International Civil Aviation Organization
CAR/SAM Regional Planning and Implementation Group (GREPECAS)

WORKING PAPER

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Fourth Joint Meeting GREPECAS–RASG-PA and Twenty-second Meeting of the Caribbean and South American Regional Planning and Implementation Group (GREPECAS/22)
Virtual Phase (Asynchronous Online, September 13 to October 11, 2024)
In-person Phase (Lima, Peru, November 20 to 22, 2024)

Agenda Item 5: **CAR/SAM Air Navigation Services (ANS) Implementation**
5.1 **Air Traffic Management (ATM), Airspace optimization, Air Traffic Flow Management (AFTM) and Search and Rescue (SAR)**

DIAGNOSTIC OF THE CENTRAL AMERICAN AIRSPACE

(Note presented by the States of Belize, Costa Rica, El Salvador, Guatemala, Honduras, and Nicaragua, Members of the Central American Corporation for Air Navigation Services - COCESNA)

EXECUTIVE SUMMARY

In 2025, COCESNA will conduct a diagnostic of the Central American airspace to identify deficiencies and opportunities in its management. This region, which includes Guatemala, Belize, El Salvador, Honduras, Nicaragua, and Costa Rica, is strategic for international aviation due to its geographic location and varied topography, presenting significant operational challenges.

Although the COVID-19 pandemic profoundly impacted global aviation, since 2021, air traffic in Central America has shown remarkable recovery, with an average annual increase of 7.45%. This growth, driven by the revival of tourism, coupled with changes in the environment, has created the need to review and update the airspace structure.

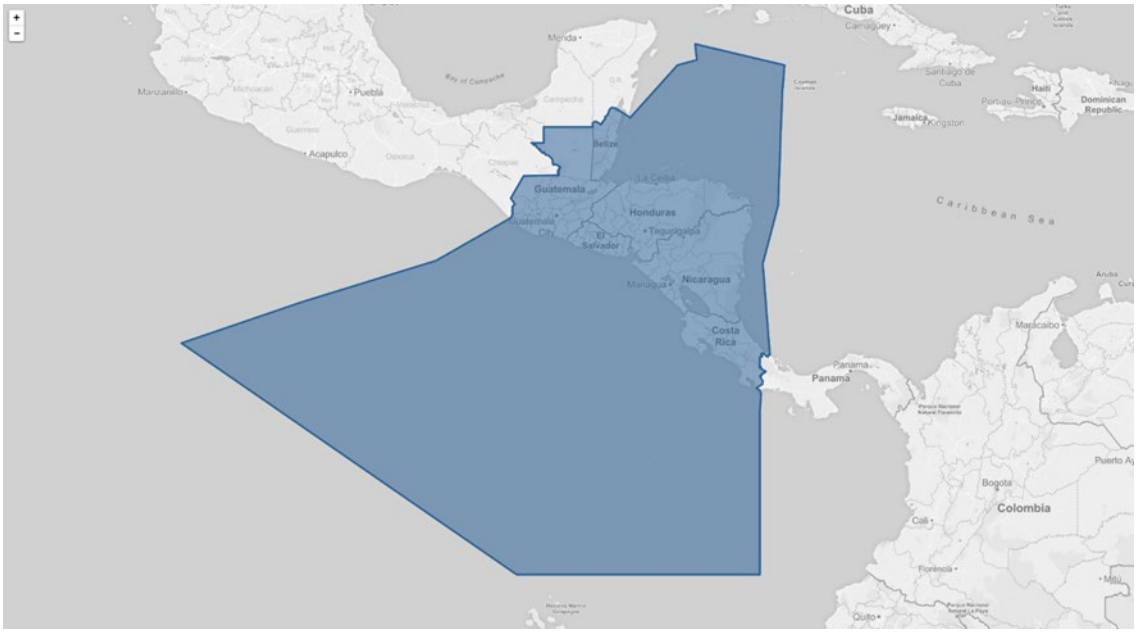
The COCESNA diagnostic will include the collection of statistical data using advanced tools for detailed analysis. Feedback from major airlines will be incorporated, and visits to various countries in the region will be conducted for a direct evaluation of the operational environment. Finally, a detailed report with recommendations aimed at improving the safety, efficiency, and capacity of the regional airspace will be prepared.

Action:	Participants in the meeting are invited to take note of the presented information. ICAO, IATA, and other interested parties are requested to support the diagnostic of the airspace in Central America to ensure a comprehensive and effective evaluation of the conditions and needs of the airspace in the region.

Strategic Objectives:	• Operational Safety • Air Navigation Capacity and Efficiency • Economic Development of Air Transport • Environmental Protection
References:	• Doc. OACI 9613, Manual PBN, Advance fourth edition (unedited) • Doc. OACI 9992, "Manual On The Use of Performance Based Navigation (PBN) in Airspace Design"

1. Introduction

1.1 The airspace of Central America represents a strategic region for international aviation due to its geographical location, which connects North America with South America. This territory, composed of Guatemala, Belize, El Salvador, Honduras, Nicaragua, and Costa Rica, presents unique characteristics that influence the management and control of air traffic.



1.2 One of the main features of the Central American airspace is its diverse topography, which includes mountains, valleys, and coastlines, posing operational challenges for aviation. Additionally, the concentration of air traffic in specific corridors due to the proximity of major international airports, such as the El Salvador International Airport San Óscar Arnulfo Romero and Galdámez in El Salvador and La Aurora International Airport in Guatemala, requires continuous and efficient surveillance.

1.3 Air traffic services in this region are provided by the aeronautical authorities of each country, who cooperate within a framework of information exchange and best practices. Air traffic control centers work in coordination to ensure that air routes are conflict-free and that aircraft are guided safely from takeoff to landing.

1.4 It is important to note that air traffic service provision in the upper airspace of Central America, specifically in the FIR (Flight Information Region) MHCC, is managed under a seamless sky model, delegated to the Central American Corporation for Air Navigation Services (COCESNA). This model allows for efficient coordination and comprehensive management of the regional airspace.

2 Current Situation

2.1 The COVID-19 pandemic had an unprecedented impact on the aviation industry worldwide. In Central America, as travel restrictions began to be lifted in 2021, air traffic started to recover at an accelerated pace. Currently, there is an average monthly increase of 9.28% in reported air operations compared to pre-pandemic levels, and an annual average increase of 7.45%.

2.2 The recovery of air traffic in Central America has been driven by the reactivation of tourism, a key sector for many of the region's economies. This increase in tourism activity has led airlines to restructure their operations, adjusting routes and frequencies to meet the new demand. This reconfiguration not only responds to the recovery of tourism but also to a shift in traveler preferences, with a growing demand for convenience and shorter travel times.

2.3 Therefore, it is necessary to conduct a comprehensive review and reorganization of air routes, air traffic control procedures, and sector assignments. This process is crucial for enhancing the safety, efficiency, and capacity of the airspace, adapting to traffic growth, the implementation of new technologies, and evolving operational needs.

3 Diagnostic of the Central American Airspace

3.1 In 2025, COCESNA will carry out a diagnostic of the Central American airspace to identify opportunities for improvement in the management and operation of the region's airspace. This activity involves several key steps:

a. Stadistic Data Collection

The first step is to identify the necessary information for a comprehensive analysis. Required data includes, but is not limited to, air traffic volume, reported incidents, airport wait times, and characteristics of the current infrastructure. It is essential to determine the available information, which may cover existing databases, previous studies, and activity records provided by national and international authorities.

To process and analyze this information, appropriate technological solutions must be implemented, which may range from statistical analysis software to data visualization platforms. The use of advanced tools will enable a clearer and more accurate interpretation of the collected data.

b. Feedback from Airlines

It is necessary to hold in-person meetings with the main airlines operating in the region. These meetings will facilitate direct information exchange regarding the operations, needs, and challenges faced by the airlines, allowing for a deeper understanding of the current state of the airspace.

c. Operational Analysis

The evaluation of the current situation will be complemented by on-site visits to different countries in the region, where a diagnosis will be conducted in each one. Visits of several days are planned to El Salvador, Guatemala, Belize, Honduras, Nicaragua, and Costa Rica. This approach will allow for direct immersion in the operational environment, facilitating the identification of specific problems and the proposal of suitable solutions.

d. Documentation of the Diagnostic

Finally, a detailed report will be prepared with the findings of the diagnostic by country. The creation of specific reports for each State will provide a holistic view of the conditions of the Central American airspace, including recommendations for the continuous improvement of air traffic management, such as:

i. Segmentation and Redesign of Routes:

Route Optimization: Redesign air routes to make them more direct and efficient, aiming to reduce flight time, fuel consumption, and emissions.

Vertical and Lateral Separation: Review the minimum required separations between aircraft to increase airspace capacity without compromising safety. This adjustment will allow for managing a higher traffic volume while maintaining safety standards.

ii. Implementation of Performance-Based Navigation (PBN):

RNAV and RNP: Implement routes and approach procedures that facilitate more precise navigation. The adoption of RNAV (Area Navigation) and RNP (Required Navigation Performance) will allow for greater efficiency in airspace management.

Optimization of SID/STAR Procedures: Update departure (SID) and arrival (STAR) procedures to align them with the new routes and the enhanced capabilities of navigation systems. This will contribute to greater efficiency in takeoff and landing operations.

iii. Air Traffic Control Sectors:

Sector Redesign: Adjust the boundaries of air traffic control sectors to balance the workload of controllers and improve traffic management. This redesign aims to optimize the assignment of responsibilities and operational efficiency.

4 Request for Action

a. Meeting participants are invited to take note of the information presented.
b. Support from ICAO, IATA, and other interested parties is requested to carry out the diagnostic of Central American airspace to ensure a comprehensive and effective assessment of the conditions and needs of the airspace in the region.

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