



ICAO

UNITING AVIATION

Regional Implementation & Planning

Roberta Luccioli
TO/AIM

Global AIM Conference
(Rio de Janeiro, Brazil, 17-19 May 2016)

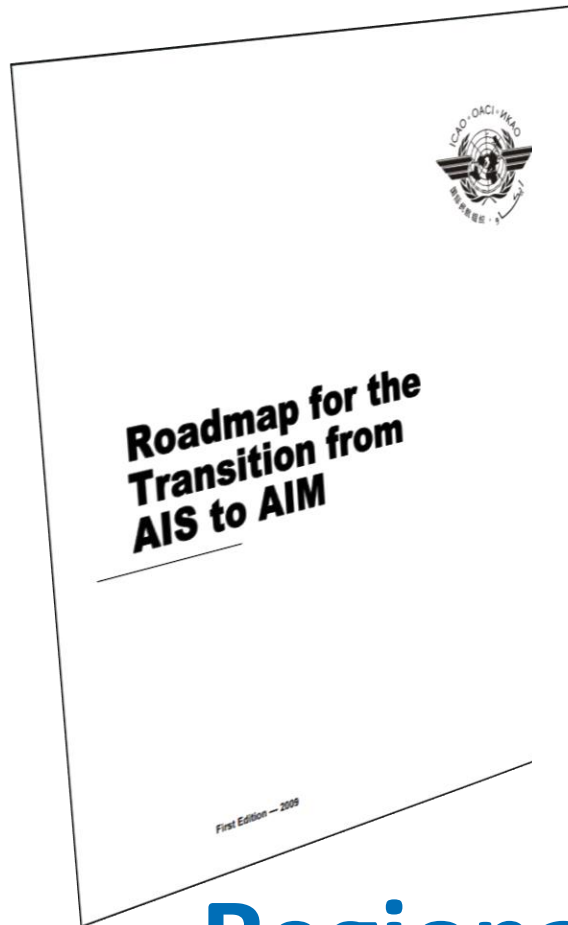
17-19 May 2016

Outline

- APAC
- MID
- AFI
- NACC

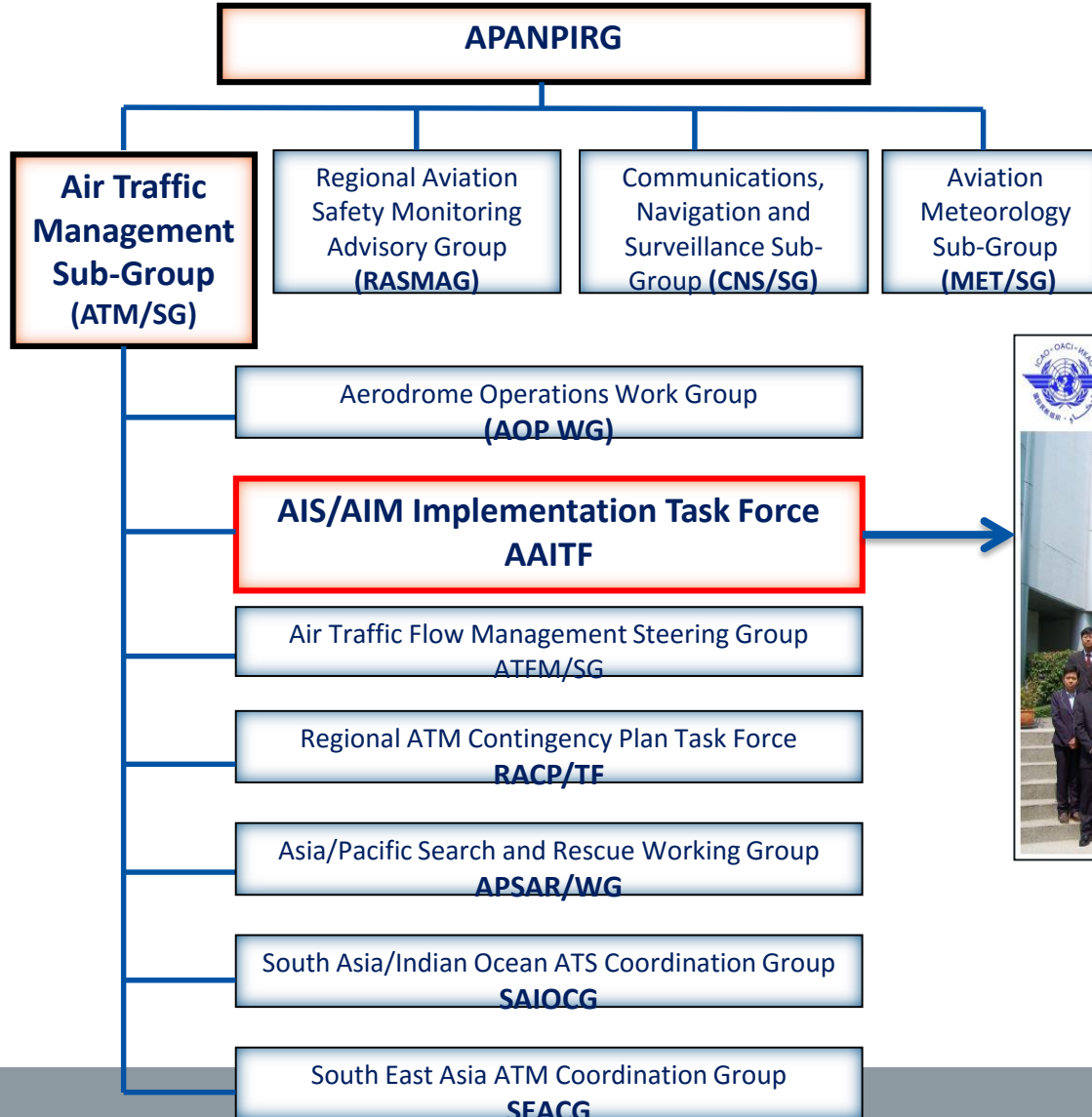


Asia Pacific



Regional Implementation

AIS-AIM Implementation Task Force (AAITF)





AIS-AIM Implementation Task Force (AAITF)

- **Guidance Manual for AIS in the Asia/Pacific Region:**
- http://www.icao.int/APAC/Documents/edocs/AIS_GM.pdf

Includes:

- Chapter 1 – AIS Quality Systems
- Chapter 2 – Selection and Training Guidelines for AIS
- Chapter 3 – Operating Procedures for AIS Dynamic Data (OPADD)



AIS-AIM Implementation Task Force (AAITF)

- **Guidance Manual for AIS in the Asia/Pacific Region:**
- Updated by AAITF/10 (2016)
 - New Appendix: Interim AIM Transition Guidance
 - Delayed delivery of global guidance documents
 - Regionally developed guidance
 - 4 identified priority steps from AIM transition roadmap



AIS-AIM Implementation Task Force (AAITF)

- **Guidance Manual for AIS in the Asia/Pacific Region:**
- Updated by AAITF/10 – adopted by APANPIRG/26 (Sep 2015)
 - New Appendix: Interim AIM Transition Guidance
 - P-17 – Quality
 - P-18 – Agreements with data originators
 - P-16 – Training
 - P-11 – Electronic AIP



APAC AIS-AIM Transition Progress

- **AIM Transition Table**
 - Maintained by AAITF
 - Measures progress against Roadmap steps/timelines
 - Updated on receipt of progress information from States
 - Posted on ICAO APAC Office website
 - Is used to support AIS Deficiencies raised under APANPIRG



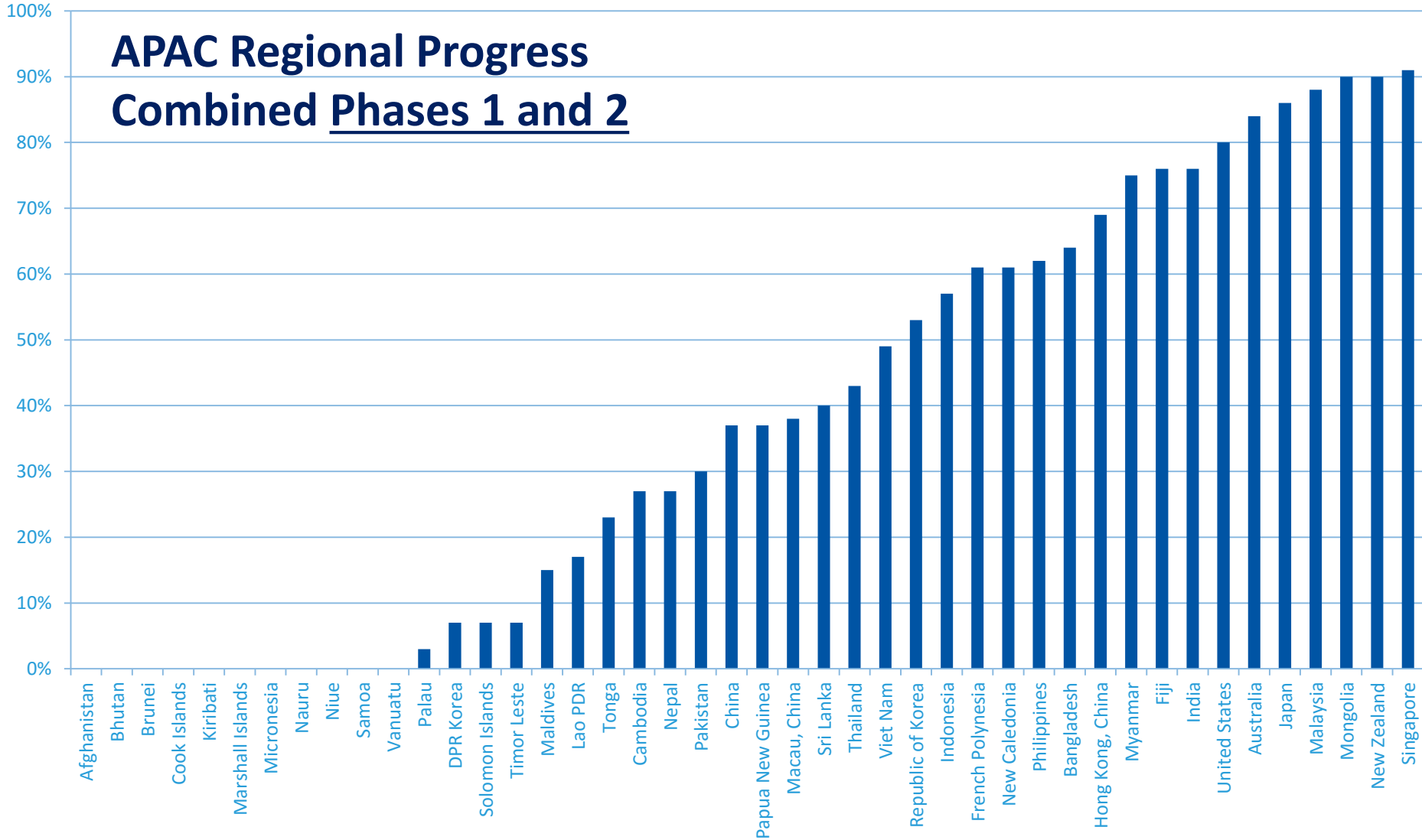
Date Last Amended: 15 October 2015

	Phase 1 Consolidation (Am. 36 November 2010)				Phase 2 Going Digital (Amendment 37 November 2013)							Phase 3 Information Management (Amendment 38 November 2016)										
	P-03	P-04	P-05	P-17	P-01	P-02	P-06	P-07	P-08	P-11		P-13	P-14	P-15	P-09	P-10	P-12	P-16	P-18	P-19	P-20	P-21
										eAP	Digital											
Afghanistan																						
Australia	√	√	√	√	80%	√	√	√	60%	Link		√	75%			10%	60%				90%	5%
Bangladesh	√	√	60%	√	√	√	70%	√		Part			60%		20%					20%		
Bhutan																						
Brunei Darussalam																						
Cambodia	√	√		10%						Part					70%		40%					
China	√	√	√	√					40%	Link								√	√			√
Hong Kong, China	√	√	√	√	√	√				Link		√	√				40%	√				
Macao, China	√	√	√	√						Link								√	√			
Cook Islands																		√				
DPR Korea			√																			
Fiji	√	√	√	√	√		√	√	√	Link			√			√	√	√				
India	√	√	√	√	√	√	√	√	√				√									
Indonesia	√	√	√	65%	50%	50%	50%	20%	20%	Link		30%	30%	10%		80%		60%	20%	10%	20%	
Japan	√	√	√	√	√	√	√	√	√	Link		80%	50%		80%	20%	60%	√	√		20%	20%
Kiribati																						
Lao PDR	√	√	25%																			
Malaysia	√	√	√	√	√	√	√	√	√	Link		50%	50%	50%	√	√	√	√				50%
Maldives			√							Link												
Marshall Islands																						
Micronesia																						
Mongolia	√	√	√	√	√	√	√	80%	√	Link	√	65%	28%	5%	20%	10%	√	90%	√		√	
Myanmar	√	√	√	√	√	√	20%	20%	20%	Link		√	√	20%	20%	50%	50%	80%	80%	80%	80%	20%
Nauru																						
Nepal	√	√	√										30%	30%								
New Caledonia	√	√	√	√	√	√		√		Link												
New Zealand	√	√	√	√	√	√	√	√	75%	Link		√	80%	15%	80%							
Pakistan	√	√	√										√		√	√	√		√			√
Palau										part												
Papua New Guinea	√	√	√	90%				√								10%						
Polynesie Française	√	√	√	√	√	√		√		Link												
Philippines	√	√	60%	50%	√	50%	√	√	√	50%												
Republic of Korea	√	√	√	√	√	√		√	√									√	√		40%	90%
Samoa																						
Singapore	√	√	√	√	√	√	50%	√	√	Link	√	60%	60%	25%	√	√	√	√	√		√	
Solomon Islands			√																			
Sri Lanka	√	√	√	95%			25%			Link					25%	25%	20%	25%				
Thailand	√	√	80%	40%	40%	30%				Link		25%	25%		10%	5%						
Timor Leste																						
Tonga		√	√																			
Vanuatu																						
Viet Nam	70%	75%	√	25%	50%	50%	50%	80%	50%	50%		20%	20%		20%	30%	20%	30%				
USA ¹	√	√	20%	√	√	√	25%	√	50%	part		√	√	√	√	√		70%	√	25%	√	√

Transition Roadmap – Implementation Status



APAC Regional Progress Combined Phases 1 and 2





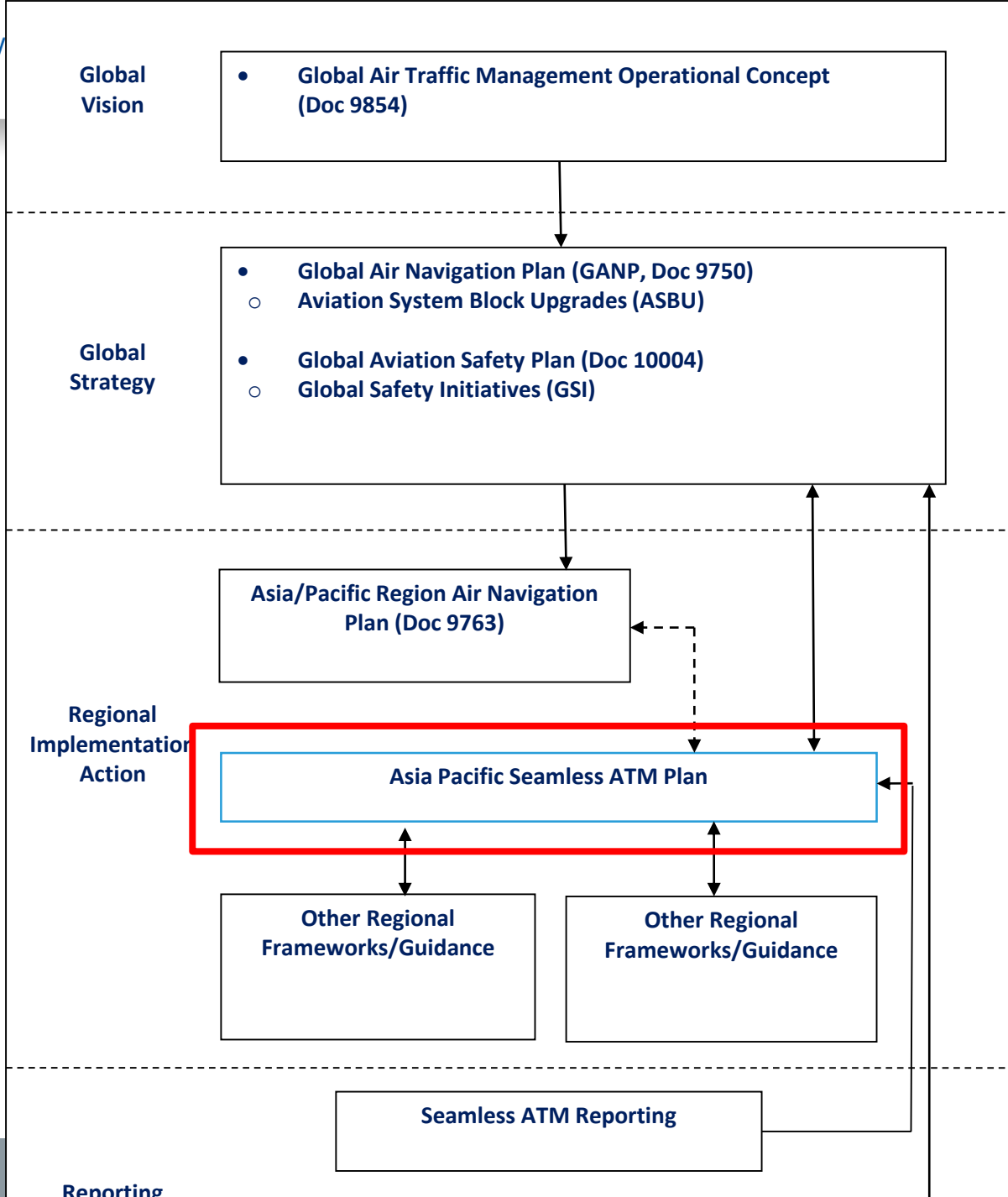
The Challenges

- **Lack of global guidance material (ICAO)**
 - Quality Manual
 - Training Manual
 - Updated AIS Manual
- **Organizational**
 - Lack of State policy and financial support for AIS/AIM
 - Poor understanding of the criticality of aeronautical information to aviation operations



Regional Plans and Expectations

Asia/Pacific Seamless ATM Plan





Asia/Pacific Seamless ATM Plan

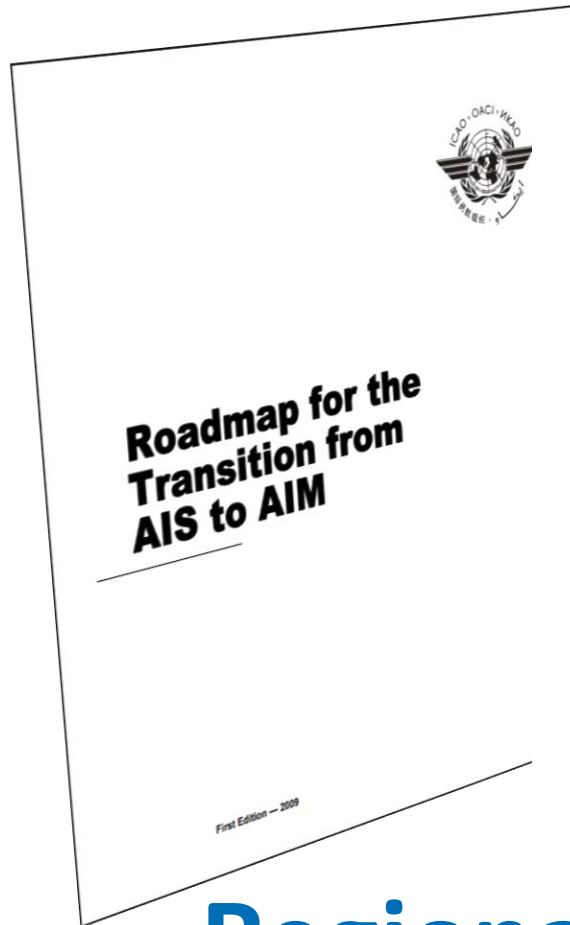
- Seamless ATM Plan (Update 2016)
- 10 Regional Priorities
 - Including **B0-DATM**
 - Seamless ATM Plan Target – by **November 2015** – (Phase I)
 - ATM systems should be supported by digitally-based AIM systems through implementation of Phase 1 and 2 of the AIS-AIM Roadmap Indicator
 - Metric – % of Phase 1 and Phase 2 elements completed



Asia/Pacific Seamless ATM Plan

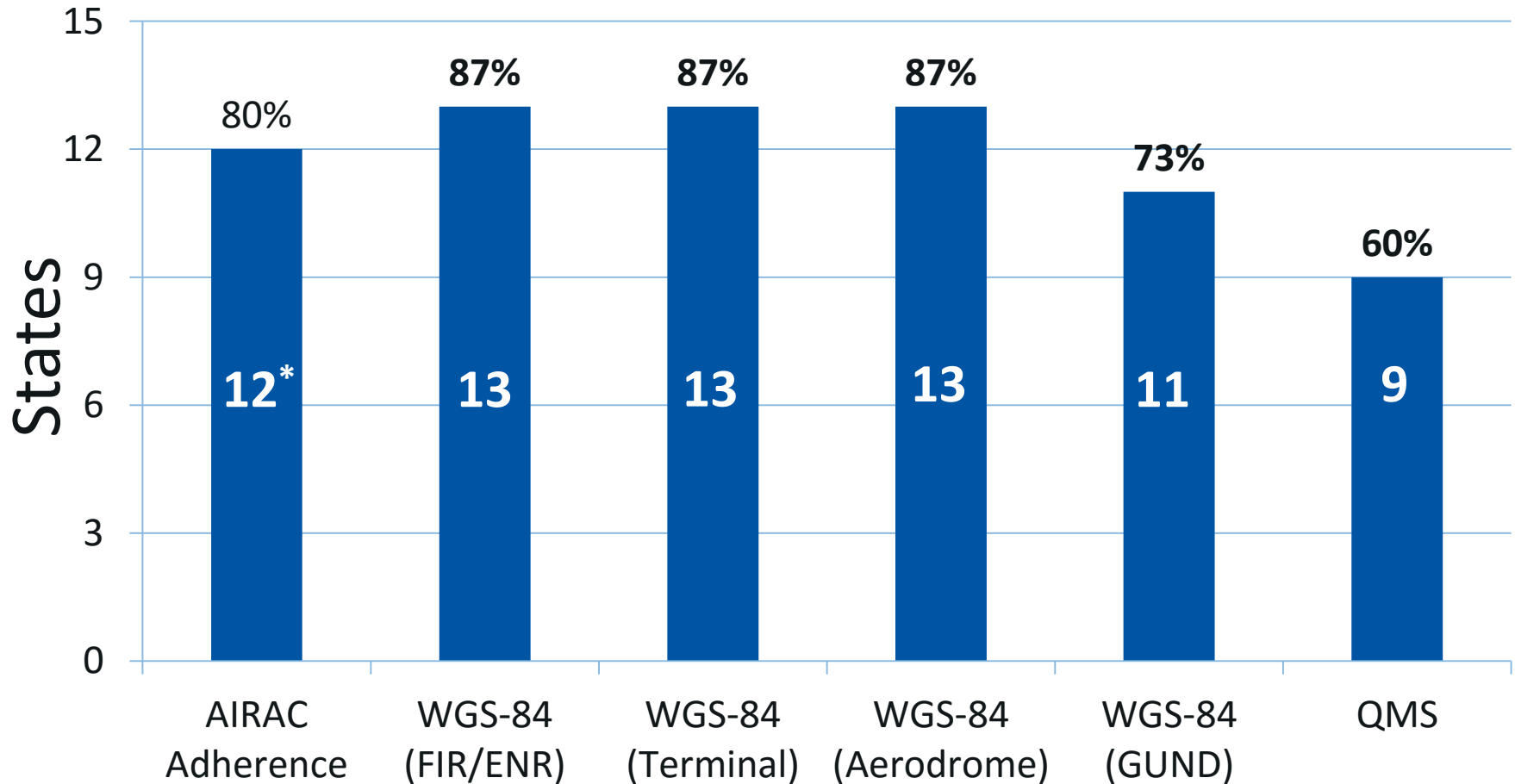
- Seamless ATM Plan (Update 2016)
- 10 Regional Priorities
 - Including **B0-DATM**
 - Seamless ATM Plan Target – by **November 2019** (Phase II)
 - ATM systems should be supported by complete implementation of AIM Phase 3 using, at a minimum, AIXM version 5.1
 - Metric – % of AIM transition steps completed

MID



Regional Implementation

Status of AIM Implementation (Phase I)



* MID Office is accredited to 15 States



MID Region AIM implementation Roadmap (Phase II)

	2014				2015				2016				2017				2018				Priority	Remarks
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4		
AIXM	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Orange	Orange	Orange	Orange	Orange	Orange	Orange	Orange	Green	Green	Green	Green	1	The target is to have 60% by 2015, 80% by 2017 and 100% by 2019
eAIP	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Orange	Orange	Orange	Orange	Orange	Orange	Orange	Orange	1	The target is to have 60% by 2016, 70% by 2018 and 100% by 2020
Terrain A-1	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Orange	Orange	Orange	Orange	Orange	Orange	Orange	Orange	Orange	Orange	Orange	Orange	2	The target is to have 50% by 2015, 70% by 2018
Obstacle A-1	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Orange	Orange	Orange	Orange	Orange	Orange	Orange	Orange	Orange	Orange	Orange	Orange	2	The target is to have 40% by 2015, 60% by 2018
Terrain A-4	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	2	The target is to have 50% by 2015, 100% by 2018
Obstacle A-4	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	2	The target is to have 50% by 2015, 100% by 2018
Terrain A-2a	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Orange	Orange	Orange	Orange	3	The target is to have 30% by 2017, 50% by 2018
Obstacle A-2a	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Orange	Orange	Orange	Orange	3	The target is to have 30% by 2017, 50% by 2018
Data Quality Monitoring	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	3	Target for 2018: To be implemented by 50% of the States that have implemented QMS at least for the segment originator-AIS (excluding the segment AIS-End user)
Data Integrity Monitoring	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	3	
Agreement with data originators	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	3	Target for 2018: 50% of the States that have implemented QMS
Terrain and Obstacle for Areas 2b, 2c, 2d and 3																					4	Optional based on the States' decision to be reflected in the States' national Regulations and AIM National Plans, in accordance with operational needs
Aerodrome Mapping																					4	Optional based on the States' decision to be reflected in the States' national Regulations and AIM National Plans, in accordance with operational needs

White: Not started Yellow: Initial Target Orange: Intermediate Target Green: Target for full implementation



National AIM Implementation Roadmap Template

Phase/Step	Step No.	Timeline					Start	End	Remarks
		2014	2015	2016	2017	2018			
Obstacle A-2	P-14								Please specify implementation of Area 2a, 2b, 2c and/or 2d
Terrain A-3	P-13								
Obstacle A-3	P-14								
AD Mapping	P-15								
Phase III									
Aeronautical data exchange	P-09								
Communication networks	P-10								
Aeronautical information briefing	P-12								
Training	P-16								
Agreement with data originators	P-18								
Interoperability with meteorological products	P-19								
Electronic aeronautical charts	P-20								
Digital NOTAM	P-21								

12 (out of 15) States (80%) have provided their National AIM Implementation Roadmap, using the Template.

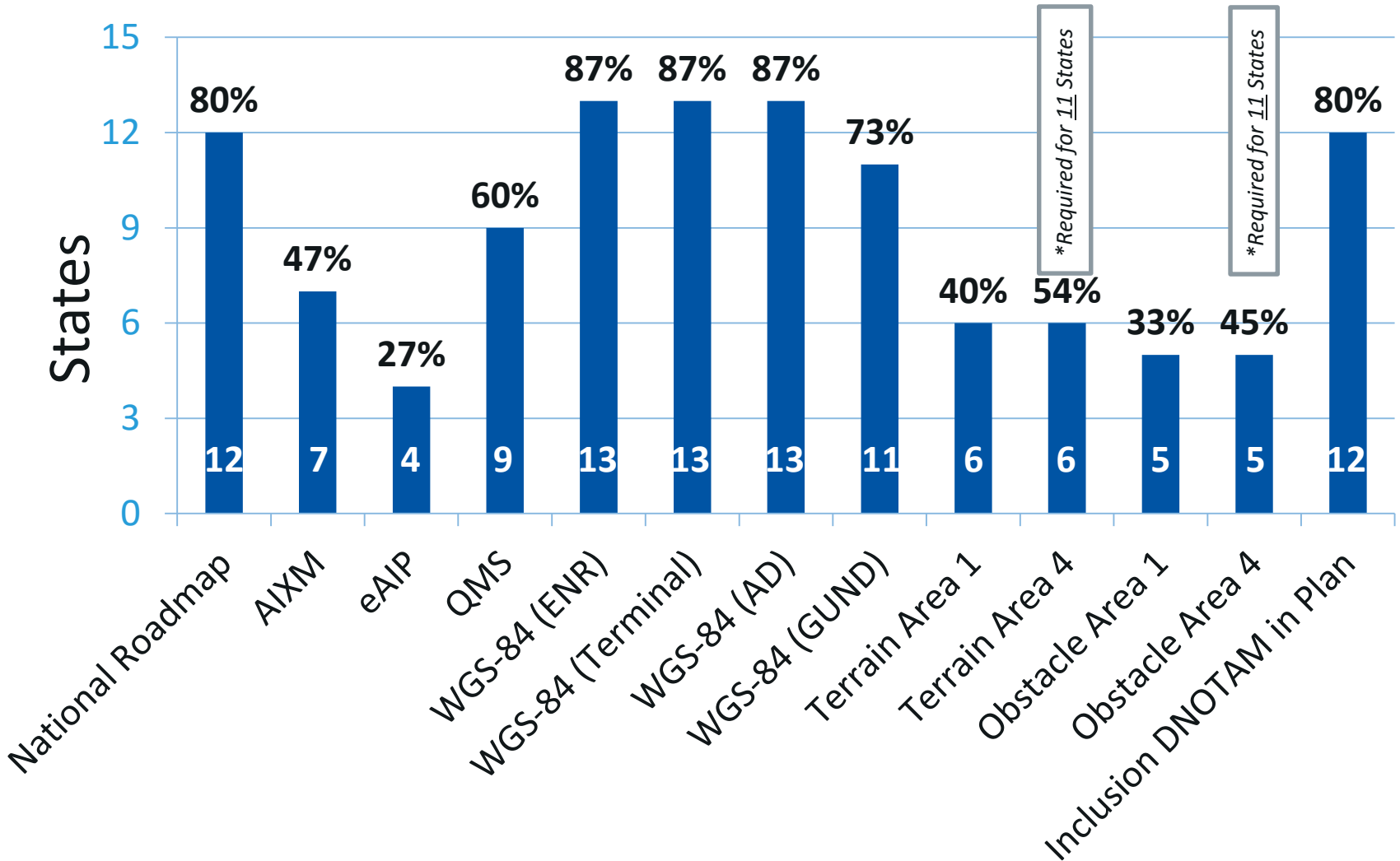
Legend		Not Started
		In Progress
		Implemented



B0-DATM (MID Region Air Navigation Strategy)

Elements	Applicability	Performance Indicators/Supporting Metrics	Targets
1- National AIM Implementation Plan/Roadmap	All States	Indicator: % of States that have National AIM Implementation Plan/Roadmap Supporting Metric: Number of States that have National AIM Implementation Plan/Roadmap	80% by Dec. 2016 90% by Dec. 2018
2-AIXM	All States	Indicator: % of States that have implemented an AIXM-based AIS database Supporting Metric: Number of States that have implemented an AIXM-based AIS database	60% by Dec. 2015 80% by Dec. 2017 100% by Dec. 2019
3-eAIP	All States	Indicator: % of States that have implemented an IAID driven AIP Production (eAIP) Supporting Metric: Number of States that have implemented an IAID driven AIP Production (eAIP)	60% by Dec. 2016 80% by Dec. 2018 100% by Dec. 2020
4-QMS	All States	Indicator: % of States that have implemented QMS for AIS/AIM Supporting Metric: Number of States that have implemented QMS for AIS/AIM	70% by Dec. 2016 90% by Dec. 2018
5-WGS-84	All States	Indicator: % of States that have implemented WGS-84 for horizontal plan (ENR, Terminal, AD) Supporting Metric: Number of States that have implemented WGS-84 for horizontal plan (ENR, Terminal, AD) Indicator: % of States that have implemented WGS-84 Geoid Undulation Supporting Metric: Number of States that have implemented WGS-84 Geoid Undulation	Horizontal: 100% by Dec. 2017 Vertical (GUND): 90% by Dec. 2018
6-eTOD	All States	Indicator: % of States that have implemented required Terrain datasets Supporting Metric: Number of States that have implemented required Terrain datasets Indicator: % of States that have implemented required Obstacle datasets Supporting Metric: Number of States that have implemented required Obstacle datasets	<u>Area 1</u> : Terrain: 50% by Dec. 2015, 70% by Dec. 2018; Obstacles: 40% by Dec. 2015, 60% by Dec. 2018 <u>Area 4</u> : Terrain: 50% by Dec. 2015, 100% by Dec. 2018; Obstacles: 50% by Dec. 2015, 100% by Dec. 2018
7-Digital NOTAM*	All States	Indicator: % of States that have included the implementation of Digital NOTAM into their National Plan for the transition from AIS to AIM Supporting Metric: Number of States that have included the implementation of Digital NOTAM into their National Plan for the transition from AIS to AIM	80% by Dec. 2016 90% by Dec. 2018

Status of B0-DATM



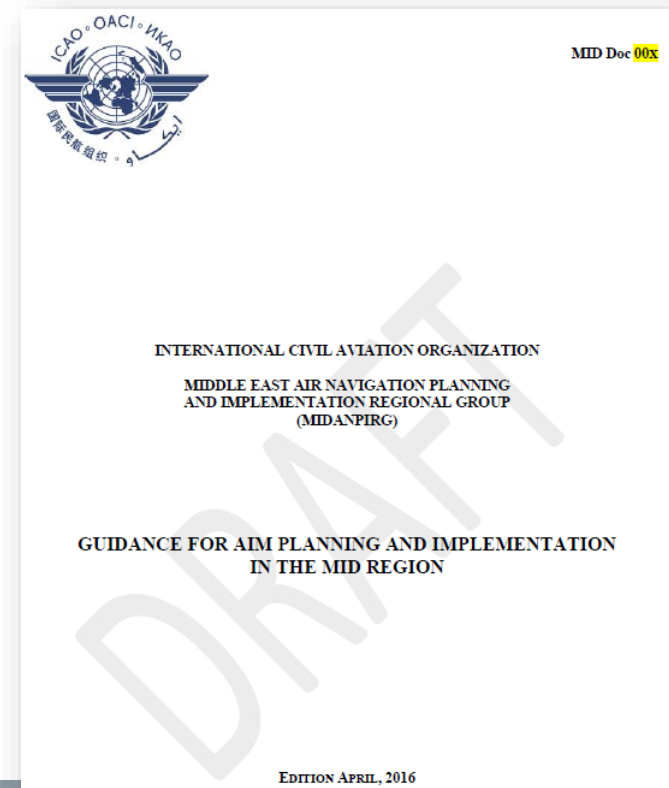


Challenges/Lessons Learned

- **Main challenges**
 - QMS, AIXM (and consequently eAIP) and eTOD are the main challenges
 - MIDAD is the main challenging Regional initiative
- **Main reasons for the non-implementation:**
 - Financial issues
 - Lack/shortage of competent human resources (needs for training)
 - 4 (out of 15) MID States (27%) faced with serious security issues (assistance missions and support could not be provided)
- **Guidance materials and iKITs (implementation KITs) could help States with the implementation**

ICAO Support (some recent initiatives)

- Development of the MID Region AIM Implementation Roadmap
- Development of template for National AIM Implementation Roadmap
- Methodology for reporting and assessing the progress of AIM Transition
- MID Region AIM Database (MIDAD) Project (ongoing)
- Assistance missions to States
- “Guidance for the AIM Planning and Implementation in the MID Region” (MID Doc 00X)

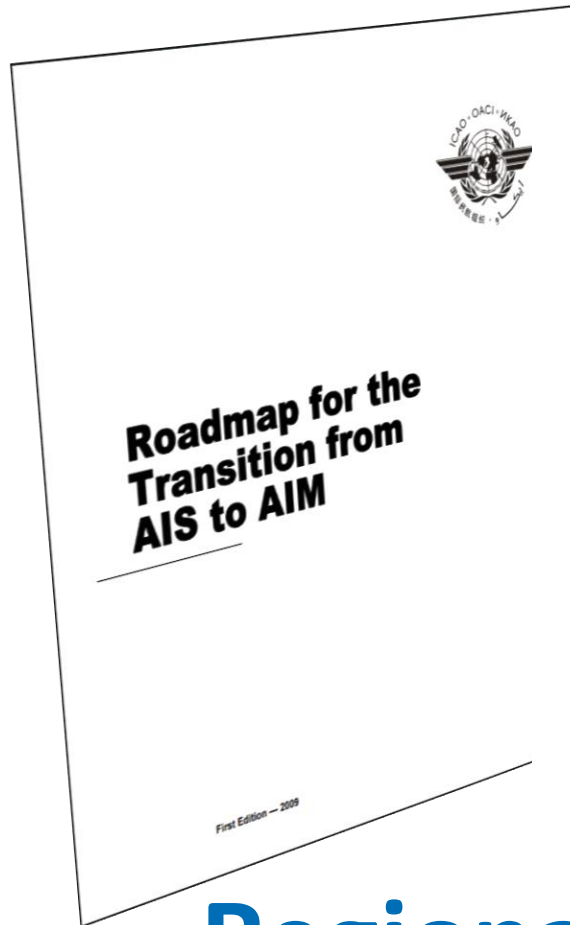




Implementation Monitoring

- **Monitoring of the implementation is carried out through:**
 - MID eANP Volume III;
 - Regional Performance Dashboard (MID Dashboard is being updated to include all the B0-DATM elements)
 - MIDANPIRG AIM Sub-Group; and
 - ICAO MID Regional Office (Secretariat).

AFI

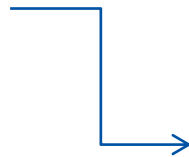


Regional Implementation

AFI PLANNING AND IMPLEMENTATION REGIONAL GROUP (APIRG)

The APIRG has identified the following main issues:

- The need to engage “management Levels” in understanding the transition to AIM
- Better understanding of new vision of AIM at all levels
- Need for guidance with respect to implementation
- Better understanding of the benefits associated with AIM



Implementation of AIM, as a facilitator of PBN, CDM, etc, reduces overall costs

Follow up by AFI AIM TF meetings

- The AFI AIM Task Force is the Regional body established under the APIRG to advance AIM implementation.
- The main objectives of the AFI AIM TF is **to provide guidance to States**, in accordance with the requirements of AFI Part of the Draft e-ANP that has been presented at the 12th Air Navigation Conference.
- The AFI AIM Task Force has also reviewed the ASBU modules related to interoperability and data (AIM) and noted that operational improvements must be outlined in a logical stepwise approach (block upgrades) that includes:
 - Identify the operational benefit
 - Determine the necessary procedures
 - Nominate the required technology
 - Develop the business case
 - Propose a preliminary strategy for regulatory approval

Follow up on AFI-CAD Concept

The AFI-CAD Business Plan was agreed by the Air Navigation Commission on 8 March 2011; the ANC noted that the transition in the AFI Region **will benefit if a robust communication infrastructure exist**. The ANC further called upon the Secretariat to support/monitor the transition of AIS to AIM through region mechanism.

Following the review of the revised AFI Plan by the 12 AN Conference, it was agreed that the Concept of AFI-CAD when implemented, will offer all AIM related tasks including even the classic AIM services to **reduce the ANSP's efforts and timelines needed by the States on their way to the AIS/AIM Transition process**. This has also been re-confirmed by Recommendation 3/8 (c) of the 12th AN Conference

The AFI States are facing a lot of challenging tasks in the AIS/AIM Transition process and it is anticipated that implementation of the AFI-CAD would provide the following solutions: 1. Support to the e-AIP Production, 2. Support to the charting production, 3. Other tailor made solutions taking into account the necessities of States

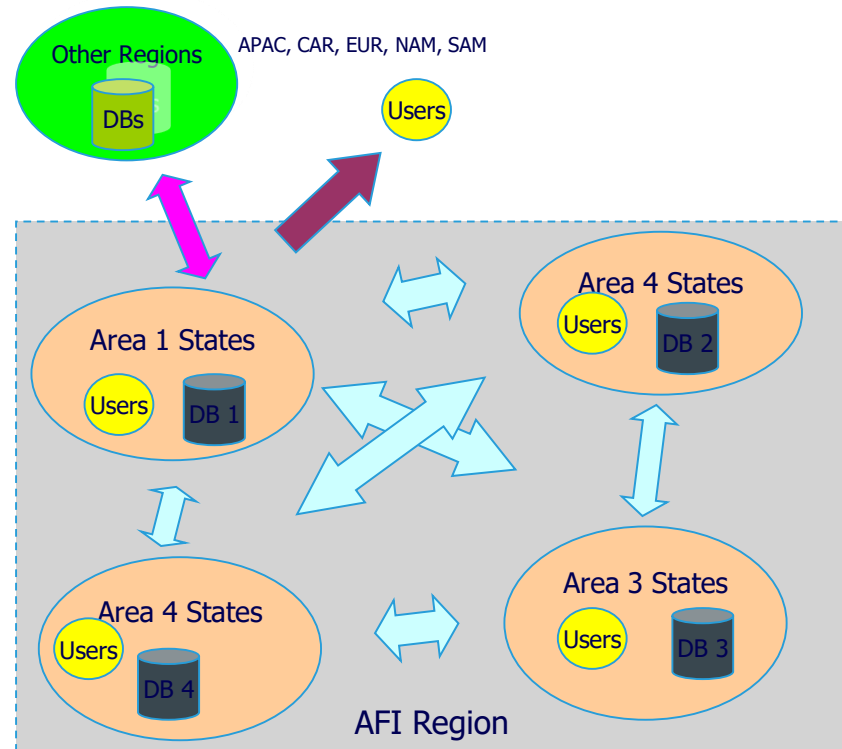
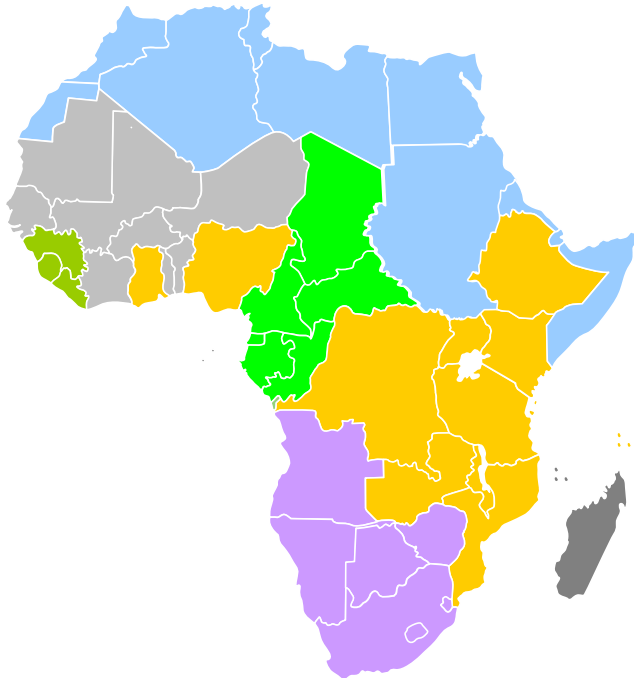


Follow-up on ANC 12 Rec.3/8 (c):

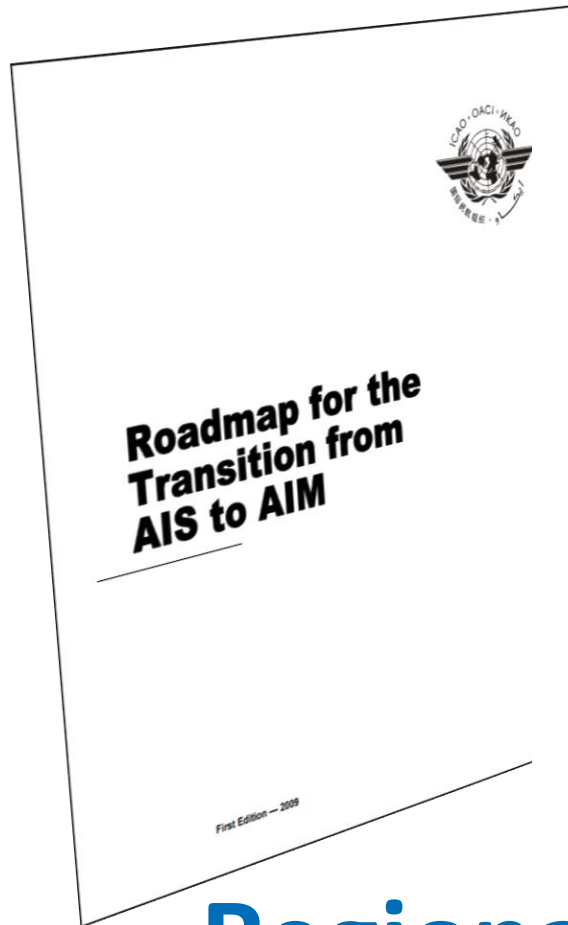
- To this effect, it is noted that **ASECNA is progressively engaged in implementing** in accordance with the AFI-CAD Concept, a **Regional AIS Database** to accommodate and enable all the States in the Western and Central African Region to effectively transition from AIS to AIM. In accordance with the AFI-CAD Concept, **South Africa has invited AFI States to join the South African Regional AIS Database** as an enabler in the transition process to enhance AIM implementation within the AFI Region.
- The APIRG has endorsed the possibility of AFI States migrating to the ASECNA Regional AIS Database as an enabler in the transition process, and also the possibility of AFI States migrating to the South African Regional AIS Database as an enabler, in accordance with the AFI-CAD Concept as per Recommendation 3/8 (c) of the 12th AN Conference.

Vision

4 AIS/AIM Databases across the AFI Region where consistent and high quality aeronautical data of the Region will be made available to airspace users and others



NACC



Regional Implementation

Performance Framework for Air Navigation Systems



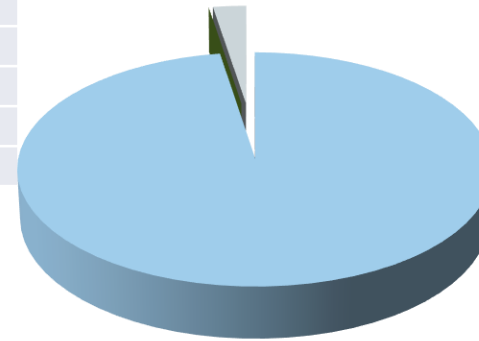
Aircraft movements forecast 2011-2031 (in thousands)

Major Route Groups	2011	2012	2013	2014	2016	2021	2031	Average Annual Growth (%)			
								2011-2016	2016-2021	2021-2031	2011-2031
South Atlantic	38.49	40.62	42.94	45.39	50.90	62.57	97.85	5.7	4.2	4.6	4.8
Mid Atlantic	60.49	64.29	68.32	72.61	81.70	102.16	173.80	6.2	4.6	5.5	5.4
Intra-South America	147.99	162.33	178.06	195.31	230.74	317.83	614.95	9.3	6.6	6.8	7.4
Between South America and Central America/ Caribbean	76.70	83.81	92.43	101.93	123.96	172.22	357.43	10.1	6.8	7.6	8.0
Intra-Central America/Caribbean	266.44	292.26	320.58	351.64	410.72	561.59	1072.08	9.0	6.5	6.7	7.2
Between <u>North</u> America and South America/Central America/Caribbean	595.73	636.07	680.28	729.62	821.20	975.69	1446.78	6.6	3.5	4.0	4.5
TOTAL	1185.84	1279.38	1382.60	1496.50	1719.22	2192.06	3762.89	7.7	5.0	5.6	5.9

Source OAG data

P-03 AIRAC

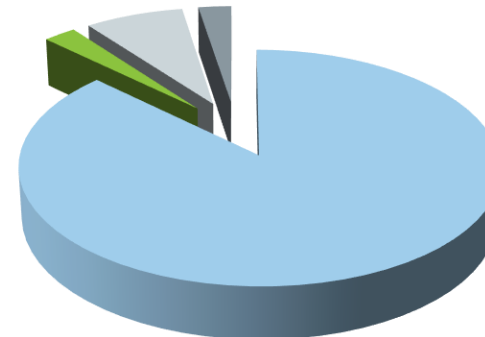
		P-03 AIRAC	
Instructions for completing the table:		Count	Percentage no segmented
FC= 1	Fully Compliant	38	97.43%
PC= 2	Partially Compliant	0	0.00%
NC= 3	Not Compliant	1	2.56%
N/A= 0	Not Applicable	0	0



- Instructions for completing the table:
- FC= 1 Fully Compliant
- PC= 2 Partially Compliant

P-04 (EFOD)

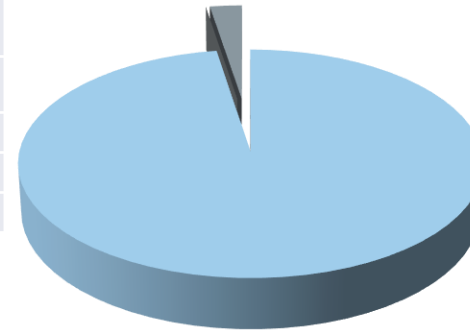
		P-04 (EFOD)	
Instructions for completing the table:		Count	Percentage no segmented
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PC= 2	Partially Compliant	1	2.56%
NC= 3	Not Compliant	3	7.69%
N/A= 0	Not Applicable	1	2.56%



- Instructions for completing the table:
- FC= 1 Fully Compliant
- PC= 2 Partially Compliant
- NC= 3 Not Compliant
- N/A= 0 Not Applicable

P-05 WGS84

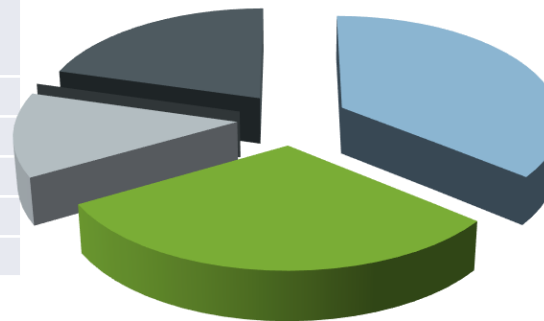
		P-05 WGS84	
Instructions for completing the table:		Count	Percentage no segmented
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PC= 2	Partially Compliant	0	0.00%
NC= 3	Not Compliant	0	2.56%
N/A= 0	Not Applicable	1	0



- Instructions for completing the table:
- FC= 1 Fully Compliant
- PC= 2 Partially Compliant
- NC= 3 Not Compliant
- N/A= 0 Not Applicable

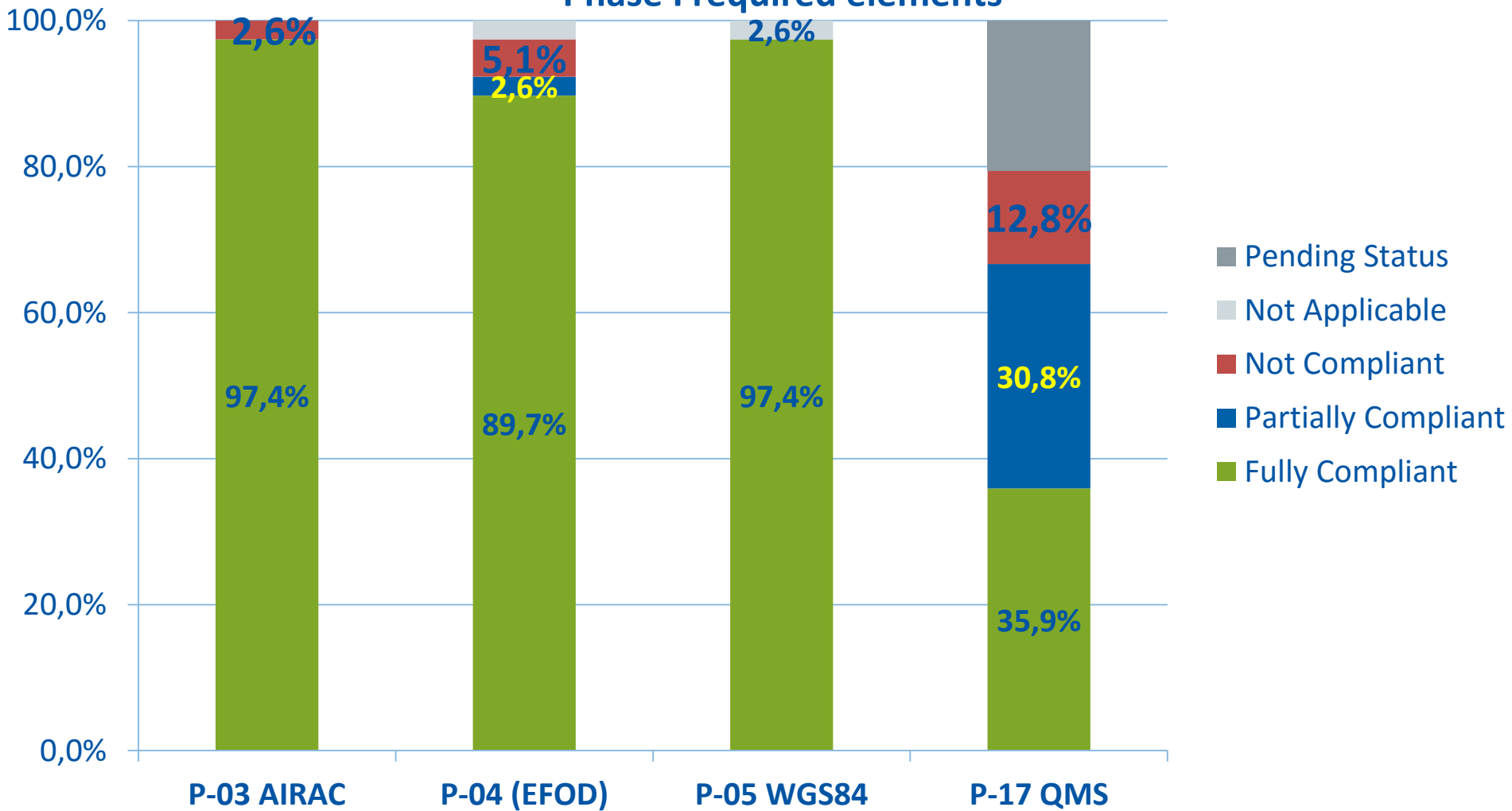
P-17 QMS

		P-17 QMS	
Instructions for completing the table:		Count	Percentage no segmented
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PC= 2	Partially Compliant	12	30.76%
NC= 3	Not Compliant	5	12.82%
N/A= 0	Not Applicable	0	0
PS/=4	Pending Status	8	20.51%



- Instructions for completing the table:
- FC= 1 Fully Compliant
- PC= 2 Partially Compliant
- NC= 3 Not Compliant
- N/A= 0 Not Applicable

Aeronautical Information Services (AIS) to implement AIM Roadmap – Phase I required elements

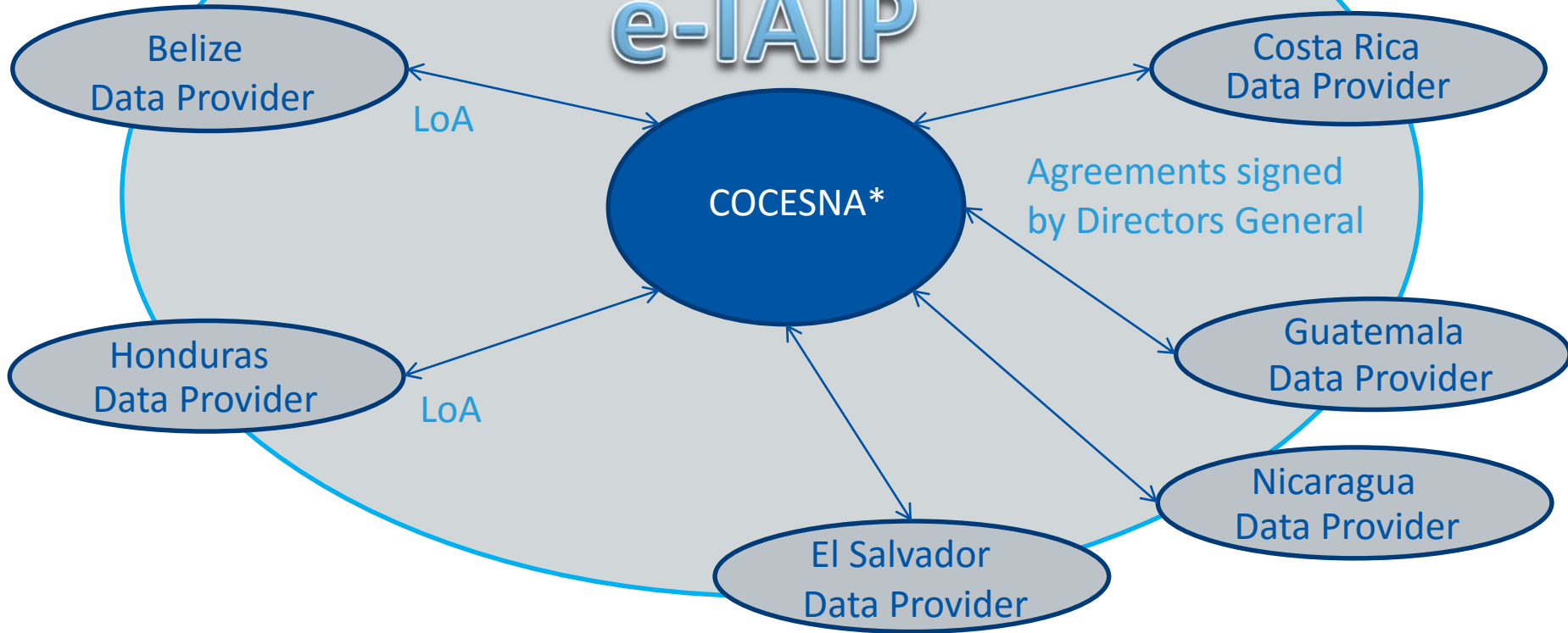




State	Phase 1 Consolidation	Phase 2 Going Digital (estimated)	Phase 3 Information Management (estimated)
Antigua & Barbuda (T&T)	87.5%	40%	25%
Bahamas	62.5%	11%	0%
Barbados	87.5%	40%	20%
Belize (COCESNA)	87.5%	55%	35%
Canada	100%	100%	89%
Costa Rica	100%	20%	0%
Cuba	100%	44%	30%
Dominican Republic	100%	60%	35%
El Salvador	87.5%	11%	0%
Grenada (T&T)	75%	40%	25%
Guatemala	87.5%	11%	0%
Haiti	75%	10%	0%
Honduras (COCESNA)	87.5%	55%	35%
Jamaica	87.5%	10%	0%
Mexico	100%	78%	40%
Nicaragua	100%	11%	10%
St. Kitts & Nevis (T&T)	87.5%	40%	25%
St. Lucia (T&T)	87.5%	40%	25%
St. Vincent and the Grenadines (T&T)	87.5%	40%	25%
Trinidad & Tobago	100%	65%	35%
United States	100%	100%	95%

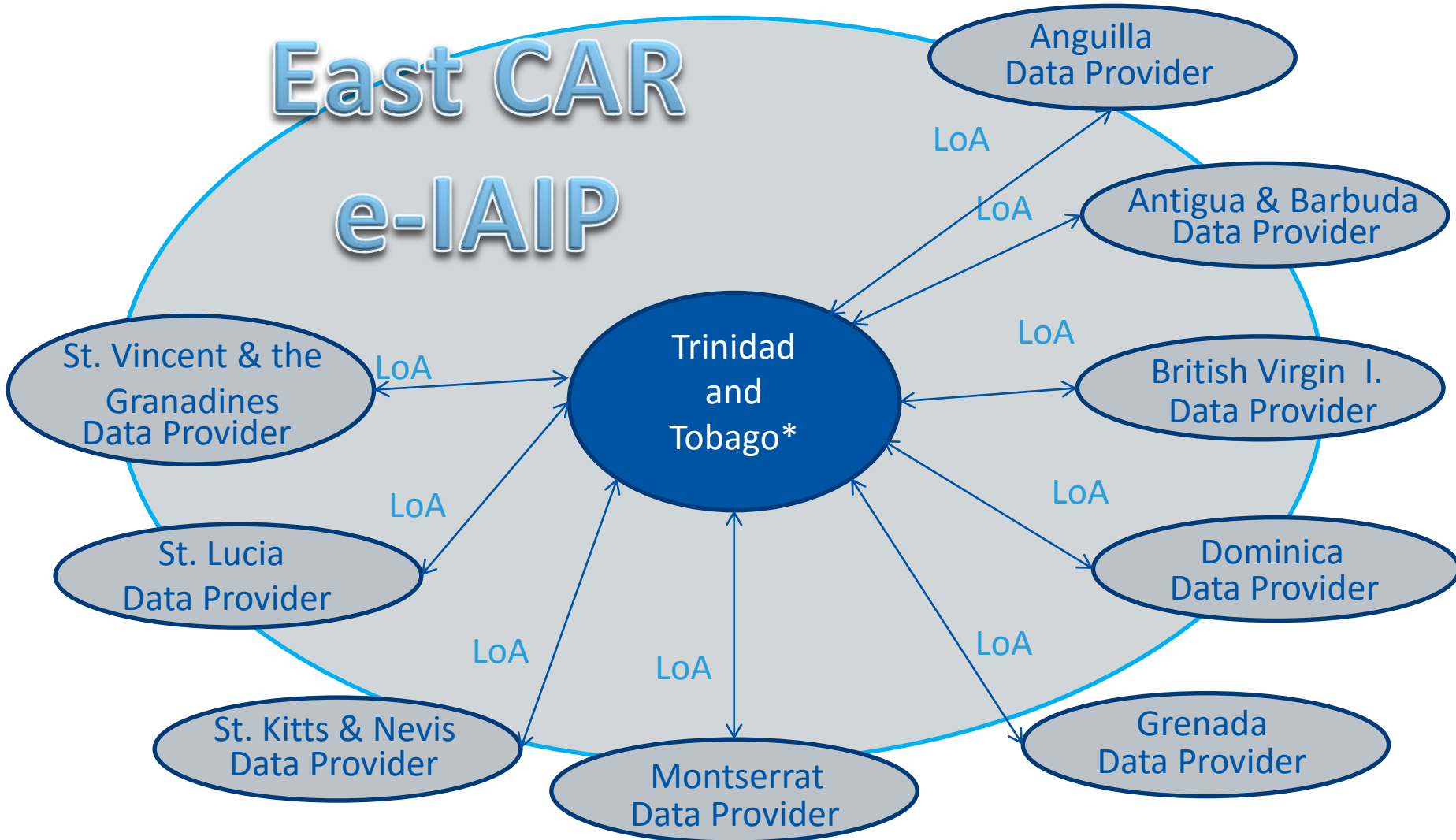


Central American e-IAIP

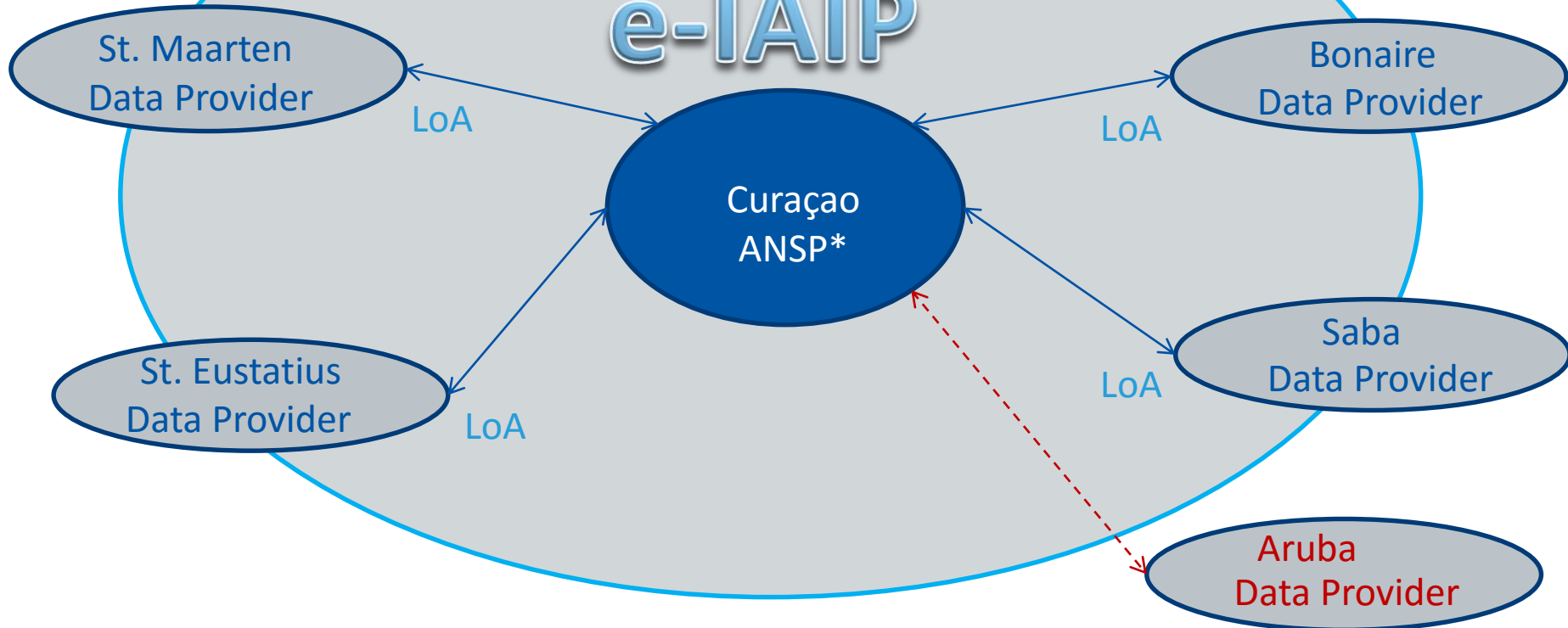


*Corporación Centroamericana de Navegación Aérea

East CAR e-IAIP



Dutch Caribbean e-IAIP



LoA under preparation between Authorities (not yet included in Dutch e-IAIP)

Conclusions

- Status of implementation varies according to the region
- No Region has fully implemented Phases 1 and 2.
- Need for global guidance material (ICAO)
- Many States challenged by the lack of State/organizational focus on this critical air navigation domain.
- Need for enhanced State policy and financial support for AIS/AIM
- Need to establish a better understanding of the criticality of aeronautical information to aviation operations
- Intra-regional and interregional cooperation for an expeditious transition from AIS to AIM in a harmonized manner
- Importance of implementing the foundation of the AIS –AIM roadmap



- North American 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