ICAO CAPACITY & EFFICIENCY

CAR/SAM Regions Air Traffic Flow Management

Concept of Operation

(CAR/SAM ATFM CONOPS)

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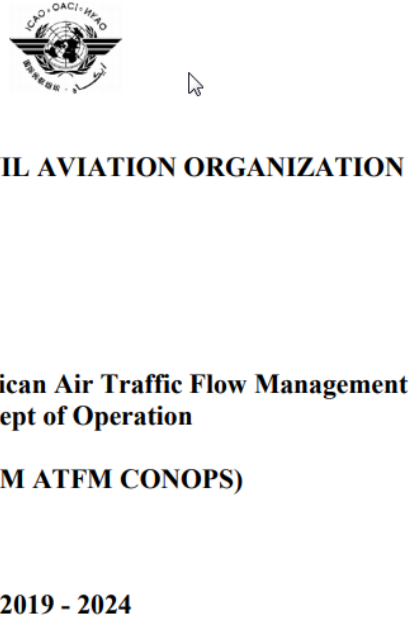
Fundamental ATFM Concepts

- The purpose of ATFM is to balance demand and capacity, providing the framework to take collaborative decisions to make an efficient use of available resources for the provision of air traffic services.
- Air operators and other stakeholders expect the ANSPs take appropriate measures to ensure safety in air operations, while guaranteeing the best possible use of the airspace and movement areas.

CAR/SAM ATFM CONOPS

- The CAR/SAM ATFM CONOPS document is a high level description of service to be provided in the CAR/SAM Regions during the period 2019 - 2024.
- The operational concept reflects the expected order of events and should assist and guide the planners in the design and gradual development of the ATFM system.
- The concept is designed to promote safety, efficiency, and an optimum flow of traffic in areas where demand exceeds, or is forecasted to exceed, the available capacity of the ATM system or airport capacity.



INTERNATIONAL CIVIL AVIATION ORGANIZATION

Caribbean/South American Air Traffic Flow Management Concept of Operation

(CAR/SAM ATFM CONOPS)

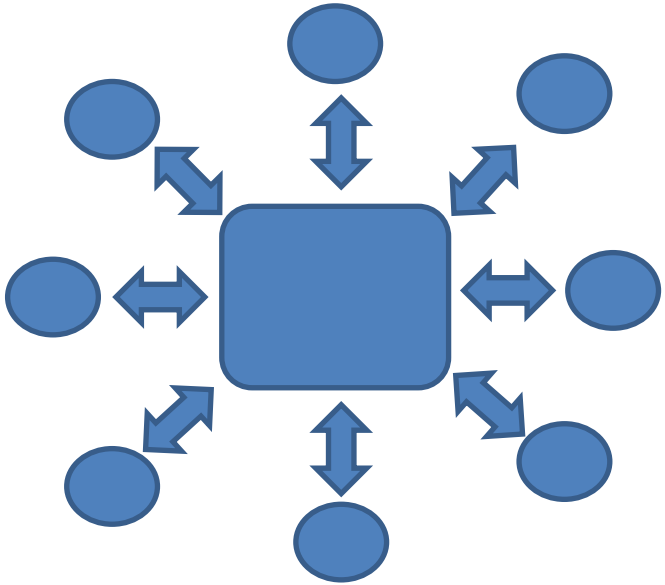
2019 - 2024

Background

- The CAR/SAM ATFM CONOPS was initially approved in 2007.
- GREPECAS considered that the early implementation of the ATFM would ensure an optimum air traffic flow towards some areas or through them, during periods in which the demand exceeds or is foreseen to exceed the available capacity.
- GREPECAS approved the CONOPS to reflect the expected order of events which might occur and should assist and guide the planners in the design and gradual development of ATFM system.

Centralized Approach

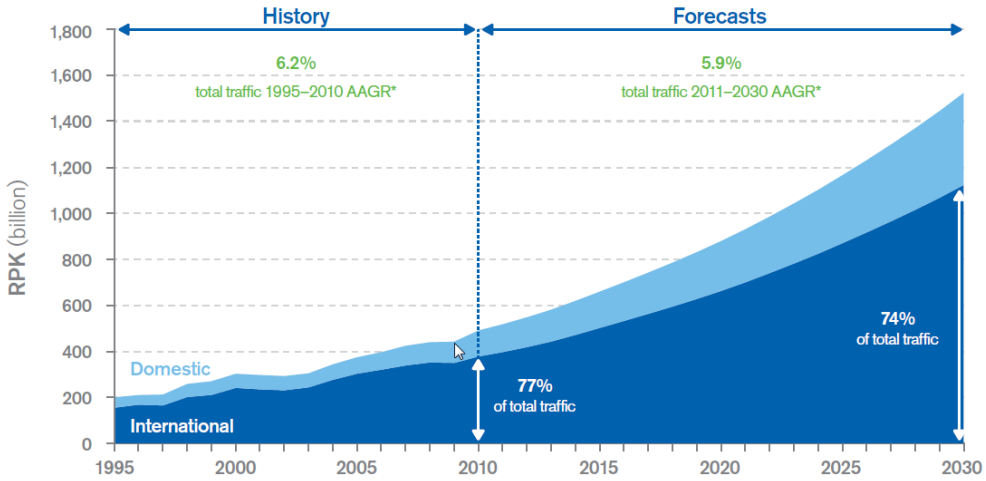
- Taking as a reference ICAO guidance, the initial version of the CAR/SAM ATFM CONOPS considered ATFM should be implemented within a region or within other defined areas as a centralized ATFM organization, with the support of Flow Management Units (FMU) established in each ACC within the region or area of application.
- The initial regional ATFM implementation principle for the CAR/SAM Regions was to establish two centralized ATFM facilities, one for each Region, with the support of Flow Management Positions (FMPs) established in each ACC within the Region of application.



CAR Regional Context

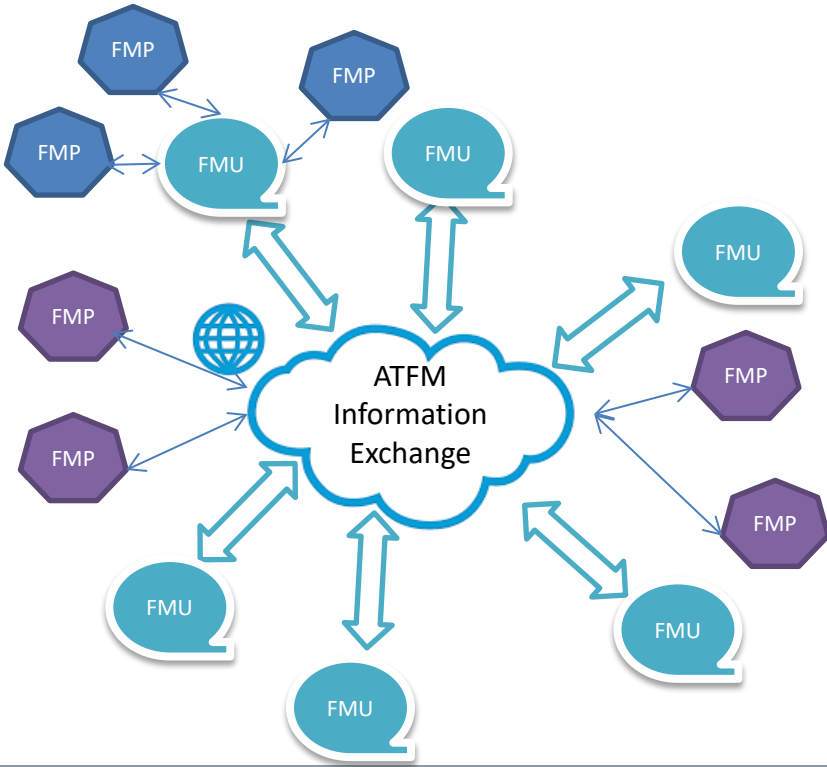
- The CAR/SAM Regions are comprised of independent ANSPs, each with ATM authority for their respective FIR and no overarching authority for the entire Region.
- ANSPs with various levels of size, maturity and automation.
- The CAR Region has:
  - Strong interdependence with United States Air Navigation Service.
  - Significant contribution of international operations and overflights.
  - Sustained growth in traffic while also links South America with North America.
  - Several ANSPs manage the upper airspace without overarching authority over the lower airspaces.

Figure 5-75: Latin America and the Caribbean passenger traffic: history and forecasts



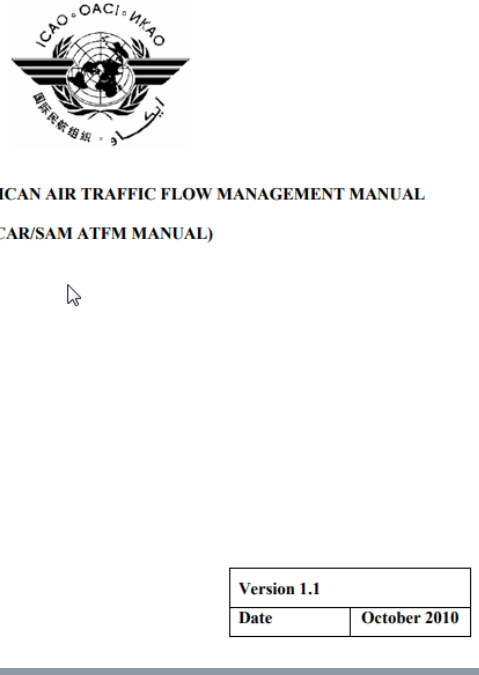
Multi-nodal cross border ATFM concept

- The establishment of a single ATFM organization for each region was not feasible due to political and institutional considerations, which resulted in a considerable delay in the expected implementation of ATFM in the CAR and SAM Regions.
- In response to these circumstances, the CAR/SAM CONOPS was updated to make emphasis on a multi-nodal cross border ATFM concept.
- Experience in other regions proves that this approach is not totally free of challenges. Although, in principle, the multi-nodal approach may seem an appropriate option for the implementation and development of basic capacities by States and ANSPs, the reality is that at a certain point it is necessary to be able to make decisions from a regional perspective, and not individually.
- Therefore, in due time, measures should be taken to determine how these decisions would be made, whether through regional agreements or the implementation of a centralized decision-making system.



CAR/SAM ATFM Manual

- Complements the CONOPS
- The purpose of this document is to assist the States/Territories of the CAR/SAM Regions to establish a common understanding of the role of each of the parties involved in the effective provision of the flow management service, air traffic services, and aircraft operators, taking into account the optimization in the use of the resources available for an adequate response in order to ensure the quality of the service and the efficiency of the ATM system (capacity management).
- The intent of this document is to serve as guidance for the implementation of the ATFM service and not as a comprehensive body of knowledge.

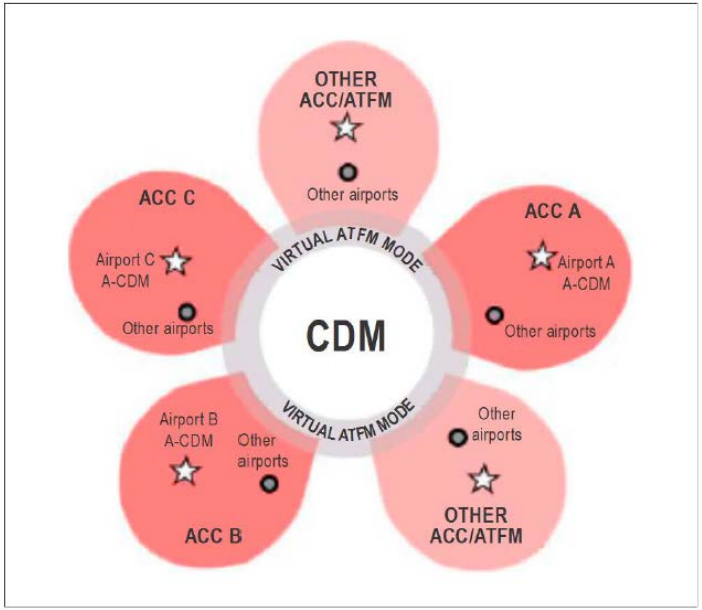


What´s Missing?

- Lack of criteria or requirements to determine different levels of ATFM services required by each airspace or service provider.
  - Identifying the need for ATFM
- Lack of specific criteria to determine where an FMU or FMP should be implemented.
  - Requirement assessment
- Clear set of rules to allow regional decision making and collaboration.
  - Establishment of Regional ATFM cross-border multi-nodal

Virtual ATFM/CDM

- Confronted with the hurdles associated with the establishment of a central ATFM unit, some States have decided to implement international cross-border ATFM relying on national resources and international cooperation.
- In this case, multiple States/ANSPs in a region implement and operate ATFM systems, which impact multiple FIRs/sectors of airspace/aerodromes (possibly in more than one State).
- In this concept, each ANSP operates an independent, virtual ATFM/CDM node supported by an interconnected information-sharing framework. The flows of air traffic are then being effectively managed based on a common set of agreed principles among the participating ANSPs and airports.

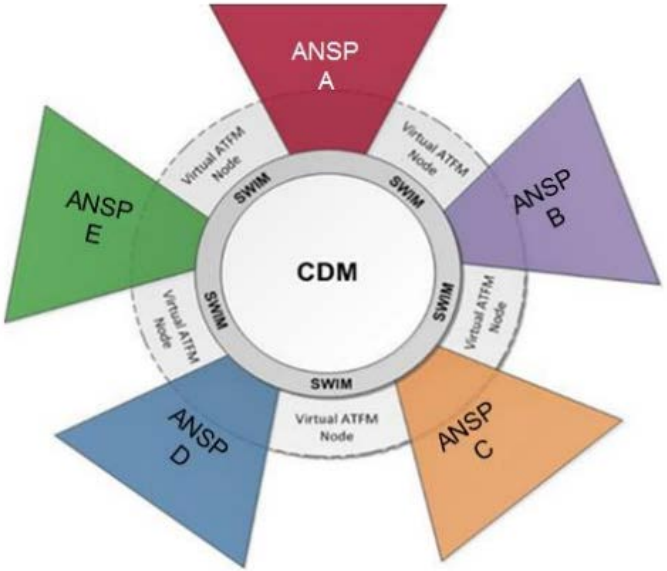


Virtual ATFM/CDM

Regional ATFM cross-border multi-nodal

System Capability and Functionality	Each ANSP has an independent ATFM system which is connected in a distributed ATFM network sharing ATFM information.
	ANSP independently manages demand/capacity of its own resources.
	Flights participating in ATFM nodes within the region subject to ATFM measures.
	CDM is performed by stakeholders via software web interfaces or accepted messaging protocols.
	Individual procedures published by each ANSP, though normally coordinated and harmonized based on common operating procedures.
Specify capacity and demand prediction	Demand prediction – flight progress is via manual input or automated data feed (e.g., FDP, AMHS or AFTN) to each node.
	Capacity management – inputs from FMP and FOC are via ATFM web-based interface. Conflicting ATFM measures must be manually resolved.
Evaluate alternatives, initiate/modify ATFM measures	Aircraft operators perform CDM with airport operators for ground/surface delay intent.
	ATFM slot assignments can be viewed via software, web interface and notifications.

Role of CADENA



- For the CAR Region the role of distributed multi-nodal ATFM network concept can be perfectly supported by CADENA (CANSO).
- Significant number of CAR ANSP have already signed the Letter of Agreement that would allow the CDM procedures to enable regional functioning.
- The CADENA OIS is an interconnected information-sharing framework that can support the regional decision making.

Integration with the Regional Planning

- Specific integration strategies for related support systems (AGA, AIM, MET and CNS).
- For these strategies to work, they have to be made an integral part of the Regional planning and implementation mechanism, i.e. the GREPECAS projects.

Case Studies / Different Scenarios

- There are particular scenarios that should be considered and analyzed by the CONOPS, that may not fit the normal regional profile for the CAR/SAM Regions.
- Success stories and challenges should be reflected and taken in consideration for regional planning.

Suggested Actions

- Propose required changes to the CAR/SAM ATFM CONOPS.
- Suggest additional actions deemed necessary.

ICAO


North American Central American and Caribbean (NACC) Office Mexico City
South American (SAM) Office Lima
ICAO Headquarters Montréal
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) Sub-office Beijing
Asia and Pacific (APAC) Office Bangkok
THANK YOU

Phased Strategy

Phase 1

Ensure (support) implementation and operation of Flow Management Units for:

- FIR Mexico (MMFR).
- FIR Central American (MHTG).
- FIR Habana (MUFH).
- FIR Kingston (MKJK).
- FIR Santo Domingo (MDCS).
- FIR Curaçao (TNCF).
- FIR Piarco (TTZP).
- * FIR Port-au-Prince (MTEG).

Phased Strategy

Phase 2.

- Establish communication and coordination procedures among Priority FIRSs and between Priority FIRs and the FAA Command Center.

Phase 3.

- Implement decision making agreements between Phase 1 FIRs and between Phase 1 FIRs and the FAA Command Center.

Specific Requirements for CONOPS v3.0

ATM	AGA	AIM	CNS	MET
Priority States /ANSPs Implement FMU/FMP	Establish International Airports Capacity	Aeronautical information sharing	Communication infrastructure requirements	Requirements for MET forecast
Establish ATS System Capacity	Establish International Airports CDM Procedures	What information should be shared and how?	Data Sharing Platform between FMUs and the FAA Command center	
Establish CDM procedures • between FIRs, and • between ACC and TMAs/Airports that the ACC serves.			Data Sharing Platform between regional FMUs	