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WORKING PAPER

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Agenda Item 2: Fostering aviation growth and air connectivity through investments in infrastructure, human capital and partnerships

AN INTEGRATED APPROACH TO MODERNIZING AIR NAVIGATION SERVICES: PROPOSAL BASED ON THE EXPERIENCE OF THE DOMINICAN REPUBLIC

(Presented by the Dominican Republic)

EXECUTIVE SUMMARY

This paper considers the need to adopt an integrated approach to planning the sustainable modernization of air navigation services in the face of growth in air traffic. It points out that infrastructure investments yield greater benefits when they address demonstrable needs for capacity and are aligned with operational transformation, financial and asset life-cycle planning, and workforce readiness.

Drawing on the experience of the Dominican Republic, including in aligning its investments with the READ project to restructure the country's airspace, the paper identifies elements that may prove useful to other States. It proposes that the Conference acknowledge this approach and recommends that the International Civil Aviation Organization (ICAO) facilitate its implementation by providing practical guidance and disseminating experiences and case studies.

Action: The conference is invited to

- take note of the experience and considerations set out in this paper;
- acknowledge the importance of making demand, operations, financing, life-cycle considerations and human capital a part of infrastructure planning;
- encourage States to consider this approach when formulating and prioritizing their modernization projects; and
- recommend that ICAO should incorporate practical guidance and case studies on integrated planning into its support activities for States.

*Strategic
Goal:*

This working paper relates to the Strategic Goal: *The Economic Development of Air Transport Assures the Delivery of Economic Prosperity and Societal Well-Being for All.*

¹ Spanish version provided by the Dominican Republic.

<i>Financial implications:</i>	The ICAO activities proposed would be carried out subject to the resources available in the Regular Budget for 2026–2028 and/or extrabudgetary contributions, including the Voluntary Air Transport Fund.
<i>References:</i>	Doc 10227 Assembly Resolutions in Force (as of 3 October 2025) (Assembly Resolution A42-26, Appendix C); Doc 9750 – Global Air Navigation Plan (GANP); Doc 9082 – ICAO's Policies on Charges for Airports and Air Navigation Services; Doc 9161 – Manual on Air Navigation Services Economics; and Doc 10170 – Manual on Economic and Financial Analyses for Aviation Infrastructure Projects.

1. INTRODUCTION

1.1 According to the International Civil Aviation Organization (ICAO) projections, global air traffic will reach 12.4 billion passengers carried by 2050. To accommodate this growth, physical and digital infrastructure will have to be modernized without creating new capacity constraints or compromising the operational safety, efficiency or financial sustainability of services.

1.2 Investments must address proven gaps between demand and available capacity, translate into measurable operational improvements, and provide the resources needed to sustain assets throughout their life cycle. Should they fail to do so, the result may be solutions that are fragmented or disconnected from the system's needs.

1.3 The Global Air Navigation Plan (GANP, Doc 9750) establishes the framework for gradual, interoperable and capacity-based development. This paper draws on the Dominican experience to propose a road map covering demand, technology, operational transformation, financial sustainability and human capital.

2. DISCUSSION

2.1 The Dominican Republic's network of international and domestic airports logged 117 014 operations and 10 982 705 passengers between January and June 2026. Punta Cana accounted for 44 642 operations (38.2% of the national total) and 58.2 per cent of passengers, necessitating proactive capacity planning at key hubs and the preservation of service continuity across the entire network.

2.2 To meet that demand, the country developed a phased modernization programme covering communications, navigation, oversight, air traffic management (ATM) automation, networks, back-up systems and meteorological support. The portfolio summarized in Appendix A covers systems implemented between 2019 and 2026, projects currently being carried out, designed or subject to tender, and activities planned for 2027.

2.3 The READ project to restructure the country's airspace links those investments to the redesign of procedures, traffic flows, terminal areas and control sectors, performance-based navigation and automation adaptations. The new procedures are scheduled to enter into force in October and November 2026, with Punta Cana ACC and APP sectors, automation and change management making coordinated progress towards entry into service.

2.4 The activities aim to improve the availability of navigation aids and communications, expand control coverage, bolster weather detection capabilities and enhance the continuity of ATM platforms. A READ-associated goal is to increase airspace capacity by 20 per cent following the implementation of the Punta Cana ACC Upper Sector and APP, subject to measurement after entry into service.

2.5 Investment planning incorporates projected operating periods of 15 to 20 years, preventive maintenance, spare parts, manufacturer support, configuration control and authorized updates. It also provides for back-up power, redundancy, monitoring, recovery and possible expansions using software, sensors, interfaces or additional stations.

2.6 The technological transition calls for training, operational validation and change management. READ included theoretical instruction, simulations and four days of radar practice for the personnel involved. In a broader institutional context, during the first half of 2026, the IDAC (Civil Aviation Institute of the Dominican Republic) carried out 246 training initiatives for 1850 employees – approximately 80 per cent of its workforce.

2.7 Implementation brought to light three main challenges: the synchronization of technology, procedures and sectorization; maintaining continuity during the transition; and the timely preparation of personnel. Those challenges were addressed via phased implementation, multidisciplinary technical coordination, automation testing, simulations and formal change management.

2.8 The main replicable lesson is that demand, capacity, technology, operational redesign, financing, the life cycle and human capital must be managed using a single road map. ICAO practical guidance and case studies would facilitate the application of this approach in States with varying institutional and financial contexts.

3. CONCLUSION

3.1 The experience of the Dominican Republic shows that the modernization of air navigation services produces greater capacity and connectivity when it involves operational transformation, financial sustainability, the asset life cycle and human capital.

3.2 The Conference is invited to

- a) take note of the experience and considerations set out in this paper;
- b) acknowledge the importance of making demand, operations, financing, life-cycle considerations and human capital a part of infrastructure planning;
- c) encourage States to consider this approach when formulating and prioritizing their modernization projects; and
- d) recommend that ICAO should incorporate practical guidance and case studies on integrated planning into its support activities for States.

APPENDIX

AIR NAVIGATION INFRASTRUCTURE INVESTMENT AND MODERNIZATION

Area	Capacities and initiatives	Number and location	Status / period	Operational contribution	Sustainability, resilience and development
Navigation	Next-generation DVOR/DME	6 systems: MDPC, MDSI and MDCR; planned for MDLR, MDPP and MDCY	MDPC and MDSI installed in 2025; MDCR being manufactured; three scheduled in 2027	Enhances coverage, accuracy and integrity of conventional navigation and includes new stations in the FIR Santo Domingo	Anticipated life-cycle: 20 years. Dual configuration and ongoing monitoring depending on the system; OEM support, responses, preventive maintenance and expansion using software and remote supervision
Navigation	GBAS Punta Cana and ILS Las Américas	1 GBAS at MDPC and 1 ILS/DME CAT I at MDSD	GBAS operational since 2019; tender issued for replacement of the ILS	Enables precision approaches and greater continuity in adverse weather conditions; the GBAS allows for multiple procedures as part of its coverage.	Highly reliable architecture and monitoring; GBAS development by approved blocks and scalability of the ILS to CAT II/III, subject to certification
Communications	Ground-to-air VHF communication systems, VCS, ATIS, recording and alerts	8 initiatives: MDJB, MDPP, Norge Botello, MDSI, MDCR, MDPC, Alto Bandera and MDCY	MDPP updated in 2025; MDSI installed in 2026; MDJB 85% complete; MDCR being manufactured; three initiatives planned for 2027	Provides air-to-ground ATS communications and contingencies, with integration into ACC Santo Domingo	Main/reserve radios, network and energy back-up, IP/VoIP segmentation, access control and capacity to incorporate new frequencies, positions and remote management
Meteorology	AWOS and sheer detection system (LLWAS)	MDPC: 2 AWOS and LLWAS with 11 anemometers/4 sites; AWOS at MDCR; planned at MDSD, MDPP and MDJB	MDPC updated in 2022; MDCR planned for 2027; three additional systems scheduled in 2027	Provides weather observations, alerts and reports for take-off, landing and operational decision-making	Distributed and scalable architecture, energy back-up and sensors, inclusion in AMHS/AIM/GBON and expansion using additional sensors and interfaces
Weather surveillance	C-band dual-polarization Doppler radar	3 radars: MDPC, MDPP and MDSD	MDPC installed in 2022; MDPP in 2025; MDSD in 2026	Detects and describes precipitation, storms, hail, wind and other adverse phenomena, expanding national weather coverage	Availability objective ≥99.95%. MDPP and MDSD use solid-state transmitters and modular redundancy; network integration, remote operation and development using software.
ATS oversight	Primary/secondary radar (PSR/SSR)	3 initiatives: MDST, MDCR and MDPP	MDST being implemented in 2026; MDCR being planned; modernization at MDPP planned for 2027	Expands and strengthens air traffic control and management, especially in the Norte and Suroeste regions	Integration into ACC Santo Domingo, energy and network back-up, remote monitoring, ATM network segregation and software-expandable architecture
ATM automation	Complete update of the TopSky system	2 centres: ACC Santo Domingo and Punta Cana	2014 systems; hardware and software updates planned for 2027	Improves interfaces, tools, alerts and transit management with a view to supporting the new operational structure	Technological update aimed at maintaining support, availability, cyber security and incorporating new ATM functions
Infrastructure and back-up	CANSNET control booths, server environment and satellite network	Booths at MDSI and MDCR; servers at Norge Botello; 1 CANSNET system	MDSI and servers implemented in 2026; MDCR being manufactured; CANSNET scheduled for 2027	Modernizes control stations, ensures continuity of DINA applications and enables regional ATS voice and data exchange	Booths with anticipated life-cycle >30 years; redundant servers and pre-disaster recovery; secure, continuous and scalable satellite connectivity