AOTF Update

Third Meeting of Rapporteurs of the North American, Central American and Caribbean Working Group (NACC/WG/RAP/03)

24 to 27 March 2025

Presented by: AOTF Rapporteur (Riaaz Mohammed)

Objectives

- Provide an update on the work conducted by the AOTF

- Discuss the challenges to the transition to FRTO

- Agree on objectives of the AOTF

What is FRTO?

Improved operations through enhanced en-route trajectories

FRTO Block	Description	Enablers
Block 0	En-route trajectories are enhanced by using more direct routings, and collaborative airspace management process and tools. ATCOs are assisted by tools for the conflict identification and conformance monitoring. Directs may be tactical or based on prior approval such as the case with UPRs.	**Required** • VHF coverage • ATS procedures/LOAs/MOUs • ATCO/Pilot training/briefings • ATFM procedures/LOAs/MOUs **Recommended** • Surveillance • Basic ATM System with MTCD • ATFM system • CPDLC
Block 1	In continental airspace, the most important operational improvement is related to Free Route Airspace (FRA) as the continuation of direct routing introduced in FRTO B0. For airspace where FRA cannot be deployed, or for connectivity between FRA and terminal manoeuvring areas (TMAs), RNP routes might be considered. Collaborative airspace management is enhanced with new features such as real time airspace management (ASM) data exchanges. Additional system capabilities such as dynamic sectorization intend to align the traffic demand to the available capacity.	**Required** • VHF coverage • Surveillance • ATS procedures/LOAs/MOUs • ATCO/Pilot training/briefings • Basic ATFM system including procedures/LOAs • ATM System with advanced MTCD **Recommended** • CPDLC • AIDC • Advanced ATFM system • Regional ATFM coordination • RNP routes
Block 2	The most important operational improvement is related to the large scale cross border Free Route Airspace (FRA) as the continuation of FRTO B1. Large scale FRA (e.g. Continental operations) are envisaged to be widely deployed, except where structure provides for efficient performance-based routings into and out of high density airspace. There is a need ensure a smooth transition between FRA and highly structured airspace based on Dynamic Airspace Configuration (DAC) principles. There is a need for more dynamic, accurate and precise information on constraints allowing the FRA extension and accommodation of different business trajectories.	**Required** • VHF coverage • Surveillance • ATS procedures/LOAs/MOUs • ATCO/Pilot training/briefings • ATM System with advanced MTCD • CPDLC • AIDC • Advanced ATFM system which includes Regional interoperability • RNP routes

Classification of Airspace related to capabilities

Level	Description
Level A	A portion of airspace which allows TDRs.
Level B	A portion of airspace which allows UPRs.
Level C	A portion of airspace which allows SDRs.
Level D	A portion of airspace which allows FRA.

Level	Requirements Requirements are a combination of Basic Building Blocks (BBBs) and ASBU Elements ASBU Elements - ICAO GANP Portal
Level A	Direct Controller-Pilot Communications (DCPC) **Currently available throughout CAR Region (Continental airspace)**
Level B	Level A requirements. ATS Surveillance. Collaborative Decision Making (CDM) process (such as CADENA) between airline operators and the ANSP. **Currently available throughout most of the CAR Region (Continental airspace)**
Level C	Level B requirements. ATM Automation System. FRTO-B0/4 -Basic conflict detection and performance monitoring. FRTO-B0/2- (Harmonized) Airspace Planning and Flexible Use of Airspace. **Currently available throughout some of the CAR Region (Continental airspace)**
Level D	Level C requirements. NOPS-B1/5 - Full integration of airspace management with air traffic flow management. FRTO-B1/4 - Dynamic sectorization. FRTO-B1/3 - Advanced Flexible Use of Airspace (FUA) and management of real time airspace data. FICE-B0/1 - Automated basic inter facility data exchange (AIDC). FRTO-B1/5 - Enhanced Conflict Detection Tools and Conformance Monitoring. DAIM-B2/2 - Daily Airspace Management information to support flight and flow Evolution. **In development, expected to be available 2028**

NEOSPACE-1 Project

GREPECAS Decision 21/07 – Approval of the Caribbean/South American Airspace Optimization Programme and the NEOSPACE -1 project. GREPECAS Decision 21/07

Development of an action plan geared towards a harmonized approach to the optimization of the airspace across the CAR/SAM Region; taking into consideration:

a) ASBU modules/elements related to APTA and FRTO;

b) Participation of States;

c) Input from all relevant stakeholders; and

d) Continuation and strengthening of ongoing implementations.

Discussions between NACC/AOTF and SAM/IG

Creation of an Overarching Document for Free Route Airspace (FRA) - Harmonized Horizons: Airspace Optimization in the CAR/SAM Region

- Collaboration/Coordination

- Harmonization

- Each State/Organization assess and implement SDRs within their own FIR based on their capabilities

- Connectivity between upper/lower airspace to be coordinated with parent FIR and TMAs within

- Phased approach - Cross-border FRA in the upper airspace

CAR Airspace Concept Document

- Reviewed and edited
- SDR guidance material added
- Roadmap with objectives added
- Approved at GREPECAS 2022

FRA Roadmap 2025-2030

Timeline	Objective	Responsible Parties	Comments
Present – End 2025	Completion of the development of CAR/SAM upper airspace harmonization concept document.	ICAO NACC/WG and SAM/IG States and Organizations IATA CANSO	The ICAO NACC/WG and the SAM/IG to coordinate with States, Organizations and industry to promulgate a concept of operations for the optimization of the upper airspace throughout the CAR/SAM regions.
Present – 2027 Phase 1	70% of Upper Airspace FIRs implement and publish the use of UPRs	States and Organizations IATA CANSO ICAO NACC/WG and SAM/IG	CAR/SAM States and Organizations collaborate with ICAO, IATA, CANSO and other relevant stakeholders to ensure that, wherever possible, UPRs continue to be developed and utilized across the CAR/SAM region.
	70% of ANSPs conduct trials SDRs within the upper airspace of their own FIRs	ICAO NACC/WG and SAM/IG States and Organizations IATA CANSO	CAR States and Organizations through collaboration with ICAO NACC/WG and SAM/IG, IATA, CANSO and other relevant stakeholders engage in conducting trials SDRs within their own airspace structure and ensuring that the relevant safety assessments and training are conducted. The trials and implementations should be based on the principle of ensuring effective implementation.
	50% of ANSPs implement and publish the use of SDRs within the upper airspace of their own FIRs		
	50% of ANSPs conduct trials for Cross-Border SDRs in the upper airspace	ICAO NACC/WG and SAM/IG States and Organizations IATA CANSO	CAR/SAM States and Organizations through collaboration with ICAO NACC/WG and SAM/IG, IATA, CANSO and other relevant stakeholders engage in testing SDRs with adjacent FIRs and ensuring that the relevant safety assessments and training are conducted.
	100% Collaboration upper/lower airspace connectivity	States and Organizations	CAR States and Organizations collaborate with all relevant stakeholders to assess the TMAs and lower airspace structure to determine the possibility of waypoint-to-waypoint operations for arrivals, departures and lower level en-route flights. This assessment should
2027 – 2030 Phase 2	75% of ANSPs implement and publish the use of SDRs within the upper airspace of their own FIRs	ICAO NACC/WG and SAM IG States and Organizations IATA CANSO	CAR States and Organizations to implement unrestricted SDRs within their upper airspace structures.
	50% of improved connectivity between upper airspace and lower airspace which allows for implementation of CCOs and CDOs	ICAO NACC/WG and SAM IG States and Organizations IATA CANSO	CAR States and Organizations to implement revised airspace concepts which include the connectivity between upper and lower airspace structures including the implementation of the relevant APTA elements including CDOs and CCOs where practical.
	25% of cross-border upper airspace SDR operations across CAR/SAM	ICAO NACC/WG and SAM IG States and Organizations IATA CANSO	States and Organizations to implement unrestricted cross-border SDRs within their upper airspace structures across the CAR/SAM region.

SDR Guidelines to CAR States

AOTF3 Meeting – State/Organization to assess their capability

- Airspace density/complexity
- CNS Capabilities
- ATM System Capability
- ATS Procedures
- Data Analysis/Safety Case
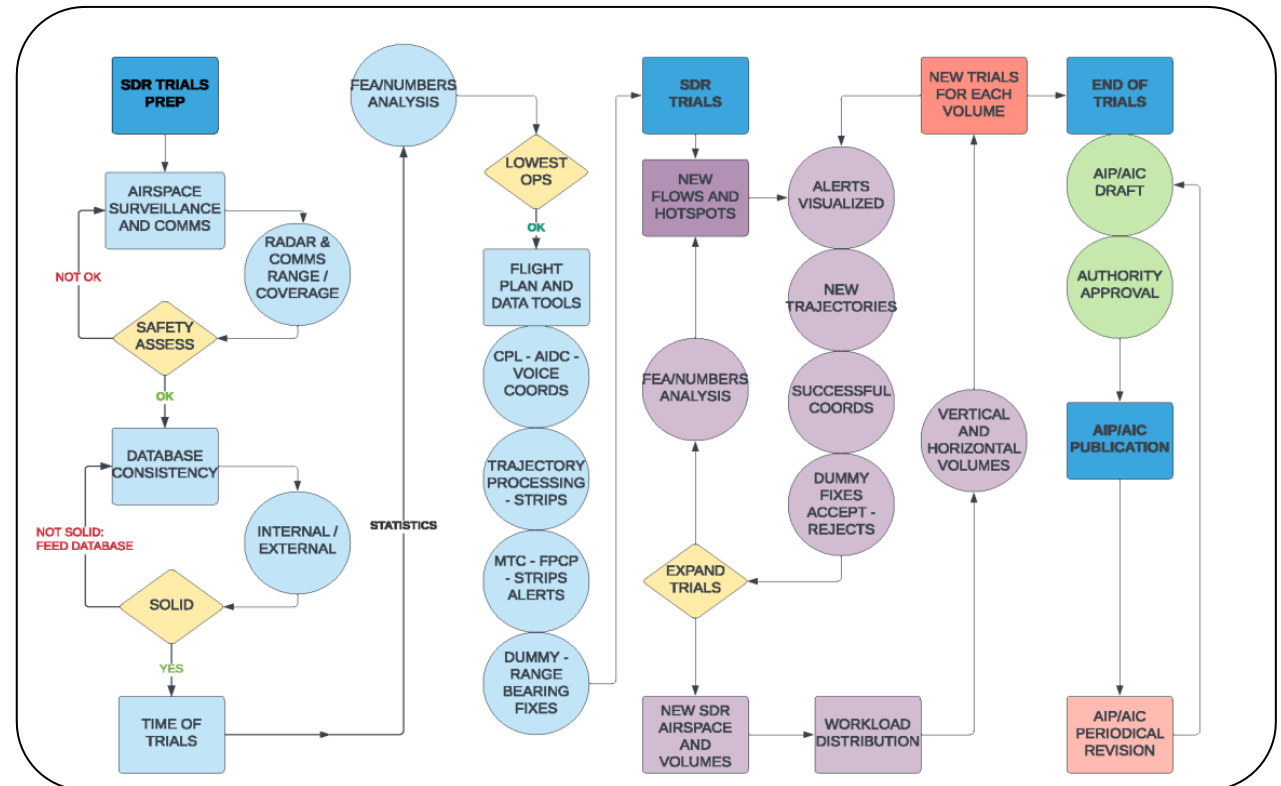
CIIFRA – CANSO, IATA, ICAO Free Route Airspace Team

- Participation: Currently, 12 airlines, including major carriers such as American Airlines, Delta Airlines, and United Airlines, along with cargo and general aviation entities, are actively involved in CIIFRA initiatives.

- Inter FIR SDR Trial: COCESNA and SENEAM initiated an inter FIR SDR Trial involving major airlines like American Airlines, Delta Airlines, United Airlines, and Aeromexico

- Route Standardization Efforts: Efforts to standardize flight plan filing procedures in the Latin America and the Caribbean (LAC) region are underway, supported by ICAO NACC recommendations to streamline AIP publication and improve accessibility.

Challenges to transition to FRA

- The requirement of some Flight Data Processors (FDP) within the automated ATM system to accept flights without a prior known position in its database
- The inability of the automated ATM system to predict conflicts on random tracks
- Lack of harmonization of UPR publications in States' AIPs
- Lack of training and briefings to Air Traffic Controllers (ATCOs) and pilots
- Outdated LOAs/MOUs between adjacent facilities
- Connectivity between upper airspace and TMAs
- Financial cost of system upgrades
- Lack of SMEs within some States with knowledge on ATM systems

Request for Collaboration Across ATM-Related Disciplines

CNS

- Determine which ANSPs/FIRs have already tested and implemented acceptance of flights on random routes across common boundaries
- Determine which ANSPs/FIRs have systems that may be capable of accepting flights on random routes across common boundaries
- Find short-term solutions which may mitigate against system inability to accept flights on random routes across common boundaries

AGA

- Identify the important aspects for connecting the construction impacts of terminal expansions and the closure of runways and taxiways to the infrastructure
- Understanding the priorities of AGA within each state will help AOTF fill in any missing milestones to establish a better plan

AIM

- Harmonization of AIP across the Region
- Agree on a common methodology to publish UPRs in the AIP
- Reduction of duplicate FPLs
- Reduction in FPL errors
- Ensuring quality management of data
- Develop a common repository for a database on all approved UPRs across the NAM/CAR/SAM region so that all stakeholders can easily access the information

MET

- Conduct a survey to determine areas for improvement
- The goal is to present a weather report in a consistent and easily understandable format
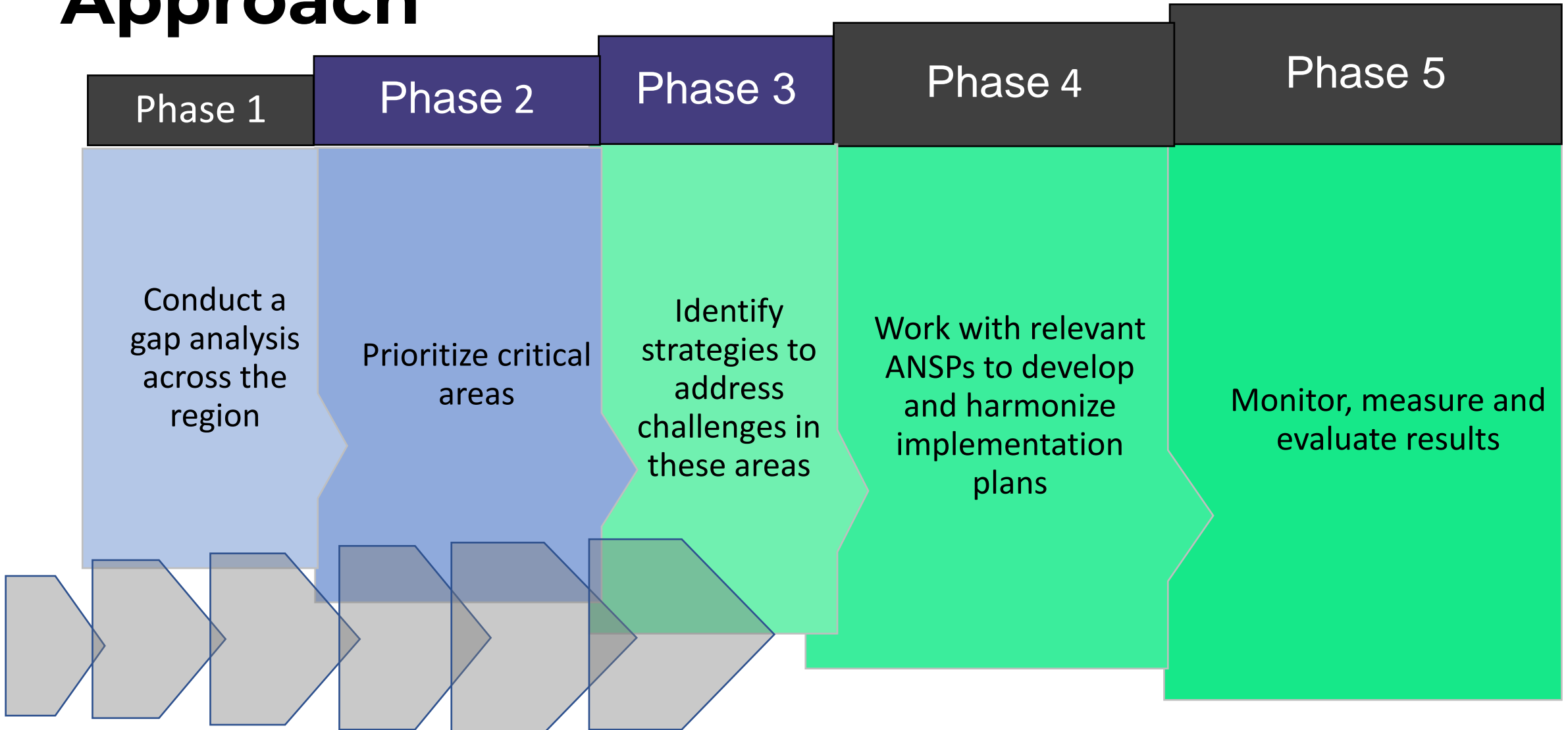
Short –term objectives of the AOTF

Improved flexibility for dispatchers to file routes based on operational considerations

Improved predictability based on advanced information on intended flight paths
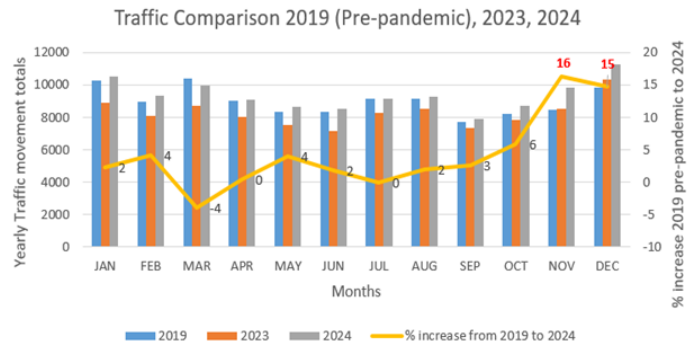
Reduced coordination between ATCOs; and

Reduced transmissions between ATCOs and pilots

Proposed Methodology – Phased Approach

Phase 1
Conduct a gap analysis across the region

Phase 2
Prioritize critical areas

Phase 3
Identify strategies to address challenges in these areas

Phase 4
Work with relevant ANSPs to develop and harmonize implementation plans

Phase 5
Monitor, measure and evaluate results

Phase 1 - Data collection

Information on Traffic Growth in each ANSP Across the Region
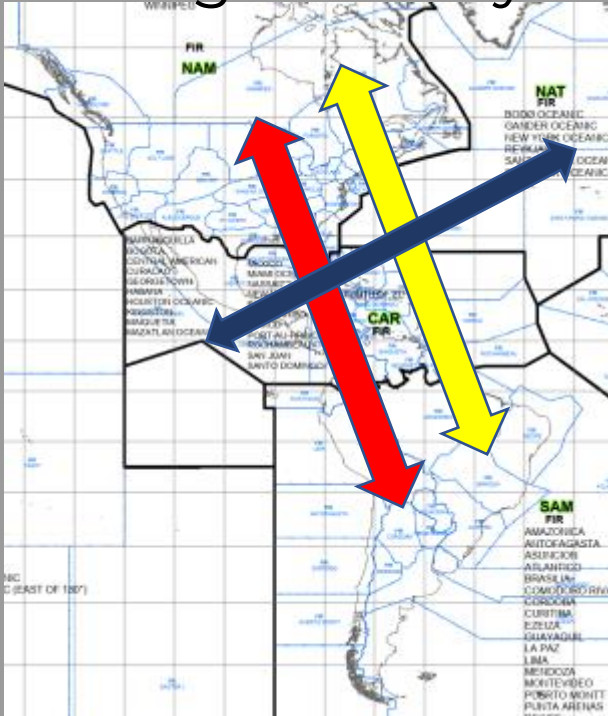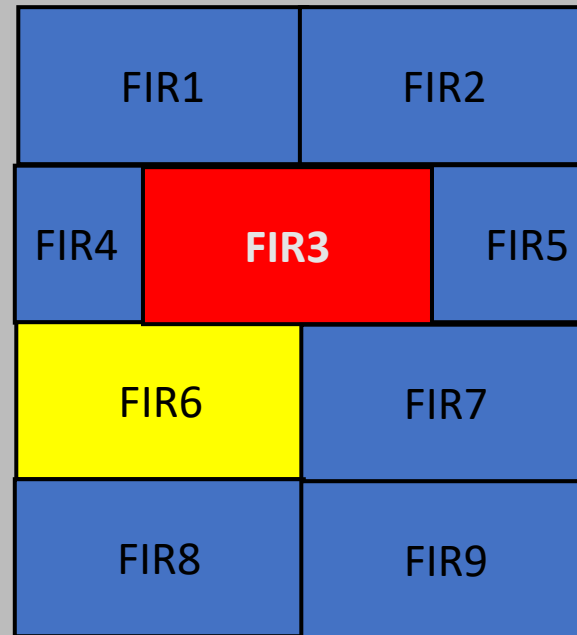

Information on ANSPs' Capabilit

Phase 2 – Analysis of Information

Main Traffic Flows - Determine areas where traffic may be increasing significantly

Identify choke points

FIR1	FIR2

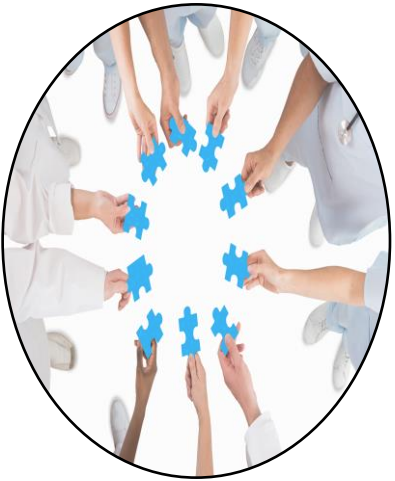|		
FIR4	**FIR3**	FIR5

FIR6	FIR7
FIR8	FIR9

Determine the causal factors (Outdated Equipment, Lack of CDM, Human Resource Challenges, Outdated Procedures/LOAs etc.)

Phase 3 – Determine appropriate strategies

- CDM with relevant stakeholders

- Brainstorming sessions

- Specific work group to formulate possible solutions

- Define and agree on applicable KPIs

Phase 4 – Development of Harmonized Implementation Plans

- Specific work group to provide SME advice to ANSPs that require assistance

- Sharing of implementation plan templates

- Work group to facilitate CDM amongst adjacent ANSPs to ensure harmonization

Phase 5 – Monitor, Measure and evaluate results

Adjust strategies where required

Conduct post-implementation analysis

IMPROVE

Data from Operators and ANSPS

Evaluate against baseline figures

Thank you for your attention