High performing aviation for Europe

Modernising Air Traffic Management for a better passenger experience

SESAR

WHY: Delivering a better passenger experience

Air travel is no longer reserved for the elite; instead it is something that more and more people find easy and affordable. With the rapid rise of a global middle class with a disposable income, this trend will continue to increase worldwide.

Europe has an opportunity to tap into this surge in global air travel by delivering a more attractive passenger experience through:

- High safety standards
- Affordable tickets
- Shorter and more punctual flights
- Greater mobility and choice
- Reduced environmental footprint

While unseen and unnoticed by passengers, air traffic management (ATM) is an essential part of air transport, playing several important roles:

- Acts as a guardian of safety
- Connects European cities and Europe with the rest of the world
- Adresses climate change by enabling green and efficient routes
- Maximises current infrastructure while delivering advanced information services
- Acts as a catalyst for Europe's competitiveness and innovative capacity

What air transport brings to Europe

European ATM in numbers

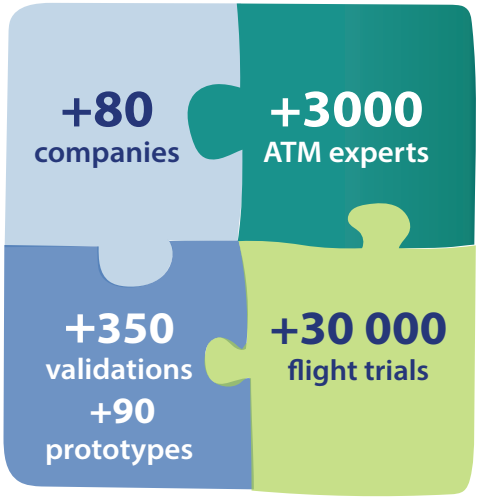
Sources: * Eurocontrol, ** ACI Europe, *** European Commission

WHY: Pooling air transport expertise and knowledge

Modernising ATM is therefore critical for the sustainability of European aviation. If we do not act now, mobility in Europe will be negatively impacted.

This is where SESAR comes in. As one of the most innovative infrastructure projects ever launched by the European Union, **SESAR's role is to define, develop and deploy what is needed to increase ATM performance and build Europe's intelligent air transport system.**

SESAR brings together the expertise of the entire air transport community through a public-private partnership, known as the SESAR Joint Undertaking (SJU), to research and test its technological solutions to improve the ATM system. Some of these solutions are already being implemented across Europe.



Thanks to these solutions, passengers can expect real benefits. For example, for a typical roundtrip from London to Rome, passengers will have:

An extra **20 minutes** free to spend at home or to do business (door-to-door travel time)

Shorter flight meaning **less fuel burnt** (**-10 kg** of fuel per passenger)

Savings of **EUR 15** on your ticket

WHAT: Before arriving at the airport

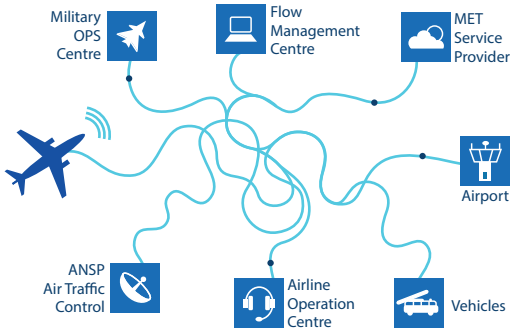
As a passenger

Every season, airlines establish routes and ticket prices based on market conditions, traffic rights, available airport slots and operational capacity, allowing passengers to book their tickets and arrive at the airport for check-in. Once through security, passengers make their way to the departure gates. Boarding begins once the cabin crew and pilots have completed a final series of checks and briefings to ensure that everything is in order for a safe and secure flight.

Behind the scenes today

Flights are scheduled by airlines between 1 year to 6 months in advance. This information is used by air navigation service providers (ANSP) to plan their airspace. A flight is prepared by the airline's flight planning department between 24 hours to 30 minutes before departure.

Three hours before take-off, this information is transmitted to the Network Manager and then to the relevant ANSP systems. Before leaving the gate, a lot can happen to jeopardise the planning: aircraft can arrive late or stay parked longer, ground operations can take longer than scheduled and connections can be missed. Bad weather can also bring operations to a halt.



With SESAR

Airlines, airports, ANSP systems become fully interconnected through modern technology and protocols allowing a seamless flow of information.

This is a new information technology "ecosystem" which provides passengers with:
- more affordable tickets
- greater options to choose from when travelling
- information about changes to the flight itinerary well in advance.

Altogether these changes ensure the full optimisation of airline and airport resources, which ultimately means a smoother passenger experience at the airport.

WHAT: Taxi, take-off and climb

As a passenger

Passengers are securely fastened into their seats as the aircraft taxies out and takes off. They must wait for the aircraft to establish cruise before unfastening their seatbelts and enjoying the inflight service.

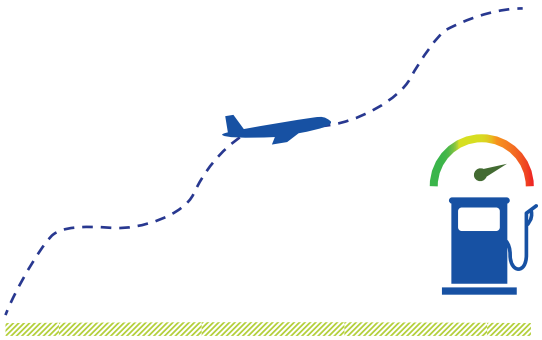
Behind the scenes today

The air traffic controller clears the aircraft for departure, indicating to the pilot the taxiing path by radio.
At this stage, controllers further along the route do not have access to this information.

The aircraft leaves the gate towards the runway threshold and waits for take-off clearance. The pilot is authorised to take off using a fixed departure route.

The aircraft climbs until a first altitude is reached and waits until the controller has authorised the pilot to continue the climb. This procedure requires more fuel and is noisy.

Today



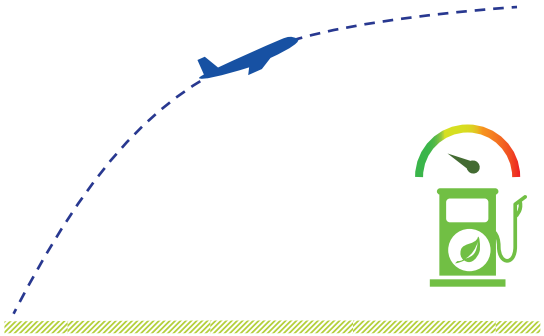
With SESAR

Controllers are supported by new tools to better organise the departure sequence, reducing taxi time and optimising runway usage.

The clearances they provide are given digitally, which is more efficient and safe.

The information about the aircraft trajectory is shared across air traffic control centres along the route. Aircraft take off and climb continuously, offering the passengers a smoother start to their journey, while also reducing fuel burn and noise impact.

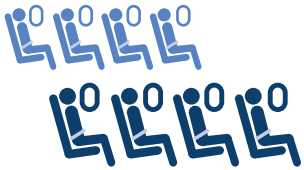
With SESAR



WHAT: En-route

As a passenger

It's a busy day in the European sky. During their trip, passengers enjoy some refreshments or use this time to get on with some work. The pilot regularly provides passengers with information about the altitude and flight path.

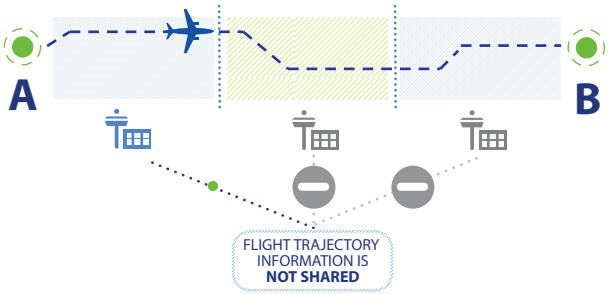


Behind the scenes today

The pilot requests the optimum altitude and speed, as computed by the Flight Management System of the aircraft.

Each controller along the route looks after a small portion of your journey, rather than managing it from beginning to end. This means they cannot give the most optimum trajectory to the aircraft.

Since the current system is not updated dynamically, it cannot benefit from released military airspace or improved weather conditions to provide more direct routes.



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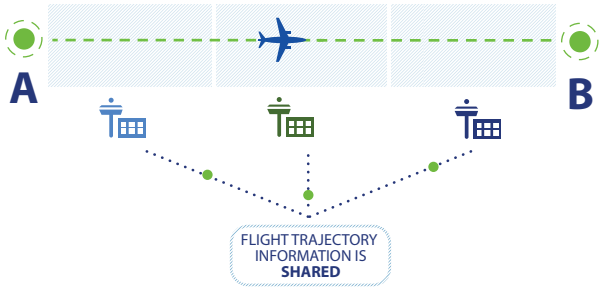
Aircraft can fly their preferred trajectories without any airspace constraints.

With increased automation support, controllers and pilots can focus on the high value-added tasks to better manage the journey throughout.

The system infrastructure will gradually evolve enabling increased digitalisation and virtualisation, thereby allowing the provision of services irrespective of national borders.

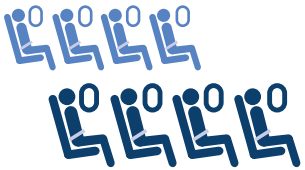
This move towards a more dynamic system means greater flexible use of the airspace in response to traffic needs.



WHAT: Approach and landing

As a passenger

The pilot gives an update to passengers about their flight and the expected time of arrival. As the aircraft prepares for landing, passengers return to their seats and fasten their seatbelts. The aircraft lands and once at the gate, passengers disembark and continue on their way.

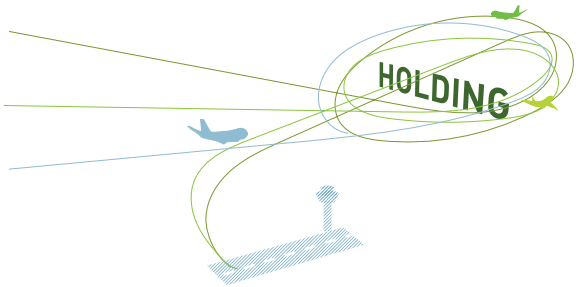


Behind the scenes today

The traffic comes from all directions towards the airport and surrounding airspace (less than 100 km from the runway).

The controller has to integrate the complex traffic flows and coordinate the final descent and approach with the airport arrival position.

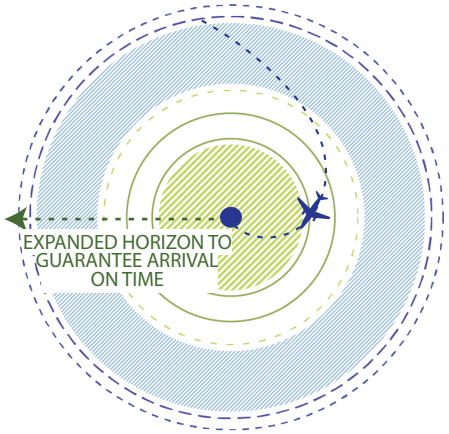
Depending on how busy the airport is, aircraft may be put in a queue or left holding. In other words, aircraft are circling the airport, burning more fuel, emitting emissions and noise, while waiting to land.



With SESAR

To avoid bottlenecks, traffic is sequenced much earlier using 4D (three dimensions and time) trajectory capabilities and extended arrival management tools, which enable greater collaboration across borders and greater flight predictability.

With SESAR, continuous descent operations mean that flights can arrive more quietly, using less fuel, to airports. They can also land even in bad weather conditions, thanks to ground and satellite-based precision approaches.

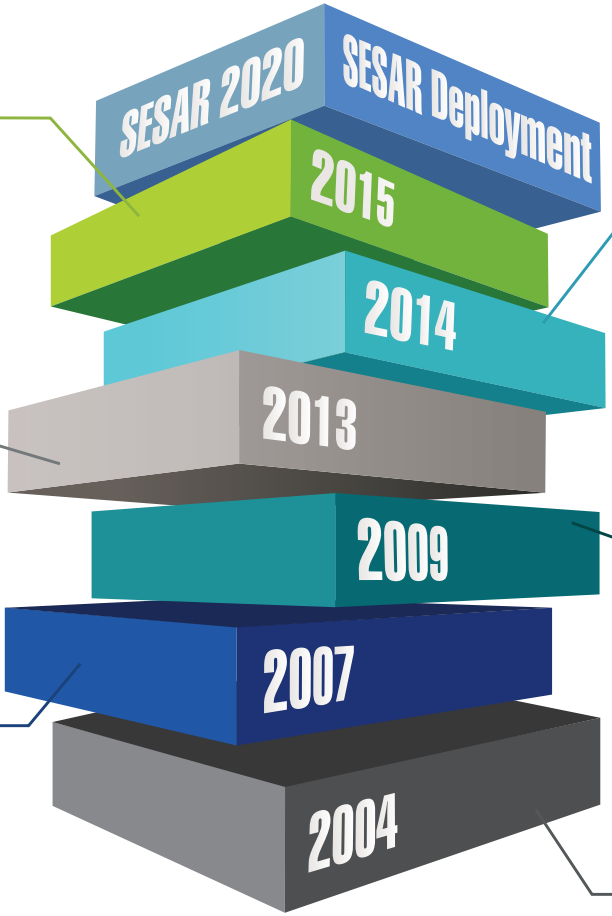


WHERE: Delivering Europe's intelligent air transport system near you

SESAR is driven by a modernisation roadmap (ATM Master Plan) that is continously maintained. An extensive set of solutions have been tried and tested in real-life operational conditions with airlines, airports, air navigation service providers and manufacturers.

The first tangible results are already being deployed across Europe through the SESAR Deployment Programme (2015-2020). In parallel, ATM research (SESAR 2020) continues in order to build the intelligent air transport system that Europe needs.

WHEN: SESAR building blocks



2015
– SESAR 2020 launched
– Latest edition of the European ATM Master Plan published
– Wide-scale deployment of SESAR across Europe starts

2014 – Establishment of the SESAR Deployment Manager (SDM) to coordinate the synchronised deployment of SESAR

2013 - Delivery of a first set of SESAR Solutions by SJU for deployment

2009 – Council resolution on the endorsement of the European ATM Master Plan

2007 - Establishment of the SESAR Joint Undertaking (SJU) for coordinating and concentrating all relevant ATM research and development efforts in the EU. The SJU has a current mandate until 2024

2004 - Establishment of SESAR as the technological pillar of the Single European Sky (SES)

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