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2.2: Investment for the development and modernization of civil aviation infrastructure

INVESTMENT IN AND MODERNIZATION OF AVIATION INFRASTRUCTURE: PROPOSAL FOR AN INTERNATIONAL METHODOLOGICAL FRAMEWORK FOR AIRPORT DEVELOPMENT PLANNING

(Presented by Mexico)

EXECUTIVE SUMMARY

This paper outlines Mexico's experience in the planning, investment, and modernization of airport infrastructure through Master Development Programs, with the aim of proposing an international methodological framework for airport development planning, designed to strengthen investment and the modernization of aviation infrastructure by integrating technical, economic, operational, technological, environmental, and sustainability criteria that optimize airports' capacity, efficiency, safety, and competitiveness in light of current and future air transport needs in the International Civil Aviation Organization (ICAO) Member States.

In Mexico, the growth and development of airport infrastructure have been encouraged through concessions to the private sector. Concession agreements establish the obligation to submit a Master Development Program (MDP) under legislation governing the construction, administration, management, and operation of airports in the country (the Airports Law and the Regulations of the Airports Law as the primary regulatory framework). Airport Master Plans (AMPs) are tools designed to establish a structured, phased, and sustainable vision for airport development, ensuring that the national airport infrastructure is aligned with SARPs, as well as with best practices, and guaranteeing at all times that users of airport and ancillary services receive efficient, high-quality, and, above all, safe services.

1. INTRODUCTION

1.1 The Mexican experience views the Master Development Plan not only as a tool for physical infrastructure planning, but also as a mechanism for planning, regulation, investment, oversight, and monitoring of airport development. In this regard, the Master Development Program (PMD) enables the establishment of a relationship between future capacity needs, infrastructure requirements, investment priorities, funding sources, and the operational conditions, operational safety, sustainability, and territorial development of each airport.

[1] English and Spanish versions provided by Mexico.

1.2 To this end, Mexico mandates the preparation and submission of a Master Development Program with a 15-year planning horizon. The first five years correspond to the short-term investment and action plan, which is subject to monitoring and updating in accordance with changes in demand and the airport's needs; the two subsequent five-year periods provide an indicative vision of the infrastructure's growth and development over the medium and long term.

1.3 This framework allows for dynamic airport planning that can adapt to changes in demand, operations, technology, fleet, regulations, the environment, and other factors that may affect airport development.

1.4 The structure of the Master Development Plans is consistent with the concept of aerodrome planning established by the International Civil Aviation Organization (ICAO) in Annex 14—Aerodromes, Volume (Vol.) I, particularly in Section 1.5, regarding airport design and the airport master plan. In that section, ICAO recognizes that a master plan represents the long-term development of an aerodrome and recommends that, for aerodromes deemed appropriate by the State, master plans be established that contain detailed infrastructure development plans, a program of priorities, and a phased implementation plan, subject to periodic review and developed through a consultative and collaborative approach.

1.5 Furthermore, Annex 14, Vol. I, itself establishes that master plans must take into account, among other elements, economic feasibility, traffic forecasts, current and future requirements of aircraft operators, projected growth in movements, passengers, and cargo, the integration of aviation security measures, as well as land-use and environmental considerations. Consequently, there is a significant alignment between the elements recommended internationally by ICAO and the requirements established by Mexico for its Master Development Programs.

1.6 Similarly, ICAO Doc 9562, *Airport Economics Manual*, recognizes the importance of master planning for developing airports to reach their optimal capacity and to efficiently accommodate projected traffic growth. It also emphasizes the need for master plans and investment programs to maintain sufficient flexibility to be revised in accordance with changes in demand, government requirements, applicable international standards, and user needs.

1.7 Furthermore, the results of GREPECAS's ADPLAN2020 project show that several countries already have national provisions or mechanisms in place related to the development of airport master plans. However, this exercise also identified opportunities to strengthen methodological harmonization, stakeholder consultation and participation processes, criteria for evaluating plans, the institutional capacities of authorities, and alignment between national, regional, and global airport planning.

1.8 Currently, through their respective Master Development Programs, investments are being considered to comply with ICAO requirements, as well as with environmental commitments made to the relevant authorities, such as the construction or expansion of wastewater treatment plants (WWTPs), the reuse of stormwater, the installation of solar panels, and the replacement and upgrading of visual aids and general lighting with LED technology, among other measures.

1.9 These actions are of the utmost importance for reducing greenhouse gas emissions and contributing to climate change mitigation, as well as for protecting natural resources through the efficient use of water and energy. They also help improve air quality by reducing air pollution associated with airport activities and facilitate compliance with applicable environmental regulations.

1.10 In this regard, Mexico's experience shows that master planning can serve as a tool for aligning infrastructure needs with investment programs, sustainability goals, operational safety requirements, service efficiency, and airport resilience. This also helps to increase certainty in investment decision-making and enhances airports' ability to respond in a timely manner to current and future air transport needs.

2. DISCUSSION

2.1 In light of the foregoing, the Mexican government proposes that ICAO expedite the establishment of Airport Advisory Committees within the Regional Offices (GREPECAS/23 – NE/8.11), which would promote an International Methodological Framework for the Implementation of Airport Development Master Plans, enabling the States in each region to establish—in accordance with their respective legal, regulatory, and institutional frameworks—mechanisms for the preparation, evaluation, approval, implementation, monitoring, and periodic updating of airport master plans linked to investment programs.

2.2 The proposal does not seek to establish a single legal model for all member States, but rather to provide a harmonized international methodology that allows the principles of master planning to be adapted to the specific circumstances, needs, and characteristics of each national airport system.

2.3 The proposed methodological framework should include, at a minimum, the following stages:

a) assessment of existing infrastructure, capacity, operations, operational safety, environmental impact, accessibility, connectivity, and territorial conditions;

b) development of forecasts for passenger, freight, and operational demand, including the calculation methodology, assumptions, and scenarios used. These forecasts must incorporate criteria for resilience and operational flexibility in the face of force majeure events or global health crises (such as COVID-19), conditioning the implementation of infrastructure on actual traffic thresholds rather than fixed chronological dates;

c) identification of gaps between projected demand and available capacity, as well as future infrastructure and service needs;

d) formulation and evaluation of alternatives for the development, modernization, and expansion of airport infrastructure;

e) integration of criteria related to operational safety, aviation security, capacity, efficiency, economic viability, environmental sustainability, resilience, and connectivity;

f) establishment of priorities and implementation phases for infrastructure projects;

g) development of an investment program based on identified needs, development priorities, and financing options;

h) identification of financing mechanisms and sources to ensure the viability and continuity of investments;

i) establishment of mechanisms for consultation and participation by aircraft operators, users, authorities, service providers, communities, and other stakeholders;

j) definition of mechanisms for approval, supervision, and monitoring by the competent authority;

k) establishment of Key Performance Indicators (KPIs) to periodically evaluate the physical, financial, operational, environmental, and capacity-related progress of the planned actions; and

l) periodic review and update of the plan, taking into account relevant changes in demand, technology, fleet, and economic, environmental, territorial, regulatory, and operational conditions.

2.4 Furthermore, the main benefits that can be achieved through this proposal are:

a) to encourage and ensure continuous and timely investment in airport infrastructure, in accordance with current and future capacity needs;

b) to harmonize infrastructure growth planning methodologies in accordance with ICAO Standards and Recommended Practices (SARPs), manuals, and best practices, as well as other applicable international references;

c) strengthen States' capacity to anticipate infrastructure needs and reduce the risks associated with delayed, insufficient, or disjointed investments;

d) improve the quality and efficiency of airport and ancillary services;

e) optimize passenger processing through the gradual implementation of technologies and solutions that reduce wait times and transit times;

f) strengthen operational safety, aviation security, environmental sustainability, and the resilience of airport infrastructure;

g) increase certainty for investment decision-making and encourage the participation of public and private funding sources; and

h) promote greater coordination among national, regional, and global air transport development objectives.

3. CONCLUSION

3.1 The adoption and promotion of an international methodological framework for master planning of airport development represents an opportunity to strengthen the capacity of ICAO Member States to plan, prioritize, finance, implement, and oversee the growth of their airport infrastructure.

3.2 Mexico's experience demonstrates that Master Development Programs can serve as comprehensive planning and governance tools by linking demand projections with infrastructure needs, investment programs, funding sources, aviation safety requirements, environmental sustainability, and airport modernization.

3.3 The proposal seeks to build on the experience accumulated by States and existing ICAO guidance, particularly that contained in Annex 14, Doc 9184 (*Airport Planning Manual*) and Doc 9562, as well as the conclusions and opportunities identified through GREPECAS's ADPLAN2020 exercise, to move toward a common international methodology that is flexible and adaptable to different legal and institutional frameworks.

3.4 As a result, airport master planning could establish itself as a strategic tool for promoting timely and sustainable investments, strengthening operational resilience, proactively addressing capacity needs, improving connectivity, and contributing to the orderly and sustainable development of air transportation at the national, regional, and global levels.

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