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INTERNATIONAL CIVIL AVIATION ORGANIZATION

A UN SPECIALIZED AGENCY

Thirty-Fourth Meeting of the Asia/Pacific Air Navigation Planning and Implementation Regional Group (APANPIRG/34)

(*Hong Kong, China, 11 to 13 December 2023*)

Air Navigation Global Developments

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Air Navigation Bureau Regional Coordinator
International Civil Aviation Organization

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Plan Overview

Traffic Overview

Aviation and Environment

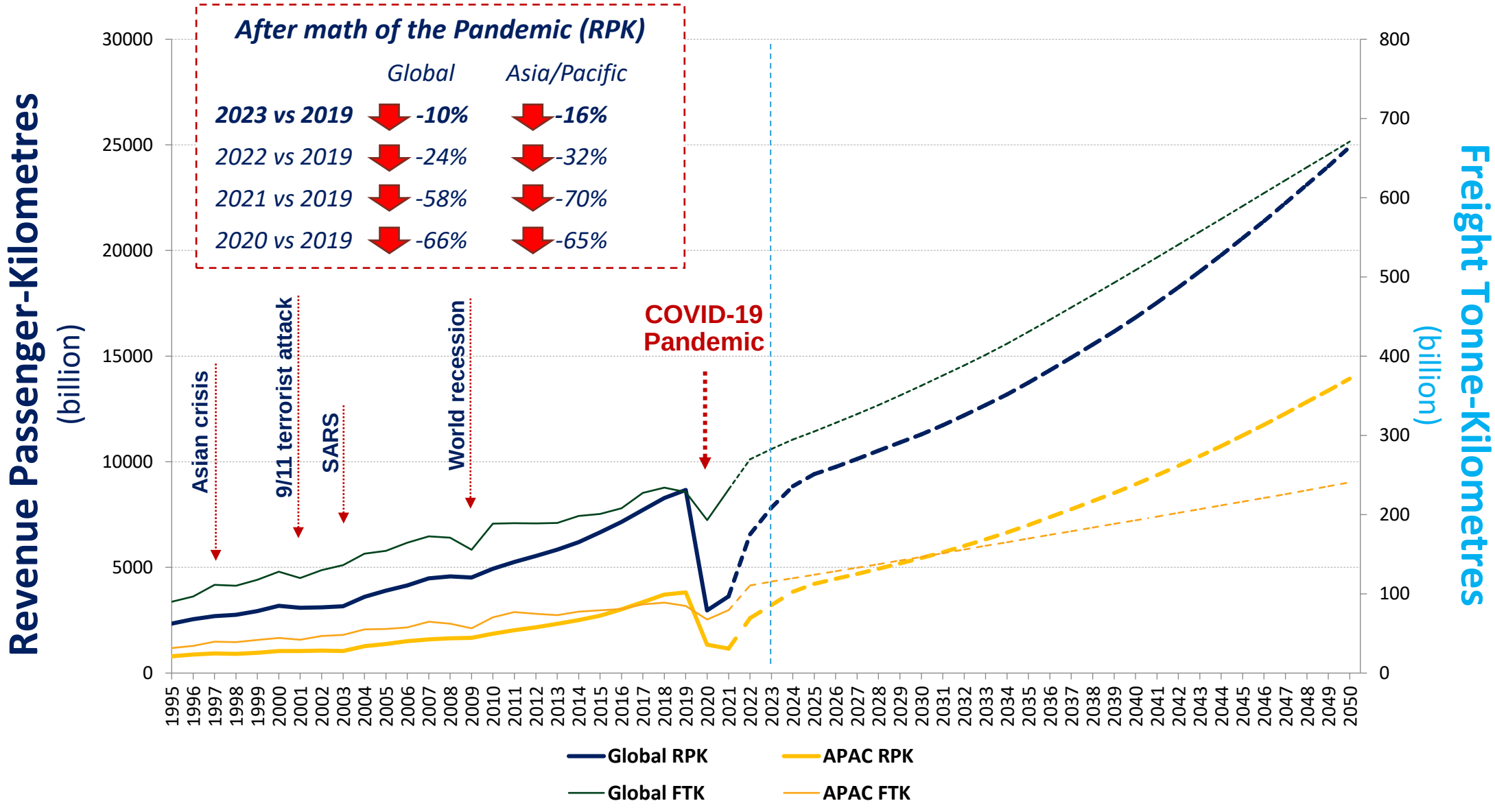
Priority Focused Areas

Global Events

Upcoming ICAO provisions

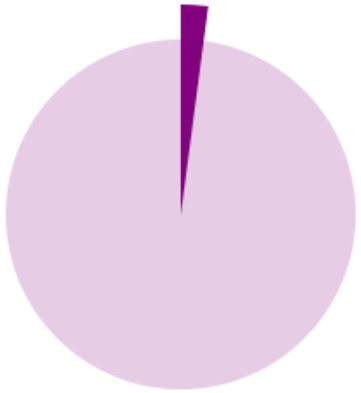
Summary

Global traffic: The Pandemic and Recovery



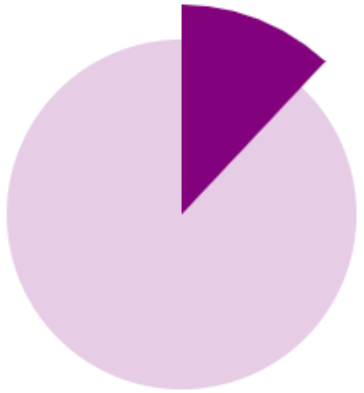
Aviation and Environment

(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.

ICAO LTAG NET-ZERO 2050

LONG TERM GLOBAL ASPIRATIONAL GOAL FOR INTERNATIONAL AVIATION

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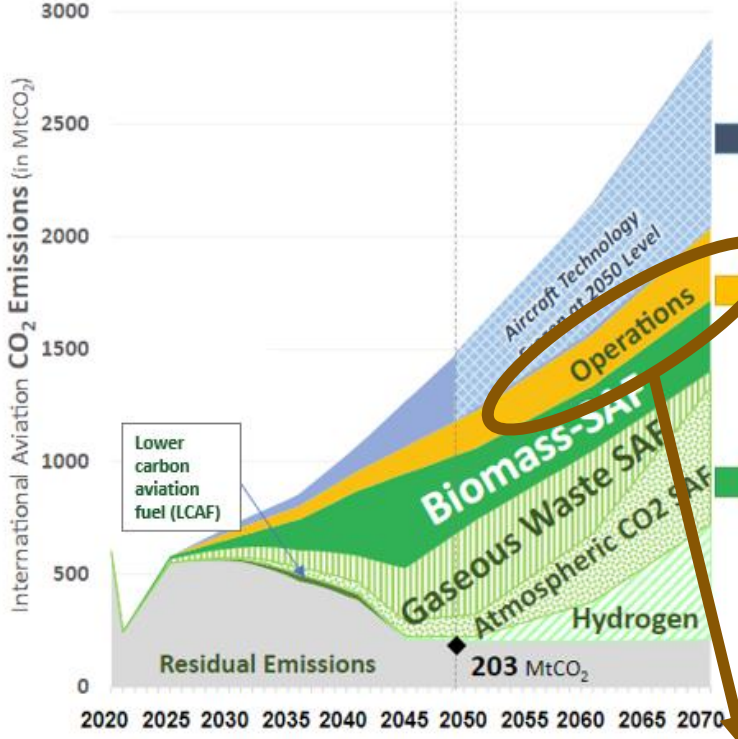
Assembly Resolution A41-21

- 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

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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;**

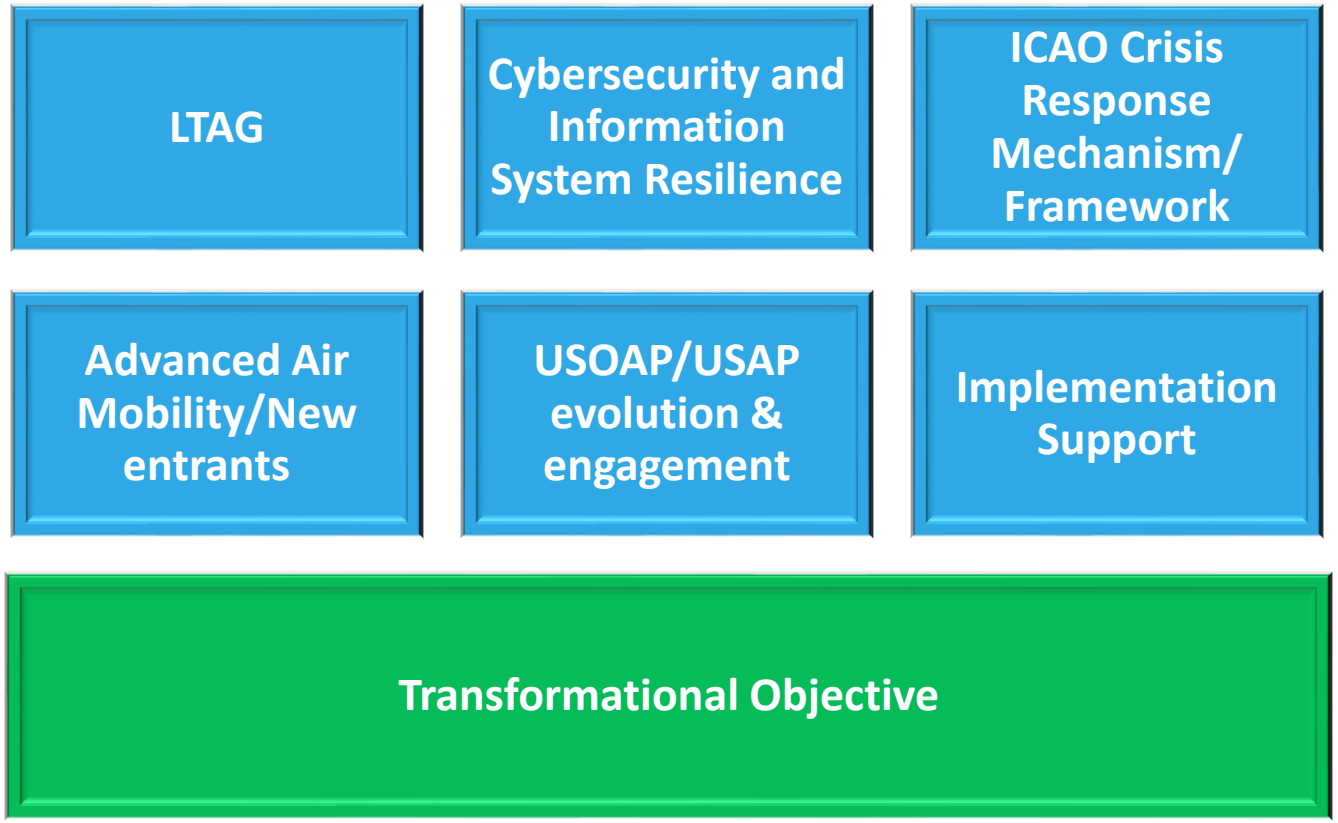
Organization-Wide Prioritization

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



Performance Improvement Offers

Better safety measures

Aircraft operating cost saving

Passenger travel time saving

Fuel saving

Examples of ATM Benefits

Better safety measures

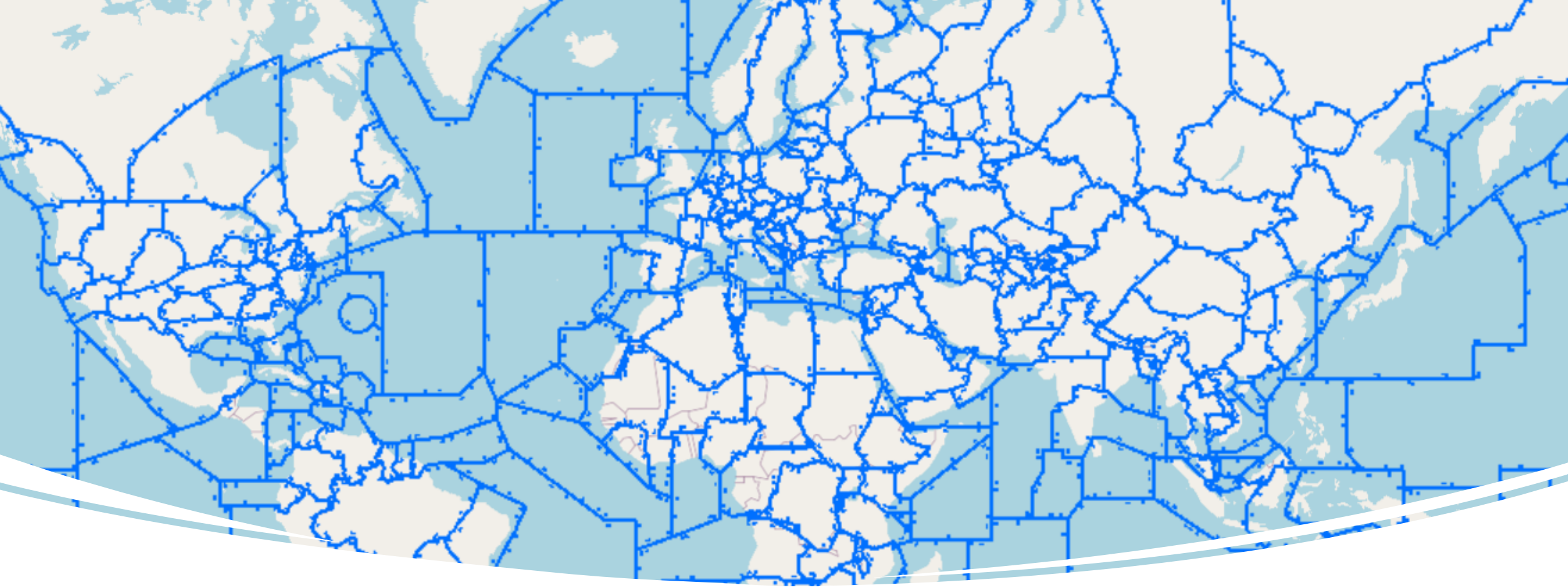
Enhanced ATS surveillance system tools provided earlier detection of unexpected deviations, enhanced weather avoidance, and emergency response capability. [Source: NAVCANADA]

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 ?

Heads-Up to Future ICAO Decision-Making Events

Montréal in August 2023: Shaping the Skies of Tomorrow

Singapore in October 2023: ATM procedures today

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AIR NAVIGATION WORLD 2023

Shaping the Skies of Tomorrow

28 - 31 August 2023 | Montréal, Canada

Performance-Based Aerodrome Operating Minima

Evolution of Aerodromes for Future Needs

Improving Safety of Helicopter Operations

Cross-Border Transferability of Aircraft

Future Meteorological Information and Services

NOTAM Replacement

Aviation Medicine

Electronic Certificates (Personnel Licences)

Future of Pilot Training

Higher Airspace Operations (HAO)

Future of the Air Navigation System

Modern Approaches to Aviation Safety

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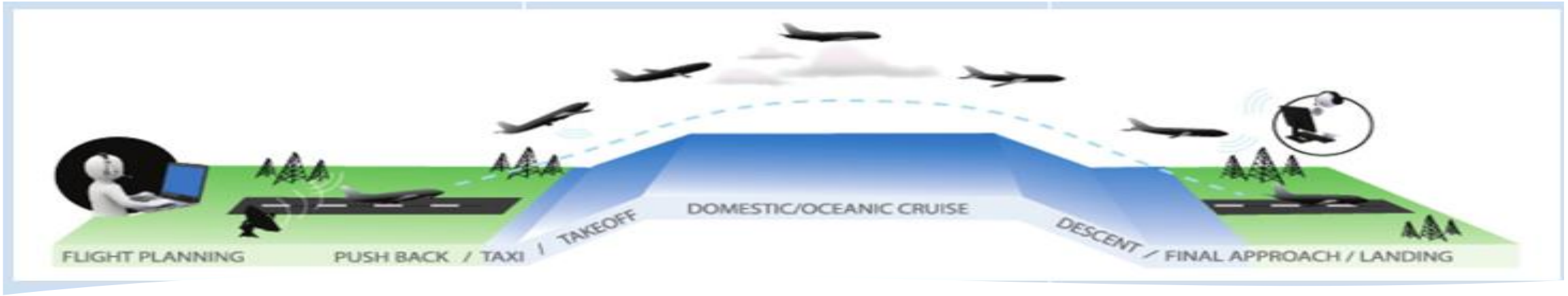

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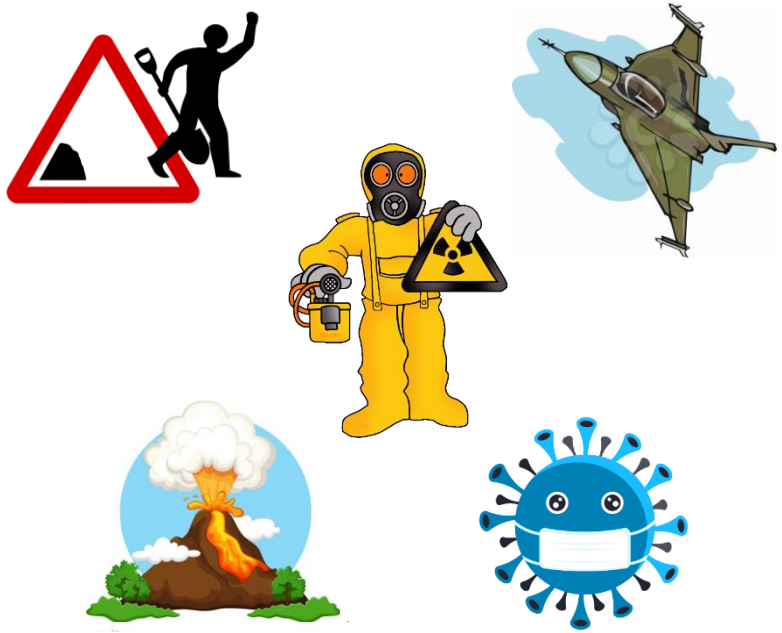
Performance Improvement Options

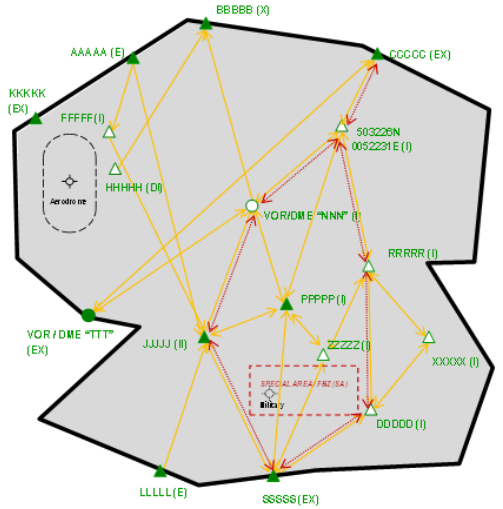
- SID and CCO
- Reduced divergence departures procedures
- Reduced longitudinal and lateral separations in the oceanic and remote areas
- STAR and CDO
- PBN instrument approaches
- Parallel approach procedures
- Enhanced wake turbulence separation minima

Performance Improvement Options (More)

Data Link

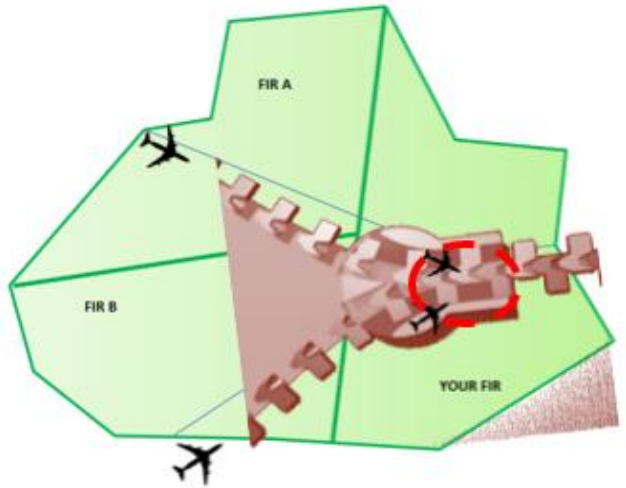
How to prepare for/respond to crises and contingencies





Free route airspace

FF-ICE



Global ATFM

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Further action to strengthen CNS systems resilience and mitigate harmful interference to GNSS

The 40th Assembly adopted the new **Appendix C to Assembly Resolution 41- 8**, which effectively constitutes the latest and most authoritative statement of ICAO policy on GNSS resilience.

On-Going - Near term Actions

The majority of the operative clauses are directed at States, starting with clause 7 ("*Urges* States to refrain from any form of jamming, or spoofing affecting civil aviation").

- Commensurate with the will and actions States and other parties involved, reduction expected to the impact of GNSS RFI, including reduction of spoofing.

On-Going - Long term Actions

Of the remaining clauses, one (clause 3) is addressed to SMO and industry, and "*Encourages* [them] to develop appropriate interference detection, mitigation and reporting capabilities for the aircraft on-board, satellite- and ground-based CNS system components".

- Coordination with relevant ICAO expert groups is expected.

The clause addressed to ICAO (clause 4) "*Invites* ICAO to ***develop high-level principles on how to integrate CNS ground, space and on-board systems and capabilities to obtain more resilient positioning and timing services***".

- This directive is aimed at the CNS Panels and the ICNSS-Task Force.

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Further action to strengthen CNS systems resilience and mitigate harmful interference to GNSS. cont.

Activities to mitigate harmful interference to GNSS

ICAO Middle East Region

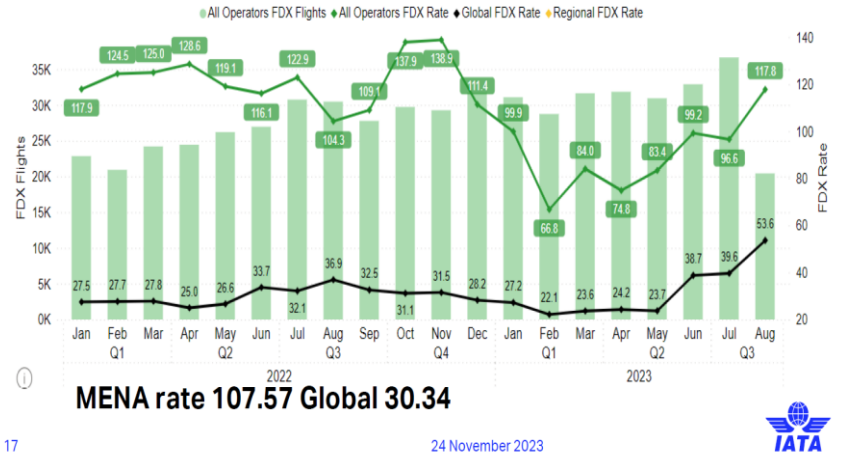
In 2019, **a regional safety advisory on GNSS vulnerabilities to mitigate the safety and operational impact of GNSS service disruption** was endorsed. The guidance includes reporting procedures in collaboration with IATA and actions to be taken by different stakeholders (pilots to report GNSS interference and ANSP to issue appropriate advisories and NOTAMs)

Regional efforts continue…including:

- Development of a NOTAM Template for GNSS jamming
- the possibility of establishing a regional monitoring system in collaboration with ACAO

To support the joint-effort monitoring the GNSS/GPS Interference in the region, IATA regularly publishes GNSS/GPS interference analysis.

GNSS/GPS Interference Trend (22-Aug.23)



17 24 November 2023 IATA

Next event:

ICAO EUR/MID Radio Navigation Symposium (Antalya, Türkiye , 6-8 February 2024)

Further action to strengthen CNS systems resilience and mitigate harmful interference to GNSS. cont.

Activities to mitigate harmful interference to GNSS

At WRC-23 (20 Nov-15 Dec 2023), concerns on harmful interference to GNSS were raised in the "Report of the Director on the Activities of the Radiocommunication Sector WRC-23 ITU".

ITU was informed *"a significant number of cases of harmful interference to the radionavigation-satellite service (RNSS) in the 1 559 – 1 610 MHz frequency band affecting receivers onboard aircraft and causing degradation or total loss of the service for passenger, cargo and humanitarian flights. In some cases, this has also led to misleading information provided by RNSS receivers to pilots"*.

Currently a relevant resolution is under development at the WRC-23. Namely:

DRAFT NEW RESOLUTION [EUR-A25-RNSS-INTERFERENCE-PREVENTION] (WRC-23)

Prevention and mitigation of harmful interference to the radionavigation-satellite service in the frequency bands [1 164-1 215 MHz,] 1 559-1 610 MHz [and 1 215-1 300 MHz]

Global Events in 2024


INNOVATION
FAIR
12
14
MARCH
2024


ICAO Global Implementation Support Symposium 2024
30 April - 2 May 2024 | Punta Cana, Dominican Republic
Optimizing Aviation Capacity: Strategies for Implementation Success


AAM 2024
ICAO'S FIRST ADVANCED AIR MOBILITY SYMPOSIUM
9 — 12 September 2024
ICAO Headquarters, Montréal, Canada

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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

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Upcoming ICAO Provisions

aircraft address assignment as a part of the registration process

RPAS inflight handing over control

remove the prohibition to duplicate information in the AIPs

space weather information service

updates to WAFS forecasts

GADSS data and information

Use of RNAV on conventional routes and procedures

Global Aeronautical Distress and Safety System (GADSS)

Time-based separation (TBS) minima for wake turbulence

Enhanced provisions related to safety performance management

relocate paragliding and hang gliding activities from NOTAM code

Enhanced provisions related to safety intelligence.

Publication of Final Reports

CHARTING NAVIGATION SPECIFICATIONS AND ACCURACIES

Investigations involving unmanned aircraft

frees aircraft from the requirement to operate on specified tracks or ATS route

Increasing State allocation of aircraft addresses

clarify the intent of the instances where the term “altitude” is used

The in-flight weather contingencies procedure

Remote air traffic services - minor editorial

Restructured Annex 3 and the new PANS-MET

RAPS ELTs

Deletion of unused registers F1 and F2

C2 Link resilience

RPAS Take-off and landing

Enhanced provisions related to State safety programmes (SSPs

quality assurance material in PANS-OPS, Volume II

AIRCRAFT WITH FOLDING WING TIPS.

clarify the existing definition for "meteorological authority"

IFP FOR HELICOPTER PBN OPERATIONS

Enhanced provisions related to safety management systems (SMs)

Deployable drift measurement devices

FF-ICE

RAPS Detect and Avoid

SAR point of contact responsiveness

first edition of PANS-IM

Global deficiencies in SAR

how to identify multi-part NOTAM

Consultation period of Final Reports

lower threshold MCTOM value for FDAP

Release of investigative information

dissemination of WAFS forecasts and VONA in IWXXM format

Quantitative volcanic ash information and IAVW updates

C2 Link switchovers

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SARPS and PANS are coming online next year

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If you are looking at growing your RPAS operations….

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Some new solutions are however foundational

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Operational Improvements

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Integrate Safety and Trend Analysis and Reporting System (iSTARS 4.0)

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iSTARS 4.0

- Web-based Modern Analytical Platform.
- Simple and convenient interface to safety and efficiency datasets.
- Web applications to carry out safety, efficiency, and risk analyses.
- Provides global and regional unique views.
- Customized regional analysis, targets and views.
- Better insights into aviation activities supporting decision-making based on national and regional data.

https://istars.icao.int

Consider the below in your planning at national and regional levels:

1. Traffic recovery and growth
2. Impact of Aviation on the Environment
3. ICAO reprioritization activities and Priority Focus Areas
4. ANW2023 and AN-Conf/14
5. Upcoming SARPs and PANS amendments
6. Take advantage of available ICAO procedures
7. iSTARS 4.0

Thank You

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