



Surveillance Seminar

Port of Spain, Trinidad and Tobago, 18 - 20 June 2007

Overview of GREPECAS Surveillance Conclusions and CAR Initiatives on the Implementation of Surveillance Systems

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North American, Central American and Caribbean Office

AGENDA

1. Overall view
2. ICAO Work on Surveillance Systems
3. Planning and Implementation
Regional Activities on Surveillance Systems
4. Conclusions
5. Questions and Answers

1. GENERAL

- ✈ ICAO has established that surveillance systems should provide proper support to all flight stages and meet ATM requirements.
- ✈ Surveillance should be provided as an integral part of the ATC, whenever it is viable, convenient or necessary for the benefit of safety, efficiency and economy of operations, mainly in those areas where traffic density or the multiplicity or the complexity of the routes cause restrictions.

2. ICAO WORK



Participants in the Work of ICAO

- ✈ **States**
- ✈ **International Organizations**
- ✈ **Airspace Users**
- ✈ **Industry**
- ✈ **Others**



Implementation of the Air Navigation Systems

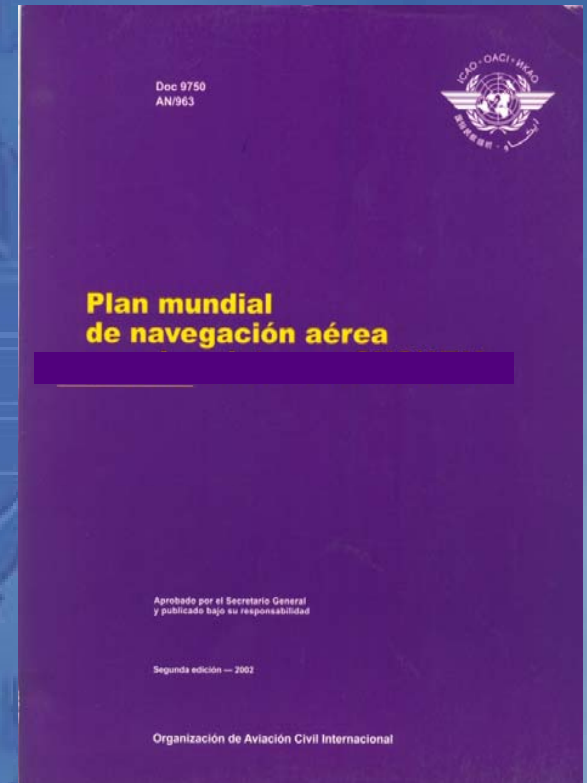
✈ Global Air Navigation Plan (Doc 9750)



Global Air Navigation Plan

✈ The **Global Air Navigation Plan** (Doc 9750) describes the strategy to reach short, medium and long term benefits.

✈ It contains guidelines on the evolutions of systems, tools for planning and implementation, as well as 23 initiatives known as GPIs.



Global Air Navigation Plan - Evolution

System  Performance Based

NEAR TERM

MEDIUM TERM

LONG TERM

Evolution- Phase 1

- Based on what we HAVE today
- Involves application of available procedures, processes and capabilities
- Identifies potential "gap" requirements that focus near term work program activities.

Evolution- Phase 2

- Based on what we KNOW today
- Involves application of emerging procedures, processes and capabilities
- Identifies "gap" requirements and drives future R&D

Evolution- Phase 3

- Based on CONCEPT expectations
- Involves application of new procedures, processes and capabilities
- Fills "gap" requirements and sustains continuous improvement R&D

Evolución Mundial de Transición

Sistema



Basado en la performance

CORTO PLAZO

MEDIANO PLAZO

LARGO PLAZO

Evolución - Fase 1

- Basada en lo que TENEMOS hoy
- Implica la aplicación de los procedimientos, procesos y capacidades disponibles
- Identifica las "brechas" potenciales en los requerimientos que se centran en las actividades del programa de trabajo del corto plazo

Evolución - Fase 2

- Basada en lo que SABEMOS hoy
- Implica la aplicación de procedimientos, procesos y capacidades emergentes
- Identifica las "brechas" en los requerimientos e impulsa la investigación y desarrollo futuros

Evolución - Fase 3

- Basada en las expectativas del CONCEPTO
- Implica la aplicación de nuevos procedimientos, procesos y capacidades
- Salva las "brechas" en los requerimientos y mantiene la mejora continua de la investigación y el desarrollo

GPI RELATED TO THE SURVEILLANCE SYSTEMS

GPI – Global Plan Initiatives
(Iniciativas de Eficiencia Mundial)

(GPI-9) Situational awareness

- ✈ **Scope:** Operational implementation of data link-based surveillance. The implementation of equipment to allow traffic information to be displayed in aircraft supporting implementation of conflict prediction and collaboration between flight crew and the ATM system. Improve situational awareness in the cockpit by making available electronic terrain and obstacle data of required quality.
- ✈ **Related ATM objectives:** AMSS; HF data; VHF data; SSR Mode S; ADS-B; ATN

(GPI-9) SITUATIONAL AWARENESS

Scope

- ✈ Data link based surveillance implementation to allow traffic information to be displayed in aircraft supporting implementation of conflict prediction and collaboration between flight crew and the ATM system. Improve situational awareness in the cockpit by making available electronic terrain and obstacle data of required quality.

(GPI-9) SITUATIONAL AWARENESS

Description of strategy

- ✈ Enhanced surveillance techniques (ADS-C or ADS-B) will allow reductions in:
 - ✈ Reductions in separation minima and an enhancement of safety, increase in capacity, improved flight efficiency, all on a cost-effective basis.
 - ✈ Applications of GPI-9: En route, Terminal area and infrastructure support.

(GPI-9) SITUATIONAL AWARENESS

Description of strategy (Cont.)

- ✈ These benefits may be achieved by bringing surveillance to areas where there is no primary or secondary radar, when cost-benefit models warrant it.
- ✈ In airspaces where radar is used, enhanced surveillance can bring a further reduction in aircraft separation minima.
- ✈ Improve, in high traffic density areas, the quality of surveillance information both on the ground and in the air, thereby increasing safety levels.

(GPI-9) SITUATIONAL AWARENESS

Description of strategy (Cont.)

- ✈ ADS-C is used in remote and oceanic airspace in conjunction with aircraft FANS capabilities.
- ✈ ADS-B can be used to enhance traffic surveillance in domestic airspace, supported by data link through Mode S 1090 extended squitter which is available and accepted to be used in a short term.

(GPI-9) SITUATIONAL AWARENESS

Description of strategy (Cont.)

- ✈ The sample of cockpit display of traffic information and associated procedures will enable pilot participation in the ATM system and improve safety through greater situational awareness.
- ✈ Implementation of surveillance systems for surface movement at aerodromes where weather conditions and capacity warrant will also enhance safety and efficiency.

(GPI-9) SITUATIONAL AWARENESS

Description of strategy (Cont.)

- ✈ At terminal areas and at aerodromes surrounded by significant terrain and obstacles, the availability of quality assured terrain and obstacle databases containing digital sets of data representing terrain surface in the form of continuous elevation values will improve situational awareness and the reduction of accidents.

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3. Regional Planning and Implementation Activities on Surveillance Systems



Caribbean and South American Regional Planning and Implementation Group

(GREPECAS)

Grupo Regional de Ejecución y Planificación del Caribe y Sudamérica

GREPECAS CNS Committee



ATM/CNS SG

**CNS
Committee**

ATN TF

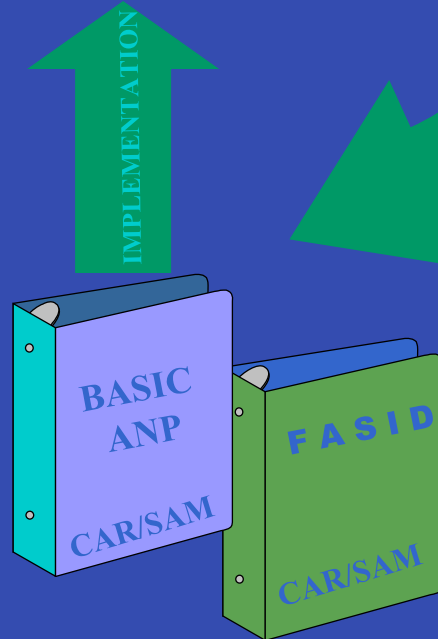
GNSS TF

SUR TF

AIR NAVIGATION REGIONAL PLANNING



**GREPECAS
CONTRIBUTORIES BODIES**



THE ROLE OF GREPECAS

- ✈ The planning and implementation of surveillance systems in the CAR/SAM Regions is guided by GREPECAS, complying with the Air Navigation Plan and in accordance with SARPs and ICAO guidelines.

Main results of the GREPECAS activities on surveillance systems

- ✈ Regional guidelines on radar system development.
- ✈ Regional guidelines on the planning and implementation of automatic dependent surveillance (ADS) systems.
- ✈ Initial studies on planning of radar data exchange.
- ✈ Actions to improve and complete the Surveillance Systems Regional Plan.
- ✈ Study on the application of ADS-B.

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ADS Conclusions Drafted by GREPECAS

GREPECAS Conclusions on Surveillance

✈ CONCLUSION 11/50 – PRELIMINARY REGIONAL GUIDELINES ON AUTOMATIC DEPENDENT SURVEILLANCE SYSTEMS

- ✈ Approved and oriented the preliminary regional guidelines on automatic dependent surveillance (ADS) systems.**

GREPECAS Conclusions on Surveillance

✈ CONCLUSION 12/44 – REGIONAL CAR/SAM GUIDANCE FOR THE ADS-B DATA LINKS INTRODUCTION

- ✈ According to operational requirements it guided the regional use of the 1090 MHz ES as data links for the implementation of short-term ADS-B.**

ADS-B trials regional programme

✈ CONCLUSION 13/87 – ADS-B TRIALS PROGRAMME IN THE CAR/SAM REGIONS

- ✈ Guided States/ Territories/ International Organizations in collaboration with the airspace users, establish and execute an ADS-B trials programme using the available technology and services in order to improve the ADS-B knowledge and to evaluate the benefits for the air traffic management.

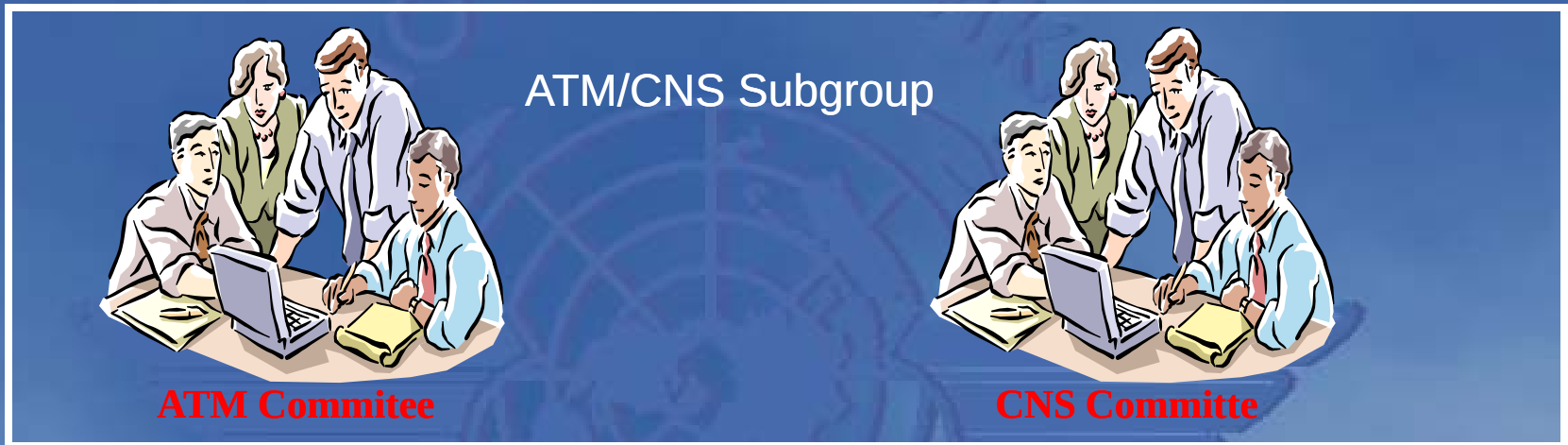
Updating of the Surveillance Regional Plan

- ✈ Taking into account the ADS-C and ADS-B implementation initiatives, as well as the results of the studies on other Surveillance systems:
- ✈ The CNS Committee prepared a proposal for amendment to Table CNS 4A – *Surveillance* Plan of the CAR/SAM ANP FASID, which was adopted by the GREPECAS/14 Meeting.

ADS-B trials regional programme

- ✈ It will involve different activities and it will need the interaction with representatives of international organizations and the industry for technical and operational assessments.
- ✈ The purpose is to obtain optimized solutions on implementation options.
- ✈ The impact could provide a new perspective on States' implementation plans.
- ✈ A **Surveillance Task Force** has been created within the GREPECAS Mechanism.

CONTINUATION OF THE GREPECAS ATM / CNS SUBGROUP



- ✈ The ATM and CNS Committees continue developing surveillance related tasks.
- ✈ The Fifth Meeting of the CNS Committee reviewed the preliminary strategy on the ADS-B implementation which was adopted by GREPECAS/14.

Regional Strategy for the ADS-C and ADS-B implementation (Preliminary)

- ✈ **Short Term (until 2011):** Deployment of ADS-C in oceanic and remote areas. ADS-B in continental airspace to improve surveillance through ICAO data-oriented communication techniques (ADS-B – 1090 ES).
- ✈ **Medium Term (2011-2015):** The use of available technologies will be continued. The planning of the implementation of a new ICAO guided surveillance data link will be initiated.

Regional Strategy for the ADS-C and ADS-B implementation (Preliminary)

✈ Long term (From 2015):

The deployment of future ADS-C and ADS-B systems will commence through the application of new concepts and technologies to meet the new ATM operational requirements.

Unified Surveillance Regional Strategy

- ✈ The CNS Committee is developing a unified regional strategy on the implementation of surveillance systems.
- ✈ This unified strategy will integrate the multilateration strategy, ADS-C, ADS-B and Mode S.

Other GREPECAS tasks on Surveillance

- ✈ Furthermore, the GREPECAS/13 and 14 noted the **States initiatives**, as well as the studies carried out by the CNS Committee of the ATM/CNS Subgroup on:
 - a) ACAS II regional implementation
 - b) Implementation of Mode S SSR
 - c) Study on the regional implementation of ADS-C and ADS-B Systems

Other Work of the GREPECAS on Aeronautical Surveillance

- ✈ It is expected that CNS Committee and ATM Committee of the ATM/CNS Subgroup ATM/CNS will continue the develop of the assigned tasks. It is expected that the results of this work will be reviewed and adopted by GREPECAS/15 meeting (Brazil, October 2008).

EXISTING PSR FACILITIES - CAR REGION

(Table CNS 4A, ANP FASID)

- ✈ Aruba (T)
- ✈ Costa Rica (T)
- ✈ Dominican Republic (T)
- ✈ El Salvador (T)
- ✈ Guatemala (T)
- ✈ Honduras (T)
- ✈ Jamaica (T)
- ✈ Mexico (E/T)
- ✈ Netherlands Antilles (E/T)
- ✈ Nicaragua (T)
- ✈ Puerto Rico (E/T)
- ✈ Trinidad and Tobago (E/T)
- ✈ Virgin Is. (USA) (E/T)

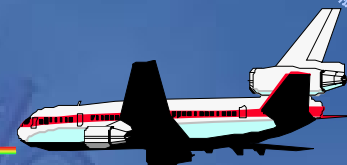
EXISTING SSR FACILITIES - CAR REGION (MANY MSSR) (Table CNS 4^a, ANP FASID)

- ✈ Antigua & Barbuda –(T)
- ✈ Aruba (T)
- ✈ Bahamas (E/T)
- ✈ Barbados (T)
- ✈ Costa Rica (T)
- ✈ Cuba (E/T)
- ✈ Dominican Republic (T)
- ✈ El Salvador (T)
- ✈ French Antilles (T)
- ✈ Guatemala (T)
- ✈ Honduras (T)
- ✈ Jamaica (T)
- ✈ Mexico (T)
- ✈ Netherlands Antilles (S/T)
- ✈ Nicaragua (T)
- ✈ Puerto Rico (E/T)
- ✈ Trinidad and Tobago (E/T)
- ✈ Turk and Caicos Is. (E/T)
- ✈ Virgin Is. (USA) (E/T)
- ✈ COCESNA (E/T)

SSR Mode S Implementation Initiatives CAR REGION

- Dominican Republic
- Mexico
- COCESNA

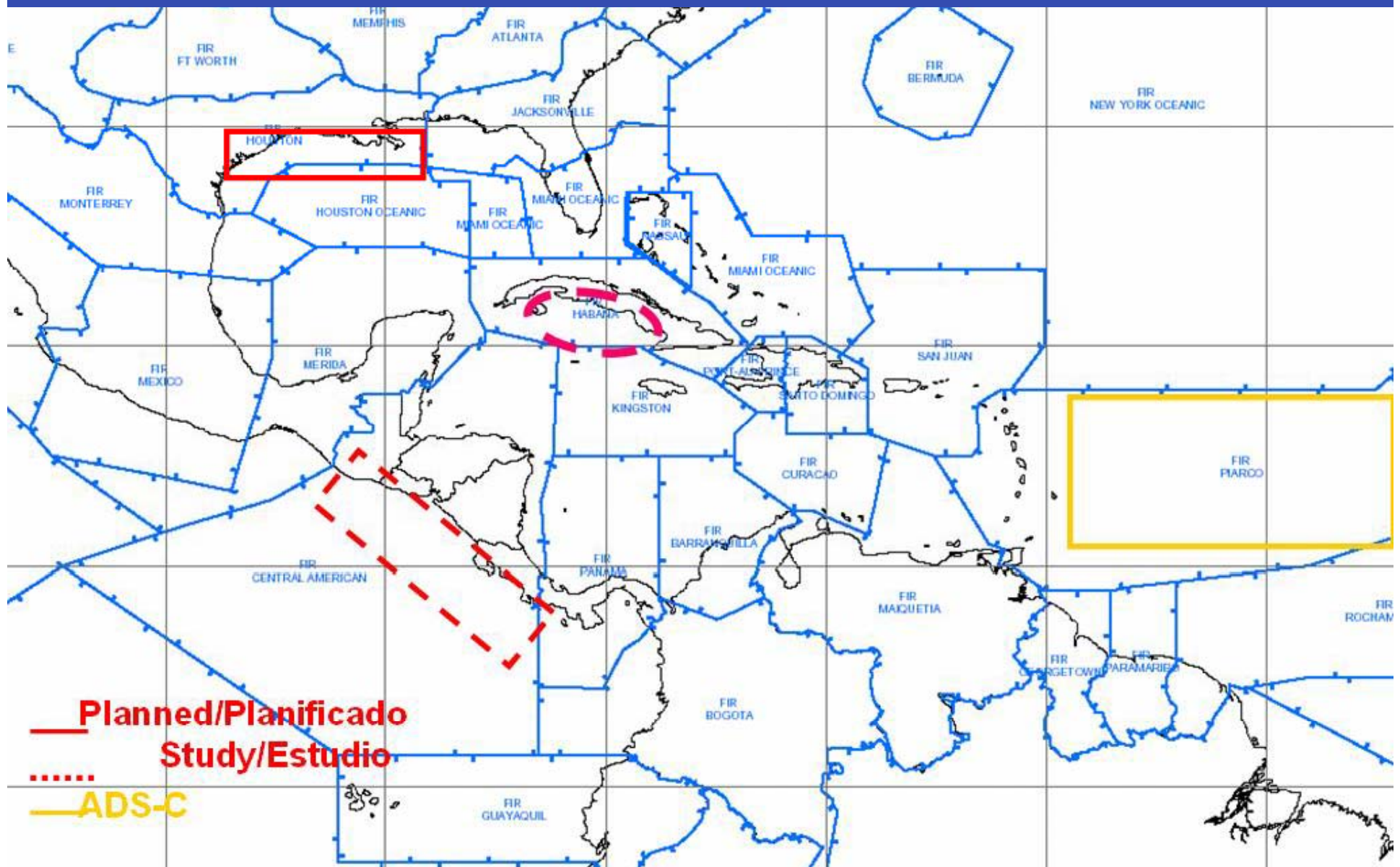
ADS-B Regional Activities



- **Studies**
- **Trials (States/T/IO and Users)**
- **Planning of Implementation (States and Airspace Users)**



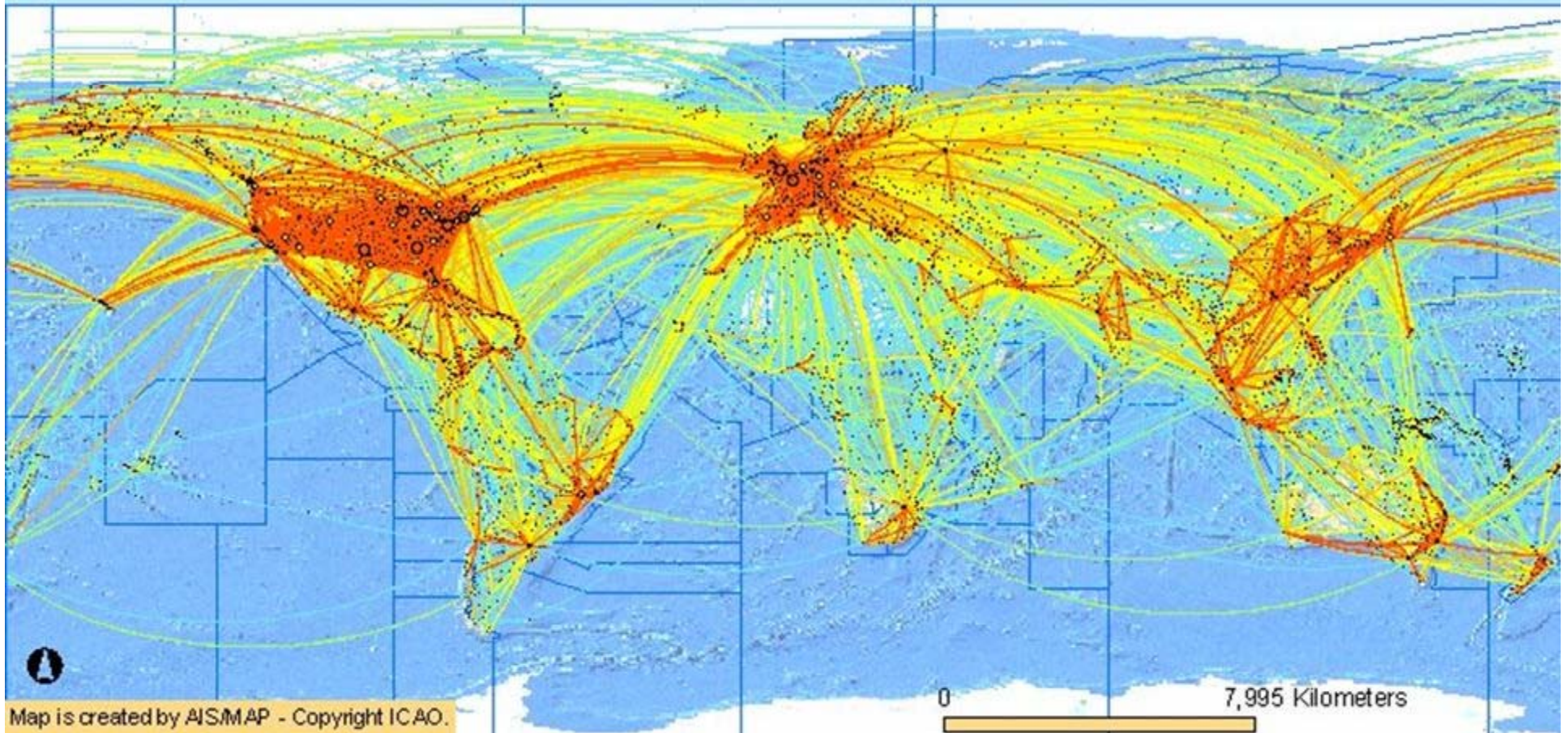
ADS-B and ADS-C Implementation Initiatives

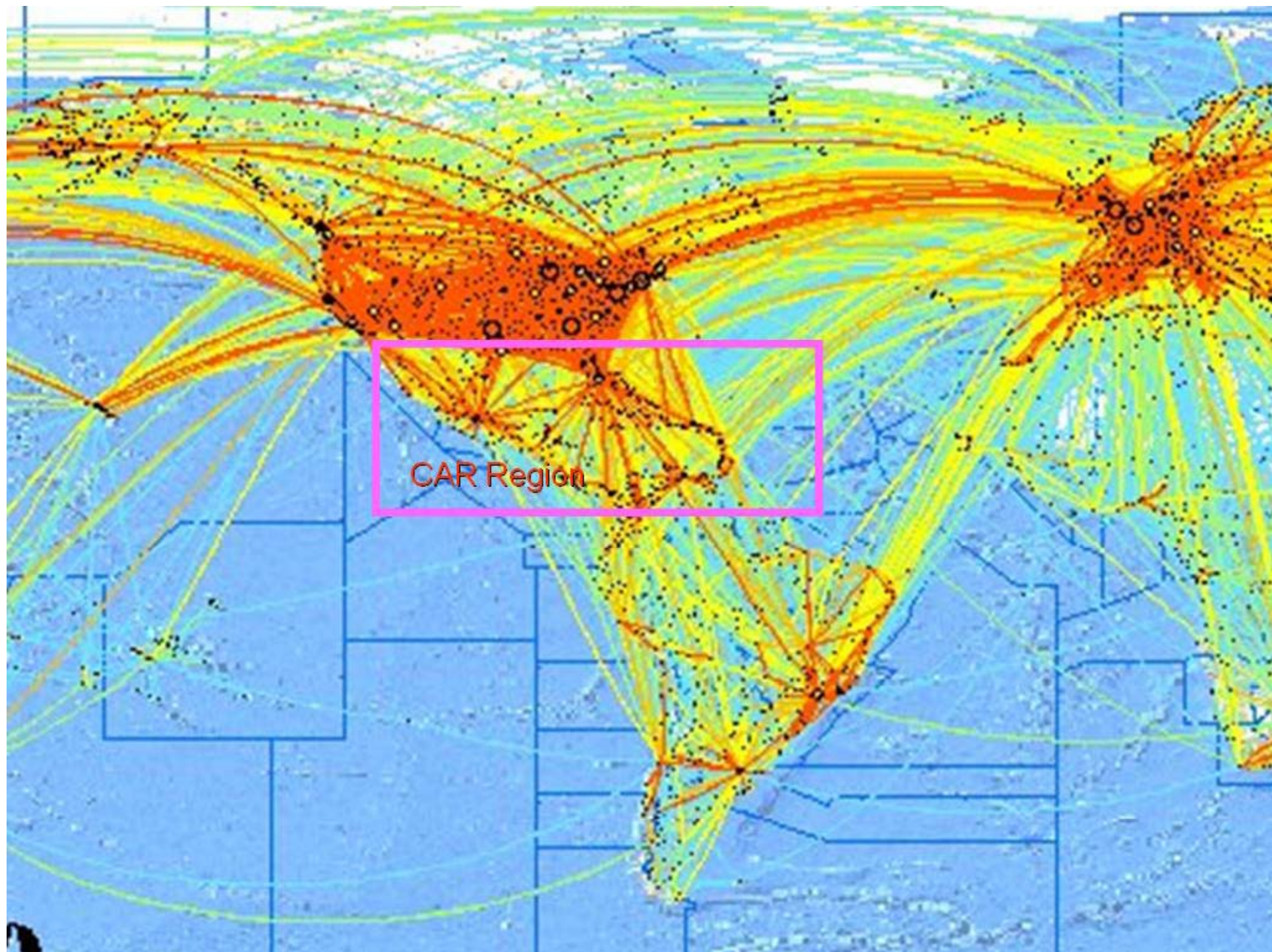




✈ The surveillance systems trials and implementation initiatives should be based on regional agreements, operational requirements and with the participation of States / Air Navigation Service Providers and Airspace Users.

Operational Requirements of the Homogenous Areas and Main Traffic flows





Other activities on Aeronautical Surveillance in the CAR/SAM Regions

- ✈ It is expected that this Seminar (Port of Spain, Trinidad and Tobago, 18 – 20 June 2007) will give fresh impetus to the Regional Surveillance Initiatives and planning of implementation based on regional agreements.

CONCLUSIONS



1. The surveillance implementation techniques should be carried out according to the required performance and based on regional guidelines.
2. Follow-up the GREPECAS work. This mechanism is preparing a unified regional strategy for the implementation of surveillance systems.
3. Take into account that surveillance based on data links is having a remarkable development and a rapid evolution due to its multiple benefits and relative low cost.

CONCLUSIONS



4. ICAO urges States and navigation service providers and airspace users to continue the implementation of surveillance related activities in a coordinated manner:

- ✓ Studies
- ✓ Trials
- ✓ Implementation Planning
- ✓ Implementation execution
- ✓ Others

CONCLUSIONES



5. The work, coordination and cooperation among States, Air navigation service providers and Users, with the support of the industry, in accordance with GREPECAS guidelines, the application of SARPs and ICAO guidelines, will contribute to meet the surveillance requirements, obtaining benefits, contributing to the improvement of safety and efficiency of air operations.

✈ All presentations of this Surveillance Seminar will be published in the ICAO NACC Regional Office Website:

✈ www.icao.int/nacc

✈ Meetings

✈ 2007 - Surveillance Seminar for the NAM/CAR/SAM Regions, Port of Spain, Trinidad and Tobago, 18 to 20 June 2007 / Seminario sobre Vigilancia para las Regiones NAM/CAR/SAM, Puerto España, Trinidad y Tabajo, del 18 al 20 de junio de 2007

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Questions & Answers



END
THANK YOU