



INTERNATIONAL CIVIL AVIATION ORGANIZATION

A United Nations Specialized Agency

AFI Flight Procedure Programme

AFI-FPP

AFI PBN Implementation Plan

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Overview



- **Historical aspects**
- **PBN Implementation planning**
 - Status of national plans
- **Details of the Regional PBN Implementation Plan**
- **Progress in States**
- **Conclusion**

Assembly Resolutions



2007 - A36-23:

- Introduction of PBN
- PBN Implementation Plans required by 2009 to meet global implementation goals
- Highlight-Approaches with vertical guidance
- Emphasis on VNAV (vertical guidance)

2010 – A37-11:

- Complete a PBN implementation plan as a matter of urgency
- Included LNAV to emphasis
- Superseded A36-23

APIRG Framework



2007 (Nov.) – APIRG 16

- Concl. 16/2
 - Establishment of PBN Task Force – charged to develop Regional Plan
- Concl. 16/3
 - Development of State PBN implementation plans harmonized with Regional Plan
- Concl. 16/4
 - National focal points for PBN implementation

APIRG Framework



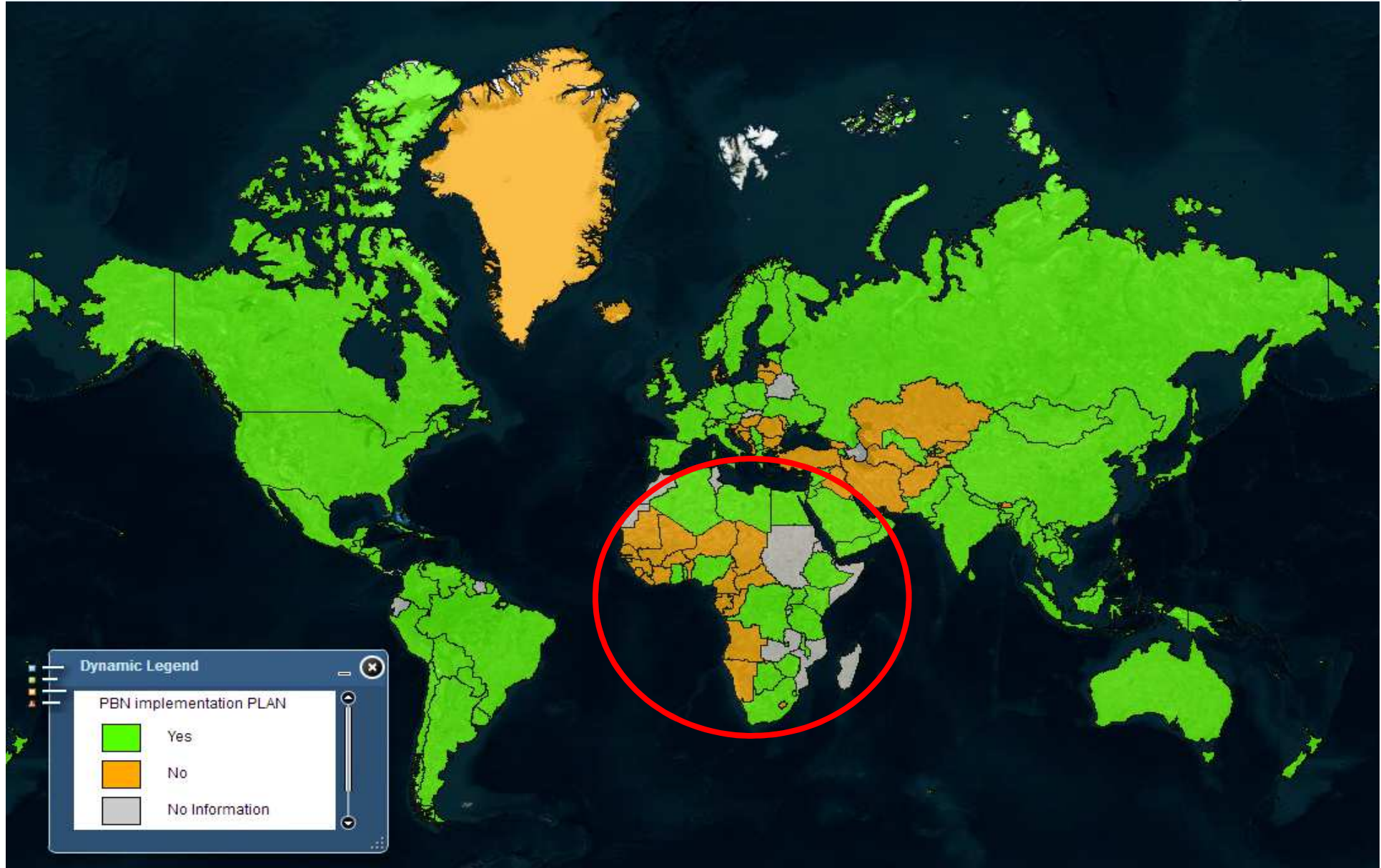
2009

- **Workshop and guidance** on development of Plans & Implementation Action Plans, **templates** provided
- **Examples** of PBN Implementation Action & Action Plans

2010 – APIRG 17

- **Concl. 17/47**
 - Provided **template** for State PBN Implementation Plan
 - Urged completion **as soon as possible**
 - Feedback to Regional Offices by 30 Oct. 2010
- **Concl. 17/48**
 - Implementation **tools** provided: Action Plan Templates, project management; reference to others.

PBN Implementation Plan - Status



Regional Goals, Near Term (2008-2012)



Airspace	Nav. Specifications	Nav. Specifications where Operationally Required
En-Route Oceanic	RNAV 10	RNP 4
En-Route Remote Continental	RNAV 10	RNP 4
En-Route Continental	RNAV 5	RNAV 1/2
TMA-Arrival/Departure	RNAV 1 in a surveillance environment	
	Basic RNP 1 in non-surveillance	
Approach	RNP APCH (with Baro-VNAV) OR RNP APCH (LNAV only). Also See Note RNP AR APCH if required	

Note: Where altimeter setting does not exist or aircraft of maximum certificated take-off mass of 5700kg or more, using an aerodrome are not suitably equipped for APV operations.



Near term- 2008-2012 Implementation targets

- **RNP APCH (with Baro-VNAV)** in 30% of instrument runways by 2010 and **50% by 2012** and priority given to airports with operational benefits. Each instrument runway will have an associated RNP APCH (LNAV only)
- Straight-in LNAV only procedures for instrument runways where there is no local altimeter setting available & where aircraft **MTOM 5 700 kg** or more are not suitably equipped for APV operations
- **RNAV 1 SID/STAR** for 30% of international airports by 2010 and **50% by 2012** and priority given to airports with RNP Approach.
- Review existing **conventional and RNAV routes to transition to PBN RNAV 5** or where operationally required RNAV 2/1 by 2012.

Regional Goals, Mid Term (2013-2016)



Airspace	Nav. Specifications	Nav. Specifications where Operationally Required
En-Route Oceanic	RNAV 10,	RNP 4
En-Route Remote Continental	RNAV 10,	RNP 4
En-Route Continental	RNAV 2, RNAV 5	RNAV 1
TMA Arrival/Departure	Expand RNAV 1, or RNP-1 application High density TMAs Mandate RNAV 1, or RNP-1	
Approach	<ul style="list-style-type: none"> Expand RNP APCH with (Baro-VNAV or Augmented GNSS), Supplemented with LNAV only procedures. Also see note Implement RNP AR APCH where there are operational benefits 	

Note: In addition, where altimeter setting does not exist or aircraft of maximum certificated take-off mass of 5700kg or more, using an aerodrome are not suitably equipped for APV.

Mid term- 2013-2016 Implementation targets



- RNP APCH (APV) (Baro-VNAV or **Augmented GNSS**) in 100% of instrument runways where practical, by 2016.
- RNP APCH (**LNAV only minima**) in **70%** of instrument runways by 2014, **100% by 2016**
- **Straight-in LNAV only** procedures for instrument runways where there is no local altimeter setting available & where aircraft **MTOM 5 700 kg** or more are not suitably equipped for APV operations
- RNAV 1 or RNP 1 SID/STAR for 100% of international airports by 2016.
- RNAV 1 or RNP 1 SID/STAR for 70% of busy domestic airports where there are operational benefits.
- Implementation of additional RNAV/RNP Routes as required.

State's progress -Terminal (on desktop)



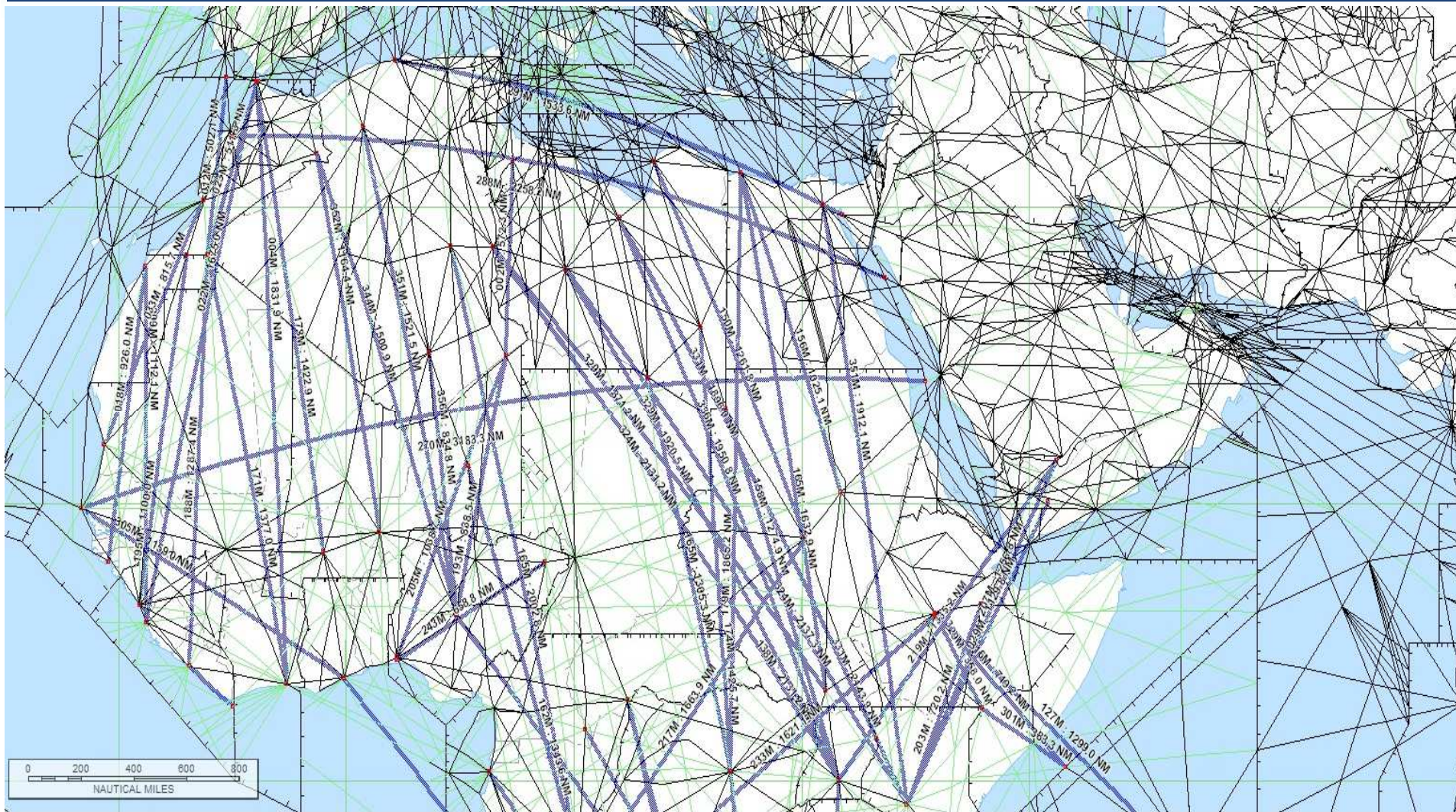
C	D	E	F	G	H	I	J	K	L	M							
STATE ICAO DESIGNATOR	COUNTRY	NO OF INT'L AIRPORTS	NO OF RWYS	NO OF INST RWYS	NO OF RNP APCH	NO OF RNAV APCH	NO OF RNAV/RNP SID	NO OF RNAV/RNP STAR	NO OF DOMESTIC AIRPORTS	NO OF RWYS	NO OF INST RWYS	NO OF RNP APCH	NO OF RNAV APCH	NO OF RNAV/RNP SID	NO OF RNAV/RNP STAR	Published GNSS Procs	
DAAG	ALGERIA*	20	40	33												Yes	
FNLU	ANGOLA*	3	6	4												Yes	
DBBB	BENIN	2	4	4	2			2								Yes	
FBSK	BOTSWANA	4	8	6			3	3								Yes	
DFFD	BURKINA FASO	2	4	4	4			4								Yes	
HBBA	BURUNDI*	1	2	2													
FKYS	CAMEROON	3	6	6	2			2	1	2	2					Yes	
GVAC	CAPE VERDE*	3	6	3													
FEFF	CENTRAL AFRICAN REP	1	2	2	2			2	1	2						Yes	
FTTJ	CHAD*	1	2	2												Yes	
FMCH	COMOROS	1	2	2												Yes	
FCBB	CONGO	2	4	4	2	2		2	5	10						Yes	
DIAP	COTE D'IVOIRE	1	2	2	2			2	6	12	2	2			2	Yes	
FZAA	D R CONGO*	5	10	8												Yes	
HDAM	DJIBOUTI*	1	2	2												Yes	
HECA	EGYPT*	16	32	25												Yes	
FGLS	EQUAT GUINEA*	1	2	2												Yes	
HHAS	ERITREA*	3	6	3												Yes	
HAAB	ETHIOPIA	4	10	10		6	1	6	14	28	4		2	2		Yes	
FOQL	GABON	3	6	6	3		2	2	1	2						Yes	
GBYD	GAMBIA*	1	2	2												Yes	
DGAA	GHANA*	3	6	6													
GUCY	GUINEA*	4	8	4												Yes	
GGOV	GUINEA-BISSAU	1	2	2												Yes	
HKJK	KENYA	8	22	3		9	6	6	28	56			6			Yes	
FXMM	LESOTHO*	2	4	1												Yes	
GLRB	LIBERIA*	1	2	2													
HILY	LIBYA*	6	12	8													
FMMI	MADAGASCAR	3	6	6	4				1	2	2					Yes	
FWKI	MALAWI	7	14	4	1		4	4	13	26						Yes	
GABS	MALI	2	4	4	4			2	4	8	8					Yes	
GQPP	MAURITANIA	2	4	4	4			4								Yes	
FIMP	MAURITIUS	1	2	2			2		1	2	2					Yes	
GMMN	MOROCCO*	12	24	24												Yes	
FQBR	MOZAMBIQUE*	3	6	4												Yes	
FYWH	NAMIBIA*	6	12	6												Yes	
DRRN	NIGER	3	6	6	6				3	6						Yes	
DNAA	NIGERIA*	11	22	20													
FMEE	REUNION (FRA)*															Yes	
HRYR	RWANDA	2	4	2			4	4	1	2			1	1		Yes	
FPST	SAO TOME & PRINCIPE*	1	2	2													
GOOY	SENEGAL	2	4	4	2		2	4	3	6	4					Yes	
FSIA	SEYCHELLES	1	2	2	4		4	4	4	8	2	2				Yes	
GFLI	SIERRA LEONE*	1	2	2													
HCMM	SOMALIA*	5	10	6													
FAJS	SOUTH AFRICA	10	36	18	8		8	8	8	22	12	14		4	4	Yes	
HSSS	SUDAN*	4	8	5												Yes	
FDMS	SWAZILAND*	1	2	1													
DXXX	TOGO	2	4	4	2		2	2								Yes	
DTTA	TUNISIA*	8	16	16												Yes	
HUEN	UGANDA	1	2	1	2		2	2	14	28						Yes	
	UK (BIOT)*																
	UK (ST. HELENA & ASCENSION)*																
HTDA	UNITED REPUBLIC OF TANZANIA*	3	6	5												Yes	
FLLS	ZAMBIA*	6	12	8												Yes	
FVHA	ZIMBABWE	11	22	8	4		4	4									
		TOTAL NO OF INT'L AIRPORTS	TOTAL NO OF RWYS	TOTAL NO OF INST RWYS	TOTAL NO OF RNP APCH	TOTAL NO OF RNAV APCH	TOTAL NO OF RNAV/RNP SID	TOTAL NO OF RNAV/RNP STAR	TOTAL NO OF DOMESTIC AIRPORTS	TOTAL NO OF RWYS	TOTAL NO OF INST RWYS	TOTAL NO OF RNP APCH	TOTAL NO OF RNAV APCH	TOTAL NO OF RNAV/RNP SID	TOTAL NO OF RNAV/RNP STAR		
		211	446	322	58	17	44	69	108	222	38	18	8	7	9		

En-route progress

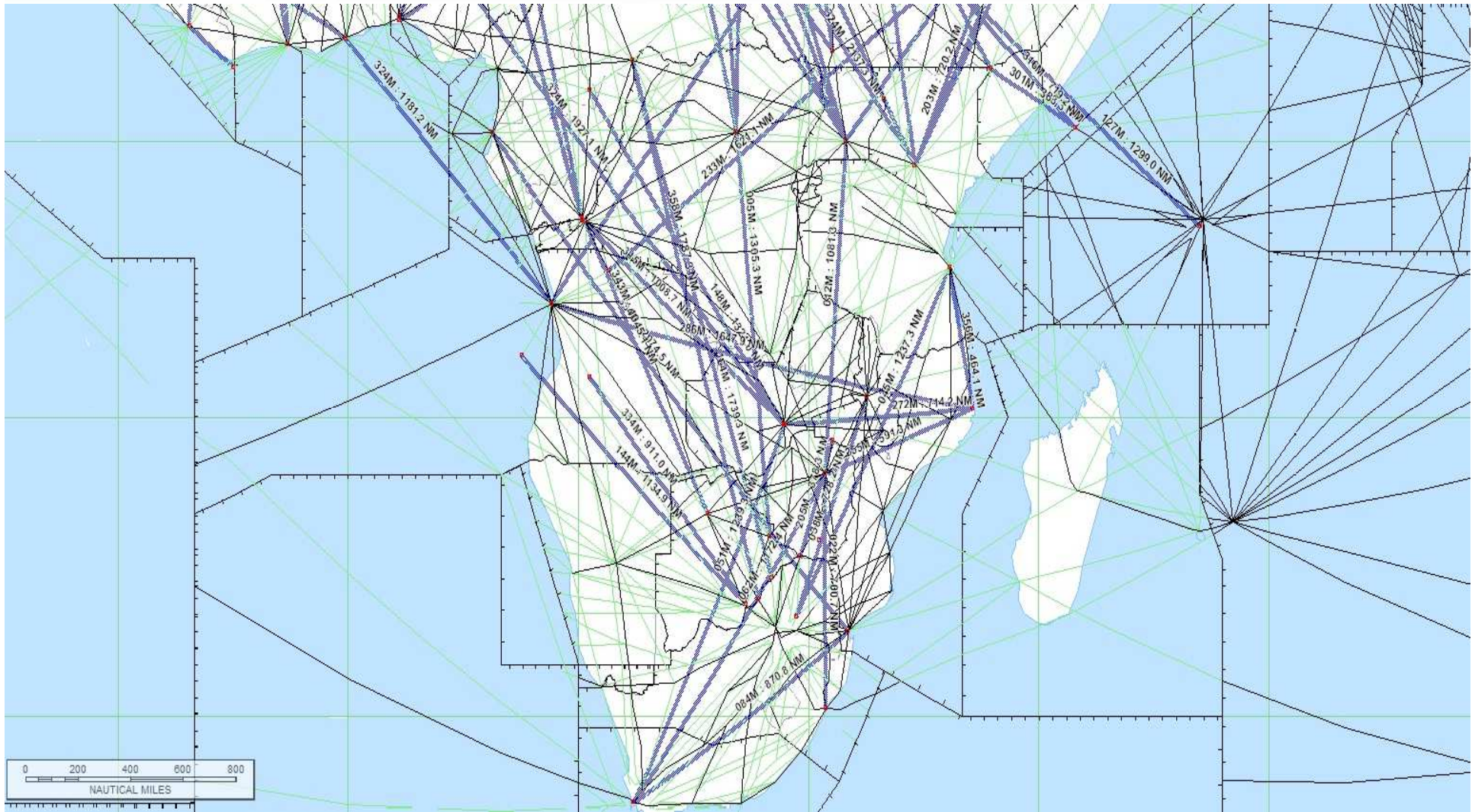


- Over 80 trajectories facilitated by ICAO and IATA (and member airlines) agreed since 2010
 - Most implemented
 - Challenges include
 - Differences in coordinates of same way point at FIR boundaries, jagged segment
 - Lack of confidence, lack of training, preference of starburst route system
 - Limitations in understanding: on issues like PBN itself, safety assessments and regulatory implications
- Now working on tracks to facilitate flexibility and provide transition to UPR/Free routing

En-route progress



En-route progress



Conclusion



- Nearly 7 years since 36th Assembly Session
- No more than 14 States have developed national PBN implementation plans
- Of the 14, most are without implementation **action** plans which form part of corporate plans, and/or plans are not part of corporate performance
- Despite support provided by IATA and member airlines, implementation targets far from being met
- **Bottom line** – Lots of ground to cover



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Central American
and Caribbean
(NACC) Office
Mexico City

South American
(SAM) Office
Lima

ICAO
Headquarters
Montreal

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) Office
Bangkok

Thank You