

Strategic Development Monitoring report 2025

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1 Introduction

1.1 Purpose

The Strategic Development Monitoring Report provides an annual update on the progress of the SESAR development activities supporting the implementation of the European ATM Master Plan 2025 edition (hereafter referred to as the “Master Plan”), ensuring alignment with performance ambitions and strategic vision.

The Master Plan is the strategic roadmap for the digital transformation of European ATM, defining the operational and technological changes required to modernise the system, achieve performance ambitions, and deliver a safe, sustainable, and efficient Digital European Sky. Its effective implementation is therefore essential to ensuring that Europe’s ATM infrastructure evolves in line with future capacity, environmental, resilience, and cost-efficiency needs.

This report is submitted to the Governing Board (GB) of the SESAR 3 JU for information. By providing a consolidated overview of progress, challenges and emerging needs related to the development phase of the SESAR innovation pipeline, it aims to support the GB in taking informed strategic decisions to steer the Digital European Sky (DES) programme.

1.2 Scope

The Strategic Development Monitoring Report aggregates information of executive relevance on the status of SESAR development, focusing specifically on the exploratory and industrial research activities conducted by the SESAR 3 JU within the Digital European Sky (DES) programme.

The **development phase** of the SESAR innovation pipeline (see Figure 1), covers the research, development and validation work needed to bring promising ATM technological improvements (i.e. SESAR Solutions) from early exploration (TRL 0–2) to full validation (TRL 6–7). Its aim is to deliver mature SESAR Solutions ready for deployment, ensuring their timely uptake by operational stakeholders and integration into the European ATM system.



Figure 1: Scope of the Strategic Development Monitoring Report

The Strategic Development Monitoring Report 2025 is aligned with the 2025 edition of the Master Plan and presents the aggregated information on the status of SESAR development progress **up to the end of 2024**.

This report is complementary to the Strategic Deployment Monitoring Report, which assesses the progress of deployment activities.

2 Progress on the development activities

The European ATM Master Plan defines the pathway to deliver the Digital European Sky (DES). The roll-out is divided into four phases (A-D). Phase A addresses known critical network performance deficiencies, Phase B delivers efficient services and infrastructure, Phase C defragments European skies through virtualisation and dynamic airspace configuration, and Phase D achieves the Digital European Sky.

Development activities underpinning this roll-out are well advanced, with 139 SESAR Solutions supporting the first three phases already delivered¹.

Phases A and B have been fully delivered, and their deployment is well underway notably supported by the Common Project (CP) 1.²

The Solutions included under Phase C, which support the Strategic Deployment Objectives (SDOs), are progressing well with around 2/3 having reached the maturity level required to proceed to industrialisation and implementation (see Section 2.1). Finally, SESAR solutions addressing Phase D, which are defined based on the development priorities (DPs) outlined in the Master Plan, are still under definition (see Section 2.2).

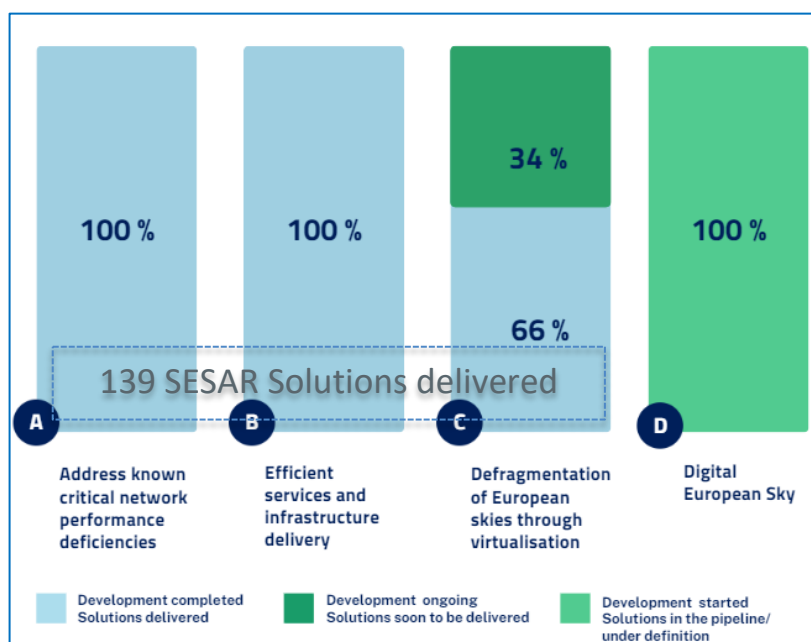


Figure 2: Overall SESAR Solutions delivery status per phase

While this report focuses primarily on development activities defined in the Master Plan 2025 for Phase C (i.e. the SDOs) and Phase D (i.e. the DPs), the SESAR 3 JU portfolio also includes a number of

¹ The 139 delivered SESAR Solutions are accessible in the [SESAR Solutions Catalogue](#).

² For more information on the deployment progress of the DES, see the Strategic Deployment Monitoring Report 2025.

promising potential SESAR Solutions emerging from ongoing projects (under ER1, ER2 and IR1 calls) that are not mapped to either phase. These activities remain an integral part of the SESAR development landscape.

The Figure 3 below illustrates the positive evolution of development activities across the DES programme since the previous Strategic Development Monitoring Report. It highlights the steady increase in maturity levels of Solutions under development and confirms the continued momentum of the programme. Further progress in Solutions maturity is expected in 2026, when most projects under the ER1 and IR1 calls will reach their exit maturity gates at the end of their development activities, thereby feeding the SDOs and contributing to the next wave of SESAR deployment.

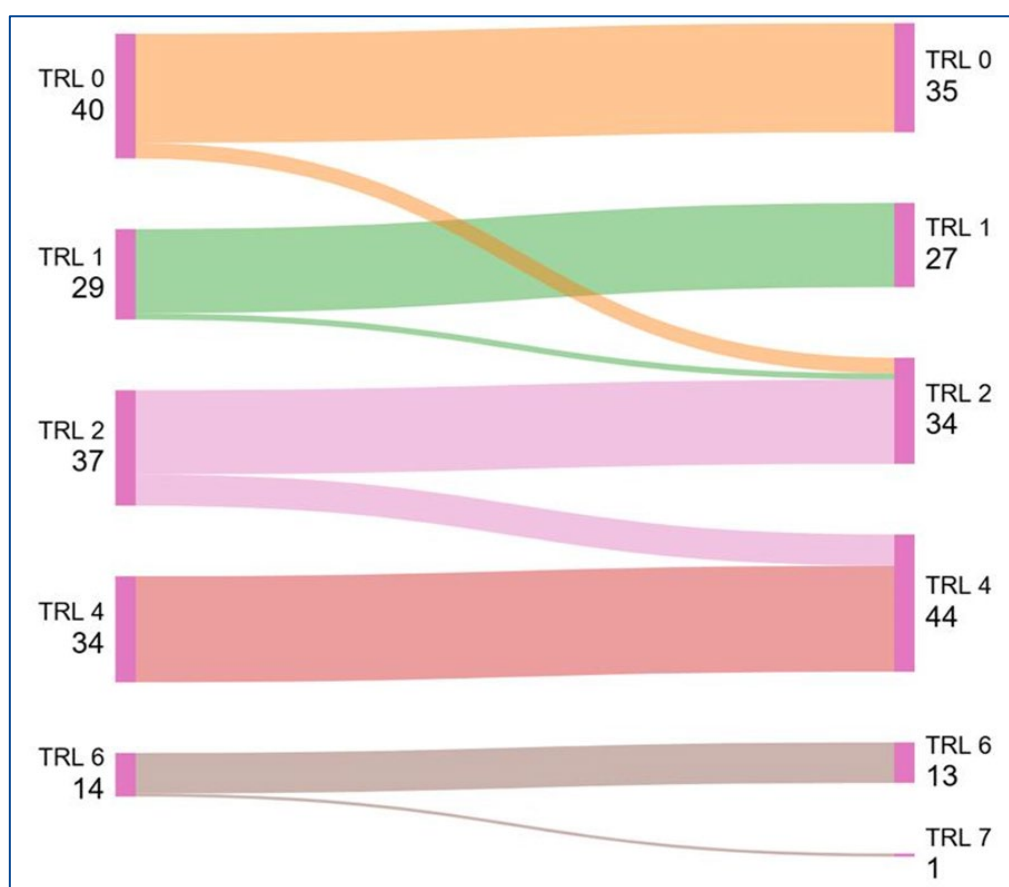


Figure 3: Overall development maturity evolution between 2023 and 2024.³

³ The Solutions at TRL 6+ in this graphic are stemming from SESAR 2020 and were part of DSD projects active in 2024. New TRL 6 Solutions will be delivered by IR1 projects mainly in 2026.

2.1 Progress in support of the Strategic Deployment Objectives (SDOs) roll-out: towards completion of development by end 2026

The SDOs (Figure 4) are prioritised actions (or operational changes) that provide significant network performance improvements to the operational stakeholders. Scheduled for rollout between 2025 and 2035, they constitute the next priority of SESAR deployment beyond CP1 and will form the foundation of the upcoming CP2.

The SDOs are underpinned by SESAR Solutions that have either already been delivered (having reached TRL 6) under the SESAR 2020 programme, or are currently in the pipeline, developed by the projects funded under the IR1 call, and expected to reach TRL 6 by the end of 2026. These SDOs are supported by over 30 concrete deployment actions, which define the practical implementation steps required from stakeholders to achieve the intended operational improvements⁴.

By the end of 2024, development of all Solutions supporting SDO#1, SDO#3, SDO#4 and SDO#9 had been completed. For the remaining six SDOs, development activities are progressing as planned and are expected to be successfully delivered, on time for their deployment by 2035.

The current development status in relation to the SDOs is presented in Figure 5 below.



Figure 4: Strategic Deployment Objectives (SDOs)

⁴ [Definitions of SDOs and deployment actions](#) are available on the SESAR 3 JU ATM Master Plan portal.



Figure 5: Development status in relation to the SDOs (at the end of 2024)

An assessment conducted on the ongoing projects identified residual development needs for SDO#2, SDO#5 and SDO#7. These few Solutions, which will not reach TRL 6 by the end of 2026, have been proactively included in the scope of the IR2 call for proposals and are anticipated to be taken forward by projects currently under evaluation. Further details are provided in Appendix A. Importantly, this extended development horizon has no impact on the ongoing preparation of CP2, which is designed as technology-agnostic and does not refer to individual Solutions.

The Figure 6 below presents the expected development trajectory for the SDOs over the coming years.

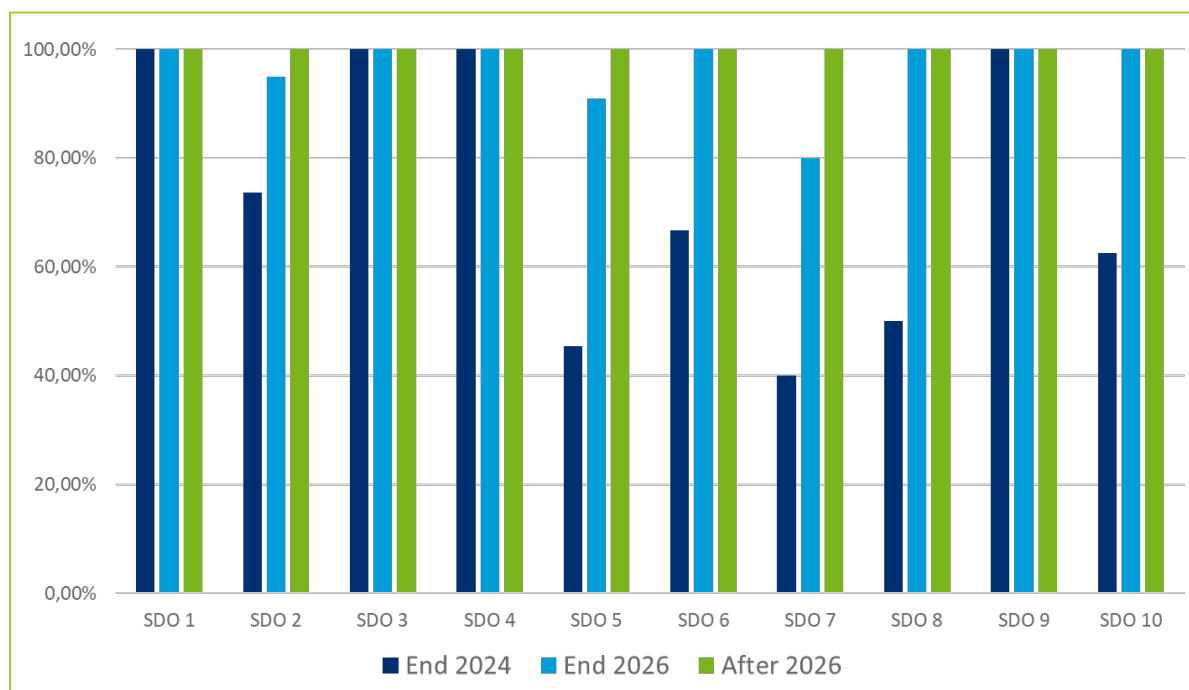


Figure 6: Anticipated progress in the development related to SDOs beyond 2024

In 2026, the SESAR 3 JU will ensure the delivery of the Solutions in the pipeline for the SDO#2, SDO#5, SDO#6, SDO#7, SDO#8 and SDO#9 that are still under development. This will be achieved through close monitoring and steering of the funded projects, ensuring that all Solutions complete their expected maturity gates. A SESAR JU-managed risk assessment process is in place to monitor potential issues affecting the development of SESAR Solutions currently in the pipeline in support of these SDOs, with mitigation actions defined and implemented in close cooperation with the beneficiaries. This process is reported and monitored at the level of the SESAR 3 JU Programme Committee.

During the implementation of the research activities, particular emphasis is placed on the early involvement of EASA to ensure that safety, regulatory, standardisation and certification aspects are adequately addressed. This early engagement will facilitate and accelerate the industrialisation phase, thereby supporting timely and effective deployment.

By doing so, the SESAR 3 JU will ensure that the SDOs are ready to populate the upcoming CP2 proposal, paving the way for their deployment.

2.2 Progress in support of the Development Priorities (DPs): the next target of our research activities

The 2025 edition of the Master Plan defines a list of 12 strategic Development Priorities (DPs) - six for exploratory research and six for industrial research - which cover the actions required to develop future ATM functionalities and support the rollout of Phase D of the DES vision. These priorities address new development challenges and expectations for Phase D that were not fully envisaged in the 2020 edition of Master Plan.

In 2025, the SESAR 3 JU launched two calls for proposals - ER3 for exploratory research and IR2 for industrial research - under the DES programme, fully aligned with the new DPs and their associated development actions. With a combined budget of EUR 254 million, these ambitious calls address both the Solutions underpinning Phase D and the disruptive technologies and innovative concepts that will shape future ATM development in line with the long-term DES vision. For IR2 in particular, projects are expected to make significant advances on the Phase D DPs. Evaluations of the submitted proposals are currently underway, and the results will be presented to the Governing Board in December.

In 2026, the SESAR 3 JU will conduct a gap assessment against the DPs of Phase D taking into account the outcomes of IR1 and progress of IR2. This assessment will inform the priorities and technical specifications of the last two calls for proposals under Horizon Europe targeting exploratory research (ER4) and industrial research (IR3) which the SESAR 3 JU will prepare during 2026 and launch in 2027.

As a result, the progress on the Phase D DPs will only be reflected in future editions of the Strategic Development Monitoring Report.

3 Performance benefits from SESAR research activities

This section is reporting on the performance benefits of SDOs and DPs with regards to expected performance as documented in the Master Plan.

3.1 Performance benefits with Phase C

The expected performance benefits defined in the Master Plan for Phase C (Figure 7) remain valid, as no additional SESAR Solutions have reached TRL 6 maturity since its publication. These benefits will be updated once the Solutions currently under development complete their exit maturity gates at the end of their project lifecycle, enabling a full assessment of their expected performance.

Performance impact (KPA)	Unit	Reference year (2023) ^(*)	CP1 (up to 2030)	CP1 + Phase C
Airspace capacity (en-route and TMA)	%	8.5 million flights ^(*)	+ 34 %	+ 60 %
Airport capacity	%	17.9 million movements ^(**)	–	+ 15 %
Environment (fuel reduction)	kg / flight	6 400	– 22	– 109
	%		– 0.3 %	– 1.6 %
Passenger time saving (departure punctuality)	minute / flight	18	–	– 0.9
Cost-efficiency (air navigation services cost reduction)	EUR / flight	1 077	– 26	– 164

Figure 7: Expected performance benefits at the end of Phase C (CP1 + Phase C)

3.2 Performance benefits with Phase D

The performance benefits of Phase D will be consolidated once SESAR solutions are allocated to the DPs following their maturity gates. The extrapolated performance agreed at each maturity gate will serve as the basis for reporting these performance benefits and assess them against the performance ambitions for Phase D defined in the Master Plan.

4 Main attention points for 2026

This report highlights the tangible progress achieved over the past year in developing SESAR Solutions supporting the SDOs and advancing the implementation of the Master Plan. To maintain this momentum, several key areas have been identified for focused attention and action in 2026:

- Secure the delivery of the SDOs: To avoid any delays in the completion of Phase C, it is essential to finalise the development activities associated with the six SDOs that are still to be completed. This will require close monitoring and steering of the industrial research projects to ensure that all Solutions are delivered in line with the Master Plan and at the expected maturity levels. The SESAR 3 JU will work closely with beneficiaries and stakeholders to monitor emerging risks and support the identification and implementation of appropriate mitigation actions⁵. *(covered under the SESAR 3 JU BAWP 2026-2027 Objective 4)*
- Ramp up the delivery of Phase D: Following the selection of IR2 projects, the SESAR 3 JU will complete grant preparation with the aim of signing grant agreements by mid-May and begin the implementation thereafter. The JU will closely monitor project progress to ensure the timely delivery of Phase D-related SESAR Solutions aligned with the Development Priorities and at the expected maturity levels.
- Conduct a gap assessment of Phase D: A comprehensive gap assessment will be carried out in 2026, taking into account the results of IR1 and the outcome of the IR2 evaluations. This assessment will guide the prioritisation and scope of the final development activities required to further advance Phase D. *(covered under the SESAR 3 JU BAWP 2026-2027 Objective 3)*
- Calls ER4 & IR3: Based on the Phase D gap assessment and taking into account the remaining budget, the SESAR 3 JU will develop the technical specifications for the final exploratory (ER4) and industrial (IR3) research calls under Horizon Europe. These technical specifications will focus on addressing the most critical gaps of strategic importance and are expected to be submitted to the GB for adoption in December 2026. *(covered under the SESAR 3 JU BAWP 2026-2027 Objective 3)*
- Secure resources to complete the timely development of Phase D: The timely completion of Phase D development depends on adequate and sustained resources for ATM R&I beyond the current programming period. To that end, all research resources across the ATM innovation pipeline must be mobilised and complemented by sufficient EU-level R&I funding under the next MFF⁶, including through the establishment of a successor public-private partnership to the SESAR 3 JU. In 2026, the SESAR 3 JU will develop a Blueprint that will provide the strategic basis for planning the next wave of ATM R&I and ensure continuity of development activities needed to underpin Phase D of the Master Plan. *(covered under the SESAR 3 JU BAWP 2026-2027 Objective 8)*

⁵ This is related to the risk “Delay in delivering the last SESAR solution for Phase C” and its mitigation action identified in the Master Plan, p.61.

⁶ This is related to the risk “Lack of resources and time to complete the development of Phase D by 2030 due to increased ambition in scope for Phase D” and its mitigation action identified in the Master Plan, p.62.

Appendix A

Remaining SDOs development needs to be addressed under IR2 call

The IR2 call for proposals, launched by the SESAR 3 JU in 2025, aimed mainly at advancing Phase D. It also addressed the remaining development needs identified under SDO#2, SDO#5 and SDO#7 that were either not yet covered or were expected to reach only TRL 4 by 2026.

SESAR Solutions not yet covered by R&I activities in the pipeline:

- Development of a simplified airport operations centre (APOC) for regional airports (SDO#2 - *Optimising airport and TMA environmental footprint*, deployment action 2.1)
- Involvement of airports, airspace users and network manager in a seamless process to close the loop of the target time of arrival (TTA) management (SDO#5 - *Transformation to trajectory-based operations (TBO)*, deployment action 5.4).

SESAR Solutions that are currently covered by ongoing R&I activities in the pipeline but are expected to complete only TRL 4 by 2026:

- Development of hyperconnected ATM communication system (in SDO#7 - *Transition towards high performance of air-ground connectivity (multilink)*, deployment action 7.3).

These elements are expected to be part of the projects funded under the IR2 call and be completed by development activities beyond 2026.

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