CARIBBEAN/SOUTH AMERICAN AIR TRAFFIC FLOW MANAGEMENT MANUAL

(CAR/SAM ATFM MANUAL)

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FOREWORD

The Caribbean/South American (CAR/SAM) ATFM Manual is published by the ATM/CNS Subgroup of the Caribbean/South American Regional Planning and Implementation Group (GREPECAS). It describes air traffic flow management practices and procedures to be applied in the CAR/SAM Regions.

The GREPECAS and its contributory bodies will issue revised editions of the Document as required to reflect ongoing implementation activities.

Copies of the CAR/SAM ATFM Manual can be obtained by contacting:

ICAO South American Office

Victor Andres Belaúnde 147
Torre Real 4, Piso 4
Lima 27, Peru
Postal Address: P. O. Box 4127, Lima 100, Peru
Tel: +511 611-8686
Fax : +511 611-8689
E-mail: mail@lima.icao.int
Web site: www.lima.icao.int
Point of contact: E-mail : jfernandez@lima.icao.int; aorero@lima.icao.int

ICAO North American, Central American and Caribbean Office

Av. Presidente Masaryk 29 – 3rd floor
Col. Chapultepec Morales
11570 México D.F., México
Postal Address: Apartado Postal 5-377, 06500 México, D.F., Mexico
Web site: www.mexico.icao.int
Tel: +5255 5250 3211
Fax: +5255 5203 2757
icao_nacc@mexico.icao.int
Point of contact: E-mail: vhernandez@mexico.icao.int

The present edition (Draft Version 1.0) includes all revisions and modifications until October 2010. Subsequent amendments and corrigenda will be indicated in the Record of Amendment and Corrigenda Table, according to the procedure established in page X.

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Chapter 1: Background

1.1 ICAO CNS/ATM Systems received support from the Tenth Air Navigation Conference held in 1991 at ICAO Headquarters in Montreal, Canada. The same year, the CAR/SAM Regional Planning and Implementation Group (GREPECAS) started to work towards a regional application of this new air navigation services concept.

1.2 Further, at the Eleventh Air Navigation Conference (AN-Conf/11, Montreal September 2003), States supported and approved the new ICAO ATM Global Operational Concept, which encourages the implementation of a services management system which enables an operationally continuous regional airspace through the application of a series of ATM functions.

1.3 As per the guidance principles established by ICAO Council with regard to the facilitation of the inter-regional harmonization, the regional plans for CNS/ATM systems implementation in the regions should be prepared in accordance to the general profiles defined in the Global Air Navigation Plan for CNS/ATM Systems. After a careful analysis of the guidance principles of this Global Plan, GREPECAS adopted them and incorporated characteristics inherent to the CAR/SAM Regions, using as a basis the definitions of Homogeneous Areas and Main Traffic Flows. Homogeneous areas are those airspace portions with ATM requirements and similar complexity degrees, while main air traffic flows are airspaces where a significant amount of air traffic exists.

1.4 From the analysis carried out by ICAO/UNDP Project RLA/98/003, it may be inferred that while in general terms in the CAR/SAM Regions environment, currently no traffic congestions are registered requiring a complex flow management, they have been identified in some airports and airspace sectors, mainly in special periods and specific hours, where some congestions are already produced, which should be avoided.

1.5 In view of the above, GREPECAS considered that the early implementation of the ATFM shall 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 of the ATC system. Therefore, an ATFM system should reduce aircraft delays both in flight and ground and avoid system overloading. The ATFM system shall assist the ATC to comply with its objectives and achieve a more effective utilization of the airspace and airports available capacity. ATFM should also ensure that air operations safety is not compromised in case unacceptable levels of air traffic congestion occur and at the same time ensure that air traffic is effectively administered without applying unnecessary restrictions to flow.

1.6 The ATFM/TF/5 Meeting examined the draft ATFM Manual to be applied by the CAR/SAM Region FMU/FMP, which contained guidelines related with ATFM implementation, such as demand and capacity, traffic management tools, traffic Management initiatives (TMI), Communications and coordination, organization and structure, system performance measurement, collaborative decision-making, common ATFM terminology whose aim was to provide orientation in ATFM management.

1.7 The document was in its initial stage and the Meeting agreed that it would be convenient to continue with its development. Subsequently, a number of the States that participated in ATFM/TF/5 reviewed the document and brought the work forward to its current version.

Chapter 2: Purpose of the Document

2.1 The purpose of this document shall be 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).

2.2 This document presents the terms, techniques and programs related to ATFM, the purpose of which is to enable, during all flight phases, a safe, economic, fluid and orderly traffic flow, by providing air traffic management services of a nature and magnitude that meet the requirements of all users and all areas of the airspace.

2.3 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.

2.4 It is understood that this will be considered a living document that will be modified as needed to reflect the growth, future needs and harmonization of the CAR/SAM Regions.

Chapter 3: Introduction

3.1 The Air Traffic Flow Management Operational Concept for the Caribbean/South American Regions (CAR/SAM ATFM CONOPS) establishes a simple implementation strategy. It is recommended that this strategy be developed in phases, so as to ensure maximum utilization of the available capacity and enable all concerned parties to obtain sufficient experience.

3.2 The experience acquired in other Regions and by some States of the CAR/SAM Regions permits States/Territories and International Organizations to apply basic ATFM procedures at airports, without the immediate need for a Regional ATFM Centre. A Regional ATFM Centre will require extensive studies to define operational concepts, system requirements and institutional aspects for ATFM implementation in the CAR/SAM Regions.

3.3 GREPECAS/13 was of the opinion that two CAR and SAM scenarios should be taken into account, but that they could be modified insofar as the operational concept development and the implementation plans progress. The strategy is to develop a harmonized planning of a CAR and SAM interregional ATFM system.

3.4 In the future, in order to maximize the operational efficiency of airspaces and airports of the Region, consideration should be given to the establishment of a Centralized ATFM unit(s) to oversee for provision of the ATFM service.

3.5 It was also considered necessary that the procedures during all the implementation process be developed in a harmonious manner among the ATFM units to avoid risking operational safety. This entails establishing a regional and interregional strategy to facilitate and harmonize all the implementation process.

Chapter 4: ATFM Implementation Strategy

4.1 Airport and airspace monitoring

4.1.1 In order to decide on the implementation of the ATFM service, airports and airspaces should start being monitored in order to identify significant increases in ground delays and in-flight holding, as well as bottlenecks (ATC sector, runway, apron and airport facilities).

Note: The different States could develop mechanisms and procedures to measure ground delays and in-flight holding.

4.2 Determining capacity

4.2.1 Airport and ATC sector capacity should be determined through the use of recognised measurement and calculation methodologies such as the "GUIDE FOR THE APPLICATION OF A COMMON METHODOLOGY FOR ESTIMATING AIRPORT AND ATC SECTOR CAPACITY IN THE SAM REGION" (approved at the SAMIG/5 meeting).

Note: The different States could develop their own measurement and calculation methodologies according to the requirements and conditions of their operational environment.

4.3 Analysis of air traffic demand

4.3.1 In order to determine and prioritise the need to implement the ATFM service, air traffic demand should be assessed and compared to the calculated capacity.

4.4 Capacity statement

4.4.1 In order to begin the application of ATFM measures at airports and the airspace, the air navigation service provider (ANSP) shall officially declare its capacity, clarifying that it could vary based on possible operational limitations (airport infrastructure, CNS or foreseen meteorological conditions), and which will be called "available capacity".

Chapter 5. Preliminary ATFM Measures

5.1 As established in the ATFM implementation strategy under the Air Traffic Flow Management Operational Concept for the Caribbean/South American Regions (CAR/SAM ATFM CONOPS), the adoption of preliminary ATFM measures at the airports located in low air traffic density airports are easy to apply, taking into account that they only require the gathering of information on flight intention (RPL, Official Airline Guide (OAG), flight forms, etc.). This process should consider the development of mechanisms for the strategic coordination of airport slots for scheduled operators, mainly aimed at ensuring airport demand and capacity balancing. The application of such slot coordination processes would ensure an effective hourly distribution of scheduled flights at the airports and would determine the capacity and slots available for non-scheduled operators.

5.2 Additionally, pre-tactical and tactical airport slot assignment processes should be implemented at high traffic density airports for non-scheduled operators.

5.3 For the application of preliminary ATFM measures, it would be advisable to implement capacity management programs (ATFCM) within the framework of the collaborative decision-making (CDM) concept, with a view to coordinating foreseeable capacity reductions (scheduled maintenance work) or addressing a significant growth in demand in face of a limited capacity during certain periods of time.

5.4 In case the preliminary ATFM measures at airports are not enough to prevent congestion and saturation of the associated airspaces, ATFM measures should be implemented during the pre-tactical and tactical planning phases, requiring more sophisticated computer tools and infrastructure to identify and avoid overload at airspace sectors and airports.

Note: See Appendix E, which shows and describes a simple format for assessing demand as required for the implementation of preliminary ATFM measures and for the development of strategic planning programs by the ATFM authority.

Chapter 6. Concepts to be taken into account for ATFM Implementation

6.1 ATFM will be established to optimize the use of available airspace and airport capacity and to improve air traffic flow management processes. It will be based on transparency and efficiency, ensuring a flexible and timely capacity, in keeping with ICAO guidelines.

6.1.1 The implementation will promote cooperation among air navigation service providers, airport operators and airspace users, and will cover the following areas:

a) Flight planning.

b) The use of available airspace capacity during all flight phases.

c) The drafting of guidelines to optimise air traffic flow.

6.1.2 The implementation will seek a balance between the financial benefits for stakeholders, derived from the safety improvements expected from the relevant parties, and the operational and technical benefits, taking into account the requirements for a globally inter-operative ATM.

6.1.3 Aircraft exempt from ATFM measures

6.1.3.1 The following status aircraft operations will be excluded from the implementation of ATFM initiatives:

a) State aircraft (according to national regulations)

b) Emergency/priority aircraft

c) Hospital flights

d) Humanitarian flights (ambulance flights)

e) Search and rescue missions

f) Transportation of human organs

Note: For more details, see the Air Traffic Flow Management Operational Concept for the Caribbean/South American Regions (CAR/SAM ATFM CONOPS).

6.1.4 It shall be recognized that the airspace and airports are resources shared by all user categories under equal and transparent conditions, taking into account State safety requirements and the commitments of international organizations.

6.1.5 Air traffic flow management should be based on partnership principles in order to meet ATM expectations through collaborative decision-making (CDM) among:

a) Central flow management units (CFMU)

b) Flow management units (FMU/FMP)

c) Airspace users: general aviation, air carriers, military forces

d) The airport community

6.1.6 Air navigation service providers and air operators should share data when a coordination agreement has been established. Examples include: SYNCHROMAX, PROSAT and TFMS (former ETMS).

6.1.7 ATFM will be applied within CAR/SAM airspace and airports for:

a) All flight to be operated or being operated under instrument flight rules (IFR), except as indicated in paragraph 6.1.3 above.

b) All the phases of these flights.

6.1.8 ATFM shall be applied to each of the following parties, or to anyone acting on their behalf and that is involved in air traffic flow management activities:

a) Aircraft operators

b) Air traffic service providers

c) Units involved in airspace management

d) Airport operators.

e) The central unit that has been charged by member States with the provision of air traffic flow management services.

6.1.8.1 Roles in ATFM planning

a) Aircraft operators

In the strategic phase, the role of aircraft operators will be based on expected demand, and they will participate in the assessment of ATFM plans in relation to their own activities. In subsequent phases, participation will be at a more individual level, since the aircraft operator must be in a position of making decisions according to the impact that ATFM has on its flights.

Cooperation will be achieved through the precise exchange of information that aircraft operators send to ATFM (for example, flight data) and the information provided by ATFM on the impact and opportunities generated.

For an efficient cooperation, procedures and tools providing seamlessness, efficiency and precision (automation) should be developed.

b) Air traffic service providers

For the strategic phase, planning of resources will be the starting point in the dialogue between ATC and ATFM, in which not only information from airspace managers, but also information about equipment availability and staffing is used. Most of the work can be done locally, managing the available resources for an efficient service provision.

In subsequent phases, the use of recourses will follow the same process and, finally, ATFM measures will be applied to avoid overload or to optimise capacity utilization.

c) Units involved in airspace management

In the strategic phase, dialogue between airspace managers (civil and/or military actors) and the other stakeholders shall be ongoing. The purpose will be to have an airspace system as efficient as possible with respect to traffic forecasts.
This system must be sufficiently flexible to accommodate new activities in order to maintain certain degree of freedom in case of unexpected events. Furthermore, the system will provide solutions to the different scenarios in case of uncertainty. The route network structure, sector design, and airspace definition will be the core elements for capacity management. In turn, ATFM will provide information about efficiency and opportunities for improvement. During subsequent phases, airspace managers will have to participate actively in the decision-making process (CDM). The impact of their activity on flow measures is significant, and the best way of providing the required efficiency would be through the integration of these decisions within the capacity management process. Airspace managers also provide key information for flight planning. In this regard, flight planning activities will be supported by the flexibility provided by airspace management; for example, considering airspace when making changes to flight plan filed in advance.

d) Airport operators

In the strategic phase, airport capacity must be considered in terms of its impact on ATFM. Likewise, airport slot coordination processes will provide valuable information for demand analysis.

In the subsequent ATFM phases, airline schedules will provide updated information about time of departure and arrival of flights. This information will be aligned with the operational data in order to integrate the ATFM process within a timeliness context.

For effective gate-to-gate management, an ongoing exchange of information between airports and between airspace managers and ATFM is required.

e) Centralized ATFM unit

The main function of a centralized ATFM unit will be to act as a catalyst and facilitator in the network management process for all ATFM actors. Planning and coordination shall be extended to the regional level in order to reflect the new role of all stakeholders, through automation and the exchange and processing of common data.

In order to improve ATFM efficiency, the centralized unit will play an airspace management role, ensuring data consistency and collaborating with airports. In particular, it will act as central database with data relevant to the area under its responsibility. It will also coordinate ATFM matters with other States outside of its area of responsibility.

Relationship between ATFM partners

6.8.1.2 The relationship among all the actors involved in ATFM shall be established through formal agreements (memoranda of understanding - MoUs). These formal agreements must emphasize safety and efficiency, through a collaborative decision-making process.

Chapter 7: ATFM Units

7.1 ATFM units are dynamic bodies that evolve according to user needs, maintaining a balance between ATC requirements, on the one hand, and airline requirements, on the other. These bodies rely largely on their CDM network that operates at airports and airlines. This CDM network constitutes an essential link, since it provides ATFM units with information on the demand and other matters, such as the existence of adverse meteorological conditions and operational limitations. ATFM units, on their own, cannot increase capacity, but they can ensure that the existing capacity is maximized. MAKE REFERENCE TO THE SAM ATFM ROADMAP.

7.2 ATFM mission

7.2.1 Provide air traffic flow management services in order to meet the safety requirements of air traffic control services, the efficiency requirements of airspace system users, and environmental requirements, duly taking into account the satisfaction of the aeronautical community and air transport development.

7.2.2 Regulate demand, based on the capacity of the operational scenario, modifying the conditions of the latter so as not to exceed the established capacity values.

7.2.3 ATFM is a service that is provided with the following main objectives in mind:

- Develop and maintain the highest level of quality of the air traffic flow and capacity management service.
- Regulate traffic flows and ensure (ATS) services are not overloaded.
- Give advice and assist in flight planning and minimisation of congestion-related penalties.
- Maintain and improve the profitability of its operations by increasing the level of automation, taking advantage of technological development.
- Provide reports and statistics on operations and delays for operational and managerial purposes.
- Maintain a high level of response to requests for system improvement and evolution from ATS services and users.

7.2.4 Management of an ATFM unit is extremely useful in case of a major difficulty. For example, it may contribute to mitigate the problems resulting from adverse meteorological conditions or disruptions caused by workers' demands. Such disturbances can be minimized thanks to its operational scope, capacity to promptly deviate flights and excellent relations it may establish with the AOs.

7.3 Organization and structure

7.3.1 It is understood that each State and/or service provider will develop an organizational structure that meets the needs of the aviation system community. These needs should at least address management and oversight of the following:

a) The air traffic flow management system

b) Coordination/exchange of information, both internally and externally

c) A line of authority for the implementation of decisions

d) Compliance with mission requirements

7.3.2 Each organization may establish a Line of Authority to support the ATFM mission. This may include the following responsibility positions:

a) Manager of the traffic flow management system

b) The flow management unit that provides surveillance over a specific geographic region and/or facilities

c) The flow management positions responsible for the day-to-day traffic flow management activities

Note: Please see **Appendix A** for an example of the Trinidad and Tobago Civil Aviation Authority Flow Diagram of Piarco Flow Management Unit

7.4 **Flow management unit (FMU) / Flow management position (FMP).**

7.4.1 FMUs monitor and balance traffic flows within their areas of responsibility in accordance with traffic management directives. The FMU is delegated the authority to direct traffic flows and implement approved traffic management initiatives (TMIs) in conjunction with, or as directed by, the oversight authority.

7.4.2 FMU/FMP duties may include:

a) Create and distribute the action plan prior consultation with the designated facilities and customers

b) Collect all relevant information, such as meteorological conditions, delays, interruption of navaids/radar, runway closures, telecommunication failures, deficient operation of computers, and procedural changes affecting air traffic facilities. This may be accomplished through various means available, such as teleconferences, e-mail, internet, etc.

c) Analyze and distribute all data

d) A complete description of all TMIs (for example, ground delay programs, miles in track - MIT) is recorded in a designated log, which must include, among other data, the time of start and end, the affected facilities/operations and the justification.

e) Coordinate procedures with the parties involved.

f) Create an structure for dissemination of information; for example, a website

g) Conduct daily teleconferences, as required

h) Monitor/review the flow management system, make adjustments where necessary, and cancel when no longer required.

7.5 Tactical capacity and demand monitoring

7.5.1 Once the declared and available capacities have been established, air traffic demand can be monitored and assessed, and traffic management initiatives (TMIs) adopted to attain a balance in the system.

7.5.2 The following example gives a general idea of the steps involved in the actions/analyses before and after the event. See Appendix B, Flow diagram for ATFM analysis.

a) Determine capacities: Review/assess airport/ATC sector capacities for accuracy

b) Assess demand: Determine foreseen demand for a specific time frame, 15-minute period(s), hour(s), etc.

c) Analysis and comparison: Compare and analyze demand and capacity levels, as well as the periods in which the demand exceeds the available capacity. It would be easier to do this by means of technological tools for a better ATFM analytical process. Appendix C shows automated tools that facilitated this process, such as SYNCHROMAX, TFMS, PROSAT, used by Brazil, Mexico, Colombia.

d) CDM model (see CDM Manual): Communicate the situation to the facilities/parties involved through the means available, using the CDM methodology.

e) Action required for mitigating a demand imbalance: After collecting and requesting information, determine the traffic management initiatives (TMIs) that are appropriate for the situation.

f) Disseminate information: Inform the parties involved about the TMIs applied using the means available to that end.

g) Monitor the situation: Examine the situation periodically, as necessary, to make sure that the TMI applied is mitigating the imbalance. If necessary, re-assess and make the corresponding adjustments.

h) Conduct an analysis after the event: Following the event, conduct an analysis to determine the effectiveness of the TMI, and catalogue the best work practices. This analysis may be conducted by reviewing the weekly or monthly report of the FMU/FMP. Appendix G describes a monthly report of the FMU of Colombia.

7.6 Training requirements for FMU/FMP personnel

7.6.1 Personnel performing functions at the centralized ATFM unit or at the regional FMU/FMP regional will require standard and recurrent training in order to keep up-to-date in a fluid and constantly changing environment. A detailed ATFM training plan will allow the personnel to attain an optimized operational efficiency in their respective FMU/FMP. This will allow them to successfully face the important changes in their operational environments and provide the highest possible level of service to the customer.

Chapter 8. ATFM phases

8.1 Initially, ATFM initiatives may be required only during certain periods of time when aerodromes and ATC sectors experience delays due to demand and capacity related issues. In order to maximize the use of all resources available in the regions, whether in terms of personnel, equipment, facilities and/or automated systems, the ATFM implementation process should be established, planned and developed by stages (airport and airspace), according to the following sequence.

Note: Doc 9854, Global Air Traffic Management Operation Concept defines the ATFM stages.

8.2 **ATFM strategic phase (Planning)**

8.2.1 Measure taken with more than one day in advance of the day in which it will become effective. This planning is normally done two to six months in advance.

8.2.2 The ATFM strategic phase seeks a greater dialog between ATFM partners and capacity "providers" in order to analyze airspace, airport and ATC restrictions, seasonal weather changes and significant meteorological phenomena. It also seeks to identify, as soon as possible, any possible discrepancies between demand and capacity in order to jointly define possible solutions with the least impact on traffic flows. These solutions would not be frozen in time, but would be applicable according to the demand foreseen in this phase.

8.2.3 The main output of this phase is the creation of a list of hypotheses, some of which are disseminated in aeronautical information publications that, through capacity forecasts, allow planners to find solutions for problem areas while improving support to ATFM by anticipating the solution to possible traffic configurations.

8.2.4 The strategic phase may be divided into two parts:

- A continuous data collection and interpretation process, with a systematic (information quality control) and regular review of procedures and measures.

- An international process of coordination with the units or positions (FMU/FMP) of the Region with a view to ensuring the compatibility and efficiency of national and international requirements.

8.2.5 The ATFM strategic phase has the following objectives:

- Identify demand/capacity imbalances in ATC systems, whether in underutilized or saturated areas.

- Use that information to recommend measures leading to the achievement of additional capacity or to an effective use of the existing one.

8.2.6 Regarding the above, a comparison between available traffic forecasts and known capacity data is a method that could be used to detect demand/capacity imbalances.

8.2.7 Gathering of demand and capacity data

a. DEMAND data can be obtained from different sources, such as:

- Demand-adjusted databases.
- Recent traffic history, comparable to the one to be analyzed (the same day of the previous week or of some high-demand period).
- Traffic trends provided by national authorities, user organizations (e.g., IATA), etc.
- Repetitive flight plans (RPL) filed by the AOs.
- Other related information (air shows, major sports events, military manoeuvres) and, in general, events or situations that might entail an additional or extraordinary demand that affects available ATC capacity.

b. CAPACITY data is provided by the different ATCs. Despite that, it is important to have close coordination among ATFM components to make sure that available capacity is distributed in such a way that it meets the existing demand.

8.2.8 Regarding the above, it is necessary to take into account factors such as personnel availability forecasts, possible medium-term changes in ATC procedures; installation of new equipment, airport infrastructure works that affect runways or parking positions, etc.

8.2.9 It is expected that ATFM strategic measures in the airspace will be enough to prevent overload in control centres, especially in those airspaces with a significant over-flight demand.

Note: Collaborative decision-making (CDM) will permit the optimization of assets to maximize performance, thus enabling a foreseeable scheduling.

8.3 ATFM pre-tactical phase (Anticipation)

8.3.1 Measures to be taken from one day to six hours prior to the operation, a definition which differs from the one described in the Procedures for Air Navigation Services - Air Traffic Management document (PANS-ATM), which specifies that the measure has to be taken more than one day prior to the date in which it will become effective. The pre-tactical phase involves the study of the demand for the day of the operation (since 48 hours before), comparing it with the capacity available on that day, adjusting the plan developed in the ATFM strategic phase, or determining different measures as necessary.

8.3.2 The main objective of the pre-tactical activity is to optimize capacity through a more effective organization of resources, based on the foreseen traffic demand (for example, sector configuration management, use of alternate flight procedures, etc.).

8.3.3 The work methodology consists in maintaining an optimum collaborative capacity (CDM) and is based on a close relationship between the ATFM unit, the air traffic management positions (FMPs) at the air traffic control centres or ATC units and the other corresponding partners (airspace managers, airlines).

8.3.4 The final result is a plan that describes the necessary capacity resources and the measures still pending for regulating traffic. This activity uses hypotheses developed in the strategic phase and adjusts them to the expected situation. The time limits of the activity are related to the precision of the forecasts (one week at the most) and to the capacity of the different partners.

8.3.5 The flight intention of air operators should be consistent with the plan developed during the strategic phase and with the adjustments made during the pre-tactical phase.

8.3.6 The success of the activity depends to a large extent on the quality of human relations and mutual trust, as well as on the precision, reliability and timeliness of the information exchanged. All this requires an effective combination of technical and diplomatic abilities to attain optimum results.

8.3.7 Once the process has been completed, the agreed measures, including restrictions, should be disseminated through an ATFM or ANM message, which may be distributed through the AFTN or the various aeronautical communication networks.

8.3.8 The tasks to be performed during this phase may include the following:

- Determine the capacity available in the various areas, based on the particular situation that day.
- Estimate the existing demand.
- Conduct a comparative demand/capacity study.
- Study the sectors that are expected to have saturation, flows affected, calculating the acceptance rates to be applied according to system capacity.
- Prepare a summary of ATFM measures to be proposed and submit them to the ATFM community for CDM.
- Eighteen hours before the operation, a last review should be carried out in consultation with the affected ATC units, in order to determine the definitive ATFM measures, which shall be published through the corresponding ATFM messaging before the operations are affected.

8.3.9 Acceptance rates may be established taking into consideration the following:

- They should be expressed as the number of flights in a period of time over a given point.
- Acceptance rates that are applied for extended periods of time must be periodically calculated.
- It is advisable to conduct a subsequent study to assess the impact of the measures and to adjust them, inasmuch as possible, based on the information received from

the various units that make up the system, and to be able to make the necessary tactical adjustments.

Note: See Appendix F, which contains and describes an application format to determine the acceptance rate over a primary radio aid for approach to an airport. With the information contained in the format, it is possible to determine the effectiveness of capacity reductions in face of the events occurred, while describing the air traffic management information coordination exercise specified in Chapter 11.

8.4 ATFM tactical phase (Reaction):

8.4.1 During this phase, measures are adopted six hours in advance of the operation. Tactical management of traffic flows and capacity involves considering, in real time, those events that affect the plan, and making the necessary modifications.

8.4.2 The main objective is to minimize disturbances and take advantage of any opportunities that may arise. The need to adjust the original plan may result from staffing problems, significant meteorological phenomena, crises and special events, unexpected opportunities or limitations related to ground or space infrastructure, more precise flight plan data (FPL), the revision of sector capacity values, etc.

8.4.3 The provision of real information is of vital importance in this phase, since it permits short-term forecasts, including the impact of any event. There are different types of solutions that may be applied, depending on whether the aircraft are already airborne or about to take off. Interaction with traffic synchronization is essential to reach the best compromise.

8.4.4 Proactive planning and management phases use all the information available on forecasts. It is also of vital importance to make improvements to the aforementioned phases based on relevant information.

8.4.5 The tactical activity is aimed at ensuring that the measures taken during the strategic and pre-tactical phases solve the demand/capacity problems in the flows or areas of application, and that the measures taken are the minimum required and unnecessary measures are avoided. It also seeks to ensure that ATC resources are properly used and that the existing capacity is maximized without jeopardizing safety.

8.4.6 It should also be borne in mind that existing delays are equitably distributed among operators. To this end, real-time monitoring of the ATFM Plan is required in close contact with the ATC.

8.4.7 In this tactical phase, the main ATFM measure is the application of ATFM slots, trying to avoid major penalties for the operators.

Chapter 9: Traffic Management Initiatives (TMIs)

9.1 TMIs are techniques used to manage air traffic demand according to system capacity. Some TMIs must be considered as control instructions or procedures. The determination is based on the size of the event, the coordination process, and the duration of the event.

9.2 Purpose of TMIs

9.2.1 TMIs are important techniques for managing the air traffic system when they are coordinated and applied properly. TMIs are applicable when it is necessary to manage fluctuations in the air traffic demand, but they do cause an impact to the customers. It is important to consider this impact and implement only the initiatives that are necessary for maintaining the integrity of the system. Therefore, traffic management personnel should employ the least restrictive methods available in order to minimize delays.

Note: In certain instances it may be necessary to apply combinations of TMIs in order to maintain system integrity while applying the least restrictive measures; i.e., miles-in-trail with holding in lieu of ground stopping aircraft.

9.3 Types of TMIs

Name	Description
In-flight holding	In-flight holding of aircraft is a commonly used TMI, especially when its use is foreseen due to traffic volume, weather conditions, power outages, unexpected events, etc. When in-flight holding is expected, AT facilities and customers can make appropriate adjustments and alert personnel as to the reasons and length of holding. Airborne holding is normally done when the operating environment supports holding and the conditions are expected to improve shortly; this ensures aircraft are available to fill the capacity at the airport.
Altitude	Used for segregating different traffic flows, or to distribute the number of aircraft requesting access to a specified geographic region. **a. Capping**: Term to indicate aircraft will be cleared to an altitude lower than their requested altitude until they are clear of a particular airspace. Capping may apply to the initial segment of the flight or for the entire flight. **b. Tunneling**: Term to indicate traffic will be descended prior to the normal descent point at the arrival airport to remain clear of an airspace situation; e.g., holding. Capping and Tunneling are techniques commonly used to keep aircraft from entering busy and complex sectors and still permitting them to depart with minimal delays.

Name	Description
Fix balancing	Assigning an aircraft a fix other than that in the filed flight plan in the arrival or departure phase of flight to equitably distribute demand.
Ground delay programme (GDP)	A GDP is a TM process administered by the FMU, when aircraft are held on the ground in order to manage capacity and demand at a specific location, by assigning arrival slots. The purpose of the programme is to support the TM mission and limit airborne holding. It is a flexible programme and may be implemented in various forms depending upon the needs of the air traffic system.
Ground stops (GS)	GS is a process that requires aircraft that meet specific criteria to remain on the ground. Since this is one of the most restrictive methods of traffic management, alternative initiatives should be explored and implemented if appropriate. GS should be used: **a.** In those cases in which capacity has been severely reduced at airports/runways closed for snow removal, or due to aircraft accidents/incidents; **b**. To preclude extended periods of in-flight holding; **c**. To preclude sector/centre reaching near saturation levels or airport grid lock; **d**. In the event a facility is unable or partially unable to provide ATC services due to unforeseen circumstances; and **e**. When routings are unavailable due to severe weather or catastrophic events.
Miles-in-trail (MIT)	The number of miles required between aircraft that meet a specific criteria. The criteria may be separation, airport, fix, altitude, sector, or route specific. MIT are used to apportion traffic into manageable flows, as well as to provide space to accommodate additional traffic (merging or departing) in the traffic flow.
Minutes-in-trail (MINIT)	The number of minutes required between successive aircraft. It is normally used in a non-radar environment, or when transitioning to a non-radar environment, or when additional spacing is required due to aircraft deviating around weather.

Name	Description
Rerouting	Reroutings are ATC routings other than those shown in the filed flight plan. They are issued to: **a.** Make sure that aircraft operate along the traffic "flow". **b.** Remain clear of special use airspace. **c.** Avoid congested airspace. **d.** Avoid areas known for their difficult weather conditions, and which aircraft are circumventing or refusing to fly.
Sequencing programmes	These programmes are designed to achieve a specified spacing between aircraft. They may be software-generated or determined by ATFM personnel. Different types of programmes accommodate different phases of flight. **a. Departure Sequencing Programme (DSP)** - Assigns a departure time to achieve a constant flow of traffic over a common point. Normally, this involves departures from multiple airports. **b. En route Sequencing Programme (ESP)** - Assigns a departure time that will facilitate integration in the en route stream. This is accomplished by instructing an air traffic control tower to call the traffic management unit for release -- "Call For Release." **c. Arrival Sequencing Programme (ASP)** - Assigns fix crossing times to aircraft destined to the same airport.

9.4 **TMI approval authority**

9.4.1 The designated FMU/FMP for each service provider and/or State is the approval authority for all TMIs that impact their airports, TMAs, and en route airspace system.

9.5 **TMI processing**

9.5.1 Prior to implementation, the FMU/FMP responsible for ATFM oversight must identify the need for a TMI, examine alternative options, and develop a justification for the TMI. The FMU/FMP shall discuss and coordinate the proposed TMI with the receiving facility prior to implementation. FMPs must continuously monitor and assess the TMIs and make the necessary adjustments, including cancellations and notifications, in a timely and effective manner.

Chapter 10: Collaborative Decision-Making Process (CDM)

10.1 CDM is a work methodology that allows the participants in the system to optimize their decisions in collaboration with others, learning about their preferences, limitations, and the actual and foreseen situation. To that end, each participant must be committed with the collaborative effort, sharing responsibility, information, resources, objectives and mutual trust. CDM is, therefore, a key element for maximizing airport and air operations, since it takes into account all the elements involved in the coordination between air navigation service providers, like flow management units (FMUs), and the recipients of such services, like aircraft and airport operators.

10.2 The CDM strategy is to include all the stakeholders in the planning process, sharing information about the position of the aircraft, predictions, weather forecasts, traffic forecasts and, in general, any aspect that will contribute to the efficient operation of a regional airspace system.

Note: See more details in the Manual on the Collaborative Decision-Making Process for the Caribbean/South American Regions.

Chapter 11: Coordination

11.1 Coordination of traffic management information

11.1.1 It is understood that there exists different levels of traffic flow management oversight within the CAR/SAM regions. The concept is for each service provider to assign responsibility for the collection, dissemination, monitoring, and surveillance of TMIs within their respective FIR.

This methodology would ensure that all service providers and customers have at their disposal the applicable information in a timely and efficient manner.

11.1.2 For example: Tactical information, such as that related to capacities, demand, imbalances, airport conditions and anything that would impact their respective system.

11.1.3 A typical prototype could consist of the following:

a. Control towers (TWR) coordinate with Approach Control Facilities (APP).

b. Approach Control Facilities (APP) coordinate with an Air Control Center (ACC).

c. Air Control Centers coordinate with ATFM authority.

d. ATFM authority would be responsible for dissemination within their respective region.

Note: The purpose of this coordination methodology is to establish a protocol for each level of the organization to be informed of timely and accurate information. It is fully realized that this as an organizational model and can be modified to meet the needs of each specific situation.

Note: For standardization, it is desirable that the States develop and/or modify the letters of agreement (LOA) in order to attain the standardization described in this coordination.

11.2 Exchange of ATFM information

11.2.1 Air Traffic Service (ATS) and/or ATFM Service Providers in adjacent FIRs should establish schedules and regular telephone conferences, as required, to meet their specific operational needs. The purpose of these conferences is to share and disseminate information to air traffic facilities and customers for making tactical adjustments as required.

11.2.2 It is recommended that the following three methods be applied:

a. Scheduled telephone conference. Consists of defining a time(s) in which the ATC/ATFM units will hold a daily operational conference to exchange ATFM information.

b. Tactical telephone conference. Consists of a non-scheduled ATFM teleconference held in real-time and at a tactical level in order to make the necessary operational adjustments.

c. Automated web page or ATFM operational information system. ATFM service providers may create a web page or an information system, containing relevant ATFM information, as described in this paragraph. The purpose is to share information about the system in order to develop a common situational awareness and minimize workload. It should include:

1. ATFM strategic/pre-tactical initiatives
2. ATFM tactical initiatives
3. Closure of airports
4. Meteorological information
5. Information about air navigation aids
6. Valid NOTAMs affecting capacity
7. Programming of inspection/calibration flights
8. GNSS operational status
9. Information about delays
10. Severe meteorological conditions
11. Information on airports
    a. Operational configurations
    b. AAR for each configuration
12. ATFM strategic plan
13. ATFM operational teleconference
    a. Schedules
    b. Registry
14. Special procedures in force
    a. LVP
    b. De-icing

11.3 ATFM strategic plan

11.3.1 The ATFM strategic plan may take into consideration the terms of balancing demand and capacity, ATFM initiatives, special operation requirements, special events and any other events that may arise. The purpose is to tactically and/or strategically develop an outlook for the applicable airspace system that the aviation community can use as a planning forecast. Specific items that may be included are similar to those in the web page/information system and allow the aviation community to contribute to the development of this plan. For example, an FMU/FMP would canvass applicable Air Traffic facilities and customers on how best to address impacts on the system.

11.3.2 Special operations may be defined as air operations conducted by State aircraft or for humanitarian activities. It is implied that each State and/or service provider may define special operations as needed.

11.4 Implementation, adjustment, coordination, and cancellation of TMIs

11.4.1 It is recommended that States and/or service providers develop an internal operations manual for their respective facilities, describing the aforementioned actions. For example:

a. The implementation of the TMIs will be accomplished through established means, such as telephony, web page/information system, or any other available methodology.

b. Constant monitoring would be required for making the corresponding adjustments.

c. TMIs shall be cancelled when no longer needed and demand/capacity balancing is achieved. It is important for all system users to be aware of cancelled initiatives so as to make the corresponding adjustments.

11.5 Civil/military coordination

11.5.1 It is recommended that States and/or service providers develop a letter of agreement (LOA) with their military customers that describes how military special use airspace can be utilized when not in use and/or during peak civilian periods in order to increase efficiency.

11.5.2 ATFCM principles are equally applicable to both civil and military flight operations and will provide more flexibility to air operations, thanks to the greater availability of both information and airspace. However, there will continue to be operational, training missions, which, by nature, could be incompatible with civil requirements or practices. The degree of civil/military integration in terms of air traffic management within each State continues to be a matter of national competence and, therefore, military participation in a regulated aeronautical information infrastructure will be subject to national security considerations.

11.5.3 The flexible use of airspace concept permits an optimum sharing of airspace under appropriate civil/military coordination to achieve the proper separation between civil and military flights, thus reducing the need for airspace segregation.

11.5.4 Benefits of civil-military coordination

a) Operational savings for flights through distance, time and fuel reductions.

b) Route network optimization for the provision of ATS services and the associated sectoring, providing ATC capacity increases and a reduction of delays of air traffic in general.

c) More efficient air traffic flow separation procedures.

d) Enhanced real-time civil/military coordination

e) Reduced need for airspace segregation.

f) Definition and use of temporary reservation of airspace more in keeping with operational military requirements, in a way that responds to their specific requirements in the best possible way.

Chapter 12: Common terminology related to ATFM unit (FMU/FMP) coordination messages

12.1 The primary goal of these guidelines is to develop standard terminology and phraseology for the exchange of ATFM telephone messages. The information contained herein is intended to reflect the current use of plain language and provide a basis for harmonization.

12.2 This includes the concept of modular and structured ATFM messages and define the components as who, what, where, when and why.

12.3 This is important because, at present, there is no module regarding how ATFM restrictions should be achieved by Service Providers. As with any communication model, it is the responsibility of both parties (sender and receiver) to ensure that the message is understood correctly and can be applied as requested.

12.4 It should be recognized that once information is exchanged regarding a restriction, it is considered MANDATORY unless otherwise coordinated.

12.5 **ATFM message components**

12.5.1 Each message should have five components that contain plain language elements and when combined provide a complete ATFM message.

12.5.2 This section breaks down the five message components.

WHO: Identifies the parties involved: who is transmitting and receiving the message.

Examples: CGNA THIS IS COLOMBIA FMU

CCFMEX THIS IS FAA ATCSCC

WHAT: Indicates the measure to be applied.

Examples: REQUEST 30 MILES IN TRAIL

REQUEST 5 MINUTES IN TRAIL

WHERE: This identifies the scope (ATC sector, airport) of application of the coordinated ATFM measure. It is often preceded by a modifying clause, indicating what aircraft or traffic the restriction will apply to. The modifying clause and the location combination are used to construct the "where" component.

Examples: FOR ALL AIRCRAFT LANDING EL DORADO INTERNATIONAL AIRPORT

FOR ALL TRAFFIC LANDING HOUSTON INTERCONTINENTAL AIRPORT

WHEN: Indicates the period of effectiveness of the ATFM measure.

Examples: FROM NOW UNTIL 1700 UTC

FROM 2000 UTC TO 2130 UTC

WHY: Indicates the reason for the ATFM measure:

Examples: DUE TO SEVERE WEATHER OVER EL DORADO INTERNATIONAL AIRPORT

DUE TO RADAR FAILURE AT EL DORADO INTERNATIONAL AIRPORT

The following is an example of a complete message:

CGNA THIS IS COLOMBIA FMU. REQUEST 30 MILES IN TRAIL FOR ALL AIRCRAFT LANDING EL DORADO INTERNATIONAL AIRPORT FROM NOW UNTIL 1700 UTC DUE TO SEVERE WEATHER OVER EL DORADO INTERNATIONAL AIRPORT

12.6 Amendments to ATFM messages

12.6.1 The amendment of an ATFM message should include similar elements but with additional modifiers. These modifiers may include (change for another State):

a. CHANGE
b. AMEND
c. REDUCE
d. INCREASE

Example: GUAYAQUIL FMP THIS IS LIMA FMP, REQUEST REDUCTION OF MILES-IN-TRAIL FOR TRAFFIC TO JORGE CHAVEZ INTERNATIONAL AIRPORT FROM 30 TO 20 MILES-IN-TRAIL FROM 1400 UTC TO 1700 UTC DUE TO IMPROVING WEATHER CONDITIONS AT JORGE CHAVEZ INTERNATIONAL AIRPORT

Cancellation (change for another State)

12.6.2 The cancellation of an ATFM message should contain a cancelling word or phrase. It is normally not necessary to state the reason for the cancellation. A cancelling word or phrase may include:

a. CANCEL
b. RESUME
c. RESUME NORMAL
d. RELEASE

Example: MAIQUETIA FMP THIS IS GEORGETOWN FMP, CANCEL THE GROUND STOP FOR TIMEHRI CHEDDI JAGAN INTERNATIONAL AIRPORT DUE TO RUNWAY NOW OPEN.

12.6.3 Cancellation messages should also identify which message is being cancelled because several restrictions could be in place at one time.

Chapter 13: ATFM control messages (via AFTN, AMHS, others)

13.1 Timely reporting of restrictions imposed on air traffic flow is fundamental for the implementation of management initiatives (TMI). Accordingly, the essence of an ATFM message is to provide information to stakeholders according to foreseen capacity, and to inform about regulations foreseen by management units.

13.2 ATFM units should use specialized messaging for reporting on regulations or the application of ATFM measures to all system users, and when restrictions need to be imposed on traffic flow, for which the following messages may be used:

- Flow delay message;
- Message on flow control restrictions; and
- Message for cancelling flow control measures

13.3 Basic information that ATFM messages should contain:

- Date and time of start and end of the message.
- Date and time of issuance of the AIM message.
- Summarized description of the message.
- The detailed message.
- Areas where the regulation is to be applied, whether a sector, airport (departures or arrivals), and even a specific point in airspace.
- Traffic that will be affected by the regulation (incoming, outgoing, en-route).
- Hour reference to be used for identifying the aircraft that will be affected, whether ETD/EOBT, ETA or ETO.
- Period of effectiveness of the regulation.
- Procedure for assigning the time of departure.

13.4 Since ICAO has not yet officially developed the format and conventional display of data for the automatic exchange of flow control messages, their design and implementation shall be proposed and discussed at the regional meetings.

ATTACHMENT A

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.

Air Traffic Flow and Capacity Management (ATFCM) – A service that optimizes the relationship between system capabilities and air traffic demand, making maximum use of available capacity to ensure an optimum air traffic flow.

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 that provides ATM through the integration and cooperation of personnel, information, technology, facilities and services. It also involves 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) -

Capacity means the operationally acceptable air traffic volume. Capacity is expressed in terms of the number of aircraft entering a specific part of the airspace (sector), overfly a point, take off from or land at an aerodrome (or group of aerodromes) in a given period of time.

Thus, ATM capacity is the one capable of providing air navigation services to a given air traffic volume, meeting maximum safety objectives without significantly impairing operating capacity, economics or the environment under normal conditions.

An example of operating capacity impairment is ground delays, the assignment of a cruise level other than the optimal during a considerable period of flight time. Consequently, the determination of capacity is fundamental for optimizing the air navigation system and achieving the highest efficiency, that is, the maximum capacity at the lowest cost.

Declared Capacity (for ATFM purposes) – A measure of the ability of the ATC system or any of its subsystems or operating position to provide service to aircraft during normal activities. It is expressed as the number of aircraft entering a specified portion of airspace in a given period of time taking into account weather, ATC unit configuration, staff and equipment available, and any other factors that may affect the workload of the controller responsible for the airspace.

Available capacity - The maximum traffic flow attainable during a specific time unit, based on the real conditions of the ATS system at each moment, and that must be kept for a period of time, in keeping with safety requirements and the acceptable mean delay factor.

Under optimum conditions, the available capacity is equivalent to the declared capacity.

Collaborative Decision Making - an operating philosophy and the associated technologies to 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 during a given time period.

Delay - Time elapsed from the moment the operation is scheduled until the moment it is performed, expressed in minutes, and indicates the capacity of the system to absorb a given traffic demand, under the rules established for the scenario under study. In order to analyse delay, the scheduling of a standard day characterized for having the largest number of movements, shall be used.

There are delays that are considered as additional holding time because the aircraft remains at the aircraft stand, at the runway-holding position, on the runway, on a taxiway and/or in any holding pattern established along the route. These delays are associated to ATC management.

Delays attributable to the ATC will only be those involving IFR flights and that exceed the number of minutes established by the corresponding authority.

For purposes of reporting and calculating delays, those resulting from the following causes will not be taken into account:

- Speed reductions (delays assumed en route)
- Deviations initiated by the crew due to meteorological conditions
- Technical problems or other operator issues
- Congestion on the apron.

The calculation of these delays starts when the aircraft enters the jurisdiction of the ATC, like, for instance, the manoeuvring area, or enters a holding pattern in flight.

Delays are normally attributed to:

- Meteorological conditions
- Air traffic volume
- CNS
- Runway and taxiway conditions
- And others, such as: safety, accidents, noise abatement, verification flights.

Flow Management Unit (FMU) - FMUs monitor and balance traffic flows within their areas of responsibility in accordance with traffic management directives. The FMU is delegated the authority to direct traffic flows and implement approved TMIs in conjunction with, or as directed by the oversight authority.

Aerodrome Traffic Density - For purposes of analyzing capacity and demand, aerodrome traffic density may be classified as follows:

Low
When the number of movements during the mean peak hour does not exceed 15 movements per runway, or typically less than 20 movements at the aerodrome.

Medium
When the number of movements during the mean peak hour is in the order of 16 to 25 movements per runway, or typically between 20 to 35 movements at the aerodrome.

High
When the number of movements during the mean peak hour is in the order of 26 movements or more per runway, or typically more than 35 movements at the aerodrome.

Note: The number of movements during the mean peak hour is the yearly arithmetic mean of the number of movements during the daily peak hour. Both take-offs and landings are considered as movements.

Efficiency - The relationship between the cost of the ideal flight and the cost of the flight with procedural restrictions.

Flow Management Position (FMP) - A position established in an appropriate air traffic control unit to ensure the necessary interface between the local ATFM functions and other FMUs and/or 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.

ATTACHMENT B

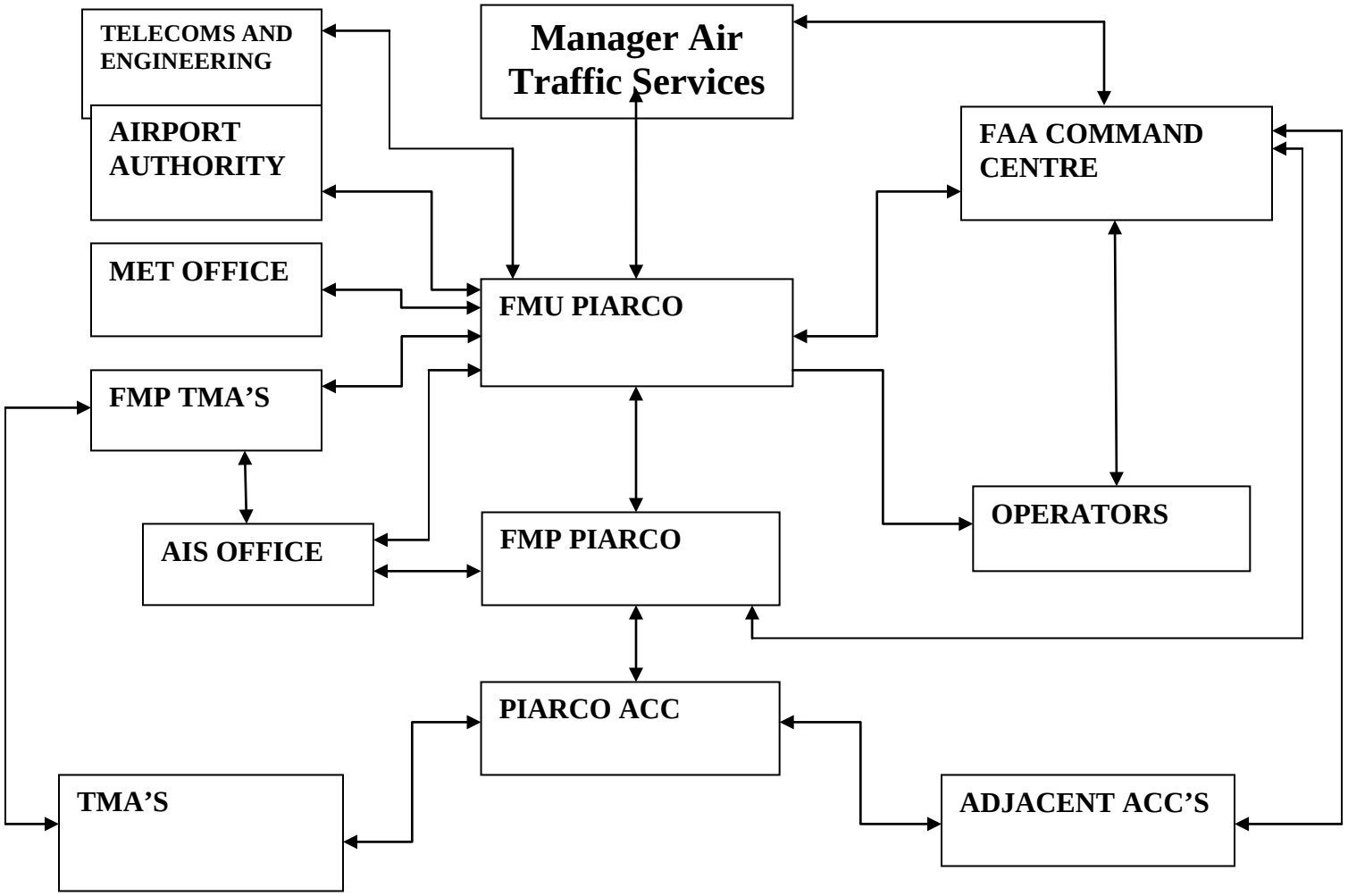
LIST OF ACRONYMS

ACC	Centro de control de área	Area control centre
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 de 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	Explotador de aeronave	Aircraft operator
APP	Oficina de control de aproximación	Approach control facility
AAR	Régimen de aceptación del aeropuerto	Airport Acceptance Rate
ADR	Régimen de salida del aeropuerto	Airport Departure Rate
ATC	Control de tránsito aéreo	Air traffic control
ATFM	Gestión de 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 central de gestión de afluencia del tránsito aéreo	Centralised air traffic flow management unit
C/BA	Análisis de costo-beneficio	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	Puesto de gestión de afluencia	Flow management position
FMU	Dependencia de gestión de afluencia	Flow management unit
FPL	Plan de vuelo	Flight plan
GREPECAS	Grupo regional CAR/SAM de planificación y ejecución	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 Línea Aérea	International Federation of Air Line Pilots' Associations
IFATCA	Federación Internacional de	International Federation of Air Traffic

	Asociaciones de Controladores de Tránsito Aéreo	Controllers' Associations
LOA	Carta de acuerdo	Letter of Agreement
MET	Servicios meteorológicos para la navegación aérea	Meteorological services for air navigation
MOU	Memorándum de Entendimiento	Memorandum of Understanding
NOTAM	Aviso a los aviadores	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	Regional planning and implementation 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
SYNCHROMAX	SYNCHROMAX	SYNCHROMAX
TBD	A ser determinado	To be determined
TELCON	Tele-conferencia	Telephone conference
TFMS	Sistema de gestión de la afluencia del tránsito (previamente, ETMS)	Traffic Flow Management System (previously called ETMS)
TMA	Área de control terminal	Terminal control area
TMC	Coordinador de la gestión del tránsito	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

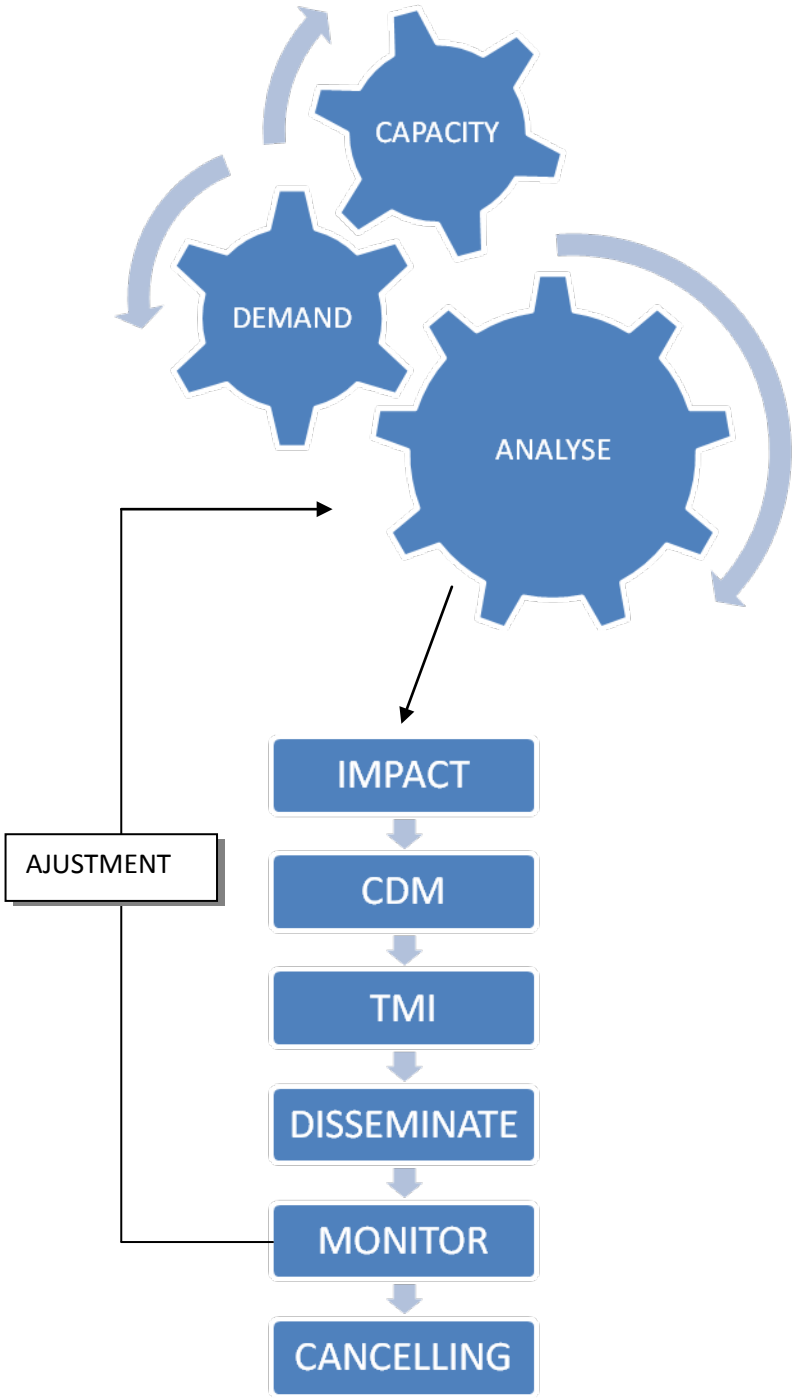
APPENDIX A

Trinidad and Tobago Civil Aviation Authority - Flow Diagram of Piarco Flow Management Unit



APPENDIX B

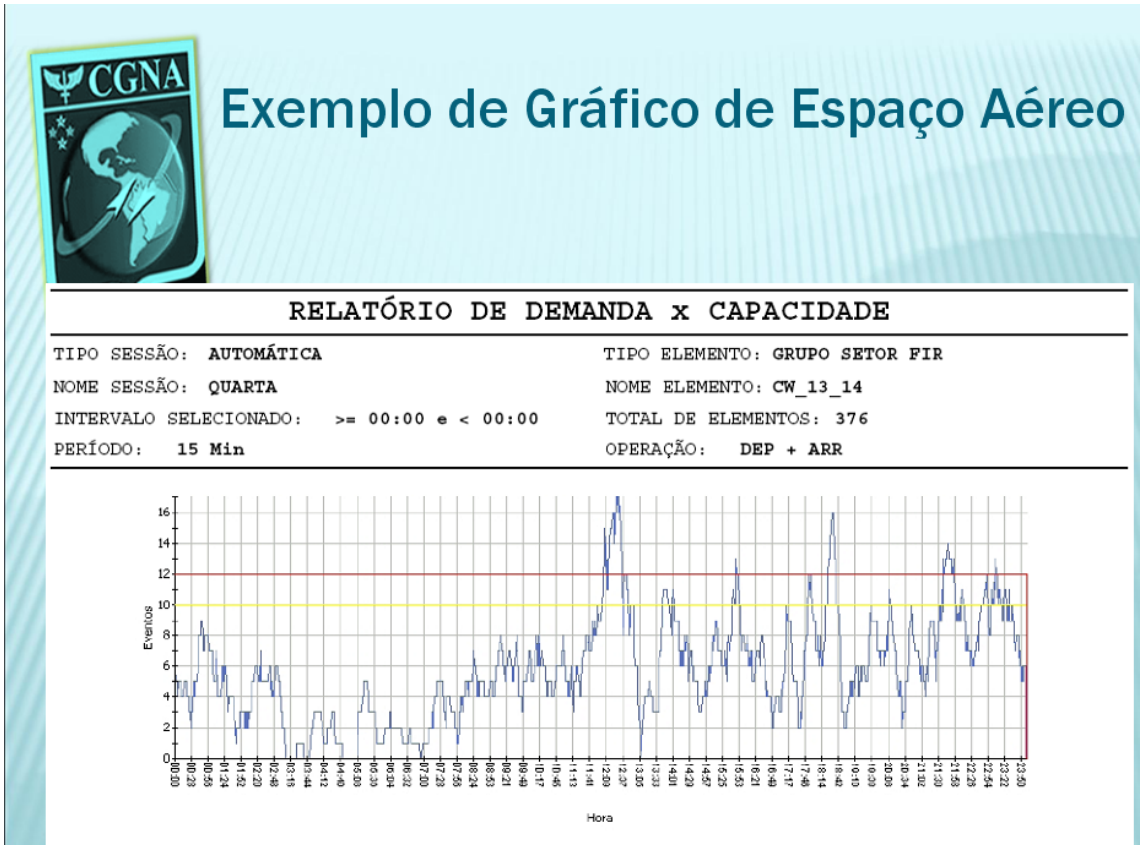
FLOW CHART ATFM ANALYSES



APPENDIX C

SCREEN SHOTS OF ATFM TOOLS IN USE IN THE CAR/SAM REGIONS

Synchromax
Brazil



PROSAT

Mexico

Traffic Flow Management System (TFMS)

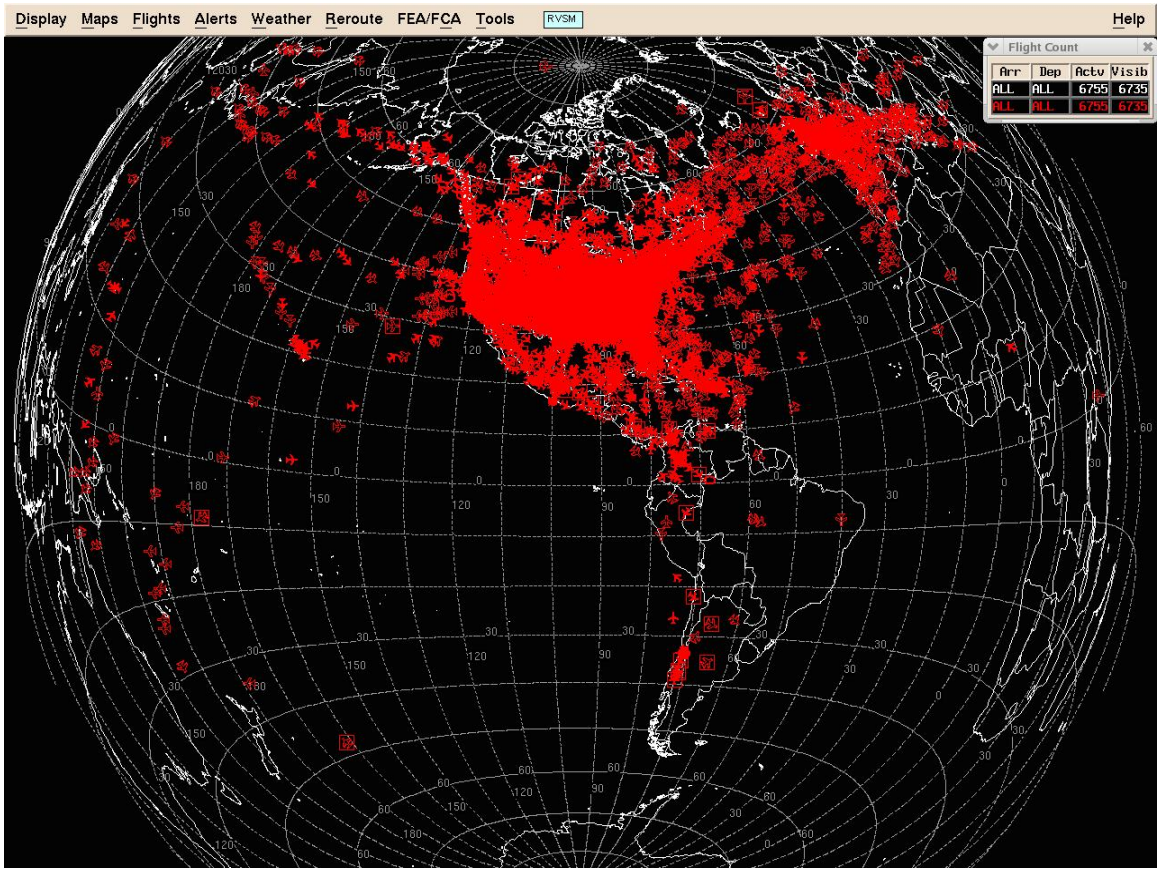
United States

Mexico

COCESNA

Colombia

Chile



APPENDIX D

INTERNATIONAL OPERATIONS PLANNING TELCON FORMAT

_____ Greeting and introduction
xxxxZ planning telcon, working from advisory xxx
Covering the timeframe from xxxx UTC to xxxx UTC

_____ Common Weather Products – working from
1) the ICAO Area "A" Prog Chart, valid xxxx UTC for (Date)
2) the ICAO Area "A" IR Satellite photo, xxxx UTC for (Date)

_____ Planning discussion -- Work from south to north then from the Caribbean to the Pacific (east to west)

Significant weather and atmospheric conditions
Thunderstorm activity
Turbulence
Volcanic ash clouds

Terminal discussion
For select aerodromes:
Airport/Sector Capacities
Projected terminal demand
Aerodrome constraints, such as construction projects or NAVAID outages

Anticipated traffic management initiatives (TMIs)
Expanded miles-in-trail
Potential airborne holding
Potential ground stops

Enroute discussion
Enroute constraints, such as frequency outages or NAVAID outages
Route discussion and issues
Anticipated TMIs
Expanded miles-in-trail
Potential airborne holding

_____ Additions to the plan, including any pertinent tactical updates.

_____ Stakeholder input, comments, and questions

_____ Next International Planning Telcon: xxxxZ

APPENDIX E

DEMAND ASSESSMENT FORM

PERIODO	DIA	FECHA	TIPO DE OPERACION	AO	ACID	a/c	ADEP	ADES	EOBT	EXOT	ETOT	EET	ELDT	ADEP	ADES	EXIT	ETTT	ACID2	EOBT	EXOT	ETOT	EET	ELDT

PERIODO	DIA	FECHA	TIPO DE OPERACION	AO	ACID	a/c	ADEP	ADES	EOBT	EXOT	ETOT	EET	ELDT	ADEP	ADES	EXIT	ETTT	ACID2	EOBT	EXOT	ETOT	EET	ELDT
07/10/10 a 19/010/10	4	7/10/10	Round Trip	SAM	7400	E-190	SKBO	SKRG	11:00	00:22	11:22	00:32	11:54	SKRG	SKBO	00:03	00:30	7507	12:28	00:13	12:41	00:32	13:14
07/10/10 a 19/010/10	4	7/10/10	One Trip	SAM	7521	E-190	SKBG	SKBO	11:00	00:15	11:15	00:38	11:54										
07/10/10 a 19/010/10	4	7/10/10	One Trip	SAM	7501	B737	SKRG	SKBO	11:00	00:15	11:15	00:33	11:49										
07/10/10 a 19/010/10	4	7/10/10	Round Trip	SAM	7542	E-190	SKCL	SKBO	11:00	00:14	11:14	00:33	11:47	SKSP	SKBO	00:04	08:07	7543	19:59	00:12	20:11	01:42	21:53
07/10/10 a 19/010/10	4	7/10/10	One Trip	SAM	660	E-190	SEQU	SKBO	11:00	00:15	11:15	01:09	12:25										
07/10/10 a 19/010/10	4	7/10/10	One Trip	SAM	670	E-190	SEGU	SKBO	11:02	00:14	11:16	01:34	12:51										
07/10/10 a 19/010/10	4	7/10/10	Round Trip	SAM	7430	E-190	SKBO	SKCC	11:03	00:24	11:27	00:48	12:15	SKCC	SKBO	00:02	00:25	7431	12:43	00:13	12:56	00:47	13:43
07/10/10 a 19/010/10	4	7/10/10	One Trip	SAM	7531	E-190	SKBQ	SKBO	11:15	00:13	11:28	01:08	12:36										
07/10/10 a 19/010/10	4	7/10/10	One Trip	SAM	7451	E-190	SKBO	SKCL	11:24	00:27	11:51	00:37	12:28										
07/10/10 a 19/010/10	4	7/10/10	Round Trip	SAM	7580	E-190	SKBO	SKCG	11:30	00:20	11:50	01:07	12:57	SKCG	SKBO	00:02	00:37	7581	13:37	00:12	13:49	01:06	14:55
07/10/10 a 19/010/10	4	7/10/10	One Trip	SAM	650	E-190	SKBO	MPTO	11:30	00:21	11:51	01:02	12:53										
07/10/10 a 19/010/10	4	7/10/10	Round Trip	SAM	7502	E-190	SKBO	SKRG	12:27	00:22	12:49	00:27	13:17	SKRG	SKBO	00:04	00:49	7511	14:11	00:18	14:29	00:23	14:53
07/10/10 a 19/010/10	4	7/10/10	Round Trip	SAM	7552	E-190	SKBO	SKMR	12:28	00:24	12:52	00:51	13:43	SKMR	SKBO	00:03	00:25	7553	14:12	00:12	14:24	00:51	15:16
07/10/10 a 19/010/10	4	7/10/10	Round Trip	SAM	7490	E-190	SKBO	SKSM	13:28	00:21	13:49	01:07	14:56	SKSM	SKBO	00:03	00:25	7491	15:25	00:13	15:38	01:09	16:48
07/10/10 a 19/010/10	4	7/10/10	One Trip	SAM	7461	E-190	SKBO	SKCL	13:58	00:25	14:23	00:38	15:01										
07/10/10 a 19/010/10	4	7/10/10	One Trip	SAM	620	E-190	SKBO	MPTO	14:00	00:22	14:22	01:09	15:32										
07/10/10 a 19/010/10	4	7/10/10	One Trip	SAM	7470	E-190	SKBO	SKCG	14:15	00:20	14:35	01:03	15:39										
07/10/10 a 19/010/10	4	7/10/10	Round Trip	SAM	7540	E-190	SKBO	SKSP	14:27	00:21	14:48	01:44	16:33	SKSP	SKBO	00:01	00:30	7541	17:05	00:14	17:19	01:41	19:00
07/10/10 a 19/010/10	4	7/10/10	Round Trip	SAM	680	B737	SKBO	MMMX	14:28	00:25	14:53	04:05	18:58	MMMX	SKBO	00:10	01:24	681	20:32	00:23	20:55	03:53	00:49
07/10/10 a 19/010/10	4	7/10/10	One Trip	SAM	627	E-190	MPTO	SKBO	14:43	00:15	14:58	01:06	16:05										
07/10/10 a 19/010/10	4	7/10/10	Round Trip	SAM	7524	E-190	SKBO	SKBG	15:37	00:19	15:56	00:39	16:35	SKBG	SKBO	00:02	00:25	7525	17:03	00:12	17:15	00:43	17:58
07/10/10 a 19/010/10	4	7/10/10	Round Trip	SAM	7546	E-190	SKBO	SKSP	15:40	00:14	15:54	01:48	17:42	SKSP	SKBO	00:02	00:30	7547	18:15	00:10	18:25	01:45	20:11
07/10/10 a 19/010/10	4	7/10/10	Round Trip	SAM	7481	E-190	SKBO	SKLT	17:18	00:21	17:39	01:35	19:14	SKLT	SKBO	00:03	00:35	7480	19:53	00:09	20:02	01:46	21:48
07/10/10 a 19/010/10	4	7/10/10	Round Trip	SAM	7542	E-190	SKBO	SKSP	17:19	00:23	17:42	01:43	19:25	SKSP	SKBO	00:03	00:30	7543	19:59	00:12	20:11	01:42	21:53

PERIOD: Period of effectiveness (start and end dates).
DAY: 1=Monday, 2=Tuesday, 3=Wednesday, 4=Thursday, 5=Friday, 6=Saturday, 7=Sunday.
DATE: The DAY must correspond to the calendar date
TYPE OF OPERATION:
***Round Trip** - If the aircraft goes and returns immediately to the airport of origin.
***One Trip** - If the aircraft returns after covering other routes.
AO: Airline - ICAO designator.
ACID: Aircraft identification - Flight number.
a/c: Type of aircraft - ICAO designator
ADEP: Airport of departure - ICAO designator
ADES: Airport of destination - ICAO designator
EOBT: Estimated time (UTC) at which the aircraft begins the movement for departure.
EXOT: Departure taxiing estimate - Estimated time of operation between the EOBT and the (ETOT).
ETOT: Estimated time of take-off - (EOBT+EXOT).
EET: Estimated time of flight.
ELDT: Estimated time of landing - (ETOT+EET).
EXIT: Arrival taxiing estimate - Estimated time between landing and the arrival at the parking position.
ETTT: Time estimated by the AO for traffic at the departure airport.

APPENDIX F

APPLICATION FORMAT FOR DETERMINING THE ACCEPTANCE RATE

		UNIDAD DE GESTION DE TANSITO									Fecha:	23/08/10	
											Clave:		
											Versión:	01	
		TITULO: GESTIÓN TÁCTICA DE CAPACIDAD - SECTORES TERMINALES LLEGADA/SALIDA									Pagina:	1 de 1	
PARA DILIGENCIAR POR EL MANAGER DE LA UNIDAD DE GESTION													
1.	Fecha de solicitud:		Hora de solicitud:										
2.	RÉGIMEN DE ACEPTACIÓN (LLEGADAS/ HORA):		SEPARACIÓN (NM)	5	6	7	8	9	10	11	E	LVP	GROUNDSTOP
			REGIMEN DE ACEPTACIÓN	36	30	26	23	20	18	16	15	12	
	Vo. Bo. Jefe Grupo ATFM.		MARQUE CON UNA (X)										
3.	RÉGIMEN DE SALIDAS ADR (SALIDAS/HORA):		SEPARACIÓN (MINUTOS)	2,5	3		4		E	LVP			
			REGIMEN DE SALIDAS	24	40	20	30	15	14	10			
	Vo. Bo. Jefe Grupo Torre de Control.		MARQUE CON UNA (X)										
4.	Periodo de aplicación (periodo de 1 hora):												
5.	Motivo:												
6.	Solicitante:												
7.	Configuración Operativa:												
8.	Iniciales (call sign) Manager (TFM) de turno FMU:												
9.	Iniciales (call sign) Supervisor de turnoTorre:												
10.	Iniciales (call sign) Supervisor de turno ACC:												
11.	Información adicional:												
SUPERVISOR ACC, Envíe el formato diligenciado al MANAGER FMU dando CLICK en el siguiente enlace													
PARA DILIGENCIAR POR EL MANAGER (TFM) FMU													
12.	AAR actual:												
13.	ADR actual:												
14.	ARR DEM prevista para el periodo de aplicación:												
15.	DEP DEM prevista para el periodo de aplicación:												
16.	DEMORA PREVISTA:												
17.	ACCIÓN TOMADA:												
18.	Vo. Bo. Jefe Aeronavegación Regional.												
MANAGER FMU, Envíe el formato diligenciado a los correos correspondientes dando CLICK en el siguiente enlace													

INSTRUCTIVO DE DILIGENCIAMIENTO	
ESTE FORMATO DEBERÁ SER DILIGENCIADO POR EL SUPERVISOR (TWR o ACC) DE ACUERDO A LA LIMITACIÓN OPERACIONAL DETERMINADA.	
1.	Fecha y hora UTC.
2.	El señor Supervisor ACC indicará en la respectiva casilla, de la tabla indicada, la separación a aplicar y el correspondiente Régimen de Aceptación. La determinación del Régimen de Aceptación considera una velocidad promedio (ponderada por la mezcla de flota), de 180 KIAS en el VOR/NDB, dividida entre una separación en secuencia determinada (promedio), teniendo como referencia el VOR/NDB (Ej.180KIAS/5NM=36). Para la aplicación de la separación mínima (5 NM) se considera un secuenciamiento alternado a las pistas 13. Para la determinación del Régimen de Aceptación, en configuración pistas 31, se define como punto de referencia el MAPt y se considera una separación mínima de 6 NM (carta de acuerdo). El régimen de Aceptación para control convencional (no Radar) será de 20 llegadas/hora.El supervisor ACC diligenciará nuevamente el formato en cuestión para restablecer la capacidad o cualquier cambio a la misma. En caso falla general de comunicaciones el Supervisor ACC deberá de inmendiato solicitar GROUND STOP a la FMU y se mantendrá coordinación permanente para la reanudación de las operacioanes.**El supervisor ACC deberá registrar el visto bueno del Jefe ACC o en su orden del Jefe Regional de Aeronavegación o del Jefe Nacional de Aeronavegación y en caso de no lograr contactar a estos, la decisión será potestativa del supervisor ACC. Nota: Para los cálculos prescritos se han tenido en cuenta los criterios de velocidad para los tramos de aproximación del Documento 8168 Vol. II de la OACI (Tabla I. 4.1.2.Velocidades (IAS) para el cálculo de procedimientos en Nudos).**
3.	El Supervisor Torre indicará en la respectiva casilla, de la tabla indicada, la separación en tiempo a aplicar y el correspondiente Régimen de Salidas. la determinación del Régimen de salidas considera unos tiempos promedio (minutos) entre despegues de acuerdo a la tabla de separación correspondiente, conforme a las condiciones de operación. **El Supervisor Torre enviará formato diligenciado al correo del supervisor ACC de turno, quien diligenciará lo correspondiente para ser enviado al Manager de la FMU. El supervisor Torre deberá registrar el visto bueno del jefe TWR o en su orden del Jefe Regional de Aeronavegación o del Jefe Nacional de Aeronavegación y en caso de no lograr contactar a estos, la decisión será potestativa del supervisor ACC.**
4.	Se indica de que hora a que hora aplica la reducción de capacidad teniendo en cuenta el tiempo de reacción de la FMU (informado por el Manager) para hacer efectiva cualquier regulación coherente con dicha reducción.
5.	Motivo o limitación operacional por lo cual se solicita la reducción de capacidad a gestionar por la FMU.
6.	ATCO y dependencia ATC que solicita la reducción.
7.	Configuración de pistas en uso.
8.	
9.	EXPLICACIÓN PROPIA
10.	
11.	Se registra toda la información relevante que motive la reducción, coordinaciones adicionales, situaciones especiales etc.
12.	Capacidad gestionada hasta el momento de la solicitud de reducción (en la hora anterior).
13.	
14.	Demanda de tránsito prevista para el periodo de aplicación de la reducción solicitada.
15.	
16.	Demora prevista resultante de la tabla de cálculo de demoras del Manager (TFM)
17.	El Manager de la FMU registrará las medidas de regulación ATFM aplicadas de acuerdo a la capacidad de reacción y a la reducción solicitada.
18.	El Manager de la FMU solicitará visto bueno del jefe de Aeronavegación Regional o en su orden del Jefe Nacional de Aeronavegación y en caso de no lograr contactar a estos, dejará registro y procederá de acuerdo a la solicitud.
19.	El Manager FMU tiene potestad de efectuar las reducciones y regulaciones correspondientes de acuerdo a las predicciones o pronósticos correspondientes como limitaciciones de infraestructura, CNS o Meteorológicas; para lo cual diligenciará igualmente el formato en cuestión y realizará las coordinaciones del caso.
20.	Este procedimiento permitirá luego de seguimiento y análisis desarrollar una matriz de reducción de capacidad teniendo en cuenta las diferentes variables y limitaciones operacionales que se presenten para determinar los regímenes de aceptación regularmente requeridos y coherentes con los requisitos de seguridad y eficiencia operacionales.
21.	Para eventos de discrepancia e incidentes ATFM se deberá diligenciar el formulario correspondiente.