



THALES
Building a future we can all trust

SESAR3 HAVEN

HIGHLY AUTOMATED AND VIRTUALISED ATS
PLATFORM FOR EN-ROUTE & TMA OPERATIONS
Accelerating the Digital European Sky

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www.thalesgroup.com



THE CHALLENGE

European airspace is at a turning point.

+50%

traffic growth
expected by 2040

€multi-B

legacy systems
need replacing

25+

ANSPs need
interoperable platforms



A new generation of Air Traffic Services platforms for Europe and beyond

STRATEGIC DEPLOYMENT OBJECTIVES (SDO)

	SDO 1	Alerts for reduction of collision risks on taxiways & runways
	SDO 2	Optimising airport and TMA environmental footprint
	SDO 3	Dynamic airspace configuration
	SDO 4	Increased automation support
	SDO 5	Transformation to trajectory-based operations (TBO)
	SDO 6	Virtualisation of operations
	SDO 7	Transition towards high performance of air-ground connectivity (multilink)
	SDO 8	Service-oriented delivery model (data-driven and cloud-based)
	SDO 9	CNS optimisation, modernisation and resilience
	SDO 10	Enable innovative air mobility (IAM) & Drone operations

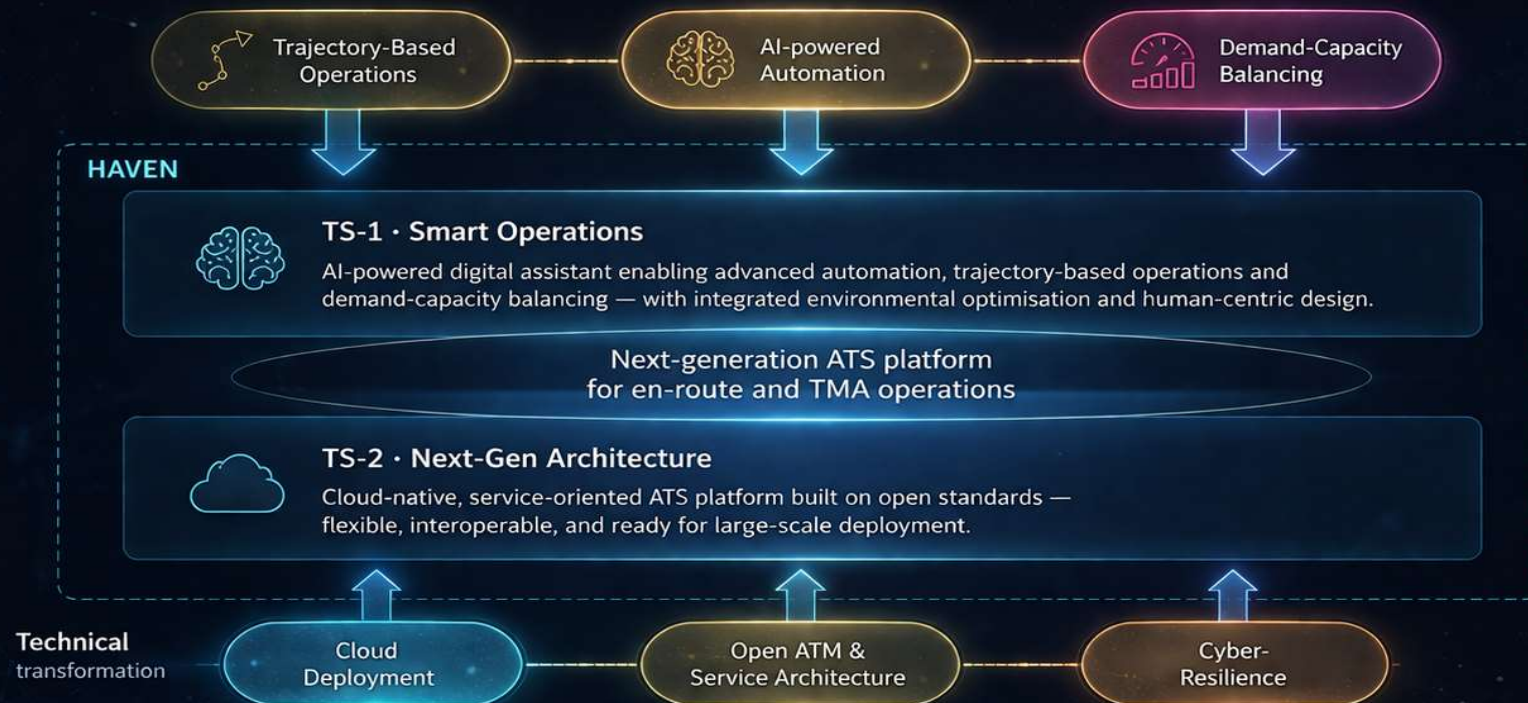
STRATEGIC DEVELOPMENT PRIORITIES (IR)

	IR-1	Transformation to trajectory-based operations
	IR-2	Transition towards high performance of air-ground connectivity (multilink)
	IR-3	Future en-route and TMA ground platforms
	IR-4	Future airport platform
	IR-5	Autonomy and digital assistants for the flight deck
	IR-6	U3 U-space advanced services, IAM and vertiports

Vision of the European ATM Master Plan



Structure of the HAVEN Project — Two SESAR Technological Solutions



AI-Powered Digital Assistant for ATCOs

From decision-support to supervised autonomy — validated with real Air Traffic Controllers



Voice Recognition & NLP

EASA AI Roadmap 2.0

- AI-driven speech recognition for ATCO-pilot communications
- Gender-balanced training datasets (audited, GDPR-compliant)
- Word-error rate & latency monitored — gender disparity reported
- Reduces manual read-back errors and cognitive load



Trajectory & Flow Optimisation

TBO • DCB • Civil-Military

- AI-assisted conflict detection and resolution for EN-ROUTE & TMA
- Demand-Capacity Balancing recommendations in real time
- Civil-Military coordination support integrated in the platform
- Environmental KPIs embedded — greener routing suggestions



Human-AI Teaming

EASA Level 2A → 3A

- Scalable autonomy: from AI assistance to full ATC supervision
- Explainability layer — AI decisions made human-understandable
- Robustness testing: stress tests, degraded-mode behaviour
- Real-time simulation with live ATCOs (Human-In-The-Loop)

From Architecture Design to Cloud-Ready ATS Platform

Technology Pillars



Service-Oriented Architecture (SOA)

- Interoperable ATM services (e.g. STCA)
- Cross-platform integration
- SWIM-based service publication



Cloud Deployment Strategy

- Elastic Scaling
- Disaster Recovery (seamless failover)
- Zero-downtime updates

Cloud Use Cases



- Scalability & performance



- Disaster recovery



Shadow mode

- Shadow mode



Continuous delivery

- Perpetuus delivery

Target: TRL 6 by end of project

HAVEN Consortium



INDUSTRIAL

THALES
Building a future we can all trust



ANSPs

COOPANS
REAL COOPERATION, REAL RESULTS

Membership



Institutions



COLLABORATION
Strengthening partnerships



INNOVATION
Driving technological advancement



IMPACT
Building the future of ATM

PROJECT ROADMAP

From kick-off to TRL6 maturity gate in 36 months



From prototype to operational readiness

Maturity progression

TRL 3-4 Concept validation

Fast prototyping, early UXI with ATCOs



TRL 5 Component validation

System integration, AI robustness baseline



TRL 6 System validation

Full Real-Time Simulation, HITL exercises



→ TRL 7+ Industrialisation

Transition roadmap to deployment



Validation exercises



Real-Time Simulation (RTS)

High complexity scenarios with live, EN-ROUTE high-complexity scenarios and TMA sequencing. Measures rates and acceptance.



AI Explainability Assessment

Controllers evaluate AI recommendation transparency, outputs validated for operational usefulness relevance. Authority at fallback procedures tested.

explainability

explainability



Performance & Safety Analysis

KPIs tracked per exercise: separation violation time, CO₂ proxy and safety/ human performance assessment embedded in the VALP.

Building the foundation for tomorrow's European skies



Safer skies

- AI tools validated with real ATCOs. Human-AI teaming reduces workload and error risk. Full safety case with EASA.



Greener flights

- Optimised trajectories and smarter demand-capacity balancing cut fuel burn and emissions across European airspace.



Interoperability

- Standardised SWIM interfaces end data silos. Any ANSP can plug in third-party services without costly migration.



Lower costs

- Reducing development and operational costs without compromising safety.



Ready to deploy

- Flexible and effortless deployment from trials to full-scale operations.



Pan-European reach

- 25+ specific partner country network node seamless enabling seamless cross-border countries ATC services.

HAVEN PROJECT: TRANSFORMING AIR TRAFFIC CONTROL ACROSS 7 DIMENSIONS

CURRENT ATC OPERATIONS (PAST)

HAVEN PROJECT FUTURE VISION

