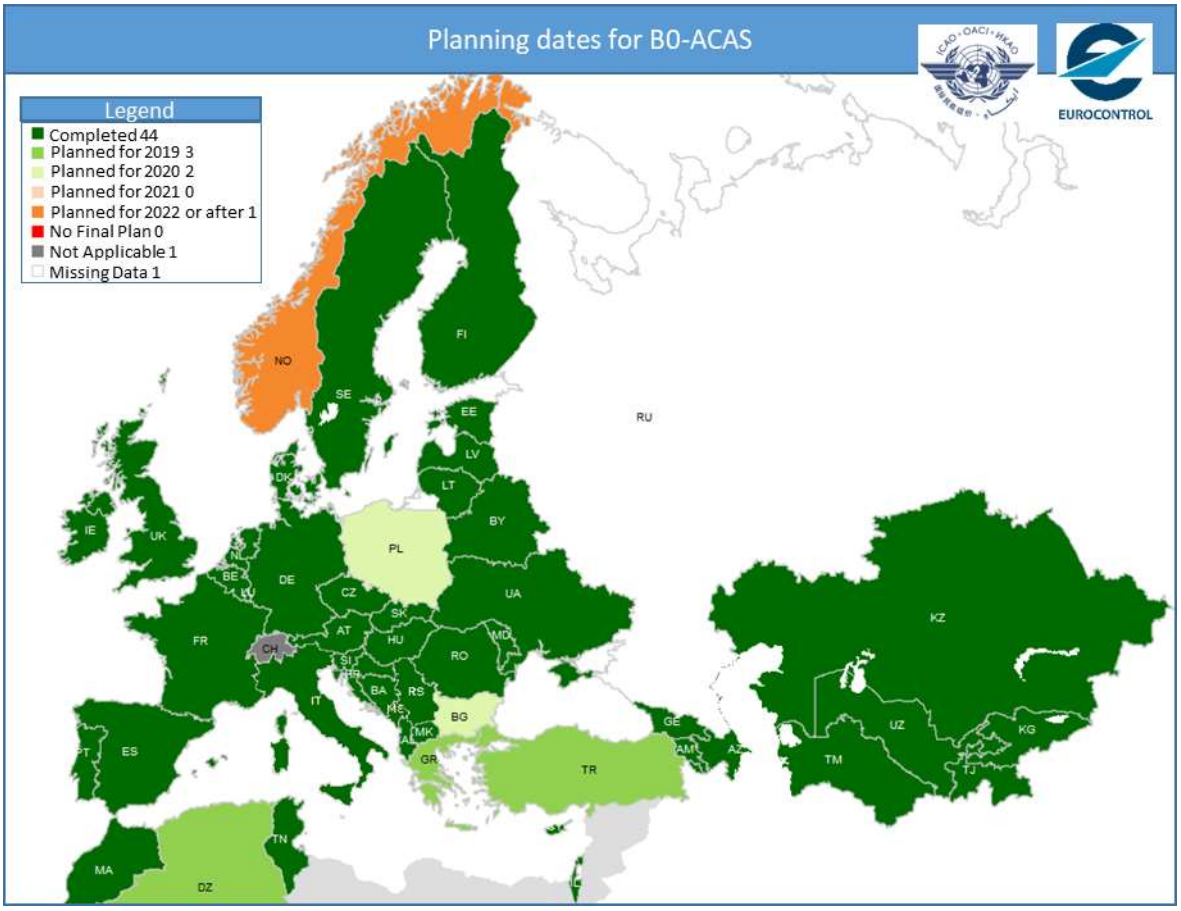


3.1 B0-ACAS - ACAS Improvements

This module is about ACAS Improvements, provision of short-term improvements to existing airborne collision avoidance systems (ACAS) in order to reduce nuisance alerts while maintaining existing levels of safety. This will reduce trajectory perturbation and increase safety in cases where there is a breakdown of separation.

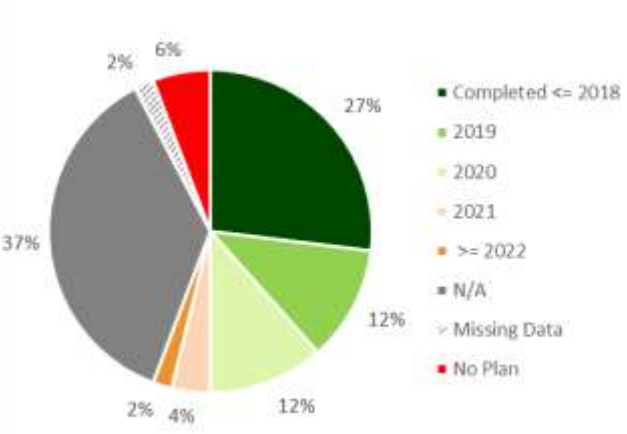


The **progress** keeps the same trend of evolution as in previous cycles. Currently, 44 States have already completed the implementation and 3 more States plan to complete it during 2019, corresponding to more than 90% of the States.

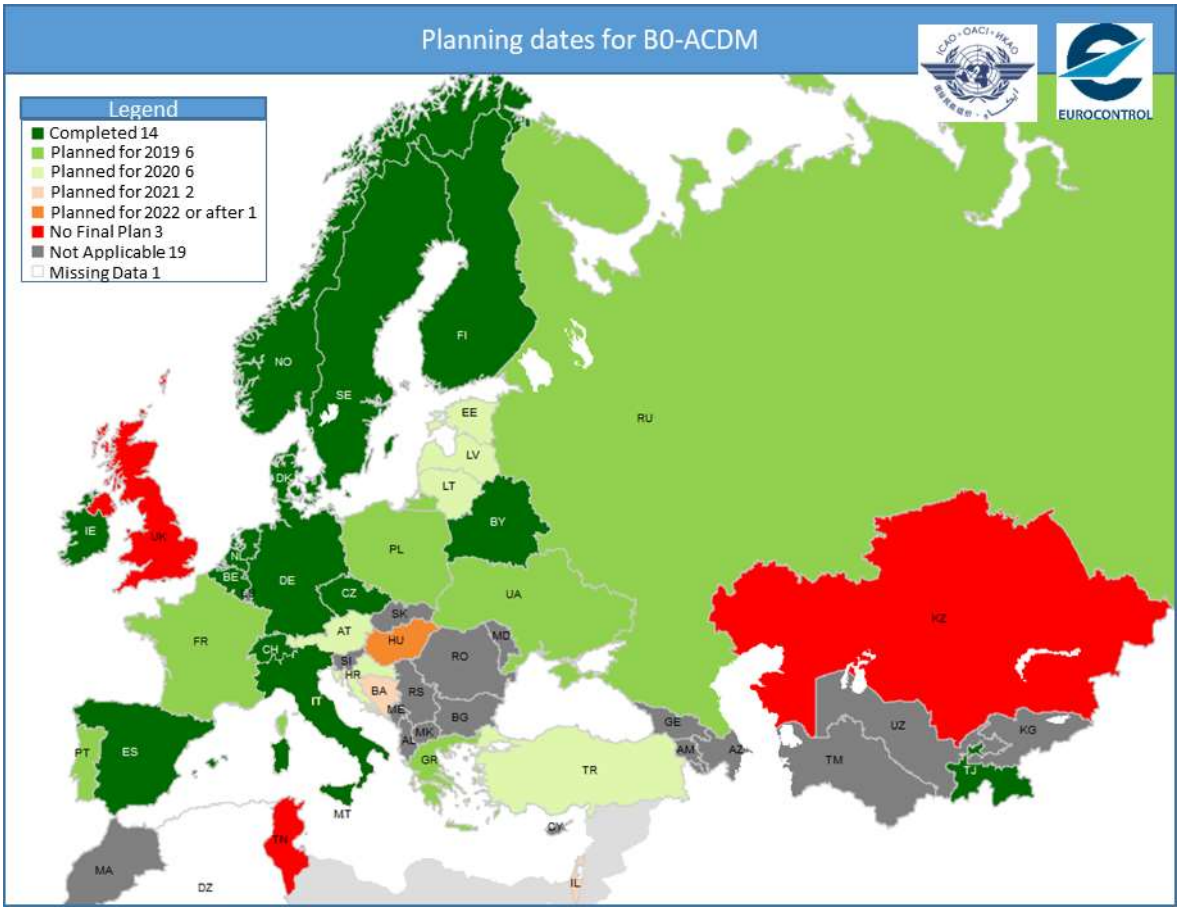


3.2 B0-ACDM - Improved Airport Operations through Airport- CDM

Improved Airport Operations through Airport-CDM and consists of Airport operational improvements through the way operational partners at airports work together.



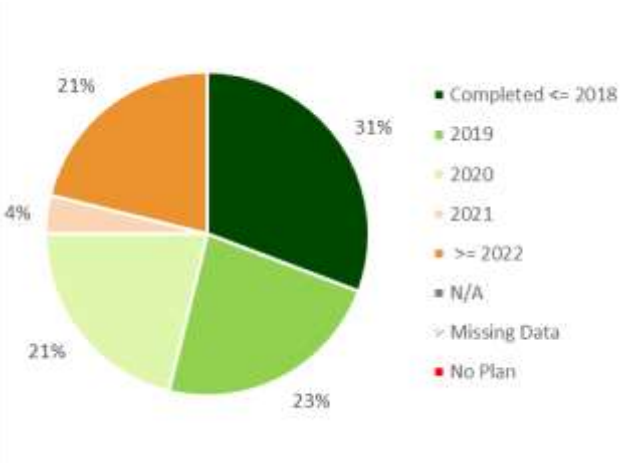
The **progress** keeps the same trend of evolution as in previous cycles. Currently, 14 States have already completed the implementation and 6 more States plan to complete it during 2019, corresponding to almost 40% of the States. For 37%of the States the B0-ACDM module is not applicable.

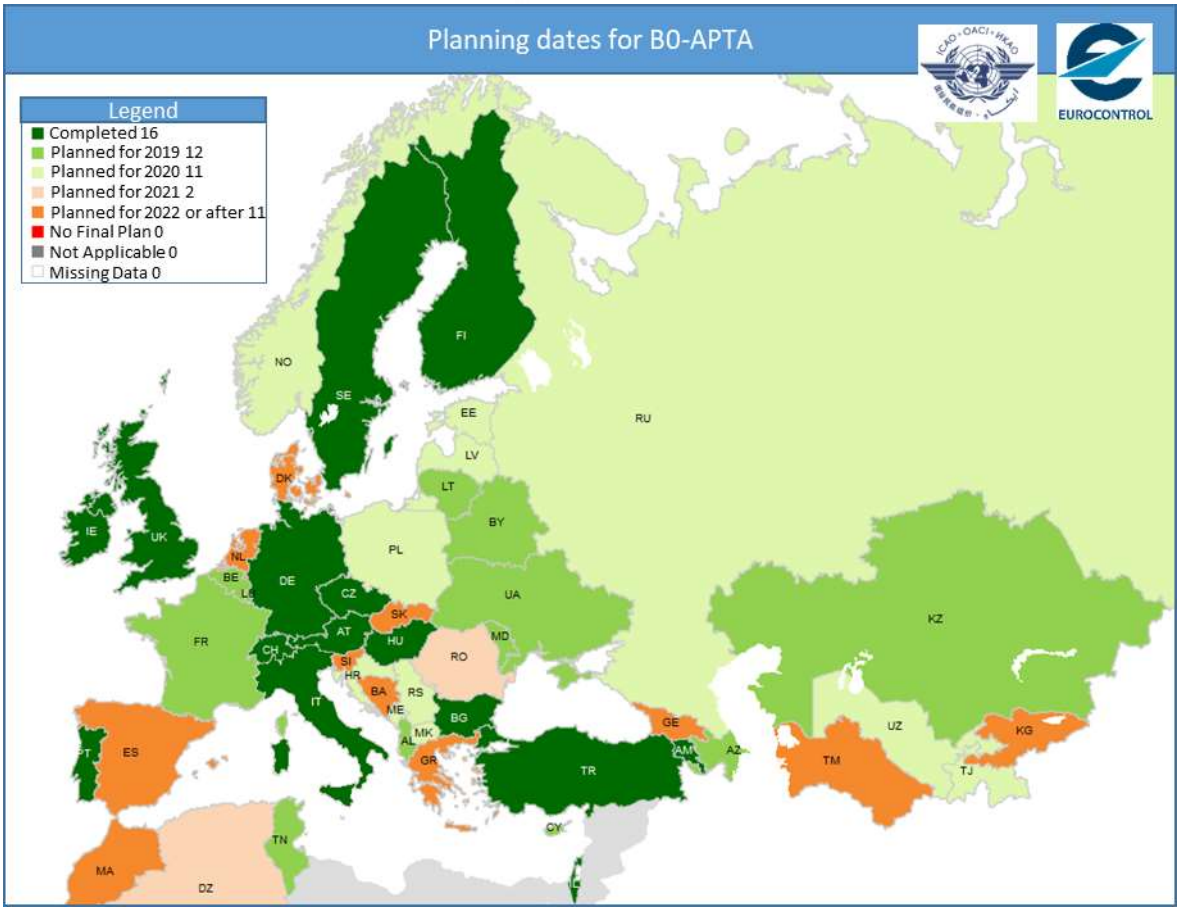


3.3 B0-APTA - Optimization of Approach Procedures including vertical guidance

This module is about the first step towards universal implementation of GNSS-based approaches.

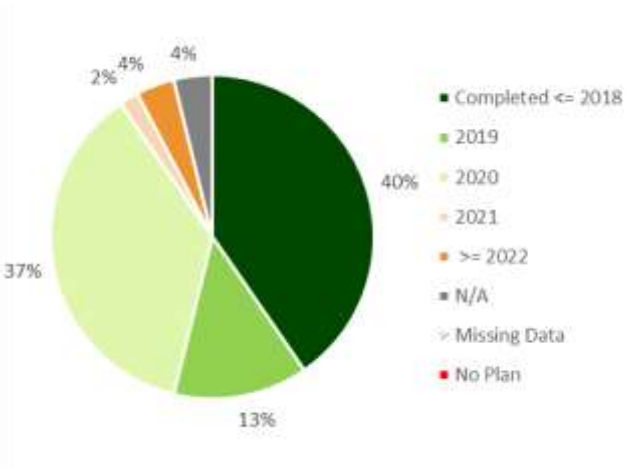
Currently, 16 States have already completed the implementation and 12 other States plan to complete it during 2019, corresponding to more than 50% of the States.



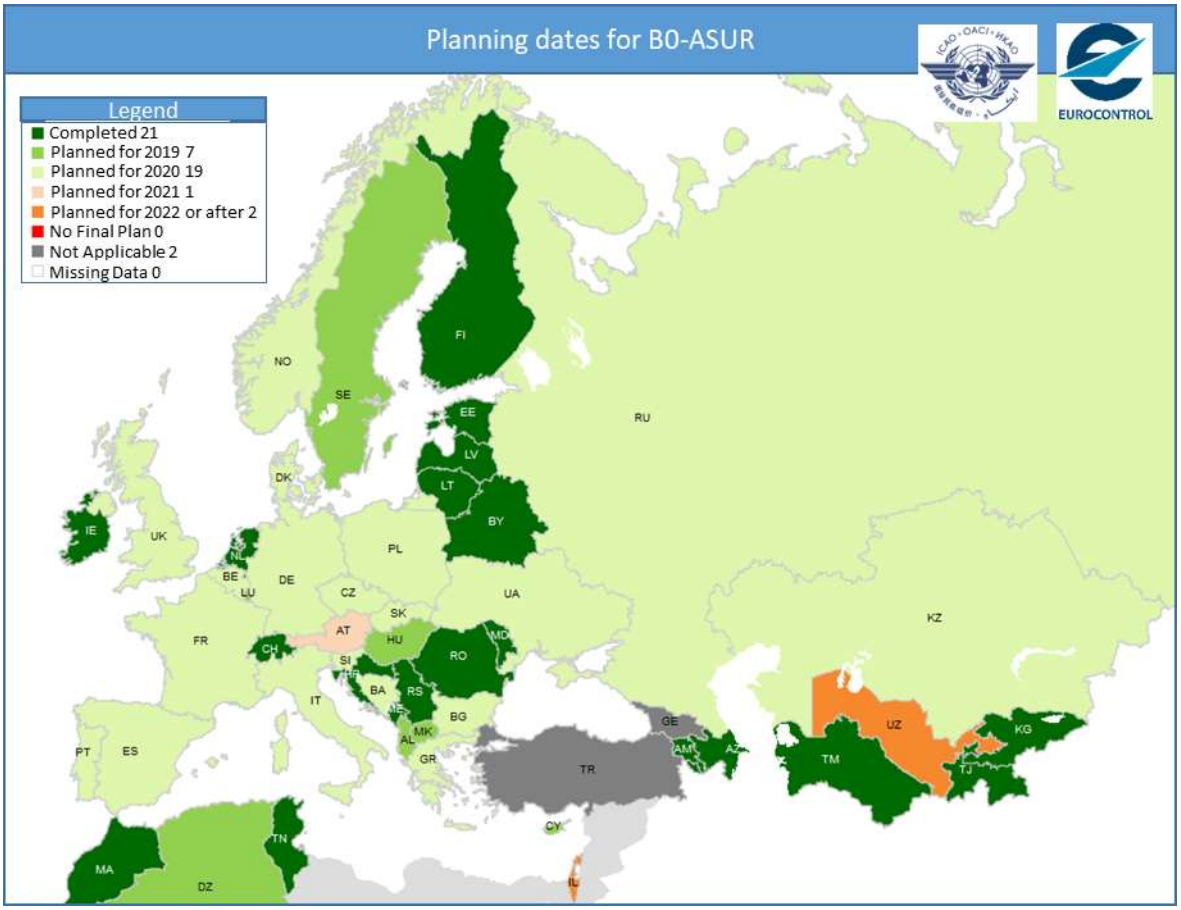


3.4 B0-ASUR - Initial capability for ground surveillance

Ground surveillance supported by ADS-B OUT and/or wide area multi-lateration systems will improve safety, especially search and rescue and capacity through separation reductions. This capability will be expressed in various ATM services, e.g. traffic information, search and rescue and separation provision.

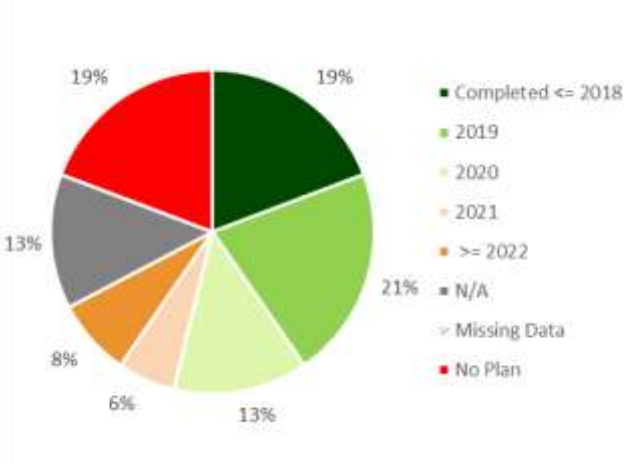


The **progress** keeps the same trend of evolution as in previous cycles. Currently, 21 States have already completed the implementation and 7 more States plan to complete it during 2019, corresponding to more than 50% of the States.

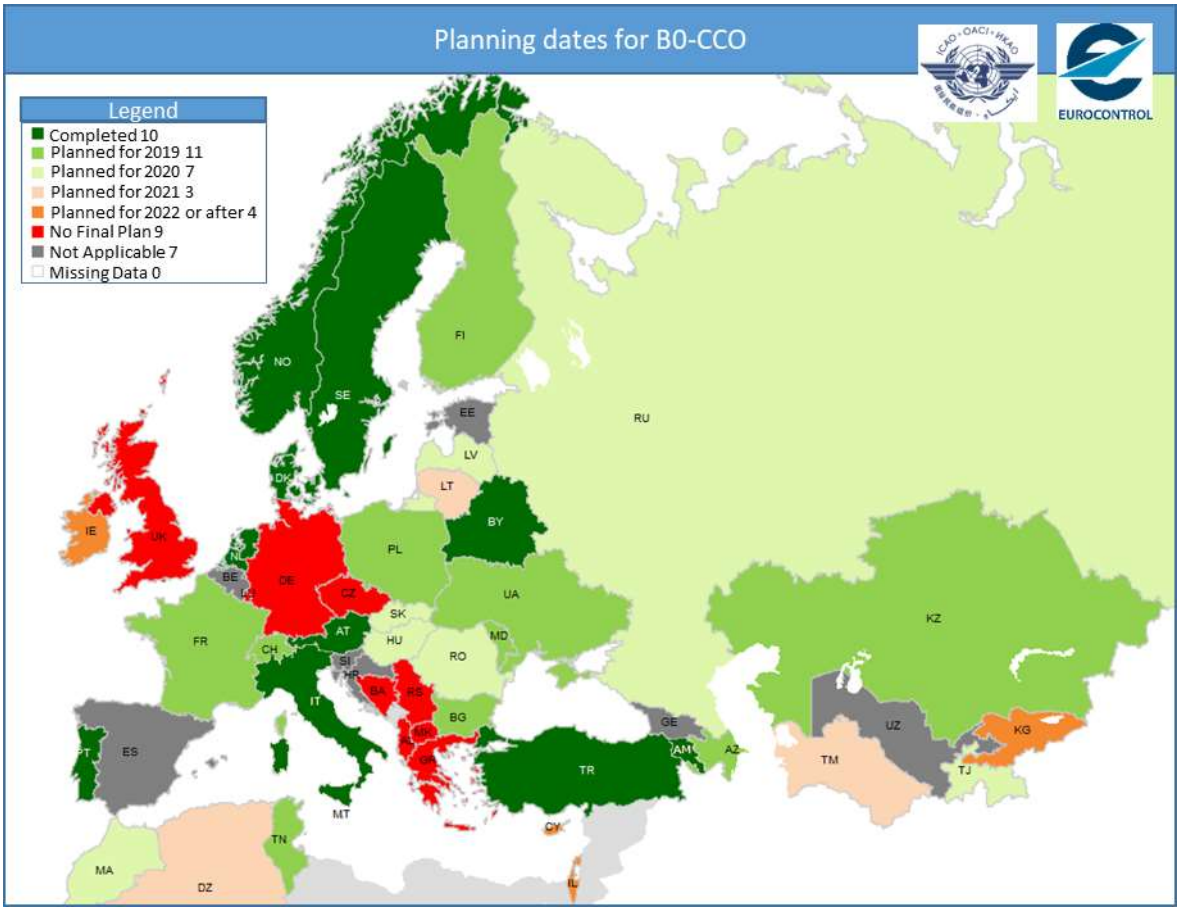


3.5 B0-CCO - Improved Flexibility and Efficiency in Departure Profiles (CCO)

This module consists in the deployment of departure procedures that allow an aircraft to fly its optimum aircraft profile taking account of airspace and traffic complexity with continuous climb operations.

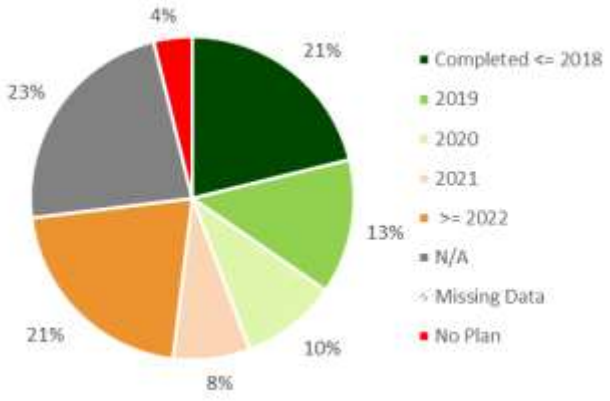


The **progress** keeps the same trend of evolution as in previous cycles. Currently, 10 States have already completed the implementation and 11 other States plan to complete it during 2019, corresponding to 40% of the States. For 13% of the States the B0-CCO module is not applicable.

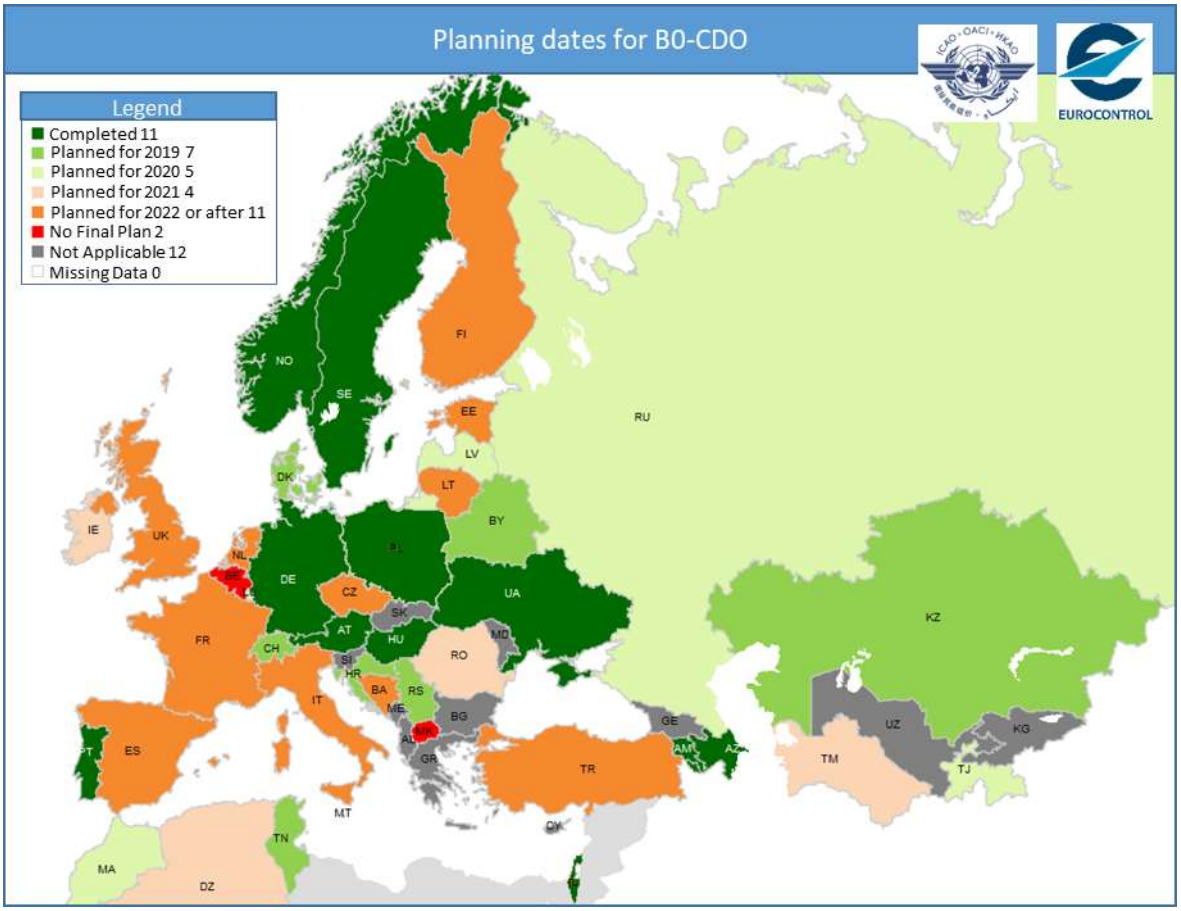


3.6 B0-CDO - Improved Flexibility and Efficiency in Descent Profiles (CDO)

This module is about the deployment of performance-based airspace and arrival procedures that allow the aircraft to fly its optimum aircraft profile taking account of airspace and traffic complexity with continuous descent operations (CDOs).



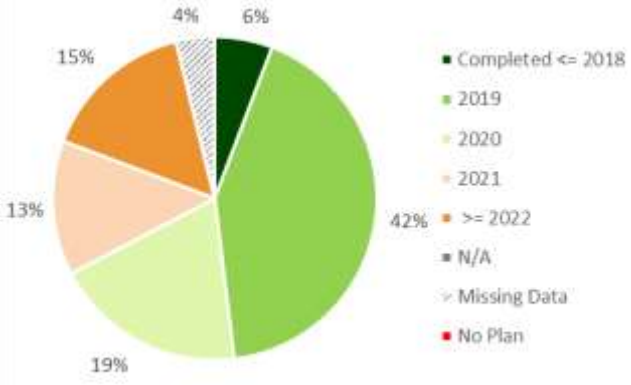
Currently, 11 States have already completed the implementation and 7 more States plan to complete it during 2019, corresponding to more than 30% of the States. [1] For 23% of the States the B0-CDO module is not applicable.



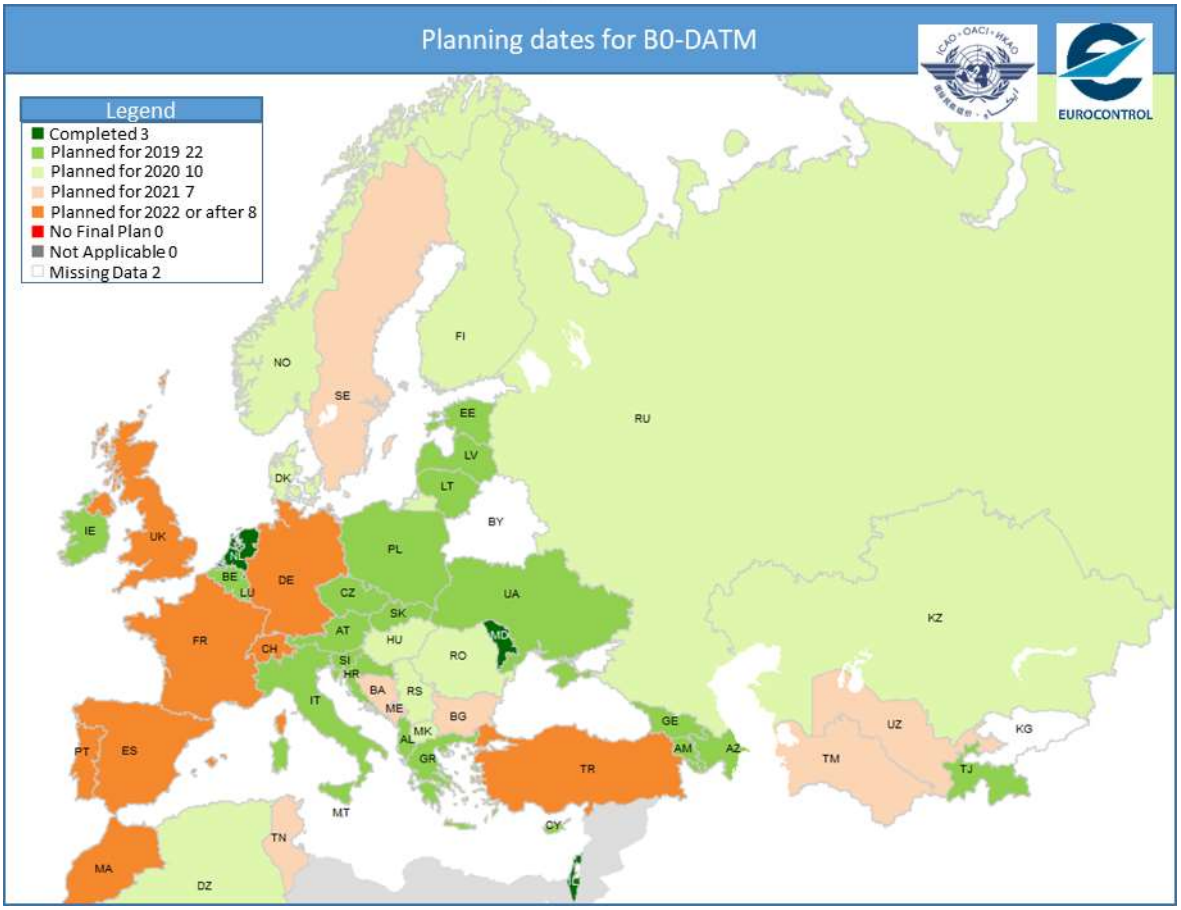
[1] Note the explanation in the MPL3 Report: Objective ENV01 (CDO) was modified to align it with the ICAO ASBU Block 0/1 elements on CDO which explains the dip in the completion rate.

3.7 B0-DATM - Service Improvement through Digital AIM

This module concerns initial introduction of digital processing and management of information, by the implementation of AIS/AIM making use of AIXM, moving to electronic AIP and better quality and availability of data.



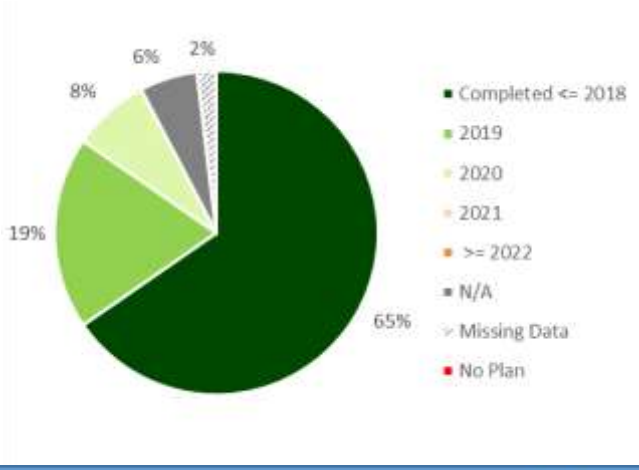
Currently, only 3 States have already completed the implementation and 22 more States plan to complete it during 2019, corresponding to almost 50% of the States.

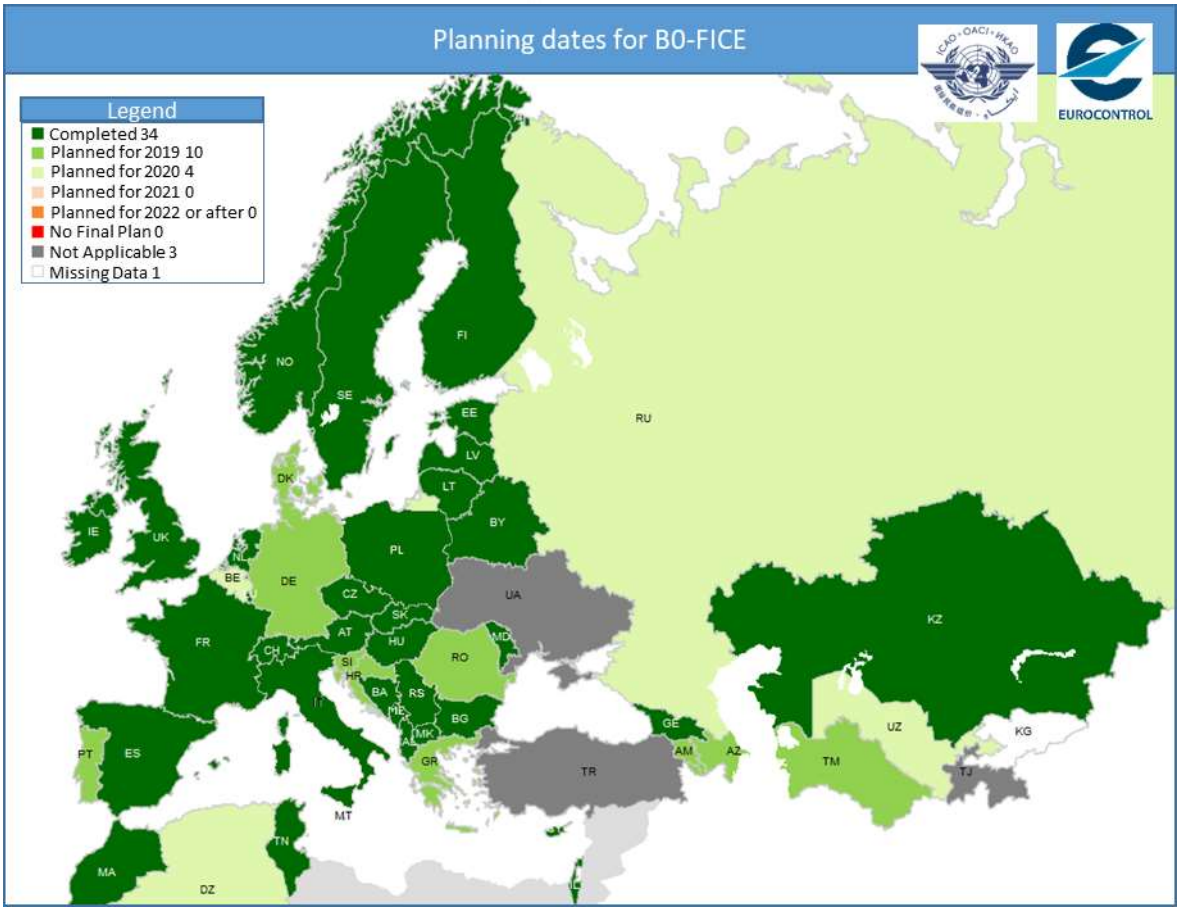


3.8 B0-FICE – Increased Interoperability, Efficiency and Capacity through G/G Integration

This module supports the coordination of ground-ground data communication between ATSU based on ATS Inter-facility Data Communication (AIDC) defined by ICAO Document 9694.

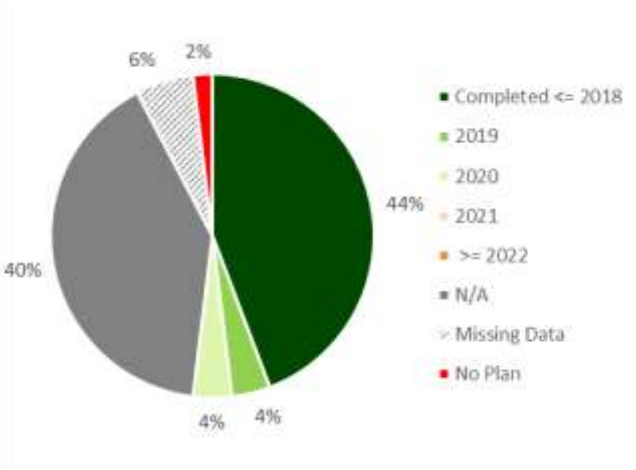
Currently, 34 States have already completed the implementation and 10 more States plan to complete it during 2019, corresponding to more than 80% of the States.



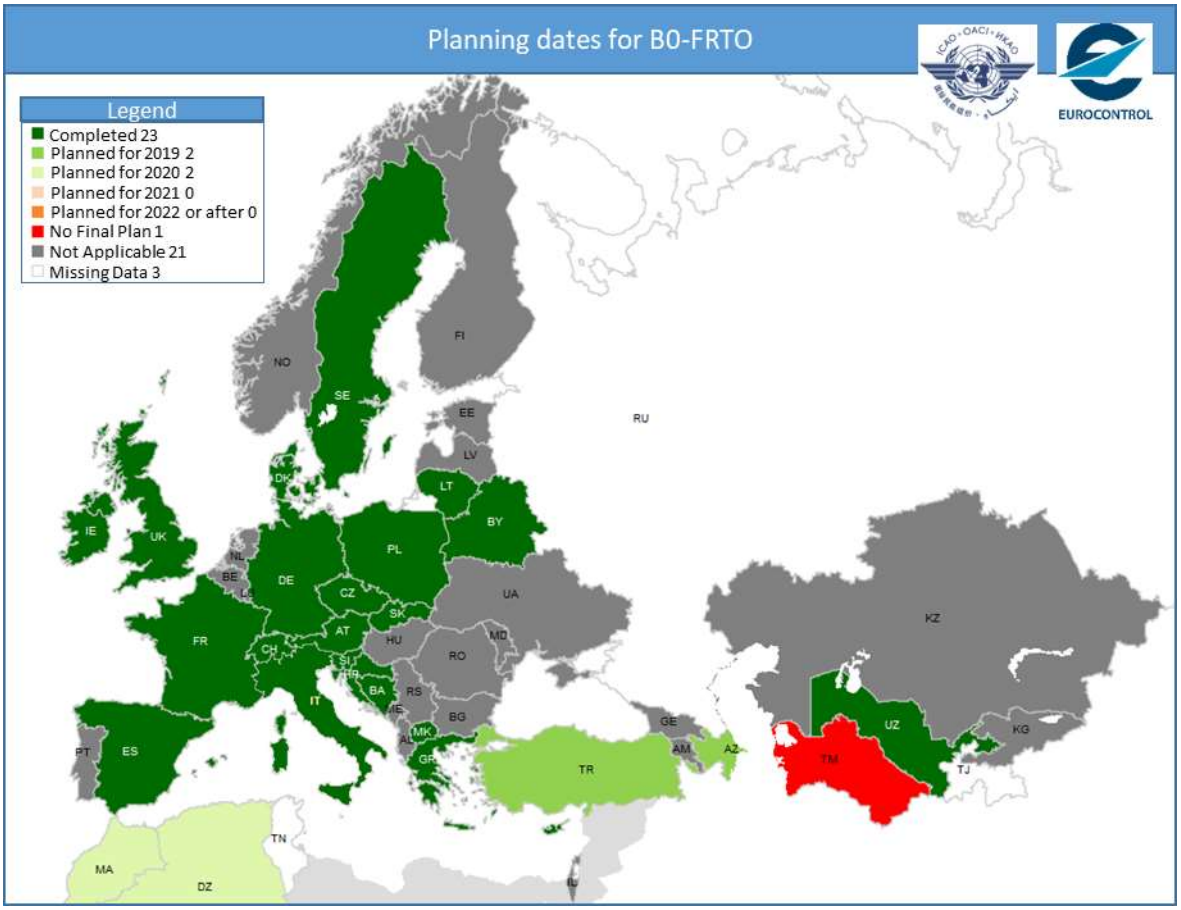


3.9 B0- FRTO – Improved Operations through Enhanced En-Route Trajectories

Improved Operations through Enhanced En-Route Trajectories in order to allow the use of airspace which would otherwise be segregated (i.e. Military airspace) along with flexible routing adjusted for specific traffic patterns. This will permit greater routing possibilities, reducing potential congestion on trunk routes and busy crossing points, resulting in reduced flight length and fuel burn.

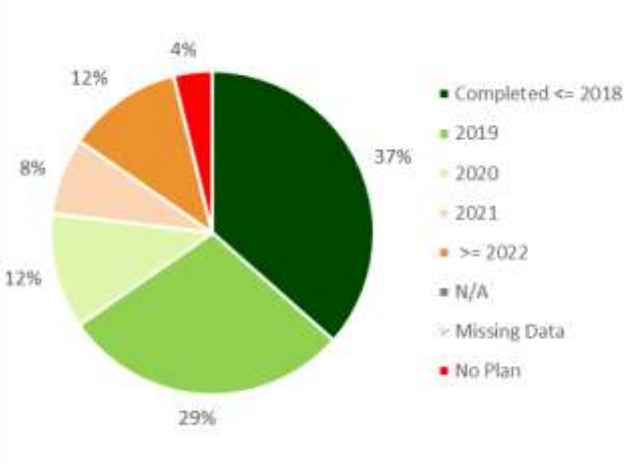


Currently, 23 States have already completed the implementation and 2 more States plan to complete it during 2019, corresponding to almost 50% of the States. For 40% of the States the B0-FRTO module is not applicable.

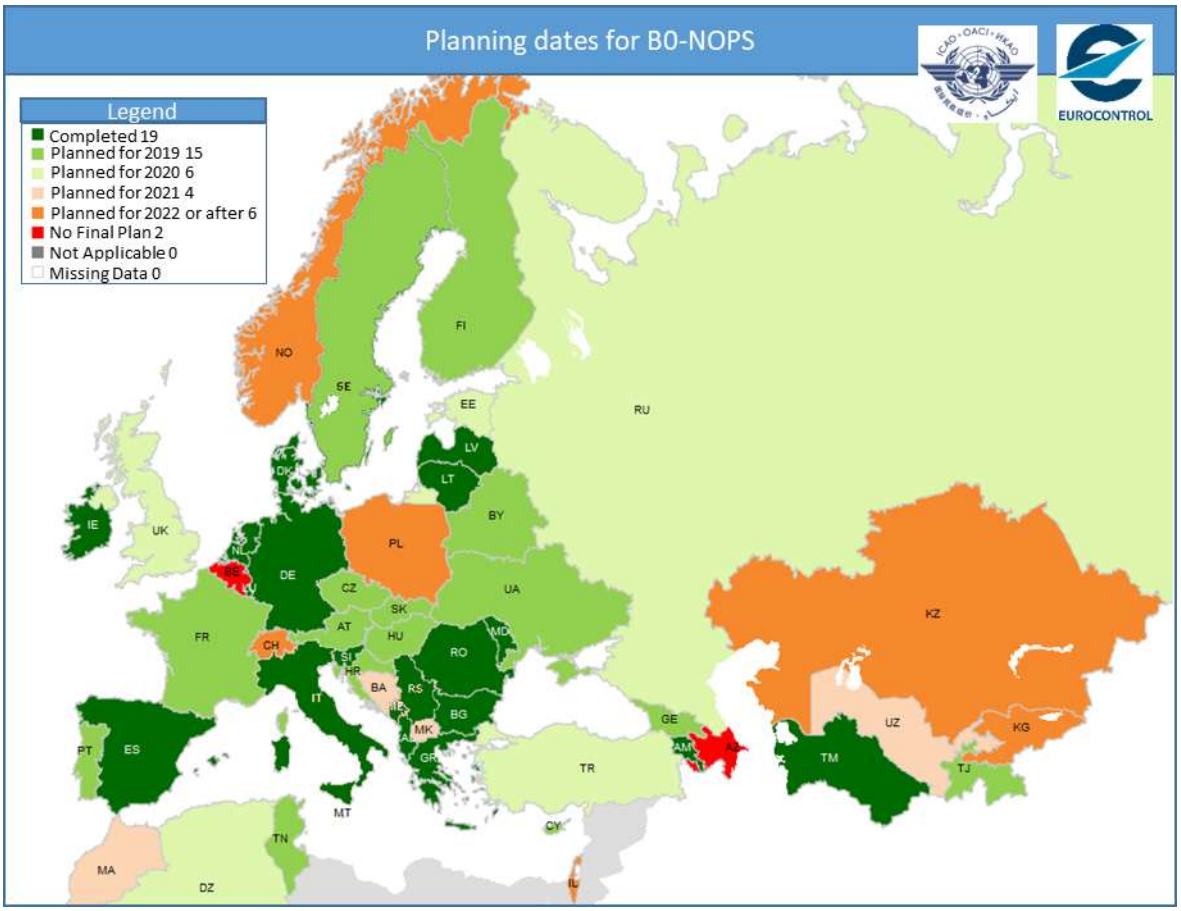


3.10 B0-NOPS – Improved Flow Performance through Planning Based on a Network-Wide View

This module includes collaborative ATFM measure to regulate peak flows involving departure slots, managed rate of entry into a given piece of airspace for traffic along a certain axis, requested time at a way-point or an FIR/sector boundary along the flight, use of miles-in-trail to smooth flows along a certain traffic axis and re-routing of traffic to avoid saturated areas.



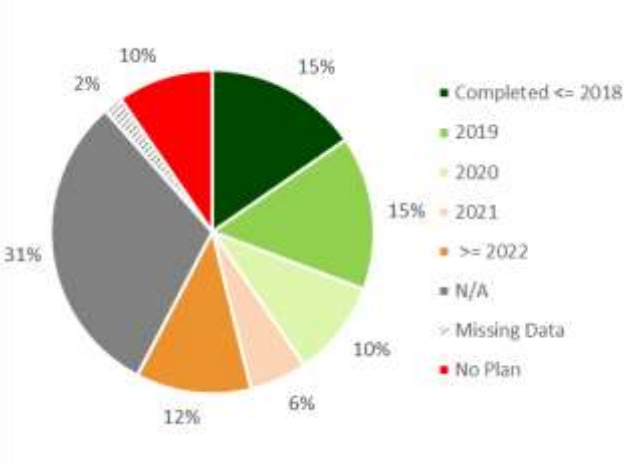
Currently, 19 States have already completed the implementation and 15 more States plan to complete it during 2019, corresponding to almost 70% of the States.

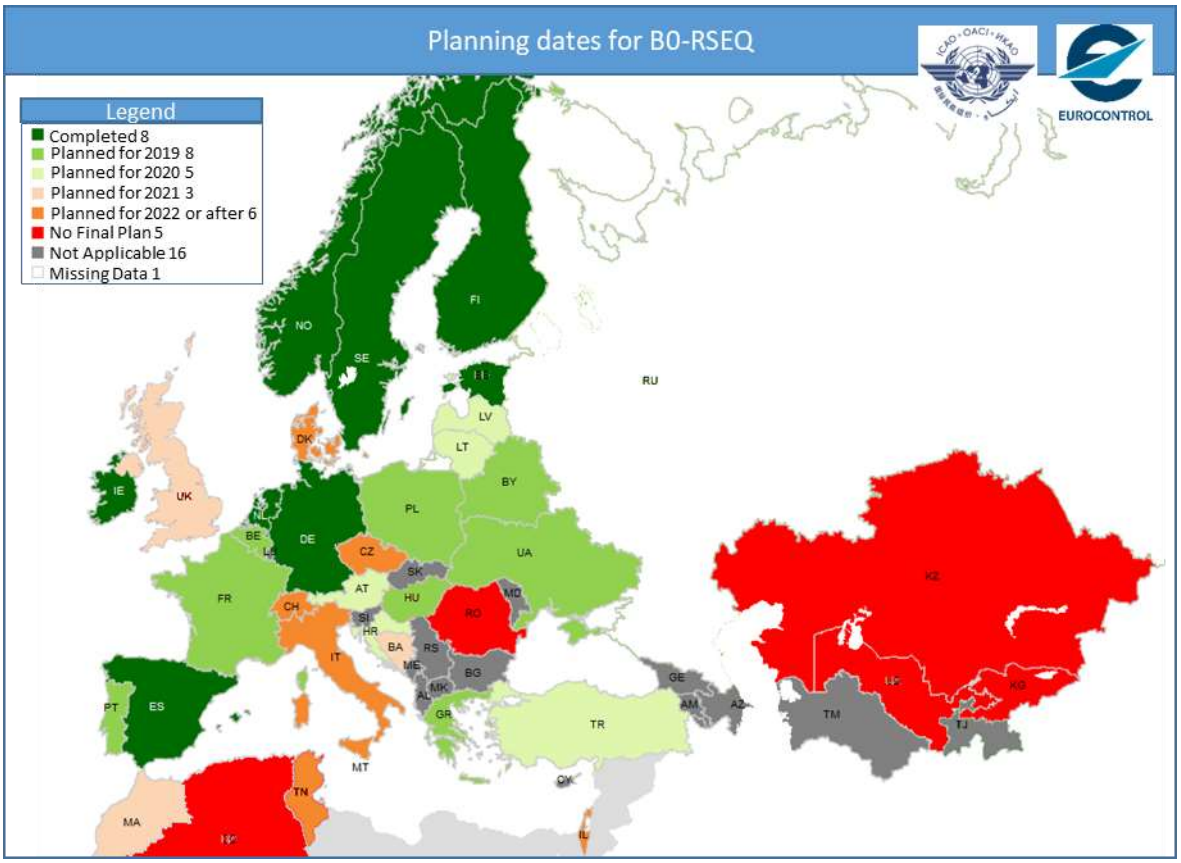


3.11 B0-RSEQ – Improve Traffic Flow through Runway Sequencing (AMAN/DMAN)

This module is about improved Traffic Flow through Runway Sequencing (AMAN/DMAN) and time-based metering to sequence departing and arriving flights.

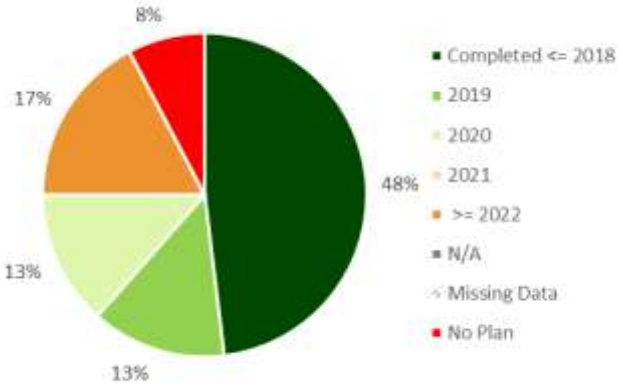
Currently, 8 States have already completed the implementation and 8 more States plan to complete it during 2019, corresponding to 30% of the States. For 31% of the States the B0-RSEQ module is not applicable and another 10% have no final implementation plan.



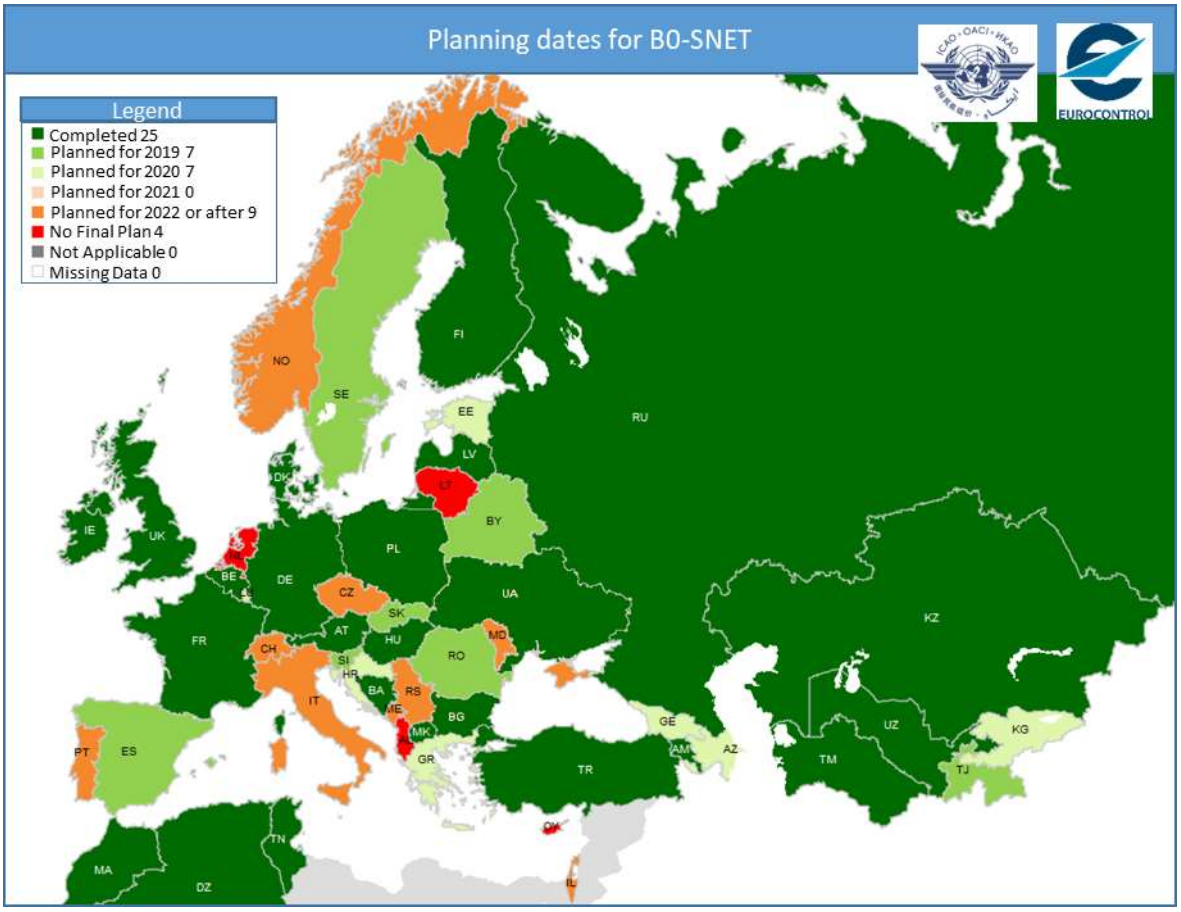


3.12 B0-SNET – Increased Effectives of Ground Based Safety Nets

This module provides improvements to the effectiveness of the ground-based safety nets, assisting the Air Traffic Controller and generating in a timely manner alerts of proximity warning and minimum safe altitude.



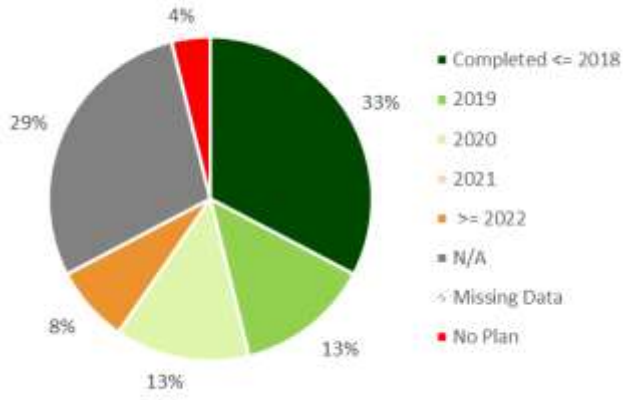
Currently, 25 States have already completed the implementation and 7 more States plan to complete it during 2019, corresponding to more than 60% of the States.

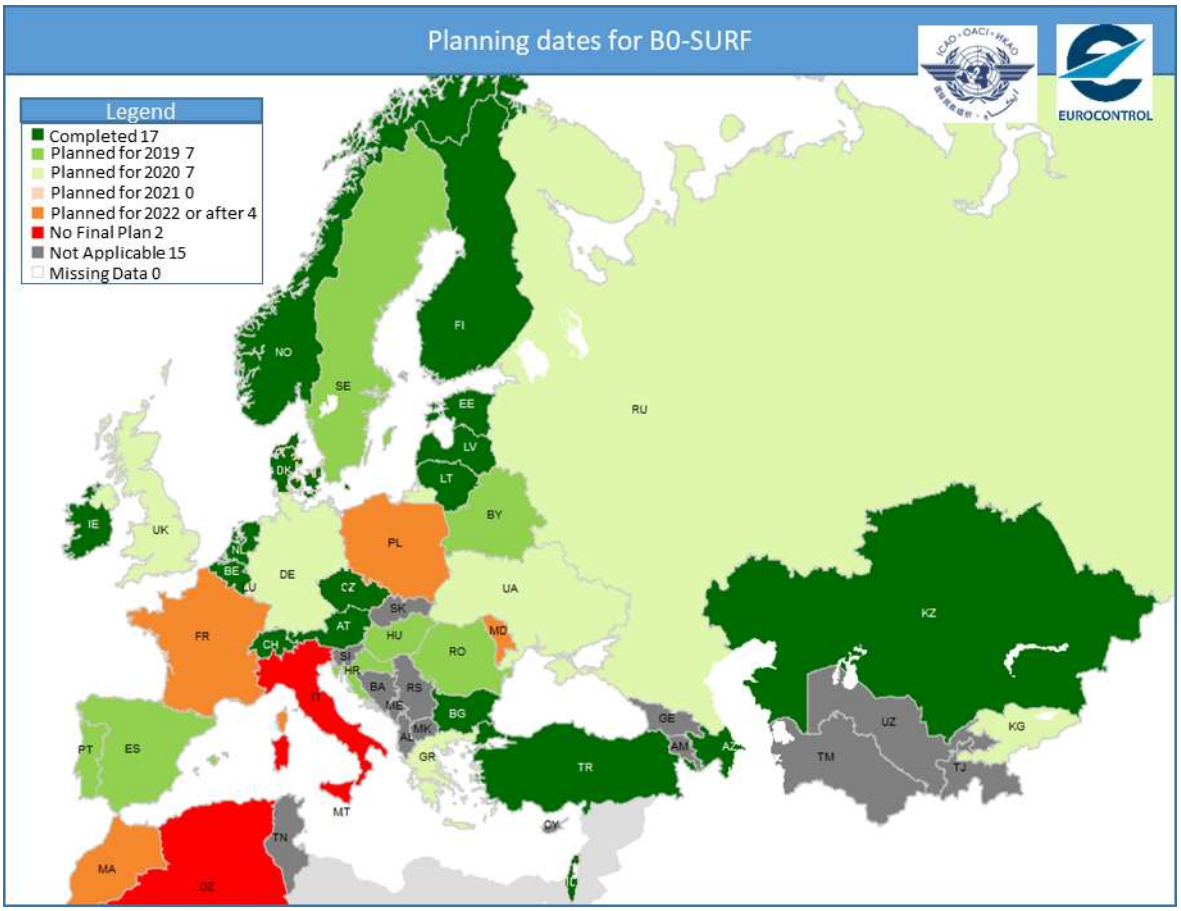


3.13 B0- SURF – Safety and Efficiency of Surface Operations (A-SMGCS Level 1 & 2)

This module is about Safety and Efficiency of Surface Operations (A-SMGCS Level 1-2) and Airport surface surveillance for ANSP.

The **progress** keeps the same trend of evolution as in previous cycles. Currently, 17 States have already completed the implementation and 7 more States plan to complete it during 2019, corresponding to almost 50% of the States. For 29% of the States the B0-SURF module is not applicable.

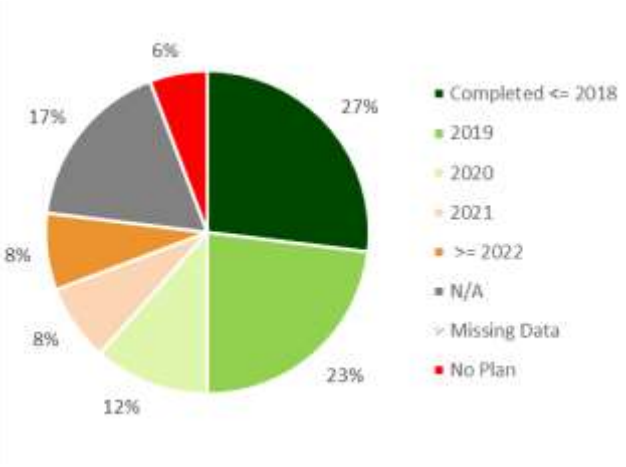


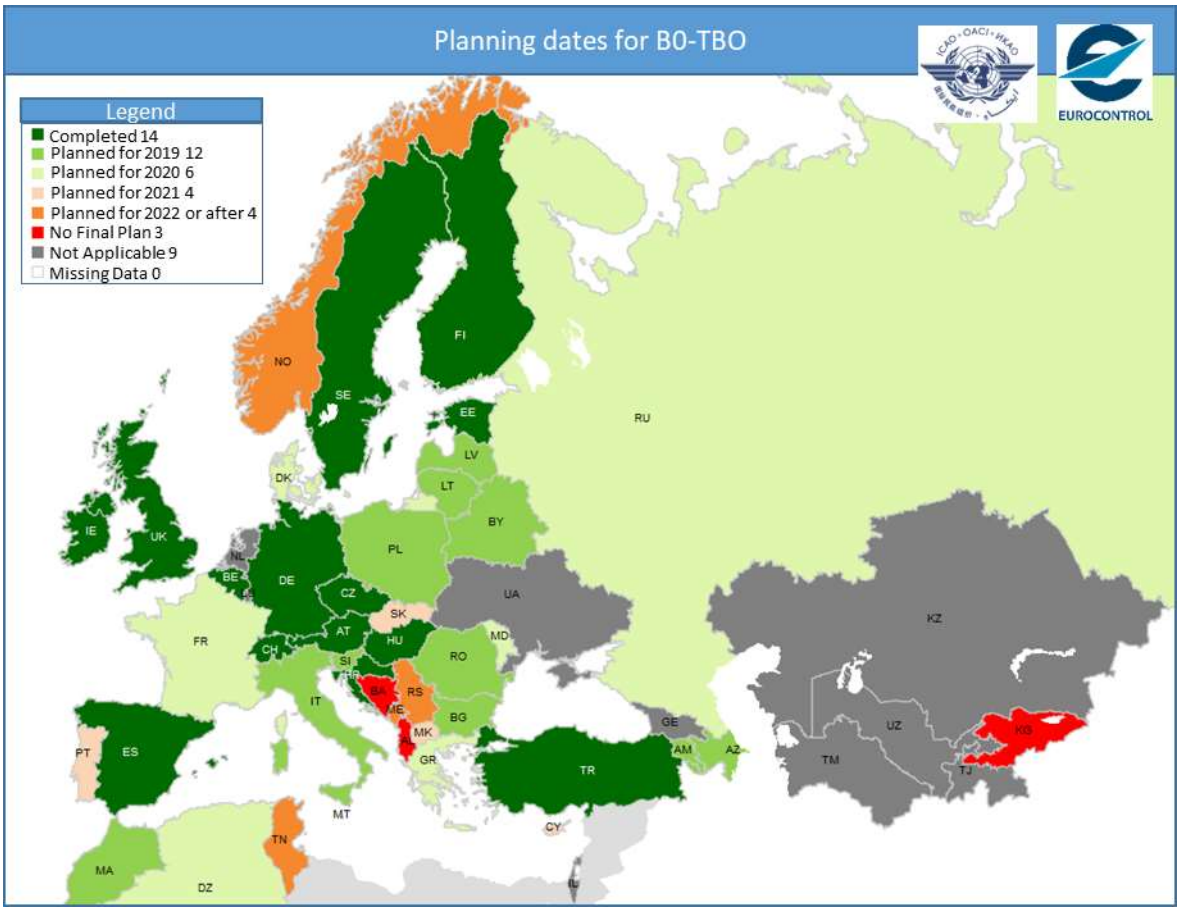


3.14 B0-TBO – Improved Safety and Efficiency through Initial Application of Data Link En-Route

This module concerns the implementation of an initial set of data link applications for surveillance and communications in ATC.

The **progress** keeps the same trend of evolution as in previous cycles. Currently, 14 States have already completed the implementation and 12 more States plan to complete it during 2019, corresponding to 50% of the States. For 17% of the States the B0-TBO module is not applicable.





4 Implementation progress view

Implementation Progress View: presents a global view (in the form of a map) of the implementation Progress Status of ASBU Module concerned, for all ICAO EUR States, at the end of year 2018. The progress is indicated in %, showing per State how many of required implementation actions have been completed in a State.

The colour coding on the map, presents achievement rate as follows:

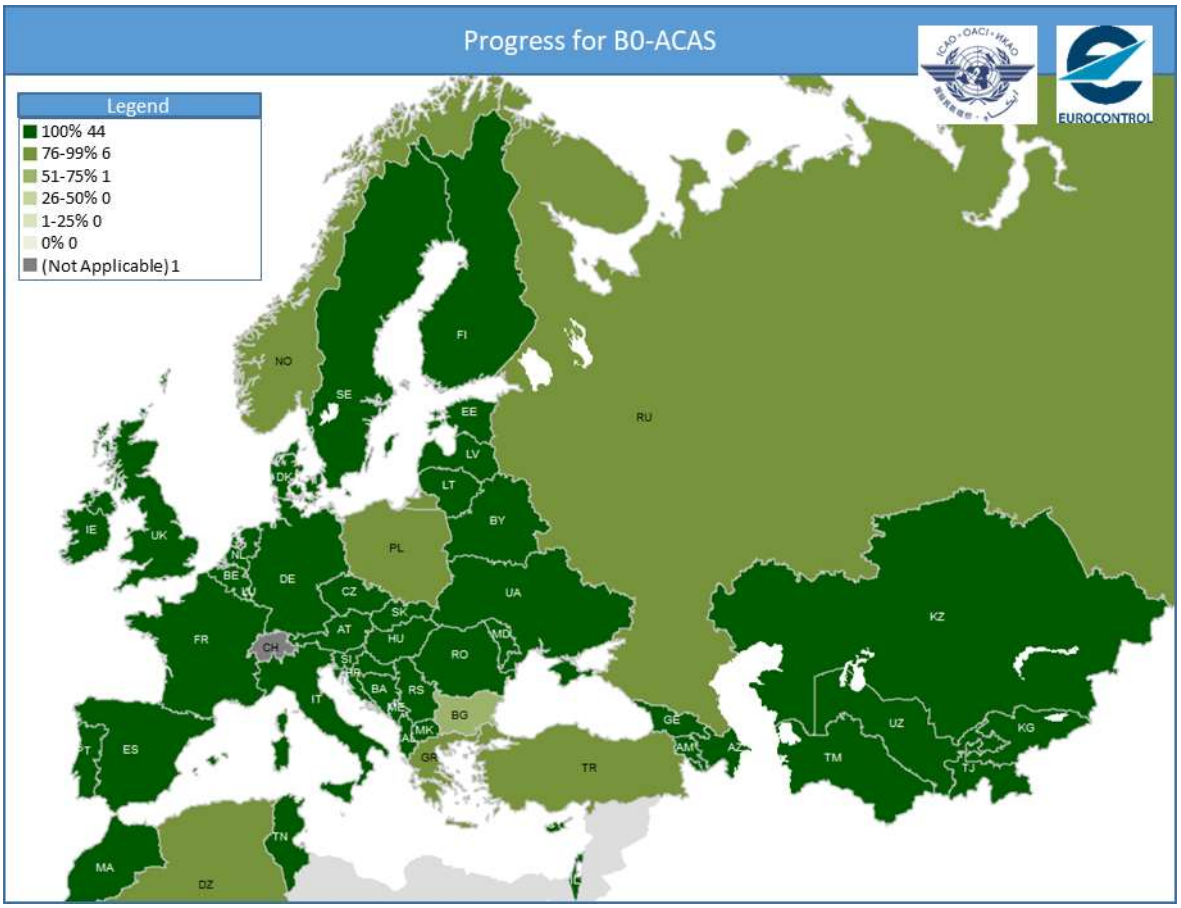
= 100%; Completed implementation of ASBU Module
= 76%-99%; implementation ongoing
= 51%75%; implementation ongoing
= 26%-50%; implementation ongoing
= 1%-25%; implementation ongoing
= 0%; No Plan yet, Planned activity did not start yet, missing data
= Not Applicable

It must be noted that “Missing Data” means that a final date for completion of all the activities related to the ASBU Module was not provided even if in some cases the status (Completed, Ongoing, Planned, etc) was indicated by the State.

It must also be noted that the status of “Not applicable” is used when an operational improvement or system is not seen as necessary or beneficial within a State and therefore can be considered as equivalent to a “Completed” status.

4.1 B0-ACAS - ACAS Improvements

As shown in the progress map below, most of the States among those that have not yet completed the module are at the advanced level of implementation (>75%), which supports the expectation of reaching the completion rate of more than 90% by end 2019.

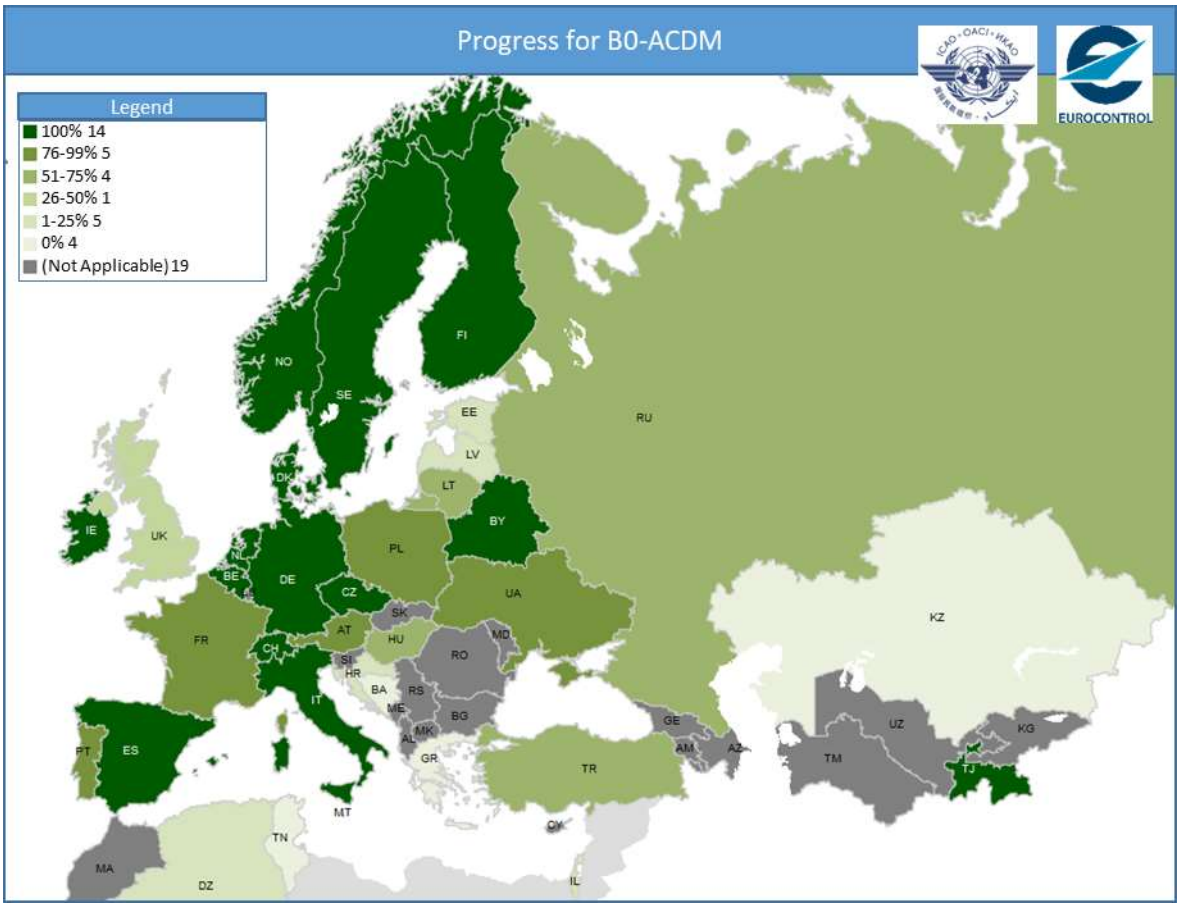


Detailed information for non-LSSIP States

Algeria	-
Belarus	Aircraft operators provide regular training for flight crew members based on the training programmes designed for flights with TCAS II version 7.1 (Operations Manual, Part D, Annex 5) approved by the Department of Aviation. Flight procedures using TCAS II version 7.1 (Operations Manual, Part A, Item 17.3.7.) have been developed and approved. Requirement to verify the activation of TCASII before take-off has been included in the checklists. Aircraft maintenance services and the training of aircraft maintenance technicians are accomplished in accordance with the Aircraft Maintenance Manuals developed by the aircraft operators and approved by the Director of the Department of Aviation. MELs are established per aircraft types and approved by the Director of the Department of Aviation. According to the manufacturer's provisions, ACASII upgrade (TCAS II version 7.1) does not require introducing amendments into the Aircraft Maintenance Programme and MEL. ACAS II (TCAS II version 7.1) performance monitoring is carried out by the Aircraft Operator's Quality Manager, taking into consideration pilot observations recorded in logbooks. Certification of activities is accomplished pursuant to the existing Aviation Rules AP 6.01-2012 (02190) Certification of civil aircraft operator activities.
Kazakhstan	-
Kyrgyzstan	Total 11 aircraft are equipped version 7.1 in July 2017. Airworthiness certification for ACAS II version 7.1 and operational approval for ACAS II version 7.1 equipped aircraft procedures are implemented.
Russian Federation	1. Aviation authorities issue permissions to operate international flights solely to aircraft equipped with ACAS II version 7.1. All a/c that operate flights in EUROCONTROL airspace are ACAS II version 7.1 equipped. 2. According to national regulations, flight crew shall inform the ATC unit concerned on a manoeuvre performed to comply with TCAS RA. 3. An incident reporting template has been adopted in the Russian Federation.
Tajikistan	All aircraft registered in Tajikistan have installed TCAS 7.1 in 2016.
Tunisia	Tunisian registered aircraft are all equipped with TCAS version 7.1 Regarding the monitoring, Air operators are invited to comply with manufacture procedures - ATC RA monitoring provision implemented.
Turkmenistan	All aircraft (which are required to be equipped with ACAS) registered in Turkmenistan have been already equipped, or have scheduled maintenance program to install ACAS II/TCAS 7.1 before the Annex 10 deadline. RA investigation process has been implemented together with other AIRPROX, LHD reports, etc.
Uzbekistan	All aircraft (which are required to be equipped with ACAS) registered in Uzbekistan have been already equipped, or have scheduled maintenance program to install ACAS II/TCAS 7.1 before the Annex 10 deadline. RA monitoring is part of the normal reporting process, similar to AIRPROX, LHD reports, etc.

4.2 B0-ACDM - Improved Airport Operations through Airport- CDM

With many States reporting the “Not applicable” status for this module, the completion rate is only 27% of the ICAO EUR region (improving to 42% if those States are not taken into account). Among those that have not yet completed the module, there are 9 States with implementation progress above 50%, giving a reason to believe that the completion rate will significantly improve over the next two years.

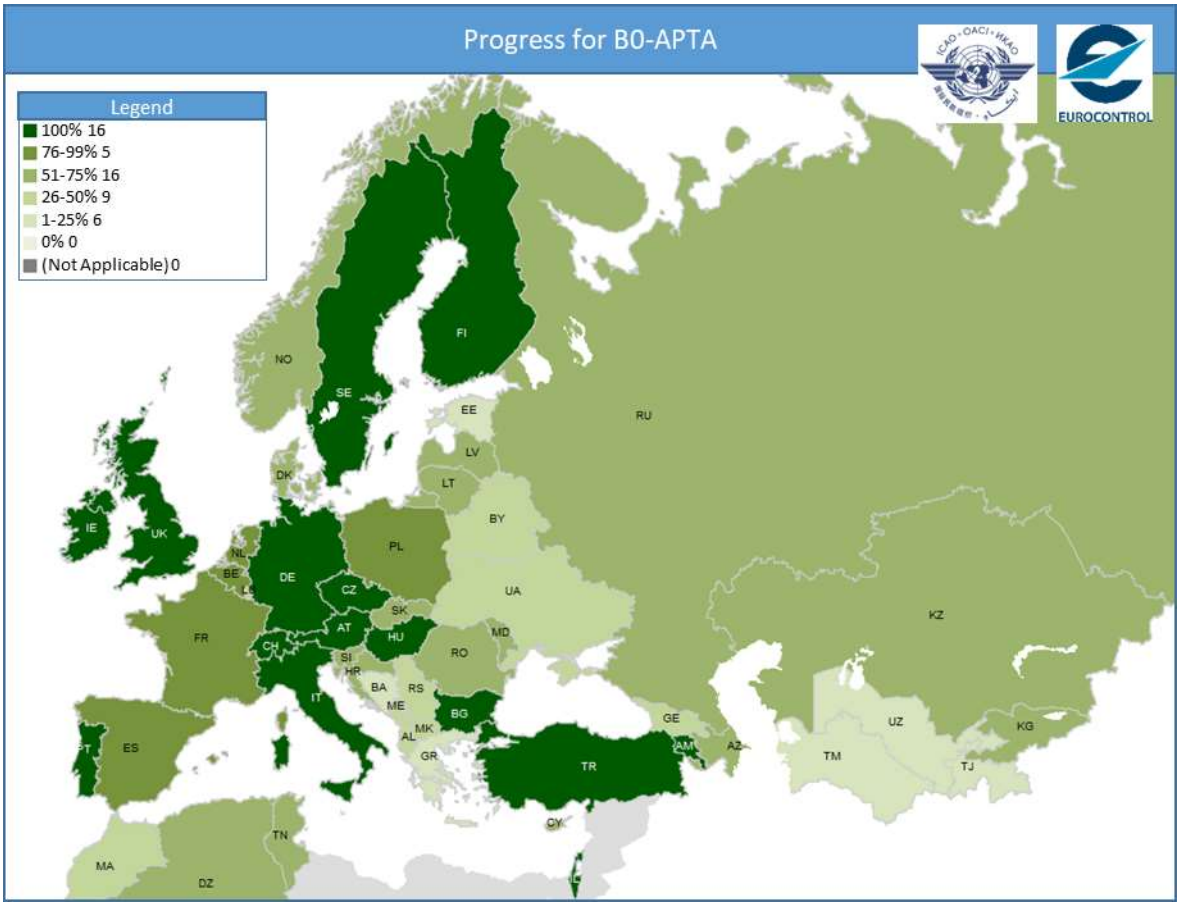


Detailed information for non-LSSIP States

Algeria	Action 1 : The sharing platform procured is a CSA (aerodrome safety committee) but without LoA or MoU signed by partners. Actions 2 and 3 are not planned yet.
Belarus	The following improvements have been achieved at Minsk National Airport: Local Air Navigation Service (ANS) procedures for information sharing have been implemented through Letters of Agreement (LoAs). Special checklists using Kobra automated system have been implemented in order to perform apron operations, monitor the compliance with maintenance schedule and manage the resources available. Agreements between the aerodrome operators and aircraft operators define variable taxi-time and pre-departure sequencing procedure. CDM procedures have been implemented.
Kazakhstan	-
Kyrgyzstan	LoAs with airport operator and airport stakeholders (for airport functions) for coordination/cooperation are in place. Consultation with airspace users is currently done via bi-lateral meetings (ANSP-AO or Airport-AO). Not Applicable in Kyrgyz Republic.
Russian Federation	1. Work is underway to establish and configure A-CDM platforms in UUDD, UUWW, UUEE. 2. Stakeholders have developed and agreed the ground handling schedule, also for turnaround flights. The procedures are applied at the planning stage and during ground handling.
Tajikistan	Instructions and special procedures for coordination/cooperation between airports and ANSP are in place. Formalisation of arrangements with airspace users (as described in CDM functionality) were finalised.
Tunisia	No current plans, but could be implemented in Tunis Carthage, Djerba Zarzis, Monastir H. Bourguiba and Enfidha-Hammamet airports, taking into consideration the traffic growth (studies in progress).
Turkmenistan	Turkmenistan is not within the area of applicability of this airport related objective.
Uzbekistan	No implementation planned for aerodromes of Uzbekistan, as all aerodromes, the national airline (Uzbekistan airlines) and ANSP are in one company. Discussions with foreign airlines are done on an ad/hoc or when necessary basis.

4.3 B0-APTA - Optimization of Approach Procedures including vertical guidance

The completion rate for this module is expected to increase significantly in the next couple of years since most of the States among those that have not yet completed the module reached over 50% of the implementation progress, with 5 States already achieving 75% or more.



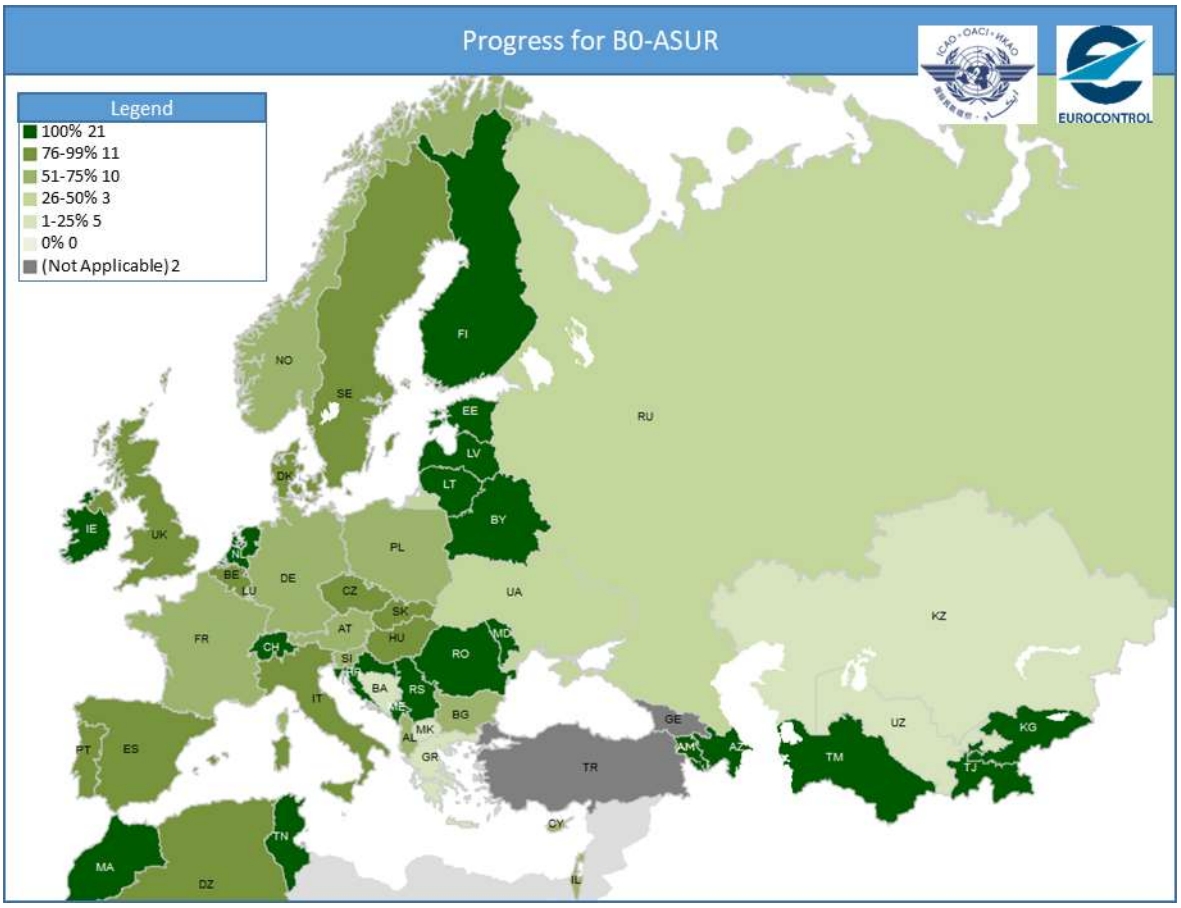
Detailed information for non-LSSIP States

Algeria	Algeria intends to complete this objective at the end of 2021 (design and publish RNP approach). A national PBN implementation plan was developed in 2015. In accordance with the National PBN plan, the ANSP (ENNA) has developed a plan and APV/Baro procedures will be implemented for Approaches of Algiers, Oran, Annaba, Constantine and Hassi Messaoud. All coordinates data are already published in WGS-84.
Belarus	National PBN Implementation Plan was developed, and it was approved on 24 June 2010. National Airspace Concept was approved on 17 December 2014. Automated aeronautical facilities (flight procedures design system, aeronautical charting system, airspace design system) have been upgraded and adapted to support the Aeronautical Information Exchange Model (AIXM) 5.1. Coordinates data are published in Belarus AIP in WGS-84 (since 17 December 2009). APV Procedures have been designed. Publication of APV Procedures in Belarus AIP: December 2019.
Kazakhstan	All coordinates data in AIP with effective date of 30th of March 2017 are published in WGS-84 in accordance with ICAO Annex 15 requirements. Astana and Almaty airports serving the major of international flights are planned to be introduced with APV/Baro by the end of 2018. Implementation of APV/Baro at the rest airports will be completed by 2019.
Kyrgyzstan	Kyrgyz Republic is not yet going to introduce APV/BARO or APV/SBAS procedures until 2029. Kyrgyz Republic publishes in AIPs all coordinates data in WGS-84 in accordance with ICAO Annex 15 requirements since 2/07/2014.
Russian Federation	1. The implementation of approaches is carried out in accordance with the PBN Implementation Plan of the Russian Federation. BARO VNAV approaches have been designed for one aerodrome. 2. PZ-90.11 system identical to WSG-84 is applied.
Tajikistan	First phase will start in 2020. International airport Dushanbe is equipped with ILS, Cat I on RWY09, RWY 27 installation was finished in March 2017. The WGS-84 project (with CAIGA) has started in 2017 for Tajikistan (Dushanbe and 3 other international airports Hujand –ILS installed on both runway sides but no category assigned, Kulob -ILS for one runway also no category, Qurgontepa- no ILS approach). National PBN implementation plan has been developed and the design of GNSS procedures for international airports included in national PBN plan, which will start after completion of WGS-84 project.
Tunisia	- According to national PBN plan, all international airports in Tunisia will have APV procedures by the end of 2019. - All runways of the 4 main Tunisian International airports (DTTA, DTNH, DTMB and DTTJ) will be provided with an APV Baro VNAV procedures, by 2019 -10 RWYs- in total. - 04 LNAV/VNAV procedures designed for Tunis Carthage airport (Approval in progress).
Turkmenistan	Work on a national PBN implementation plan has started, but has not been completed.

Uzbekistan	1. WGS-84 co-ordinates data have been defined for all applicable airports, except for airports Namangan, Bukara, Termez and Nukus. 2. WGS-84 co-ordinates data have been published in AIP for all applicable airports, except for airports Namangan, Bukara, Termez and Nukus. 3. There are 11 international airports in Uzbekistan with Tashkent being the main airport. Tashkent has 2 parallel runways (210m apart) with 08L CAT II, 26 R CAT I, 08R CAT I, 26L VOR/DME approaches. Navoi airport has ILS CAT II on both runways and all other airports have either CAT I on some runways or VOR/NDB approaches. The implementation of a national PBN plan has started. GNSS procedures for all international airports reflected in the national PBN plan.

4.4 B0-ASUR - Initial capability for ground surveillance

According to plans reported by States, the completion rate for this module is going to reach 90% in the coming two years. This is further supported by the fact that vast majority of States among those that have not yet completed the objective (21 out of 31) have already reached over 50% of implementation progress, as seen in the map below.

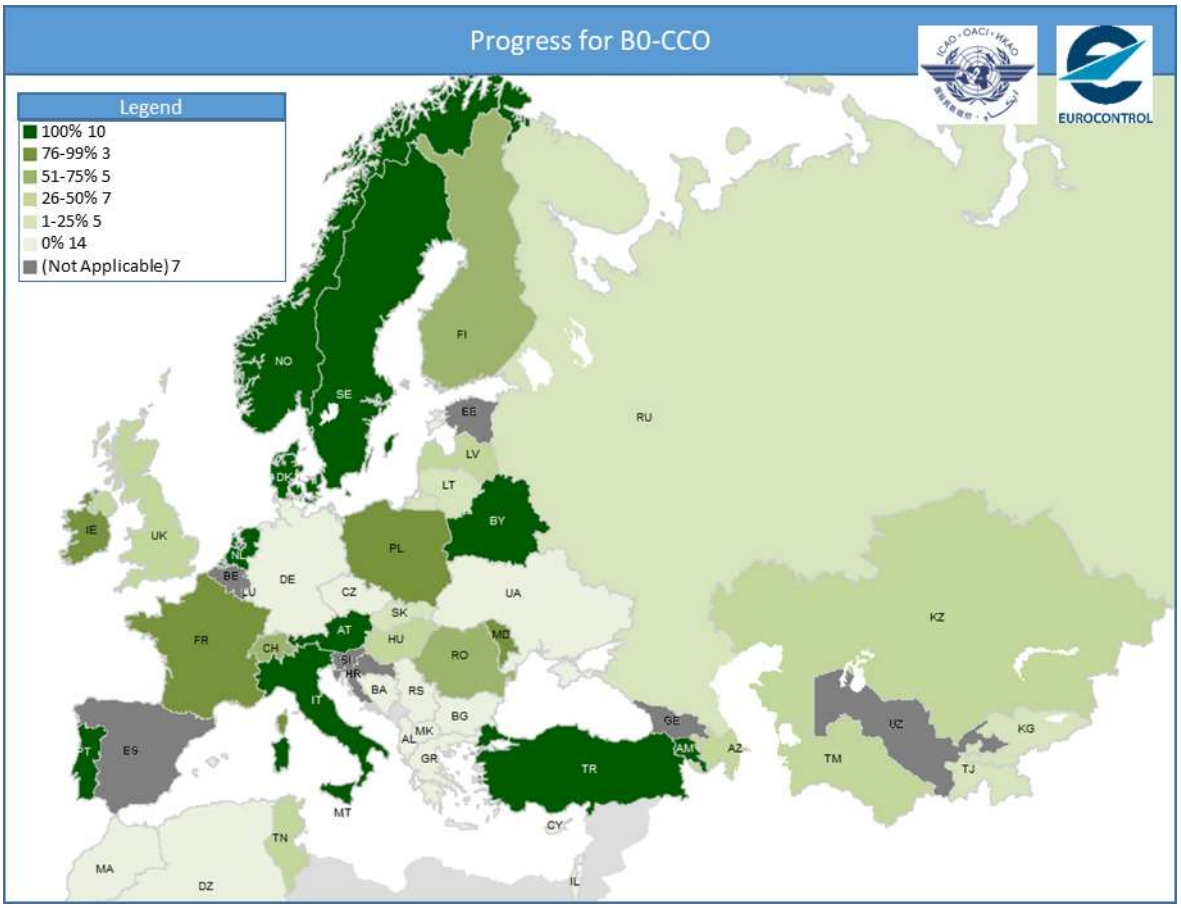


Detailed information for non-LSSIP States

Algeria	5 SSR Mode C Sensors and 1 PSR are installed in the northern part of Algiers FIR. Since 2008 ADS-C is used for surveillance functions in the southern part of the Algiers FIR. For the southern and northern part of the Algiers FIR the deployment of ADS-B and SSR Mode S ground stations are planned within the framework of the Project PDGEA.
Belarus	Safety assessment of the existing CNS facilities is carried out in accordance with the national regulations. Interoperability of surveillance data from all ground surveillance systems and relevant surveillance data processing systems is provided. Surveillance data are not transmitted to other ANS providers since this is not required. Safety assessment is carried out for all existing ground surveillance systems, surveillance data processing systems and ground-ground communication systems used for dissemination and processing of surveillance data. Safety assessment is accomplished when any changes are introduced into the systems and relevant procedures. State aircraft are not equipped with Mode S Elementary Surveillance equipment and ADS-B Out transponders.
Kazakhstan	Work is being carried out to determine requirements for equipping the aircraft with ADS-B out avionics.
Kyrgyzstan	Kyrgyz ANSP has surveillance equipment with Mode S and ADS-B.
Russian Federation	Risk assessment is carried out for surveillance systems under consideration in various configurations with the existing surveillance infrastructure. Data exchange is performed based on existing requirements.
Tajikistan	Tajikistan has installed SSR radar at Dushanbe and Hujand airport. A MLAT system (ERA) covering the whole FIR was installed in 2013. Surveillance data is shared with all other airports.
Tunisia	03 primary radar, 05 secondary radar Mode S and 3 ADS-B are already implemented. Tunis ATM is fully capable of Mode S and ADS-B extended squitter data processing.
Turkmenistan	The airspace over Turkmenistan is covered with SSR Mode 3A/C surveillance radars (range up to 400 km). At all 5 aerodromes additional PSR radars (range 110-120 km) were installed. There are no plans for ADS-B, ADS-C or MLAT installations.
Uzbekistan	After new ATC system installation, Uzaeronavigation has installed SSR Mode 3A/C and PSR radars which cover most (90%) of the airspace in Uzbekistan. At Tashkent airport an ASR has been installed (80 NM coverage). The Mode 3A/C surveillance radars coverage is up to 200 NM and PSR coverage is also around 200 NM. 8 aerodromes have a SSR or PSR/SSR radar installation and 3 aerodromes (Namangan, Karshi and Andizan) have no radar installed. There are currently no plans for ADSB/ADSC/MLAT installations.

4.5 B0-CCO - Improved Flexibility and Efficiency in Departure Profiles (CCO)

As many States have reached very low implementation progress so far, the completion rate for this module is not likely to improve significantly over the next few years, despite many States planning to complete the implementation until 2021.

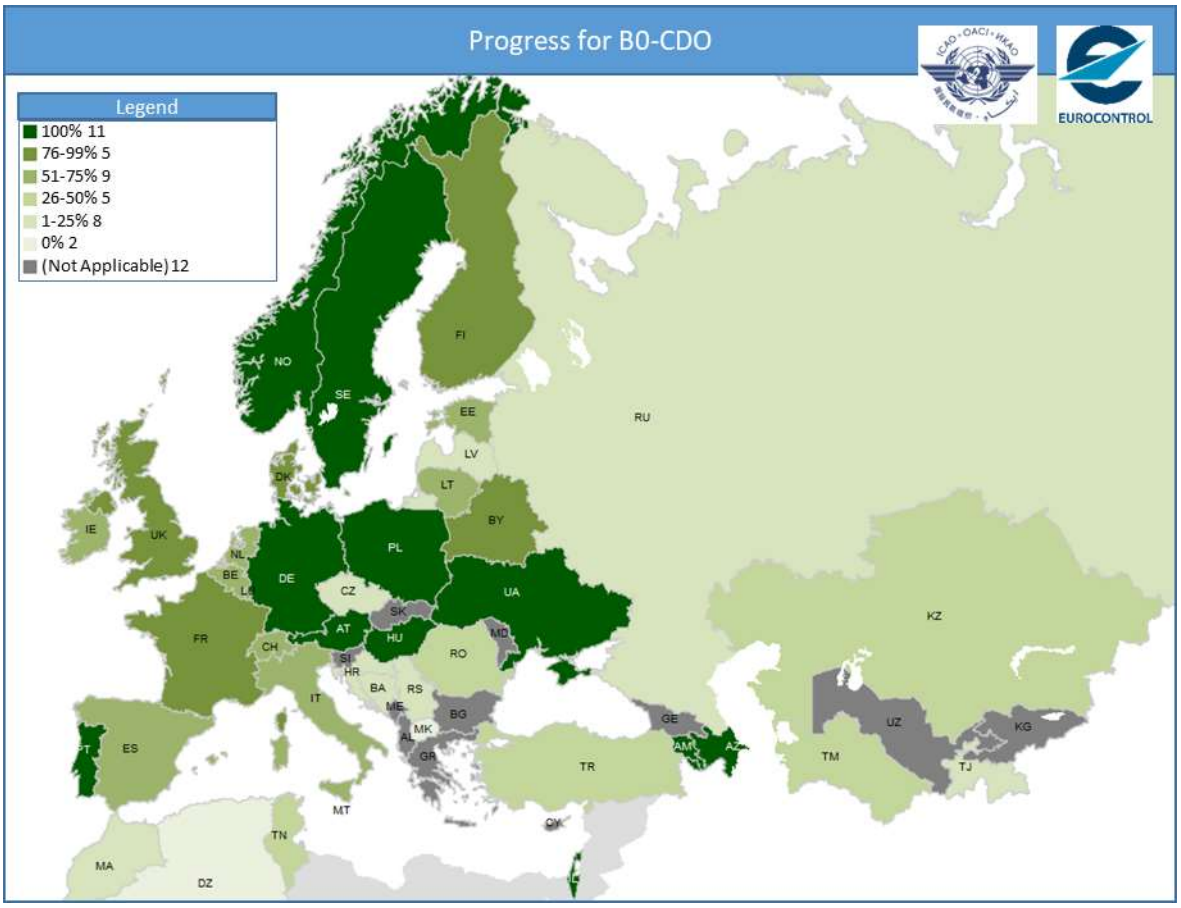


Detailed information for non-LSSIP States

Algeria	This action is planned at the end of 2021 for Algiers, Oran, Annaba, Constantine and Hassi Messaoud airports.
Belarus	CCO techniques have been developed. Training of ATM personnel has been provided.
Kazakhstan	Astana and Almaty airports serving the major of international flights are planned to be introduced with CCO by the end of 2019. Implementation of CCO in the remaining airports will continue as required.
Kyrgyzstan	Ongoing.
Russian Federation	CCO is envisaged by the flight procedures design process in accordance with the PBN Implementation Plan of the Russian Federation.
Tajikistan	National PBN implementation plan has been developed and PBN implementation will be gradually started after completion of WGS-84 data. CCOs/CDOs are a part of the national PBN plan and are expected to be implemented by 2020.
Tunisia	PBN STARs to be implemented within the PBN implementation framework. 100% by 2019 To be developed based on the results of studies that will be conducted for the review of Tunis TMA network for 3 airports.
Turkmenistan	Full scale CCOs/CDOs are currently not implemented in Turkmenistan, but aircraft are cleared for STARs without level-offs. Departure Clearances include the climb up to the filed FL.
Uzbekistan	Due to low traffic no implementation planned.

4.6 B0-CDO - Improved Flexibility and Efficiency in Descent Profiles (CDO)

As many States reported the “Not applicable” status for this module, the completion rate is only 21% of the ICAO EUR region (improving slightly to 28% if those States are not taken into account). The implementation progress among States that have not yet completed the module is more or less evenly spread between 0% and 100%, reflecting the planned dates of completion reported by States.

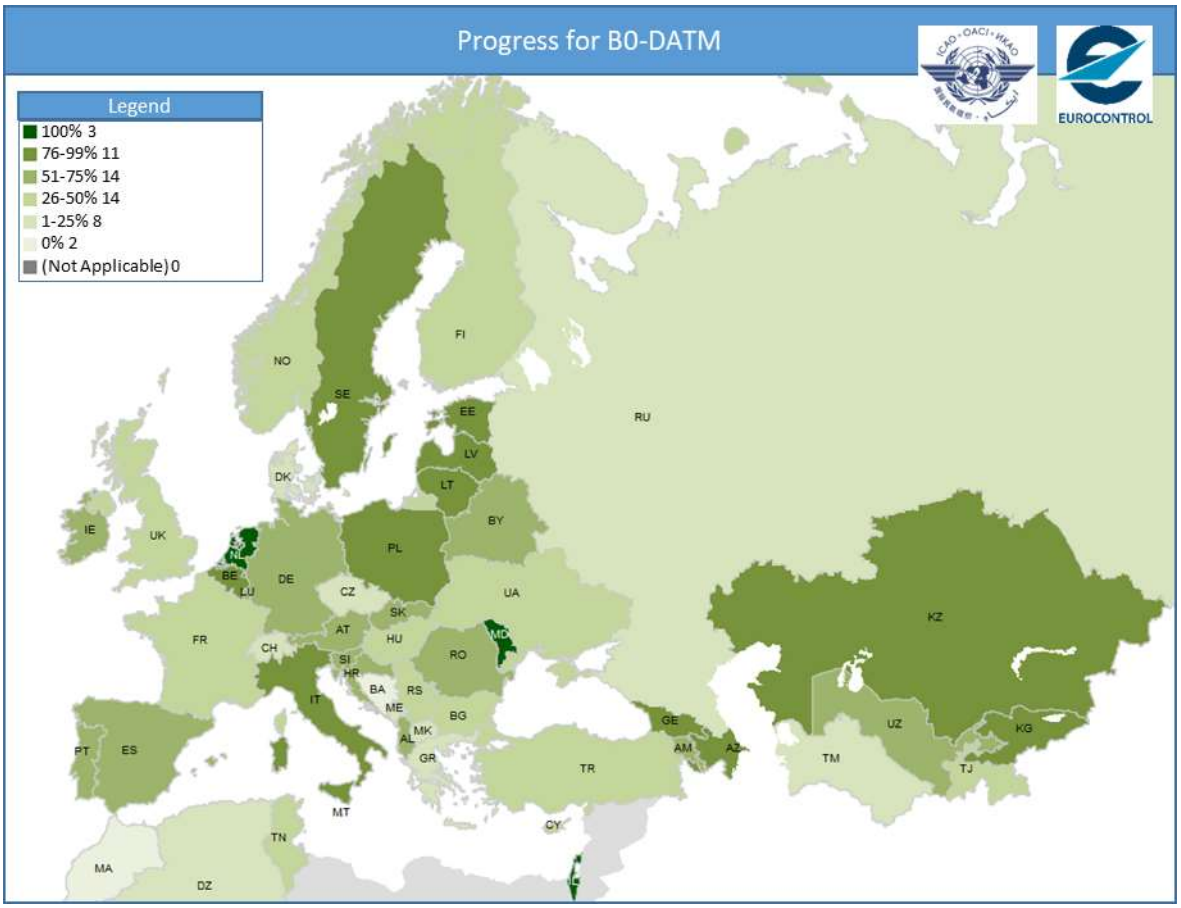


Detailed information for non-LSSIP States

Algeria	In accordance with the National PBN plan implementation, ENNA plans to implement CDOs for Algiers, Oran, Annaba, Constantine and Hassi Messaoud airports.
Belarus	Regulations are being updated to include rules and procedures for the application of CDO techniques. CDO techniques are included into the Training Manual for Flight Crew Members.
Kazakhstan	Astana and Almaty airports serving the major of international flights are planned to be introduced with CDO by the end of 2019. Implementation of CDO in the remaining airports will continue as required.
Kyrgyzstan	Not applicable due to mountainous terrain.
Russian Federation	CDO is envisaged by the flight procedures design process in accordance with the PBN Implementation Plan of the Russian Federation.
Tajikistan	National PBN implementation plan has been developed and PBN implementation will be gradually started after completion of WGS-84 data. CCOs/CDOs are a part of the national PBN plan and are expected to be implemented by 2020.
Tunisia	PBN STARs to be implemented within the PBN implementation framework. 100% by 2019 To be developed based on the results of studies that will be conducted for the review of Tunis TMA network for 3 airports.
Turkmenistan	Full scale CCOs/CDOs are currently not implemented in Turkmenistan, but aircraft are cleared for STARs without level-offs. Departure Clearances include the climb up to the filed FL.
Uzbekistan	Due to low traffic no implementation planned.

4.7 B0-DATM - Service Improvement through Digital AIM

The completion rate for this module is currently very low and amounts only to 6%. However, as many as 25 States have reached over 50% of implementation progress so far, indicating a notable improvement in the completion rate over the next few years.



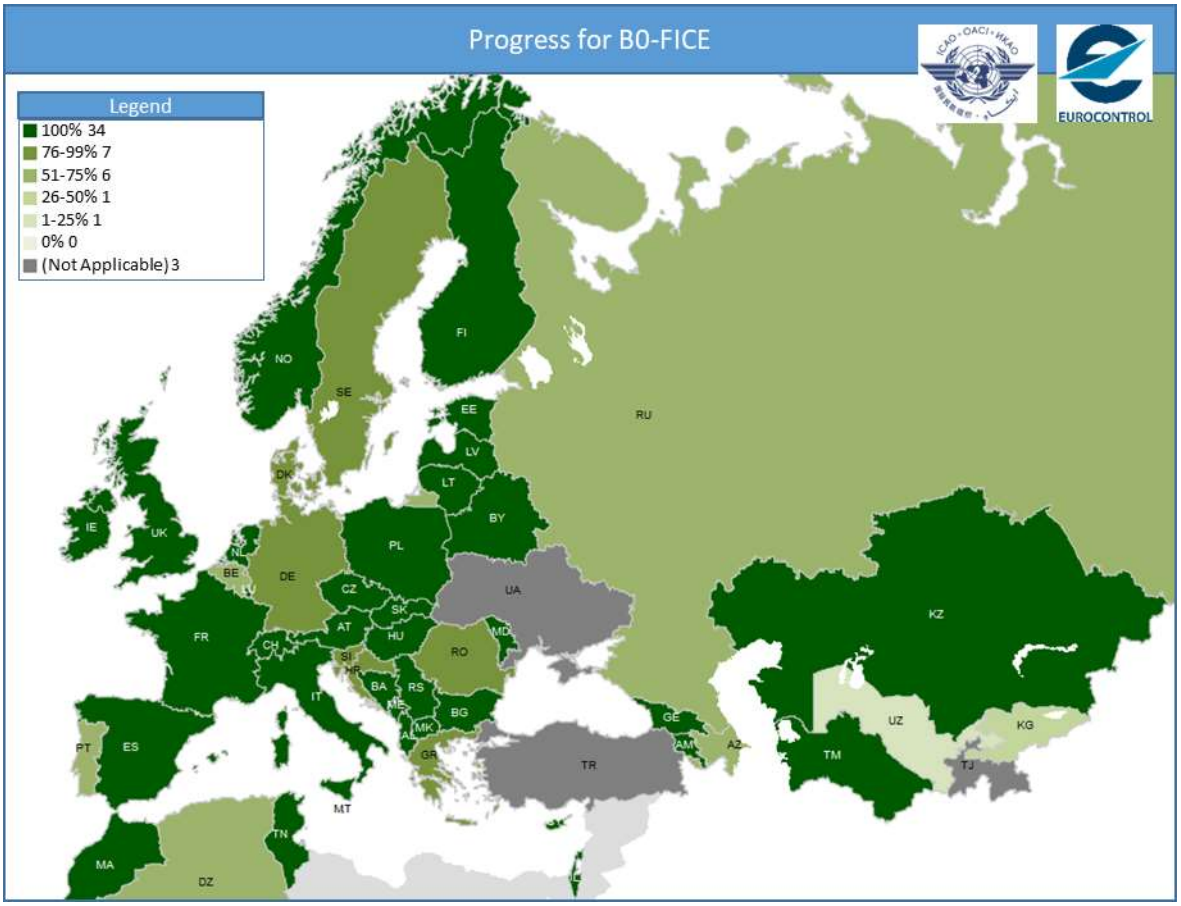
Detailed information for non-LSSIP States

Algeria	This objective will be completed at the end of 2020.
Belarus	QMS for Aeronautical Information Services was implemented in 2014. ISO Certificate 9001: implemented in 2015 No. BY228888Q-U, was issued by Bureau Veritas on 26 June 2017. Additionally safety management and security management objectives are included in the QMS as described in Art 10 of EU regulation 73/2010. Data quality requirements have been implemented as per Annex 15, in terms of completeness, timeliness, consistency, accuracy, resolution and integrity, in accordance with the Order of the Department of Aviation No. 139 dd 07 July 2015 "On approval of the regulation for the provision of aeronautical information". Aeronautical data are provided in AIXM 4.5 format. Upon upgrade of the database and software for creation of aeronautical charts the aeronautical data will be provided as datasets (AIP, TOD, Aerodrome Mapping Data) in AIXM 5.1 format, pursuant to Annex 15. Agreements have been concluded between aeronautical information providers and data originators for the exchange of aeronautical data/information, in accordance with the Order of the Department of Aviation No. 139 dd 07 July 2015 "On approval of the regulation for the provision of aeronautical information". LoAs for Provision or Aeronautical Information and Data Integration between AIS of Belarus and AIS of Latvia and AIS of Lithuania have been agreed.
Kazakhstan	Hardware and software of EAD Briefing Facilities is installed in Astana and Almaty airports serving the major of international flights. AIS, FPL, MET and ATFM information will be integrated into one single source.
Kyrgyzstan	-
Russian Federation	Action 1. The regulation on the requirements for quality management of aeronautical information development is pending approval. Action 2. The regulation on verification and validation of flight procedures design procedure is pending approval. Action 4. It is planned to conduct research on the development of a single AXIM 5.1 standard. Action 5. Creation of eAIP instrument "PAC ANI" is in progress (adjustment stage).
Tajikistan	Integrated briefing (AIS, FPL, MET and ATFM information) was implemented at all international airports. AIM QMS development is ongoing, cooperation with CAIGA established, but QMS aspects need to be verified.
Tunisia	WGS-84 fully implemented. A new survey campaign for eTOD was held in 2016 at Tunisian airports level. • QMS fully implemented: Certification of the Management System for the Quality of the AIS and the AIO of the Tunisian Airports according to the international standard ISO 9001 since 2006. , 100 and has recently migrated to the 2015 version. • e-AIP and Digital NOTAM will be implemented in 2020. • integrated briefing function is planned for Implementation in 2021.

Turkmenistan	An integrated briefing function (AIS, FPL, MET and partially ATFM information) was implemented in Ashgabat during 2003. The 4 other international airports (Turkmenbashi, Turkmenabat, Dashoguz and Mary) have no integrated briefing functionality and the briefing data is/will be prepared in Ashgabat. All aeronautical information for Turkmenistan is managed by the FSUE in the Russian Federation. They are also publishing the Turkmenistan AIP. There are no plans for a separate AIS QMS implementation, but these digital aeronautical information management issues could be part of the WGS/eTOD data server development project and/or the possible EAD migration project.
Uzbekistan	Data quality requirements standards, implementation of common dataset and digital exchange formats, establish formal arrangements satisfied is part of the WGS-84 program, which has started after State approval. Annual QMS audit is successfully completed.

4.8 B0-FICE – Increased Interoperability, Efficiency and Capacity through G/G Integration

The already high completion rate for this module (65%) is likely to further improve over the next few years, as 13 more States have reached over 50% of implementation progress so far.

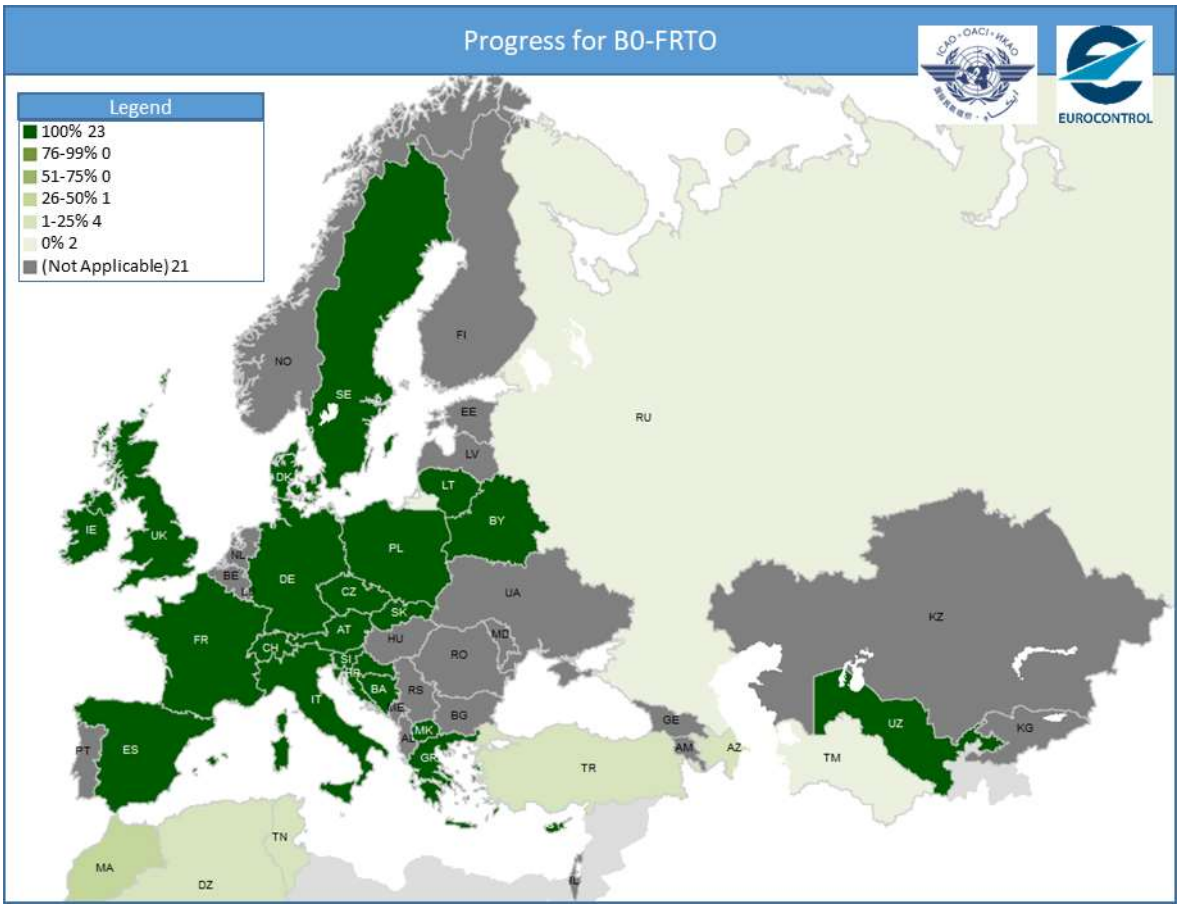


Detailed information for non-LSSIP States

Algeria	The current system includes Basic OLDI messages (ABI, ACT, PAC, LAM) and some AIDC messages. An OLDI connection exists between Algiers ACC and Aix-en-Provence ACC and is fully operational since 2006.The future ATC system (as part of the PDGEA project) will implement the Full OLDI protocol and the AIDC protocol.
Belarus	OLDI connection (ABI, ACT, REV, PAC, MAC, LAM) was implemented between Minsk ACC and the following adjacent ATS centres: with Lviv ACC in December 2004, with Kyiv ACC in May 2005, with Riga ACC in July 2006, with Vilnius ACC in December 2006, with Warsaw ACC in July 2007, with St-Petersburg ACC in March 2014, with Moscow ACC in July 2015. Relevant amendments have been introduced into LoAs with the adjacent ATS Centres.
Kazakhstan	All listed functionalities of the B0-FICE were tested and validated within FAT, SAT and further modernization of the ATC system. All the processes are in operational use.
Kyrgyzstan	-
Russian Federation	The basic OLDI-based voice-free functionality is implemented and applied for 80% of interactions . The advanced OLDI functionality is implemented in two automated ATC systems. All newly created automated ATC systems possess basic OLDI-based voice-free interaction functionality.
Tajikistan	ATC System (Master from Peleng) was installed in 2012, but ground-ground ATC system functionality was not installed.
Tunisia	• Current FDPs support the different levels of data online exchange (OLDI messages), including COD and PAC • Current FDPs are fully capable to handle AIDC /OLDI and/or FMTP protocols. OLDI is also used between Tunis ACC and Djerba system is based on FMTP protocols. • Roma and Malta ACCs are completely linked via OLDI to Tunis ACC. • OLDI connection implementation studies with Algiers and Marseille ACCs are in progress • connection with PENS network in progress. Contract with PENS in progress, upgrade and support already implemented and tested. OLDI is also used between Tunis ACC and Djerba system is based on FMTP protocols.
Turkmenistan	-
Uzbekistan	The current ATC System (Thomson/Peling Master) includes AFTN and FPL/FDPS/RDPS functionalities. The automatic G/G ATC system coordination functionality is operational in Tashkent ACC with coordination between ACC, APP and TWR. The coordination (COTR) between Samarkand and Nukus ACC, and with any other adjacent ACC is done via phone. ANP will announce tendering (selection of new ATC system in 2018) for new ATC system for Uzbekistan that will include the ground-ground automated co-ordination functionalities.

4.9 B0- FRTO – Improved Operations through Enhanced En-Route Trajectories

The completion rate for this module is currently only at 44% of the ICAO EUR region, since many States reported the “Not applicable” status for this module. Most of the States among those that have not yet completed the module have reached only up to 25% of implementation progress.

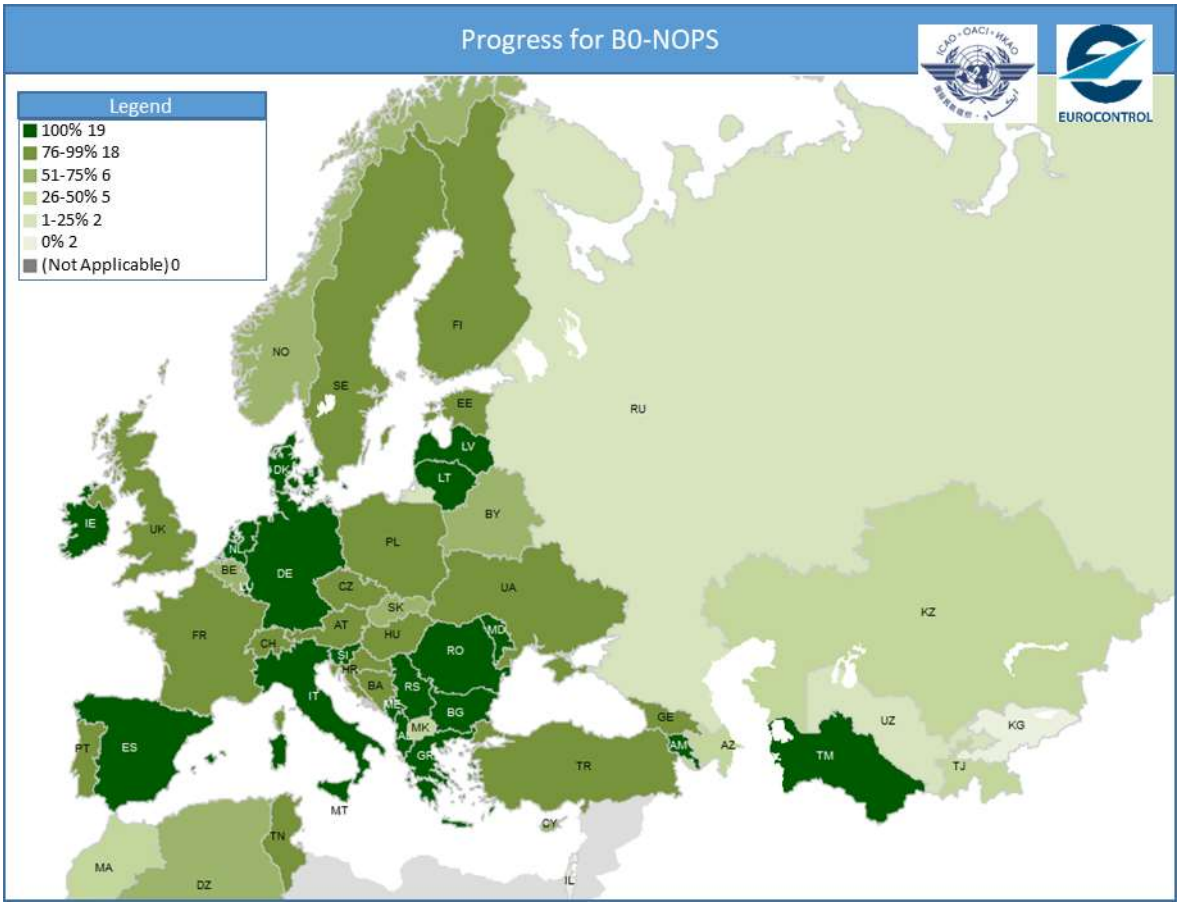


Detailed information for non-LSSIP States

Algeria	A formal letter has been sent to EUROCONTROL to include DAAA FIR into NM ATFM area of responsibility which will provide the necessary means to implement the abovementioned actions.
Belarus	Road Map for implementation of free route operations in Belarus airspace has been developed. Relevant consultations with EUROCONTROL experts have been held. Working meeting was organized on 04-05 April 2018 at EUROCONTROL office in order to discuss operational aspects of FRA implementation in Belarus, using simulation of air traffic environment. Taking into account EUROCONTROL recommendations, free route operations in Belarus airspace were implemented starting from 08 November 2018, in the airspace layer of FL 305 to FL 660 during the time period of 23.00h to 05.00h UTC.
Kazakhstan	-
Kyrgyzstan	-
Russian Federation	The concept of Flexible Use of Airspace is planned to be developed in the Russian Federation.
Tajikistan	The Tajikistan Main Air Navigation Center includes an ATFM Unit which provides some of described services.
Tunisia	-
Turkmenistan	No implementation planned in Turkmenistan.
Uzbekistan	-

4.10 B0-NOPS – Improved Flow Performance through Planning Based on a Network-Wide View

The completion rate for this module (currently at 37%) is expected to improve significantly over the next two years, as 18 more States have already reached over 75% of implementation progress, which reflects the planned dates of completion reported by States.



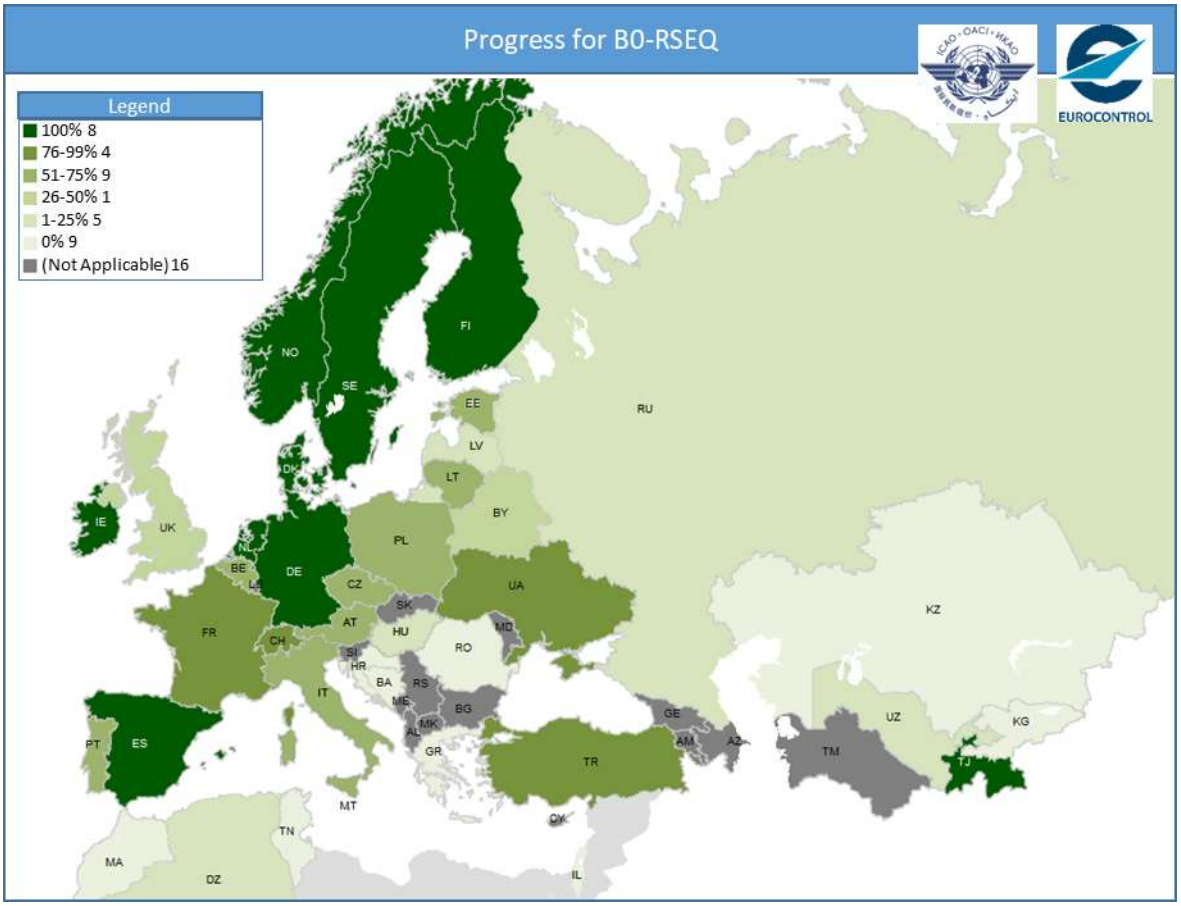
Detailed information for non-LSSIP States

Algeria	***Implement enhanced tactical flow management services:*** An EUROCONTROL FMP has been installed in Algiers ACC and Algiers ACC is considered as an adjacent area for operational purposes. We include in the PDGEA project the following elements of the present Module: - Receive and process ATFM data from the NM. - Inform NM of flight activations and estimates for ATFM purposes. The remaining elements (re-routings inside FDPA, aircraft holding, Departure Planning Information) are not applicable and therefore not planned. A formal letter has been sent to EUROCONTROL to include DAAA FIR into NM ATFM area of responsibility. ***Collaborative Flight Planning:*** Current system process FPLs derived from RPLs, FPL handling is managed by a converter. Other functions will be included in the new system (PDGEA).
Belarus	***Implement enhanced tactical flow management services:*** FMP was established at Minsk ACC in 2010. Information about traffic flows is disseminated by the FMP to all interested users. If necessary, ATFM measures can be taken by ATC in Minsk FIR. In order to arrange for applying ATFM measures in Belarus airspace and adjacent states, the following agreements have been concluded: - Agreement for Air Traffic Flow Management between EUROCONTROL and the Department of Aviation No. 00/74 dd 05/07/2000 as amended by Protocol dd 31/07/2008. - Agreement for Coordination of Flights over Belarus airspace aiming at reducing overload in congested areas within CFMU zone dd May 2010. ***Collaborative Flight Planning:*** Flight plan messages in ICAO format are processed manually. FPL and ACH messages are processed manually. Flight plan message processing in ADEXP format is not provided. Automatically provision of AFP messages is not accomplished.
Kazakhstan	***Implement enhanced tactical flow management services:*** ANSP has planned discussions with Automated Traffic Flow Management system manufacturer. Technical specifications is being developed (Preliminary stage). ***Collaborative Flight Planning:*** The automated Traffic Flow Management system provides part of specified functions of Collaborative Flight Planning. AFP message for a change of flight rules or flight type is not applicable. AFP message for a change of requested cruising level is not applicable. AFP message for a change of aircraft equipment is not applicable.
Kyrgyzstan	***Implement enhanced tactical flow management services:*** Planned for 2022. ***Collaborative Flight Planning:*** Planned to 2022.

Russian Federation	***Implement enhanced tactical flow management services:*** The functions are planned to be implemented as part of an upgrade of the Russian Joint ATM System Main Centre and all zonal centers. ***Collaborative Flight Planning:*** 1. Messages are processed in accordance with ICAO SARPs. 2. The generation of PLN from RPL disabled on 08.02.2019 in accordance with national rules.
Tajikistan	***Implement enhanced tactical flow management services:*** The ATFM unit coordinates a number of ATFM measures with adjacent ATFMUs in neighbouring States and the Moscow Main ATFM Center. Further clarification needed, if this relates to the EURASIA CC regional ATFM project. ***Collaborative Flight Planning:*** ICAO FPLs are processed
Tunisia	***Implement enhanced tactical flow management services:*** • FMP (Flow management position) implemented at Tunis ACC. • Fully linked to Network Manager Operations Center NMOC systems. • Tunis FMP linked to ETFMS system through CIFLO. • ATFM activities are provided as an adjacent FMP. • FSA messages are sent by Tunis and Djerba FDPs to the NM ETFMS operational system since July 2016 • new support via PENS ***Collaborative Flight Planning:*** Latest function implemented through new FDPs systems in 2014.
Turkmenistan	***Implement enhanced tactical flow management services:*** - ***Collaborative Flight Planning:*** -
Uzbekistan	***Implement enhanced tactical flow management services:*** Was planned in Eurasia coordination council Plan. An ATFM unit has been established in Tashkent ACC, as published in AIP ENR 1.9, which coordinates with military units and other ACCs. Some of the ATFM functions are performed and ATFM measures are coordinated with all adjacent ATFMUs in neighbouring States. One of the activities of the Eurasia coordination council is the establishment of a sub-regional ATFM Center and Uzbekistan is supporting these developments. ***Collaborative Flight Planning:*** After new ATC system installation.

4.11 B0-RSEQ – Improve Traffic Flow through Runway Sequencing (AMAN/DMAN)

With 16 States reporting the “Not applicable” status for this module, the completion rate is currently at 15%. However, it is going to improve notably in the next couple of years as 13 more States have reached over 50% of implementation progress.



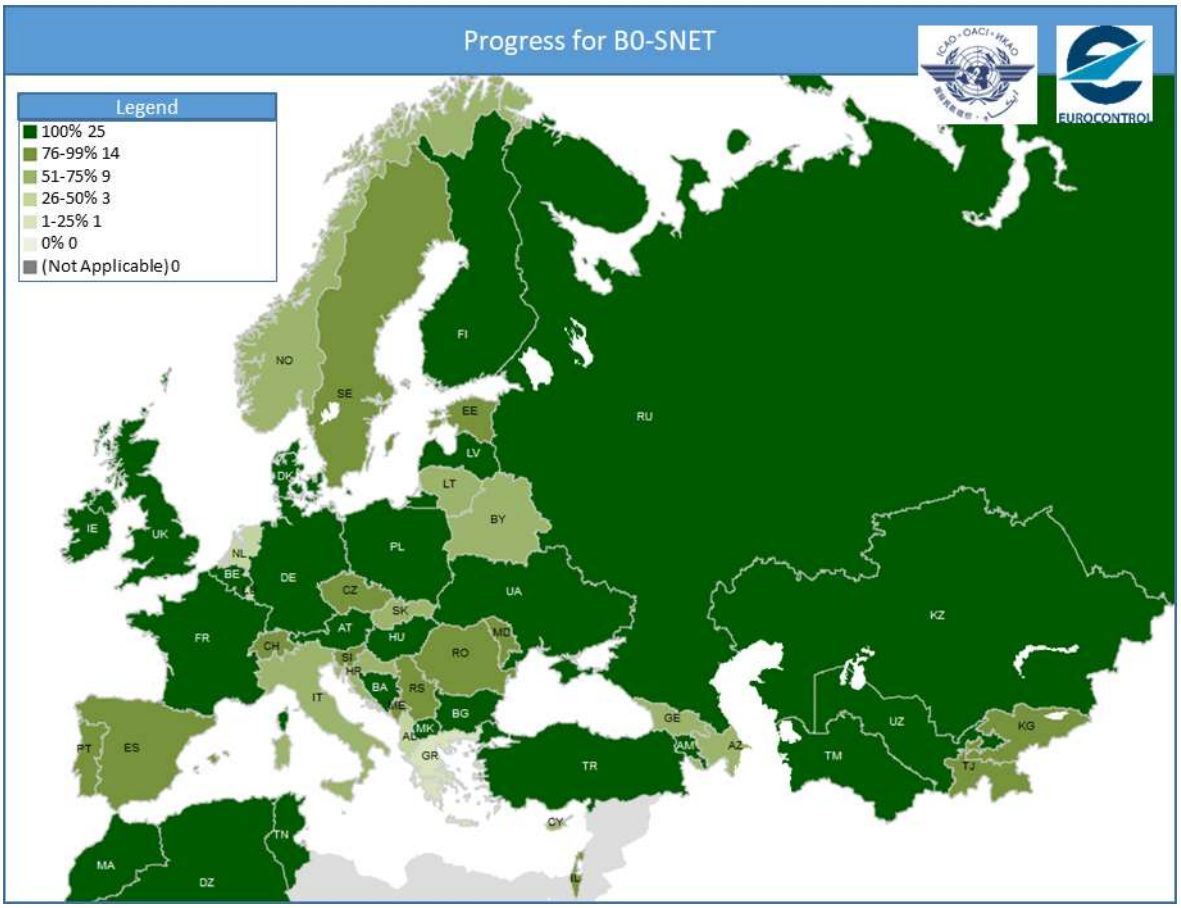
Detailed information for non-LSSIP States

Algeria	***AMAN Tools and Procedures:*** This objective will be implemented in December 2020. The future system (PDGEA) will integrate the Arrival sequencing function for Airports with Approach services, especially for Algiers Approach. ***Airport Collaborative Decision Making (A-CDM):*** Not planned yet.
Belarus	***AMAN Tools and Procedures:*** AMAN/DMAN functions will be implemented at the new Automated ATC System to be put into operation at Minsk-2 aerodrome. ***Airport Collaborative Decision Making (A-CDM):*** AMAN/DMAN functions will be implemented at the new Automated ATC System to be put into operation at Minsk-2 aerodrome.
Kazakhstan	***AMAN Tools and Procedures:*** - ***Airport Collaborative Decision Making (A-CDM):*** -
Kyrgyzstan	***AMAN Tools and Procedures:*** Plan for a later date. Depends on adjacent countries. ***Airport Collaborative Decision Making (A-CDM):*** -
Russian Federation	***AMAN Tools and Procedures:*** AMAN is integrated in 2 automated ATC systems, procedures are designed and applied in 1 automated ATC system for approaches in 1 TMA. It is planned to integrate AMAN in 9 ATC systems. ***Airport Collaborative Decision Making (A-CDM):*** -
Tajikistan	***AMAN Tools and Procedures:*** No implementation planned for airports in Tajikistan (Dushanbe airport has currently 40-45 flights per day). ***Airport Collaborative Decision Making (A-CDM):*** No implementation planned for airports in Tajikistan (Dushanbe airport has currently 40-45 flights per day).
Tunisia	***AMAN Tools and Procedures:*** To be implemented in Tunis Carthage, Djerba Zarzis, Monastir H. Bourguiba and Enfidha-Hammamet airports, taking into consideration the traffic growth. ***Airport Collaborative Decision Making (A-CDM):*** To be implemented in Tunis Carthage, Djerba Zarzis, Monastir H. Bourguiba and Enfidha-Hammamet airports, taking into consideration the traffic growth.

Turkmenistan	***AMAN Tools and Procedures:*** No implementation planned for the international airports in Turkmenistan (Ashgabat airport has currently 60 aircraft movements per day, Turkmenbashi airport has around 20 movements per day, Turkmenabat and Dashoguz airports have around 15 movements per day and Mary airport has 10 movements per day). ***Airport Collaborative Decision Making (A-CDM):*** No implementation planned for the international airports in Turkmenistan (Ashgabat airport has currently 60 aircraft movements per day, Turkmenbashi airport has around 20 movements per day, Turkmenabat and Dashoguz airports have around 15 movements per day and Mary airport has 10 movements per day).
Uzbekistan	***AMAN Tools and Procedures:*** After new ATC system installation. ***Airport Collaborative Decision Making (A-CDM):*** No implementation planned for aerodromes of Uzbekistan, as all aerodromes, the national airline (Uzbekistan airlines) and ANSP are in one company. Discussions with foreign airlines are done on an ad hoc or when necessary basis.

4.12 B0-SNET – Increased Effectives of Ground Based Safety Nets

The completion rate for this module (currently at 48%) is expected to improve significantly over the next two years, as 14 more States have already reached over 75% of implementation progress, which reflects the planned dates of completion reported by States.



Detailed information for non-LSSIP States

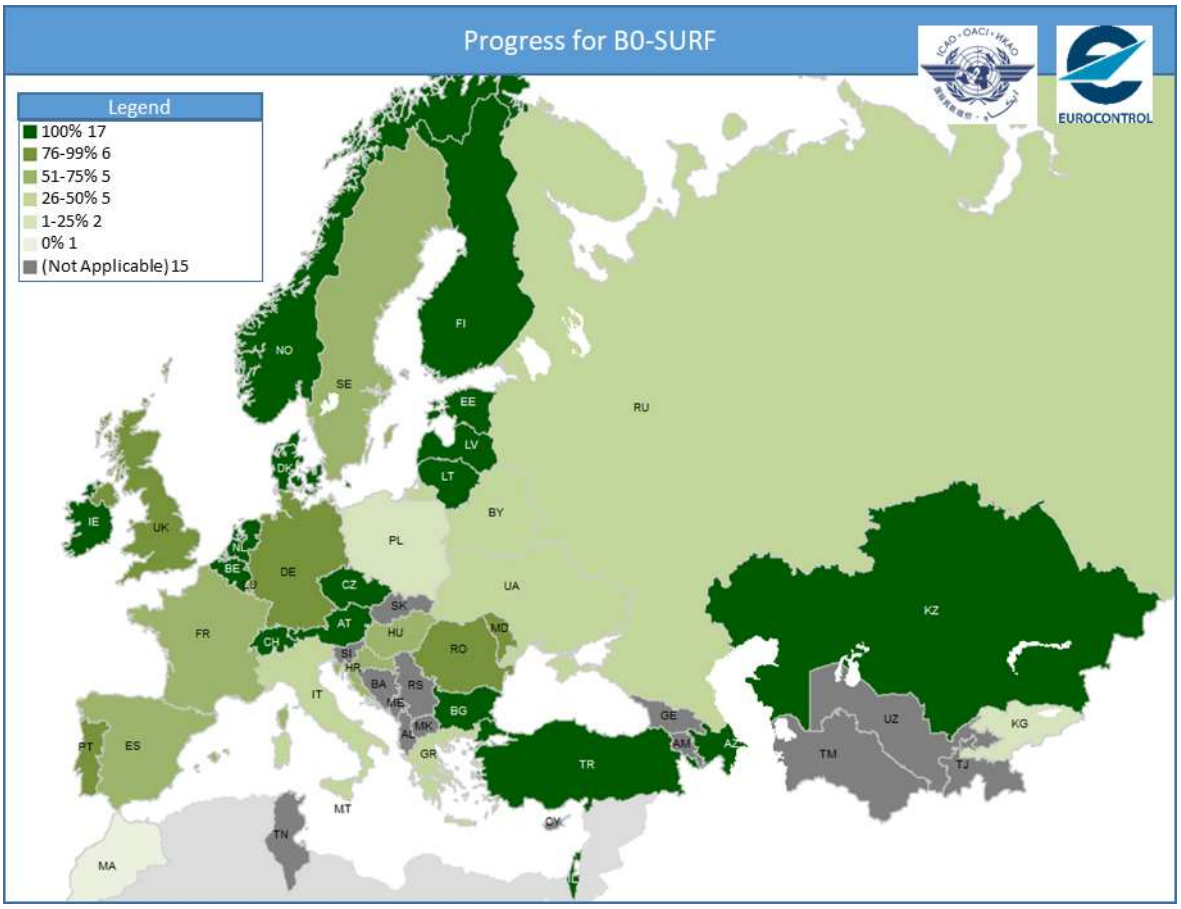
Algeria	***Implement ground based safety nets - Short Term Conflict Alert (STCA) - level 2 for en-route operations:*** The current system includes the STCA function. ***Ground-Based Safety Nets:*** The current system includes the MSAW end APW function. ***Implement Enhanced Short Term Conflict Alert (STCA) for TMAs:*** -
Belarus	***Implement ground based safety nets - Short Term Conflict Alert (STCA) - level 2 for en-route operations:*** STCA Level 1 has been implemented for TMA and for ATS routes. Activities for implementation of STCA Level 2 are in progress. Level 2 will be implemented at the new Automated ATC system to be put into operation at Minsk-2 aerodrome. ***Ground-Based Safety Nets:*** - ***Implement Enhanced Short Term Conflict Alert (STCA) for TMAs:*** -
Kazakhstan	***Implement ground based safety nets - Short Term Conflict Alert (STCA) - level 2 for en-route operations:*** The STCA function and associated procedures have been implemented in line with Kazakhstan regulations at all ATC centres providing radar services throughout the country since 2013 with the exception of Military ATC units. ***Ground-Based Safety Nets:*** 1. Ground systems have been upgraded to support the APW function. APW function is in operational use. 2. Ground systems have been upgraded to support the MSAW function. MSAW function is in operational use. ***Implement Enhanced Short Term Conflict Alert (STCA) for TMAs:*** -
Kyrgyzstan	***Implement ground based safety nets - Short Term Conflict Alert (STCA) - level 2 for en-route operations:*** All ATC systems in the Kyrgyzyz Republic meet these requirements. ***Ground-Based Safety Nets:*** Minimum Safe Altitude Warning implemented - 100% in 2009. Area Proximity Warning implemented only in ATS system Issyk-Kul. ***Implement Enhanced Short Term Conflict Alert (STCA) for TMAs:*** -

Russian Federation	***Implement ground based safety nets - Short Term Conflict Alert (STCA) - level 2 for en-route operations:*** This functionality is included in the equipment standard and is applied by all operating automated ATC systems. ***Ground-Based Safety Nets:*** This functionality is included in the equipment standard and is applied by all operating automated ATC systems. ***Implement Enhanced Short Term Conflict Alert (STCA) for TMAs:*** -
Tajikistan	***Implement ground based safety nets - Short Term Conflict Alert (STCA) - level 2 for en-route operations:*** ATC System (Master Plan Peleng) was installed in 2012 and STCA functionality was installed for CWPs in ACC. ***Ground-Based Safety Nets:*** ATC System (Master from Peleng) was installed in 2012 and APW functionality was installed for CPWs in ACC. With the new ATC System installation, MSAW was not put into operation (lack of terrain data), the final integration of MSAW could be started after completion of WGS-84 project. ***Implement Enhanced Short Term Conflict Alert (STCA) for TMAs:*** Installed with the ATC system.
Tunisia	***Implement ground based safety nets - Short Term Conflict Alert (STCA) - level 2 for en-route operations:*** Functionalities implemented through the current SDP system. ***Ground-Based Safety Nets:*** Functionalities implemented through the current SDP system. ***Implement Enhanced Short Term Conflict Alert (STCA) for TMAs:*** Functionalities implemented through the current SDP system.
Turkmenistan	***Implement ground based safety nets - Short Term Conflict Alert (STCA) - level 2 for en-route operations:*** - ***Ground-Based Safety Nets:*** - ***Implement Enhanced Short Term Conflict Alert (STCA) for TMAs:*** -

Uzbekistan	***Implement ground based safety nets - Short Term Conflict Alert (STCA) - level 2 for en-route operations:*** The current ATC System (Thomson/Peling Master which was installed after QNH implementation in 2014) includes STCA functions. The system is installed in all 3 ACCs (Tashkent, Samarkand, Nukus). ***Ground-Based Safety Nets:*** The current ATC System (Thomson/Peling Master) includes ATC system provides MSAW and APW functions. The system is installed in all 3 ACCs (Tashkent, Samarkand, Nukus). The MSAW functionality could be enhanced with the integration of eTOD data after WGS-84 program completion. ***Implement Enhanced Short Term Conflict Alert (STCA) for TMAs:*** -

4.13 B0- SURF – Safety and Efficiency of Surface Operations (A-SMGCS Level 1 & 2)

With 15 States reporting the "Not applicable" status for this module, the completion rate is currently at 33%. However, it is going to improve notably in the next few years as 11 more States have reached over 50% of implementation progress.



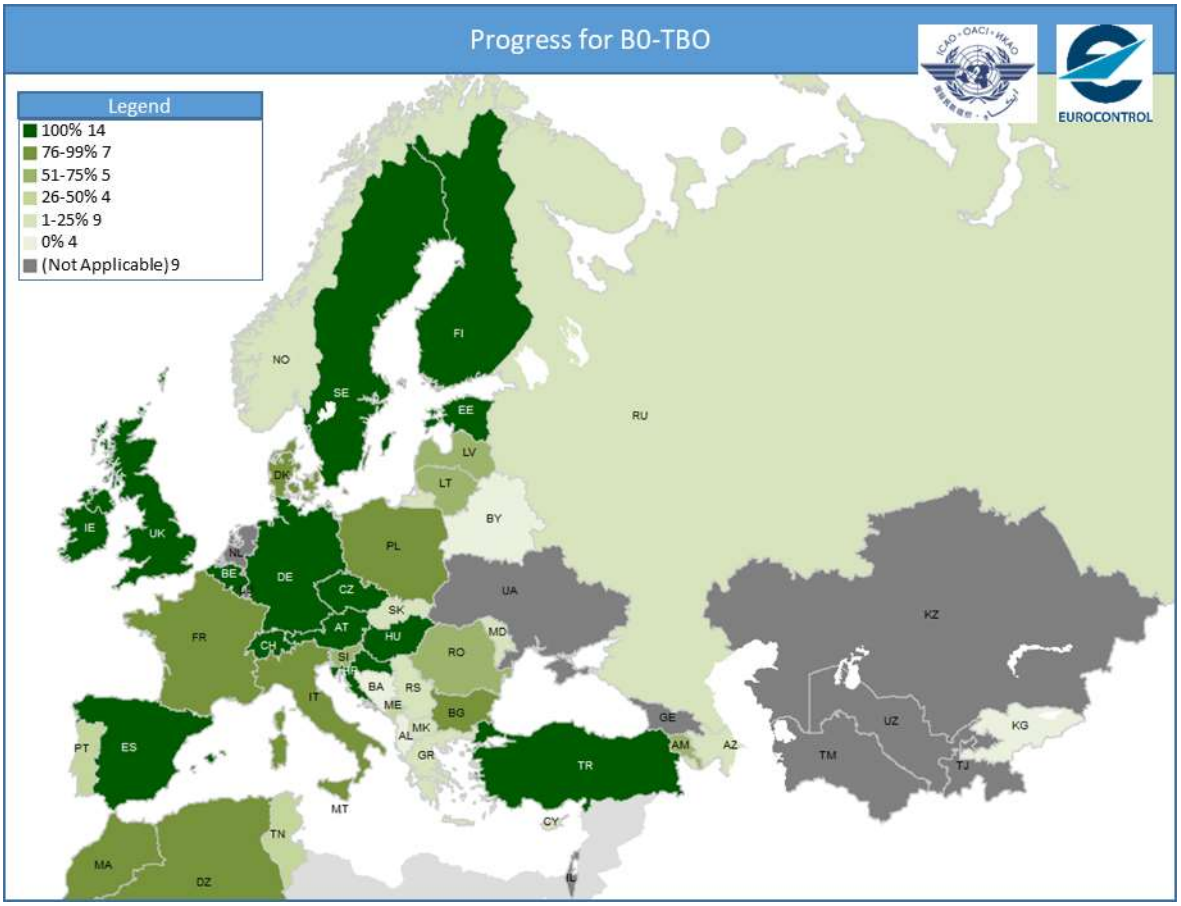
Detailed information for non-LSSIP States

Algeria	***Advanced Surface Movement Guidance and Control System A-SMGCS Surveillance:*** - ***Advanced Surface Movement Guidance and Control System (A-SMGCS) Runway Monitoring and Conflict Alerting (RMCA):*** -
Belarus	***Advanced Surface Movement Guidance and Control System A-SMGCS Surveillance:*** A-SMGCS Level 1 system was put into operation at Minsk-2 aerodrome on 01 September 2016. Ground vehicles have been equipped with ADS-B transponders. ASMGCS operational procedures have been implemented. ***Advanced Surface Movement Guidance and Control System (A-SMGCS) Runway Monitoring and Conflict Alerting (RMCA):*** Construction of the second runway at Minsk-2 aerodrome is in progress. A-SMGCS Level 2will be implemented alongside with commissioning of the second runway. Aiming at improving A-SMGCS procedures, the Call for Tender for supply of MLAT system for Minsk-2 aerodrome has been announced.
Kazakhstan	***Advanced Surface Movement Guidance and Control System A-SMGCS Surveillance:*** A-SMGCS level 1 is installed at Almaty and Nur-Sultan. There no plans for A-SMGCS installation at other airports Operational procedures will be developed. A-SMGCS procedures (including transponder operating procedures) are not published in national AIP. Vehicles operating on the maneuvering area of airports equipped with necessary systems. ***Advanced Surface Movement Guidance and Control System (A-SMGCS) Runway Monitoring and Conflict Alerting (RMCA):*** A-SMGCS level 2 is installed at Almaty and Nur-Sultan.
Kyrgyzstan	***Advanced Surface Movement Guidance and Control System A-SMGCS Surveillance:*** Kyrgyz Republic will make it in 2020 and install surveillance equipment at Manas international airport. ***Advanced Surface Movement Guidance and Control System (A-SMGCS) Runway Monitoring and Conflict Alerting (RMCA):*** SE "Kyrgyzaeronavigatsia" plans system with predict and detect of conflict function at Manas international airport.
Russian Federation	***Advanced Surface Movement Guidance and Control System A-SMGCS Surveillance:*** 1. There is no mandatory requirement for the equipment of aircraft by mode S transponders. 2. There is no mandatory requirement for the equipment of vehicles moved in maneuvering area by mode S beacons. 3. Implementation of A-SMGCS is carried out in accordance with the Internal plan. The plan provides for the equipment of 20 aerodromes. The different configuration of equipment is operational at 11 aerodromes. At aerodromes with MLAT, mode S transponders are being installed on ground vehicles. 4. Transponder application procedure for 2 aerodromes was published in AIP. 5. MLAT is implemented at 4 aerodromes.

	A-SMGCS is in place at UUDD (Domodedovo), ULLI (Pulkovo), UUEE (Sheremetyevo), UUWW (Vnukovo), and URSS (Sochi) airports. MLAT is operational at UUDD (Domodedovo) and URSS (Sochi) airports; ground vehicles operating in the manoeuvring area are equipped with Mode S beacons. Further equipment installation is in progress. ***Advanced Surface Movement Guidance and Control System (A-SMGCS) Runway Monitoring and Conflict Alerting (RMCA):*** Work is under way at UUDD (Domodedovo), ULLI (Pulkovo), UUEE (Sheremetyevo), and UUWW (Vnukovo) airports to extend A-SMGCS functionalities up to the specified level.
Tajikistan	***Advanced Surface Movement Guidance and Control System A-SMGCS Surveillance:*** No implementation planned for airports in Tajikistan (The largest Dushanbe airport has currently 40-45 flights per day). ***Advanced Surface Movement Guidance and Control System (A-SMGCS) Runway Monitoring and Conflict Alerting (RMCA):*** No implementation planned for airports in Tajikistan (The largest Dushanbe airport has currently 40-45 flights per day).
Tunisia	***Advanced Surface Movement Guidance and Control System A-SMGCS Surveillance:*** No need to implement A-SMGCS in Tunisian airports. ***Advanced Surface Movement Guidance and Control System (A-SMGCS) Runway Monitoring and Conflict Alerting (RMCA):*** No need to implement A-SMGCS at Tunisian airports. Functionalities implemented through the current SDP system
Turkmenistan	***Advanced Surface Movement Guidance and Control System A-SMGCS Surveillance:*** Due to low airport traffic figures (around 60 aircraft movements per day in Ashgabat and between 15-20 aircraft movements per day at the other 4 airports) there is currently no implementation planned for the 5 airports in Turkmenistan, even if there would be a benefit during the periods (less than 30 days per year for main airport Ashgabat) of LVPs low visibility operations. As part of the runway incursion prevention measures for Ashgabat airport, an optical beam system was installed that would give a warning to the TWR for any object higher than 30 cm which passes this bar. The monitoring of the movement area at Ashgabat airport (all vehicles with transponders) has been implemented. ***Advanced Surface Movement Guidance and Control System (A-SMGCS) Runway Monitoring and Conflict Alerting (RMCA):*** No implementation planned for 5 international or any national airports in Turkmenistan.
Uzbekistan	***Advanced Surface Movement Guidance and Control System A-SMGCS Surveillance:*** Due to low traffic no implementation planned. ***Advanced Surface Movement Guidance and Control System (A-SMGCS) Runway Monitoring and Conflict Alerting (RMCA):*** Due to low traffic no implementation planned.

4.14 B0-TBO – Improved Safety and Efficiency through Initial Application of Data Link En-Route

With 9 States reporting the “Not applicable” status for this module, the completion rate is currently at 27%. Stable improvements are expected over the next period, since the implementation progress for remaining States is evenly distributed between 0% and 100%.



Detailed information for non-LSSIP States

Algeria	Action 2 (ATN/VDL2) will be implemented in December 2020. The current system includes Data-link services using FANS/ACARS since 2011 for CPDLC, especially for the operations in the southern part of Algiers FIR. The future system will integrate ATN protocol for data-link services, no plan for VDL2 equipment.
Belarus	These actions have been planned.
Kazakhstan	-
Kyrgyzstan	-
Russian Federation	Work is under way to initiate the CPDLC Digital Communication System Fragment pilot project in Moscow TMA based on VDL-2 data link.
Tajikistan	Not planned. There are no interested users.
Tunisia	Functionality is in the new ATC system, will be used according to traffic growth and ATC capacities needs.
Turkmenistan	No implementation planned for Turkmenistan.
Uzbekistan	No implementation is planned for Uzbekistan.

4.15 B0-AMET - Meteorological information supporting enhanced operational efficiency and safety

This module is about global, regional and local meteorological information, including:

a) forecasts provided by world area forecast centres (WAFC), volcanic ash advisory centres (VAAC) and tropical cyclone advisory centres (TCAC);
b) aerodrome warnings to give concise information of meteorological conditions that could adversely affect all aircraft at an aerodrome including wind shear; and
c) SIGMETs to provide information on occurrence or expected occurrence of specific en-route weather phenomena which may affect the safety of aircraft operations and other operational meteorological (OPMET) information, including METAR/SPECI and TAF, to provide routine and special observations and forecasts of meteorological conditions occurring or expected to occur at the aerodrome.

The source of the monitoring information for B0-AMET indicated in this chapter is the ICAO EUR METG.

This module includes elements which should be viewed as a subset of all available meteorological information that can be used to support enhanced operational efficiency and safety.

Main performance impact:

KPA- 01 – Access and Equity	KPA-02 – Capacity	KPA-04 – Efficiency	KPA-05 – Environment	KPA-10 – Safety
N	Y	Y	Y	Y

Applicability consideration:

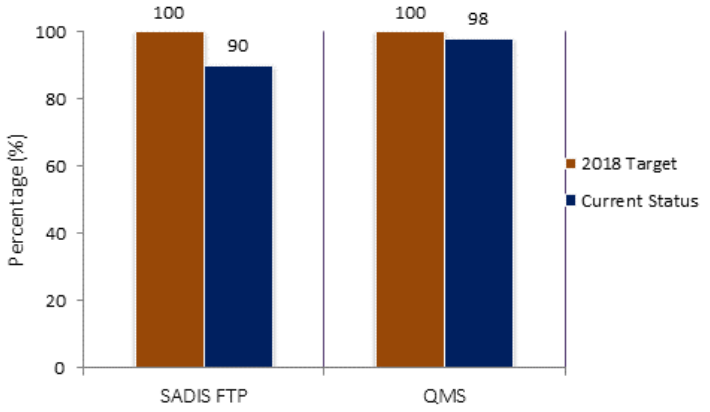
Applicable to traffic flow planning, and to all aircraft operations in all domains and flight phases, regardless of level of aircraft equipage.

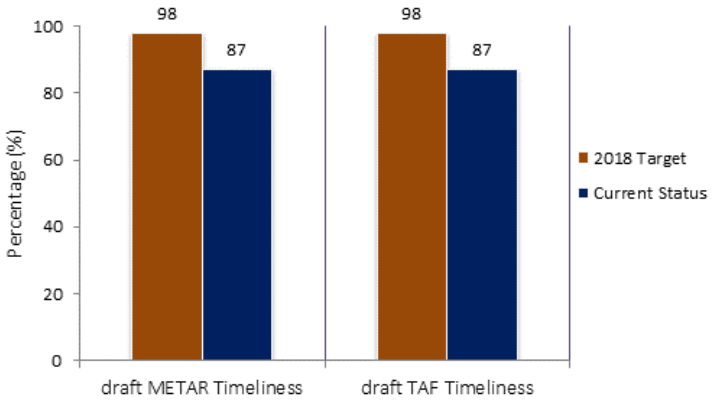
Elements	***Applicability***	***Performance Indicators/Supporting Metrics***	***Targets***
SADIS FTP	***All** States*	Indicator: % of States having implemented SADIS FTP Supporting metric: number of States having implemented SADIS FTP	100% by Dec 2019
QMS	***All** States*	Indicator: % of States having implemented QMS for MET Supporting metric: number of States having implemented QMS for MET	100% by Dec 2019
METAR Availability	***All** States*	Indicator: % of States providing METAR as per requirements in the eANP, Volume II Table MET II-2	98% by Dec 2019

Elements	*Applicability*	*Performance Indicators/Supporting Metrics*	*Targets*
		Supporting metric: number of States providing METAR as per requirements in the eANP Volume II Table MET II-2	
TAF Availability	***All** States*	Indicator: % of States providing TAF as per requirements in the eANP, Volume II Table MET II-2 Supporting metric: number of States providing TAF as per requirements in the eANP Volume II Table MET II-2	98% by Dec 2019
METAR Timeliness	***All** States*	Indicator: % of States providing METAR in the time required as defined in Annex 3 Supporting metric: number of States providing METAR in the time required as defined in Annex 3	98% by Dec 2019
TAF Timeliness	***All** States*	Indicator: % of States providing TAF in the time required as defined in Annex 3 Supporting metric: number of States providing TAF in the time required as defined in Annex 3	98% by Dec 2019
SIGMET Availability	***All** with a FIR*	Indicator: % of States providing SIGMET Supporting metric: number of States providing SIGMET	100% by Dec 2019
SIGMET Format	***All** with a FIR*	Indicator: % of States providing SIGMET format in accordance with WMO AHL in EUR Doc 014 Supporting metric: number of States providing SIGMET format in accordance with WMO AHL in EUR Doc 014	100% by Dec 2019
VAAC	***France, United Kingdom***	Indicator: % of VAACs in or serving the EUR Region that provide Annex 3 volcanic ash products (Volcanic Ash Advisories (VAA) and Volcanic Ash Advisories in Graphic Form (VAG)) Supporting metric: number of States hosting a VAAC having implemented VAA/VAG	100% by Dec 2016
VONA	***Italy, Russian***	Indicator: % of Volcano Observatories in the EUR Region that provide volcano observatory notice for aviation (VONA) as per the	100% by Dec 2016

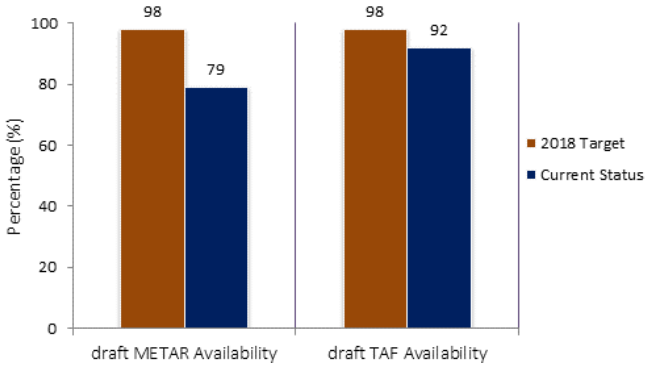
Elements	*Applicability*	*Performance Indicators/Supporting Metrics*	*Targets*
	Federation, Spain	Handbook on the International Airways Watch (IAVW) (Doc 9766) Supporting metric: number of States with Volcano Observatory having implemented VONA	

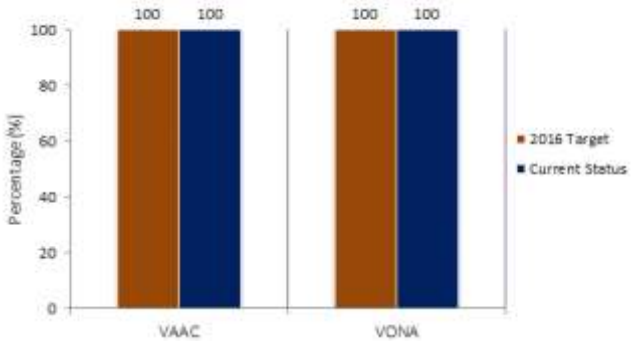
B0-AMET Status of implementation in the EUR Region

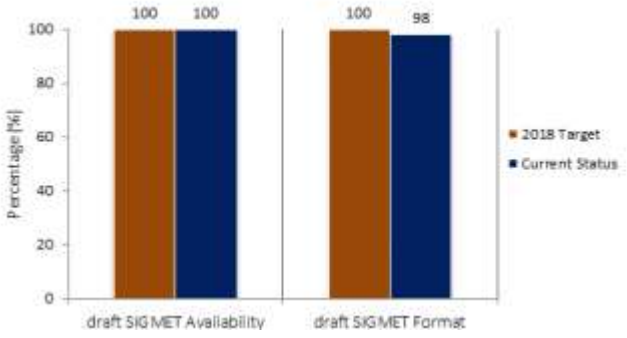




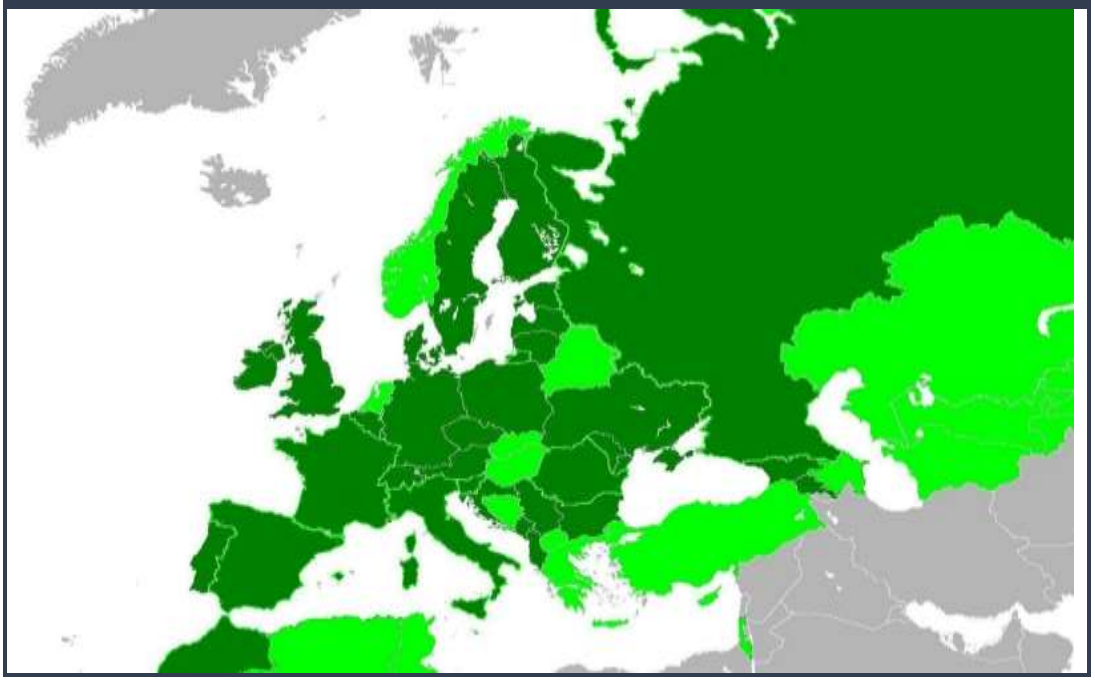
B0-AMET Status of implementation in the EUR Region







B0-AMET Status of implementation in the EUR Region



Legend

- Completed
- Partially Completed (50%+)
- Partially Completed/Late (50%-)
- Not Started/Not Implemented
- Not Applicable
- Missing Data

The progress for B0-AMET is acceptable (with approximately 91% implementation including draft tables).

Note: These high-level implementation elements are not applicable to Andorra, Monaco and San Marino.

Module	Elements	Albania	Algeria	Armenia	Austria	Azerbaijan	Belarus	Belgium	Bosnia and	Bulgaria	Croatia	Cyprus	Czechia	Denmark	Estonia	Finland
B0-AMET	SADIS FTP															
	QMS															
	Draft METAR availability															
	Draft TAF availability															
	Draft METAR timeliness															
	Draft TAF timeliness															
	Draft SIGMET availability															
	Draft SIGMET format															
	VAAC															
	VONA															

Module	Elements	France	Georgia	Germany	Greece	Hungary	Ireland	Israel	Italy	Kazakhstan	Kyrgyzstan	Latvia	Lithuania	Luxembourg	Malta	Monaco
B0-AMET	SADIS FTP															
	QMS															
	Draft METAR availability															
	Draft TAF availability															
	Draft METAR timeliness															
	Draft TAF timeliness															
	Draft SIGMET availability															
	Draft SIGMET format															
	VAAC															
	VONA															

Module	Elements	Montenegro	Morocco	Netherlands	North	Norway	Poland	Portugal	Republic of	Romania	Russian	Serbia	Slovakia	Slovenia	Spain	Sweden
B0-AMET	SADIS FTP															
	QMS															
	Draft METAR availability															
	Draft TAF availability															
	Draft METAR timeliness															
	Draft TAF timeliness															
	Draft SIGMET availability															
	Draft SIGMET format															
	VAAC															
	VONA															

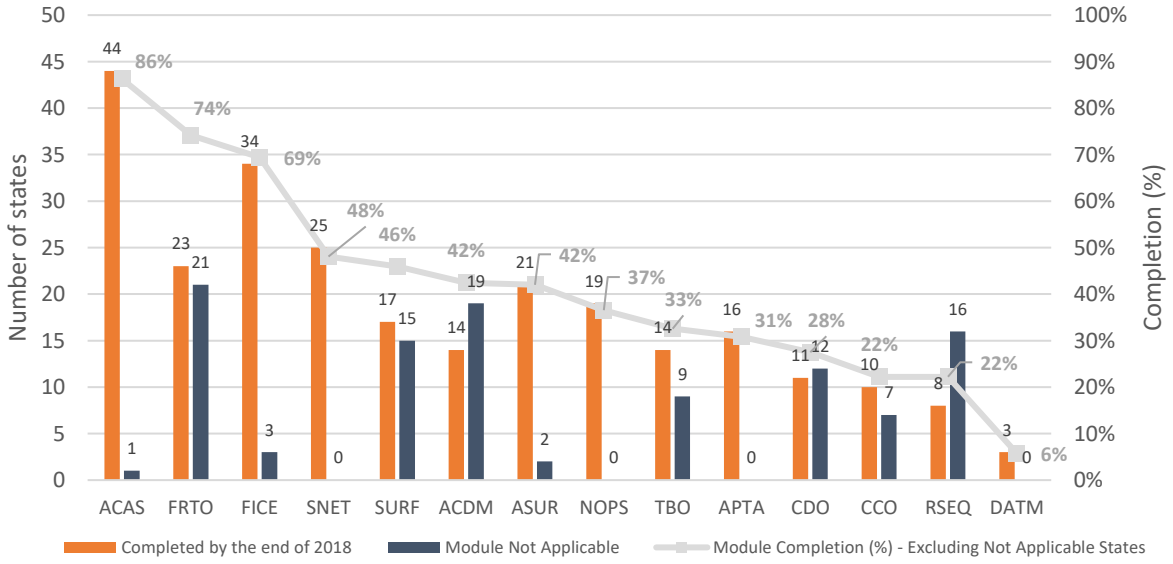
Module	Elements	Switzerland	Tajikistan	Tunisia	Turkey	Turkmenistan	Ukraine	United	Uzbekistan
B0-AMET	SADIS FTP								
	QMS								
	Draft METAR availability								
	Draft TAF availability								
	Draft METAR timeliness								
	Draft TAF timeliness								
	Draft SIGMET availability								
	Draft SIGMET format								
	VAAC								
	VONA								

5 Conclusions And Recommendations

5.1 Conclusions

In order to summarise the information presented in chapters 3, namely the planning views, the following graphs and tables were developed. They are aiming to give an overall and straightforward understanding of the ASBUs Implementation status so far.

The "**ASBU Block 0 Modules Implementation Dashboard**" compares, in a simple way, the evolution of implementation/achievement/completion of the modules. It presents the number of States that have achieved full implementation and gives the overall rate of "Completion" (%) by the end of 2018. It excludes those States where the module is considered as "Not Applicable".



Due to the change in the reporting mapping mechanism, it was unfortunately not possible to develop the implementation progress chart for the overall deployment and compare it with the progress in previous reports.

B0-AMET is not addressed in the tables and graphs because the data is only available in tabular form METG since 2017.

ASBU Block 0 Modules Implementation Outlook 2020 and 2021

The following tables present the "Completion" status (number of States and rates) that are expected to be achieved by the end of 2020 and 2021, in accordance with the planning dates reported by States in the ICAO EUR Region.

The aim of this table is to project implementation scenarios for 2020 and 2021.

ASBU B0 Module	Number of States Completed by the end of 2020	Not Applicable States	Completion by the end of 2020 (%) - Excludes States where the module is Not Applicable
ACAS	49	1	96%
ACDM	26	19	79%
APTA	39	0	75%
ASUR	47	2	94%
CCO	28	7	62%
CDO	23	12	58%
DATM	35	0	67%
FICE	48	3	98%
FRTO	27	21	87%
NOPS	40	0	77%
RSEQ	21	16	58%
SNET	39	0	75%
SURF	31	15	84%
TBO	32	9	74%

Table 2: ASBU Block 0 Modules Implementation Outlook for 2020

ASBU B0 Module	Number of States Completed by the end of 2021	Not Applicable States	Completion by the end of 2021 (%) - Excludes States where the module is Not Applicable
ACAS	49	1	96%
ACDM	28	19	85%
APTA	41	0	79%
ASUR	48	2	96%
CCO	31	7	69%
CDO	27	12	68%
DATM	42	0	81%
FICE	48	3	98%
FRTO	27	21	87%
NOPS	44	0	85%
RSEQ	24	16	67%
SNET	39	0	75%
SURF	31	15	84%
TBO	36	9	84%

Table 3: ASBU Block 0 Modules Implementation Outlook 2021

5.2 Recommendations

Based on the analysis of the reported implementation status and the lessons learned from the development of this version of the report, the following high level recommendations are proposed:

Recommendation 1:

Continue to ensure that no duplication of reporting activities will be requested from the States, meaning that the data available through existing reporting mechanisms such as the LSSIP shall be always used.

Recommendation 2:

Ensure that future evolution of ICAO GANP Monitoring mechanism/tool will not require from EUR States to report through a separate reporting channel thus creating a double effort for them. The new ICAO GANP Monitoring mechanism/tool should rather make use of existing reporting mechanisms, which are utilised in the EUR Region, such as the LSSIP process.

Recommendation 3:

States are invited to further address carefully the completeness of the reported data and their timely availability. In this context, States are encouraged to ask for further support and clarification if required.

Recommendation 4:

States need a continuous support with ASBU workshops in individual States or group of States so that implementation data is available from all 55 States and that the regional developments and deployment actions can be coordinated across the regions and interoperability can be ensured at the highest level.

6 Acronyms

A	
ACAS	Airborne Collision Avoidance System
ACC	Area Control Centre
A-CDM	Airport Collaborative Decision Making
ADQ	Aeronautical Data Quality
ADS-B	Automatic Dependent Surveillance - Broadcast
AGDL	Air-Ground Data Link
AMAN	Arrival Manager
ANSP	Air Navigation Service Provider
AOP	Airport Operations
APTA	Airport Accessibility
APV	Approach with Vertical Guidance
ASBU	Aviation System Block Upgrades
ASM	Airspace Management
A-SMGCS	Advanced Surface Movement Guidance and Control System
ASUR	Alternative Surveillance
ATC	Air Traffic Control
ATM	Air Traffic Management
ATMGE	Air Traffic Management Group-East
AU	Airspace Users
C	
CDO	Continuous Descent Operations
COTR	Coordination and Transfer
D	
DATM	Digital Aeronautical Information Management
DMAN	Departure Manager
E	
EAD	European AIS Database
EANPG	European Air Navigation Planning Group
EASA	European Aviation Safety Agency
EASPG	European Aviation System Planning Group
EC	European Commission
ECAC	European Civil Aviation Conference
ENV	Environment
ESSIP	European Single Sky Implementation
EU	European Union
F	
FCM	Flow and Capacity Management
FICIE	Flight and Flow Information for a Collaborative Environment
FIR	Flight Information Region
FMTP	Flight Message Transfer Protocol
FOC	Full Operational Capability
FRTO	Free-Route Operations
G	
GANP	Global Air Navigation Plan
I	
ICAO	International Civil Aviation Organisation
ITY	Interoperability
INF	Information Management
IP	Internet Protocol
IR	Implementing Rule
L	
LoA	Letter of Agreement
LPV	Localizer Performance with Vertical Guidance
LSSIP	Local Single Sky Implementation
M	
MIL	Military Authorities
MUAC	Maastricht Upper Area Control Centre
NAV	Navigation
NM	Network Manager
NOPS	Network Operations
O	
OI	Operational Improvements
OLDI	On-Line Data Interchange
P	
PBN	Performance Based Navigation
PCP	Pilot Common Project
PIRG	Planning and Implementation Regional Group
PRISME	Pan-European Repository of Information Supporting the Management of EATM
R	
RATS	Remote Air Traffic Services
REG	Regulatory Authorities
RNAV	Required Navigation Performance
RSEQ	Runway Sequencing
S	
SBAS	Satellite-Based Augmentation System
SES	Single European Sky
SESAR	Single European Sky ATM Research
SLoA	Stakeholder Lines of Actions
SNET	Safety NETs
SPI	Surveillance Performance and Interoperability
SURF	Surface Operation
SWIM	System-Wide Information Management
T	
TBA	Trajectory-Based Operations
TCAS	Traffic Alert and Collision Avoidance System
TMA	Terminal Control Area
V	
VDL	VHF Digital Link
W	
WAKE	WAKE Turbulence Separation

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