REGIONAL AIR NAVIGATION PLAN

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Chicago Convention, 1944

PREAMBLE

WHEREAS the future development of international civil aviation can greatly help to create and preserve friendship and understanding among the nations and peoples of the world, yet its abuse can become a threat to the general security; and

WHEREAS it is desirable to avoid friction and to promote that cooperation between nations and peoples upon which the peace of the world depends;

THEREFORE, the undersigned governments having agreed on certain principles and arrangements in order that international civil aviation may be developed in a safe and orderly manner and that international air transport services may be established on the basis of equality of opportunity and operated soundly and economically;

Have accordingly concluded this Convention to that end.

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;

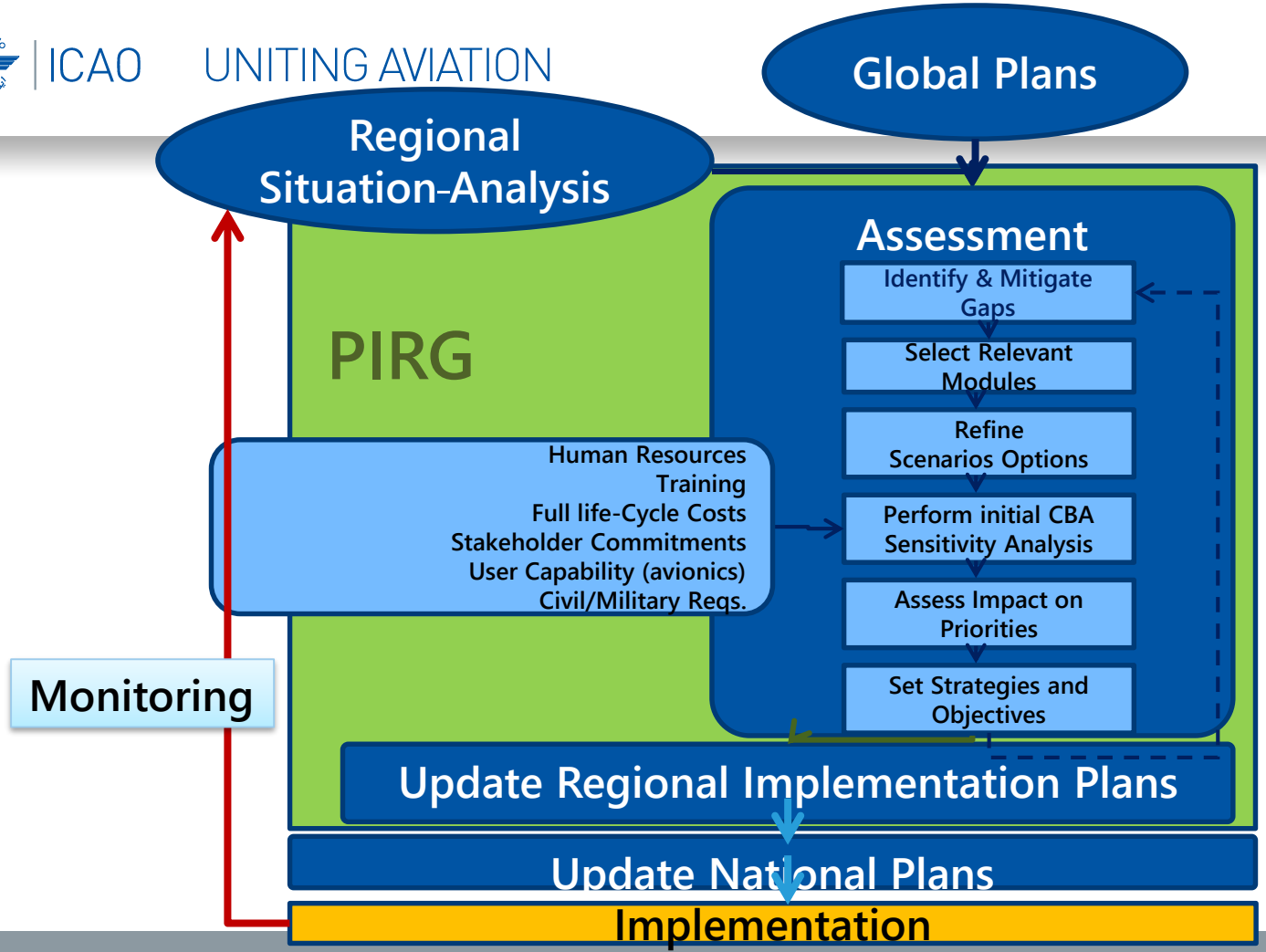
c) Collaborate in international measures to secure the publication of aeronautical maps and charts in accordance with standards which may be recommended or established from time to time, pursuant to this Convention.

Performance Based Planning Framework

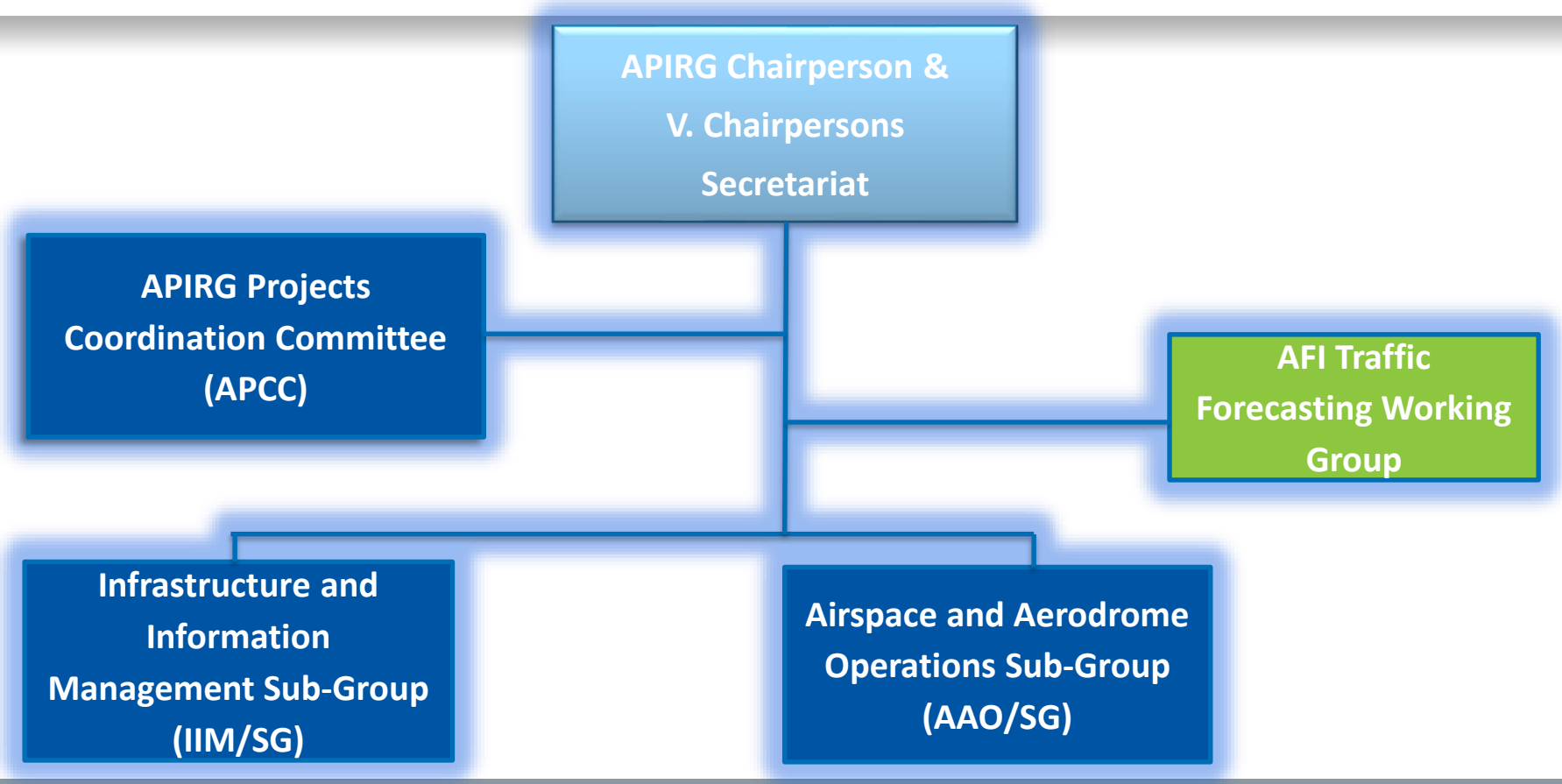
- **ICAO Global Air Navigation Plan (GANP, Doc 9750)**
  - developed to assist States and regional planning groups (PIRGs) in identifying the most appropriate operational improvements based on current and foreseen aircraft capabilities and ATM infrastructure.

- **Global Air Traffic Management Operational Concept (GATMOC, Doc 9854)**
  - provides the overall vision of a performance based ATM system.

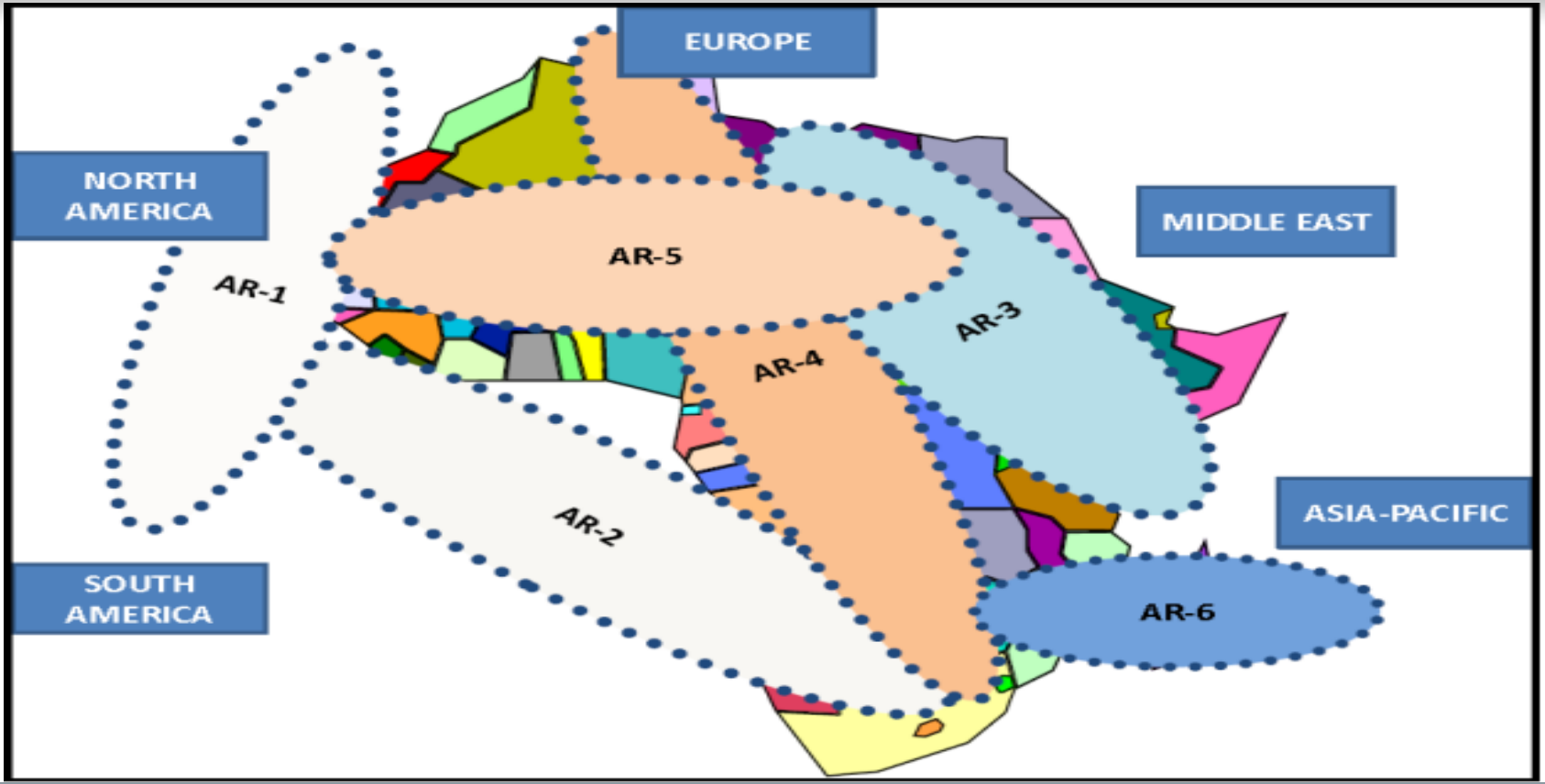
From the GANP to Regional Planning



APIRG Structure



HOMOGENEOUS AREAS AND MAJOR TRAFFIC FLOWS IN THE AFI REGION



ATM Homogeneous Areas in AFI Region

Areas of routing (AR)	Traffic Flows	Areas involved	Type of area covered	Remarks
Africa-Indian Ocean (AFI) Region				
AR1	Europe — South America (EUR/SAM) (oceanic)	Atlantico [1], Canarias, Casablanca, Dakar Oceanic, Recife, Sal Oceanic	Oceanic en route low density in southern part and oceanic high density in northern part	Major traffic flow EUR/SAM
AR2	Atlantic Ocean interface between the AFI, NAT and SAM Regions	Accra, Dakar, Johannesburg, Luanda, Sal	Oceanic en route low density	Homogeneous ATM area AFI/NAT/SAM
AR3	Europe — Eastern Africa routes including the area of the Indian Ocean	Addis Ababa, Antananarivo, Asmara, Cairo, Dar es-Salaam, Entebbe, Khartoum, Mauritius, Mogadishu, Nairobi, Seychelles, Tripoli	Continental en route/ oceanic low density	Major traffic flow AFIEUR
AR4	Europe to Southern Africa	Algiers, Beira, Brazzaville, Cape Town, Gaborone, Harare, Johannesburg, Kano, Kinshasa, Lilongwe, Luanda, Lusaka, N'Djamena, Niamey, Tripoli, Tunis, Windhoek	Continental en route low density	Major traffic flow AFI/EUR
AR5	Continental Western Africa including coastal areas	Accra, Addis Ababa, Brazzaville, Dakar, Dar-es-Salaam, Entebbe, Kano, Khartoum, Kinshasa, Nairobi, Ndjamena, Niamey, Roberts	Continental/oceanic low density	Homogeneous area AFI (this is a growing traffic, developing into major traffic flow)
AR6	Trans-Indian	Antananarivo, Bombay [1], Johannesburg Male [1], Mauritius, Melbourne [1], Seychelles	Oceanic high density	Homogeneous ATM area AFI/ASIA

What is Regional ANP?

- The Regional Air Navigation Plans (ANPs) set forth in detail the facilities, services and procedures required for international air navigation within a specified geographical area.
- The development of these regional plans is undertaken by ICAO's six planning and implementation regional groups (PIRGs) in coordination with States and supported by ICAO's Regional Offices and the Air Navigation Bureau.

Regional ANPs -Documents

PIRG	ANP Document
APANPIRG	Asia/Pacific Region (Doc 9673)
APIRG	Africa-Indian Ocean Region (Doc 7474)
EANPG	European Region (Doc 7754)
GREPECAS	Caribbean and South American Regions (Doc 8733)
MIDANPIRG	Middle East Region (Doc 9708)
NAT SPG	North Atlantic Region (Doc 9634/9635)

eANP features

PART I - TOC, INTRO

PART II - GEN

PART III - AOP

PART IV - CNS

PART V - ATM

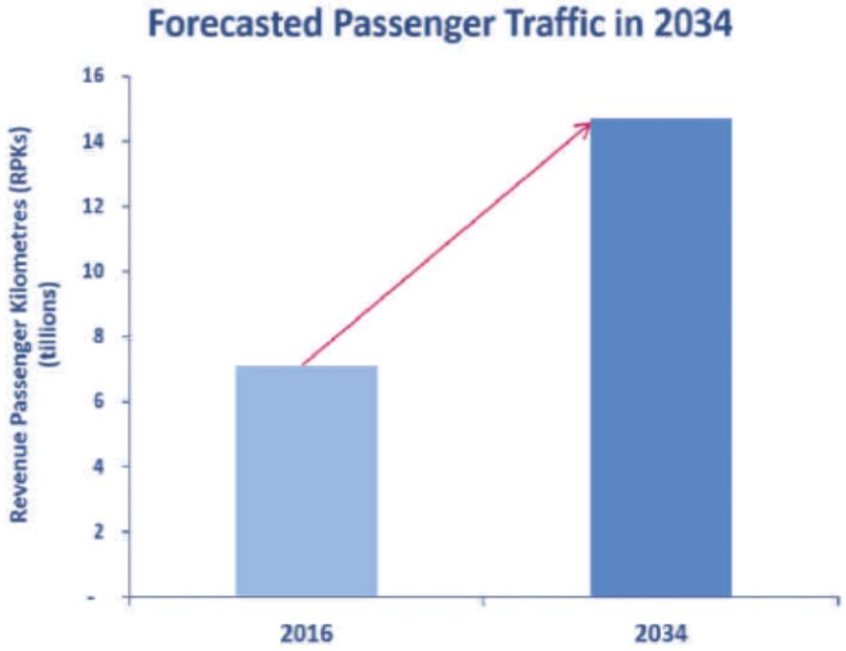
PART VI - MET

PART VII - SAR

PART VIII - AIS/MAP

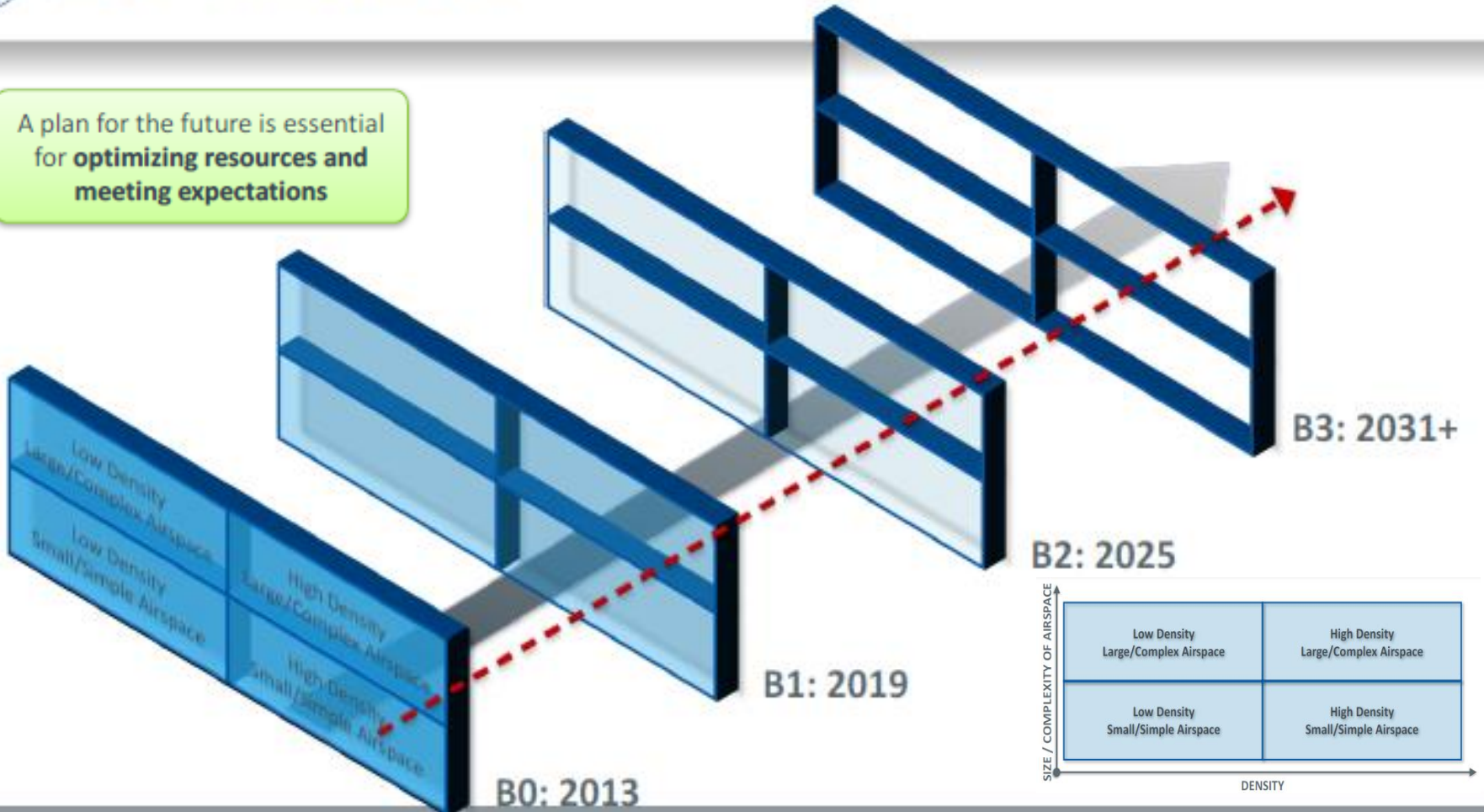
SUMMARY

Air traffic will double by 2034

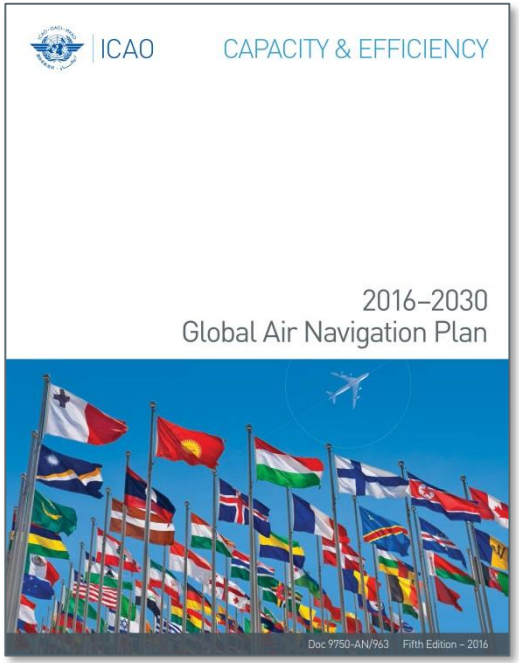


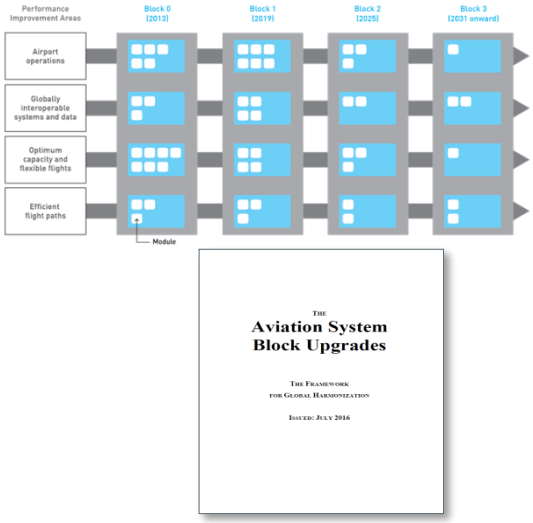
SOURCE: ICAO LONG-TERM TRAFFIC FORECASTS

A plan for the future is essential for **optimizing resources and meeting expectations**

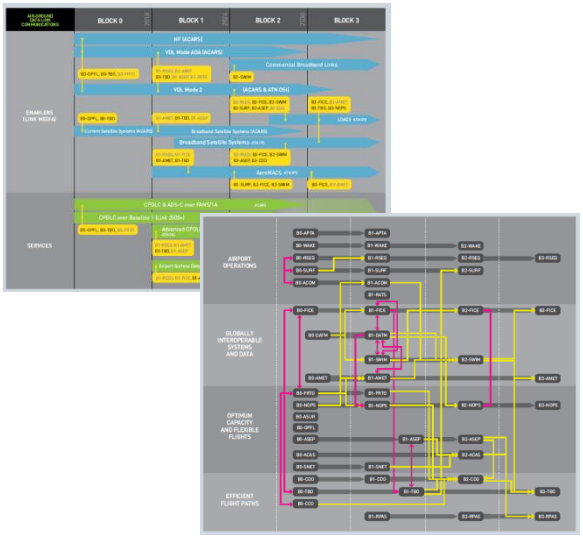


2016-2030 GANP



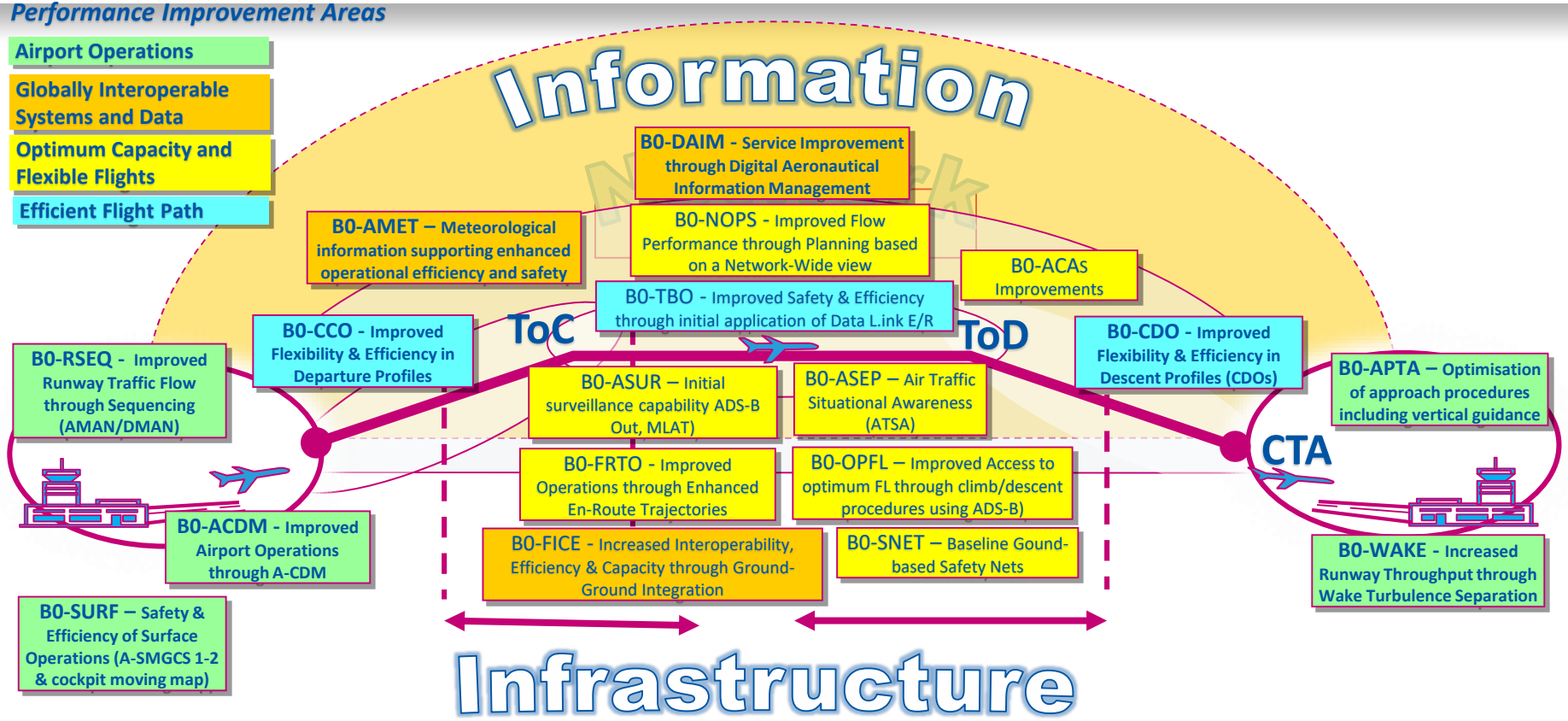


Aviation System Block Upgrades (ASBU) Methodology



Technology Roadmaps and Module Dependencies

ASBU Block 0 in Perspective

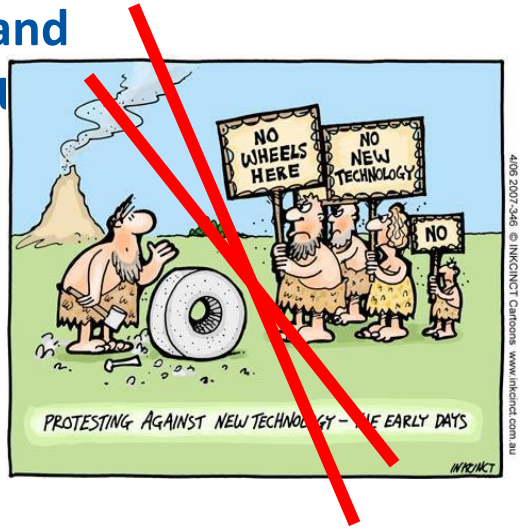


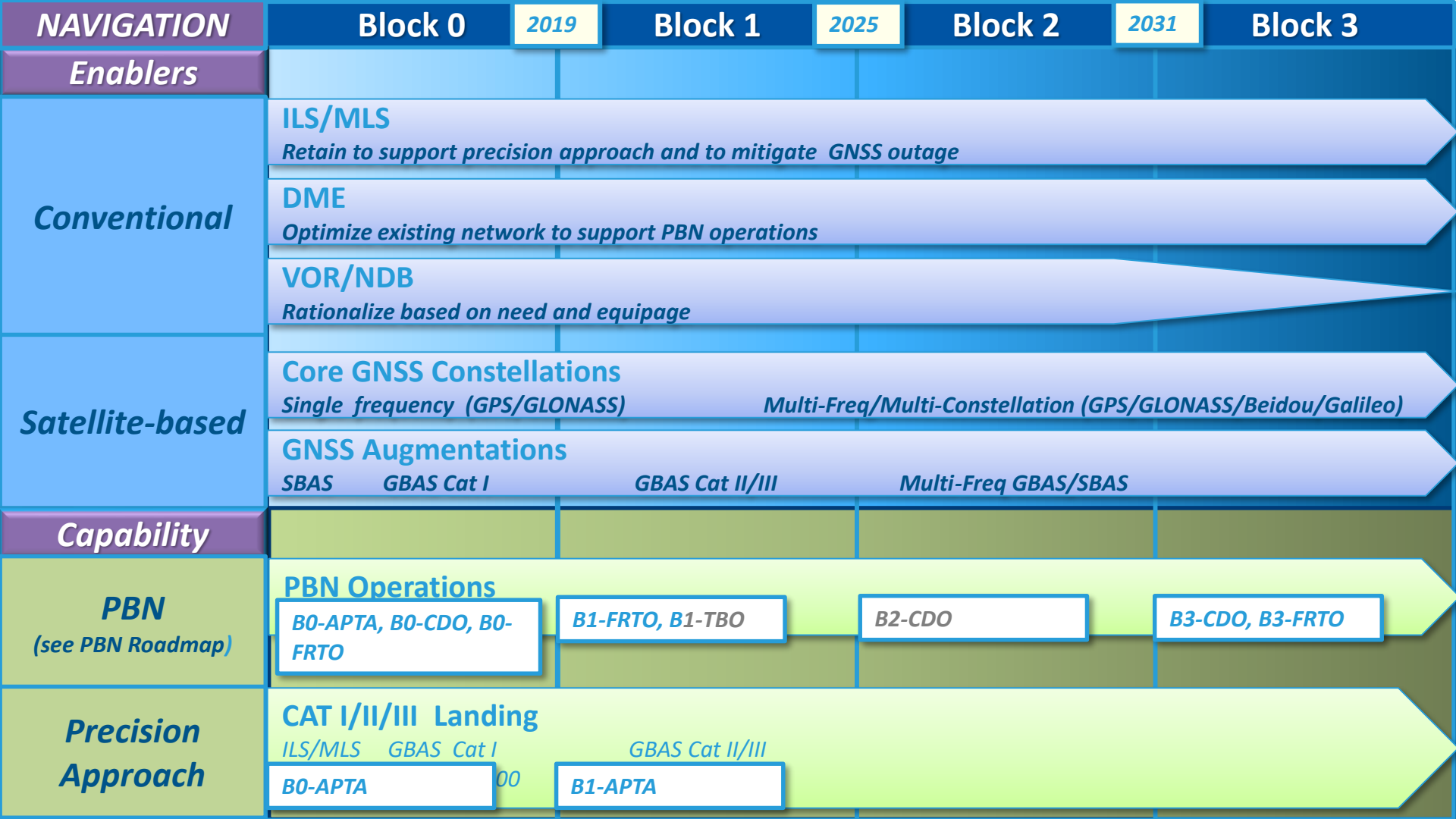
AFI CATEGORIZATION AND PRIORITIZATION OF BLOCK 0 MODULES

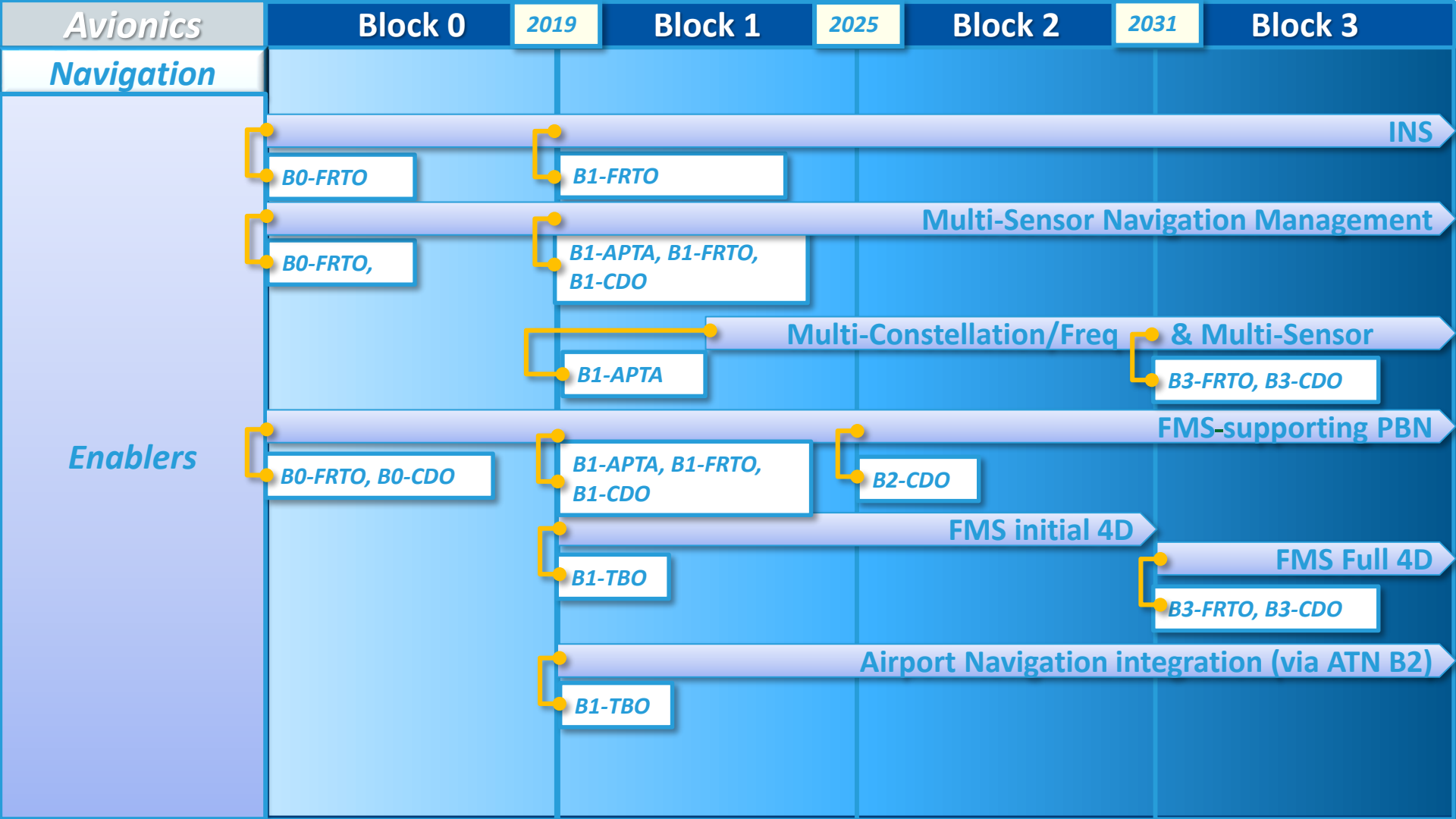
PIA	Module Description	Module	Category	Priority
PIA 1	Optimization of Approach Procedures including vertical guidance	B0-APTA	E	1
	Improved Airport Operations through Airport-CDM	B0-ACDM	E	1
PIA 2	Increased Interoperability, Efficiency and Capacity through Ground-Ground Integration	B0-FICE	E	1
	Service Improvement through Digital Aeronautical Information Management	B0-DAIM	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

Technology Roadmaps

- **The ASBUs are supplemented by communications, navigation and surveillance (CNS), Avionics and Information Management Roadmaps. The ASBUs and associated technology roadmaps are an integral part of t 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.




NAVIGATION
Block 0
2019
Block 1
2025
Block 2
2031
Block 3
Enablers
Conventional
ILS/MLS
Retain to support precision approach and to mitigate GNSS outage
DME
Optimize existing network to support PBN operations
VOR/NDB
Rationalize based on need and equipage
Satellite-based
Core GNSS Constellations
Single frequency (GPS/GLONASS)
Multi-Freq/Multi-Constellation (GPS/GLONASS/Beidou/Galileo)
GNSS Augmentations
SBAS
GBAS Cat I
GBAS Cat II/III
Multi-Freq GBAS/SBAS
Capability
PBN
(see PBN Roadmap)
PBN Operations
B0-APTA, B0-CDO, B0-FRTO
B1-FRTO, B1-TBO
B2-CDO
B3-CDO, B3-FRTO
Precision Approach
CAT I/II/III Landing
ILS/MLS
GBAS Cat I
GBAS Cat II/III
B0-APTA
B1-APTA


Avionics
Block 0
2019
Block 1
2025
Block 2
2031
Block 3
Navigation
Enablers
INS
B0-FRTO
B1-FRTO
Multi-Sensor Navigation Management
B0-FRTO,
B1-APTA, B1-FRTO,
B1-CDO
Multi-Constellation/Freq
& Multi-Sensor
B1-APTA
B3-FRTO, B3-CDO
FMS-supporting PBN
B0-FRTO, B0-CDO
B1-APTA, B1-FRTO,
B1-CDO
B2-CDO
FMS initial 4D
FMS Full 4D
B1-TBO
B3-FRTO, B3-CDO
Airport Navigation integration (via ATN B2)
B1-TBO

ICAO UNITING AVIATION

Regional Targets

AIR NAV. REGION	REGIONAL OFFICE	SAFETY	AIR NAVIGATION
AFI	ESAF	**ADOPTED** (Abuja Ministerial – July 2012)	**ADOPTED** (APIRG/19 – October 2013)
	WACAF		
MID	MID	**ADOPTED** (DGCA-MID/2 May 2013) (Review – 27-29 April 2014)	**MSG Meeting** (November 2014)
ASIA/PAC	APAC	**RASG-APAC/4** (November 2014)	**ADOPTED** (APANPIRG/25 - September 2014)
NAM	NACC	**US CAST/Canada**	**ADOPTED** (NACC/DCA/5 – April 2014)
CAR		**ADOPTED** (NACC/DCA/5 – April 2014)	
SAM	SAM	**ADOPTED** (RAAC/13 - December 2013)	**ADOPTED** (RAAC/13 - December 2013)
EUR	EUR/NAT	**ADOPTED** (RASG-EUR/03 - February 2014)	**ADOPTED** (EANPG/55 - November 2013)
NAT		**ADOPTED** (NAT SPG/49-June 2013)	*TBA*

Monitoring & Reporting Uniform Methodology

(adopted by ICAO Council 30 November 2001)

Definition

- A deficiency is a **situation where a facility, service or procedure does not comply with a regional air navigation plan approved by the Council**, or with related ICAO Standards and Recommended Practices (SARPs), **and which situation has a negative impact on the safety, regularity and/or efficiency of international civil aviation.**

Priority

- **U: High priority tasks**, on which work should be speeded up;
- **A: Medium priority tasks**, on which work should be undertaken as soon as possible, but without detriment to priority A tasks;
- **B: Lesser priority tasks**, on which work should be undertaken as time and resources permit, but without detriment to priority A and B task.

ICAO UNITING AVIATION

AFI Air Navigation Deficiency Database

Add Deficiency | Delete Deficiency | Update Deficiency | Approve Deficiency | Search Deficiency

ICAO AFI DEFICIENCIES REPORTING FORM

Select State: Algeria

Identification

Status: N

Requirement

Facility / Services

Deficiencies

Description

Date First Reported

Remarks

Corrective Action

Description

Executing Body

Date of Completion

Priority for Action: A B U

Submit Cancel

Burkina Faso
Burundi
Cameroon
Central African Republic
Chad
Comoros
Congo
Côte dIvoire
Democratic Republic of the Congo
Djibouti
Equatorial Guinea
Eritrea
Ethiopia
Ghana
Guinea
Kenya
Lesotho
Liberia
Libyan Arab Jamahiriya
Madagascar
Malawi
Mali
Mauritania
Mauritius
Morocco
Mozambique
Namibia
Niger
Nigeria
Rwanda

Monitoring & Reporting
Air Navigation Reporting Form

REGIONAL/NATIONAL PERFORMANCE OBJECTIVE – B0-CDO: Improved Flexibility and Efficiency in Descent Profiles (CDO)					
ASBU B0-CDO: Impact on Main Key Performance Areas (KPA)					
	Access & Equity	**Capacity**	**Efficiency**	**Environment**	**Safety**
Applicable	**N**	**N**	**Y**	**Y**	**Y**

ASBUB0- CDO: Implementation Progress	
Elements	**Implementation Status (Ground and Air)**
1. CDO	
2. PBN STARs	

ASBU B0-CDO: Implementation Roadblocks/Issues				
Elements	**Implementation Area**			
	Ground Implementation	**Air Implementation**	**Procedures Availability**	**Operational Approvals**
1. CDO				
2. PBN STARs				

Monitoring & Reporting
Air Navigation Reporting Form

ASBU B0-CDO: Performance Monitoring and Measurement (Benefits)	
Key Performance Areas	**Performance Metrics**
Access & Equity	Not applicable
Capacity	Not applicable
Efficiency	Kilograms of fuel saved per flight
Environment	Kilograms of CO_2 emissions reduced per flight (= KGs fuel saved per flight x 3.157)
Safety	Number of controlled flight into terrain (CFIT) incidents/accidents

ASBU B0-CDO: Performance Monitoring and Measurement (Implementation)	
Elements	**Implementation Indicators/Metrics**
1. CDO	Percentage of international aerodromes/TMAs with CDO implemented
2. PBN STARs	Percentage of international aerodromes/TMAs with PBN STARs implemented

ICAO


North American Central American and Caribbean (NACC) Office
Mexico City
South American (SAM) Office
Lima
ICAO Headquarters
Montréal
Western and Central African (WACAF) Office
Dakar
European and North Atlantic (EUR/NAT) Office
Paris
Middle East (MID) Office
Cairo
Eastern and Southern African (ESAF) Office
Nairobi
Asia and Pacific (APAC) Sub-office
Beijing
Asia and Pacific (APAC) Office
Bangkok
THANK YOU