International Civil Aviation Organization
North American, Central American and Caribbean Office

DISCUSSION PAPER

Second NAM/CAR Air Navigation Implementation Working Group Meeting (ANI/WG/2)
Puntarenas, Costa Rica, 1 to 4 June 2015

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Agenda Item 4	**Follow-up on the NAM/CAR Regional Performance Based Air Navigation Implementation Plan (NAM/CAR RPBANIP)**
	4.1 Progress reports of the Task Forces and the ANI/WG

**ANRFS ADOPTED WITH THE REGIONAL PERFORMANCE-BASED AIR NAVIGATION
IMPLEMENTATION PLAN (RPBANIP)**
(Presented by the ad-hoc working group on performance metrics)

EXECUTIVE SUMMARY
This working paper presents the concern for the lack of use of the ANRFs adopted with the Regional Performance-Based Air Navigation Implementation Plan (RPBANIP) and proposes several ideas for review and improvements for this form to be implemented, including an analysis of the Air Navigation metrics.

Strategic Objectives:	• Safety • Air Navigation Capacity and Efficiency • Environmental Protection
References:	• First NAM/CAR Air Navigation Implementation Working Group Meeting (ANI/WG/1), Mexico City, Mexico, from 29 July to 1 August 2013 • Fourth North American, Central American and Caribbean Working Group Meeting (NACC/WG/4) Ottawa, Canada, from 24 to 28 March 2014 • Fourteenth Directors of Civil Aviation of the Central Caribbean Meeting (C/CAR/DCA/14), Kingston, Jamaica, from11 to 13 May 2015

1. Introduction

1.1 From the ANI/WG/01 Meeting, the ANI/WG agreed on the implementation monitoring through the Air Navigation Report Form (ANRF) contained in the ICAO Aviation System Block Upgrade (ASBU) Modules, whose information is part of the regional input to the global follow-up made in the Annual Global Air Navigation Report and feedback for the global Air Navigation Plan (GANP) and the Regional dashboards.
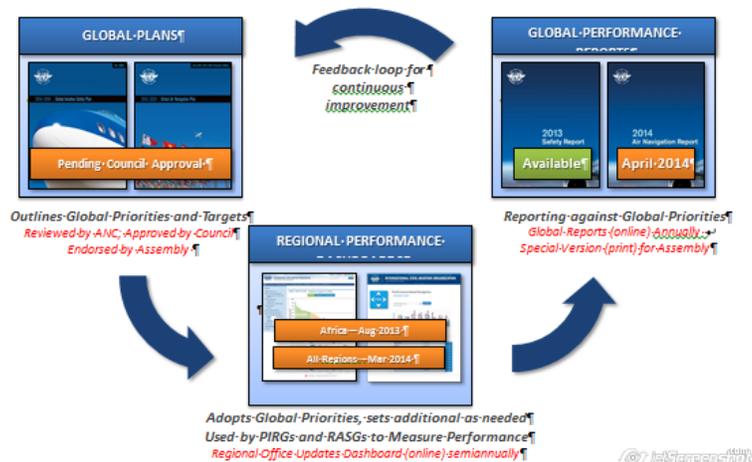
1.2 From the NACC/WG/04, the States/territories were:

a) urged to take the necessary actions in support of the ICAO NACC Regional Office for collecting the required information/data for the performance metrics to be included in the ICAO NACC Regional Performance Dashboard, recalling that a detailed description of the ANRF is included in Chapter 3 of the RPBANIP.

b) Informed that with the implementation of the Electronic Air navigation Plan (eANP) a third Volume is being included for the purpose of reflecting every regional adopted ASBU module, and the way the monitoring reporting of their implementation is going to be made.

2. Discussion

2.1 Since the adoption of the RPBANIP, all States and Territories of the NAM/CAR regions have been urged to develop their national implementation Plans in accordance to the RPBANIP and have committed to achieve the targets and goals defined in the RPBANIP and the core targets reflected in the *Port-of-Spain Declaration*.

2.2 In this sense, ICAO will assist and take the necessary actions to support the States in the completion of the reporting forms to ensure the proper understanding and appropriate provision of information for monitoring the implementation.

2.3 In this regard, to harmonize the collection of information following the implementation and benefits achieved with the RPBANIP, Conclusion NACC/WG/4/15 *Air Navigation Reporting/ Monitoring in the NAM/CAR Regions* was adopted for NAM/CAR States/Territories to:

a) invite all Air Navigation stakeholders in the data collection and reporting process;

b) use the RPBANIP ANRFs to the extent possible, to report their national, sub-regional and regional progress in implementation and performance; and

c) report periodically to the ICAO NACC Office to reflect the NAM/CAR Regions status in the different forums as needed.

2.4 Following this Conclusion NACC/WG/4/15, the C/CAR Directors of Civil Aviation mandated the ANI/WG through their conclusion C/CAR/DCA/14/6, that, in order to streamline the air navigation performance reporting/monitoring activities:

a) present the operational benefits and performance achievements in the CAR States resulting from the ANI/WG activities;

b) in coordination with the ICAO NACC Regional Office, develop a way of showing the progress on the different air navigation targets for ease of follow-up;

c) update their Terms of reference to include the actions a) and b); and

d) present the results of items a) to c) at the C/CAR/DCA/15 Meeting.

2.5 The adoption of the ANRFs was to support and facilitate the monitoring and reporting on the achievement of the elements conforming the ASBU modules, including the progress in the implementation of the elements and the reporting of the operational benefits gained from the ASBU modules. The operational benefits may be different from State to State depending on each State particular operational scenario.

2.6 ICAO has conducted a preliminary analysis for completing the Air Navigation targets as shown in **Appendix** to this paper, where several metrics need to be defined starting with the definition of the criteria of success, the selection criteria and the selection to be applied.

2.7 At the ANI/WG/2 meeting, an ad-hoc group was formed to discuss metrics and performance reporting. Along with the information above, the ad-hoc group considered WP/14 in which Canada and the United States proposed revisions to the ANRF to be used by States in the NAM/CAR Regions.

2.8 The ad-hoc group discussed the difficulty for Regions and States to correlate their plans with the ICAO ASBU planning framework. In particular, the information about the ASBU Modules provided in the GANP was not sufficiently detailed to permit easy mapping to existing regional and national plans. The group agreed that the Module descriptions were a high level capability description and were not suitable to guide specific implementations. To determine implementations, it was necessary to consider the Module elements. Unfortunately, this level of detail was not provided in the GANP.

2.9 The ad-hoc group reviewed a working document used by some of its members to map their national air navigation implementation plans to ASBU implementation. The document consisted of the basic Module information provided in the GANP, plus the elements for each Module, determined by careful review of the March 2013 ASBU Working Document. The ad-hoc group agreed this provided a straightforward tool for States and Regions to determine how their particular air navigation improvements would address ASBU implementation. It was noted that the March 2013 document was very large, not generally available and inconsistently written. Additionally, the Module elements were only sometimes directly listed; for many Modules, it was necessary to extract the elements from the descriptive text.

2.10   The ad-hoc group then discussed what performance needed to be measured, particularly in regard to ICAO's No Country Left Behind initiative. The ad-hoc group agreed that the first indication that should be measured was whether or not a State had assessed the requirement and feasibility of implementing a specific improvement. The group agreed that a flow chart description of the assessment, planning and implementation process would assist States in reporting their actual implementation status and also ICAO in understanding whether a State was being "Left Behind" at critical steps in the implementation process.

2.11   The group created a table of metrics for all ASBU Block 0 elements and then reviewed the RPBANIP and inserted already agreed metrics in the appropriate places. All metrics from the RPBANIP are indicated in blue highlight. This was possible for all ASBU Block 0 Modules except APTA (Airport Accessibility), for which the RPBANIP descriptions were not technically correct, to the understanding of the ad-hoc group. It is therefore suggested that this section be reviewed by experts in the naming and categorization of PBN approaches.

3.   Suggested Actions

3.1   The Meeting is invited to:

a)   take note of the background information for applying the ANRFs;
b)   review the ease of use and filling the ANRFs in practical terms;
c)   identify improvements to the ANRFs;
d)   review the analysis of the metrics presented in Appendix to this paper;
e)   propose a way of showing the progress on the different air navigation targets for ease of follow-up; and
f)   take any action as deem necessary.

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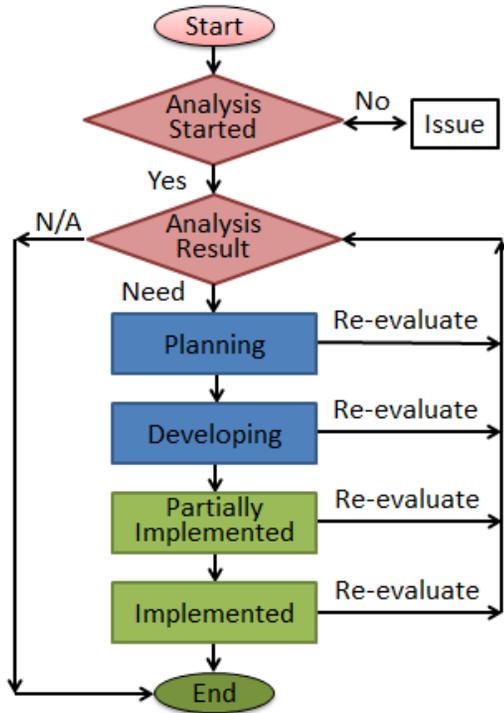
Selection criteria:

Safety assessments need to be conducted to identify airports and FIRs where improvements are required for safety reasons. For example, where do runway incursions occur? Where do missed approaches occur? Where do separation losses occur?

Operational assessments need to be conducted to identify airports and FIRs where improvements are required for efficiency reasons. For example, where are there departure or arrival delays? Where are there flow restrictions?

Business case analyses need to be conducted to determine whether the identified improvements are feasible: are enough aircraft equipped, certified, approved, to participate in the new operation? Can the improvement be financed? Are the costs to implement justified/offset by the savings or safety improvements that are foreseen?

ICAO Guidance Documents often include material to assist States to assess whether a particular airspace or airport is suitable or should be considered for a specific implementation.

IATA and CANSO produce best practices guidance documents to assist ANSPs and operators to carry out operational benefits analyses.

ICAO provides implementation kits (iKits) at the following link:

http://www.icao.int/safety/Implementation/Pages/iKITs.aspx

CANSO and IATA have produced guidance and best practices on how to develop metrics and measure performance from implementations, in order to determine whether the intended improvements have been achieved.

Module Code	Module Title	Elements	Source	Metric	Target
B0-APTA	Optimization of Approach Procedures including vertical guidance	1. PBN Approach Procedures with vertical guidance (LPV, LNAV/VNAV minima, using SBAS and Baro VNAV)	Derived from 4.1.1	a. # out of # Table AOP I-1 airports which have assessed all runway ends for requirement b. # out of # required implementations planned c. # out of # required implementations completed	**B0-APTA 1.a.** 100% by Dec 31, 2015 **B0-APTA 1.b.** TBD **B0-APTA 1.c.** TBD

Module Code	Module Title	Elements	Source	Metric	Target
		2. PBN Approach Procedures without vertical guidance (LP, LNAV minima; using SBAS)	Derived from 4.1.1	**a.** # out of # Table AOP I-1 airports which have assessed all runway ends for requirement **b.** # out of # required implementations planned **c.** # out of # required implementations completed	**B0-APTA 2.a.** 100% by Dec 31, 2015
		3. GBAS Landing System (GLS) Approach procedures	Derived from 1.3.2	**a.** # out of # Table AOP I-1 airports that have assessed all runway ends for requirement **b.** # out of # required implementations planned **c.** # out of # required implementations completed	**B0-APTA 3.a.** 100% by Dec 31, 2015
The RPBANIP has: 1. APV with BARO VNAV, 2. APV with SBAS (WAAS), 3. APV with GBAS and 4. LNAV. This does not make sense, because LNAV refers to the approach limits possible, not an approach type. The types of PBN approaches are those with or without vertical guidance and another (less frequently implemented) type based on GBAS. We don't believe the stated targets are possible.				
B0-WAKE	Increased Runway Throughput through Optimized Wake Turbulence Separation	**1.** New PANS-ATM wake turbulence categories and separation minima	Defined: Element 1	**a.** publication of new minima	**B0-WAKE 1.a.** Applicable by Nov 2017?
		2. Dependent diagonal paired approach procedures for parallel runways with centrelines spaced less than 760 meters (2,500 feet) apart	Derived from Element 2	**a.** # out of # of Table AOP I-1 airports with such parallel runways that have been assessed for requirement **b.** # out of # required implementations planned **c.** # out of # required implementations completed	**B0-WAKE 2.a.** 100% by Dec 31, 2016
		3. Wake independent departure and arrival procedures for parallel runways with centrelines spaced less than 760 meters (2,500 feet) apart	Derived from Element 3)	**a.** # out of # of Table AOP I-1 airports with such parallel runways that have been assessed for requirement **b.** # out of # required implementations planned **c.** # out of # required implementations completed	**B0-WAKE 3.a.** 100% by Dec 31, 2016

Module Code	Module Title	Elements	Source	Metric	Target
		4. Wake turbulence mitigation for departures procedures for parallel runways with centrelines spaced less than 760 meters (2,500 feet) apart	Derived from Element 3	**a.** # out of # of Table AOP I-1 airports with such parallel runways that have been assessed for requirement **b.** # out of # required implementations planned **c.** # out of # required implementations completed	**B0-WAKE 4.a.** 100% by Dec 31, 2016
		5. 6 wake turbulence categories and separation minima	Identified by the United States	**a.** # of # selected airports at which this has been implemented	**B0-WAKE 5.a.** 100% by Dec 31, 2015
B0-RSEQ	Improve Traffic flow through Runway Sequencing (AMAN/DMAN)	**1.** AMAN via controlled time of arrival to a reference fix	Derived from Element 1	**a.** # out of # Table AOP I-1 airports assessed for requirement **b.** # out of # required implementations planned **c.** # out of # required implementations completed	**B0-RSEQ 1.a.** All by 31 Dec, 2015 **B0-RSEQ 1.b.** All by 31 Dec, 2015 **B0-RSEQ 1.c.** 10% by 31 Dec, 2016
		2. AMAN via controlled time of arrival at the aerodrome	Derived from Element 1	**a.** # out of # Table AOP I-1 airports assessed for requirement **b.** # out of # required implementations planned **c.** # out of # required implementations completed	**B0-RSEQ 2.a.** 100% by 31 Dec, 2015 **B0-RSEQ 2.b.** All by 31 Dec, 2015 **B0-RSEQ 3.c.** 10% by 31 Dec, 2016
		3. Departure management	Defined: Element 2	**a.** # out of # Table AOP I-1 airports assessed for requirement **b.** # out of # required implementations planned **c.** # out of # required implementations completed	**B0-RSEQ 3.a.** 100% by 31 Dec, 2015 **B0-RSEQ 3.b.** All by 31 Dec, 2015 **B0-RSEQ 3.c.** 10% by 31 Dec, 2016

Module Code	Module Title	Elements	Source	Metric	Target
		4. Departure flow management	Derived from Element 2	**a.** # out of # Table AOP I-1 airports assessed for requirement **b.** # out of # required implementations planned **c.** # out of # required implementations completed	**B0-RSEQ 4.a.** 100% by 31 Dec, 2016 **B0-RSEQ 1.b.** All by 31 Dec, 2015 **B0-RSEQ 1.c.** 10% by 31 Dec, 2016
		5. Point merge	Defined: Element 3	**a.** # out of # Table AOP I-1 airports assessed for requirement **b.** # out of # required implementations planned **c.** # out of # required implementations completed	**B0-RSEQ 5.a.** 100% by 31 Dec, 2016
B1-RSEQ	Improved airport operations through departure, surface and arrival management	**1.** Surface movement optimization		**a.** # out of # Table AOP I-1 airports assessed for requirement **b.** # out of # required implementations planned **c.** # out of # required implementations completed	**B1-RSEQ 1.a.** 100% by Dec, 2015 **B1-RSEQ 1.b.** 100% by Dec, 2016 **B1-RSEQ 1.c.** 20% by Dec, 2016
B0-SURF	Safety and Efficiency of Surface Operations (A-SMGCS Level 1-2)	**1.** A-SMGCS with at least one cooperative surface surveillance system	Derived from Element 1	**a.** # out of # Table AOP I-1 airports assessed for requirement **b.** # out of # required implementations planned **c.** # out of # required implementations completed	**B0-SURF 1.a.** 100% by 31 Dec, 2016
		2. Including ADS-B APT as an element of A-SMGCS	Derived from Element 1	**a.** # out of # Table AOP I-1 airports assessed for requirement **b.** # out of # required implementations planned **c.** # out of # required implementations completed	**B0-SURF 2.a.** 100% by 31 Dec, 2016 **B0-SURF 2.b.** 100% by 31 Dec, 2017 **B0-SURF 2.c.** 30% by 30 June, 2018
		3. A-SMGCS alerting with flight identification information	Derived from Element 2	**a.** # out of # Table AOP I-1 airports assessed for requirement **b.** # out of # required implementations planned **c.** # out of # required implementations completed	**B0-SURF 3.a.** 100% by 31 Dec, 2016

Module Code	Module Title	Elements	Source	Metric	Target
		4. Airport vehicles equipped with transponders	Derived from 1.4.1	**a.** # out of # Table AOP I-1 airports assessed for requirement **b.** # out of # required airports where vehicle equipage planned **c.** # out of # required airports where vehicle equipage completed	**B0-SURF 2.a.** 100% by 31 Dec, 2015 **B0-SURF 2.b.** 100% by 31 Dec, 2017 **B0-SURF 2.c.** 20% by 30 June, 2018
B0-ACDM	Improved Airport Operations through Airport-CDM	**1.** Airport CDM procedures	Derived from 1.1.2	**a.** # out of # Table AOP I-1 airports assessed for requirement **b.** # out of # required airports where planning completed **c.** # out of # required airports where implementation completed	**B0-ACDM 1.a.** 100% by 31 Dec, 2016 **B0-ACDM 1.b.** 100% by 31 Dec, 2017 **B0-ACDM 1.c.** 60% by 31 Dec, 2018
		2. Airport CDM tools	Derived from 1.1.2	**a.** # out of # Table AOP I-1 airports assessed for requirement **b.** # out of # required airports where planning completed **c.** # out of # required airports where implementation completed	**B0-ACDM 2.a.** 100% by 31 Dec, 2016
		3. Collaborative departure queue management	Derived from 3.1 & 7.2.1	**a.** # out of # Table AOP I-1 airports assessed for requirement **b.** # out of # required airports where planning completed **c.** # out of # required airports where implementation completed	**B0-ACDM 3.a.** 100% by 31 Dec, 2016
B0-FICE	Increased Interoperability, Efficiency and Capacity through Ground-Ground Integration	~~% of FIRs within which all applicable ACCs have implemented at least one interface to use AIDC / OLDI with neighbouring ACCs~~			

Module Code	Module Title	Elements	Source	Metric	Target
		1. AIDC to provide initial flight data to adjacent ATSUs	Derived from 1.1.4	**a.** # out of # FIRs within which all ACCs have assessed requirement with all adjacent ACCs **b.** # out of # required implementations planned **c.** # out of # required implementations completed	**B0-FICE 1.a.** 100% by 31 Dec, 2015 **B0-FICE 1.b.** 100% by 31 Dec, 2016 **B0-FICE 1.c.** 50% by Dec, 2016
		2. AIDC to update previously coordinated flight data	Derived from 1.1.5	**a.** # out of # FIRs within which all ACCs have assessed requirement with all adjacent ACCs **b.** # out of # required implementations planned **c.** # out of # required implementations completed	**B0-FICE 2.a.** All by 31 Dec, 2015 **B0-FICE 2.b.** 100% by 31 Dec, 2016 **B0-FICE 2.c.** 50% by Dec, 2016
		3. AIDC for control transfer	Derived from 1.1.5	**a.** # out of # FIRs within which all ACCs have assessed requirement with all adjacent ACCs **b.** # out of # required implementations planned **c.** # out of # required implementations completed	**B0-FICE 3.a.** 100% by 31 Dec, 2015
		4. AIDC to transfer CPDLC logon information to the Next Data Authority	Derived from 1.1.6	**a.** # out of # FIRs within which all ACCs have assessed requirement with all adjacent ACCs **b.** # out of # required implementations planned **c.** # out of # required implementations completed	**B0-FICE 4.a.** 100% by 31 Dec, 2015
B0-DATM	Service Improvement through Digital Aeronautical Information Management	~~% of States having implemented an AIXM based AIS database~~ ~~% of States having implemented QMS~~			

Module Code	Module Title	Elements	Source	Metric	Target
		1. Aeronautical Information Conceptual Model (AICM) Aeronautical Information Exchange Model (AIXM)	Derived from 1.1.1	**a.** # out of # States that have assessed requirement **b.** # out of # required States that have completed planning **c.** # out of # required States that have completed implementation	**B0-DATM 1.a.** 100% by 31 Dec, 2015 **B0-DATM 1.b.** ?% by 31 Dec, 2016 **B0-DATM 1.c.** 40% by 31 Dec, 2018
		2. eAIP	Derived from 3.1.3	**a.** # out of # States that have assessed requirement **b.** # out of # required States that have completed planning **c.** # out of # required States that have completed implementation	**B0-DATM 2.a.** 100% by 31 Dec, 2015 **B0-DATM 2.b.** 100% by 31 Dec, 2017 **B0-DATM 2.c.** 45% by 31 Dec, 2018
		3. Digital NOTAM	Derived from 7.1	**a.** # out of # States that have assessed requirement **b.** # out of # required States that have completed planning **c.** # out of # required States that have completed implementation	**B0-DATM 3.a.** 100% by 31 Dec, 2015 **B0-DATM 3.b.** 100% by 31 Dec, 2017 **B0-DATM 3.c.** 35% by 31 Dec, 2018
		4. eTOD	Identified by NACC	**a.** # out of # States that have assessed requirement **b.** # out of # required States that have completed planning **c.** # out of # required States that have completed implementation	**B0-DATM 4.a.** 100% by 31 Dec, 2015 **B0-DATM 4.b.** 100% by 31 Dec, 2017 **B0-DATM 4.c.** 10% by 31 Dec, 2018
		5. WGS-84	?????	**a.** # out of # States that have assessed requirement **b.** # out of # required States that have completed planning **c.** # out of # required States that have completed implementation	**B0-DATM 5.a.** 100% by 31 Dec, 2015
		6. QMS for AIM	Identified by NACC	**a.** # out of # States that have assessed requirement **b.** # out of # required States that have completed planning **c.** # out of # required States that have completed implementation	**B0-DATM 6.a.** 100% by 31 Dec, 2015 **B0-DATM 6.b.** 100% by 31 Dec, 2015 **B0-DATM 6.c.** 100% by 31 Dec, 2016

Module Code	Module Title	Elements	Source	Metric	Target
B0-AMET	Meteorological information supporting enhanced operational efficiency and safety	**1.** WAFS	Defined: Element 1	**a.** # out of # States that have completed planning **b.** # out of # States that have completed implementation	**B0-AMET 1.a.** 100% by 31 Dec, 2014 **B0-AMET 1.b.** 100% by 31 Dec, 2014

		2. IAVW	Defined: Element 2	**a.** # out of # States that have completed planning **b.** # out of # States that have completed implementation	**B0-AMET 2.a.** 100% by 31 Dec, 2014 **B0-AMET 2.b.** 70% by 31 Dec, 2014 **B0-AMET 2.b.** 100% by 31 Dec, 2015
		3. TCAC forecasts	Defined: Element 3	**a.** # out of # States that have completed planning **b.** # out of # States that have completed implementation	**B0-AMET 3.a.** 100% by 31 Dec, 2014 **B0-AMET 3.b.** 100% by 31 Dec, 2014
		4. Aerodrome warnings	Defined: Element 4	**a.** # out of # States that have completed planning **b.** # out of # States that have completed implementation	**B0-AMET 4.a.** 100% by 31 Dec, 2014 **B0-AMET 4.b.** 50% by 31 Dec, 2014 **B0-AMET 4.b.** 80% by 31 Dec, 2015
		5. Wind shear warnings and alerts	Defined: Element 5	**a.** # out of # States which have completed planning **b.** # out of # States that have completed implementation	**B0-AMET 5.a.** 100% by 31 Dec, 2015 **B0-AMET 5.b.** 20% by 31 Dec, 2015
		6. SIGMET	Derived from Element 6	**a.** # out of # States that have completed planning **b.** # out of # States that have completed implementation	**B0-AMET 6.a.** 100% by 31 Dec, 2014 **B0-AMET 6.b.** 90% by 31 Dec, 2014 **B0-AMET 6.b.** 100% by 31 Dec, 2015
		7. Other OPMET information (METAR, SPECI and/or TAF)	Derived from Element 6	**a.** # out of # States that have assessed requirement to provide other OPMET information **b.** # of # required implementations planned **c.** # of # required implementations completed	**B0-AMET 7.a.** 100% by 31 Dec, 2015
B0-FRTO	Improved Operations	~~% of FIRs in which FUA is implemented~~			

	through Enhanced En-Route Trajectories	**1.** CDM incorporated into airspace planning	Derived from Element 1	**a.** # out of # States that have assessed requirement **b.** # out of # required States that have completed planning **c.** # out of # required States that have completed implementation	**B0-FRTO 1.a.** 100% by 31 Dec, 2016
		2. Flexible Use of Airspace (FUA)	Defined: Element 2	**a.** # out of # States that have assessed requirement **b.** # out of # required States that have completed planning **c.** # out of # required States that have completed implementation	**B0-FRTO 2.a.** 100% by 31 Dec, 2015 **B0-FRTO 2.b.** 100% by 31 Dec, 2015 **B0-FRTO 2.c.** 50% by 31 Dec, 2016
		3. Flexible route systems	Defined: Element 3	**a.** # out of # FIRs that have assessed requirement **b.** # out of # required States that have completed planning **c.** # out of # required States that have completed implementation	**B0-FRTO 3.a.** 100% by 31 Dec, 2016
		4. CPDLC used to request and receive re-route clearances	Derived from Element 3	**a.** # out of # FIRs that have assessed requirement **b.** # out of # required States that have completed planning **c.** # out of # required States that have completed implementation	**B0-FRTO 4.a.** 100% by 31 Dec, 2016
B0-NOPS	Improved Flow Performance through Planning based on a Network-Wide view	~~% of FIRs within which all ACCs utilize ATFM systems~~			
		1. ATFM	Derived from 1.1.1	**a.** # out of # FIRs that have assessed requirement **b.** # out of # required FIRs that have completed planning **c.** # out of # required FIRs that have completed implementation	**B0-NOPS 1.a.** 100% by 31 Dec, 2015 **B0-NOPS 1.b.** 100% by 31 Dec, 2017 **B0-NOPS 1.c.** 100% by 31 Dec, 2018
B0-ASUR	Initial capability for ground surveillance	~~% of FIRs where ADS-B OUT and/or MLAT are implemented for the provision of surveillance services in identified areas.~~	~~1. Not to be considered for the first reporting cycles due to lack of maturity.~~		

				a. # out of # Table AOP I-1 airports that have been assessed for requirement	**B0-ASUR 1.a.** 100% by 31 Dec, 2016
		1. ADS-B	Defined: Element 1	b. # out of # required implementations that have been planned	**B0-ASUR 1.b.** 100% by 31 Dec, 2017
				c. # out of # required implementations that have been completed	**B0-ASUR 1.c.** 30% by 31 Dec, 2018
		2. Multilateration (MLAT)	Defined: Element 2	a. # out of # Table AOP I-1 airports that have been assessed for requirement	**B0-ASUR 2.a.** 100% by 31 Dec, 2016
				b. # out of # required implementations that have been planned	**B0-ASUR 2.b.** 100% by 31 Dec, 2017
				c. # out of # required implementations that have been completed	**B0-ASUR 2.c.** 80% by 30 June, 2018
B0-ASEP	Air Traffic Situational Awareness (ATSA)	% of States having implemented air traffic situational awareness	1. Not to be considered for the first reporting cycles due to lack of maturity.		
		1. ATSA-AIRB	Defined: Element 1	a. # out of # FIRs that have assessed requirement b. # out of # required States that have completed planning c. # out of # required States that have completed implementation	**B0-ASEP 1.a.** 100% by Dec, 2016
		2. ATSA-VSA	Defined: Element 2	a. # out of # FIRs that have assessed requirement b. # out of # required States that have completed planning c. # out of # required States that have completed implementation	**B0-ASEP 2.a.** 100% by Dec, 2016
B0-OPFL	Improved access to optimum flight levels through climb/descent procedures using ADS-B	% of FIRs having implemented in-trail procedures	1. Not to be considered for the first reporting cycles due to lack of maturity.		

		1. ITP using ADS-B	Derived from 1.3.1	**a.** # of # FIRs that have assessed requirement **b.** # out of # required States that have completed planning **c.** # out of # required States that have completed implementation	**B0-OPFL 1.a.** 100% by Dec, 2016
B0-ACAS	ACAS Improvements	~~% of States requiring carriage of ACAS (with TCAS 7.1 evolution)~~			
		1. ACAS II (TCAS version 7.1)	Derived from 1.3.2	**a.** # of # States that have assessed requirement for aircraft to carry and operate ACAS II **b.** # out of # required States that have completed planning **c.** # out of # required States that require carriage and operation of ACAS II	**B0-ACAS 1.a.** 100% by 31 Dec, 2015 **B0-ACAS 1.b.** 50% by Dec 31, 2017 **B0-ACAS 1.c.** 10% by 31 Dec, 2018
		2. Auto Pilot/Flight Director (AP/FD) TCAS	Derived from 1.3.7 a	**a.** # of # States that have assessed requirement **b.** # out of # required States that have completed planning **c.** # out of # required States that have completed implementation	**B0-ACAS 2.a.** 100% by Dec 31, 2016
		3. TCAS Alert Prevention (TCAP)	Derived from 1.3.7 b	**a.** # of # States that have assessed requirement **b.** # out of # required States that have completed planning **c.** # out of # required States that have completed implementation	**B0-ACAS 3.a.** 100% by Dec 31, 2016
B0-SNET	Increased Effectiveness of Ground-Based Safety Nets	**1.** Short Term Conflict Alert (STCA)	Defined: Element 1	**a.** # of # States that have assessed requirement for all ACCs **b.** # out of # States that have completed planning for all required ACCs **c.** # out of # States that have completed implementation at all required ACCs	**B0-SNET 1.a.** 100% by 31 Dec, 2015 **B0-SNET 1.b.** 100% by 31 Dec, 2015 **B0-SNET 1.c.** 80% by 31 Dec, 2015

		2. Area Proximity Warning (APW)	Defined: Element 2	**a.** # of # States that have assessed requirement at all ACCs **b.** # out of # States that have completed planning for all required ACCs **c.** # out of # States that have completed implementation at all required ACCs	**B0-SNET 2.a.** 100% by 31 Dec, 2015 **B0-SNET 2.b.** 100% by 31 Dec, 2015 **B0-SNET 2.c.** 70% by 31 Dec, 2015
		3. Minimum Safe Altitude Warning (MSAW)	Defined: Element 3	**a.** # of # States that have assessed requirement at all ACCs **b.** # out of # States that have completed planning for all required ACCs **c.** # out of # States that have completed implementation at all required ACCs	**B0-SNET 3.a.** 100% by 31 Dec, 2015 **B0-SNET 3.b.** 100% by 31 Dec, 2015 **B0-SNET 3.c.** 70% by 31 Dec, 2015
		4. Medium Term Conflict Alert (MTCA)	Identified by NACC	**a.** # of # States that have assessed requirement at all ACCs **b.** # out of # States that have completed planning for all required ACCs **c.** # out of # States that have completed implementation at all required ACCs	**B0-SNET 4.a.** 100% by 31 Dec, 2015 **B0-SNET 4.b.** 100% by 31 Dec, 2015 **B0-SNET 4.c.** 80% by 31 Dec, 2016
B0-CDO	Improved Flexibility and Efficiency in Descent Profiles (CDO)	**1**. Procedure changes to facilitate CDO	Derived from Element 1	**a.** # out of # FIRs that have been assessed for requirement **b.** # out of # required FIRs that have planned implementation **c.** # out of # required FIRs that have completed implementation	**B0-CDO 1.a.** 100% by 31 Dec, 2015 **B0-CDO 1.b.** 100% by 31 Dec, 2015 **B0-CDO 1.c.** 50% by 31 Dec, 2016
		2. Route changes to facilitate CDO	Derived from Element 1	**a.** # out of # FIRs that have been assessed for requirement **b.** # out of # required FIRs that have planned implementation **c.** # out of # required FIRs that have completed implementation	**B0-CDO 2.a.** 100% by 31 Dec, 2015
		3. PBN STARs	Derived from Element 2	**a.** # out of # Table AOP I-1 airports that have been assessed for requirement **b.** # out of # required procedures that have been planned **c.** # out of # required procedures that have been completed	**B0-CDO 3.a.** 100% by 31 Dec, 2015 **B0-CDO 3.b.** 100% by 31 Dec, 2015 **B0-CDO 3.c.** 80% by 31 Dec, 2016

B0-TBO	Improved Safety and Efficiency through the initial application of Data Link En-Route	**1.** ADS-C over oceanic and remote areas	Defined: Element 1	**a.** # out of # FIRs that have been assessed for requirement **b.** # out of # required FIRs that have planned implementation **c.** # out of # required FIRs that have completed implementation	**B0-TBO 1.a.** 100% by 31 Dec, 2015 **B0-TBO 1.b.** 100% by 31 Dec, 2015 **B0-TBO 1.c.** 80% by 31 Dec, 2016
		2. Continental CPDLC	Defined: Element 2	**a.** # out of # FIRs that have been assessed for requirement **b.** # out of # required FIRs that have planned implementation **c.** # out of # required FIRs that have completed implementation	**B0-TBO 2.a.** 100% by 31 Dec, 2015 **B0-TBO 2.b.** 100% by 31 Dec, 2015 **B0-TBO 2.c.** 80% by 30 June, 2018
B0-CCO	Improved Flexibility and Efficiency Departure Profiles - Continuous Climb Operations (CCO)	**1.** Procedure changes to facilitate CCO	Derived from Element 1	**a.** # out of # FIRs that have been assessed for requirement **b.** # out of # required FIRs that have planned implementation **c.** # out of # required FIRs that have completed implementation	**B0-CCO 1.a.** 100% by 31 Dec, 2015 **B0-CCO 1.b.** 80% by 31 Dec, 2015 **B0-CCO 1.c.** 60% by 31 Dec, 2016
		2. Route changes to facilitate CCO	Derived from Element 1	**a.** # out of # FIRs that have been assessed for requirement **b.** # out of # required FIRs that have planned implementation **c.** # out of # required FIRs that have completed implementation	**B0-CCO 2.a.** 100% by 31 Dec, 2015
		3. PBN SIDs	Derived from Element 2	**a.** # out of # Table AOP I-1 airports that have been assessed for requirement **b.** # out of # required procedures that have been planned **c.** # out of # required procedures that have been completed	**B0-CCO 3.a.** 100% by 31 Dec, 2015 **B0-CCO 3.b.** 80% by 31 Dec, 2015 **B0-CCO 3.c.** 60% by 31 Dec, 2016

Regional Operational Priorities

		Visual Aids for Navigation		**B0-75/SURF: RPBANIP**	70% of selected aerodromes complying with visual aid requirements as per Annex 14 by December 2015 States/Airport operators
		Aerodrome Bird/Wildlife Organization and Control Programme		**B0-75/SURF: RPBANIP**	70% of selected airports with an aerodrome bird/wildlife organization and control programme by December 2018 Airport operators
		Aerodrome Certification		**B0-ACDM: RPBANIP**	48% of international aerodromes to be certified in the CAR Region by December 2016– State CAA
		Heliport Operations		**B0-ACDM: RPBANIP**	30% of selected Heliports with operational approval by Dec. 2018 – State CAA
		MEVA III IP Network Implementation		**Supports B0-FICE implementation: RPBANIP**	100% implementation of MEVA III IP Network by MEVA Member States by August 2015
		AMHS Implementation		**Supports B0-FICE implementation: RPBANIP**	4 States with Air Traffic Services Message Handling Services (AMHS) interconnected with other AMHS by December 2014
		ATN Router Structure Implementation		**Supports B0-FICE implementation: RPBANIP**	70% of ATN router structure implemented by June 2016
		PBN Planning		**B0-FRTO: RPBANIP**	100% of States to have completed a PBN plan by Dec. 2018

ASBU Implementation Status check list

Block 0 Modules	Elements	Not Started	Need Analysis			Implementation Status (if Needed)			
			In process	Need	N/A	Plan-ning	Develop-ing	Partially Imple-mented	Imple-mented
ACDM	1. Airport CDM procedures								
	2. Airport CDM tools								
	3. Collaborative departure queue management								
APTA	1. PBN Approach Procedures with vertical guidance (LPV, LNAV/VNAV minima, using SBAS and Baro VNAV)								
	2. PBN Approach Procedures without vertical guidance (LP, LNAV minima; using SBAS)								
	3. GBAS Landing System (GLS) Approach procedures								
RSEQ	1. AMAN via controlled time of arrival to a reference fix								
	2. AMAN via controlled time of arrival at the aerodrome								
	3. Departure management								
	4. Departure flow management								
	5. Point merge								
SURF	1. A-SMGCS with at least one cooperative surface surveillance system								
	2. Including ADS-B APT as an element of A-SMGCS								
	3. A-SMGCS alerting with flight identification information								
	4. Airport vehicles equipped with transponders								
WAKE	1. New PANS-ATM wake turbulence categories and separation minima								
	2. Dependent diagonal paired approach procedures for parallel runways with centrelines spaced less than 760 meters (2,500 feet) apart								
	3. Wake independent departure and arrival procedures for parallel runways with centrelines spaced less than 760 meters (2,500 feet) apart								
	4. Wake turbulence mitigation for departures procedures for parallel runways with centrelines spaced less than 760 meters (2,500 feet) apart								
	5. State-defined additional wake turbulence categories and separation minima (6-category wake vortex separation)								
AMET	1. WAFS								
	2. IAVW								
	3. TCAC forecasts								
	4. Aerodrome warnings								
	5. Wind sheer warnings and alerts								
	6. SIGMET								
	7. Other OPMET) information (METAR, SPECI and/or TAF)								
DATM	1. Aeronautical Information Conceptual Model (AICM) Aeronautical Information Exchange Model (AIXM)								
	2: eAIP								
	3: Digital NOTAM								
	4: eTOD								
	5: WGS-84								
	6: QMS for AIM								
FICE	1. AIDC to provide initial flight data to adjacent ATSUs								
	2. AIDC to update previously coordinated flight data								
	3. AIDC for control transfer								
	4. AIDC to transfer CPDLC logon information to the Next Data Authority								
ACAS	1. ACAS II (TCAS version 7.1)								
	2. Auto Pilot/Flight Director (AP.FD) TCAS								
	3. TCAS Alert Prevention (TCAP)								
ASEP	1. ATSA-AIRB								

	2. ATSA-VSA								
ASUR	1. ADS-B								
	2. Multilateration (MLAT)								
FRTO	1: CDM incorporated into airspace planning								
	2: Flexible Use of Airspace (FUA)								
	3. Flexible route system								
	4: CPDLC used to request and receive re-route clearances								
NOPS	1. ATFM								
OPFL	1. ITP using ADS-B								
SNET	1. Short Term Conflict Alert implementation (STCA)								
	2. Area Proximity Warning (APW)/								
	3. Minimum Safe Altitude Warning (MSAW)								
	4. Medium Term Conflict Alert (MTCA)								
CCO	1. Procedure changes to facilitate CDO								
	2. Route changes to facilitate CDO								
	3. PBN SIDs								
CDO	1. Procedure changes to facilitate CDO								
	2. Route changes to facilitate CDO								
	3. PBN STARs								
TBO	1. ADS-C over oceanic and remote areas								
	2. Continental CPDLC								
Summary Counts		0	0	0	0	0	0	0	0

APPENDIX
NAM/CAR RPBANIP AIR NAVIGATION TARGETS
BASED ON RPBANIP VER 3.1

Element	Targets	RO	Source of data to measure it/ supporting body	Action needed/ Concern
1. Airspace Planning	100% of States to have completed a PBN plan by Dec. 2018	ATM/ VH	List of National PBN plans	
2. Flexible Use Airspace	50% of selected segregated airspaces available for civil operations by Dec. 2016	ATM/ VH		• Define criteria for selecting the segregated airspace • Define selection
3. AMAN And Time-Based Metering	10% of selected aerodromes with AMAN and time based metering by Dec. 2016	ATM/ VH		• Define AMAN application w/ time based metering • Define criteria for selecting the aerodrome for AMAN • Define selection
4. Departure Management (DMAN)	10% of selected aerodromes with DMAN by Dec. 2016	ATM/ VH		• Define DMAN application • Define criteria for selecting the aerodrome for DMAN • Define selection
5. Movement Area Capacity Optimization	20% of selected aerodromes with Airport-capacity calculated by Dec. 2016	AGA/JC		• Define criteria for selecting the aerodrome for airport capacity • Define selection
6. ADS-C Over Oceanic and Remote Areas	80% of selected FIRs with ADS-C implemented by December 2016	CNS/ JS	Regional NAM/CAR ADS-C/CPDLC Plan: GOLD TF	
7. CPDLC	80% of selected FIRs with CPDLC implemented by June 2018	CNS/ JS	Regional NAM/CAR ADS-C/CPDLC Plan: GOLD TF	
8. APV with Baro VNAV	80% of instrument runways to have APV with Baro VNAV implemented by December 2016 – Service Providers and users	ATM/ VH	AIPs	Collect data to have a table for the metric
9. APV with SBAS (WAAS)	20% of instrument runways to have APV with SBAS/WAAS implemented by December 2018– Service Providers and users	ATM/ VH	AIPs	Collect data to have a table for the metric

Element	Targets	RO	Source of data to measure it/ supporting body	Action needed/ Concern
10. APV with GBAS	20% of instrument runways to have APV with GBAS by December 2018 – Initial implementation at some States (services providers)	ATM/ VH	AIPs	Collect data to have a table for the metric
11. LNAV	60% of instrument runways to have LNAV procedure implemented by December 2016 – Service Providers and users as per Assembly Resolution A37-11	ATM/ VH	AIPs	Collect data to have a table for the metric
12. Surveillance System for Ground Surface Movement (PSR, SSR, ADS B or Multilateration)	30% of selected aerodromes with SMR/ SSR Mode S/ ADS-B/ Multilateration for ground surface movement by June 2018 States/airport operator	CNS/ JS	Regional ADS-B/MLAT Plan for selected aerodromes (TBD) / ADS-B TF	• Define criteria for selecting the aerodrome with SMR/ SSR Mode S/ ADS-B/ Multilateration (AGA) • Define selection
13. On-board Surveillance Systems (transponder with ADS-B capacity)	20% of aircraft on the NAM/CAR State registries to have surveillance system on board (SSR transponder, ADS B capacity) by June 2018 Aircraft operators	CNS/JS	IATA and States (General aviation) / ADS-B TF	• Define total aircraft registry in NAM/CAR • Define procedure for data collection from States/IATA
14. Vehicle Surveillance Systems	20% of vehicles at selected aerodromes with a cooperative transponder systems by June 2018 Vehicle operators	CNS/ JS	Regional ADS-B/MLAT Plan for selected aerodromes (TBD) / ADS-B TF	• Define of cooperative transponder system for vehicles • Define criteria for selecting the aerodrome where vehicles are to have collaborative transponders (AGA) • Define selection
15. Visual Aids for Navigation	70% of selected aerodromes complying with visual aid requirements as per Annex 14 by December 2015 States/Airport operators	AGA/ JC	ICAO´s requirement per Annex 14, Vol I for all airports. Aerodromes certified shall comply with the requirement.	• Define criteria for selecting the aerodrome complying with visual aid requirements • Define selection
16. Aerodrome Bird/Wildlife Organization and Control Programme	70% of selected airports with an aerodrome bird/wildlife organization and control programme by December 2018 Airport operators	AGA/ JC	ICAO´s requirement per Annex 14, Vol I for all airports. Aerodromes certified shall comply with the requirement.	• Define criteria for selecting the aerodrome with an aerodrome bird/wildlife organization and control programme • Define selection

Element	Targets	RO	Source of data to measure it/ supporting body	Action needed/ Concern
17. Airport – CDM	60% of selected aerodromes with Airport-CDM by Dec. 2018 – Airport Operator, Stakeholders	AGA/ JC	In consultation	• Define criteria for selecting the aerodrome with Airport-CDM • Define selection
18. Aerodrome Certification	48% of international aerodromes to be certified in the CAR Region by December 2016– State CAA	AGA/ JC	CAR Regional Aerodrome Certification Implementation Plan (CRACIP)	
19. Heliport Operations	30% of selected Heliports with operational approval by Dec. 2018 – State CAA	AGA/ JC	To request States for a list of heliports with operational approval	• Define criteria for selecting the Heliports with operational approval • Define selection
20. Implementation of ADS-B	30% of selected aerodromes with ADS-B implemented by Dec 2018	CNS/ JS	Regional ADS-B/MLAT Plan for selected aerodromes (TBD) / ADS-B TF	• Define criteria for selecting the aerodrome with ADS-B • Define selection
21. Implementation of Multilateration	80% of multilateration system implemented in selected aerodromes by June 2018	CNS/ JS	Regional ADS-B/MLAT Plan for selected aerodromes (TBD) / ADS-B TF	• Define criteria for selecting the aerodrome to have Multilateration System • Define selection
22. ACAS II (TCAS Version 7.1)	10% of aircraft on NAM/CAR State registries equipped with ACAS II (TCAS Version 7.1) by Dec 2018	CNS/ JS	States response	Enquiry to States
23. Short-term Conflict Alert Implementation (STCA)	80% of selected ATS units with ground based safety nets (STCA) implemented by Dec 2015	ATM/ VH	Enquiry to States / GREPECAS C-Project	• Define criteria for selecting the ATS units with ground based safety nets (STCA) implemented • Define selection
24. Area Proximity Warning (APW)/ Minimum Safe Altitude Warning (MSAW)	70% of selected ATS units with ground based safety nets (APW) implemented / 70% of selected ATS units with ground based safety nets (MSAW) implemented by Dec 2015	ATM/ VH	Enquiry to States / GREPECAS C-Project	• Define criteria for selecting the ATS units with ground based safety nets (APW) / MSAW implemented • Define selection
25. Medium-term Conflict Alert (MTCA)	80% of selected ATS units with ground based safety nets (MTCA) implemented by Dec 2016	ATM/ VH	Enquiry to States / GREPECAS C-Project	• Define criteria for selecting the ATS units with ground based safety nets (MTCA) implemented • Define selection
26. WAFS	100% of States implementation of WAFS Internet File Service (WIFS) by December 2014	MET	Table listing the WIFS implementation	

Element	Targets	RO	Source of data to measure it/ supporting body	Action needed/ Concern
27. IAVW	70% of MWOs with IAVW procedures implemented by December 2014. Volcanic Ash Advisory Centre, Washington USA and VAAC Montréal, Montréal, Canada	MET	Table of MWOs with IAVW procedures implemented	
28. Tropical Cyclone Watch	100% of MWOs with tropical cyclone watch procedures implemented by December 2014. Tropical Cyclone Advisory Centre, Miami, USA	MET	Table of MWOs with tropical cyclone watch procedures implemented	
29. Aerodrome Warnings	50% of selected aerodromes/AMOs with Aerodrome warnings implemented by December 2014	MET		• Define criteria for selecting the aerodromes/AMOs with Aerodrome warnings • Define selection
30. Wind Shear Warnings and Alerts	20% of selected aerodromes/AMOs with wind shear warnings procedures implemented (MET provider services) by December 2015	MET		• Define criteria for selecting the aerodromes/AMOs with wind shear warnings procedures • Define selection
31. SIGMET	90% of selected aerodromes/MWOs with SIGMET procedures implemented (MET provider services) by Dec. 2014	MET	Table of MWOs with IAVW procedures implemented	• Define criteria for selecting the aerodromes/AMOs with SIGMET procedures • Define selection
32. MEVA III IP Network Implementation	100% implementation of MEVA III IP Network by MEVA Member States by August 2015	CNS/JS	MEVA III Implementation Plan / MEVA TMG	
33. AMHS Implementation	4 States with Air Traffic Services Message Handling Services (AMHS) interconnected with other AMHS by December 2014	CNS/JS	Regional AMHS Implementation Plan / AMHS TF	
34. AIDC Implementation	50% of FIRs within which all applicable ACCs have implemented at least one interface to use AIDC/OLDI with a neighbouring ACC by December 2016	CNS/JS	Regional AIDC Implementation Plan/ AIDC TF	
35. ATN Router Structure Implementation	70% of ATN router structure implemented by June 2016	CNS/JS	CAR/SAM CNS Table 1Ba/ Enquiry to States/ AMHS TF	Check ATN router criteria
36. QMS - AIM	100 % of States QMS Certified by Dec.2016	AIM/RM		
37. e.TOD Implementation	10 % of States e-TOD Implemented by Dec.2018	AIM/RM		

Element	Targets	RO	Source of data to measure it/ supporting body	Action needed/ Concern
38. AIXM 5.1 Implementation	40 % of States with AIXM 5.1 implemented by Dec.2018	AIM/RM		
39. e-AIP Implementation	45 % of States with e-AIP implemented by Dec.2018	AIM/RM		
40. Digital NOTAM	35 % of States with Digital NOTAM implemented by Dec. 2018	AIM/ RM		
41. Air Traffic Flow Management	100% of FIRs within which all ACCs have ATFM measures available by Dec. 2018	ATM/ VH		
42. CDO implementation	50% of selected. Aerodromes with continuous descent operations (CDO) implemented by Dec.2016	ATM/ VH		
43. PBN STARs	80% of selected. Aerodromes with PBN STARs implemented by Dec.2016	ATM/ VH		
44. CCO Implementation	60 % of selected aerodromes with continuous climb operations (CCO) implemented by Dec.2016	ATM/ VH		
45. PBN SIDs Implementation	60% of selected aerodromes with PBN SIDs implemented by Dec.2016	ATM/ VH		
Results from 36-40	100% of Aeronautical Information Services (AIS) to implement AIM Roadmap – Phase I required elements by December 2016	AIM/ RM		Need to define elements to measure from individual elements
Result form PBN- IFSET	Reduce Regional CO2 emissions by 40,000 tons per year through PBN implementation by December 2016	ATM/ VH	IATA	

— END —