

# Digitalising Europe's aviation infrastructure



Rapid changes in technology hold enormous promise for the future use of our airspace as the digital transformation expands skyward. This requires a step-change in the way we manage our skies. Essentially, we are moving from several thousand conventional aircraft in the sky every day to potentially hundreds of thousands of highly connected and automated air vehicles (drones, air taxis), offering advanced data-driven services and operating in all areas, including cities. The players with a stake in the aviation sector are expanding beyond traditional stakeholders, such as airlines, airports, aircraft manufacturers and air navigation service providers. This is nothing short of a new frontier in aviation and a major breakthrough, which will unlock tremendous value and new avenues for innovation.

In this digital future, building the right infrastructure to support operations will be critical to harnessing the potential of the sector. Today, access to the airspace and the management of air traffic rely on principles and technology that were developed 40 years ago. The current system is fragmented across national borders, and poorly automated and connected, resulting in many inefficiencies and a lack of readiness to cope with the expected evolution of air traffic. SESAR's mission is to bring together established and new players to rethink airspace and scale up technologies in preparation for this exciting new era.

## Driving collaboration and open innovation

SESAR's collaborative model is proving to be a highly effective means in this transformative process. The key to its success is breaking down silos by bringing together both established aviation players and new entrants (digital start-ups, SMEs, academia, research centres) as well as other industries, such as the automotive and mobile communication sectors. The result is a new mode of public-private partnership which blends corporate and academic values, new talent, expertise and capital, giving rise to fresh ideas that are fed into the innovation pipeline.

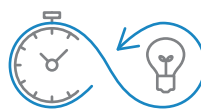
**Public-private partnership**



**Blending corporate & academic values**



**Acceleration of the innovation lifecycle**

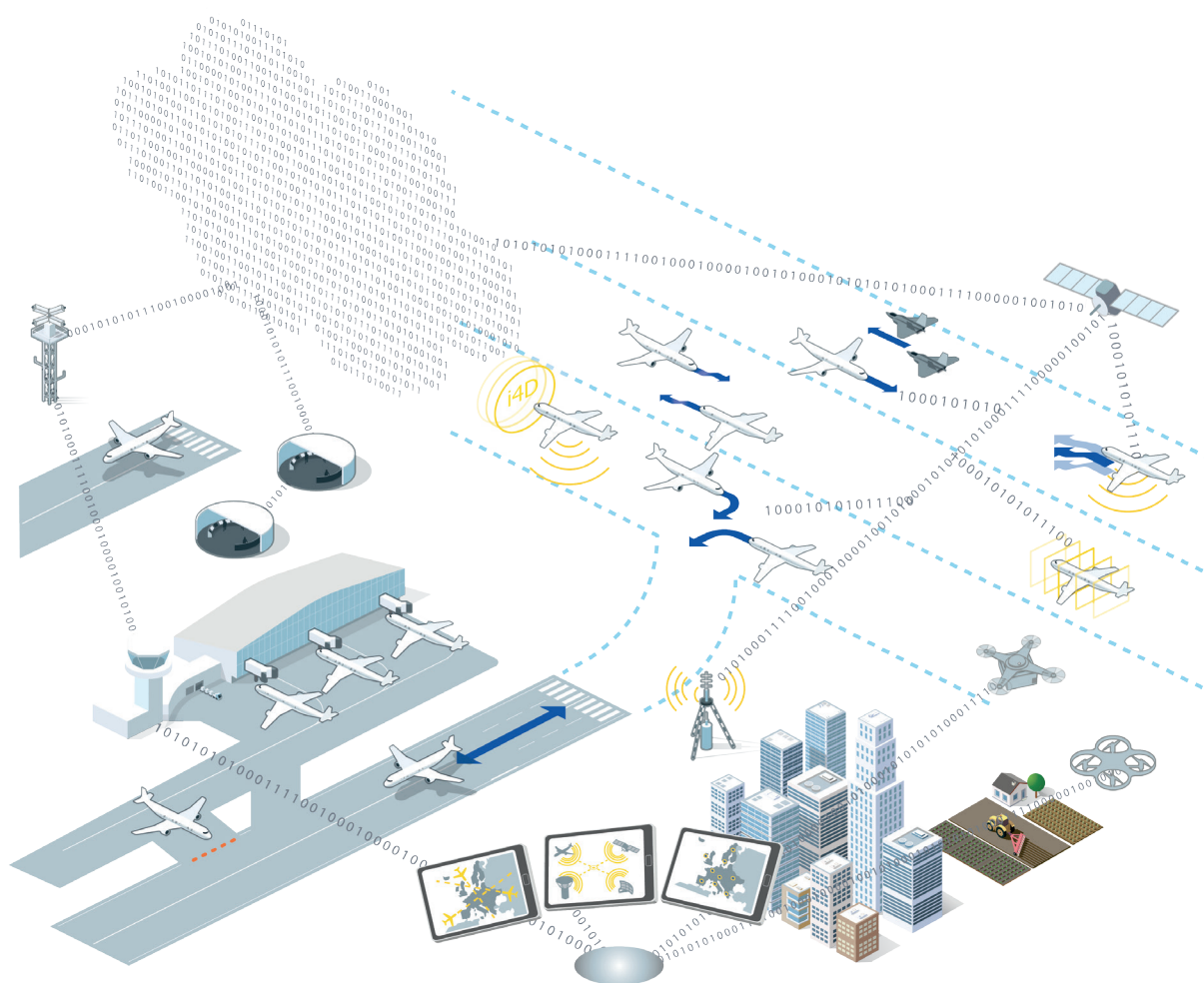


**Worldwide outreach**



With an 8-year mandate, SESAR is composed of small project teams working under time pressure of 2-3 years. In this way, SESAR encourages risk taking, and is more agile and responsive to emerging trends both within aviation and in the broader industry landscape. Proof that this approach is paying off is the acceleration of the innovation lifecycle from 30 years to 5 years (e.g. remote towers, extended arrival management). Demonstrating the scalability of technology solutions in real operations has been essential to encouraging accelerated and broader uptake.

SESAR is recognised in Europe as the "home for aviation technology", working in close cooperation with the European Aviation Safety Agency (EASA) and within the framework of the European Commission's mobility and transport agenda. At the same time, SESAR has developed extensive worldwide outreach through cooperative agreements with key regions including Asia, America and the Middle East, and relevant organisations such as NASA and ICAO.



## Delivering a new ecosystem for aviation

In the coming years, European citizens will live in smart cities, travelling door-to-door using green autonomous vehicles and communicating using smart devices. Aviation is very much part of this intelligent transport system and will rely on technological advances to transform its services and enable seamless travel and transport for all. To get there, SESAR is acting now by preparing a new ecosystem for aviation, and more specifically, modernising the underlying air traffic management infrastructure.

This ecosystem is built on safe and secure solutions characterised by:

- **Higher levels of autonomy and connectivity** of all air vehicles coupled with a smarter, more automated management of the traffic, and enabled by an “intranet of flight”.
- **Mobile, terrestrial and satellite-based communications**, which are used to provide real-time vehicle trajectory information, shared between vehicles and with the ground infrastructure.
- **Digital and automated tools** provided on board the air vehicle itself, or as part of the ground-based infrastructure.
- **Virtual technologies** to decouple the physical infrastructure such as sensors, communication or navigation devices from the services that are provided to manage the airspace.
- **High-tech video, synthetic and enhanced sensor technologies** to operate air traffic services for airports or to enable aircraft to land in low-visibility conditions.
- **Big data analytics and open source data usage** to encourage the creation of new services and to allow for better flight planning, airport operations and increased predictability of the overall traffic.
- **System modularity** to allow for scalable and easier upgrades and greater interoperability.
- **System flexibility** to handle increasing number of air vehicles, such as drones.

With these first solutions, SESAR has set in motion the digital transformation of aviation and its infrastructure. New SESAR innovations will continue to be delivered, accelerating the pace of change towards this new era in aviation.