ICAO

INTERNATIONAL CIVIL AVIATION ORGANIZATION

A UN SPECIALIZED AGENCY

REGIONAL AIR NAVIGATION PLAN

Mayda Alicia Avila/
Regional Officer,
Communications, Navigation
and Surveillance

Fabiana Todesco
Regional Officer, Aerodromes
and Ground Aids

Eighth North American, Central American and Caribbean Working Group Meeting (NACC/WG/8)

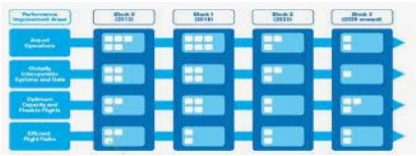
ICAO NACC Regional Office, Mexico City, Mexico, August 29-September 1, 2023

ICAO

AGENDA

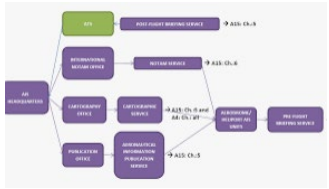
INTRODUCTION

ASBU ELEMENTS

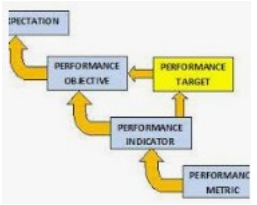


e-ANP VOLUME III

BASIC BUILDING BLOCKS



KEY PERFORMANCE INDICATORS



NATIONAL AIR NAVIGATION PLANS

ICAO

INTRODUCTION

- *The process of developing a regional CAR plan requires the undertaking of a series of activities to assess the current status of SLA implementation and to identify the subsequent implementation based on data, both at the State and Regional levels. The project, based on the GANP, version 7, has the following deliverables:*
  - *The establishment of the status of implementation of Air Navigation Services and aerodromes in the region.*
  - *The development of the National Air Navigation Plans of the CAR States.*
  - *The establishment of regional growth targets for at least the next 10 years.*

Source: https://www.icao.int/NACC/Documents/Meetings/2023/WGRAP02/NACCWGRAP02-InformeFinal.pdf

CAR Regional Planning

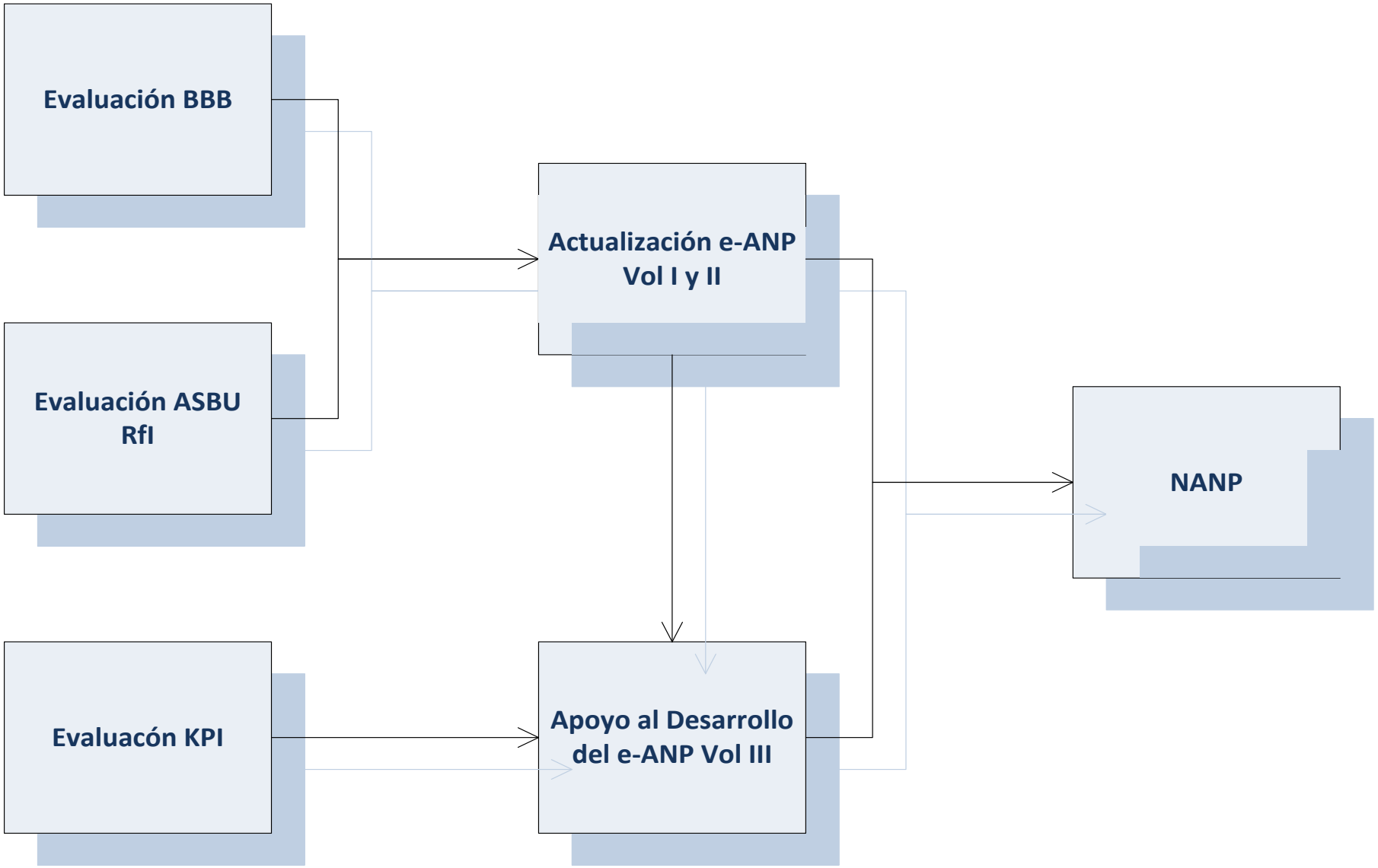
During the evolution process of the project, the following activities will be executed:

1. *Electronic Air Navigation Plan Volume I Update (e-ANP Vol I)*
2. *Electronic Air Navigation Plan Volume II Update (e-ANP Vol II)*
3. *Electronic Air Navigation Plan Volume III Update (e-ANP Vol III)*

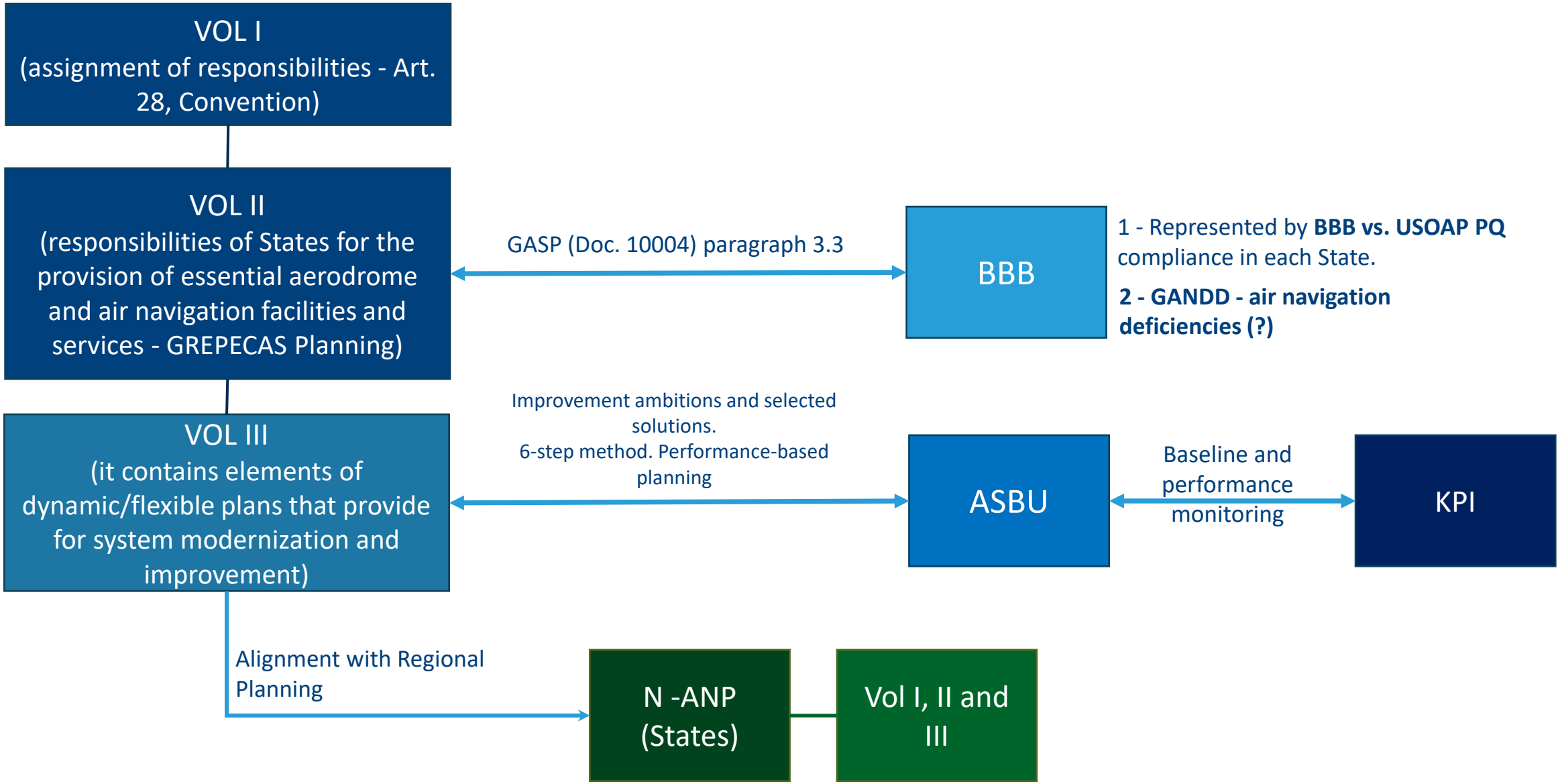
The e-ANP Vol III project will support:

1. *The creation of the State's baseline for the process of identifying and measuring key performance indicators (KPIs).*
2. *The establishment of the subsequent ASBU module implementation planning according to the needs identified by the State and using the "Air Navigation - System Performance Assessment (AN-SPA) tool".*

AIR NAVIGATION PLAN DEVELOPMENT PROCESS

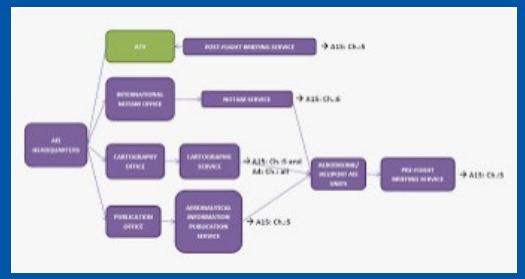


CAR/SAM REGIONAL AIR NAVIGATION PLAN:



02

Basic Building Blocks (BBBs)



- *Basic Building Blocks (BBBs) outline the foundation of any robust air navigation system, and identify the essential services that must be provided to international civil aviation in accordance with ICAO standards. Essential services are identified in the areas of:*
  - *AGA*
  - *MET*
  - *ATS (ATM)*
  - *AIS/AIM*
  - *SAR*
  - *CNS, as evaluator of the infrastructure necessary to provide the services.*

ICAO

States should incorporate BBBs, as their national planning framework strategy in their national Air Navigation Plans, to ensure the provision of seamless Air Navigation Services based on the deployment of interoperable systems and harmonized procedures.

ICAO

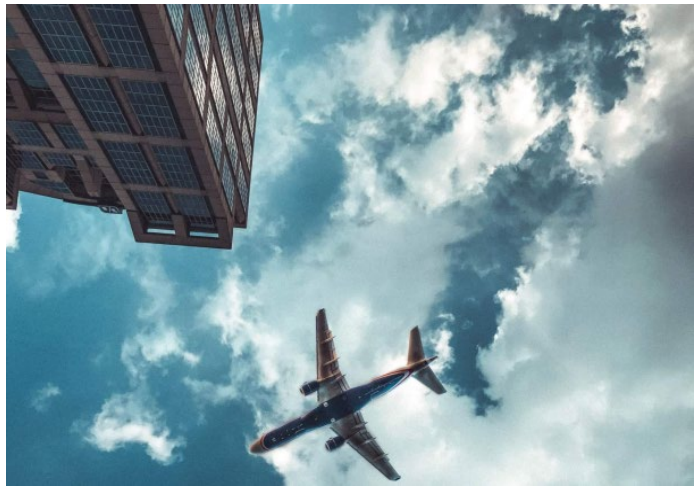
As a regional strategy for the development of CAR States' Air Navigation Plans and the identification of regional priorities, it is necessary to identify the status of SLA implementation by assessing the Basic Building Blocks (BBBs) level of implementation.

It is important to point out that BBBs are considered essential services that the States must have in operation on a mandatory basis, since they follow the implementation of the ICAO SARPs and that the lack of operation of any of them is considered a deficiency.

ICAO

With the BBBs assessment, the region will be able to identify:

- *Regional deficiencies/differences;*
- *Regional implementation status;*
- *Update the information of the electronic air navigation plan services in Volumes I and II;*
- *Support the execution of priority regional projects by providing information.*



BBBs EVALUATION FORMAT

- The guidance document for the evaluation of these mandated services.
- The format includes the USOAP protocol questions (PQ) related to the implementation of these services, in addition to references to ICAO documentation.

AGREED STRATEGY FOR EVALUATING BBBs

- ***MET:*** *Evaluation through a software tool which will be conducted through the NACC/WG MET Task Force (NACC/WG/MET/TF).*

- ***AGA:*** *Data will be obtained through the work of the NACC/WG/AGA/TF via direct consultation with States developing case studies.*

- ***AIM:*** *It will obtain the information through a direct survey to the States, developed by the NACC/WG/AIM/TF.*

- ***SAR:*** *The SAR Implementation Support TF will define its strategy at its next annual meeting.*

- ***AO:*** *The Airspace Optimization TF (NACC/WG/AO/TF) will define its evaluation strategy.*

- ***CNS:*** *The CNS area will evaluate the level of implementation of the CNS infrastructure necessary to provide all the above services according to the results provided in the previous items.*

03

ASBU

The Aviation System Block Upgrade (ASBU) elements are divided into three different categories:

1. *Operational*
2. *Information*
3. *Technology*

Each element is part of a module and an implementation block that defines the time in which the element can be implemented.

Each element requires the implementation of a series of enablers that can be:

1. *Technology: Aircraft ground and onboard systems.*
2. *Development of operational, technical and other procedures according to the element.*
3. *Certification processes*
4. *Personnel training*
5. *In some cases, development of regulation/legislation applied to the operation.*
6. *Other*

ICAO

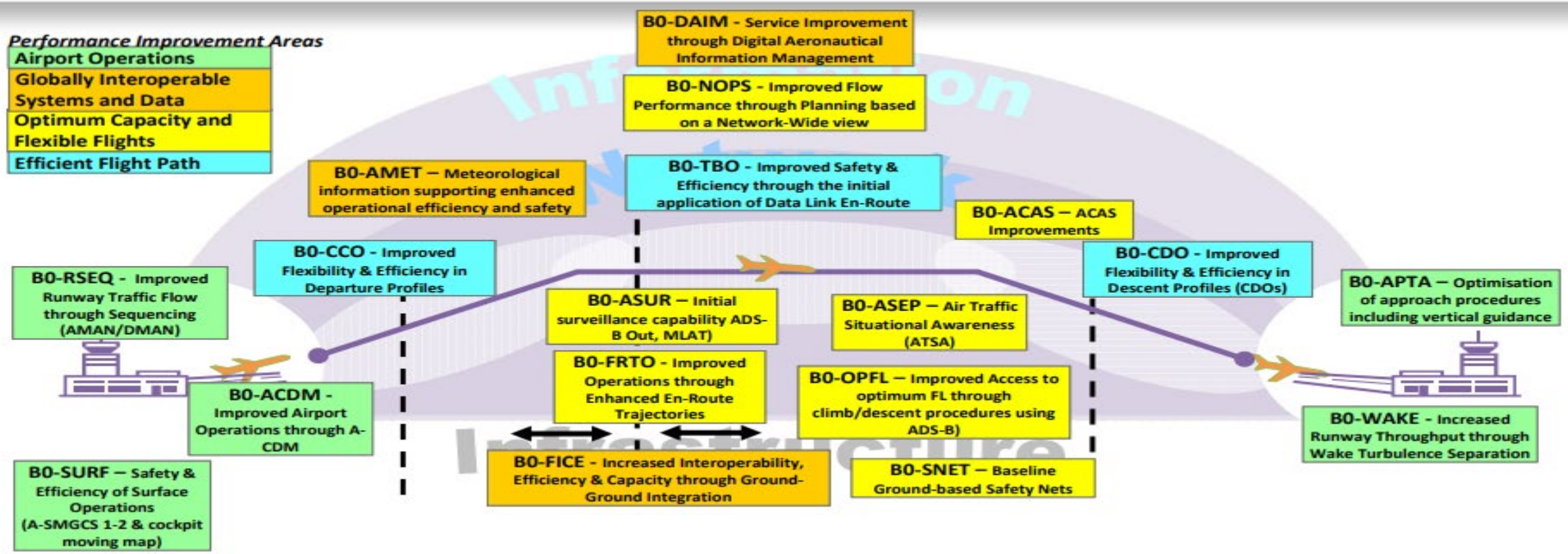
The Aviation System Block Upgrade (ASBU) elements have different levels of maturity:

- ***Ready for implementation**: focuses on the end of system development and initial worldwide operational capability.*

- ***Standardization:** focuses on defining the provisions necessary for system interoperability and harmonization of procedures.*

- ***Validation**: focuses on industrial research and validation and includes proof-of-concept validation, stand-alone prototype implementation and testing, testing and prototyping in a representative environment, and full engineering feasibility demonstration in real system application.*

- ***Concept**: focuses on exploratory research and includes scientific research, investigation of the basic principles observed and reported, and definition of the concept.*

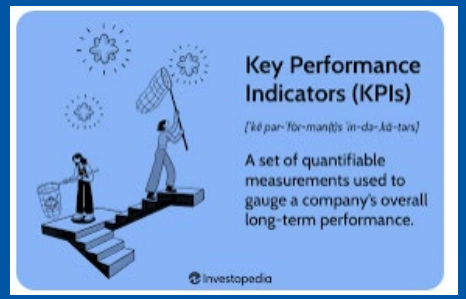


The analysis of the ASBU elements will help identify weak areas, projects to be prioritized and short, medium and long-term goals. The block upgrade elements are an important step in the development of the regional aviation system and their proper implementation is an important step in the development of the States' aviation and regional development.

ICAO

04

Key Performance Indicators (KPIs)



- ***KPIs*** *are quantitative means of measuring current/past performance, expected future performance and actual progress in achieving performance objectives.*

- *For **ANS** services, they provide information for review by States on service performance and support decision making for operational improvements.*

- *Regional performance objectives help the aviation community identify relevant and timely improvements (operational improvements) for the air navigation system in a given region.*

- *In addition, at the national level, States can set performance targets for their different operating environments using the list of KPIs, taking into account regional performance requirements.*

ICAO

KEY PERFORMANCE INDICATORS

*All **KPIs** are related to operational areas of aviation and airport services, supported by information and technology.*

- *Data collection involves analyzing the source of the data and monitoring:*
  - *What type of data are they?*
  - *What is the source of the data?*
  - *What is the accuracy of the data?*
  - *What is the periodicity with which the data is obtained?*
  - *What are the data formatting characteristics?*
  - *What is the data validation process?*
  - *Who are the data providers?*
  - *What is the metadata of the data (type of data, date, time, system that obtained it, who obtained it, etc.)? A clear and precise definition of the data.*

Data providers (source)

- *The State must analyze who the data providers are and map the information according to its operations and the key performance indicators it wishes to start measuring:*

- *The sources of this data are:*
  - *Air Navigation Service Providers (ANSP) through automated systems, surveillance data systems, aeronautical and meteorological information systems, among others.*
  - *Airlines*
  - *Airport suppliers*
  - *Data link information providers*
  - *ATFM Suppliers*
  - *Others*

05

Electronic Air Navigation Plan Vol III (e-ANP Vol III)

Table PMP III-CAR/SAM-1 – List of CTA/TMA in the CAR/SAM Region

STATE	FIR/UIR	UTA/CTA/TMA	Remarks
1	2	3	4

Table PMP III-4 – Performance baseline within the CAR/SAM Region

(1) STATE	(2) FIR/CTA/TMA /AIRPORT	(3) KPIs											(4) Remarks
		KPI01 (Var 2A)	KPI02	KPI04	KPI05	KPI06	KPI08	KPI09	KPI10	KPI13	KPI14	KPI15 (Var 1)	

Table PMP III-5 – Performance targets and needs within CAR/SAM Region

(1) STATE	(2) FIR/CTA/TMA /AIRPORT	(3) KPIs TARGETS											(4) Remarks
		KPI01 (Var 2A)	KPI02	KPI04	KPI05	KPI06	KPI08	KPI09	KPI10	KPI13	KPI14	KPI15 (Var 1)	

Table PMP III-6 – Deployment planning: selected ASBU Elements / Operational Improvements for the CAR/SAM Region

(1) STATE	(2) FIR/CTA /TMA/AIRPORT	(3) ASBU Elements / Operational Improvements	(4) Dependencies and relations	(5) Start Year	(6) End Year	(7) Remarks

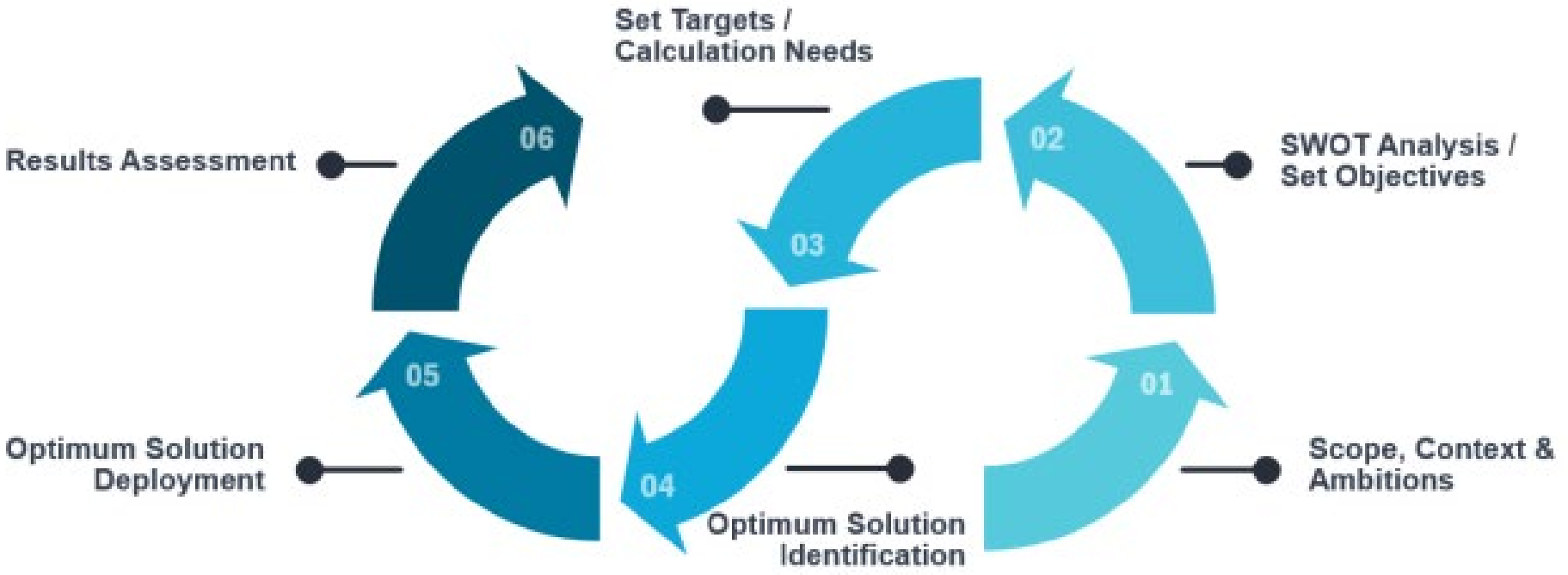
Table PMP III-7 – Implementation progress on the selected operational improvements of the ASBU elements / Operational Improvements for the (NAME) Region

STATE	FIR/CTA /TMA /AIRPORT	ASBU Elements / Operational Improvements	Start Year	End Year	Implementation progress	Remarks

Table PMP III-8 – Performance benefits accrued form the implementation of the selected ASBU elements / Operational Improvements for the (NAME) Region

STATE	FIR/CTA /TMA/AIRPORT	ASBU Elements/operational improvements	KPI s						Remarks

"*Air Navigation - System Performance Assessment (AN-SPA)*".



Tables to be completed

1.2 The geographical scope is defined in Volume I and in particular in the following tables:

- Table GEN I-1 — List of Flight Information Regions (FIR)/Upper Information Regions (UIR) in the Region
- Table ATM I-1 — Flight Information Regions (FIR)/Upper Flight Information Regions (UIR) of the Region
- Table SAR I-1 — Search and Rescue Regions (SRR) of the Region
- Table AOP I-1 — International aerodromes required in the Region (main City Pairs?)
- Table PMP III CAR/SAM - 1 – List of CTA/TMA in the Region

  (Optional. Please note that, if it is decided that this level of granularity is required in the Region, the rest of the performance management process will be applied at this level of granularity for consistency purposes. If this table is not developed, the PMP will be applied at an FIR level)

Homogeneous areas and/or major traffic flows

1.3 The homogeneous ATM areas and major traffic flows/routing areas identified are given in:

- Table GEN II-1 — Homogeneous areas and major traffic flows identified in the Region

Time Horizon

Goal

1.4 Volume III of the CAR/SAM ANP provides short term **(5 *years*)** and medium term **(10 *years*)** implementation planning.

PERFORMANCE TARGET

- Efficiency
- Capacity
- Predictability
- Safety
- Security
- Environment
- Cost effectiveness
- Interoperability
- Access and equity
- Participation by the ATM community
- Flexibility

- ***KPIs analysis process per State***

  - *Identification of information sources*
  - *Identification of the indicators to be measured*
  - *Building knowledge in the State*
  - *Start the measurement process*
  - *Establishment of the measurement baseline*
  - *Feeding the e-ANP Vol III*

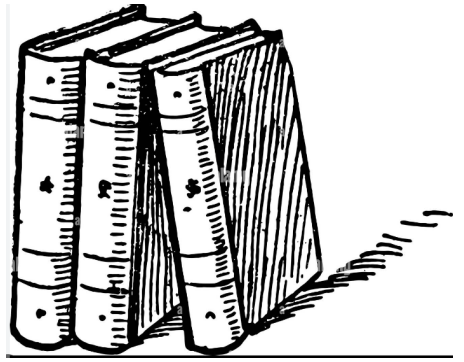
06

National Air Navigation Plans

- *For the development of the National Air Navigation Plans, the State must ensure:*
  - *The integration of global harmonization through the GANP and the provision of minimum services for international civil aviation, agreed levels of performance and global interoperability.*
  - *Linkage to the national context through facilitating access to funding for topics related to sustainable aviation development and linkage to other deliverables such as Maintenance Plans (example of systems), investment plans, training plans, NASP, SSP, SMS, budget control, etc.*
  - *Identification of all stakeholders, definition of roles and responsibilities, definition of a strategy.*
  - *Do not jump to solutions, analyze and find data to justify decisions (AN-SPA).*
  - *Choose the optimal solution, consider feasibility, safety assessment, environmental assessment, consider dependencies and maximize benefits.*

- *Structure of National Air Navigation Plans*
  - ***Reflection of the Regional Air Navigation Plans Vol I, Vol II and Vol III***
  - ***Adapted to the national context***

Structure of the National Air Navigation Plan



Volume I

Introduction

Part I: General Information

Part II: Aerodromes

Part III: CNS

Part IV: ATM

Part V: MET

Part VI: SAR

Part VII: AIM

Volume II

Introduction

Part I: General Information

Part II: Aerodromes

Part III: CNS

Part IV: ATM

Part V: MET

Part VI: SAR

Part VII: AIM

Volume III

Part I: General

Part II: Performance management planning and implementation of the SNA (PMP).

ICAO

CONTENTS

NATIONAL AIR NAVIGATION PLANS

Introduction

- *Context and scope*
- *Overview of the content/structure of the plan*
- *State commitment to the plan and to its resourcing*
- *Link to the Strategic level (if any and it is not part of the document)*
- *Relationship with other State plans*
- *Objective and purpose*
- *Roles and responsibilities*
- *Management and amendment of the plan*
- *Abbreviations/glossary (if needed)*
- *Others (if needed)*

Vol I, Part I - General

- *Geographical scope*
- *Traffic Forecast*
- *Specific regional priorities*

Vol I, Part II - Aerodromes

- *Introduction*
- *Aerodromes*
- *Domestic/international?*
- *Military?*
- *Heliports?*
- *Current traffic/ Traffic forecast?*

Vol I, Part III - CNS

- *Introduction*
- *Communications*
- *AFS*
- *ATN*
- *AMS*
- *Air-ground communications for ATS*
- *Air-ground data link communications*

Navigation

- *PBN*
- *GBAS/SBAS*

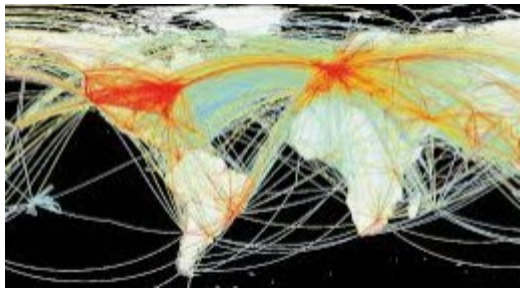
Surveillance

Frequency Management

ICAO

CONTENTS

NATIONAL AIR NAVIGATION PLANS



Vol I, Part IV - ATM

- *Introduction*
- *FIRS*
- *List*
- *Charts*
- *ATS Routes and organized track structures*
- *ICARD Global Database*
- *Aircraft Identification -SSR Code Assignments*
- *Flexible use of airspace*
- *RVSM*

Vol I, Part V - METEOROLOGY

- *Introduction*
- *World area forecast systems and meteorological offices*
- *Volcanic Ash*
- *Tropical Cyclone*

Vol I, Part VI - SAR

- *Introduction*
- *Search and Rescue Regions*
- *List*
- *Charts*

Vol I, Part VII - AIM

- *Introduction*
- *Areas of responsibility for the provision of aeronautical information*

Vol II, Part I - General

- *Homogeneous ATM areas*
- *Major traffic flows/routing areas*

Vol II, Part II - Aerodromes

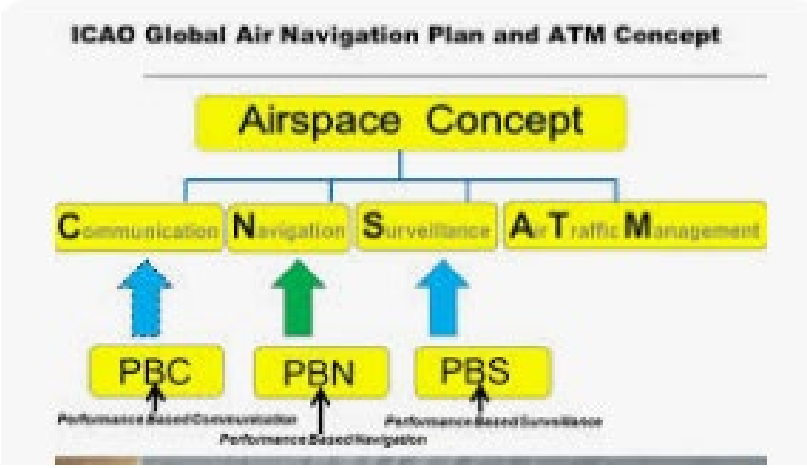
- *Introduction*
- *Aerodromes*
- *Name of the city and aerodrome, preceded by the location indicator.*
- *Designation of the aerodrome*
- *Required rescue and firefighting service (RFF)*
- *Aerodrome reference code (RC)*
- *Runway Designation numbers*
- *Visual aids for low visibility aerodrome operations*
- *Non-precision approach aids - Type of each of the runways*
- *Reduced runway declared distances for take-off*
- *Aerodrome capacity management*
- *Aerodrome capacity assessment and requirement*
- *Closure of regular aerodromes*
- *Scheduling aerodrome maintenance*
- *Other*

CONTENTS

NATIONAL AIR NAVIGATION PLANS

Vol II, Part III - CNS

- *Introduction*
- *Communications*
  - AFS
    - Systems and applications.
    - AFTN Stations and Centers
- *ATN*
  - Supporting services
- *AMS*
  - HF/VHF
  - Supporting services
- *Air-ground data link*
  - VDL2 and/or FANS-1/A
  - Supporting services
- Network services
  - IP
- Network management
  - Technical performance
  - Configuration
  - Security
  - Contract
- Required Communication Performance (RCP)
- Specific ATM requirements
- Specific MET requirements
- Specific AIM requirements



- Navigation
  - Navigation infrastructure
  - PBN
  - Use of specific navigation aids
- Surveillance
  - Surveillance infrastructure
  - Use of specific surveillance systems
- Frequency Management
  - AMS
  - Radio navigation aids for Aeronautical Radio Navigation Services

ICAO

CONTENTS

NATIONAL AIR NAVIGATION PLANS

Vol II, Part IV - ATM

- Introduction
- Optimization of traffic flows
- ATS Routes
- Designator type
- Significant points
- Aircraft Identification-SSR Code Management

Vol II, Part V - METEOROLOGY

- Introduction
- MWO
- Name
- ICAO Location indicator
- Meteorological observations and reports
- Forecast
- Requirements for and use of communications

Vol II, Part VI - SAR

- Introduction
- Rescue Coordination Centres (RCCs) and Rescue Sub-centres (RSCs)
- List
- Charts

Vol II, Part VII - AIM

- Introduction
- NOTAM Office (NOF),
- Designated State for AIP production
- Designated State for aeronautical charts (MAP) production
- Designated State for the provision of the authoritative Integrated Aeronautical Information Database (IAID)
- Designated State for the provision of the pre-flight information services
- Responsibility for sheets of the World Aeronautical Chart (WAC) - ICAO 1: 1 000 000 or Aeronautical Chart - ICAO 1: 500 000 (as an alternative to the World Aeronautical Chart - ICAO 1:1 000 000)

ICAO

CONTENTS

NATIONAL AIR NAVIGATION PLANS

Vol III, Part I - General

- Planning method

Vol III, Part II - Performance management planning and ANS implementation (PMP)

- STEP 1: DEFINE SCOPE, CONTEXT AND SET AMBITIONS
- STEP 2: KNOW YOUR SYSTEM - SWOT ANALYSIS AND REGIONAL OBJECTIVES
- STEP 3: QUANTIFY OBJECTIVES, SET TARGETS AND CALCULATE NEEDS
- STEP 4: SELECT SOLUTIONS
- STEP 5: IMPLEMENT SOLUTIONS
- STEP 6: ASSESS ACHIEVEMENTS

IMPORTANT

Don’t wait for perfection before you start. Start somewhere so you can have something tangible you can work to perfect.

Simon Sinek

Thank You!

ICAO