ICAO

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CAAS

Civil Aviation Authority of Singapore

AIR NAVIGATION WORLD 2023

ATM Procedures for Today

Overview

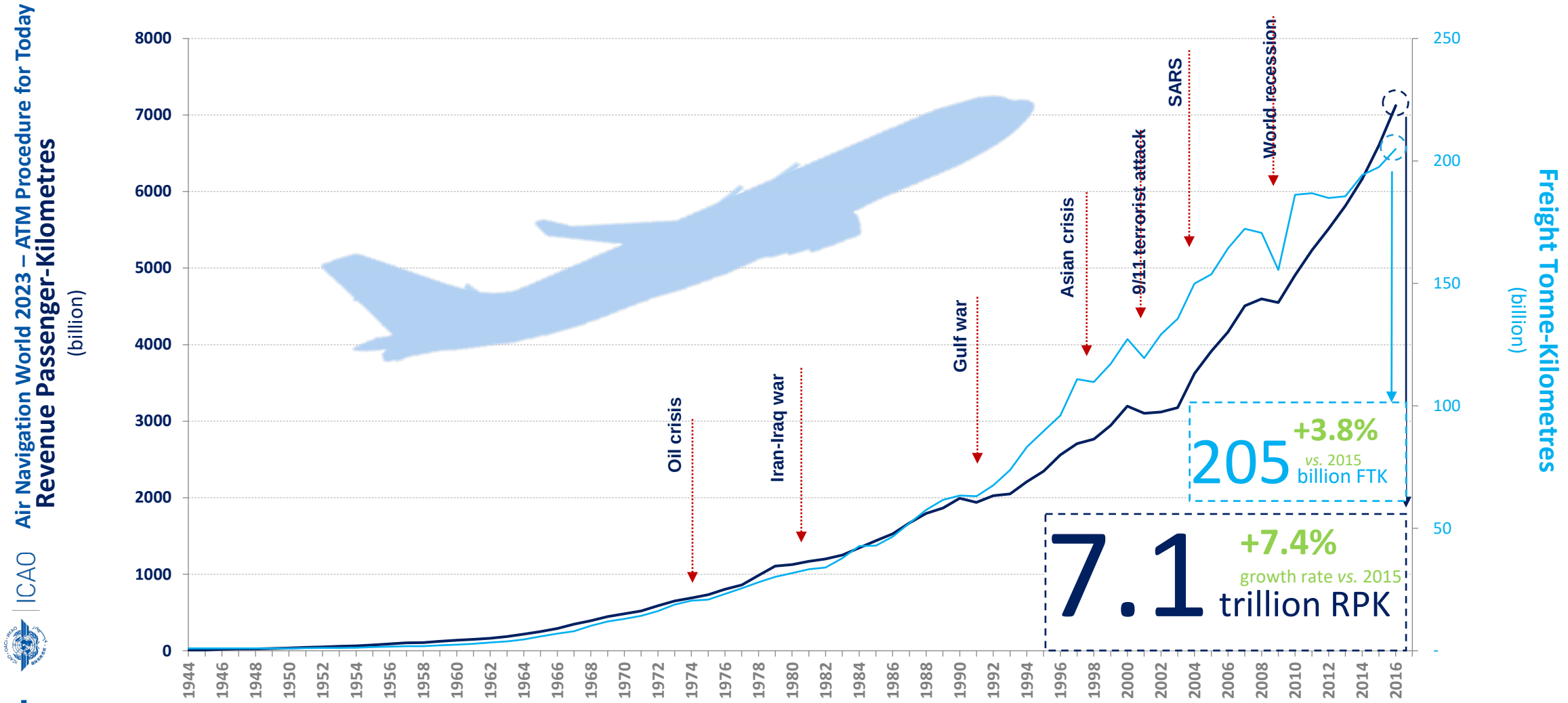
01 Facts and Figures

02 This event in the context of other ICAO initiatives

03 The first of its kind, why ?

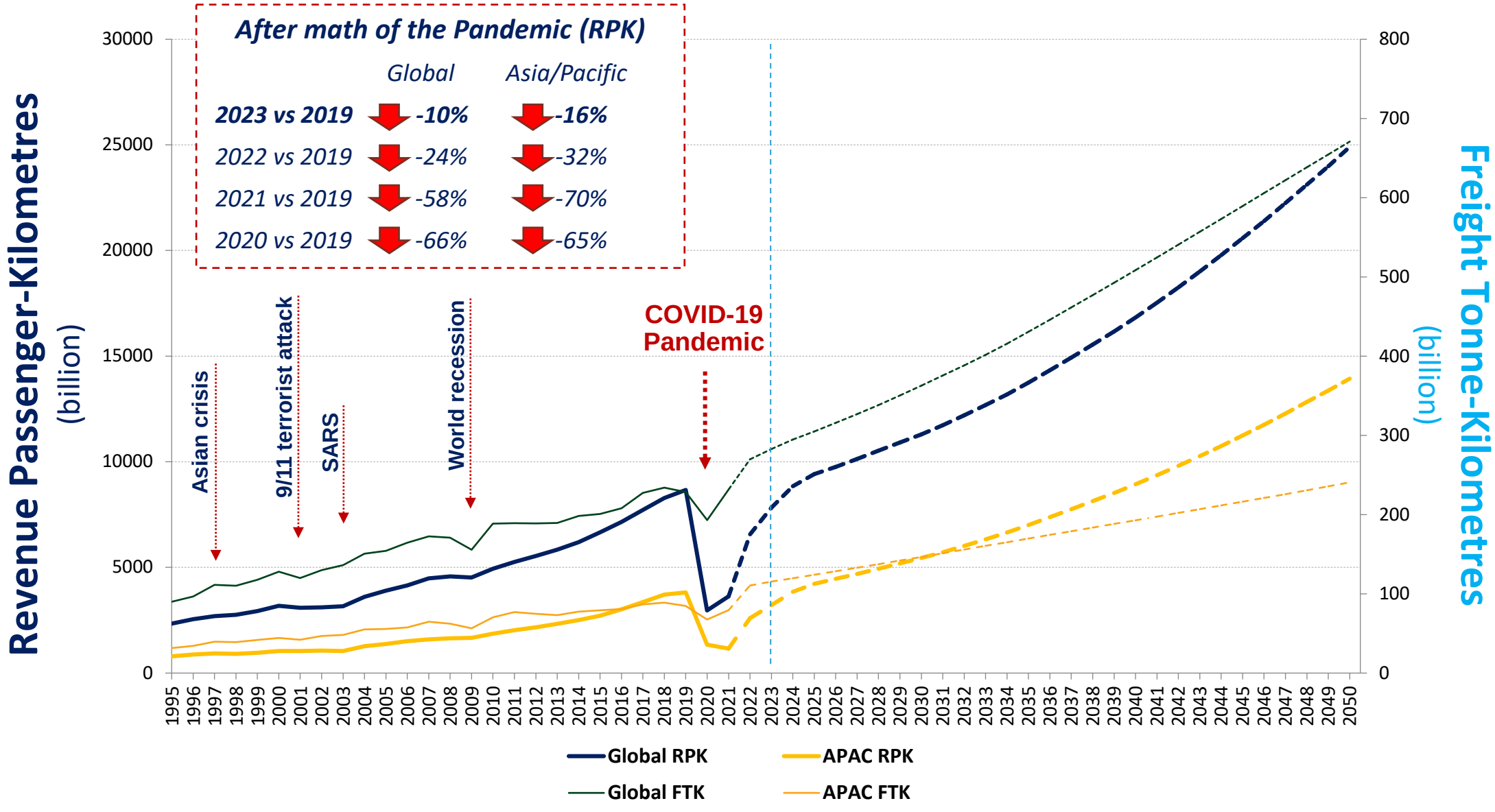
04 Some key take aways

Global traffic: Before COVID-19

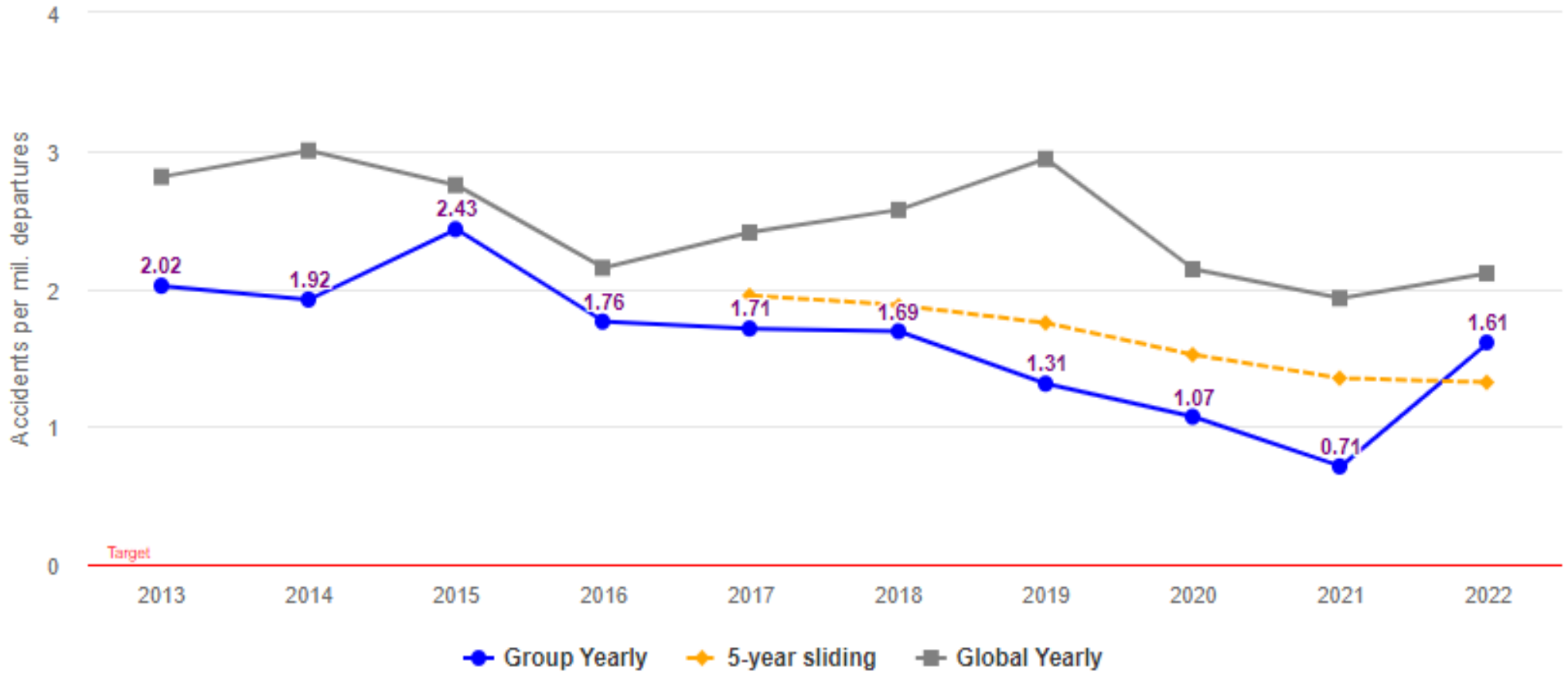


Source: ICAO Annual Report of the Council

Global traffic: The Pandemic and Recovery

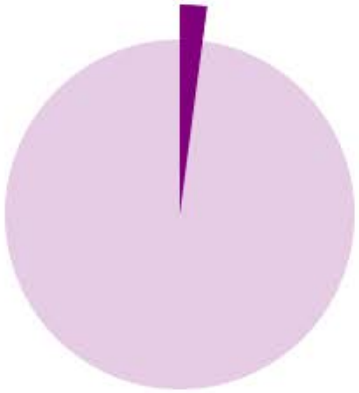


Accident Rate – Scheduled Commercial Above 5700 kg



Aviation and Environment

(Source: Air Transport Action Group Facts and Figures)



2.1%

The global aviation industry produces around 2.1% of all human-induced CO2 emissions.

12%

Aviation is responsible for 12% of C02 emissions from all transports sources, compared to 74% from road transport.

80%

Jet aircraft in service today are well over 80% more fuel efficient per seat kilometre than the first jets in the 1950s.

80%

Around 80% of aviation CO2 emissions are emitted from flights of over 1,500 kilometres, for which there is no practical alternative mode of transport.

ATM Performance Improvement Offers

Better safety measures

Aircraft operating cost saving

Passenger travel time saving

Fuel saving

Examples of ATM Benefits

Better safety measures

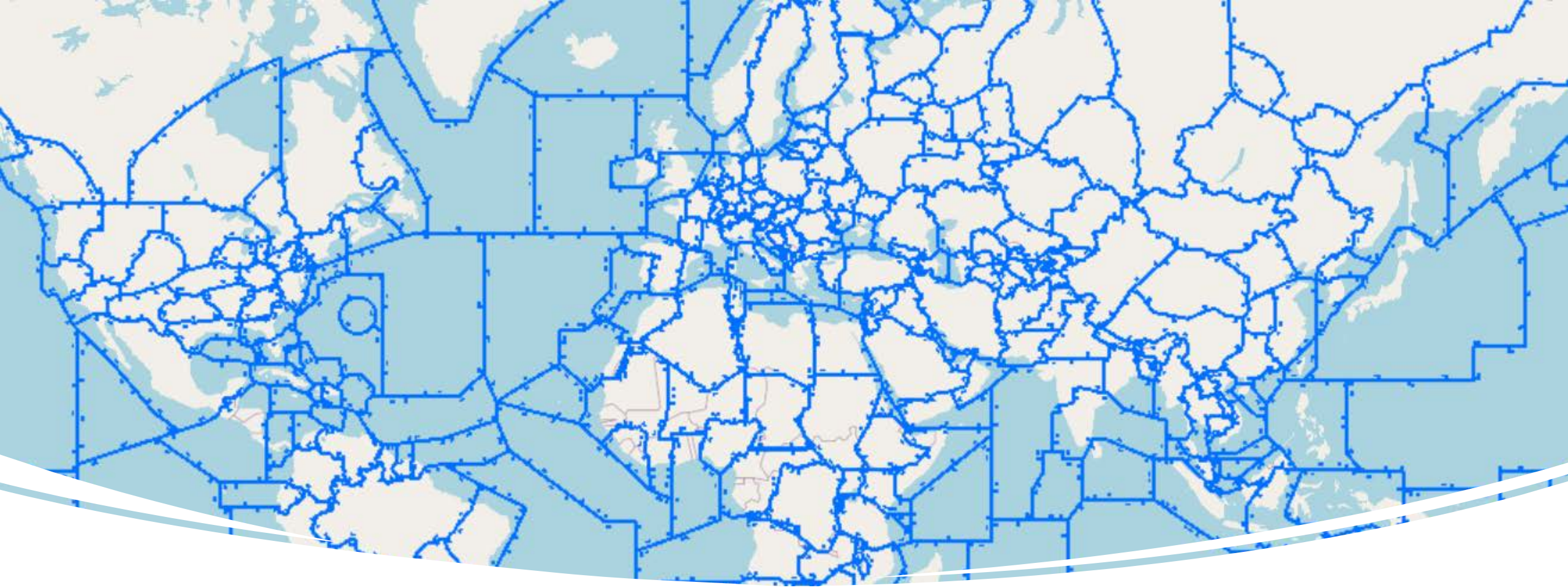
Enhanced ATS surveillance system tools provided earlier detection of unexpected deviations, enhanced weather avoidance, and emergency response capability. [Source: NAVCANADA]

Fuel-saving

With reduced separation in oceanic airspace, flights were 20% more likely to receive the requested trajectory. That represents approximately **1,760,000 kg of fuel saved**, which converts to a reduction of approximately **5.5 million kg of CO2** [Source: NAVCANADA]

Fuel-saving

With the use of Established on RNP (EoR) for one month, shorter tracks and continuous descents resulted in 80-90% less level flights. These benefits add up to **the equivalent of almost 10,000 cars being removed** from the roads.



Questions to Ourselves

- Are these benefits accrued around the world ? If not, why ?
- Is there anything that ICAO can do more to assist ?
- What can you - States and industry – do more ?

ANW-ATM in the context of other ICAO initiatives

- ICAO Assembly Resolution A41-21
- ICAO priorities for 2023-2025
- AN-Conf/14 in 2024

ICAO LTAG

LONG TERM GLOBAL ASPIRATIONAL GOAL FOR INTERNATIONAL AVIATION

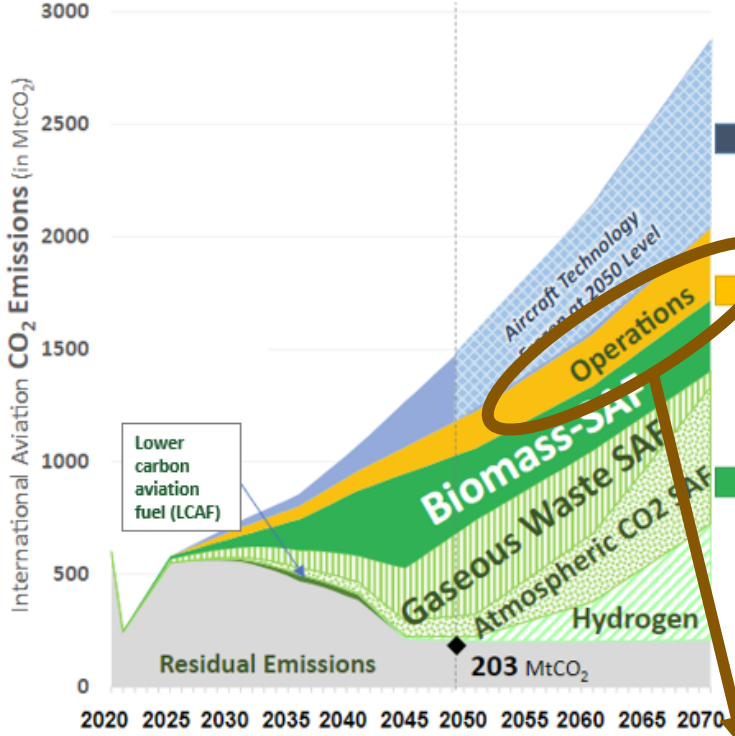
NET-ZERO 2050

Assembly Resolution A41-21

- In support of Paris Agreement’s temperature goal
- LTAG supported by wide range of stakeholders

LTAG - Technology, Operations, and Fuel

"When visualizing the ICAO basket of measures to reduce CO2 emissions, **Air Traffic Management (ATM) and operations are often overlooked** as one of the main measures to support the decarbonization process. However, despite being depicted as a small wedge, **ATM and operations offer the highest potential** for reducing CO2 and related **emissions in the short to medium term."** (ICAO 2022 Environmental Report)



Based on LTAG scenario with high ambition

Advanced tube and wing, unconventional airframe/propulsion concept aircraft, non-drop-in fuels such as battery electric etc.

Improvements in the performance of flights across all phases

Sustainable aviation fuels (SAF) and other cleaner energy have the largest impact (contributing more than half) on residual CO_2 emissions

Contributions from hydrogen may increase in the 2050s and 2060s if technically feasible and commercially viable

Can be implemented relatively quickly and widely

Assembly Resolution A41-21 Consolidated statement of continuing ICAO policies and practices related to environmental protection — Climate change

Recognizing that **air traffic management (ATM) measures** under the ICAO Global Air Navigation Plan **contribute to enhanced operational efficiency and the reduction of aircraft CO_2 emissions**;

. . .

25. *Requests* States to:

a) work together with manufacturers, air navigation services providers (ANSPs), aircraft operators and airport operators to accelerate the development and **implementation of fuel-efficient routings and air navigation procedures** and ground operations to reduce aviation emissions, and work with ICAO to bring the environmental benefits to all regions and States, taking into account the Aviation System Block Upgrades (ASBUs);

b) reduce legal, security, economic and other institutional barriers to **enable implementation of the new air traffic management operating concepts** for the environmentally efficient use of airspace;

. . .

26. *Requests* the Council to:

a) maintain and update guidance on operational measures to reduce international aviation emissions, and place emphasis on increasing fuel efficiency in all aspects of the ICAO's Global Air Navigation Plan (GANP); **encourage States and stakeholders to develop air traffic management that optimizes environmental benefits;**

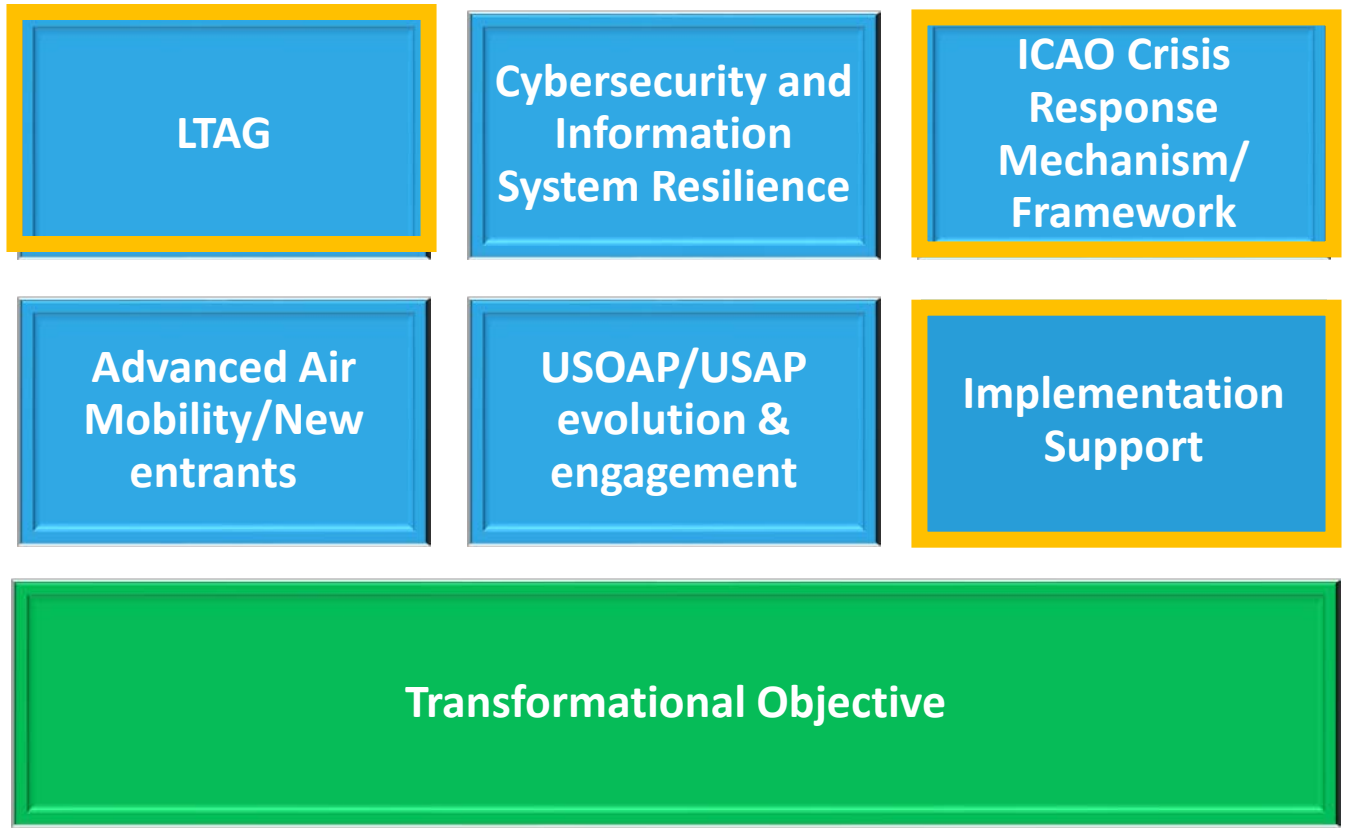
Organization-Wide Prioritization

Results-based ICAO Business Plan 2023-2025

- ICAO Secretariat reviewed Assembly resolutions and proposed follow-up action — Q4 2022
- Council (C228) agreed with follow-up actions and directed Secretariat for a re-prioritization of Business Plan — Q1 2023
- Secretariat executed re-prioritization and Council (C229) agreed to 7 Priority Focus Areas — Q2 2023

Global Priorities - Priority Focus Areas

ICAO Business Plan 2023-2025



Heads-Up to Future ICAO Decision-Making Events

AN-Conf/14

Montréal, 26 August – 6 September 2024

Theme: Performance Improvement Driving Sustainability

1. **Prioritization and long-term strategic planning**
2. **Timely and safe use of new technologies**
3. **Air Navigation System Performance Improvement**
   a) Proposals to improve the efficiency of Air Navigation Services contributing to LTAG
   b) Phasing out legacy systems
   c) Eighth Edition of the Global Air Navigation Plan (GANP)
4. **Hyper-connectivity of air navigation system**
   a) Connected aircraft concept and associated challenges
   b) Cybersecurity and information system resilience

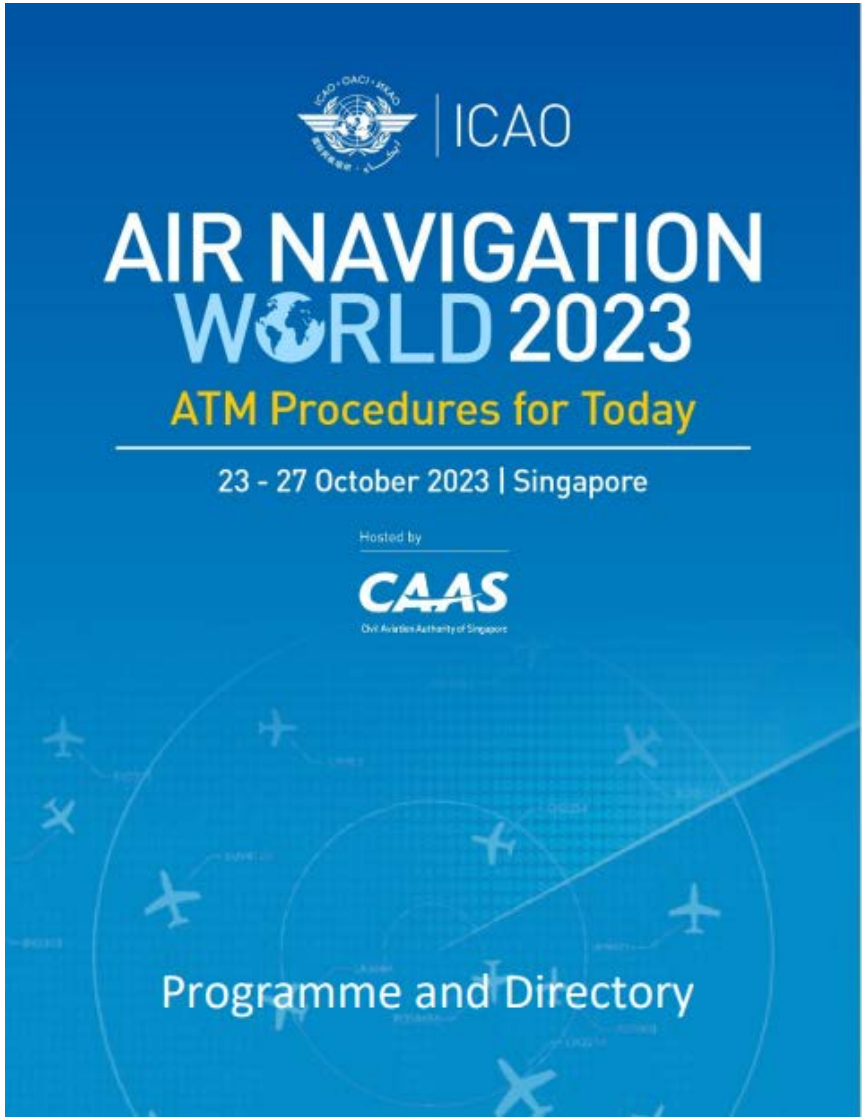
ANW ATM Procedures Today

- ✓ Wide range of ATM subjects
- ✓ The whole ICAO ATM Team from HQ and Regional Offices

Meet and Network with Speakers that are the Authors/Implementers of ICAO provisions

Amendment(s)	*Source(s)*	*Subject(s)*	*Adopted/approved Effective Applicable*
50-A (14th Edition)	Second meeting of the Operational Data Link Panel (OPLINKP/2); Twelfth meeting of the Instrument Flight Procedures Panel (IFPP/12); Meteorology (MET) Divisional Meeting (2014) (Recommendation 5/1 refers)	Provisions concerning performance-based communication and surveillance (PBCS); regulatory framework on instrument flight procedure design service; and consequential amendment concerning aeronautical meteorology.	22 February 2016 11 July 2016 10 November 2016

Amendment(s)	*Source(s)*	*Subject(s)*	*Adopted/approved Effective Applicable*
7-A (16th edition)	The Separation and Airspace Safety Panel (SASP), the second meeting of the Operational Data Link Panel (OPLINKP/2), the third meeting of the Air Traffic Management Operations Panel (ATMOPSP/3) and the Secretariat, the first meeting of the Flight Operations Panel (FLTOPSP/1), the sixteenth meeting of the Operations Panel Working Group of the Whole (OPSP/WG/WHL/16), the third meeting of the Aerodromes Panel (AP/3) and the Meteorology (MET) Divisional Meeting (2014).	Performance-based longitudinal and lateral separation minima and ADS-C CDP; separation between arrival and departure operations; DLIC, CPDLC, ADS-C, PBCS and SATVOICE; procedures used to vector for final approach, advising of TORA and SID/STAR; standard phraseology for ground and flight de/anti-icing crews; emergency descent procedures; autonomous runway incursion warning system (ARIWS); and forwarding of special air-reports and definition of SIGMET information.	6 June 2016 10 November 2016
9	The second meeting of the Separation and Airspace Safety Panel (SASP/2), the tenth meeting of the Wake Turbulence Specific Working Group (WTSWG/10) and the fourth meeting of the Meteorology Panel (METP/4).	Reduced lateral and longitudinal performance based separation minima, reduced wake turbulence separation minima, ATS surveillance separating minima where VHF is not available, special procedures for in-flight contingencies in oceanic airspace, strategic lateral offset procedures (SLOP), alignment of reporting of heavy dust and sand storms with Annex 3, and alignment with Annex 19 terminology for safety risk assessment.	19 May 2020 5 November 2020



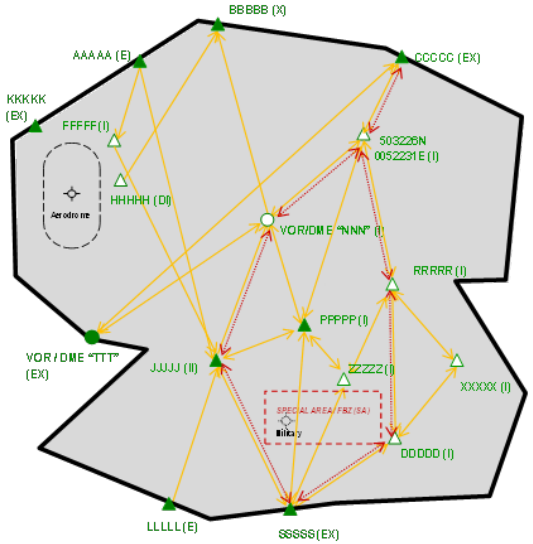
- Change management
- Implementation challenges
- Performance improvement options
- Getting ready for the future
- Test your ATM knowledge

Performance Improvement Options

- SID and CCO
- Reduced divergence departures procedures
- Reduced longitudinal and lateral separations in the oceanic and remote areas
- User Preferred Routes and Free Route Airspace
- STAR and CDO
- PBN instrument approaches
- Parallel approach procedures
- Enhanced wake turbulence separation minima

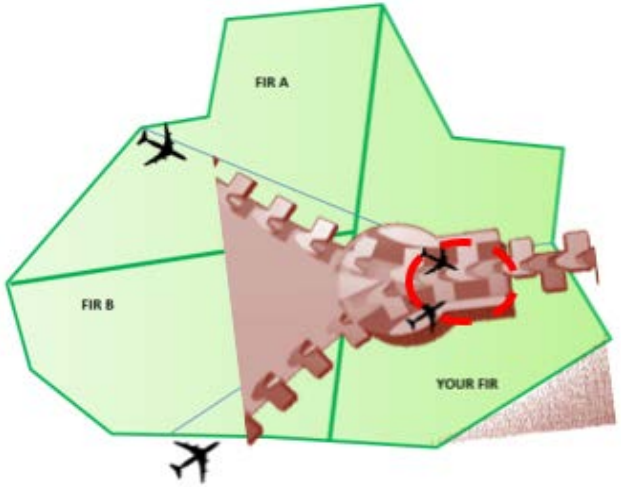
Performance Improvement Options (More)

Data Link



Free route airspace

Flight planning



Global ATFM

How to prepare for/respond to crises and contingencies

01 Air traffic management has a critical role in accommodating the expected growth of air traffic in a safe, efficient, and environmentally sustainable manner.

02 The ATM procedures are available today, but not implemented on a wider and more consistent scale.

03 When it comes to climate change, just as with safety, we must never stop asking what else we can do.

Thank You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