



ICAO GLOBAL AIR NAVIGATION PLAN (GANP) AVIATION SYSTEM BLOCK UPGRADES (ASBUS) DRIVERS



Prosper Zo'o Minto'o

Deputy Director,
International Civil Aviation Organization (ICAO)
Western and Central African Office

World Meteorological Organization
African Conference on Meteorology for Aviation (ACMA)
29 November 2018, Saly Portudal, Senegal



ICAO

UNITING AVIATION

Chicago Convention, 1944

Article 28

Air navigation facilities and standard systems

Each contracting State undertakes, so far as it may find practicable, to:

a) Provide, in its territory, airports, radio services, meteorological services and other air navigation facilities to facilitate international air navigation, in accordance with the standards and practices recommended or established from time to time, pursuant to this Convention;

b) Adopt and put into operation the appropriate standard systems of communications procedure, codes, markings, signals, lighting and other operational practices and rules which may be recommended or established from time to time, pursuant to this Convention;

c) Collaborate in international measures to secure the publication of aeronautical maps and charts in accordance with standards which may be recommended or established from time to time, pursuant to this Convention.



ICAO

International Standards
and Recommended Practices

Annex 3 to the Convention on International Civil Aviation

Meteorological Service for International Air Navigation

Part I – Core SARPs

Part II – Appendices and Attachments

Nineteenth Edition, July 2016

Doc 7475/2

WORKING ARRANGEMENTS
BETWEEN THE
INTERNATIONAL CIVIL AVIATION ORGANIZATION
AND THE
WORLD METEOROLOGICAL ORGANIZATION



SECOND EDITION — 1963

INTERNATIONAL CIVIL AVIATION ORGANIZATION

A Global Picture

4.1 BILLION

PASSENGERS

carried by airlines
(7.1% increase
from 2016)

53 MILLION

TONNES OF FREIGHT

carried by airlines
(4.0% increase
from 2015)

35 MILLION

**SCHEDULED
COMMERCIAL FLIGHTS**

flown by airlines
(3.7% increase
from 2015)

62.7 MILLION

JOBS SUPPORTED

54,000

ROUTES WORLDWIDE

(over 2,000 new
routes from 2015)

49 BILLION

KILOMETRES FLOWN

by airlines
(5.3% increase
from 2015)

76 MILLION

HOURS FLOWN

by airlines
(5.0% increase
from 2015)

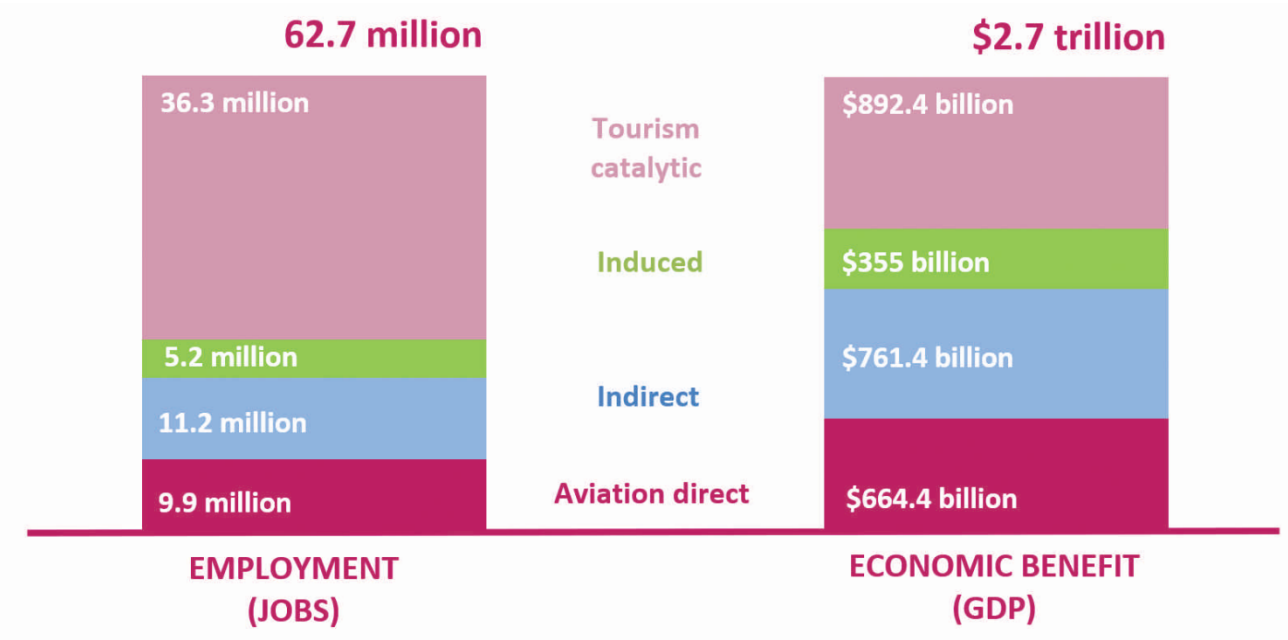
3.5 PER CENT

OF GDP SUPPORTED

\$2.7 TRILLION

ECONOMIC IMPACT

A Global Picture



Source: *Aviation Benefits 2017* (<https://www.icao.int/sustainability/Pages/IHLG.aspx>)

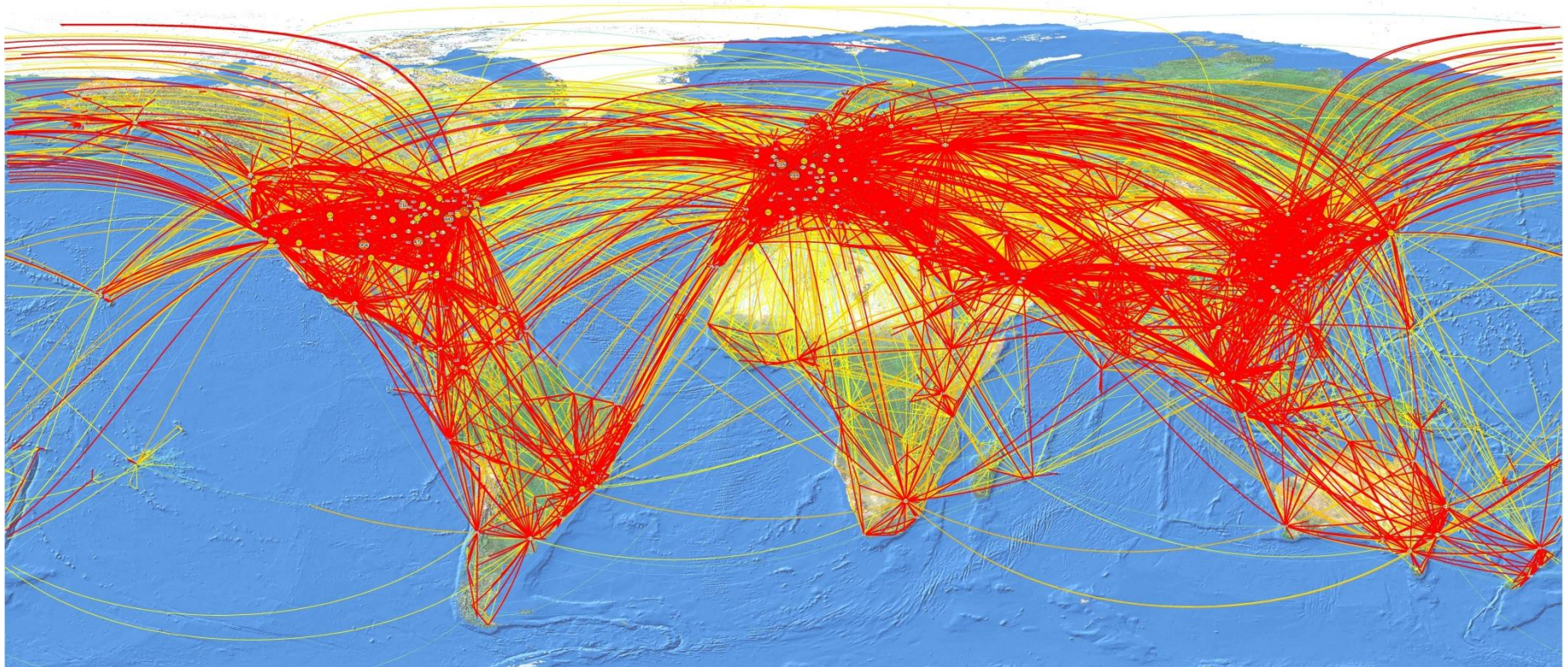


ICAO

UNITING AVIATION

Traffic Density

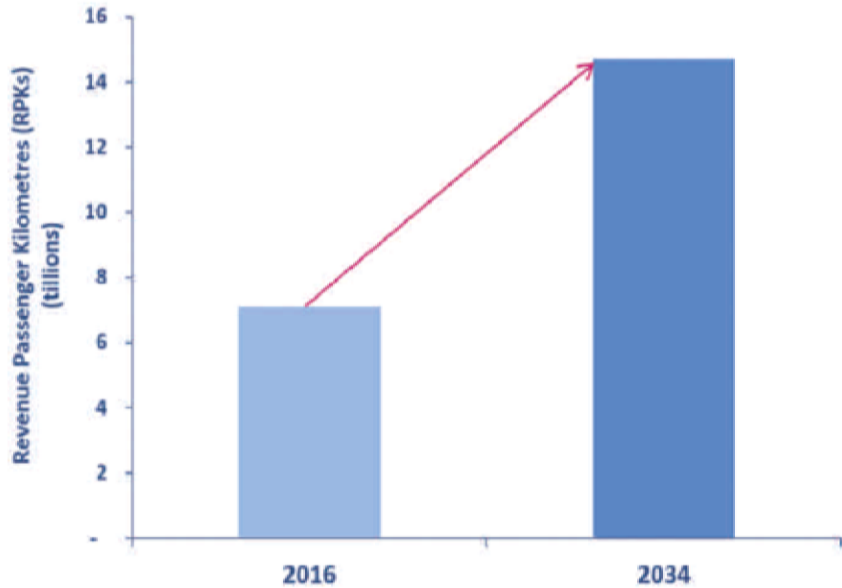
2040



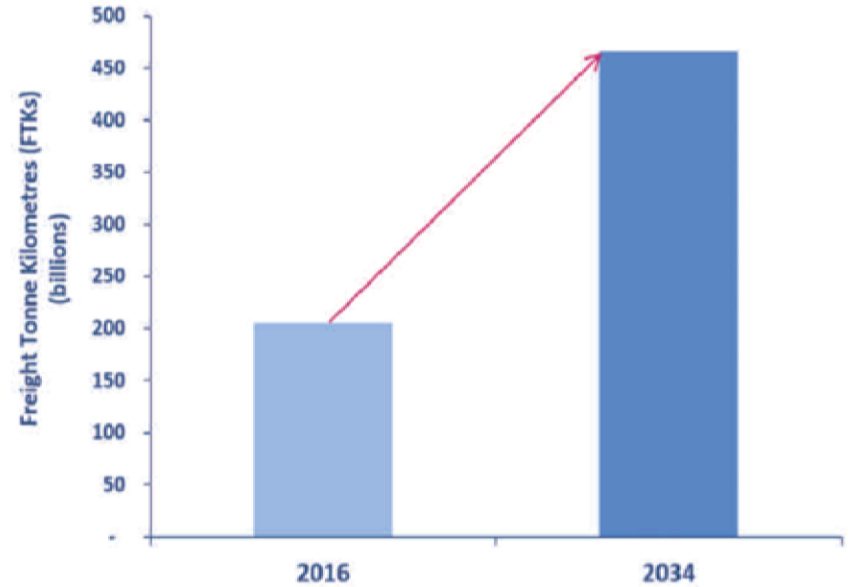


Air traffic will double by 2034

Forecasted Passenger Traffic in 2034



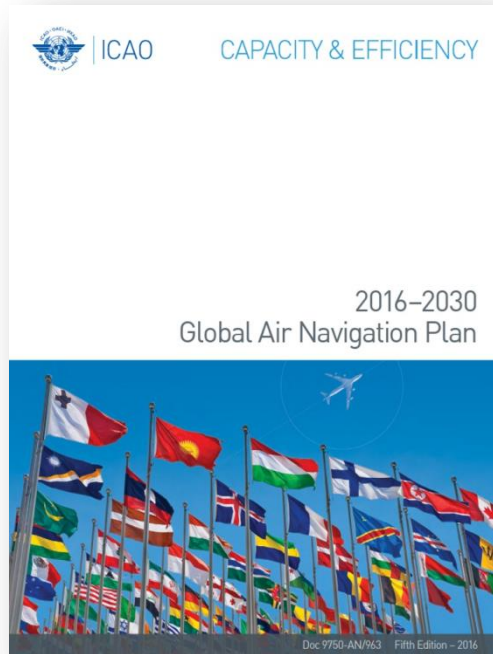
Forecasted Freight Traffic in 2034



SOURCE: ICAO LONG-TERM TRAFFIC FORECASTS



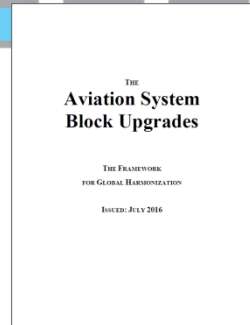
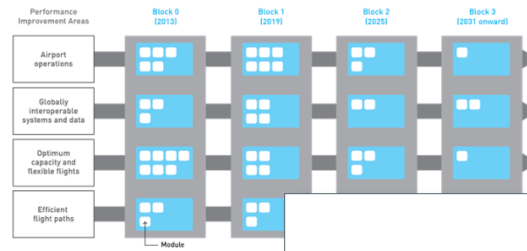
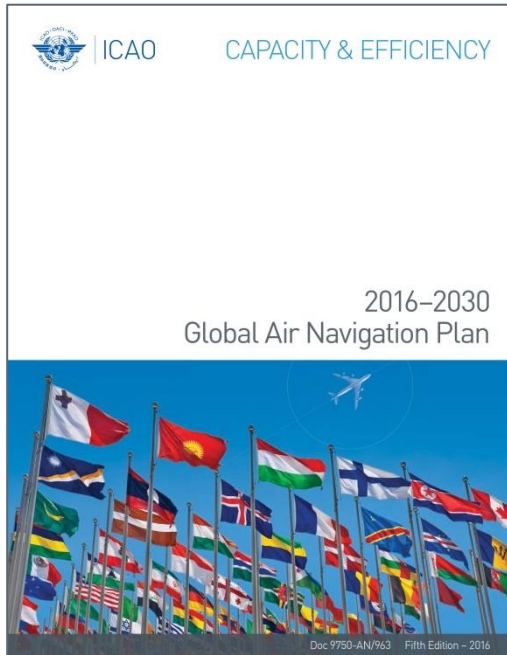
The Global Air Navigation Plan (GANP)



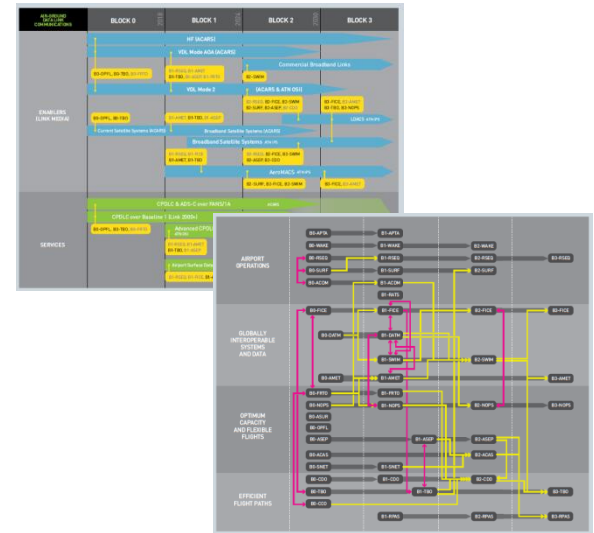
- Strategy to achieve a global interoperable air navigation system offering safe, secure and efficient air transport for people and goods worldwide, while limiting the impact of aviation on the environment.
- The GANP serves as a worldwide reference to transform the air navigation system in an evolutionary and inclusive manner so that no State or Stakeholder is left behind.



The 2016-2030 GANP



Aviation System Block Upgrades (ASBU) Methodology



Technology Roadmaps and Module Dependencies

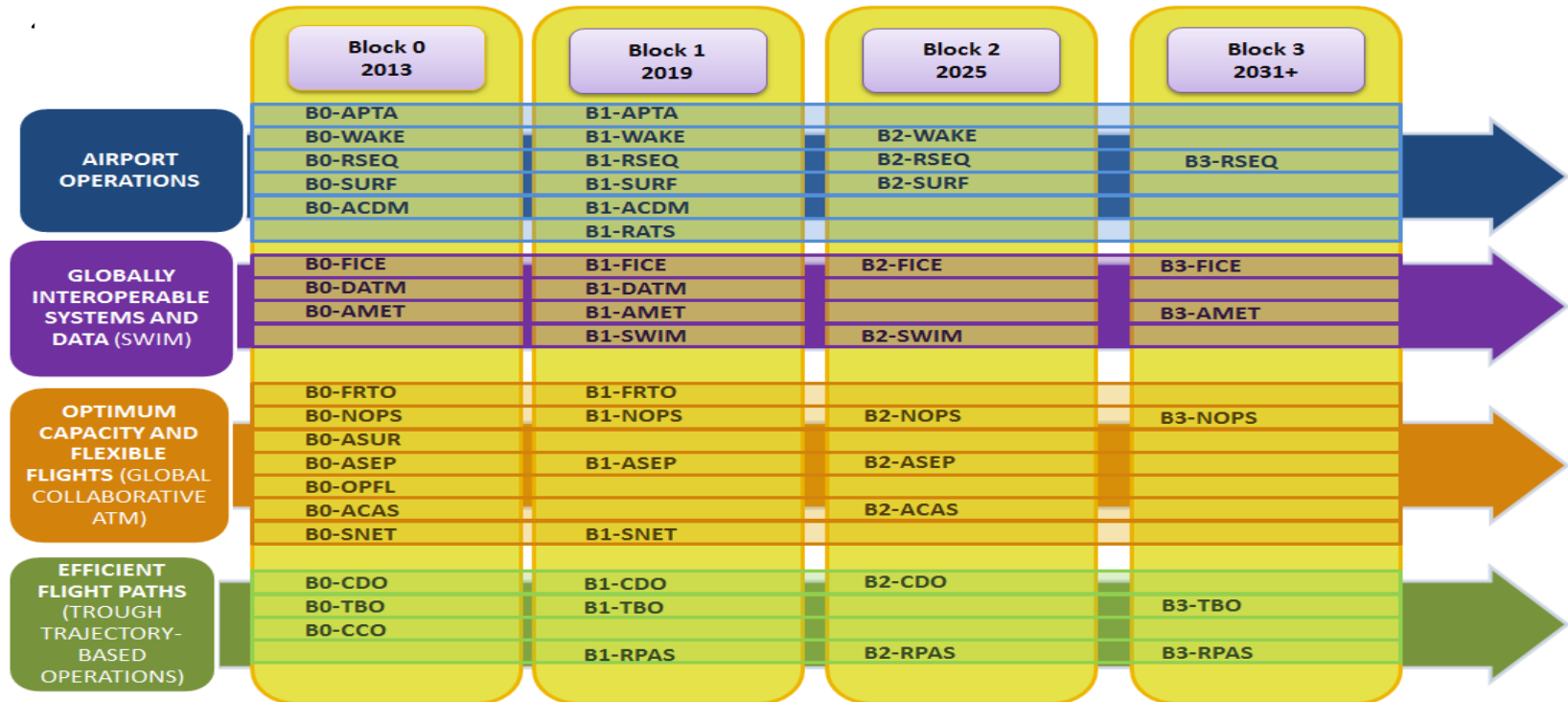


A high-performing Air Navigation System

Global interoperability	Ensure global interoperability
Access and equity	Access and equity to all airspace users
Capacity	Capacity to accommodate forecast demand
Efficiency	Increase efficiency of air operations
Flexibility and predictability	Enable flexibility to meet arrival times
Sustainability	Secure air navigation system sustainability
Resilience	Resilience to cope with system disruptions



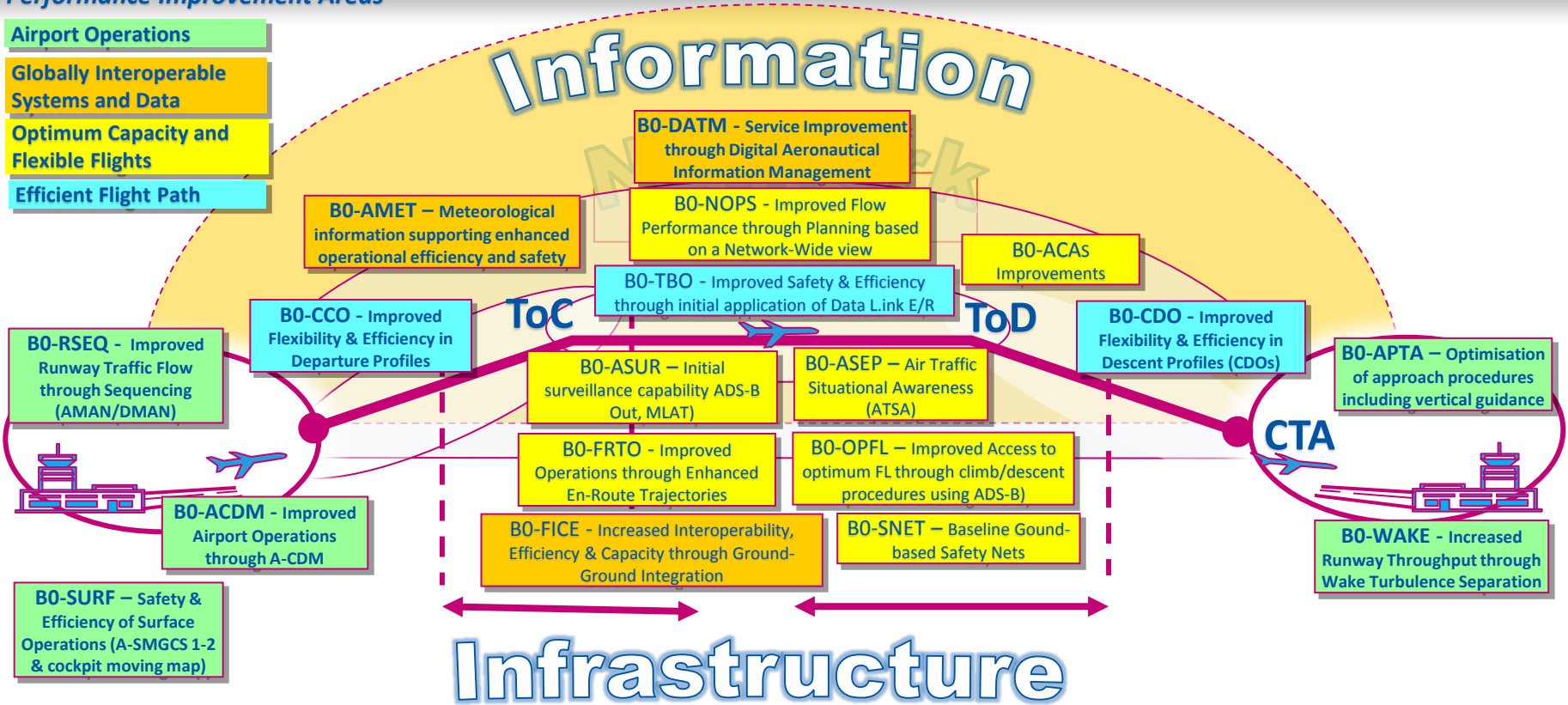
GANP Timelines





Performance Improvement Areas

- Airport Operations
- Globally Interoperable Systems and Data
- Optimum Capacity and Flexible Flights
- Efficient Flight Path





Performance Improvement Area 2:

Globally interoperable systems and data – through globally interoperable system-wide information management

Block 0

B0-DATM

Service improvement through digital aeronautical information management

Initial introduction of digital processing and management of information, by the implementation of AIS/AIM making use of AIXM, moving to electronic AIP and better quality and availability of data.

Block 1

B1-DATM

Service improvement through integration of all digital ATM information

This module addresses the need for increased information integration and will support a new concept of ATM information exchange fostering access via internet-protocol-based tools Exchange models such as AIXM, FIXM, IWXXM and others relate their concepts to the AIRM fostering convergence, re-use, and collaborative alignment.

Block 2

B2-SWIM

Enabling airborne participation in collaborative ATM through SWIM

Connection of the aircraft as an information node in SWIM enabling participation in collaborative ATM processes with exchange of data including meteorology.

Block 3

B1-SWIM

Performance improvement through the application of system-wide information management (SWIM)

Implementation of SWIM services (applications and infrastructure) creating the aviation intranet based on standard data models, and internet-based protocols to maximize interoperability.

B0-AMET

Meteorological information supporting enhanced operational efficiency and safety

Global, regional and local meteorological information provided by world area forecast centres, volcanic ash advisory centres, tropical cyclone advisory centres, aerodrome meteorological offices and meteorological watch offices in support of flexible airspace management, improved situational awareness and collaborative decision-making, and dynamically-optimized flight trajectory planning.

B1-AMET

Enhanced operational decisions through integrated meteorological information (planning and near-term service)

Meteorological information supporting automated decision process or aids, involving meteorological information, meteorological information translation, ATM impact conversion and ATM decision support.

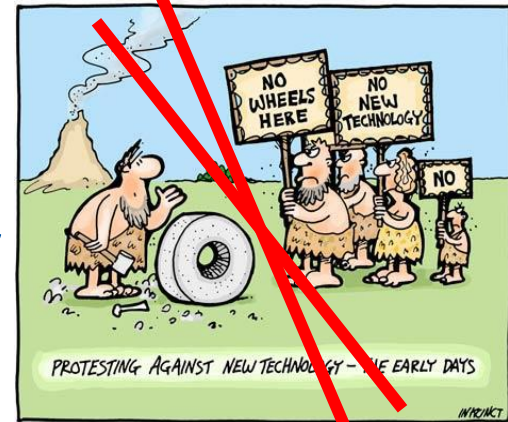
B3-AMET

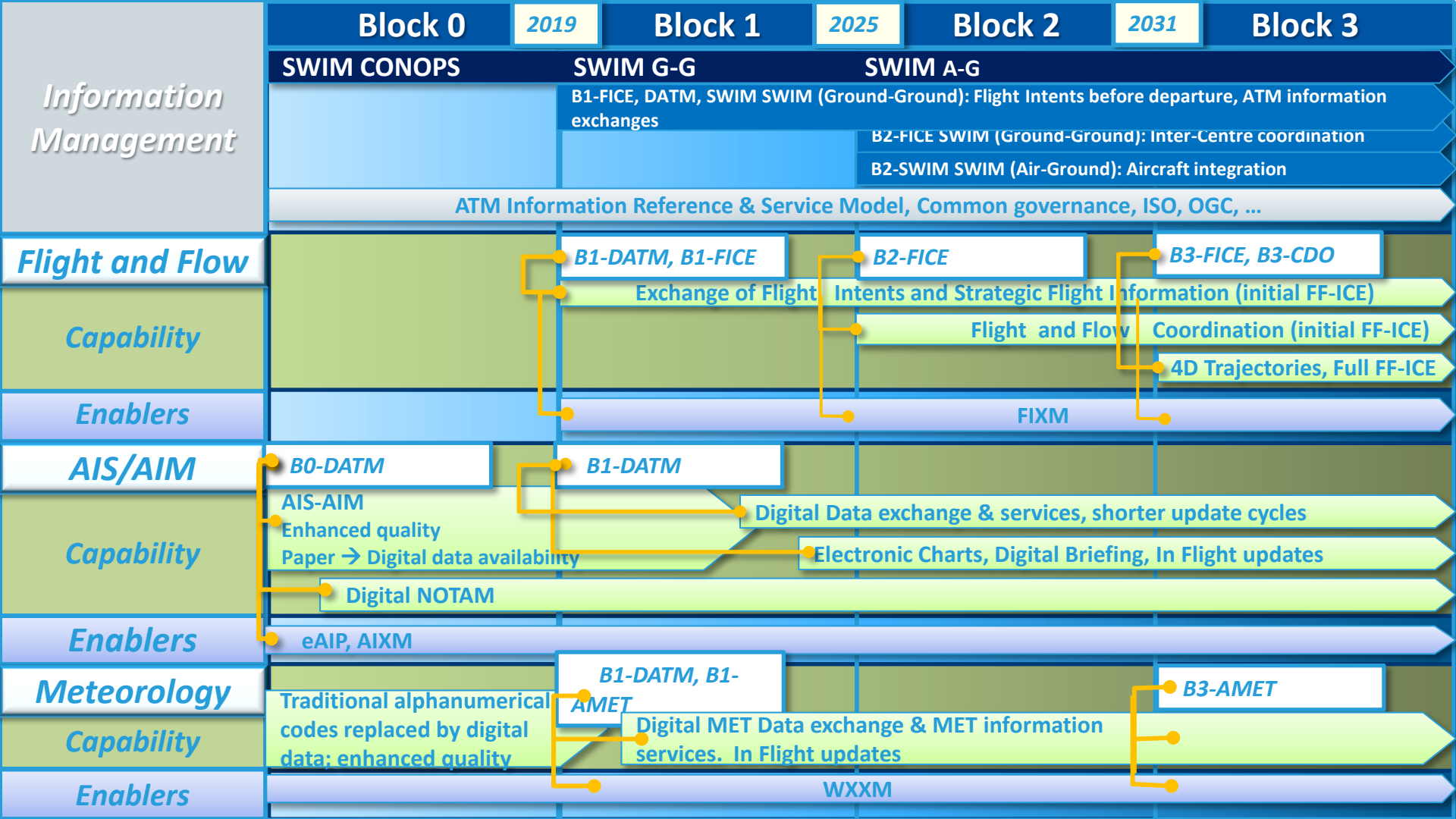
Enhanced operational decisions through integrated meteorological information (near-term and immediate service)

Meteorological information supporting both air and ground automated decision support aids for implementing immediate weather mitigation strategies.

Technology Roadmaps

- The ASBUs are supplemented by CNS, Avionics and Information Management Roadmaps. The ASBUs and associated technology roadmaps are an integral part of the GANP.
- The GANP represents a rolling, fifteen-year strategic methodology which leverages existing technologies and anticipates future developments based on State/Industry agreed operational objectives.
- This will enable sound investment strategies and help to generate the required commitment to the Plan from States, equipment manufacturers, operators and service providers.







AFI CATEGORIZATION AND PRIORITIZATION OF BLOCK 0 MODULES

PIA	Module Description	Module	Category	Priority
PIA 1	Optimization of Approach Procedures including vertical guidance	B0-APTA	E	1
	Improved Airport Operations through Airport-CDM	B0-ACDM	E	1
PIA 2	Increased Interoperability, Efficiency and Capacity through Ground-Ground Integration	B0-FICE	E	1
	Service Improvement through Digital Aeronautical Information Management	B0-DATM	E	1
	Meteorological information supporting enhanced operational efficiency and safety	B0-AMET	E	1
PIA 3	Improved Operations through Enhanced En-Route Trajectories	B0-FRTO	E	1
	ACAS Improvements	B0-ACAS	E	1
PIA 4	Improved Flexibility and Efficiency in Descent Profiles (CDO)	B0-CDO	E	1
	Improved Flexibility and Efficiency Departure Profiles - Continuous Climb Operations (CCO)	B0-CCO	E	1

APIRG Projects

18 AAO Projects

ATM/SAR Projects: 09
AGA Projects: 09

15 IIM/SG Projects

AIM Projects:03
CNS Projects:10
MET Projects:02

Project coordination

As per APIRG Procedural Handbook

- Project teams comprised of States and industry
- Supported by Regional Offices
- Project Team Coordination by Electronic Mail, Teleconferences, less physical Meetings
- Reporting to APCC between APIRG Plenary Meetings
- Progress report provided to APIRG



Current and Emerging Challenges



Conflict Zones



Global Tracking



Cyber Safety



RPAS

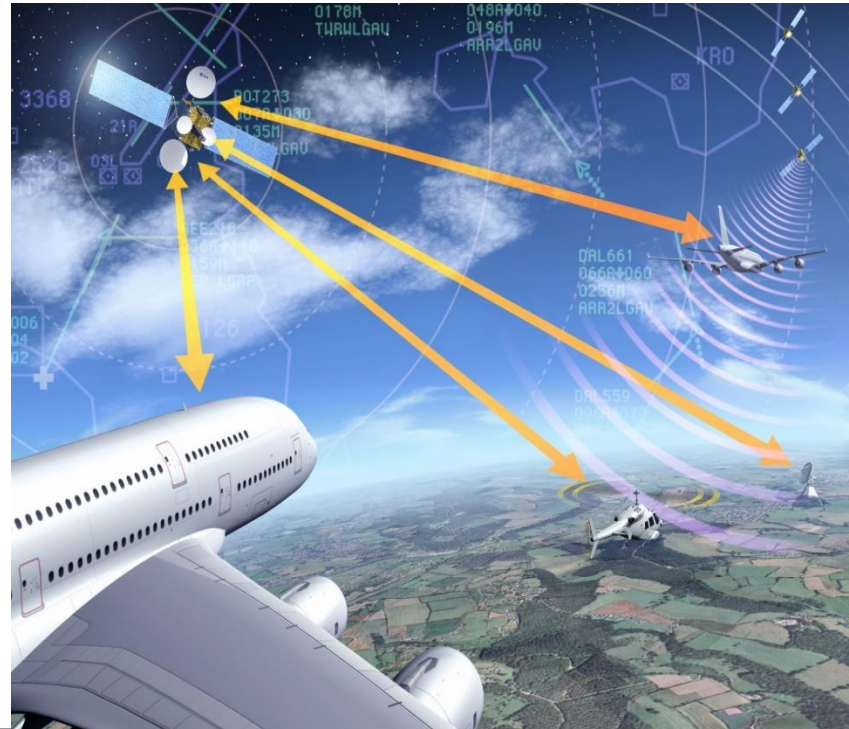


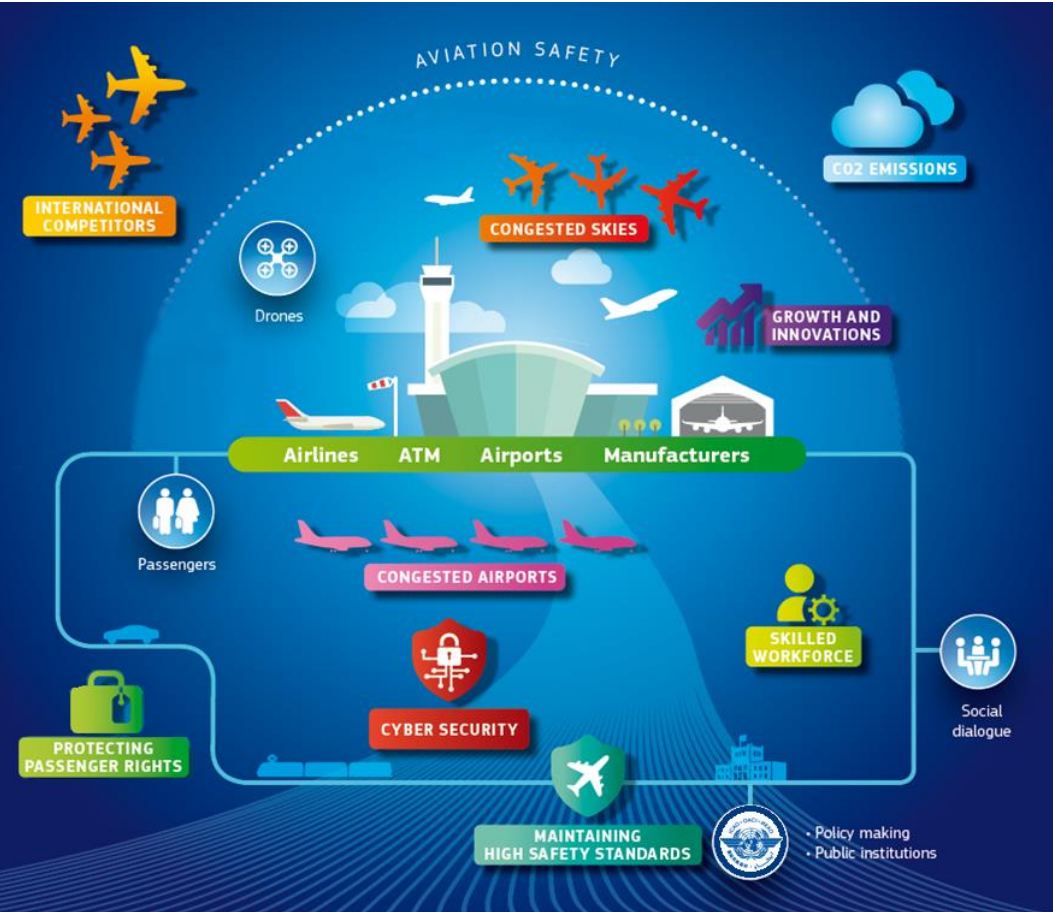
Space Transportation

What's next?
Mental Health
Unmanned Air System Traffic Management (UTM) & FL600+
Cargo Safety
Supersonic aircraft

Cybersecurity vulnerabilities and threats

- Reduced interoperability
- Requirement for increased digital certificates
- Creates overlap and gaps at the seams
- Shift of authority from States to Commercial Certificate Authorities





- ### Improved Efficiencies
- Increased Traffic Flow to meet Industry Growth Projections
 - Impacts routing and fuel cost
 - Impacts airport operations
 - Impacts ATM and Airline Operations
 - Drives Operational Changes
 - A more interconnected community
 - Aircraft communications
 - Cockpit (Safety Services)
 - Cabin (Passenger)
 - Ground communications

These changes can only be accomplished through:

- Technology Enhancements
- Modernized software applications

Drives modernized methods of securing the global aviation community end-to-end



To develop a New Generation of Aviation Professionals!

13th Air Navigation Conference (AN-Conf/13)

9 – 19 October 2018, Montréal, Canada

- Theme: *From development to implementation*
- A forum for detailed technical discussions leading to agreement on high-level recommendations
- Two Committee structure working in parallel and reporting back to Plenary
 - Air Navigation Committee (Committee A)
 - Aviation Safety Committee (Committee B)
 - Recommendations to be submitted to Council and subsequent endorsement by the Assembly
 - Allows the Assembly to **focus on strategic issues** based on sound technical advice, contributing to a more efficient and effective ordinary session (C-DEC 210/6)

**APPENDIX B
ORGANIZATIONAL PLAN**

BODY	AGENDA ITEM																						
		9		10		11		12		13		14		15		16		17		18		19	
		am	pm	am	pm	am	pm	am	pm	am	pm	am	pm	am	pm	am	pm	am	pm	am	pm		
Plenary		O P	O P																		J	P	
Committee A	1.1 to 1.4																						
	2.1 to 2.4																						
	3.1 to 3.5																						
	4.1 to 4.4																						
	5.1 to 5.4																						
Committee B	6.1 to 6.3																						
	7.1 to 7.3																						
	8.1 to 8.2																						

LEGEND:
 O – Opening session
 P – Plenary meeting
 R – Review of draft report
 J – Joint Meeting of Committees A and B



13th Air Navigation Conference (AN-Conf/13)

9 – 19 October 2018, Montréal, Canada

Recommendation 2.3/1: Future provision of aeronautical meteorological service

Recommendation 2.3/2 — Further Development of IWXXM for the Exchange of Aeronautical Meteorological Information

Recommendation 2.3/3 — Provision of space weather information service meeting the operational needs of users



Questions and Comments

