



**Fifth GREPECAS–RASG-PA Joint Meeting (GREPECAS-RASG-PA/5) and
Twenty-Third Meeting of the CAR/SAM Regional Planning and Implementation Group
(GREPECAS/23)**

Virtual Phase (Asynchronous, 19 January to 17 February 2026)

In-Person Phase (Mexico City, Mexico, 4 to 6 March 2026)

Agenda Item 8: Implementation of CAR/SAM Air Navigation

**AIRSPACE CONCEPT DEVELOPMENT IN THE RIO DE JANEIRO AND BELO HORIZONTE
TMAS: OPERATIONAL OPTIMIZATION AND ENVIRONMENTAL BENEFITS**

(Presented by Brazil)

EXECUTIVE SUMMARY

In line with international best practices, DECEA has been conducting airspace restructuring initiatives focused on operational needs and strategic objectives, such as trajectory optimization, reduction of fuel consumption and CO₂ emissions, and the expanded use of CDO/CCO operations. Currently, airspace concept development projects are underway in the Rio de Janeiro and Belo Horizonte Terminal Control Areas (TMAs), with the aim of implementing more efficient trajectories, prioritizing key aerodromes, reducing IFR/VFR operational complexity, and aligning airspace capacity with current and future demand.

*Strategic
Objectives
2026-2050:*

- Every flight is safe and secure
- Aviation is environmentally sustainable
- Aviation delivers seamless, accessible, and reliable mobility for all
- No country left behind
- The International Civil Aviation Convention and Other Treaties, Laws and Regulations Address All Challenges
- The Economic Development of Air Transport Assures the Delivery of Economic Prosperity and Societal Well-Being for All

References:

- Global Air Navigation Plan (GANP)
- Doc 8168

1 Introduction

1.1 The Rio de Janeiro and Belo Horizonte TMAs rank, respectively, second and third nationwide in terms of traffic movements among Brazilian Terminal Areas, concentrating a high volume and wide diversity of operations.

1.2 Operational analyses, combined with feedback from airspace users and air traffic controllers, highlight opportunities to improve the currently used trajectories, particularly regarding flight efficiency, traffic flow predictability, and optimization of airspace utilization. With specific regard to the new Airspace Concept for the Rio de Janeiro TMA, these analyses have been systematically conducted within the AGILE RIO collaborative forum for more than six years, providing a consolidated technical and operational basis to support the development of the proposed solutions.

1.3 In accordance with the process established by national regulations (ICA 100-44 – *Airspace Concept*), DECEA has established dedicated Working Groups (WGs) for the Airspace Concept (AC) development of these two TMAs.

1.4 These WGs include the participation of air traffic controllers, instrument flight procedure designers, airspace planners, pilots, airline representatives, and organizations that are part of Brazilian Airspace Control System (SISCEAB).

1.5 The structural update of these TMAs aims to enhance operational efficiency, align sector capacity with current and future demand, reduce conflicts between traffic flows, and ensure alignment with international best practices in airspace organization and management, in accordance with the concepts set forth in the GANP/ASBU framework.

2 Projects Development

2.1 The development of the airspace concept projects for the Rio de Janeiro and Belo Horizonte TMAs will be conducted in five phases:

- a) **Planning (completed):** definition of the working groups, scope, schedule, and responsibilities.
- b) **Design:** development of the proposed scenarios, including airspace structure, SIDs, STARs, instrument approach procedures (IAPs), and visual corridors.
- c) **Validation:** execution of Fast-Time Simulation (FTS) and Real-Time Simulation (RTS) to perform quantitative and qualitative analyses of the scenarios, with the participation of air traffic controllers and air operators.
- d) **Implementation:** development of air navigation procedures, updating of aeronautical information for publication in the national AIP, and training of the involved units.
- e) **Post-Implementation:** evaluation of performance indicators and analysis of operational results to refine the design and consolidate the achieved benefits.

3 Operational Needs and Expected Benefits

3.1 Rio de Janeiro TMA

3.1.1 The Rio de Janeiro TMA presents a high level of operational complexity due to heavy traffic volume, the presence of three of the country's busiest airports within the same terminal area, intense offshore traffic, and the operational integration between Galeão and Santos Dumont airports.

3.1.2 The last airspace concept, implemented in 2013, no longer fully meets current operational needs, with identified opportunities for improvement in vertical profiles, SID/STAR interactions, and IFR/VFR segregation.

3.1.3 Expected Benefits:

- a) Shorter trajectories and reductions in fuel burn and CO₂ emissions;
- b) Increased operational efficiency and predictability;
- c) Reduction of conflict points and enhanced safety;
- d) Improved integration between IFR, VFR, and offshore operations;
- e) Alignment with international best practices, including CDO/CCO and A-RNP.

3.2 Belo Horizonte TMA

3.2.1 The Belo Horizonte TMA requires modernization due to continued demand growth since its last airspace concept implementation in 2015.

3.2.2 Confins International Airport (SBCF) is the fifth busiest airport in the country, and its proximity to Pampulha Airport (SBBH) generates conflicts between IFR and VFR traffic flows, as well as trajectory crossings, indicating the need to update procedures in order to optimize vertical and lateral profiles.

3.2.3 Expected Benefits:

- a) Shorter trajectories, with reductions in flight time, fuel consumption, and emissions;
- b) Increased efficiency and reduced need for vectoring;
- c) Reduction of conflicts between arrivals, departures, and IFR/VFR traffic flows;
- d) Alignment with international best practices, including CDO/CCO and A-RNP.

4 Conclusion

4.1 The Airspace Concept projects for the Belo Horizonte and Rio de Janeiro TMAs, with planned entry into force in November 2026 and June 2027, respectively, represent significant steps toward the modernization of the Brazilian ATM system.

4.2 Developed through a structured, multidisciplinary and participatory approach, these projects will deliver significant improvements in safety, efficiency, and environmental sustainability.

4.3 By aligning the TMA structures with international best practices and modern airspace organization and management concepts, DECEA is preparing the system to meet current and future aviation demands in a more robust, predictable, and resilient manner.