

## Seamless Airspace:

# Are Today's Flight Rules Ready for the Future of Aviation?

Think Paper of the CATS Global Council



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# 1. Introduction

The **Complete Air Traffic System (CATS) Global Council** is committed to enabling a globally harmonised, seamless airspace that integrates crewed, uncrewed, and highly automated operations safely and efficiently. As aviation enters a period of unprecedented transformation—driven by automation, digitalisation, and the introduction of new entrant aircraft—an urgent question emerges:

**Are today's flight rules and airspace structures fit for the future of aviation, or will they require fundamental reform?**

This Think Paper explores that question by examining whether the traditional frameworks of Visual Flight Rules (VFR) and Instrument Flight Rules (IFR) can continue to support the growing diversity of aviation activities. These legacy constructs—developed for human-piloted aircraft in relatively predictable environments—have served conventional aviation well for decades.

However, the rise of uncrewed aircraft systems (UAS), high-altitude platform systems (HAPS), electric vertical take-off and landing (eVTOL) aircraft, and highly automated operations introduces new challenges in performance, communication, conflict management, and coordination. As the aviation ecosystem grows increasingly complex, it is essential to assess whether the current methods of separation assurance and the allocation of responsibilities defined by existing flight rules can scale to maintain safety, efficiency, and equitable access—or whether a new generation of complementary rules, informed by automation, performance-based data, and flight path intent, will be needed.

## **Purpose of this Think Paper**

This paper aims to:

1. **Identify key gaps and challenges** in current flight rules and airspace structures in the context of increasingly diverse and automated aviation operations.
2. **Propose areas for research** into new or adapted flight rules that support an integrated, dynamic, and scalable airspace.
3. **Stimulate dialogue** among regulators, industry, and academia on how flight rules must evolve to support aviation's digital and operational transformation.

This Think Paper invites the global aviation community to move beyond exploration and begin shaping the future through collaborative action — developing tangible roadmaps, piloting new concepts, and collectively advancing the next generation of airspace management. The future of aviation demands bold thinking, shared responsibility, and a commitment to global harmonisation —not just to address challenges, but to unlock transformative opportunities.

## 2. The CATS Global Council Vision

The CATS Global Council envisions a future airspace that is:

- **Seamless** – enabling conventional and emerging aviation operations with varying levels of automation to operate in shared airspace harmoniously, safely, and efficiently.
- **Digitally Enabled** – leveraging automation, data-sharing, digital sensors, and advanced communication technologies to enhance real-time situational awareness and coordination across diverse operations. This vision aims to enable seamless integration between traditional and emerging users while minimising additional equipment or procedural burdens on conventional VFR/IFR operations.

This vision is outlined in the **CATS Concept of Operations (CONOPS) for Future Skies**<sup>1</sup>, which provides a strategic roadmap for transforming Air Traffic Management (ATM) by 2045. The CONOPS describes a three-phase evolution, culminating in Phase 3: Seamless Airspace, where digitalisation and automation converge to support highly integrated operations across all aircraft types and altitude layers.

This Think Paper supports **Phase 3 of the CATS CONOPS**, by focusing on one of its foundational enablers: the evolution of flight rules and airspace structures to support global interoperability and scalable integration. It asks whether existing VFR and IFR can evolve to accommodate future operations—or whether an additional, adaptable operating mode is needed to guide the next era of aviation.

### Linking to the CATS CONOPS Roadmap

The CATS CONOPS envisions several key transformations that underpin the transition to seamless, future-ready airspace:

- **Evolving Flight Rules and Airspace Structures:** Legacy rules are challenged by diverse performance profiles and operational behaviours. A move toward digitally enabled, dynamic airspace frameworks is needed to accommodate both crewed and uncrewed operations at scale.
- **Advanced Automation in Aircraft Systems:** Aircraft will increasingly rely on onboard automation, AI-driven decision-making, and machine-to-machine (M2M) communication to safely operate in complex, shared airspace environments.
- **Dynamic Separation and Collision Avoidance:** The evolution from fixed separation minima to dynamic, context-aware deconfliction will enable more efficient and flexible airspace use. With advancements in detect-and-avoid capabilities and cooperative surveillance technologies—such as upgraded TCAS, ADS-B IN, and target-to-target flight path intent exchange—tactical, in-close separation becomes feasible. This opens the door to advanced concepts like “fello’fly”<sup>2</sup> and wake energy retrieval techniques, designed to maintain safe distances through automated coordination.

### Alignment with ICAO’s Strategic Frameworks

This work aligns with ICAO’s long-term vision, including the ICAO Strategic Plan for 2026-2050 and the Global Air Navigation Plan (GANP). It supports the evolution of globally harmonised, performance-based frameworks and complements ICAO’s efforts to safely integrate new entrants and automation through scalable, interoperable airspace solutions.

<sup>1</sup>CATS CONOPS for Future Skies (2025):  
<https://www.futureskyvision.com/cats-conops>

<sup>2</sup>[https://www.icao.int/environmental-protection/Documents/EnvironmentalReports/2022/ENVReport2022\\_Art39.pdf](https://www.icao.int/environmental-protection/Documents/EnvironmentalReports/2022/ENVReport2022_Art39.pdf)







## 2.1 Glossary of Key Concepts

This glossary provides a working lexicon of terms critical to the evolving airspace management ecosystem. As we envision the integration of new technologies and operational practices, these terms represent key concepts without rigid definitions to allow flexibility in adapting them to future advancements.

- **Flight Rules:** Regulatory, procedural, and technical frameworks that facilitate safe aircraft operations within the airspace. These rules define standards and protocols for navigation, separation, surveillance, and communication—guiding aircraft in maintaining coordinated, conflict-free flight. Traditional flight rules include VFR and IFR, which rely on visual cues or instrument-based navigation, respectively and fixed separation standards for IFR. Additionally, specialised operating modes—such as those for balloons or military aircraft—provide tailored provisions for unique mission profiles. As new entrants and technologies emerge, future flight rules may authorise digital self-separation and assign accountability to operators based on defined conflict management performance requirements.
- **Unoccupied Aircraft** - An aircraft that is not designed to carry any people (whether crew or passenger).
- **Highly Automated Aircraft System (HAAS):** An aircraft of multi-aircraft (fleet) system where individual aircraft functions and tasks are performed by automation, such that the operation of the system is done by an organisation with novel roles (system management organisation) rather than by individual controllers or pilots. HAAS enables an aircraft's core operational tasks to run with minimal human intervention, and incorporating actions that support efficient, safe operations whether in controlled or uncontrolled airspace.  
  
Examples:
  - A large fleet of HAPS providing connectivity services, for which operations are managed by a System Management Organisation (rather than Remote Pilots).
  - A large delivery operation performed with small UAS for which operations are managed by a System Management Organisation (rather than Remote Pilots).
- **Autonomy:** Ability and authority to independently determine the course of action without control from an external entity (whether human or system).
- **Automation:** The application of technology, programs, or other processes to make an apparatus, a process or a system operate automatically.
- **Uncrewed Aircraft** - An aircraft that is operated without a human pilot on board.

### 3. Why Change is Needed: Challenges Driving the Evolution of Flight Rules

As aviation enters an era marked by automation, uncrewed operations, and increasingly diverse performance profiles, the foundational structures of airspace management—namely flight rules and airspace classifications—are showing their limitations. These legacy frameworks were designed for a world of human pilots, conventional aircraft, and predictable flight patterns. They are now under pressure to accommodate:

- High volumes of automated and heterogeneous operations
- Varying levels of situational awareness and equipage
- New operational paradigms that no longer fit traditional VFR/IFR assumptions

These emerging challenges and misalignments make evolution essential, not optional. To ensure future airspace is scalable, interoperable, inclusive and automation-ready change is needed.



## 3.1 Redefining Roles and Responsibilities in Airspace Management

ATM has long relied on clearly defined human roles. Traditional flight rules are built on established roles for pilots, controllers, and Air Traffic Services (ATS), which assume that pilots will visually monitor their surroundings to maintain safety, particularly under VFR. Under IFR, controllers provide tactical separation and maintain wide situational awareness, coordinating traffic through structured procedures and voice or datalink communication. These assumptions depend on the presence of onboard pilots, real-time decision-making, and human-to-human coordination.

Emerging concepts such as Highly Automated Aircraft Systems (HAAS)—in which large fleets are managed by system management organisations rather than individual pilots—further accelerate the need to redefine responsibility, authority, and accountability. In HAAS models, many traditional roles may be distributed across digital actors, with supervisory oversight rather than direct control.

**Key Challenge:** Who is responsible for separation in highly automated operations where aircraft, procedures and airspace are all in advanced states of automation?

- As uncrewed and highly automated aircraft enter the airspace, these roles begin to erode. Many new operations rely on remote pilots, ground-based operators, or fully automated systems—raising fundamental questions about how responsibilities for separation, situational awareness, and operational control should be defined and shared.
- This is not a minor adjustment. It requires a fundamental rethinking of how roles are defined, and responsibilities are assigned. Future frameworks must support the safe delegation of separation and decision-making to automated systems, remote supervisors, or system management organisations—without compromising public trust, operational traceability, or regulatory clarity.

### Research Need:

- How to structure responsibility handovers in highly automated airspace.
- Responsibility (the obligation to act), authority (the legal or operational mandate to act), and accountability (being answerable for outcomes) must all be reassessed in the context of novel actors and new service models.
- How to assign roles to digital actors while preserving fairness and safety.
- Determining when and how separation responsibility can be delegated to human supervisors, automated systems, or service providers;
- Clarifying the operational roles of each actor (including fallback or exception management);
- Studying how to advance human-machine teaming and defining evolved roles of human actors in highly automated ATM.
- Ensuring that delegation frameworks uphold transparency, accountability, and operational safety—while recognising that fairness does not imply uniform or continued access for all users, but rather alignment with the performance and expectations of each operational context.
- Identifying unintended consequences, such as the implications for environmental performance.



## 3.2 Enabling Performance-Based Separation and Deconfliction

Today's separation standards are largely static, based on broad assumptions about conflict risk, aircraft capabilities and fixed airspace structures. While effective in conventional aviation, these one-size-fits-all rules do not scale to a world of diverse performance profiles, extended mission durations, and automation-centric operations.

Aircraft such as high-endurance drones, fast-moving eVTOLs, supersonic flights, and persistent HAPS challenge uniform standards. They vary significantly in speed, manoeuvrability, equipment, and intent-sharing capabilities. Future frameworks must move beyond legacy separation margins to adopt tailored, context-sensitive solutions.

### Key Challenge:

- The future requires dynamic, performance-based separation minima—defined by actual aircraft behaviour, automation capabilities, and operational risk context—not simply by airspace class.
- The legacy model assigns separation responsibility based on pilot or controller roles, underpinned by qualitative assumptions about communication, surveillance, and human judgement. However, automation demands quantifiable, adaptable frameworks that operate reliably at scale.

### Research Need:

- Develop performance-based separation frameworks that reflect the operational intent-based behaviour of aircraft rather than traditional categories.
- Identify which airborne systems can safely self-separate and under what conditions.
- Validate hybrid systems combining automated separation (for capable fleets) with strategic deconfliction services (for mixed-equipment environments).
- Examine the architecture of all three layers of separation management—strategic (planning and flow), tactical (near-term conflict resolution), and collision avoidance (last-resort

manoeuvres)—to determine how they can be delivered by a mix of ANSPs, third parties, onboard systems, and vehicle-to-vehicle (V2V) logic.

- Assess means to enable different types of aircraft—such as autonomous, crewed, and remotely operated—to safely coexist in the same airspace, and determine what types of deconfliction rules or separation standards would apply to each.
- Explore how self-separating aircraft can maintain appropriate and timely responsiveness to ATC interventions during contingencies or emergencies, including the development of protocols that ensure they can safely yield space to aircraft experiencing abnormal situations.

A hybrid model is likely to emerge, combining:

- **Distributed capabilities:** such as certified automated self-separation system, cooperative vehicle-to-vehicle (V2V) communication, and integrated sensor fusion, enabling automated self-separation where feasible.
- **Centralised services:** including strategic conflict detection, predictive flow management, and intent-based coordination—especially useful in environments with varied levels of equipment or automation.
- **Federated services** where certified third-party service suppliers may offer separation services particularly in the cooperative airspace

Crucially, these systems must operate with measurable and predictable outcomes, enabling regulators, operators, and the public to trust that automated systems can manage separation reliably and fairly, and that they will be responsive to automation failures or adverse events.

The core question is not whether separation minima must change, but how to achieve equivalent or better safety performance through new mechanisms—while managing compromised access or interoperability of legacy operations. This includes exploring the role of tailored separation minima, as outlined in the CATS CONOPS.







## 3.3 Modernising Infrastructure: From Systems to Seamless Services

The traditional CNS (Communication, Navigation, and Surveillance) infrastructure was designed to support human-in-the-loop aviation, relying heavily on voice communication, ground-based navigation aids, and radar surveillance. This legacy architecture, while robust and reliable for conventional aviation, is increasingly inadequate for managing the growing diversity and automation levels of future operations—ranging from low-level eVTOL corridors to persistent stratospheric flights.

Emerging operations differ not only in performance but also in how they access and interact with airspace services. Urban air mobility may rely on localised, cloud-enabled services and dense route networks; high-altitude operations demand persistent, wide-area situational awareness; and legacy aviation continues to depend on certified, guaranteed infrastructure. The future system must accommodate all these needs within a unified, interoperable infrastructure—without fragmentation or duplication.

**Key Challenge:** How can infrastructure evolve to support dynamic, scalable, and mission-adaptive service delivery?

- Existing systems are largely centralised, platform-specific, and designed around pre-defined operational categories. This limits the flexibility required to support new service-based models and real-time interoperability between ATM, UTM, AAM, and space operations.
- A shift is needed from monolithic, technology-specific infrastructures to modular, digital service architectures that provide functions—such as separation, route negotiation, or weather integration—as accessible, interoperable services.
- Interoperability must be built into the infrastructure itself, enabling harmonised integrated coordination across domains, actors, and operational types without mandating one-size-fits-all technology adoption.

Infrastructure evolution must support tailored service provision based on aircraft profile, automation level, and mission complexity. Services should be accessible through open digital interfaces (e.g. APIs), allowing actors to plug into the system dynamically—rather than being locked into static infrastructures or fixed procedural pathways.

If all operators are connected to a shared network, cooperation becomes significantly easier, enabling performance-based separation based on real-time intent, trajectory, and aircraft characteristics. This approach could reduce the infrastructure footprint and improve interoperability among different airspace users.

### Research Need:

- **Define service-oriented architectures** that allow for scalable and flexible infrastructure provisioning, decoupled from specific platforms or vehicle types. Explore how modular services (e.g. conflict detection, route negotiation, or advisory management) can be accessed through common digital layers, without forcing uniform technology adoption. The architecture should enable strategic, tactical and collision avoidance services from a variety of cooperative sources as necessary (e.g., centralised, decentralised, federated, V2V).
- **Identify service needs for self-separating operations.** These operators may not require traditional separation services but do need high-quality information services—such as real-time traffic, airspace constraints, and weather—tailored to their performance and mission. Research should determine how to deliver these services reliably and equitably within shared airspace, ensuring interoperability without fragmentation.
- **Develop interface standards** to enable secure, highly integrated and harmonised real-time coordination between service providers and airspace users supporting cross-domain services such as conflict detection, trajectory management, and system-wide information sharing.
- **Assess infrastructure requirements** not only by altitude or operation type, but by actual service demand—enabling fit-for-purpose solutions for low-level urban operations, extended-range flights, and persistent high-altitude missions alike.
- **Support mixed-mode environments**, where conventionally piloted aircraft and digitally-coordinated vehicles operate side-by-side.



## 3.4 Evolving Terminology for Highly Automated Operations

Much of today's aviation terminology—such as Visual Flight Rules, Instrument Flight Rules, or pilot-in-command—is grounded in a human-in-the-loop paradigm. These terms carry implicit assumptions about who is in control, how decisions are made, and how responsibility is assigned.

As we transition to a world of highly automated and uncrewed operations, priority should be given to developing a new terminology that reflects emerging operational models, the role of digital actors, and the realities of machine-led decision-making.

### Key Challenge:

Terms like “responsibility,” “command,” or “visual separation” may not make sense—or may be misleading—when operations are coordinated by systems rather than people. This creates ambiguity in both legal accountability and operational coordination, especially when machines are interacting with human actors in mixed-mode environments.

### Human Factors Link:

Clear, unambiguous terminology is essential for trust, predictability, and coordination—especially at handover points between humans and machines (e.g. remote supervisors and autonomous vehicles, or ATCOs managing hybrid airspace).

### Research Need:

- Define new terminology that accurately reflects roles in machine-led, service-based, and digital coordination environments.
- Clarify how terms like pilot, operator, service provider, system manager, and flight are applied in contexts where roles may be virtual or distributed.
- Standardise communications protocols and interaction models between automated systems and humans.
- Define advanced concepts like human-machine teaming, identifying that evolution in ATM must occur not just in the realm of automation, but also in the human roles and working methods within a highly automated human-machine teaming model.

This is not a cosmetic or linguistic update—it is a safety enabler. Clear, consistent and globally recognised definitions, roles and responsibilities are the foundation for certifiable procedures, automation validation, regulatory frameworks, and public understanding.

## 4. A Framework for Digitally-Enabled Airspace Operations

The increasing complexity of aviation—driven by automation, new entrants, and mission diversity—demands more than incremental reform. The next generation of flight operations requires a digitally enabled, performance-based system that supports both human-and machine-coordinated trajectories in shared, dynamic airspace.

Legacy rules and infrastructure, centred around voice-based comms and human-centred decisions, are no longer sufficient. A future-ready framework must provide predictable, scalable, and interoperable services across varying equipage levels, autonomy states, and operational environments.

The framework should accommodate both traditional flight rules (e.g. VFR and IFR) and emerging digitally driven operations that rely on computer-based automation. It must enable harmonised integration interoperability between crewed, uncrewed, and highly automated systems, allowing multiple modes of operation to coexist in shared or adjacent airspace. Flexibility will be essential to preserve safety while supporting innovation and diversity in aircraft capabilities.



## 4.1 Core Features

### a) A Unified Yet Flexible Structure

The future framework must accommodate traditional flight rules (e.g. VFR and IFR) while enabling digitally coordinated operations driven by automation. It must avoid fragmented solutions by establishing one unified, digitally enabled operating mode that can be flexibly applied across different environments and use cases. This unified structure ensures compatibility and interoperability while avoiding the inefficiencies and risks of fragmented, siloed approaches that may be developed independently and prove incompatible over time.

Flexibility within this structure can be achieved by assigning tailored performance requirements and operational parameters based on the mission profile, airspace environment, or aircraft capabilities. This allows for scalable adaptation without sacrificing cohesion or safety.

This structure should support:

- Harmonised integration interaction between crewed, uncrewed, and highly automated systems.
- Multi-modal operations in shared or adjacent airspace.
- Flexible access policies tailored to performance and mission needs.

### b) An Automated Strategic Deconfliction Core

Increasing diversity in aircraft performance, automation levels, and operational concepts makes compatibility a key concern. For example, current IFR/VFR structures may fail to ensure effective separation when mixing slow, persistent aircraft with high-speed or agile vehicles. Likewise, tactical self-separation may be ineffective if aircraft have incompatible capabilities or generational mismatches.

A strategic, automation-enabled deconfliction layer is needed to coordinate flight intent and reduce reliance on static segregation. This core will help ensure that tactical self-separation, when required, is reserved for scenarios where participants are demonstrably interoperable and capable.



### c) Tactical Deconfliction in a Highly Automated Environment

In certain environments, tactical deconfliction may be managed by the aircraft's onboard systems or supported by external services, depending on operational complexity, airspace density, and the interoperability of participants. In all cases, the operator remains accountable for the actions of their aircraft, even when functions are automated or supported externally.

Two modes may emerge:

- **Self-Separation** (analogous to VFR for highly automated systems): Aircraft equipped with certified automation and situational awareness capabilities may manage separation autonomously within defined airspace structures and operating conditions. This model is suited for environments where traffic is sparse, predictability is high, and interoperability can be assured. Operator accountability remains intact, with human oversight and intervention protocols needed in edge cases, failures, or transitional phases.
- **(Automated) Separation Services** (analogous to IFR, potentially supported by automation): In more structured or constrained environments—such as terminal areas or dense corridors—centralised separation services may be required. These services may be automated, but responsibility for separation lies with the service provider, consistent with current IFR principles.

The key question is not whether automation is used, but under what operational and safety conditions a centralised service is necessary to ensure safe trajectories and equitable access.

### d) Performance-Based and Mission-Oriented Adaptation

Rather than applying rigid, one-size-fits-all rule sets, the future framework should enable flexible application of rules based on certified aircraft capabilities and operational context. Separation standards, for example, could adapt in real time to parameters such as navigation precision, surveillance performance, or manoeuvring characteristics.

This approach allows airspace access and operational procedures to be tailored to the specific needs of each mission—whether it's low-level urban mobility, long-range automated flight, or conventional crewed aviation—while maintaining safety and interoperability across all users.

## 4.2 Transition Strategy: From Concept to Capability

Building a digitally enabled airspace system is both a technological transformation and a regulatory challenge. Success will depend on coordinated global action, shared validation processes, and equitable implementation strategies.

### Key priorities:

- **Develop Scalable Automation Protocols** that enable predictive, self-coordinated operations and harmonised integration of crewed and uncrewed systems at scale.
- **Enhance Global Regulatory Alignment** to strengthen cooperation among ICAO, regional regulators, and industry to create shared standards that reflect modern technologies and operational models.
- **Invest in Next-generation Capabilities** such as AI-based separation models, advanced CNS systems, and cybersecurity infrastructure that ensure safe and resilient operations.
- **Establish a Common Reference System for Azimuth, Altitude, and Time** to enable all airborne vehicles to seamlessly negotiate deconfliction using true north heading and track, geoid-referenced altitude, and a unified time standard. Relying on disparate magnetic models, pressure-based altitudes, or inconsistent time sources will undermine target-to-target deconfliction and compromise interoperability.
- **Support Research and Expand Industry-Academic Partnerships** to validate emerging technologies, design risk-based performance frameworks for digital airspace operations, and study the evolution of human roles and competencies in the needed human-machine teaming models of the future.
- **Ensure Equitable Access Across Equipage Levels.** One of the greatest challenges to automation will be accommodating the lowest-equipped aircraft, particularly in environments where full traffic conspicuity is not yet guaranteed. Systems must be designed to gracefully manage a mixed-equipage ecosystem, balancing innovation with inclusivity. Resistance to change—particularly from operators reliant on legacy technologies—must be proactively addressed through clear transition strategies, incentives, and robust backward compatibility.
- **Define the Future Separation Management Framework.** Identify strategic, tactical, and collision avoidance layers—and assess corresponding architecture options for managing separation across diverse operational context.

### A Vision for the Future

The airspace of tomorrow must be built on **trust, transparency, accountability and shared responsibility**—not just technology. A digital airspace framework must work for all stakeholders and be resilient, and globally interoperable. By aligning regulatory foresight with innovation, the aviation community can ensure that the benefits of automation are both scalable and universally accessible.

This vision is not about replacing the past—it is about evolving with purpose.

## 5. Final Thought and Next Steps

The aviation system is at an inflection point. Emerging operations—powered by advances in automation, evolution of the human role, digital connectivity, and emerging aircraft types—are testing the limits of airspace frameworks designed for a different era.

Adapting today's rules isn't enough. We must design for the world we are entering, not the one we're leaving behind. That world is digitally coordinated, performance-based, and globally integrated—a world in which the skies are managed in a harmonised integration of both humans and machines.

This Think Paper contributes to the broader vision of the CATS CONOPS for Future Skies, particularly Phase 3: Seamless Airspace. It outlines a path toward harmonised flight operations that integrate crewed, uncrewed, and highly automated systems safely and efficiently.

### Next Steps

#### 1. Conduct Targeted Research

Promote targeted research to assess the operational concepts, enabling technologies, and system architectures needed to support next-generation flight rules. This includes investigating how responsibility, authority, and accountability should be allocated among human and digital actors; defining fallback mechanisms; and developing legal and operational frameworks to support safe, fair, and transparent role distribution in highly automated environment.

#### 2. Launch Coordinated Demonstration Projects

Encourage key stakeholders—including regulators, ANSPs, industry, and research institutions—to align their ongoing and planned demonstration activities with the research priorities outlined in this paper. Real-world trials should aim to validate concepts such as machine-supported separation, digital flight rules, and

interoperable operations across varying levels of performance and automation. International coordination will help ensure that outcomes are scalable, consistent, and globally relevant.

#### 3. Define a Global Transition Roadmap

Develop a globally supported roadmap to guide the transition from today's air traffic system to a digitally coordinated airspace environment. This roadmap should prioritise foundational projects, such as automated separation trials, digital flight rules prototyping, and mixed-equipage integration models.

#### 4. Strengthen Global Regulatory Alignment

Enhance cooperation through ICAO and regional frameworks to advance harmonised standards that reflect the realities of automation, new actors, and emerging responsibilities in airspace management.

#### 5. Invest in Digital Infrastructure and Cyber Resilience

As the system becomes more connected, cybersecurity and digital integrity must be treated as critical infrastructure. Future solutions must embed secure-by-design principles and support resilience against evolving threats.

#### 6. Build an Inclusive, Scalable Ecosystem

Balance innovation with access. One of the most persistent challenges will be ensuring safe integration of legacy aircraft without holding back innovation. Research should focus on full conspicuity solutions, equitable access models, and practical transition strategies.



# A Call to Action

The vision laid out in the CATS CONOPS is bold—and necessary. This Think Paper supports Phase 3: **Seamless Airspace**, not with abstract principles, but with a clear argument for why evolution is essential and what that evolution must involve.

This Think Paper serves as a **call to action** for aviation stakeholders, regulators, and researchers to move from exploration to structured collaboration — advancing global harmonisation, adaptability, human and technological progress through tangible roadmaps and pilot projects that demonstrate what the next generation of airspace management can deliver.

**The transformation of flight rules and airspace structures is no longer a theoretical discussion—it is an operational and regulatory necessity. The question is no longer if the system must evolve, but how, how fast, and how fairly that evolution will unfold.**

**Let's move forward—together—with bold thinking, shared responsibility, and future-ready action.**

**Join the conversation on shaping the skies of tomorrow—share your insights with the CATS Global Council at: <https://futureskyvision.com/>**

