International Civil Aviation Organization
Fifth Meeting of the ATFM Task Force (ATFM/TF/5)
(Armenia, Colombia, 8 to 12 June 2009)

Agenda Item4: Review of ATFM documentation for the CAR/SAM Regions
4.1 CAR/SAM Air Traffic Flow Management Roadmap

CAR/SAM ATFM Roadmap

(Presented by the Rapporteur of the ATFM/TF)

SUMMARY
This working paper presents the follow up activities for the implementation of ATFM which is in accordance with the Strategy for the CAR/SAM Regions approved by GREPECAS.

1. Introduction

1.1 The GREPECAS throughout its Conclusion 14/51 approved a Demand Capacity Balancing Strategy for CAR/SAM Regions. The goal was to attain interoperability and continuity for all users during all the flight phases throughout the regions; to meet the agreed upon safety levels; to develop economically optimal and environmentally sustainable operations; and to satisfy national safety requirements.

2. Background Information

2.1 The Meeting considered that ATFM implementation in the CAR/SAM Regions would require the development of detailed guidelines for States and International Organizations, including the following aspects:

a) Review experience in other regions; and

b) Obtain and complete the information, taking note of the status in the participating States/Territories and organizations regarding the electronic databases required for the evolutionary phases of the ATFM system.

2.2 The work related to these tasks requires the development of an ATFM roadmap according to the implementation Strategy (**Appendix**).

2.3 It is important to stress that the documents included in Appendix require additional discussion and exchange of ideas to develop the final products before submitting it to GREPECAS for approval.

3. Suggested Action

3.1 The Meeting is invited to:

a) Take note of the information contained in this working paper;
b) Consider adopting the ATFM Roadmap presented in Appendix to this working paper for application in the CAR/SAM Regions; and
c) Consider developing a timetable for accomplishing the activities associated with the ATFM Strategy adopted by GREPECAS.

- - - - - - - - -

APPENDIX

ATFM

INTERNATIONAL CIVIL AVIATION ORGANIZATION

ROADMAP FOR AIR TRAFFIC FLOW MANAGEMENT FOR CAR/SAM REGIONS

Version 1.1

TABLE OF CONTENTS

1.0 EXECUTIVE SUMMARY

1.1 GREPECAS determined that air traffic flow management (ATFM) implementation will help ensure optimum air traffic flow to/through specific airspace areas during periods in which the demand exceeds, or is foreseen to exceed, available capacity of the air traffic control (ATC) system. An ATFM system will help reduce ground and airborne delays and help avoid overloading the air traffic system.

1.2 In this connection, GREPECAS approved the CAR/SAM ATFM Concept of Operations (CAR/SAM ATFM CONOPS), which reflects the expected order of development events and should assist and guide the planners in the design and gradual implementation of an ATFM system.

1.3 The main stakeholders involved in ATFM include the organizations, bodies or entities which might participate, collaborate and cooperate in the planning, development, use, regulation, operation and maintenance of the ATFM System.

1.4 With regard to air traffic management, a number of airspace areas with common interests have been identified. The common interests are based on similar characteristics of traffic density, complexity and air navigation system infrastructure requirements. The identification of these airspace areas will help foster the implementation of the Global ATM Operational Concept. A description of such homogeneous and routing areas is attached to the CAR/SAM ATFM CONOPS.

1.5 As established in ICAO documents, ATFM cannot be restricted to the area of one State because of its far-reaching effects on the flow of air traffic elsewhere. ATFM should be implemented within a region, or within a defined area, as a regional ATFM centre. The main objectives of the regional ATFM centre include: assist ATC in making the maximum use of its airspace and capacity; issue flow management initiatives, as required, in order to maintain a safe, orderly and expeditious flow of air traffic; ensure that air traffic volume is compatible with declared capacities; develop a description of the principles and functions of flow management units (FMU); and establish the requirements for equipping flow management units and regional ATFM centres. The regional ATFM centre will be supported by FMUs established in each ACC within the region or defined area of application.

1.6 GREPECAS established a simple phased ATFM implementation strategy in order to ensure maximum utilization of available capacity and permit all parties concerned to obtain sufficient experience. The implementation will be initiated with the application of basic ATFM procedures at airports and then progress in an evolutionary manner to reach more complex phases, without the immediate need for a regional ATFM center. GREPECAS noted that the implementation of a regional ATFM centre would require further studies to define the operational concepts, systems requirements and institutional aspects for its implementation.

1.7 In view of the need for harmonized ATFM planning, it is considered advisable to prepare an ATFM Roadmap to provide guidance to air navigation service providers, airspace operators and users, international organisations, and others regarding the applications that should be implemented in the short term (2008 – 2010) and medium term (2010 – 2014) in the SAM Region.

1.8 The SAM ATFM Roadmap will provide material for regional projects regarding the implementation of ATFM as well as guidance for national implementation plans.

2.0 INTRODUCTION

2.1 The SAM ATFM Roadmap is being developed by the SAM States and Territories together with concerned international organizations such as COCESNA, IATA, IFALPA, and IFATCA. It is intended to assist the main stakeholders of the aviation community with planning a harmonized and coordinated transition to ATFM applications. The main stakeholders of the aviation community that benefit from this roadmap are:

- Airspace operators and users.
- Air navigation service providers.
- International organizations.

2.2 ATFM is a service designed to assist ATC with making the maximum efficient use of its airspace. This is done by balancing system demand with capacity in order to maintain a safe, orderly and expeditious flow of traffic.

2.3 In its beginning applications, ATFM need not involve complicated procedures or tools. The goal is to collaborate with system stakeholders and communicate operational information to airspace operators and ATC providers in a timely manner. In the initial application of ATFM, this can be accomplished via point-to-point telephone calls designed to exchange pertinent weather information, system constraints, and other information of operational significance. Examples include relaying information on known runway closures, volcanic activity, and reroute information. Significant benefits can be realized by applying the initial levels of ATFM service.

2.4 In more advanced applications, ATFM requires a continuous analysis and monitoring of traffic flows, regular coordination between traffic management units, and dynamic use of traffic management initiatives and programs. This involves the development, maintenance, and use of flight plan data bases, electronic flight data displays, and telephone conference systems.

2.5 Because ATFM is a collaborative process, it is ever improving, growing, and changing with a focus on meeting the operational needs of the stakeholder community. The establishment of a Collaborative Decision Making community is therefore an important key to the long-term success of ATFM.

3.0 OBJECTIVES OF THE ATFM ROADMAP

The following strategic objectives apply to the SAM ATFM Roadmap:

a) That SAM States, Territories, and Organizations will work together to develop a seamless and harmonized ATFM system in the SAM region.
b) To communicate with and involve all of the appropriate stakeholders during the development and implementation process.
c) To develop the applicable regional and national documents necessary for the support of the ATFM system.
d) To provide training to all of the appropriate stakeholders with regard to the principles and processes of ATFM in the SAM region.

4.0 PRINCIPLES OF ATFM IMPLEMENTATION

The implementation of ATFM in the SAM Region will be based on the following principles:

a) Development of a Collaborative Decision Making process based on the concepts of teamwork, trust, transparency, and communication;
b) Use of the existing system capacity on a first-come, first-served basis without compromising safety;
c) Completion of the necessary coordination to make every possible attempt to make the best use of and to increase available capacity before resorting to the application of ATFM measures;
d) Equitable distribution of delays among operators when taking pertinent measures to balance air traffic demand with system capacity;
e) Application of Safety Management System processes to the ATFM services provided; and
f) Development of a process at the local, State, and global levels to identify and correct system deficiencies to improve the capacity.

5.0 ATFM DEVELOPMENT STRATEGY

5.1 The initial development of ATFM in the SAM region can be characterized by the following steps.

a) Develop and apply a common methodology to determine:

1) airport capacity; and
2) enroute sector capacity

b) Identify and apply weather products that can be commonly used to assess weather impact to the system.

1) METAR and TAF information
2) Prognostic websites and charts
3) Satellite websites and charts
4) Other

c) Identify the personnel and operational phone numbers that will serve as the point of contact for ATFM issues at each:

1) ACC
2) TMA
3) Control Tower
4) Airline Operations Center
5) Weather Office
6) Military Flight Operations Center
7) General Aviation Operations Center
8) Airport Operations Center
9) Other

d) Develop a local database to analyze the arrival and departure demand at key airports for the following time increments:

1) annually
2) monthly
3) daily
4) hourly

e) Discuss, develop, and apply basic traffic management initiatives and procedures to balance air traffic demand with system capacity.

1) Example 1: Request expanded miles-in-trail between arrivals to the same airport from adjacent sectors or ACCs.
2) Example 2: Have adjacent sectors or ACCs call-for-release of departures to a constrained airport in order to fit them into the arrival flow.
3) Example 3: Coordinate reroutes with adjacent ACCs for flights to a constrained airport to avoid

f) Develop the procedures for and use point-to-point (for example, FMU-to-FMU, FMP-to-FMP, ACC-to-ACC, control tower-to-airline operator) phone calls for the initial application of traffic management initiatives.

g) Develop the applicable procedures manuals and training materials to support this initial ATFM phase.

h) Establish an implementation date for this phase of ATFM.

i) Train the appropriate personnel regarding the process and procedures of this phase of ATFM implementation.

j) Implement the processes and procedures.

k) Evaluate the results and coordinate changes as necessary.

l) Other.

Initial ATFM Development Steps (2008 – 2010)	
a) Develop and apply a common methodology to determine: 1) airport capacity; and 2) enroute sector capacity	March 2009
b) Identify and apply weather products that can be commonly used to assess weather impact to the system. 1) METAR and TAF information 2) Prognostic websites and charts 3) Satellite websites and charts 4) Other	March 2009

Initial ATFM Development Steps (2008 – 2010)	
c) Identify the personnel and operational phone numbers that will serve as the point of contact for ATFM issues at each: 1) ACC 2) TMA 3) Control Tower 4) Airline Operations Center 5) Weather Office 6) Military Flight Operations Center 7) General Aviation Operations Center 8) Airport Operations Center 9) Other	March 2009
d) Develop a local database to analyze the arrival and departure demand at key airports for the following time increments: 1) annually 2) monthly 3) daily 4) hourly	June 2009
e) Discuss, develop, and apply basic traffic management initiatives and procedures to balance air traffic demand with system capacity.	August 2009
f) Develop the procedures for and use point-to-point (for example, FMU-to-FMU, FMP-to-FMP, ACC-to-ACC, control tower-to-airline operator) phone calls for the initial application of traffic management initiatives.	November 2009
g) Develop the applicable procedures manuals and training materials to support this initial ATFM phase.	December 2009
h) Establish an implementation date for this phase of ATFM.	December 2009
i) Train the appropriate personnel regarding the process and procedures of this phase of ATFM implementation.	March 2010
j) Implement the processes and procedures.	June 2010
k) Evaluate the results and coordinate changes as necessary.	September 2010

5.2 The intermediate development of ATFM in the SAM region can be characterized by the following steps.

a) Develop a SAM flight plan database with the flexibility to allow operators to input, modify, or cancel their arrival / departure flight data information.

b) Discuss, develop, and apply more advanced traffic management initiatives and procedures to balance air traffic demand with system capacity.

1) Example: Establish an electronic route database to facilitate the coordination and implementation of reroutes around volcanic activity, hurricanes, severe turbulence, etc.

c) Develop the procedures for and use of ATFM telcons among facilities in the SAM region.

d) Update the procedures manuals and training materials to support this intermediate ATFM phase.

e) Establish an implementation date for this phase of ATFM.

f) Train the appropriate personnel regarding the process and procedures of this phase of ATFM implementation.

g) Implement the processes and procedures.

h) Evaluate the results and coordinate changes as necessary.

i) Other.

Intermediate ATFM Development Steps (2011 – 2012)	
a) Develop a SAM flight plan database with the flexibility to allow operators to input, modify, or cancel their arrival / departure flight data information.	March 2011
b) Discuss, develop, and apply more advanced traffic management initiatives and procedures to balance air traffic demand with system capacity.	June 2011
c) Develop the procedures for and use of ATFM telcons among facilities in the SAM region.	September 2011
d) Update the procedures manuals and training materials to support this intermediate ATFM phase.	December 2011
e) Establish an implementation date for this phase of ATFM.	December 2011
f) Train the appropriate personnel regarding the process and procedures of this phase of ATFM implementation.	March 2012
g) Implement the processes and procedures.	June 2012
h) Evaluate the results and coordinate changes as necessary.	September 2012

5.3 The advanced development of ATFM in the SAM region can be characterized by the following steps.

a) Develop a process for electronic exchange of both textual and visual flight data.

1) Example: SYNCROMAX (Brazil), PROSAT (Mexico), TFMS (USA) - (previously, ETMS), an interface between these two systems, or another system yet to be defined.

b) Develop and implement regional ATFM command centers to coordinate inter-facility traffic management initiatives, flows, etc.

c) Update the procedures manuals and training materials to support this advanced ATFM phase.

d) Establish an implementation date for this phase of ATFM.

e) Train the appropriate personnel regarding the process and procedures of this phase of ATFM implementation.

f) Implement the processes and procedures.

g) Evaluate the results and coordinate changes as necessary.

h) Other.

Advanced ATFM Development Steps (2014 – 2015)	
a) Develop a process for electronic exchange of both textual and visual flight data.	January 2014
b) Develop and implement regional ATFM command centers to coordinate inter-facility traffic management initiatives, flows, etc.	June 2014
c) Update the procedures manuals and training materials to support this intermediate ATFM phase.	December 2014
d) Establish an implementation date for this phase of ATFM.	December 2014
e) Train the appropriate personnel regarding the process and procedures of this phase of ATFM implementation.	March 2015
f) Implement the processes and procedures.	June 2015
g) Evaluate the results and coordinate changes as necessary.	September 2015

EXPLANATION OF TERMS

The development of this document is based on the understanding of important terms and expressions that are described below:

Stakeholders involved in ATFM -

The ATFM stakeholder community includes the organizations, bodies or entities which could participate, collaborate and cooperate in the planning, development, utilization, regulation, operation, and maintenance of ATFM system. Among them are:

Aerodrome Community - The air traffic control authorities, aerodrome authorities, commercial, military, and general aviation operators, and other parties involved in the provision and operation of the physical infrastructure needed to support the take-off, landing, and ground handling of aircraft.

Airspace Providers - Refers, in general terms, to Contracting States/Territories in their capacity as airspace owners with the legal authority to permit or deny access to their sovereign airspace. The term may also be applied to organizations of the State assigned responsibility for establishing the standards and guidelines for use of the airspace.

Airspace users - Refers to the commercial, military, and general aviation operators that utilize the sovereign airspace of States/Territories/Organizations.

ATM service providers - All of the organizations and personnel (e.g., controllers, engineers, technicians) involved in the provision of ATFM services to airspace users.

Military aviation - Refers to the personnel, aircraft, and equipment of military organizations that serve a vital role in the security of States/Territories.

International Civil Aviation Organization (ICAO) - Considered the only international organization in position to efficiently coordinate the implementation activities of global ATM.

Air Traffic Flow Management (ATFM) - A service established with the objective of contributing to a safe, orderly and expeditious flow of air traffic by ensuring that ATC capacity is utilized to the maximum extent possible and that the traffic volume is compatible with the capacities declared by the appropriate ATC authority.

Air Traffic Management (ATM) - A service which comprises airspace management, air traffic flow management, and air traffic services.

ATM Community - All the organizations, bodies or entities which might participate, collaborate and cooperate in the planning, development, use, regulation, operation and maintenance of the ATM System.

Air Traffic Management System - A system which provides ATM through the integration and cooperation of personnel, information, technology, facilities and services. It also invloves the support of on-board and space-based communications, navigation and surveillance.

Air Traffic Volume - The number of aircraft within a defined airspace or aerodrome movement area in a given period of time.

Capacity (for ATFM purposes) - The maximum number of aircraft that can be accommodated in a defined airspace or aerodrome (throughput) in given period of time.

SAM ATFM Roadmap - A document offering appropriate guidance for air navigation service providers, airspace operators and users, international organizations and other appropriate ATM community members that describes the ATFM applications that will be implemented in the short, medium and long term in the SAM Region.

Regional ATFM Center - A flow management unit responsible for the provision of air traffic flow management across multiple area control centers.

Collaborative Decision Making - an operating philosophy and the associated technologies that enable traffic managers and aviation industry representatives to respond in a timely manner to constraints in the airspace system.

Demand - The number of aircraft requesting to use the ATC system in a given time period.

Efficiency - The ratio of the cost of ideal flight to the cost of procedurally constrained flight.

Flow Management Position / Flow Management Unit (FMP/FMU) - A position or working unit established in an appropriate air traffic control unit to ensure the necessary interface between the local ATFM and a centralized ATFM unit.

Homogeneous ATM area - An airspace with a common ATM interest, based on similar characteristics of traffic density, complexity, air navigation system infrastructure requirements and other specified considerations, wherein a common detailed plan will foster the implementation of ATFM.

Main Traffic Flow - The concentration of a significant volume of air traffic on the same, or similar, flight trajectories.

Routing area - An area that encompasses one or more major traffic flows, defined for the purpose of developing a detailed plan for the implementation of ATM systems and procedures.

Traffic Management Initiatives - Techniques used by traffic managers to balance air traffic demand with available capacity.

ACRONYMS

LISTA DE ACRÓNIMOS/ LIST OF ACRONYMS

ACC	Centro de control de área	Area control center
AFTN	Red de telecomunicaciones fijas aeronáuticas	Aeronautical fixed telecommunication network
AIP	Publicación de Información aeronáutica	Aeronautical Information Publication
AIS	Servicio de información aeronáutica	Aeronautical information service
ANP	Plan navegación aérea	Air navigation plan
ANS	Servicios de navegación aérea	Air navigation services
ANSP	Proveedor de servicios de navegación aérea	Air navigation service provider
AO	Operador de aeronave	Aircraft operator
APP	Oficina de control de aproximación	Approach control facility
AAR	Regimen de aceptacion del aeropuerto	Airport Acceptance Rate
ADR	Regimen de salida del aeropuerto	Airport Departure Rate
ATC	Control de tránsito aéreo	Air traffic control
ATFM	Gestión de la afluencia del tránsito aéreo	Air traffic flow management
ATM	Gestión del tránsito aéreo	Air traffic management
ATS	Servicios de tránsito aéreo	Air traffic services
CAA	Administración de aviación civil	Civil aviation authority
CAR/SAM	Regiones Caribe y Sudamérica	Caribbean and South American Regions
CATFM	Dependencia de Gestión de la afluencia del tránsito centralizada	Centralized air traffic flow management unit
C/BA	Análisis de costo/beneficios	Cost/benefit analysis
CDM	Toma de decisiones en colaboración	Collaborative Decision Making
CNS/ATM	Comunicaciones, navegación y vigilancia/gestión del tránsito aéreo	Communications, navigation, and surveillance/air traffic management
CTA	Area de control	Control Area
FDPS	Sistema de procesamiento de datos de vuelo	Flight data processing system
FIR	Región de información de vuelo	Flight information region
FMP	Puestos de gestión de afluencia	Flow management position
FMU	Dependencia de organización de la afluencia	Flow management unit
FPL	Plan de vuelo	Flight plan
GREPECAS	Grupo regional de planificación y ejecución CAR/SAM	CAR/SAM regional planning and implementation group
IATA	Asociación del Transporte Aéreo Internacional	International Air Transport Association

IFALPA	Federación Internacional de Asociaciones de Pilotos de Líneas Aéreas	International Federation of Air Line Pilots' Associations
IFATCA	Federación Internacional de Asociaciones de Controladores de Tránsito Aéreo	International Federation of Air Traffic Controllers' Associations
LOA	Carta de acuerdo	Letter of Agreement
MET	Servicios meteorológicos para la navegación aérea	Meteorological services for air navigation
NOTAM	Aviso al Personal Encargado de las Operaciones de Vuelo	Notice to Airmen
OACI/ICAO	Organización de aviación civil internacional	International civil aviation organization
PANS ATM	Procedimientos para los servicios de navegación aérea –Gestión de tránsito aéreo	Procedures for Air Navigation Services –Air traffic management
PIRG	Grupo regional de planificación y ejecución	Planning and implementation regional group
PROSAT	Pronóstico de Saturación	PROSAT
RNAV	Navegación de área/Area Navigation - RNAV Route: Ruta de navegación de área	Area navigation route
RNP	Performance de navegación requerida	Required Navigation Performance
SID	Salida Normalizada por Instrumentos	Standard Instrument Departure
STAR	Llegada Normalizada por Instrumentos	Standard Instrument Arrival
SYNCROMAX	SYNCROMAX	SYNCROMAX
TBD	A ser determinado	To be determined
TELCON	Tele-conferencia	Telephone conference
TFMS	Sistema de gestión de la afluencia del transito (previamente, ETMS)	Traffic Flow Management System (previously called ETMS)
TMA	Area de control terminal	Terminal management area
TMC	Coordinador de la gestión del transito	Traffic Management Coordinator
TMI	Iniciativa de gestión del tránsito	Traffic management initiative
TWR	Torre de control	Control Tower
WSO	Oficina del servicio meteorológico	Weather Service Office
WWW	Red mundial	World Wide Web

- END –