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# **Global Air Navigation System ~ Planning Mechanisms ~**

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**Workshop on the development of  
National Performance Framework for  
Air Navigation Systems  
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# Overview

- **Global ATM system**
- **Planning by partners**
- **Global/Regional/National level**
- **Subregional/Multinational approach**
- **Other Planning Mechanisms**
  - **Homogeneous ATM areas**
  - **Major Air Traffic Flows**
- **Implementation Strategy**

# Global ATM System

- **It is a worldwide system**
  - **Meets agreed levels of safety**
  - **Provides for optimum economic operations**
  - **Environmentally sustainable**
  - **Meets national security requirements**
  - **Provides seamlessness for all users during all phases of flight**
- **Achieves seamlessness through**
  - **Homogeneous ATM areas and Major Traffic flows**
  - **Interoperability (common requirements, Standards and procedures) and harmonization ( tools and timing)**
  - **Performance based equipment carriage**

# Planning Approach...

Partners	Planning Levels	Deliverables	Guidance
ICAO	Global	Global plan	ICAO policy
Regional planning groups	Regional	Regional plan	Global plan
Subregional/ or Multinational groups	Subregional or Multinational	Subregional plan or Multinational	Regional plan
States	National	National plan	Regional plan

# Planning Approach

<b>Partners</b>	<b>Planning Levels</b>	<b>Deliverables</b>	<b>Guidance</b>
Airspace users	Regional, national	User-driven plan	Regional and national plans
Service providers	Global, regional, national	Service- provider plan	Global, regional and national plans
Industry	Global, regional, national	Manufacturer plan	Global, regional and national plans

Council ↔ Air Navigation Commission

ANC panels

- User requirements
- Operator requirements
- ATS provider requirements
- EUROCAE
- RTCA

**ATM OPERATIONAL CONCEPT**

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**Global Planning**

- ◆ Global Air Navigation Plan
- ◆ Standards & Recommended Practices
- ◆ Procedures and Air Navigation Services manuals and circulars

User needs

ATM requirements

Validation

ATM system requirements

Air traffic forecasts

**Regional Planning**  
**Regional Air Navigation Plans**

APANPIRG (ASIA/PAC)	APIRG (AFI)	EANPG (EUR)	GREPECAS (CAR/SAM)	MIDANPIRG (MID)	NATSPG (NAT)	NAMPNG (NAM)
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**National Planning**  
**National Plans**

National Architecture	National Architecture	National Architecture	National Architecture
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National Architecture

National Architecture

National Architecture

National Architecture

ATM requirements

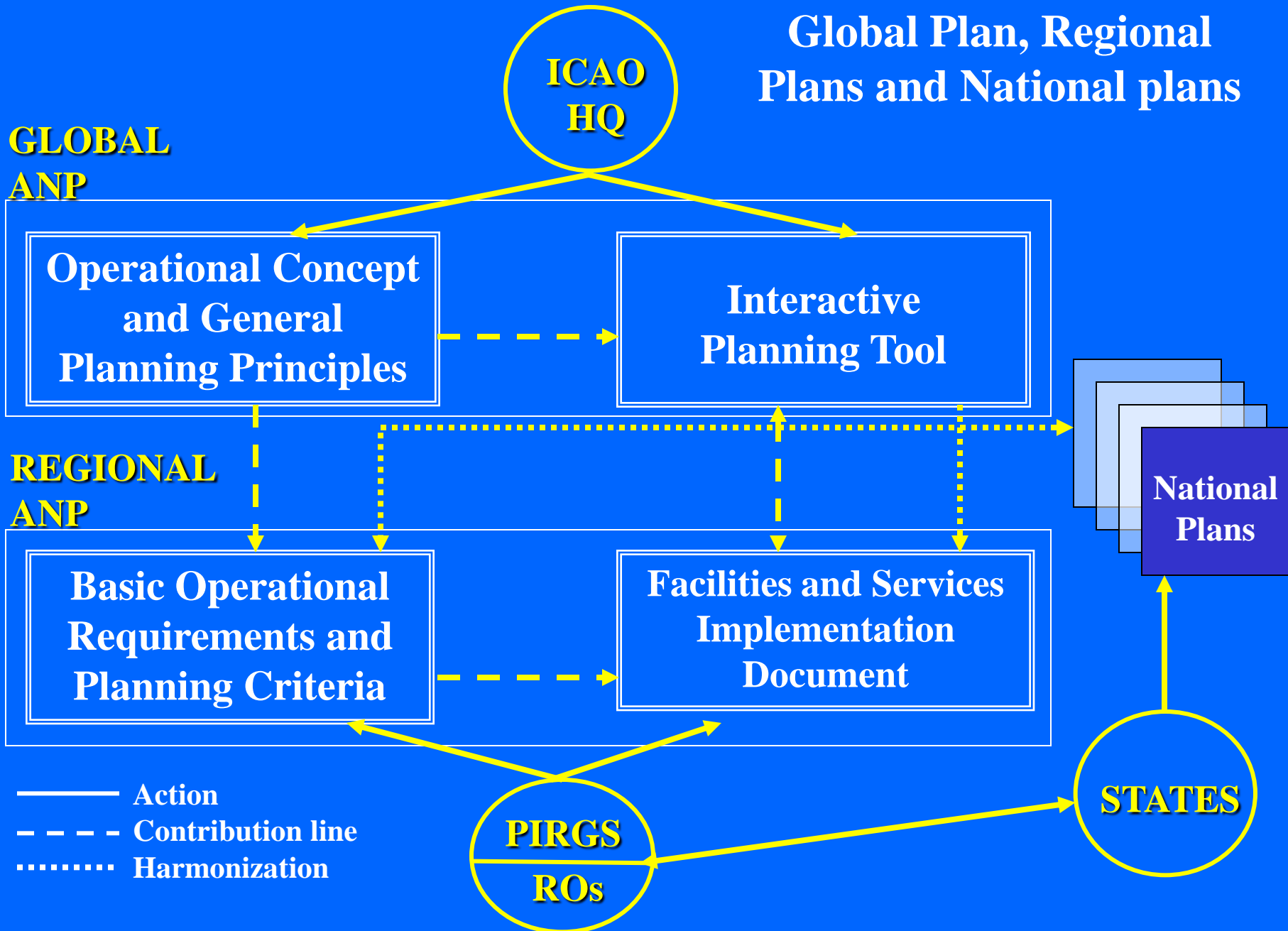
ATM requirements

**ICAO AIR NAVIGATION PLANNING PROCESS**

◆ = regional air navigation plan

**ATM OPERATIONAL CONCEPT**

# Global Plan, Regional Plans and National plans



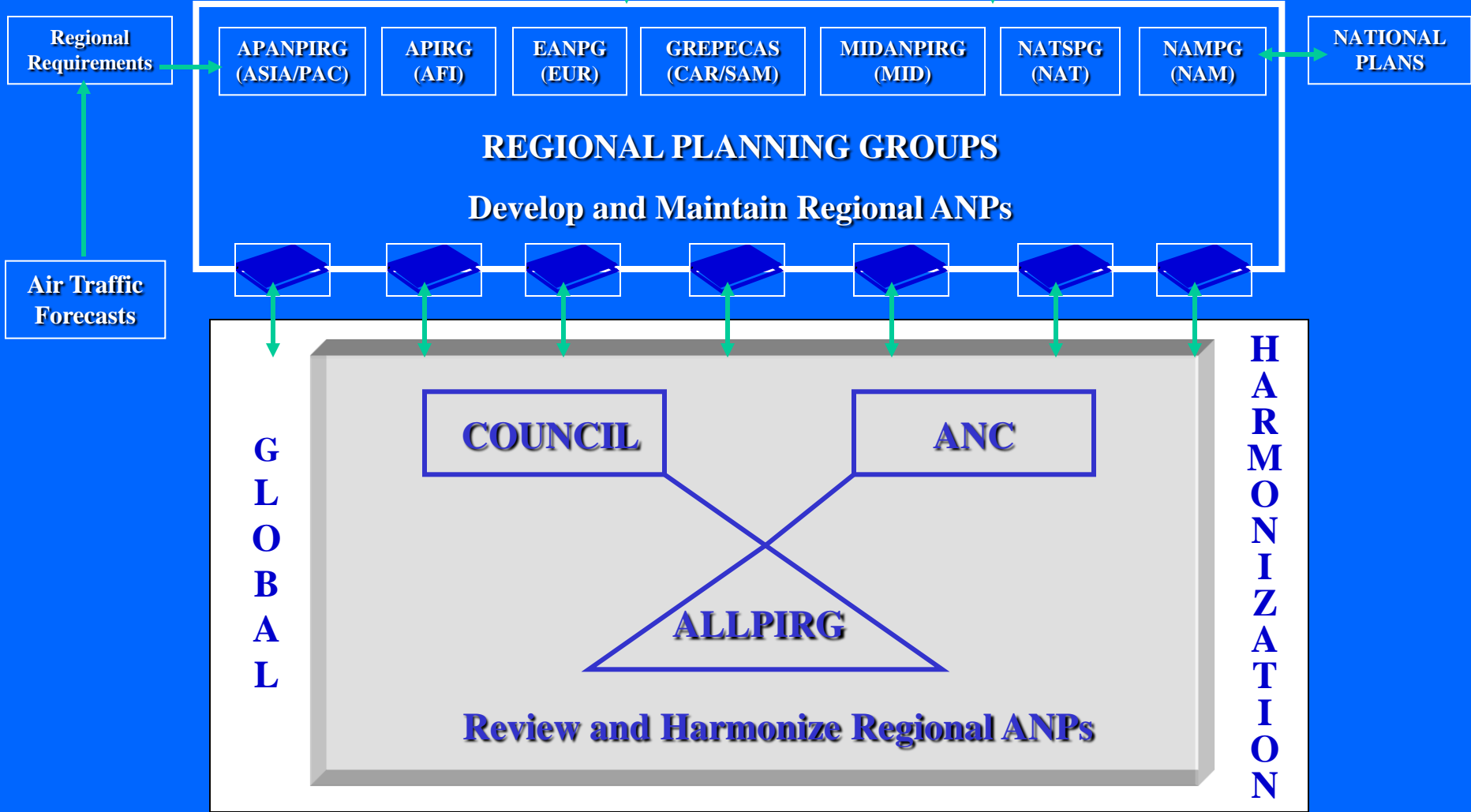


Planning process at the regional level



# GLOBAL GUIDANCE

## Global Plan , SARPS, PANS, Guidance Material



**Interregional coordination**

# Subregional/ Multinational approach ...

- **Calls for political will**
- **Common goals in terms of ATM objectives and/or CNS requirements**
- **Not necessarily adjoining or cross-border**
- **Provides integration, rationalization and harmonization of systems and procedures**
- **Reduces equipage and maintenance costs**
- **Facilitates financing**

# Subregional/ Multinational approach ...

- Envelops multiple States/regions
- Infrastructure establishment by a multinational group, service providers or State(s)
- Operational management rests with multinational group, service providers or State(s)
- Better utilization of combined and unified airspace

# Subregional/ Multinational approach

- **Early benefits to airspace users and States**
- **Lends itself to a business case**
- **User charges is one means of cost recovery; will also serve as a source of repayment**
- **Possible to establish joint charges collection agency**
- **Based on Homogenous ATM area**
- **Examples: Eurocontrol; ASECNA; and COSESNA**

# Other planning mechanisms

- **Planning based on Homogenous ATM areas**
- **Planning based on Major Traffic Flows.**

# Planning based on homogeneous ATM areas and major traffic flows ...

## Homogeneous ATM areas

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 common detailed plan fosters the implementation of interoperable CNS/ATM systems.

They may extend over States, specific portions of States or groupings of smaller States. They may include large oceanic and continental en route areas.

# Homogeneous ATM areas – some examples



# Planning based on homogeneous ATM areas and major traffic flows

## Major traffic flows

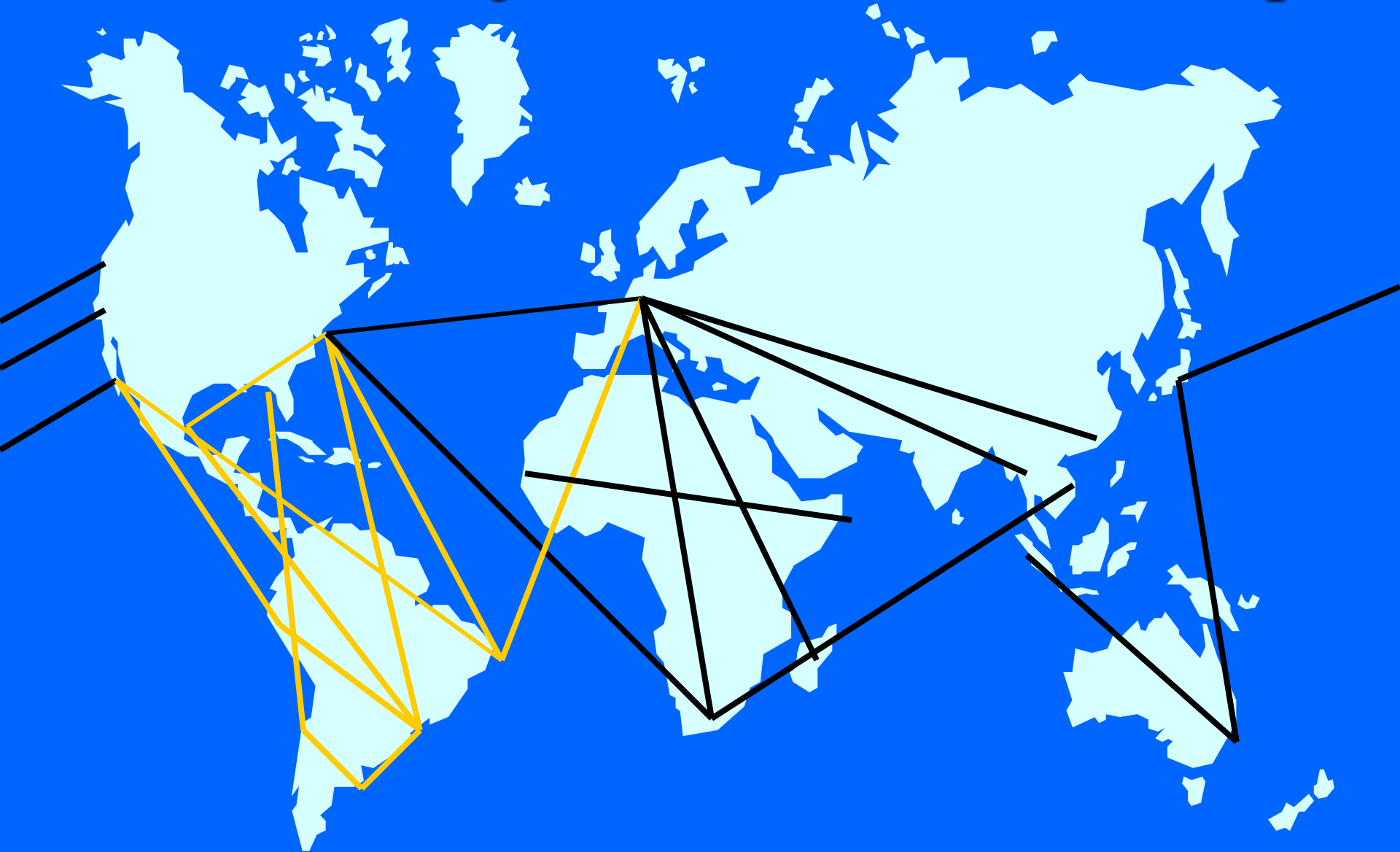
**Major traffic flow:** A concentration of significant volumes of air traffic on the same or proximate flight trajectories.

*Note: Major traffic flows may cross several homogeneous ATM areas with different characteristics*

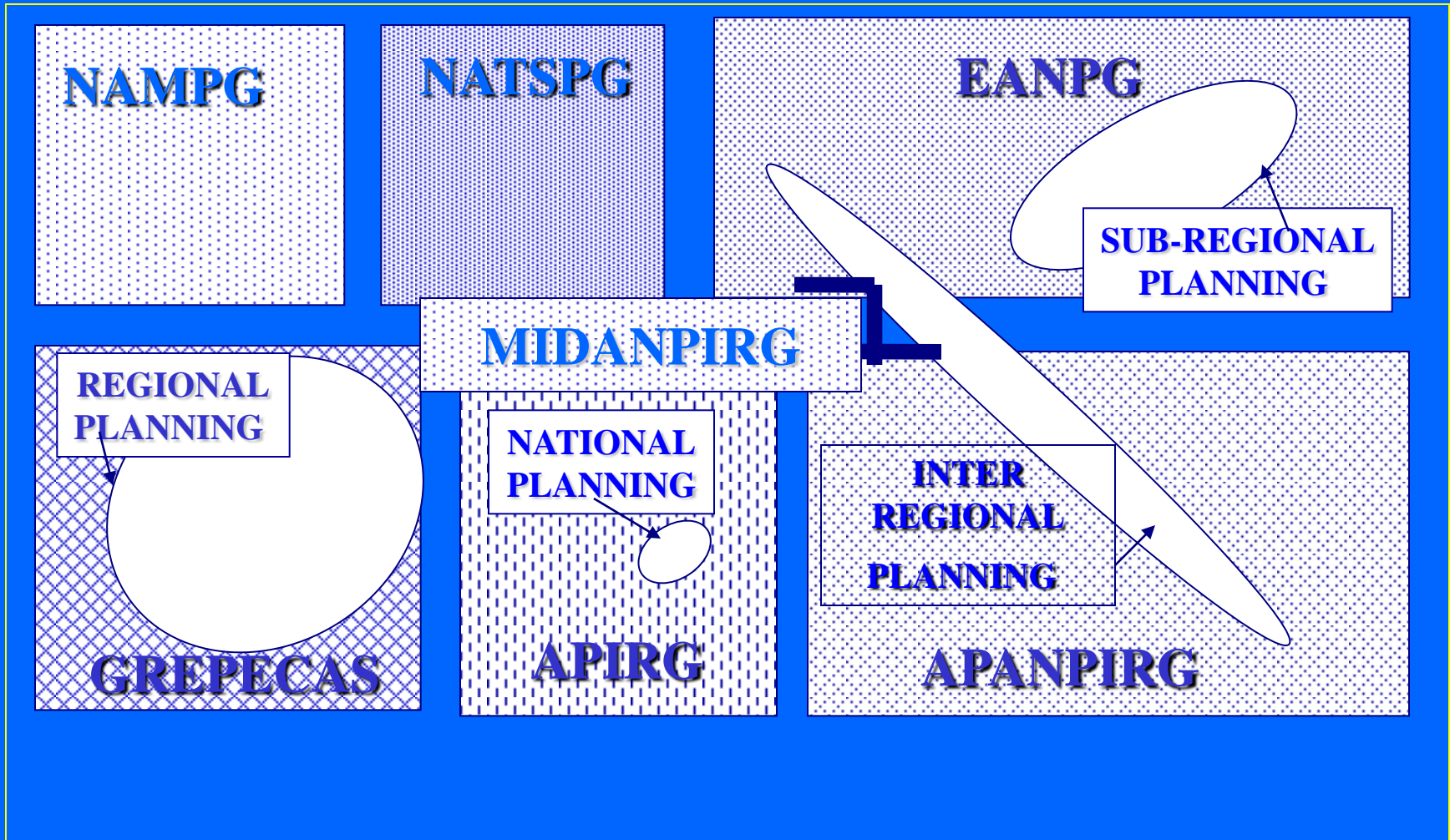
**Routing area:** A defined area encompassing one or more major traffic flows



# World major traffic flows – example



# Major traffic flows



**Interface issues**

# Major traffic flow approach ...

- **May include various types of airspace; oceanic, continental en route and terminal areas**
- **Common goals in terms of ATM objectives and/or CNS requirements**
- **Early benefits to airspace users and States**

## **Major traffic flow approach ...**

- **Envelops multiple States and/or regions**
- **Involves consideration of air navigation infrastructure, traffic density and airspace users' needs**
- **Necessarily adjoining or cross-border for it to be a part of the traffic flow**
- **Has interoperable CNS systems**

# Major traffic flow approach ...

- Absorbs gate-to-gate concept
- Establishment of infrastructure could be by a multinational group, ANS provider or State(s)
- Provides integration, rationalization and harmonization of systems and procedures

# **Major traffic flow approach ...**

- **Facilitates financing**
- **Operational management rests with multinational group, ANS providers or State(s)**
- **Lends itself to a business case; consequently, it is easier to fund the project**

# Major traffic flow approach

- User charges is one of the means of cost recovery and will also serve as a source of repayment
- Possible to establish a joint charges collection agency

# **Examples of implementation based on major traffic flow approach**

- **Implementation RVSM from Asia to Europe via south of the Himalayas, through the Middle East, effective 23 November 2003; and**
- **RVSM implementation in the Europe/South America corridor, through the Africa-Indian Ocean Region, effective 24 January 2002**



# Approach to implementation...

- **The approach to implementation is on the basis of:**
  - **progress already achieved**
  - **experience gained by PIRGs and States in the previous cycle of air navigation systems implementation process**
  - **existing capabilities of the air navigation systems**

# **Approach to implementation**

- **23 GPIs identified for addressing short- and medium-term requirements**
- **All GPIs are being implemented by PIRGs and States in different degrees and different time frames**

# Implementation strategy

- A collective commitment of all participating/ concerned entities in the State
- Air navigation systems to be introduced in evolutionary stages, with progressive development of technology and procedures
- High-risk approach associated with a “big bang” implementation to be prevented
- Framework must include an integrated approach, encompassing all elements of air navigation systems, such as technical, operational, economical and institutional issues

# Implementation strategy

- **Current ATM operations not be effected**
- **During the transition and implementation stages, no degradation in the level of safety**
- **Must be a continuous interface with adjacent areas/cross-border States/States within the region to ensure coordinated implementation and consistency of ATM services**

# SUMMARY

- **Discussed planning mechanisms**
  - **Global, Regional, Subregional, and National level**
  - **Planning based on Homogeneous ATM areas and Major Traffic Flows**
- **Reviewed Implementation Strategy**

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