

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

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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

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29 November 2018

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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 UNITING AVIATION Chicago Convention, 1944

Article 28 Doc 7475/2 International Standards Air navigation facilities and and Recommended Practices standard systems Each contracting State undertakes, so far as it may find WORKING ARRANGEMENTS practicable. to: BETWEEN THE INTERNATIONAL CIVIL AVIATION ORGANIZATION AND THE a) Provide, in its territory, airports, radio services, Annex 3 to the Convention on International Civil Aviation WORLD METEOROLOGICAL ORGANIZATION meteorological services and other air navigation facilities to facilitate international ai navigation, in accordance with the standards and practices recommended or established from time to time, pursuant to this Convention; Meteorological Service for International Air Navigation b) Adopt and put into operation the appropriate standard systems of communications procedure, codes, Part I — Core SARPs markings, signals, lighting and other operational practices and rules which may be recommended or established from Part II — Appendices and Attachments time to time, pursuant to this Convention; Nineteenth Edition, July 2016 SECOND EDITION - 1963 Collaborate in international measures to secure the c

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** 

3.5 PER CENT OF GDP 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)

# \$2.7 TRILLION

**ECONOMIC IMPACT** 

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





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

29 November 2018



# **Traffic Density**







## Air traffic will double by 2034



Forecasted Freight Traffic in 2034

SOURCE: ICAO LONG-TERM TRAFFIC FORECASTS



# The Global Air Navigation Plan (GANP)



CAPACITY & EFFICIENCY

2016–2030 Global Air Navigation Plan



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



Upgrades (ASBU) Methodology



# 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

AIRPORT OPERATIONS    B0-APTA    B1-APTA    B2-WAKE      B0-WAKE    B1-WAKE    B2-WAKE      B0-SURF    B1-SURF    B2-SURF      B0-SURF    B1-SURF    B2-SURF      B0-ACDM    B1-ACDM    B1-RATS      B0-FICE    B1-FICE    B2-FICE    B3-FICE      Systems and DATA (SWIM)    B0-ACDM    B1-AMET    B3-AMET      B0-ARDE    B0-ARDE    B1-SWIM    B2-SWIM      OPTIMUM CAPACITY AND FLEXIBLE B0-ASUR    B1-FRTO    B3-AMET      B0-ASUR    B0-ASUR    B0-ASUR    B0-ASUR      FLIGHT S (GLOBAL ATM)    B0-SNET    B1-SNET    B2-ACAS      B0-ASUR    B0-ASEP    B1-ASEP    B2-ASEP      B0-ASEP    B1-ASEP    B2-ASEP    B3-NOPS      B0-ASEP    B1-SNET    B0-SNET    B1-SNET      B0-SNET    B1-SNET    B0-SNET    B1-SNET      B0-COO    B1-CDO    B2-CDO    B3-TBO      B0-CO    B1-TBO    B3-TBO    B3-TBO		Block 0 2013	Block 1 2019	Block 2 2025		Block 3 2031+
AIRPORT OPERATIONSB0-WAKEB1-WAKEB2-WAKEB0-RSEQB1-RSEQB2-RSEQB3-RSEQB0-SURFB1-SURFB2-SURFB2-SURFB0-ACDMB1-ACDMImage: Constraint of the second sec		BO-APTA	Β1-ΑΡΤΑ			
AIRPORT OPERATIONSB0-RSEQB1-RSEQB2-RSEQB3-RSEQB0-SURFB1-SURFB1-SURFB2-SURFB3-RSEQB0-ACDMB1-ACDMB1-ACDMB1-ACDMB1-ACDMB0-ACDMB1-RATSB1-RATSB1-RATSB3-FICEB0-DATMB1-DATMB1-DATMB2-SWIMB3-AMETDATA (SWIM)B1-SWIMB2-SWIMB3-AMETOPTIMUM CAPACITY AND FLIGHT S (GLOBAL COLLABORATIVE ATM)B0-FRTOB1-RSEPB2-NOPSB0-ASURB0-ASURB1-ASEPB2-ASEPFLIGHT PATHS (TROUGH TRAJECTORY-B0-CDOB1-CDOB2-CDOB0-TBOB1-SNETB2-ACASCB0-TBOB1-SNETB2-ACASCB0-TBOB1-TBOCCB0-CDOB1-CDOB2-CDOB3-TBOB0-TBOB1-TBOCCB0-TBOB1-TBOCCB0-COOB1-TBOCCB0-COB1-TBOCC		BO-WAKE	B1-WAKE	B2-WAKE	=	
OPERATIONSB0-SURFB1-SURFB2-SURFDB0-ACDMB1-ACDMB1-ACDMB0-ACDMB1-RATSB1-RATSB0-BALLYB0-FICEB1-FICEB2-FICEINTEROPERABLE SYSTEMS AND DATA (SWIM)B0-DATMB1-DATMB0-AMETB1-AMETB3-AMETB0-AMETB1-SWIMB2-SWIMB0-FRTOB1-FRTOB2-SWIMB0-FRTOB1-FRTOB2-NOPSB0-FRTOB1-FRTOB2-NOPSB0-ASURB1-NOPSB2-NOPSB0-ASURB1-ASEPB2-ASEPB0-ASURB1-ASEPB2-ASEPB0-ACASB1-ASEPB2-ASEPB0-ACASB1-SNETB2-ACASB0-SNETB1-SNETB2-ACASB0-SNETB1-SNETB2-ACASB0-TBOB1-CDOB2-CDOB0-TBOB1-TBOB3-TBO	AIRPORT	B0-RSEQ	B1-RSEQ	B2-RSEQ		B3-RSEO
GLOBALLY INTEROPERABLE SYSTEMS AND DATA (SWIM)B0-ACDMB1-ACDM B1-RATSB2-FICEB3-FICEB0-FICE B0-DATMB1-DATMB1-DATMB1-DATMB3-AMETB0-AMETB1-AMETB1-AMETB3-AMETB0-AMETB1-SWIMB2-SWIMB3-AMETOPTIMUM CAPACITY AND FLEXIBLE FLIGHTS (GLOBAL COLLABORATIVE ATM)B0-FRTOB1-FRTOB3-NOPSEFFICIENT FLIGHT PATHS (TRAJECTORY-B0-CDOB1-SNETB1-SNETB3-NOPSB0-COOB1-CDOB2-CDOB3-TBO	OPERATIONS	B0-SURF	B1-SURF	B2-SURF		
GLOBALLY INTEROPERABLE SYSTEMS AND DATA (SWIM)B0-FICE B0-DATMB1-FICE B1-AMETB2-FICE B2-SWIMB3-AMETOPTIMUM CAPACITY AND FLEXIBLE PLIGHTS (GLOBAL COLLABORATIVE ATM)B0-FRTOB1-FRTOB2-NOPSB3-NOPSB0-ASUR FLEXIBLE FLIGHTS (GLOBAL COLLABORATIVE ATM)B0-SNETB1-SNETB2-ASEPB3-NOPSEFFICIENT FLIGHT PATHS (TROUGH TRAJECTORY-B0-COOB1-CDOB1-SNETB2-ACASB0-COOB1-CDOB1-SNETB2-ACASB3-TBOB0-COOB1-CDOB1-TBOB3-TBO		B0-ACDM	B1-ACDM			
GLOBALLY INTEROPERABLE SYSTEMS AND DATA (SWIM)    B0-FICE    B1-FICE    B2-FICE    B3-FICE      OPTIMUM CAPACITY AND FLEXIBLE FLIGHT S (GLOBAL COLLABORATIVE ATM)    B0-FRTO    B1-FRTO    B1-SWIM    B2-SWIM      B0-ASEP    B1-NOPS    B1-ASEP    B2-NOPS    B3-NOPS      B0-ASEP    B1-ASEP    B2-ASEP    B3-NOPS      B0-ASEP    B1-ASEP    B2-ASEP    B3-NOPS      B0-ASEP    B1-ASEP    B2-ASEP    B1-ASEP      B0-SNET    B1-SNET    B1-SNET    B1-SNET      B0-SNET    B1-SNET    B1-SNET    B1-SNET      B0-TBO    B1-TBO    B3-TBO			B1-RATS			
GLOBALLY INTEROPERABLE SYSTEMS AND DATA (SWIM)B0-DATM B1-DATM B1-AMETB1-DATM B1-AMETB2-FICEB3-FICEOPTIMUM CAPACITY AND FLEXIBLE FLIGHT PATHS (TROUGH TRAJECTORY-B0-FRTOB1-FRTOB2-NOPSB3-NOPSOPTIMUM CAPACITY AND FLEXIBLE B0-ASUR B0-A			54 5165			
INTEROPERABLE SYSTEMS AND DATA (SWIM)B0-BATMB1-DATMB1-AMETB3-AMET0B1-AMETB1-AMETB2-SWIMB3-AMET0B1-SWIMB2-SWIMB2-SWIMB3-AMET0B0-FRTOB1-FRTOB2-NOPSB3-NOPS0B0-NOPSB1-NOPSB2-NOPSB3-NOPS0B0-ASURB1-ASEPB2-ASEPB3-NOPS0B0-ASURB1-ASEPB2-ASEPB1-ASEP0B0-ASEPB1-ASEPB2-ACASB2-ACAS0B0-ACASB2-ACASB1-ASEPB1-ASEP0B0-ACASB1-SNETB1-SNETB1-ASEP0B0-SNETB1-SNETB1-SNETB1-ASEP0B0-SNETB1-SNETB1-SNETB1-SNET0B0-SNETB1-SNETB1-SNETB1-SNET0B0-SNETB1-SNETB1-SNETB1-SNET0B0-CDOB1-CDOB2-CDOB3-TB00B0-TBOB1-TBOB3-TBOB3-TBO0B0-COB1-CDOB1-CDOB1-CDO0B0-COB1-CDOB1-CDOB1-CDO0B0-COB1-TBOB1-CDOB1-CDO0B1-CDOB1-CDOB1-CDOB1-CDO0B1-CDOB1-CDOB1-CDOB1-CDO0B1-CDOB1-CDOB1-CDOB1-CDO0B1-CDOB1-CDOB1-CDOB1-CDO0B1-CDOB1-CDOB1-CDOB1-CDO0B1-CDOB1-CDO<	GLOBALLY	BU-FICE	B1-FICE	B2-FICE		B3-FICE
SYSTEMS AND DATA (SWIM)  B0-AMET  B3-AMET    OPTIMUM CAPACITY AND FLEXIBLE FLIGHTS (GLOBAL COLLABORATIVE ATM)  B0-FRTO  B1-FRTO  B2-NOPS    B0-ASUR  B1-NOPS  B1-NOPS  B2-NOPS  B3-NOPS    B0-ASUR  B1-ASEP  B2-ASEP  B3-NOPS    B0-ASUR  B1-ASEP  B2-ASEP  B1-ASEP    B0-ASEP  B1-ASEP  B2-ACAS  B1-ASEP    B0-ACAS  B1-SNET  B1-SNET  B1-ASEP    B0-SNET  B1-SNET  B1-SNET  B1-SNET    FLIGHT PATHS (TROUGH TRAJECTORY-  B0-CO  B1-CDO  B2-CDO	INTEROPERABLE	BO-DATM	B1-DATM			
DATA (SWIM)  B1-SWIM  B2-SWIM    OPTIMUM CAPACITY AND FLEXIBLE FLIGHTS (GLOBAL COLLABORATIVE ATM)  B0-FRTO  B1-FRTO  B0-ACAS    B0-ASUR  B1-NOPS  B2-NOPS  B3-NOPS    B0-ASUR  B1-ASEP  B2-ASEP    B0-OPFL  B1-ASEP  B2-ACAS    B0-ACAS  B1-SNET  B1-SNET    EFFICIENT FLIGHT PATHS (TROUGH TRAJECTORY-  B0-CDO  B1-CDO  B2-CDO	SYSTEMS AND	BO-AMET	B1-AMET			B3-AMET
OPTIMUM CAPACITY AND FLEXIBLE FLIGHTS (GLOBAL COLLABORATIVE ATM)    B0-FRTO    B1-FRTO    B2-NOPS    B3-NOPS      B0-ASUR B0-ASUR B0-ASEP    B1-ASEP    B2-ASEP    B3-NOPS      B0-OPFL B0-ACAS    B1-ASEP    B2-ACAS    B1-ASEP      B0-ACAS    B1-SNET    B2-ACAS    B1-ASEP    B2-ACAS      B0-SNET    B1-SNET    B1-SNET    B1-SNET    B1-SNET    B1-SNET      B0-CD0    B1-CD0    B1-CD0    B2-CD0    B3-TB0    B3-TB0      B0-TB0    B1-TB0    B1-TB0 <td< td=""><td>DATA (SWIM)</td><td></td><td>B1-SWIM</td><td>B2-SWIM</td><td></td><td></td></td<>	DATA (SWIM)		B1-SWIM	B2-SWIM		
OPTIMUM CAPACITY AND FLEXIBLE FLIGHTS (GLOBAL COLLABORATIVE ATM)B0-FRTOB1-FRTOB2-NOPSB3-NOPSB0-ASURB0-ASURB1-ASEPB2-ASEPB1-ASEPB2-ASEPB0-ASEPB1-ASEPB2-ACASB2-ACASB1-ASEPB0-ACASB1-ASEPB2-ACASB1-ASEPB1-ASEPB0-ACASB1-ASEPB2-ACASB1-ASEPB1-ASEPB0-ACASB1-ASEPB2-ACASB1-ASEPB1-ASEPB0-ACASB1-SNETB1-SNETB1-ASEPB1-ASEPB0-ACASB1-SNETB1-SNETB1-ASEPB1-ASEPB0-CDOB1-CDOB1-CDOB2-CDOB1-CDOB0-TB0B1-TB0B1-TB0B1-TB0B1-TB0TRAJECTORY-B0-CCOB1-TB0B1-TB0B1-TB0						
OPTIMUM    B0-NOPS    B1-NOPS    B2-NOPS    B3-NOPS      CAPACITY AND    B0-ASUR    B0-ASUR    B0-ASUR    B0-ASUR      FLIGHTS (GLOBAL    B0-ASEP    B1-ASEP    B2-ASEP    B0-ASEP      COLLABORATIVE    B0-ACAS    B0-ACAS    B0-SNET    B1-SNET    B2-ACAS      EFFICIENT    B0-CDO    B1-CDO    B2-CDO    B3-TBO      KTRUIGH    B0-CDO    B1-TBO    B3-TBO		B0-FRTO	B1-FRTO			
CAPACITY AND FLEXIBLE    B0-ASUR    B0-ASUR      FLIGHTS (GLOBAL COLLABORATIVE ATM)    B0-ASEP    B1-ASEP    B2-ASEP      B0-ACAS    B0-ACAS    B2-ACAS    B2-ACAS      B0-SNET    B1-SNET    B2-ACAS    B2-ACAS      FLIGHT PATHS (TROUGH TRAJECTORY-    B0-CDO    B1-CDO    B2-CDO    B3-TBO	ΟΡΤΙΜUΜ	B0-NOPS	B1-NOPS	B2-NOPS		B3-NOPS
FLEXIBLE    B0-ASEP    B1-ASEP    B2-ASEP      FLIGHTS (GLOBAL COLLABORATIVE ATM)    B0-OPFL    B0-OPFL    B0-ACAS      B0-ACAS    B1-SNET    B2-ACAS    B0-CDO      EFFICIENT    B0-CDO    B1-CDO    B2-CDO      FLIGHT PATHS (TROUGH TRAJECTORY-    B0-CDO    B1-TBO    B3-TBO	CAPACITY AND	B0-ASUR				
B0-OPFL  B0-OPFL    B0-ACAS  B2-ACAS    B0-SNET  B1-SNET    EFFICIENT  B0-CDO    FLIGHT PATHS  B0-CDO    (TROUGH  B0-TBO    TRAJECTORY-  B0-CCO	FLEXIBLE	BO-ASEP	B1-ASEP	B2-ASEP		
B0-ACAS  B2-ACAS    B0-SNET  B1-SNET    EFFICIENT  B0-CDO    FLIGHT PATHS  B0-CDO    (TROUGH  B0-CDO    TRAJECTORY-  B0-CCO	COLLABORATIVE	B0-OPFL				
BO-SNET  B1-SNET    EFFICIENT  B0-CDO    FLIGHT PATHS  B0-CDO    (TROUGH  B0-TBO    TRAJECTORY-  B0-CCO		BO-ACAS		B2-ACAS		
EFFICIENT  B0-CDO  B1-CDO  B2-CDO    FLIGHT PATHS (TROUGH TRAJECTORY-  B0-TBO  B1-TBO  B3-TBO		BO-SNET	B1-SNET			
B0-CDO  B1-CDO  B2-CDO    FLIGHT PATHS (TROUGH  B0-TBO  B1-TBO  B2-CDO    TRAJECTORY-  B0-CCO  B1-TBO  B2-CDO						
B0-TBO  B1-TBO  B3-TBO    TRAJECTORY-  B0-CCO  B1-TBO		B0-CDO	B1-CDO	B2-CDO		
TRAJECTORY- B0-CCO	(TROUGH	во-тво	B1-TBO			ВЗ-ТВО
	TRAIECTORY-	B0-CCO				
BASED B1-RPAS B2-RPAS B3-RPAS B3-RPAS	BASED		B1-RPAS	B2-RPAS		B3-RPAS
	OPERATIONS)		Л			



### **ASBU Block 0 in Perspective**





#### Performance Improvement Area 2:

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

Block 0	Block 1	Block 2	Block 3
80-DATM ervice improvement through digital eronautical information management	B1-DATM Service improvement through integration of all digital ATM information	B2-SWIM Enabling airborne participation in collaborative ATM through SWIM	
itial introduction of digital processing and	This module addresses the need for increased	Connection of the aircraft as an information node	
nanagement of information, by the implementation f AIS/AIM making use of AIXM, moving to electronic	information integration and will support a new concept of ATM information exchange fostering	in SWIM enabling participation in collaborative ATM processes with exchange of data including	

meteorology.

#### 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.

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.

#### 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.

AIP and better quality and availability of data.

#### 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.

# ICAO UNITING AVIATION 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 <u>enable sound investment strategies and help to</u> <u>generate the required commitment to the Plan from States,</u> <u>equipment manufacturers, operators and service providers.</u>



	Block 0	2019	Block 1	2025	Block 2	2031	Block 3	
	SWIM CONOPS	SV	VIM G-G	SWI	M A-G			
Information	B1-FICE, DATM, SWIM SWIM (Ground-Ground): Flight Intents before departure, ATM information							
Management		B2-FICE SWIM (Ground-Ground): Inter-Centre coordination						
	B2-SWIM SWIM (Air-Ground): Aircraft integration							
	ATM Information Reference & Service Model, Common governance, ISO, OGC,							
Flight and Flow		B1	-DATM, B1-FICE	B2-1	FICE	B3-	FICE, B3-CDO	
			Exchange of Flight	Intents	and Strategic Flight I	nformati	on (initial FF-ICE)	
Capability					Flight and Flo	v Coord	dination (initial FF-ICE)	
						4D	Trajectories, Full FF-ICE	
Enablers		4 <u>–</u>		L.,	FIXM	L.		
AIS/AIM	B0-DATM	B	1-DATM					
	AIS-AIM		Digita	l Data exc	hange & services, sh	orter upo	late cycles	
Capability	Paper -> Digital data availability Electronic Charts, Digital Briefing, In Flight updates							
	Digital NOTAM							
Enablers	eAIP, AIXM							
Meteorology	Traditional alphanumer	rical Alv	B1-DATM, B1-			• B3	B-AMET	
Capability	codes replaced by digita data: enhanced quality	al	Digital MET Data services. In Flight	exchange updates	& MET information	-•		
Enablers			)	WXXM		<b></b>		



## ICAO UNITING AVIATION

### AFI CATEGORIZATION AND PRIORITIZATION OF BLOCK 0 MODULES

ΡΙΑ	Module Description	Module	Category	Priority
PIA 1	Optimization of Approach Procedures including vertical guidance	BO-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	BO-AMET	E	1
PIA 3	Improved Operations through Enhanced En-Route Trajectories	BO-FRTO	E	1
	ACAS Improvements	BO-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**





# **Cybersecurity vulnerabilities and threats**

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







### Improved Efficiencies

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- 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)





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**



