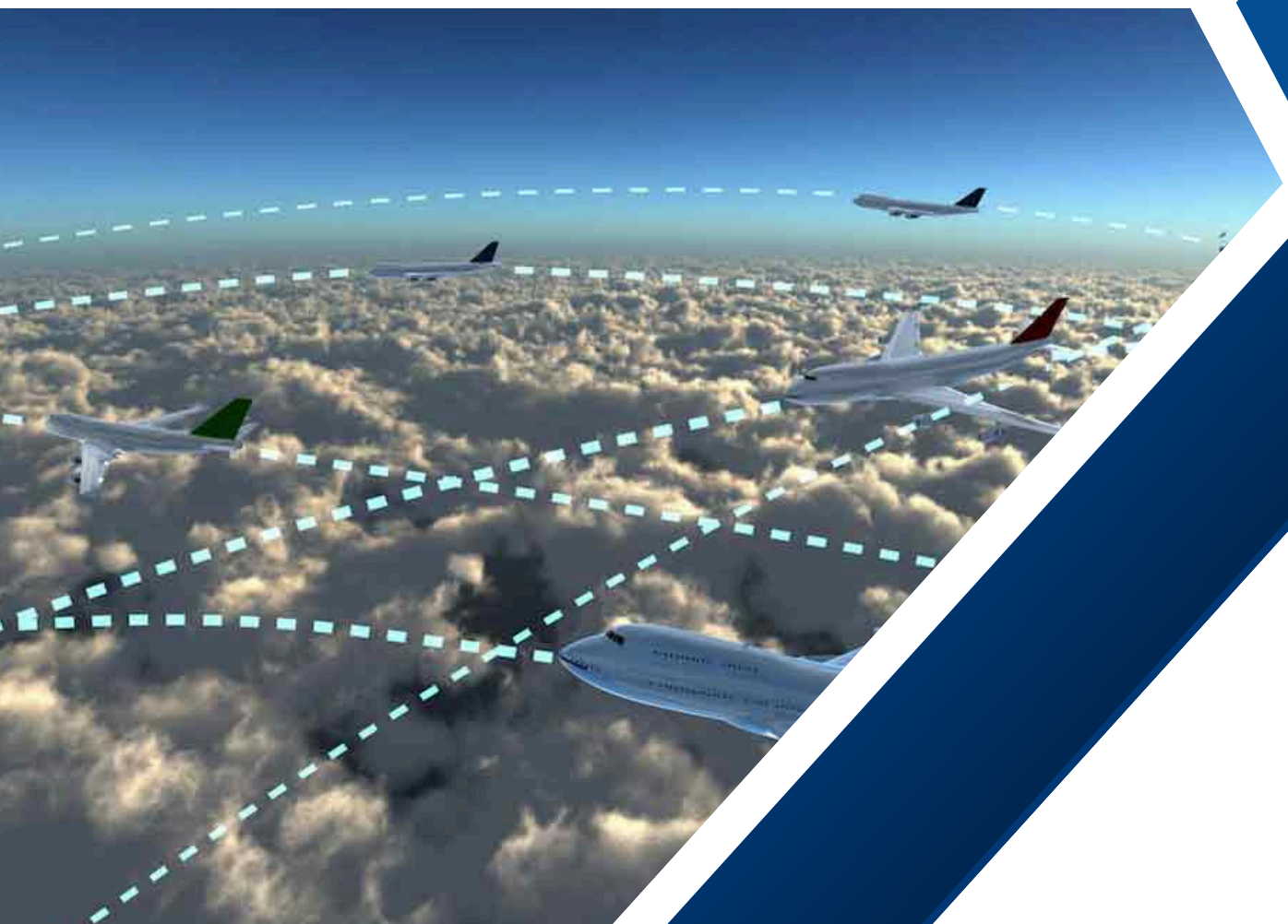
FRANCE
AVIATION CIVILE
SERVICES

Sustainable Airspace Design



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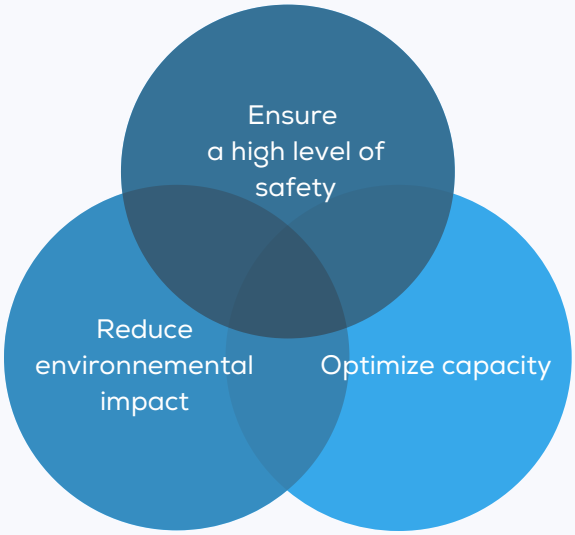
What is airspace design ?

Definition

Airspace design aims to improve the capacity of airspace to manage air traffic and ensure flight safety through rigorous airspace planning. It also allows to optimize flight path efficiency, reduce environmental impact, and minimize noise pollution, while supporting the sustainable growth of air transport.



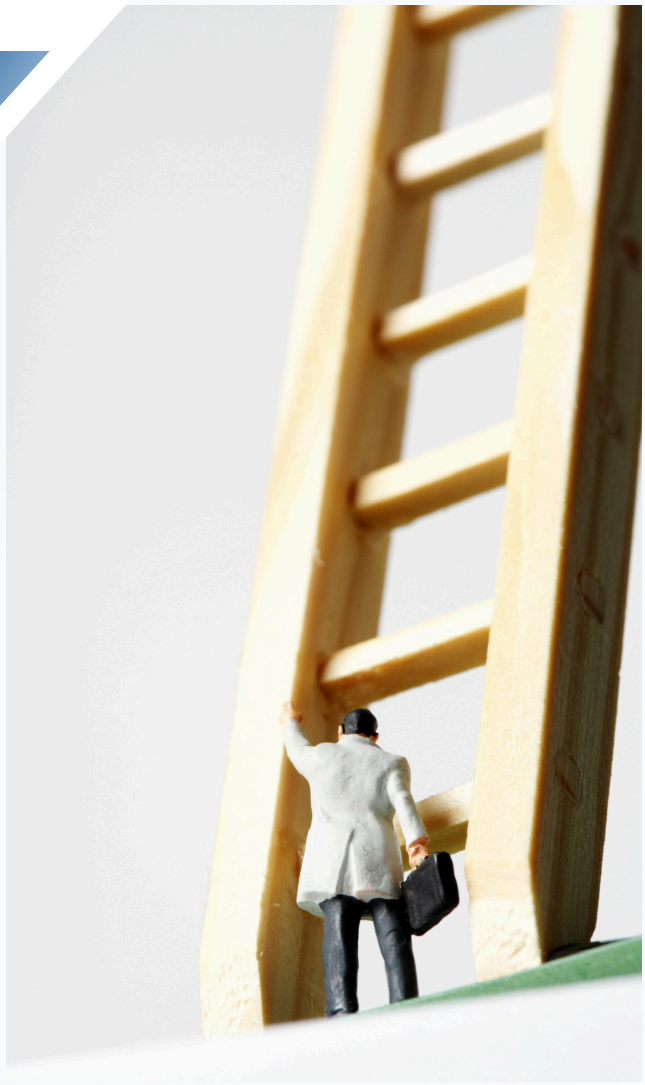
Objectives

The primary objective of sustainable airspace design is to ensure a safe, efficient airspace capable of accommodating traffic growth. Secondly, it aims to reduce the environmental impact of flights by:

- Promoting more direct flight paths to limit greenhouse gas emissions,
- Reducing noise pollution by avoiding overflight of densely populated areas,
- Minimizing level flight segments, which lead to increased fuel consumption.

To achieve these goals, optimized flight procedures—such as continuous descent approaches (CDA/CDO)—are implemented. These help to streamline traffic flow, reduce airborne holding, and ensure efficient and optimal use of airspace.

The challenges of airspace design



Airspace design represents a major strategic challenge to ensure the safety, efficiency, and sustainability of air operations. It involves structuring the airspace based on traffic flows, aircraft performance, operational and environmental constraints, and the capabilities of air traffic control systems.

The main challenges are:

- Operational safety: ensuring adequate separation between aircraft.
- Trajectory optimization: reducing flight distances, flight times, and fuel consumption.
- Capacity and resilience: handling high traffic density while remaining flexible facing unforeseen events.
- Interoperability: integrating new entrants (drones, eVTOLs, etc.) and new navigation systems into a shared airspace.

Safety

- Minimal number of deviations

Capacity

- Airport
- TMA (Terminal Maneuvering Area)
- En-route
- ATFCM measures

Environment

- Reduction of fuel consumption
- Reduction of CO2 emissions
- Reduction of other pollutants
- Minimization of noise footprint

New concepts

- PBN (Satellite Navigation)
- CDO / CDA (Continuous Descent Operations)
- CCO (Continuous Climbing Operations)
- FUA (Flexible Use of Airspace – Civil-Military Coordination)
- Dynamic Airspace Management

An offer tailored to your needs

Your challenges are evolving ? We have the solution.

In the face of climate emergency, global increase in air traffic, growing saturation of airspace, and new international requirements, every decision matters.

We support aviation stakeholders in the sustainable, smart, and efficient transformation of their airspace and infrastructure.

Optimize your airport and airspace capacity without compromising safety.

Integrate environmental constraints into your operational procedures.

Modernize your airspace by combining satellite technologies and ground-based equipment for optimal performance.

Anticipate the future with innovative concepts aligned with ICAO commitments for a greener sky.

FRACS's role in the management of your project

Diagnosis

- Evaluation of the air traffic management system
- Type of air traffic control

Definition of objectives

- Maintain or enhance safety
- Improve efficiency
- Reduce environmental impact
- Comply with ICAO guidelines
- Define key performance indicators (KPIs)

Conducting the study

- Airspace modeling
- Traffic volume assessment
- Simulations: FTS, RTS
- Identification of sectorization needs
- Identification of new procedure requirements

Project approval

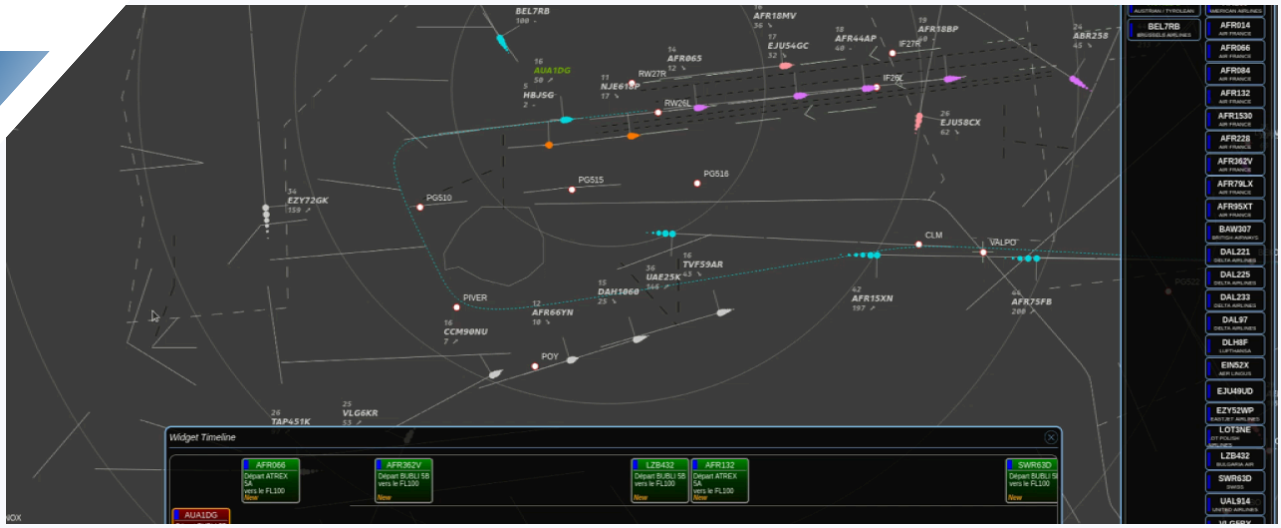
- Change management study related to the project
- Promotion of the system

Implementation of the system

- Training
- Tools and systems
- Aeronautical publications
- Coordination with the authority
- Communication
- Safety monitoring

We accompany you all along your project

Optimize your airspace with DIADEME



Diademe: a collaborative, high-performance platform accessible remotly, developed by France Aviation Civile Services to provide innovative and tailor-made airspace engineering solutions.

What is Diademe ?

DIADEME is a collaborative web platform that allows simulation, modification, and evaluation of air traffic situations to optimize airspace design at every stage of its development.

Key features

- Air traffic simulation and evaluation
- Multi-criteria optimization (operational, economic, environmental)
- Comparative analysis between procedures (conventional vs. PBN)
- Environmental impact assessment per flight, per zone, per airport
- Tool-supported discussions for negotiations (e.g., civil-military, cross-border)
- Real-time collaboration between experts and users, remotely

Why choose Diademe ?

- Secure access
- Support for airspace strategy and modernization
- Time and productivity savings
- Interoperability among all stakeholders
- Assistance in reducing environmental footprint

Where do our experts come from?

A diversity of experience

Our experts combine strategic consulting, technical engineering, and operational expertise (tower, approach, and en-route). This diversity of profiles is a real asset, allowing us to meet your needs with agility, precision, and a comprehensive vision.

- French air navigation service provider (DSNA) :
  - Procedure designers
  - Experts in charge of airspace restructuring projects
  - Expert trainers in all areas related to airspace restructuring including CNS
  - Environmental mission
- Competent authority : French civil aviation directorate (DSAC) :
  - Validation and approval of changes to airspace and instrument procedures

High-value expertise

Thanks to their strong professional background, they bring key expertise to ensure the success of your initiatives.
Based in France, they operate within one of Europe's most complex airspace environments, subject to strict environmental requirements: heavy traffic, , major airports facing challenges related to noise pollution, capacity, and punctuality.

This demanding operational reality shapes their expertise every day.

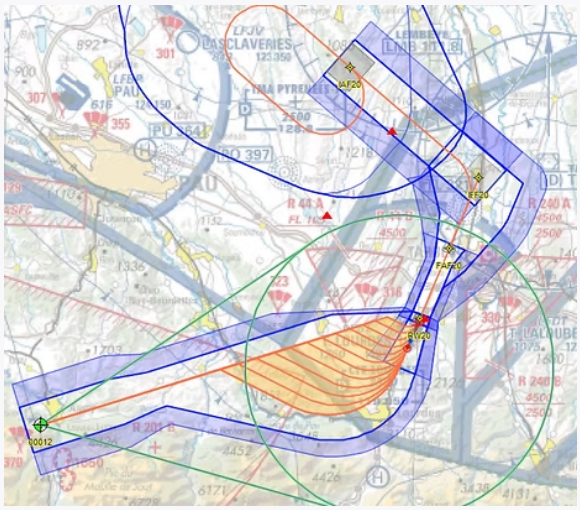
dgac DSNA

dgac DSAC

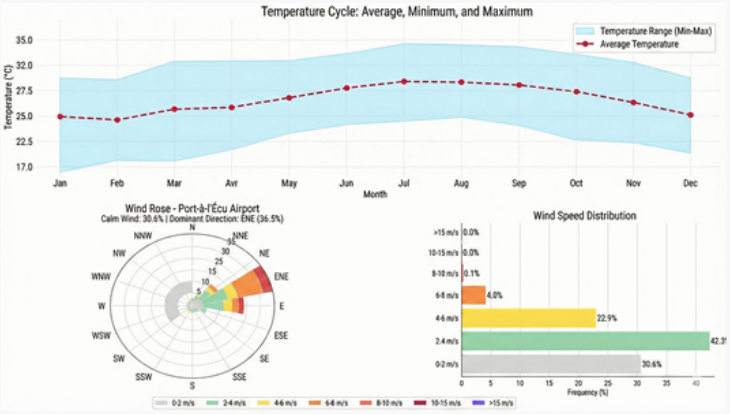
Enhanced expertise thanks to our partners

CGX Aero

To more effectively address your needs, we regularlyy collaborate with CGX AERO, a partner specialising in instrument flight paths and aeronautical mapping. This synergy enables us to enhance our proficiency by integrating trajectory modification capabilities to achieve airspace capacity, operational and environmental optimization objectives. Each of these aspects is fundamental for all projects pertaining to terminal areas and/or with significant terrain and urban density challenges.



MetSafe



Meteorology plays an important role in many Airspace Design projects, especially as severe weather phenomena become more prevalent in many countries, including temperate ones.
MetSafe is able to characterize meteorological situations around the world, to feed into simulations and analytical studies that allow meteorological phenomena to be taken into account in the design of airspaces, or even for the creation of a new airport.

The benefits of partnerships

- Extensive experience shared across numerous ambitious projects with high challenges.
- A continuity of working methods and tools synonymous of performance in project management.
- A mutual enrichment in terms of know-how and expertise.

Why choose us ?

Expertise

- Unique multidisciplinary expertise
- Hands-on field experience
- Compliance with international standards: ICAO, EASA
- Recognized mastery of complex projects

Collaborative work

- Synergy of expertise
- Co-construction with the client
- Stakeholder engagement
- Use of a dedicated platform for project modeling

Projects structure

- Proven methodology
- Long-term vision
- Monitoring and commitment to results
- End-to-end support

Our references

Airspace reorganization in Sudan

Client : Civil aviation authority of Sudan
Scope : En route

As part of the Sudanese airspace restructuring, we contributed our expertise through an initial assessment, the proposal and simulation of new reorganization scenarios (both accelerated and real-time), a safety study, as well as change management support including technical workshops (CDM, CCO/CDO), awareness sessions, and air traffic controller training.

Optimization of Vietnam's airspace

Client : VATM (Project carried out with Navblue)
Scope : Approach and tower

As part of the airspace optimization for the Hanoi and Ho Chi Minh City regions, our company provided its expertise to support the increase in traffic at Noi Bai and Tan Son Nhat international airports. The project included a gap analysis between the initial situation and the expected outcomes, the design of concepts of operations (CONOPS) for optimized connectivity between the two cities, as well as support for real-time simulations and validation of the proposed solutions.

Optimization of Bogota's airspace

Client : Civil aviation authority of Colombia
Scope : Approach

This project, part of the modernization of Bogotá's airport system, aimed to study 14 scenarios to define a new operational concept for the TMA. We provided a detailed methodology, analyzed the current situation and previous studies, evaluated the scenarios based on criteria such as air traffic control, capacity, efficiency, performance, weather, and environment, and designed the initial procedures for the selected scenario. This work aimed to support industry stakeholders in managing the growth of air traffic.

RNP-AR Feasibility Study on Airfields in the Himalayan Region: Pakistan

Client : Pakistan Civil Aviation Authority
Scope : En-Route, Approach, Aerodrome, CNS, ATM

This project consists in studying the feasibility of improving the accessibility of Skardu, Chitral, and Gilgit airfields at all times through the implementation of RNP-AR procedures. Following a procedure design study conducted by CGX AERO, FRACS defines the airspace organization, working methods, and CNS resources to be implemented to ensure the safety of operations. Support for the civil aviation authority in managing this change is also provided by FRACS.

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