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ICB

Industry Consultation Body

ICB VISION FOR A SINGLE EUROPEAN SKY

2035

"An innovative, efficient, resilient, globally interoperable and sustainable European ATM network, delivering predictable and seamless operations for passengers and the aviation supply chain"

1 FOREWORD BY THE ICB CHAIRS TEAM

The role of the Industry Consultation Body (ICB) is to advise the European Commission on the development and delivery of the Single European Sky (SES). The previous ICB vision, from 2015, needed to be updated to account for recent developments affecting European ATM Performance. The ICB also notes recent recommendations from the Wise Persons Group (WPG) Report, the Airspace Architecture Study (AAS) Report, the Network Strategy Plan and the draft 2019 ATM Master Plan. The industry stakeholders (airspace users, air navigation service providers, airport operators, suppliers, social partners and professional staff) have met over the last 12 months to review and agree what the SES should look like in 2035. The output is this revised ICB vision.

In 2035, the European ATM system will be innovative, efficient, resilient, globally interoperable, delivering predictable and seamless operation for passengers and all airspace users including the aviation supply chain. Its core elements are based around four pillars: safety/cyber-security/sustainability; network-centric planning with seamless operations; clear roles and responsibilities for a simplified institutional environment; and using economic regulation to stimulate and accelerate the required network performance.

An unprecedented degree of cooperation between the institutional and industry levels will be required to deliver the optimum network performance over the next 15 years. There is a real sense of urgency to ensure that the network capacity meets demand using new concepts of operation and the associated technological developments whilst maintaining today's excellent safety record. The new ICB Vision recognises that the industry partners, tasked with the delivery of the required performance level, are ready and willing to rise to this challenge enabled by a supportive legislative programme, regulatory oversight and with a strong industry governance incentivised to deliver the Digital European Sky.

The ICB members are fully committed to supporting the European Commission in achieving the refocused goals of the SES, to engage fully in the next steps and the associated consultation process with industry. We are delighted to acknowledge the support of the industry partners and to thank them for their contribution to this vision over the last 12 months.

CHAIRS TEAM OF THE ICB

LEFT TO RIGHT:
LARRY JOHNSSON – ICB VICE CHAIR AND TSG CHAIR,
GERRY O'CONNELL – ICB CHAIR AND ISG CHAIR,
PATRICIA BIER – ISG VICE CHAIR,
MICHAEL MOWINSKI – TSG VICE CHAIR

2 | THE ICB'S VISION FOR 2035

An innovative, efficient, resilient, globally interoperable and sustainable European ATM network, delivering predictable and seamless operations for passengers and the aviation supply chain.

EXECUTIVE SUMMARY

As defined in EU regulation 549/2004, ATM is the aggregation of the airborne and ground-based functions (air traffic services, airspace management and air traffic flow management) required to ensure the safe and efficient movement of aircraft during all phases of operations. Ensuring the safe and efficient movement of aircraft will remain as essential in 2035 as it is today, for both flying and non-flying citizens.

By 2035 European ATM will be delivering optimum network performance at all times, for the benefit of both end users (passengers and cargo) and airspace users (commercial airlines, business and general aviation, drones, military and cargo operators).

The ICB recognises that there are several dimensions to network performance, including the existing Key Performance Areas (KPAs) of the SES legal framework (safety, cost-efficiency, capacity and environment) and other aspects of quality of service such as on-time performance. The challenge is both to balance these dimensions according to the needs of the network (driven by the macro-economic and geopolitical environment) and continually improve performance to give users increasingly better services.

Air navigation services will be delivered seamlessly to ensure that the airspace can match the demands of its users. As traffic grows and new airspace users emerge, it is imperative that the network can deliver the necessary capacity to enable a predictable service and is resilient to disruptions.

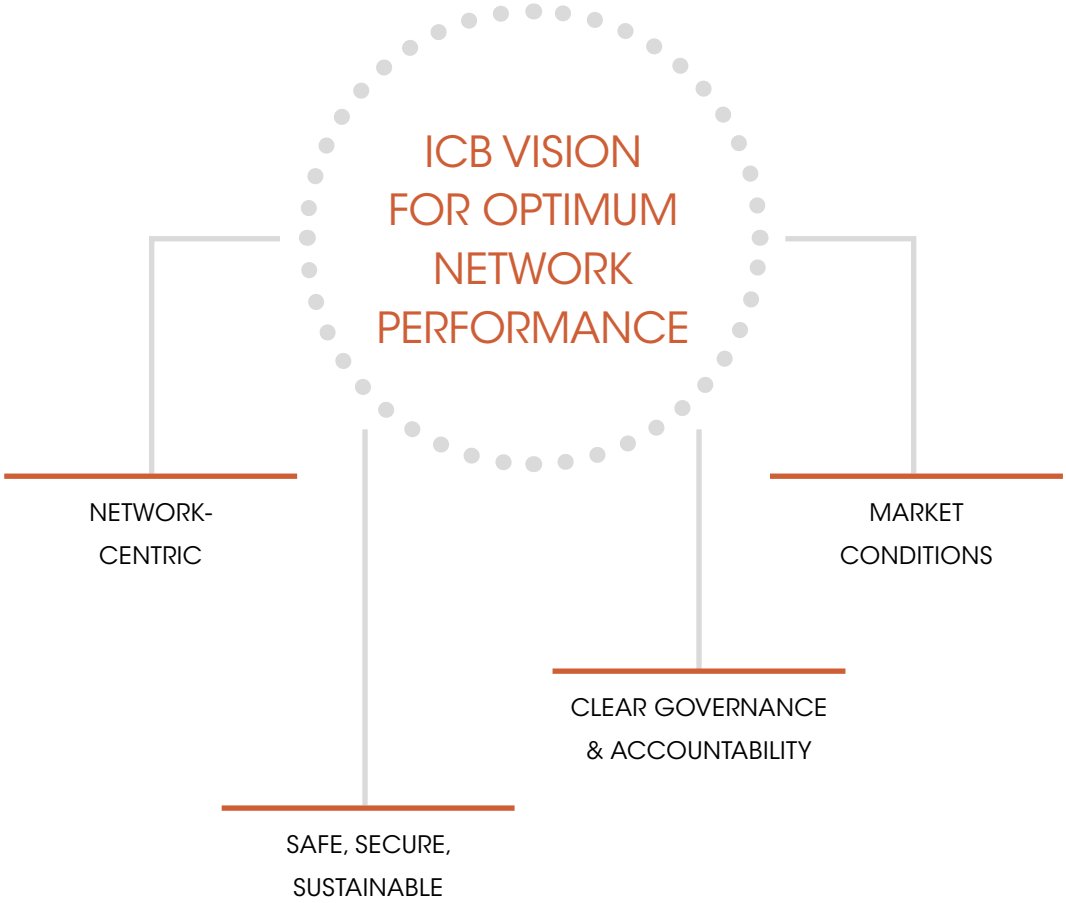
By 2035 there will be a fully optimised air traffic system, supported by high levels of automation that deliver seamless air traffic services both in upper and terminal airspace as well as in the airport environment. This will have been achieved by a careful and targeted implementation of SESAR technological solutions, bearing in mind that not one size fits all. The whole network will operate efficiently at optimal capability with the human at the centre.

States and institutions will have a clear assignment of roles and responsibilities that do not overlap or generate unintended consequences for industry. Industry will play a core role, not only in a formal governance, but also in the actual functioning (definition, planning, development, deployment and execution) of network tasks and functions. Industry will also play a core role in proper consultation mechanisms in the legislative processes.

In the absence of a market the effects of market conditions will be mimicked through use of economic regulation. This will help set the foundation for delivering the SES and the required network performance.

The ICB takes note of the 2019 WPG and AAS reports' major recommendations, and also the Network Strategy Plan and ATM Master Plan. Whilst broadly supporting the AAS, the ICB recognises the huge challenges and difficulties in elaborating the service model and architecture it targets. A stepwise roadmap, along with careful safety assessment and change management considerations, are needed to get there. ICB members express their readiness to actively participate in the ATM and airspace system transition plan elaboration.

The remainder of this vision sets out the underlying principles of European ATM in 2035, together with the key implications for the transformation ahead. The principles are grouped under the following four areas, which all enable optimum network performance in 2035.



3 | SAFE SECURE SUSTAINABLE

VISION

Safety and Just Culture are underlying principles of aviation and safety will always have primacy over all the other goals and principles. Safety is a core part of normal, every-day activities. Today's excellent safety levels will be maintained and improved where possible. Every stakeholder, including non-flyers, expect the highest levels of safety and environmental protection from noise and emissions. Safety is supported by a cyber-resilient ATM infrastructure and staff following operational procedures that underpin the Digital European Sky. Data integrity is a prerequisite when modernising ATM, managing growing traffic and busier skies, whilst enabling new entrants such as drones and vehicles operating above FL 600.

PRINCIPLES TO ACHIEVE THE VISION

Safety underpinned by Just Culture

Safety will continue to be the industry's priority and will be underpinned by a Just Culture enabling a positive and proactive approach to safety, which will be integrated into how business is done.

Safeguarding cyber-security of ATM systems and infrastructure

The cyber-security[1] of ATM services must also be safeguarded, thereby contributing to safe and resilient operations. This implies that safety and cyber-security requirements are designed in from the start, and prioritised during development, operations, maintenance and further evolution. The role of all actors, including ATSEPs, is crucial to achieve the required safety and cyber-security.

Human-centric approach

Future operational concepts enabled by new technology will change and/or complement the role of the human in the system. These changes will be managed and supported by the appropriate training and working environment. Keeping and enhancing the level of safety requires that the shift of risks is understood, and that proportionate responses and measures by an efficient human-machine system are developed.

The human-machine system is the integrated functioning of the human and machine in an ATM environment. A system that is based on a complementary approach between humans and technology is essential to enable more efficient use of data, and requires a human-centric approach to the implementation of decision-support tools.

It also supports a shift from air traffic controllers to air traffic managers and a transition from a geo-based licensing approach to system-based licensing. This human-centric approach is even more important with the upcoming digitalisation: with virtualisation and artificial intelligence, ATCOs will be able to act in any point of the network when necessary, making best use of digital technologies and increased automation.

Reducing environmental impact

In aviation there will be an even greater focus on the environment. Within the ATM sector, industry's commitment is to minimise fuel consumption through all phases of flight, notwithstanding all other improvements from elsewhere in the aviation industry. Commitment from all stakeholders to reduce the environmental impact of civil aviation will be addressed thanks to new concepts such as Trajectory Based Operations, which supports greater fuel efficiency, along with continuous descent and climb, which will reduce both emissions and noise.

[1] Cyber-security is the focus of this vision, but security is recognised as being broader, for example also including physical security of infrastructure.

4 | NETWORK-CENTRIC

VISION

The network[2] comprises all actors and elements that impact the movement of an aircraft through European airspace. Network performance will be enabled by a step-change in the level, quality and consistency of information shared between all operational stakeholders, coordinated by the Network Manager function. Its foundation will be principally based on the development and implementation of a comprehensive SWIM framework.

Operation plans for both the network and airports will be developed and integrated on an equal basis. Overall network performance will be prioritised over local performance and enhanced through balancing of all network activities while also considering interdependencies of KPAs at local level. Where local burdens are required to keep network efficiency at its optimum, resulting losses and gains will be allocated appropriately.

This new approach will require careful consideration of institutional and regulatory aspects to ensure appropriate governance and working arrangements that deliver the necessary balance between all stakeholders in the network. The end result will be optimum network performance, including predictability of operations and gate-to-gate punctuality, benefitting passengers and other end-users.

PRINCIPLES TO ACHIEVE THE VISION

Network-centric planning processes

Short- and medium-term[3] capacity planning will be coordinated at network level with network performance articulated in a network plan and agreed collaboratively. Planning processes will include commitments to ensure longer term investments such as infrastructure and manpower.

Interoperable systems will be available to optimise day-to-day network operations in real-time and at all stages of the planning and execution processes.

Clearly defined roles and responsibilities with collaborative decision-making processes

The regulatory framework will be clear about the roles and responsibilities of all actors and more effective and inclusive Collaborative Decision-Making (CDM) processes will help improve network performance. This implies that existing CDM processes, including the Network Operations Plan (NOP) and Airport Operations Plans (AOP), are refined and expanded. Through this, operational actors will be fully involved in network decision processes and the Network Manager function secures a strong commitment with and from industry. CDM processes should be extended to support trajectory planning.

[2] Network definition Regulation (EU) 2019/123 Article 3: the network shall include the airports, the airspace structures and interfaces that connect them, and the infrastructure and operational capabilities of the EATMN that together serve the civil and military airspace users.

[3] Short- to medium-term as defined in the Network Operations Plan is up to 5 years.

Seamless operations

Seamless operations will be the day-to-day reality of the future network. In the context of SES:

- For the human pillar it means operating in a safe and resilient working environment.
- For actors at the airports it means predictability as a contribution to the network operation facilitated by the ground coordinator.
- For airspace users it means operating, regardless of the area of their operation, without disruption or service degradation.
- For new airspace users it means safe integration with ATM.
- For Air Navigation Service Providers (ANSPs) it means collaborative working with other providers, with both airspace and service provision optimised according to traffic patterns.
- For member states and institutions it means supporting SES by providing sufficient legal and regulatory support.
- For technology[4] it means the operation of the European ATM Network (EATMN) in such a manner that from the user's perspective it functions as if it were a single entity.

One implication of this is that common, ICAO-aligned operational concepts (e.g. Free Route Airspace), harmonised services and optimised airspace need to be implemented across Europe.

Predictable operations from closer adherence to plans

Once the operation plans for the network and airports, which are updated over time and in real time, are agreed all actors will adhere to them to the greatest extent possible.

Every stakeholder will understand the network impact of decisions and the full implications of network issues such as knock-on delays, technical failures, weather disruption and crisis situations. At the same time network management will understand, and factor in, local issues using full situational awareness. Increasing the transparency of trade-offs in decisions engenders trust between operational actors.

[4] Seamless operation definition Regulation (EC) 549/2004, amended by Regulation (EC) 1070/2009.

Improved information quality and sharing

Data services will be a key part of a service-oriented model that supports true harmonisation of operational concepts. This implies that actors need the understanding, trust and mechanisms to share, manage and exploit information.

The legal and regulatory framework will facilitate and, where necessary, enable greater cooperation between all actors in advance of finalising plans, aiming to enhance network performance. In this process the accuracy and integrity of all relevant forecast data (meteorological, flight readiness, airspace and airport status, etc), with which ANSPs plan and operate, will be of increasing importance with the evolution to trajectory-based operations.

In particular improving the essential information needed for network management, in collaboration with operational actors, is the critical enabler for network planning and on-the-day decision-making. SWIM, including its standards, governance and services, will be the default means of sharing and managing information.

New operational concepts enabled by technology in the air and on the ground

Aircraft will fly their preferred trajectories without being constrained by airspace configurations. Business trajectories will be strategically de-conflicted. Operations are then based on optimised, accurate and constantly updated trajectory information. High trajectory performance will be a success factor of the future network, with a focus on minimal deviation from desired business trajectories. This implies that the necessary operational and technical enablers will be matured and safely deployed both in the air and on the ground in a harmonised way.

Emerging concepts will have moved operations away from one controller controlling all aircraft in one airspace sector. The legal, safety and operational issues of the new operational concept will have been overcome.

Enhanced civil-military coordination

Advanced cooperation, concepts and services will minimise the impact of the military's needs on civil aviation performance whilst still meeting military priorities and needs. More generally, the change to an emphasis on airspace management, rather than airspace ownership, will have to be supported by States. This change has the potential to unlock benefits of greater dynamic access for end-users and sharing of resources between civil and military.

Dual-use solutions and interoperability must also be ensured as they can support safety, regularity and efficiency of the whole aviation system, while also providing compliance with requirements of military air operations and training.

Flexible use of airspace will further contribute to the overall ATM performance gains with an expected proactive military contribution. Synergies will occur regarding dual-use, performance, network access and cyber-security. Coordination on the evolution of the CNS infrastructure will also save costs and provide a solution for spectrum congestion. Virtualisation, automation and digitalisation and artificial intelligence technologies will be key enablers.

Resilient service provision

As traffic grows and new airspace users emerge, the network must provide the necessary capacity to deliver a predictable service, resilient to disruptions. In this regard, service provision must be able to flex and scale to handle demand variations.

5 | MARKET CONDITIONS

VISION

European ATM will be increasingly provided through market-based approaches to services, for example marketable Terminal ANS (TANS), where a clear business case exists, but independent economic regulation at EU level will continue for monopoly services. Safety and cyber-security will always be assured by the institutional and regulatory frameworks.

PRINCIPLES TO ACHIEVE THE VISION

Economic regulation unless market conditions are achieved

Independent economic regulation at EU-level is needed today due to the monopoly position that ANSPs have. Competition for the market has been introduced at some tower and approach units, but competition has not been achieved at all units. Increasingly opening the market remains a critical goal for approach and tower services where feasible, so that airports have choices.

These principles will also be extended to the provision of other monopolistic services, such as CNS and data services. This competition may also support technical and operational consolidation on a voluntary basis and where a positive business case exists. Common rules are needed, with common application and a level playing field for service providers.

The need for economic regulation diminishes when the level of competition increases.

Performance-based partnerships for service provision

Cooperation between service providers should always be facilitated. Partnerships and alliances, where appropriate, will become a vital tool for meeting operational needs. They will be built around the commitment needed to deliver safe ATM and the performance outcomes defined at the policy level.

Partnerships predicated on a specific purpose to deliver operational value, regardless of their construct, will play an increasing role in delivering the 2035 vision. The current experience of Collaborative Decision Making (CDM) should be generalised at European level and made more efficient. The institutional framework should recognise the need for innovation in the sector arising from the Digital European Sky and foster the flexibility afforded with new technologies and market entrants.

Distinction and separation of infrastructure and services

Backed by positive, robust CBA and safety case, services and infrastructure can be distinguished and separated, catered for by the regulatory framework.

6 | CLEAR GOVERNANCE AND ACCOUNTABILITY

VISION

States and institutions will have a clear assignment of roles and responsibilities that do not overlap or generate unintended consequences for industry. The principles of Smarter Regulation will apply. Operational stakeholders have accountability for safe operations and technical deployment.

Industry will play a core role, not only in a formal governance, but also in the actual functioning (definition, planning, development, deployment and execution) of network tasks and functions. Industry will also play a core role in proper consultation mechanisms in the legislative processes.

Managed and accountable programmes will be established for major changes with strong direct industry involvement.

PRINCIPLES TO ACHIEVE THE VISION

Separation of regulation from ANS provision

Regulators will be clearly separated from ANS provision, allowing ANSPs to serve their customers. Regulators will continue to establish and oversee rules to protect safety, environment (e.g. noise and emissions), data, etc. These interests will be continually balanced and consulted according to the regulatory framework and through independent, capable and strong oversight from regulators.

Simplified institutional framework

By setting clear accountabilities, tasks and objectives and reducing consultation overheads, a simplified institutional framework will be established and support industry. There will be clear separation between the institutional framework – covering policy-making and performance target setting – from service provision. In the regulatory context, institutions will define what is expected. Industry, including the industry partnerships, will deliver against that objective, including deciding how it is best achieved and delivered. The result will be less complexity, faster decisions, which improves effectiveness, and more focused accountability.

Performance and output-based regulation

Regulation will only be used where it is needed and will be performance- and output-based.

Programme-based approach

Managed programmes are especially important when deployment includes several stakeholder groups (e.g. ground and air implementation) as the benefits only emerge when all parts have been implemented. For technical aspects much greater interoperability, based on common standards, will be part of an overall work programme for a Digital European Sky.

To support achieving the vision there should be incentives for early movers, subject to cost benefit analysis.

7 | ACHIEVING THE VISION

A vision sets an ambitious goal and direction but is only the start. There are many challenges and all parties - including institutions, regulators, and member states - must be committed to solving them. The ICB remains committed to providing the European Commission with industry's view of what must be done and how best to do it. Through its work programme it will continually define and advise on the next policy and programmatic steps to achieve the ICB vision for the Single European Sky.

ICB

Industry Consultation Body

ICB MEMBERS

A4E AIRLINES FOR EUROPE

Collins Aerospace

EUMETNET EUROPEAN METEOROLOGICAL SERVICES NETWORK

ACI EUROPE AIRPORTS COUNCIL INTERNATIONAL

EBAA EUROPEAN BUSINESS AVIATION ASSOCIATION

IAOPA EUROPE

AIR-E Airlines International Representation in Europe

ECA Piloting Safety European Cockpit Association

IATA

ASD AeroSpace and Defence Industries Association of Europe

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ETF EUROPEAN TRANSPORT WORKERS' FEDERATION

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