

Delivering the Digital European Sky







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As the European Commission's Transport Commissioner, it is my mission to develop a European transport system that is safe, reliable and affordable while becoming ever more sustainable and efficient. This means making full use of all the opportunities offered by new technologies and accelerated digitalisation.

Further modernising and digitising Europe's air traffic management system holds vast potential for driving aviation's sustainable transition, delivering much-needed efficiency gains, and supporting the safe and continued growth and diversification of air travel, as new types of vehicles such as drones take to the sky. The Covid-19 pandemic has also shown the importance of ensuring that our ATM systems are sufficiently flexible and resilient to cope with unexpected shocks.

Over the years, SESAR has become a synonym for innovation in air traffic management. It has provided not just a vision, but also contributed directly to turning that vision into reality. This has been possible thanks to the commitment and collaboration of the entire aviation value chain, which is enabled by the SESAR Joint Undertaking.

Building on the momentum of past years, I look forward to the SESAR 3 Joint Undertaking taking us yet another step forward, delivering solutions in critical domains such as automation support, virtualisation and trajectory-based operations. With this, Europe will have access to a fully scalable and digitalised system able to handle all traffic in the safest, most efficient and environmentally friendly way. This is the type of investment that makes a real difference for citizens and businesses, and that will help Europe to drive its leadership and competitiveness globally.

Adina-Ioana Vălean
European Commissioner for Transport

Digital European Sky vision

Leverages the latest digital technologies ("SESAR Solutions") to increase the levels of automation, cyber-secure data sharing and connectivity in air traffic management, as well as to enable the virtualisation of its infrastructure and air traffic service provision in all types of airspace, including for very-low and high-altitude operations. In doing so, these technologies enable the system to become more scalable and agile, while building resilience to disruptions, changes in traffic demand and diversity of air vehicles. These attributes are all key to future-proofing the system in a smart and sustainable way.

Why a SESAR 3 Joint Undertaking?

Air transport has been a key driver for European integration and economic prosperity. However, an outdated aviation infrastructure means that air traffic in Europe is hitting its limits both in the air and on the ground, resulting in growing delays and unnecessary emissions. Add to that the multitude of new types of air vehicles, such as delivery drones and air taxis, that will soon be seeking access to the airspace, and the need for action becomes clear and urgent.

While an energy transition is the only way in the long term to ensure carbon neutral air transport in the future, the aviation infrastructure (air traffic management) can be modernised at a more rapid pace and bring environmental benefits in the shorter term.



Climate and COVID

The combination of the climate and COVID crises is accelerating a societal shift towards more sustainable air transport. The dual crisis also means that collaboration and the pooling of resources is more critical than ever, since industry-wide challenges can only be overcome together.

Advancing innovations applied today in the digital economy will result in a radical transformation of Europe's aviation infrastructure, making air transport smarter, more sustainable, connected and accessible to all.

Transforming the infrastructure that supports European aviation cannot be done by any one organisation or country. It requires close collaboration between all the stakeholders that contribute to it, from the European and national decision-makers that regulate it, the organisations and staff that operate it, to the academic and industry stakeholders that research, design and manufacture it.

A public-private partnership that is strongly linked to policy and regulation through an institutional partnership offers the best means to coordinate all the stakeholders, pooling the critical mass of resources and expertise needed to deliver the Digital European Sky.



Bigger and bolder

The SESAR 3 JU builds on the work and achievements of earlier SESAR research and innovation programmes (SESAR 1 and SESAR 2020), but seeks to accelerate the market uptake of innovative solutions through a portfolio of demonstrators and a fast-track mechanism. The new partnership is bigger and broader, reflecting a growing aviation/air traffic management industry and the diversity of stakeholders active within it. The partnership is a catalyst for speeding up the transition towards a green, climate neutral and digital Europe, and for making European industry more resilient and competitive.

SESAR 3 JU in a snapshot



Mission

Accelerate through research and innovation the delivery of an inclusive, resilient and sustainable Digital European Sky



Features



Policy/mission oriented – Embedding the partnership within the EU’s policy and regulatory framework ensures that research is oriented towards the right priorities, bringing real added value to Europe’s economy and society.



Resilient – enabling flexible, scalable, safe and secure air traffic management that can withstand disruptions and enhance cost-efficiency in the aviation system.



Accelerated – reducing time to market through focused and agile research and innovation, supporting faster transition to deployment through an extended innovation lifecycle.



Sustainable – establishing Europe as the most efficient and environmentally-friendly sky to fly in the world.



Inclusive – integrating and connecting all types of air vehicle and user, including civil and military, manned and unmanned.



Global – ensuring global interoperability and promoting the competitiveness of European industry.



Budget

The SESAR 3 JU is co-funded by the European Union through the Horizon Europe research and innovation programme and industry as follows:

- Horizon Europe - EUR 600 million
- Eurocontrol – up to EUR 500 million (in-kind and financial contributions)
- Industry - EUR 500 million minimum (in-kind and financial contributions)

In addition, the Digital European Sky programme will benefit from funding for its demonstrators from the Connecting Europe Facility (in coordination with CINEA) to the value of at least EUR 200 million.



The partnership

The SESAR 3 JU brings together the EU, Eurocontrol, and more than 50 organisations covering the entire aviation value chain, from airports, airspace users of all categories, air navigation service providers, drone operators and service providers, the manufacturing industry and scientific community.

The partnership also works closely with the regulatory and standardisation bodies, notably EASA and EUROCAE, as well as key stakeholders such as professional staff organisations, the space and military communities and global partners.



Governance

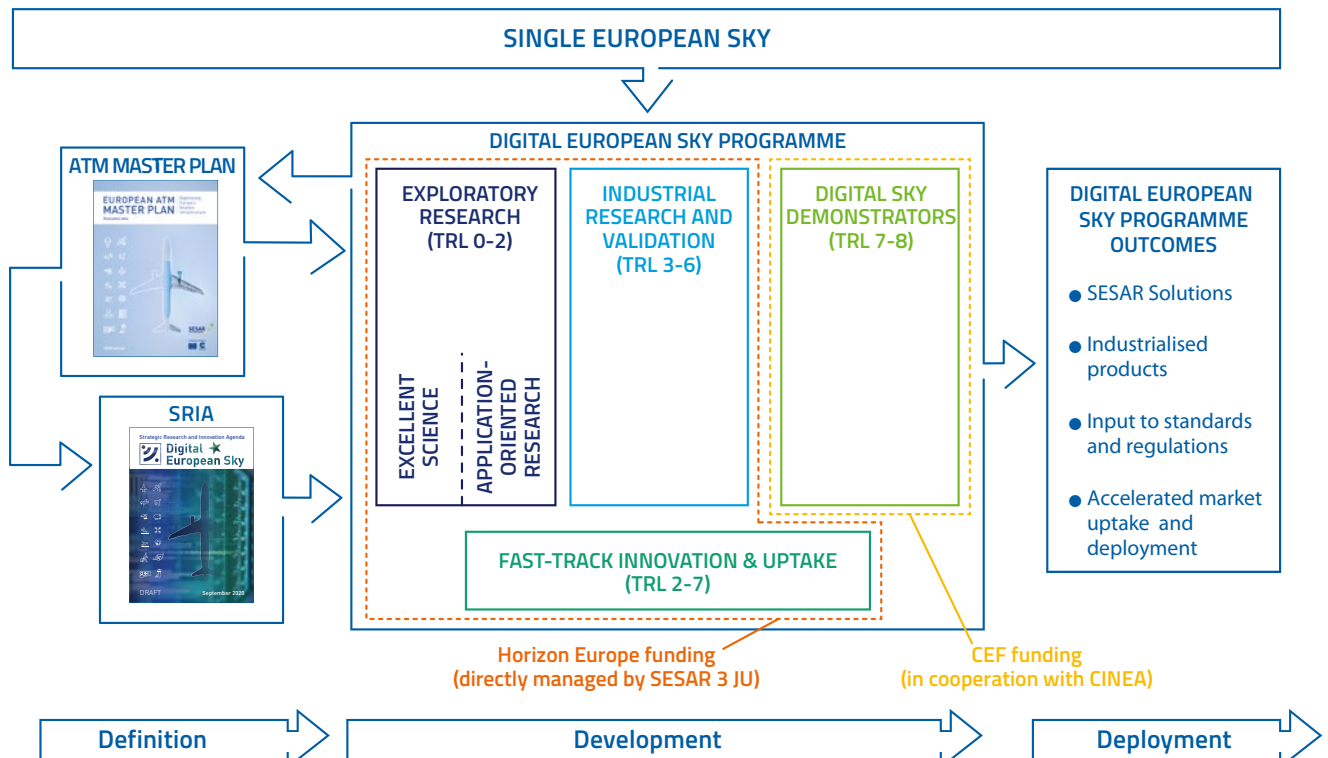


SESAR 3 JU innovation pipeline

The programme is designed as an innovation pipeline, made up of exploratory research, industrial research and validation and Digital Sky Demonstrators, where ideas are transformed into tangible solutions. These are underpinned by an innovation and market uptake fast-track to get things moving!

Calls related to the programme are launched within the framework of the EU's Horizon Europe or Connecting Europe Facility funding programmes. These are open to private and public 'for-profit' and 'not-for-profit' organisations, including large enterprises and SMEs, research and technology organisations (RTOs), universities, associations, and any other type of legal entity interested in the SESAR 3 JU's activities.

The SESAR 3 JU innovation pipeline is part of the broader SESAR project lifecycle covering definition, development and deployment.





research and innovation portfolio

To deliver the Digital European Sky, the SESAR 3 JU has designed a portfolio of research and innovation activities for delivering solutions across nine flagships:





Connected and automated ATM

The future ATM system will deliver hyper connectivity between all stakeholders (vehicle-to-vehicle, vehicle-to-infrastructure) via high bandwidth, low latency fixed and mobile networks. Highly automated systems with numerous actors will interact with each other seamlessly, making the system scalable and even safer than today.



Air-ground integration and autonomy

The progressive move towards autonomous flying enabled by self-piloting technologies requires a closer integration between vehicle and infrastructure capabilities so that the infrastructure can act as a digital twin of the aircraft.



Capacity-on-demand and dynamic airspace

Technology will enable the dynamic reconfiguration and the activation of cross-border capacity-on-demand services to maintain smooth traffic services at busy times.



U-space and urban air mobility

A digitally native traffic management system will ensure the safe and secure integration of drones in the airspace especially in urban areas, taking into account new and existing air vehicles and autonomous operations. One of the most challenging use cases from U-space will be to enable urban air mobility, which is expected to advance autonomous technologies in a number of areas.



Virtualisation and cyber-secure data sharing

Service provision will be decoupled from the physical infrastructure, enabling air traffic and data service providers, irrespective of national borders, to plug in their operations where needed in a secure manner.



Multimodality and passenger experience

Considering ATM to be an integrated part of an intermodal transport system will make it possible to share data between modes and to collaborate better to optimise the performance of both the overall transport system and the door-to-door journey.



Aviation green deal

Europe should be the world's most environmentally-friendly continent to fly. This requires putting in place solutions to enable aircraft to fly their optimum fuel-efficient 4D trajectory gate-to-gate, and integrating next generation aircraft that will be cleaner and quieter.



Artificial intelligence (AI) for aviation

Tomorrow's aviation infrastructure will be more data-intensive. Thanks to the application of machine learning, deep learning and big data analytics, we will be able to design an ATM system that is smarter and safer by constantly analysing and learning from the ATM environment.



Civil/Military interoperability and coordination

Dual-use technologies such as those for communications, navigation and surveillance, and other solutions that allow real-time exchange of trajectory information will improve the predictability of military operations and overall network capacity.

Benefits for European society and economy

Delivering the Digital European Sky will bring substantial value for every stakeholder in the aviation value chain; it will also significantly benefit the European economy and society in general at a relatively small investment cost. It is estimated that, by 2040, the Digital European Sky could amount to EUR 80 billion in annual recurring benefits for Europe.

Realising the benefits will largely depend on the ability of the sector to create the conditions to shorten the innovation life cycle for infrastructure modernisation. If these conditions are not created, the transformation is likely to be completed only by 2050 with negative implications for the environment, jobs and growth in Europe.



Zero environmental waste: eliminates environmental inefficiencies caused by the aviation infrastructure, ensuring that it offers solutions that will fully exploit the potential offered by the next generation aircraft for cleaner and quieter flight.



Fully scalable: creates the capacity needed to handle traffic in the most efficient way where and when capacity is needed.



Cyber-resilient: delivers the intended continuity of service despite adverse events.



More productive: enables resources (including data) to be shared across the network.



Safer: relies on the talent of both humans and new technologies to advance the level of safety beyond current levels.



Enabling advanced mobility services: offers smart and personalised mobility options to passengers, allowing them to travel seamlessly and efficiently across modes of transport.

What does this mean for citizens?

28
million
CO₂ **SAVED**

Potential savings of 28 million CO₂ tonnes per year, which is roughly equivalent to the emissions produced by 3.2 million people or the population in the metropolitan area of a city like Madrid.

**Digital
opportunities**



An aviation infrastructure that opens up digital opportunities for people and business and enhances Europe's position as a world leader in the digital economy.

14.5
million
HOURS **SAVED**

Saving time for passengers at airports or in the air in Europe, up to 14.5 million hours annually that passengers will be able to spend otherwise.

**Environment
friendly**



Positions Europe as the most environmentally-friendly sky to fly in the world.

Interested in getting involved?

- ✦ Take part in open calls for tender
- ✦ Follow our work on social media
- ✦ Be part of the Digital European Sky!

Visit **sesarju.eu** for more information

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