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

WORKING PAPER

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Agenda Item 6: Progress on Regional and National air navigation planning

A COMPREHENSIVE AVIATION INFRASTRUCTURE GAP ANALYSIS AND CONTINUOUS MONITORING FOR THE CAR/SAM REGIONS

(Presented by the Secretariat)

EXECUTIVE SUMMARY

This working paper proposes the launch of a comprehensive aviation infrastructure gap analysis for the CAR/SAM region. Building on the methodology successfully implemented in the AFI Region (2023), this project moves beyond traditional compliance checks to identify "strategic gaps" between current infrastructure and the capabilities required to achieve regional performance objectives. The initiative includes the establishment of a CAR/SAM Technical Working Group (TWG) to guide the project and the creation of a Regional Aviation Infrastructure Management Platform (RAIMP) to transition from periodic surveys to continuous implementation monitoring.

Action:	States are invited to consider the actions in Section 4.
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:	• CAR/SAM ANP (Doc 8733); Global Air Navigation Plan (Doc 9750).

1. Introduction

1.1 To ensure an effective regional infrastructure development, commensurate with predicted growth, a comprehensive data-driven analysis, in line with the CAR/SAM ANP and the GANP, is required. This analysis should include political, financial and operational considerations.

1.2 In 2023, the AFI Region completed an "Aviation Infrastructure Gap Analysis" that identified 64 gaps across 42 States through a series of surveys in aerodrome and ground aids and air navigation services as well as aircraft fleet and equipage. The gap analysis also included a 25-year traffic forecast. To address the gaps, bankable projects were defined of a total ask for over 30 billion US$. This approach has provided a data-driven foundation for upgrading the aviation infrastructure in Africa.

1.3 This paper proposes a similar initiative for the CAR/SAM region, governed by a multi-disciplinary Technical Working Group (TWG), coordinated with GREPECAS and the respective CAR/SAM ANS Regional Implementation Groups and supported by a digital platform to ensure that the identified gaps are managed and monitored continuously rather than through recurring one-off cycles.

2. Discussion

Definition of a Gap: A Strategic Approach

2.1 It is critical to clarify that this initiative does not aim to assess the oversight capability of the States to comply with ICAO Standards since this is already covered by the ICAO's Universal Safety Oversight Audit Programme (USOAP). In the context of this initiative, a gap is defined as the difference between the existing services, infrastructure and equipage (baseline), and the ones required to achieve the CAR/SAM regional strategic objectives.

2.2 This approach recognizes that a State may be compliant with minimum ICAO Standards but still possess a "gap" if its system cannot support the required capacity and efficiency to provide for seamless operations. By focusing on "what should exist" to enable regional economic development and operational goals, the analysis becomes a tool for modernization and operational readiness.

Complementary to the CAR/SAM Regional Air Navigation Plan (ANP)

2.3 The CAR/SAM ANP lays out the current to medium-term regional requirements related to aerodrome and air navigation facilities and services to be implemented by States in accordance with regional air navigation agreements. It also identifies dynamic/flexible planning elements for modernizing the regional air navigation system, following a performance-based approach. While the ANP defines the "what" (requirements and objectives), it does not provide the "how" for every State.

2.4 The proposed Gap Analysis serves as the operational bridge for the realization of the ANP. It provides the necessary procedures and means to plan and deploy the requirements identified in the ANP and realized its objectives. It also supports the assessment, collecting and reporting of data in the ANP to show implementation progress. By identifying these specific gaps, the project transforms the static planning of the ANP into an actionable, monitored implementation roadmap. This shall actively support the work of the GREPECAS and the CAR/SAM ANS implementation Groups and State’s territories.

Project pillars and scope

2.5 The proposed analysis is structured around four interconnected pillars:

a) 25-Year Traffic Forecast: Providing the evidentiary basis for prioritization through econometric modelling of passenger and aircraft movements (2025–2050);

b) Aerodrome and Ground Aids (AGA): Assessing the capacity of airports to meet the demand, focusing on the basic services (e.g. certification) and infrastructure (e.g. pavement) as well as runway and terminal throughput.

c) Air Navigation Services (ANS): Focusing on airspace capacity and efficiency as well as the technological enablers for regional harmonization across Flight Information Region (FIR) boundaries. This includes Air Traffic Management (ATM), Communication Navigation Surveillance (CNS), Aeronautical Information Management (AIM) and meteorological information (MET).

d) Aircraft Fleet and Equipage: Ensuring that ground-based investments (e.g., Performance Based Navigation, ADS-B) are matched by the capabilities of the aircraft operating in the airspace.

Methodology and role of the Technical Working Group (TWG)

2.6 To ensure the project is guided by regional expertise and maintains high data integrity, a CAR/SAM Technical Working Group (TWG) should be established. The TWG should be composed of experts from Member States, the ICAO Secretariat and key industry stakeholders (e.g., IATA, ACI).

2.7 The CAR/SAM TWG should be responsible for:

a) Defining the specific regional benchmarks and data collection parameters;

b) Validating the initial "Gap" findings to ensure they reflect operational reality;

c) Guiding the development of business cases for the resulting bankable projects; and

d) Overseeing the transition of data into the continuous monitoring platform.

The Regional Aviation Infrastructure Management Platform (RAIMP)

2.8 A fundamental enabler of the project is the establishment of a RAIMP. Rather than conducting periodic gap analysis cycles, the regions transition to a model of continuous infrastructure monitoring.

2.9 Once the initial baseline data is validated by the CAR/SAM TWG, it is migrated to the RAIMP living database. States are then able to log updates on project implementation, financing, and technical milestones in real-time. This eliminates "survey fatigue" and ensures that GREPECAS decision-making is always based on the most current data.

2.10 The platform automatically organizes gaps using a multi-criteria prioritization matrix (safety risk, operational impact and strategic complexity), providing stakeholders with a real-time view of the regions' "bankable projects" that are ready for investment.

Project execution and funding

2.11 The project is planned for a duration of 24 months and to be run as a regional ICAO implementation support project under the ICAO Implementation Support Policy.

2.12 Project costs are estimated at 500,000.00 USD covering expenses related to development of the RAIMP and the functioning of the technical working group, for which funding is sought from voluntary contributions and grants from the World Bank or other development banks.

3. Conclusion

3.1 Defining a "Gap" as a strategic delta—rather than a compliance deficiency—aligns infrastructure investment with the actual performance needs within the CAR/SAM regions.

3.2 By acting as the implementation engine for the ANP and utilizing a continuous monitoring platform (RAIMP), this project ensures that regional planning remains dynamic, transparent and attractive to international financial institutions.

3.3 The establishment of a multi-disciplinary Technical Working Group (TWG) ensures that the project is led by regional expertise, providing the technical oversight and cross-sectoral collaboration required to transform raw data into a credible, validated roadmap for the regions.

4. Action

4.1 The meeting is invited to:

a) note the strategic definition of "Gap" as the delta between current status and regional objectives;

b) support the launch of the CAR/SAM Aviation Infrastructure Gap Analysis project and the request for project funding;

c) support the establishment of the CAR/SAM Technical Working Group (TWG) to guide and oversee the project’s development;

d) support the development of the Regional Aviation Infrastructure Management Platform (RAIMP) for continuous monitoring; and

e) urge States and stakeholders to commit the necessary data and expertise to populate the initial baseline of the platform.

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