



International Civil Aviation Organization

NORTH AMERICAN, CENTRAL AMERICAN AND CARIBBEAN OFFICE

Regional North American/Caribbean (NAM/CAR) Air Traffic Management (ATM) Meeting

(Santo Domingo, Dominican Republic, 19-21 April 2006)

NAM/CAR ATM - WP/05

07/04/06

Agenda Item 1: Second amendment to the *Global Air Navigation Plan for CNS/ATM Systems* (Doc 9750) and ICAO new related initiatives

BASIC REGIONAL AND INTERREGIONAL ATM PLANNING AND IMPLEMENTATION ASPECTS

(Presented by the Secretariat)

SUMMARY

This Working paper presents up-to-date information on the basic regional and interregional ATM planning and implementation aspects to achieve a harmonious and interoperable global system

References:

- Doc 9750 - *Global Air Navigation Plan for CNS/ATM Systems - 2nd ed. - 2002*
- Doc 8733 - *Air Navigation Plan - Caribbean and South American Regions*
- *Canada/Mexico/USA CNS/ATM implementation and Transition Plan*

1. Introduction

1.1 The Council of ICAO accepted to review the the first amendment in 2001 to the Global Air Navigation Plan for communications, navigation, and surveillance/air traffic management (CNS/ATM) Systems (Global Plan). Further to the Eleventh Air Navigation Conference (AN-Conf/11), ICAO is in process of reviewing the second amendment to the Global Plan, which is expected to be finished during 2006.

2 Planning Based on Homogeneous ATM Areas and Major Traffic Flows

2.1 The process of ATM planning is based on two elements: the review of the main traffic flows and the definition of the homogeneous areas. The basic planning parameter in establishing a homogeneous ATM area or major traffic flow is the number of aircraft movements that must be provided with ATM services in an area or along a flow. Estimates and forecasts of annual aircraft movements over the planning period are therefore required for high-level planning. Forecasts of aircraft movements in peak periods, such as during a particularly busy hour, are needed for detailed planning. Additionally, appropriate civil/military coordination and consideration of special use airspace (SUA) is required.

3. Major Traffic Flow

3.1 A *major traffic flow* is defined as a concentration of significant volumes of air traffic on the same or proximate flight trajectories, which may cross several homogeneous ATM areas with different characteristics. A *routing area* is a defined area encompassing one or more major traffic flows.

3.2 A routing area may include groupings of routes, or area navigation (RNAV) areas, wherein it is logical to specify a detailed plan for the implementation of CNS/ATM systems and procedures, where the objective would be to attain a seamless system throughout the area concerned. Major traffic flows and routing areas are defined by origin and destination geographic areas, which could be States, specific portions of States or groupings of smaller States.

3.3 **Appendix A** shows the main traffic flows studied up to year 2000 and published in Table II-19 of the CAR/SAM ANP.

4. Homogeneous ATM Area

4.1 In accordance with the new Air Navigation Global Plan, a homogeneous ATM area is defined as an airspace with a common ATM interest based on similar characteristics of traffic density, complexity, air navigation infrastructure requirements or other specified considerations, wherein a detailed plan fosters the implementation of interoperable CNS/ATM systems. These areas may be identified on the basis of political and economic considerations; however, the essential elements to be considered when determining a homogeneous ATM area should be the technical and operational requirements. Identifying homogeneous ATM areas therefore involves consideration of the varying degrees of complexity and diversity of the air navigation infrastructure.

4.2 Homogeneous ATM areas may extend over States, specified portions of States or groupings of smaller States. They may also extend over large oceanic and continental en-route areas. They are considered to be areas of shared common interest and requirements. **Appendix B** shows the homogeneous areas defined based on traffic flows of year 2000

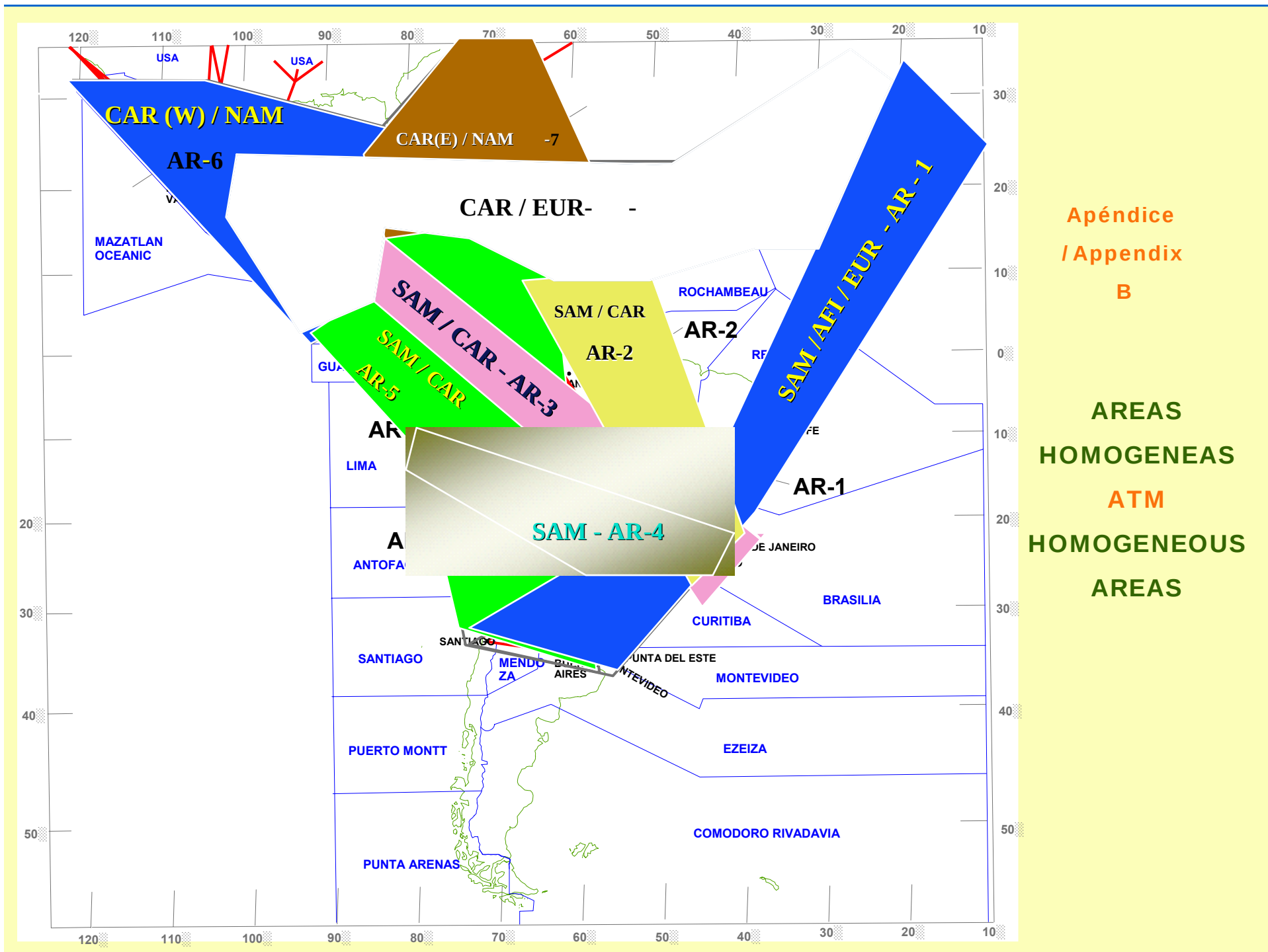
4.3 Taking into consideration the traffic growth in the past years, **Appendix C** to this Working paper includes up-to-date information on the proposed changes to the table of the main traffic flows and homogeneous areas of the NAM and CAR Regions of Doc 9759, in line with the latest reviews and information received in the ICAO NACC Regional Office, renumbering the areas of each Region in order to make them more consistent with the regional and interregional planning and implementation needs.

4.4 The Meeting should review the data presented in this Working Paper so as to facilitate effective planning and implementation process looking for global harmonious ATM System.

5 **Action by the Meeting**

5.1 The Meeting is invited to:

- a) note the information presented in this Working paper;
- b) review and update the information presented in Appendix C to this Working paper with regard to the second amendment to the Global Air Navigation Plan for CNS/ATM Systems (Doc 9750); and
- c) recommend other actions as deemed appropriate to support the ATM regional and intraregional planning and implementation activities.



Apéndice
/ Appendix
B

AREAS
HOMOGENEAS
ATM
HOMOGENEOUS
AREAS

APPENDIX/APÉNDICE **C**

Table II-4-1. Homogeneous ATM areas and major traffic flows/routing areas

<i>Areas (AR)</i>	<i>Homogeneous ATM areas and major traffic flows/routing areas</i>	<i>FIRs involved</i>	<i>Type of area covered</i>	<i>Remarks</i>
Caribbean/South American (CAR/ SAM) Regions				
ARZH 1	Buenos Aires — Santiago de Chile	Ezeiza, Mendoza, Santiago	Continental low density	SAM intra-regional major traffic flow
	Buenos Aires — São Paulo/ Rio de Janeiro	Ezeiza, Montevideo, Curitiba, Brasília	Continental low density	SAM intra-regional major traffic flow
	Santiago de Chile — São Paulo/Rio de Janeiro	Santiago, Mendoza, Cordoba, Resistencia, Asunción, Curitiba, Brasília	Continental low density	SAM intra-regional major traffic flow
	São Paulo/Rio de Janeiro Europe	Brasília, Recife	Continental/oceanic low density	SAM/AFI/EUR inter-regional major traffic flow
ARZH 2	São Paulo/Rio de Janeiro Miami	Brasília, Manaus, Maiquetía, Curaçao, Kingston, Santo Domingo, Port-au-Prince, Havana, Miami	Continental/oceanic low density	CAR/SAM/NAM inter- and intra-regional major traffic flow
	São Paulo/Rio de Janeiro New York	Brasília, Belem, Paramaribo, Georgetown, Piarco, Rochambeau, San Juan (New York)	Continental/oceanic low density	CAR/SAM/NAM/NAT inter- and intra-regional major traffic flow
ARZH 3	São Paulo/Rio de Janeiro — Lima	Brasília, Curitiba, La Paz, Lima	Continental low density	SAM intra-regional major traffic flow
	São Paulo/Rio de Janeiro — Los Angeles	Brasília, Porto Velho, Bogotá, Barranquilla, Panama, Central America, Mérida, México, Mazatlan (Los Angeles)	Continental low density	CAR/SAM/NAM inter and intra-regional major traffic flow
	Mexico — North America	Mexico, Monterrey, Houston, Miami	Continental/oceanic low high density	CAR/NAM interregional major traffic flow
ARZH 4	Santiago — Lima — Miami	Ezeiza, Resistencia, Cordoba, La Paz, Porto Velho, Bogotá, Barranquilla, Kingston, Havana, Miami	Continental/oceanic low density	CAR/SAM/NAM inter and intra-regional major traffic flow
	Buenos Aires — New York	Ezeiza, Resistencia, Asunción, La Paz, Porto Velho, Manaus, Maiquetía, Curaçao, Santo Domingo, Miami (New York)	Continental/oceanic low density	CAR/SAM/NAM/NAT inter and intra-regional major traffic flow
	Buenos Aires — Miami	Ezeiza, Resistencia, Cordoba, La Paz, Porto Velho, Bogotá, Barranquilla, Kingston, Havana, Miami	Continental/oceanic low density	CAR/SAM/NAM intra and inter-regional major traffic flow
ARZH 5	North of South America — Europe	Guayaquil, Bogotá, Maiquetía, Piarco (NATEUR)	Continental/oceanic low density	SAM/CAR/NAT/EUR interregional major traffic flow
AR6	Mexico — Europe	México, Mérida, Havana, Miami (NATEUR)	Continental/oceanic low high density	CAR/NAM/NAT/EUR interregional major traffic flow

	Central America — Europe	Central America, Panama, Kingston, Port au Prince, Curaçao, Santo Domingo, San Juan (EUR)	Oceanic low high density	CAR/NAT/EUR intra and interregional major traffic flow
ARZH 67	Santiago — Lima — Los Angeles	Santiago, Antofagasta, Lima, Guayaquil, Central America, Mérida , México, Mazatlan	Oceanic low density	CAR/SAM/NAM intra and interregional major traffic flow
ARZH 78	South America — South Africa	Ezeiza, Montevideo, Brasilia, Johannesburg (AFI)	Oceanic low density	SAM/AFI interregional major traffic flow
	Santiago de Chile — Easter Island — Papeete (PAC)	Santiago, Easter, Tahiti	Oceanic low density	SAM/PAC interregional major traffic flow
GM-1	Mexico, Toluca, -Guadalajara, Monterrey, Mazatlán, La Paz, Acapulco, Puerto Vallarta, Huatulco, Cancún Gulf of Mexico — North America	Mexico, Houston, Miami; Mexico , Albuquerque; Mexico , Los Angeles	Continental/oceanic low high density Major traffic flow	CAR/NAM inter-regional major traffic flow
	Cancún, Guatemala, El Salvador, Nicaragua, Honduras, Costa Rica - Miami	Mexico, Central America, Havana, Miami	Continental/oceanic high density	CAR/NAM interregional traffic flow
GM-2	Mexico, Cancun, La Havana, Nassau — Europe	Mexico, Havana, Miami (NAT-EUR)	Continental/oceanic low high density Major traffic flow	CAR/NAM/NAT/EUR inter-regional traffic flow
GM-3	Costa Rica, Panama, Honduras, Kingston, Haiti, Santo Domingo San Juan, The Caribbean — Europe	Central America, Panama, Kingston, Port-au-Prince, Curaçao, Santo Domingo, San Juan – EUR	Oceanic high density	CAR/ EUR intra and interregional major traffic flow
	North America – East Caribbean	New York, Miami, Havana, San Juan, Santo Domingo Piarco	Oceanic high density	West Atlantic Route System CAR/NAM inter-regional traffic flow
North America (NAM) Region				
NA-1	North America / Russian Far East	Toronto, Montreal, Edmonton, Winnipeg, Vancouver, Anchorage, Hong Kong, Russian Far East FIRS, Shanghai, Beijing, Tokyo	Continental High/Low Density	Major traffic flow ASIA/NAM/PAC
NA-142	North America/ polar tracks	Domestic US FIRs (Chicago, Seattle, Cleveland, New York, Boston, Minneapolis, Salt Lake), Canadian FIRs (Montreal, Toronto, Winnipeg, Edmonton, Vancouver), Anchorage, Arctic, Anchorage Continental, Beijing, Guangzhou, Hong Kong, Pyongyang, Russian Far East FIRs, Shanghai, Shenyang, Taegu, Tokyo, Wuhan, and Ulaanbaatar	Continental/oceanic low density Major traffic flow	One-directional flow ASIA/EUR/NAM/NAT
NA-153	Toronto — Cleveland, Chicago	Toronto, Cleveland, Chicago	Continental high density Major traffic flow	CAN-US East-west route
	Toronto — New York,	Toronto, Cleveland, New	Continental high density	CAN-US

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	Philadelphia, Washington	York, Washington	Major traffic flow	North-south route
	Montreal — New York	Montreal, Boston, New York	Continental high density Major traffic flow	CAN-US North-south route
	Anchorage, Vancouver Seattle — San Francisco — Los Angeles	Anchorage, Arctic , Vancouver, Seattle, Oakland, Los Angeles	Continental high density Major traffic flow	CAN-US North-south route
NA-164 Canada East-west flows	Toronto — Winnipeg — Calgary — Regina — Vancouver	Winnipeg, Edmonton, Vancouver	Continental high density Major traffic flow	Major traffic flows in Canadian southern domestic airspace
	Toronto — Ottawa — Montreal — Halifax	Toronto, Montreal, Moncton <u>Halifax</u>	Continental high density Major traffic flow	Major traffic flows in Canadian southern domestic airspace
	Vancouver — Edmonton	Vancouver, Edmonton	Continental high density Major traffic flow	Major traffic flows in Canadian southern domestic airspace
	Edmonton — Calgary	Edmonton	Continental high density Major traffic flow	Major traffic flows in Canadian southern domestic airspace
	Winnipeg — Regina	Winnipeg	Continental high density Major traffic flow	Major traffic flows in Canadian southern domestic airspace
NA-175 US East-west flows	Boston/New York/Chicago <u>Seattle</u> <u>Traffic flows within the US FIRs</u>	Boston, New York, Cleveland, Indianapolis, Chicago, Minneapolis, Salt Lake, Seattle, <u>Oakland, Kansas City, Albuquerque, Los Angeles, Atlanta, Memphis, Fort Worth, Miami, Houston, Dallas,</u>	Continental <u>very</u> high density Major traffic flow	<u>Core homogeneous ATM area</u> Major traffic flows in domestic US airspace
	Boston/New York/Washington DC/Denver — San Francisco	Boston, New York, Cleveland, Indianapolis, Chicago, Kansas City, Salt Lake, Oakland	Continental high density Major traffic flow	Major traffic flows in Canadian southern domestic airspace
	Boston/New York/Washington DC/Denver — Los Angeles	Boston, New York, Cleveland, Indianapolis, Chicago, Kansas City, Albuquerque, Los Angeles	Continental high density Major traffic flow	Major traffic flows in Canadian southern domestic airspace
	Atlanta/Dallas/Phoenix — Los Angeles	Atlanta, Memphis, Fort Worth, Albuquerque, Los Angeles	Continental high density Major traffic flow	Major traffic flows in Canadian southern domestic airspace
NA-17 US East-west flows	Atlanta/Dallas/Phoenix — San Diego	Atlanta, Memphis, Fort Worth, Albuquerque, Los Angeles	Continental high density Major traffic flow	Major traffic flows in Canadian southern domestic airspace
	Miami/Houston/Dallas/Phoenix — San Diego	Miami, Houston, Fort Worth, Albuquerque, Los Angeles	Continental high density Major traffic flow	Major traffic flows in Canadian southern domestic airspace
	Miami/Houston/Dallas/Phoenix — Los Angeles	Miami, Houston, Dallas, Albuquerque, Los Angeles	Continental high density Major traffic flow	Major traffic flows in Canadian southern domestic airspace

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