



# **GLOBAL AIR NAVIGATION PLAN**

**(Presented by the Secretariat)**

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**Fifth meeting of ALLPIRG/Advisory Group  
(ALLPIRG/5)**

**Montreal, 23-24 March 2006**

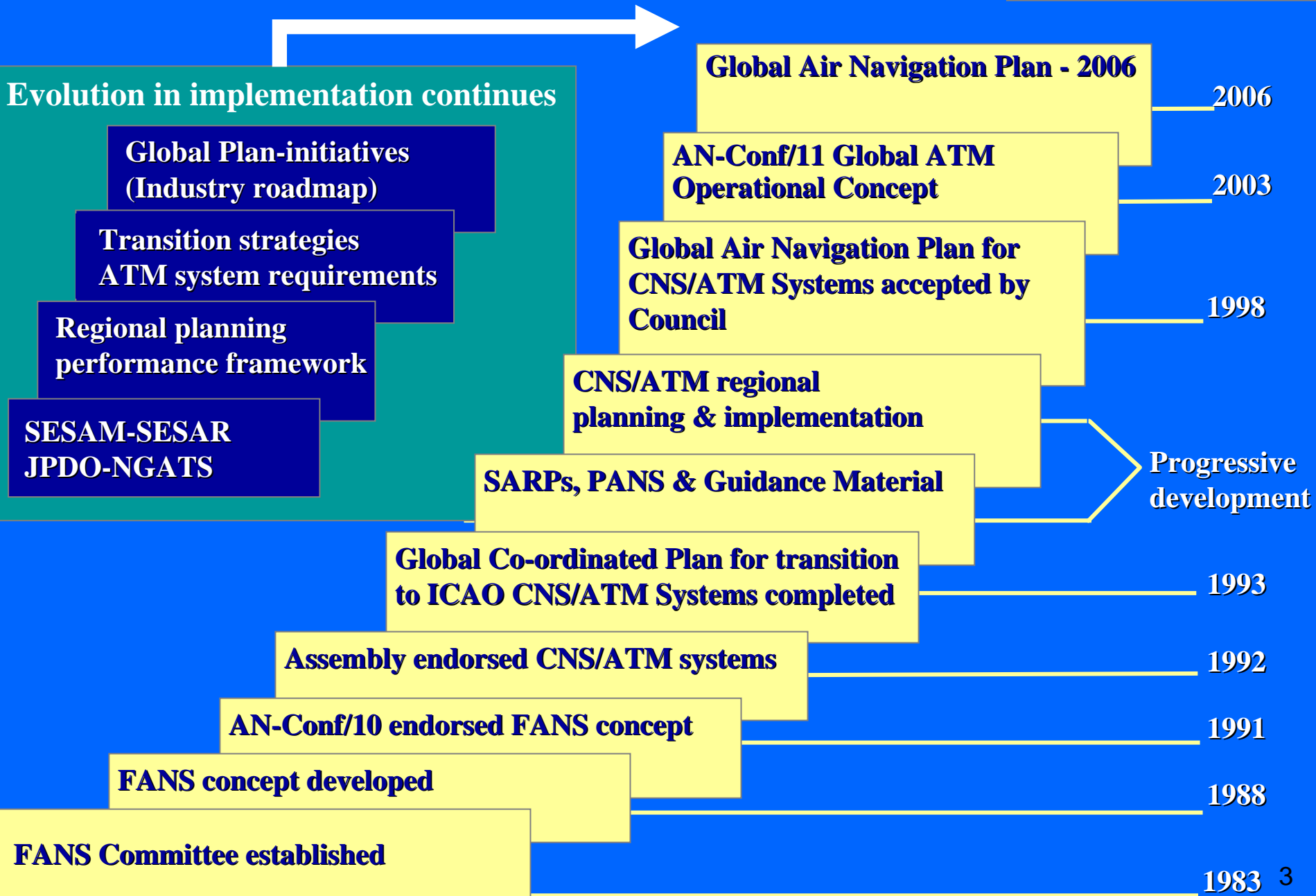


# Presentation Outline

- **Historical**
- **Global Plan Initiatives**
- **Achieving a global ATM system**
- **Measuring success**
- **Regional integration**
- **Transition**

# Path toward Global ATM

Global ATM  
2010 and beyond





# A Global ATM System

- **Worldwide system**
- **Achieves interoperability and seamlessness**
  - **Homogeneous ATM areas and Major Traffic flows**
  - **Aerodromes and terminal control areas**
- **For all users during all phases of flight**
- **Meets agreed safety levels**
- **Provides for optimum economic operations**
- **Environmentally sustainable**
- **Meets national security requirements**



# **Eleventh Air Navigation Conference (AN-Conf/11) -Outcome**

- **endorsed the global ATM operational concept**
- **requested ICAO to:**
  - **develop ATM system requirements**
  - **address interoperability and seamlessness**
  - **define requirements for global AIM**
  - **publish the operational concept**
  - **amend the Global Plan**
  - **harmonize interregional AN systems**
  - **establish an ICAO air navigation database**
  - **develop a performance framework**



# **Eleventh Air Navigation Conference (AN-Conf/11) — Outcome**

- **That States and PIRGs consider the Global Air Navigation Plan for CNS/ATM Systems as a catalyst for change, providing a global safety and interoperability framework while allowing regional or local adaptation to efficiently meet regional and local needs**



# Partnering with Industry

## ANC Industry Meeting – Conclusions

- That those industry partners in a position to do so, work together toward the development of a common roadmap/global action plan, aimed at attaining operational benefits in the near to medium term for inclusion in the ICAO Global Air Navigation Plan



# Partnering with Industry

- To ensure that the capabilities and capacities offered through existing aircraft equipage, ATM infrastructure and ATC systems is utilized to the maximum extent possible
- To deliver transitional benefits while we continue our evolution





# **Global Plan as a transition roadmap**

- **Revised Global Plan** developed on the basis of
  - **Recommendations of AN-Conf/11**
  - **Global ATM Operational Concept**, which provides the target system
  - **Industry Roadmap**, which provides the near and medium industry requirements
- **Global Plan** provides guidance on environment, business case, costs, human resources, etc.



# Revised Global Plan — Structure

- Global Plan is contained in a single volume instead of the present two-parts format
- The first three chapters of the amended Global Plan provides guidance including GPIs
- Part I of the present version of the Global Plan is valid and has been relocated as appendices to the amended Global Plan; and
- In response to changing needs, Part II of the present Global Plan has been discontinued, as it is not relevant any more



# **Global Plan Initiatives (GPI)**

- **Options for ATM improvements**
- **Relate to ATM objectives in current version of Global Plan**
- **Result in direct performance enhancements**
- **Meet performance objectives**
- **Based on Industry Roadmaps and current regional activities**
- **Bring near- and medium-term benefits to aircraft operators**





# Measuring success

- **Success of ICAO**
  - **Business Plan and timelines**
- **Success of the Global air navigation system**
  - **capacity**
  - **efficiency**
  - **environment**
  - **flexibility**
  - **interoperability**
  - **safety**



# Regional integration



# **Approach to implementation**

- **The approach to implementation of GPIs builds on:**
  - **progress already achieved**
  - **experience gained by PIRGs in the previous cycle of CNS/ATM systems implementation process**
  - **existing capabilities of the air navigation systems; and**
  - **successful regional implementation**

# What is new in the revised Global Plan?

No	Current version	New version
1	Covers only CNS and ATM elements thus known as Global ANP for CNS/ATM systems	Expands to related elements such as AIS/AGA/MET thus known as Global ANP
2	ICAO developed with indirect participation from industry and States	ICAO developed with direct participation from industry and States





# What is new in the revised Global Plan?

No	Current version	New version
3	Extends to near-, mid-, and long-term	Restricted to near-and mid-term, with long-term to be addressed
4	Focuses on objectives & systems	Relates to Performance
5	P (paper)—based	E (electronic)—based



# What is new in the revised Global Plan?

No	Current version	New version
6	Provided passive harmonization	Ensures active harmonization
7	Implementation based on 45 objectives and systems	45 objectives have been refined and aligned to performance based 23 Global Plan Initiatives
8	Does not support planning tools for its implementation	Number of planning tools (software, web-based, project mgt, etc.) available



# What is new in the revised Global Plan?

No	Current version	New version
9	Need for separate regional CNS/ATM plans	Integrated as a part of Global Plan
10	Limited interregional as well as functional integration within ICAO	Extended interregional as well as functional integration within ICAO



# **Regional integration of Global Plan Initiatives (GPIs)**

- **23 GPIs identified for addressing short- and medium-term requirements**
- **Of 23 GPIs, only 6 were not part of previous Global Plan**
- **All GPIs are being implemented by PIRGs in different degrees and different timeframes**



# **Regional integration of Global Plan Initiatives (GPIs)**

- **Secretariat is**
  - **Including GPIs into ANPs thus integrating in the planning process**
  - **Harmonizing all ANP tables**
  - **Revisiting the BORPC as contained in the regional ANPs**
- **Implementation of GPIs is encouraged using progressive, cooperative and cost-effective approach**



# **Global Plan – Final delivery**

- **Secretariat is presently consulting States**
- **Comments from States/ALLPIRG will be presented to the ANC for its final review in October 2006**
- **Final approval by the Council is scheduled for November 2006**
- **Publication**



# Transition

# Transition Strategy

## NEAR-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

## MEDIUM-TERM

### 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

## LONG-TERM

### Evolution – Phase 3

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

→ Overlap Period ←

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The “Overlap Period” indicates that there is no set date by which the objectives of each transition should be met – other than within a time band of perhaps 2-3 years. It also recognizes that some States or Regions may not have a specific performance requirement that would need the application of changes identified in the transition maps at the same time as another State or Region.



# Transition – Near-term

## NEAR-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.

- The GPI’s are based on capabilities that have been implemented in the existing aviation environment.
- What can’t be implemented based on available procedures, processes and capabilities?

## NEAR-TERM

### Establish an Inventory of Existing Capabilities

- Current ICAO SARPS
- Current Industry Standards
- Current Industry Equipage
- Current Technology
- Current Fleet Equipage
- etc

### Performance Capability Gap Analysis

### Establish Performance Objectives

Example:

- Increase Efficiency
- Enhance Capacity
- Improve Safety
- Enhance Cost-Effectiveness
- etc

### Integrate Existing Capabilities with Performance Objectives

### Group GPI Sets against Performance Objectives

Example:

- Use RVSM to provide additional capacity
- Use datalinks to provide situational awareness
- Use enhanced data reporting and analysis tools to enhance safety
- Standardize cross boundary coordination procedures to enhance cost effectiveness
- Utilize PBN capability to fly instrument approaches, enhancing safety [reduced CFIT] and increasing access
- etc

# Transition – Medium-term

## MEDIUM-TERM

### 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

- The focus of medium term efforts is supported by the “gap” analysis outcomes of near term efforts.
- The work programs are structured towards implementations of procedures, processes and capabilities based on validated operational requirements and supporting cost-benefit analyses

## MEDIUM-TERM

### Establish an Inventory of Planned Capabilities

- Short-term capabilities +
- Emerging ICAO and Industry SARPS
- Emerging Equipage
- Emerging Technology
- etc

### High-Level Performance Gap Analysis

#### Establish High-Level Performance Objectives

Example:

- Reduce Delay
- Enhance Efficiency
- Reduce Environment Effect
- etc

### Integrate Capabilities with High-Level Performance Objectives

### Group into Operational Improvements Sets against Performance Objectives

Example:

- Use datalink and new RNP standards to increase capacity
- Use emerging flow tools and traffic prediction to reduce delay
- Leverage the undertaking by OEMs to improve engine efficiency by 10% by 2010 to develop more environmentally effective route structures.
- etc

# Transition – Long-term

## LONG-TERM

### Evolution – Phase 3

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

- Long term efforts are focused on meeting the expectations of the ATM Operational Concept.
- The application of new procedures, processes and capabilities will be characterized by “Performance Standards”

## LONG-TERM

### Establish an Inventory of Gap Capabilities

- Short- and medium-term capabilities +
- Identified Gap Standards
- Identified Gap Capability
- etc

### High-Level Performance Gap Analysis

#### Establish High-Level Performance Objectives

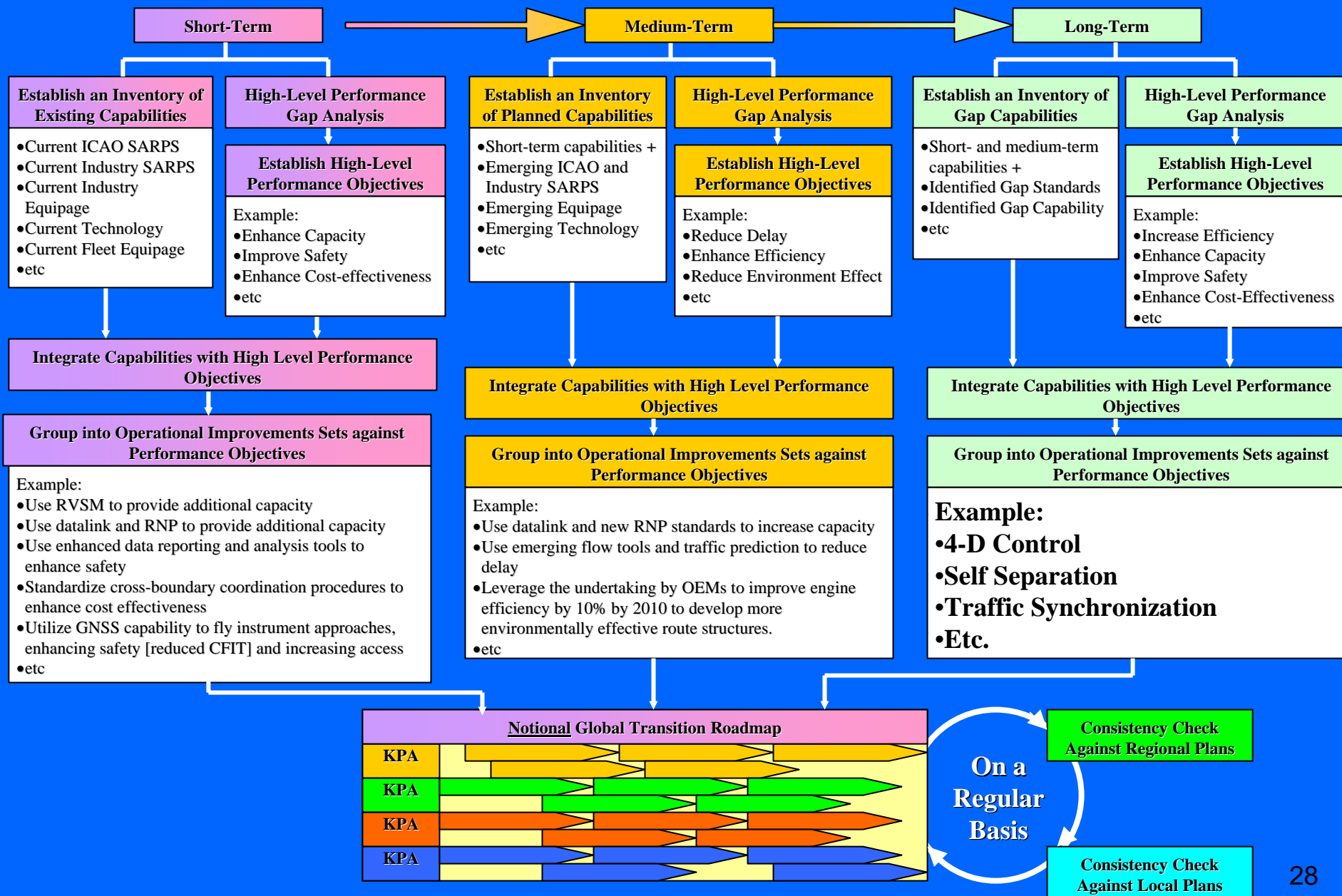
- Example:
- Increase Efficiency
- Enhance Capacity
- Improve Safety
- Enhance Cost-Effectiveness
- etc

### Integrate Capabilities with High-Level Performance Objectives

### Group into Operational Improvements Sets against Performance Objectives

- Example:
- 4-D Control
  - Self Separation
  - Traffic Synchronization
  - etc.

# The Global Transition Roadmap



# Current Global Plan Baseline

- The current Global Plan provides a static representation of the ATM Enhancement timeline.
- The regions have incorporated this format into their CNS/ATM implementation plans.
- Although this static format was useful to provide a survey and planning framework it does not provide adequate visibility of current implementation status.

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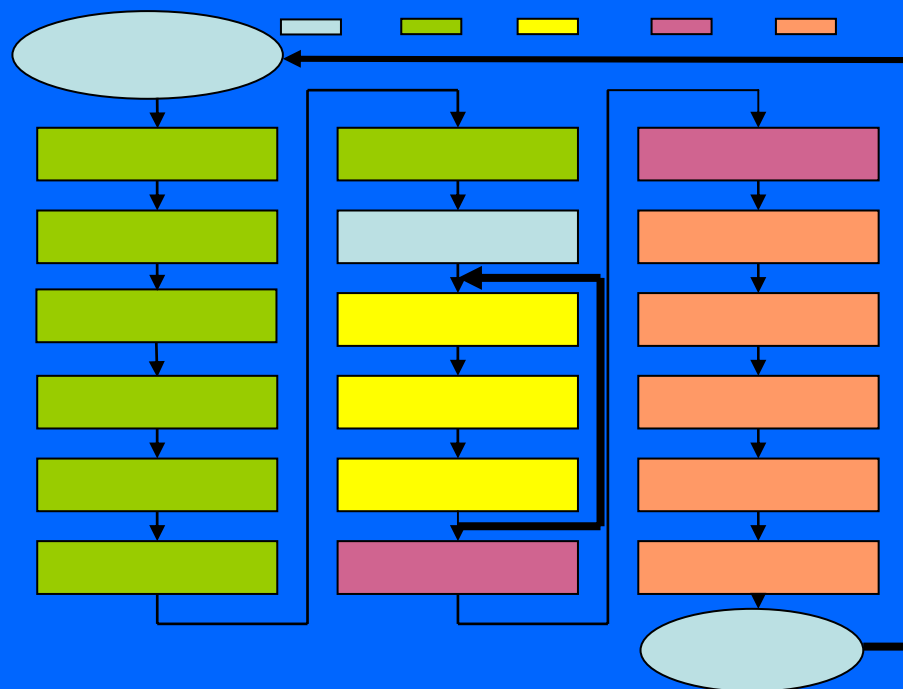
# Global Plan Transition

- A stated objective of the updated Global Plan is the transition to a living document.
- A dynamic reporting system will allow management visibility into the current status of program activities.
- A common reporting format will allow ICAO to establish measurable progress at both global and regional levels.

ID	Notes	Task Name	2005	2006	2007	2008	2009	2010
1	test	Development of SARPs						
2		Global ATM						
3		Functional Integration of Flight OPS/ATM						
4		ATM Requirements for CNS						
5		Separation Between Aircraft						
6		AIDC						
7		ATM Procedures and Systems						
8		Aircraft Equipage / Flight Operations						
9		RNP Certification/Approval						
10		Functional Integration of Airborne Systems with Ground Systems						
11		Implementation and Operational Use						
12		Regional ATM Operational Concept						
13		Determination of Major Traffic Flows - Global						
14		Identification of ATM Objectives Based on These Traffic Flows - Global						
15		Development of Regional Strategic Airspace CNS Infrastructure Plan Based on ATM Requirements - Global						
16		Airspace Management						
17		Optimized Sectorization - Global						
18		Fixed RNAV ATS Routes - Global						
19		Contingency RNAV Routes - Global						
20		Airspace Disaggregation/Flexible Use of Airspace - Global						
21		Application of RNP - Global						
22		Application of RCP - Global						
23		Application of RSP - Global						
24		Air Traffic Services						
25		Trajectory Performance Monitoring - Global						
26		Minimum Safe Altitude Warning - Global						
27		Conflict Prediction - Global						
28		Conflict Alert - Global						
29		Conflict Resolution Advice - Global						
30		Functional Integration of Ground Systems with Airborne Systems - Global						
31		Dynamic Accommodation of User-preferred Flight Profiles - Global						
32		Reduced Vertical Separation - Global						
33		Reduced Longitudinal Separation - Global						
34		Reduced Lateral Separation - Global						
35		Independent IFR Approaches to Closely-spaced Runways - Global						
36		RNAV SIDs and STARs - Global						
37		Curved and Segmented Approaches - Global						
38		Airport Metering, Sequencing and Spacing - Global						

# Implementation Model

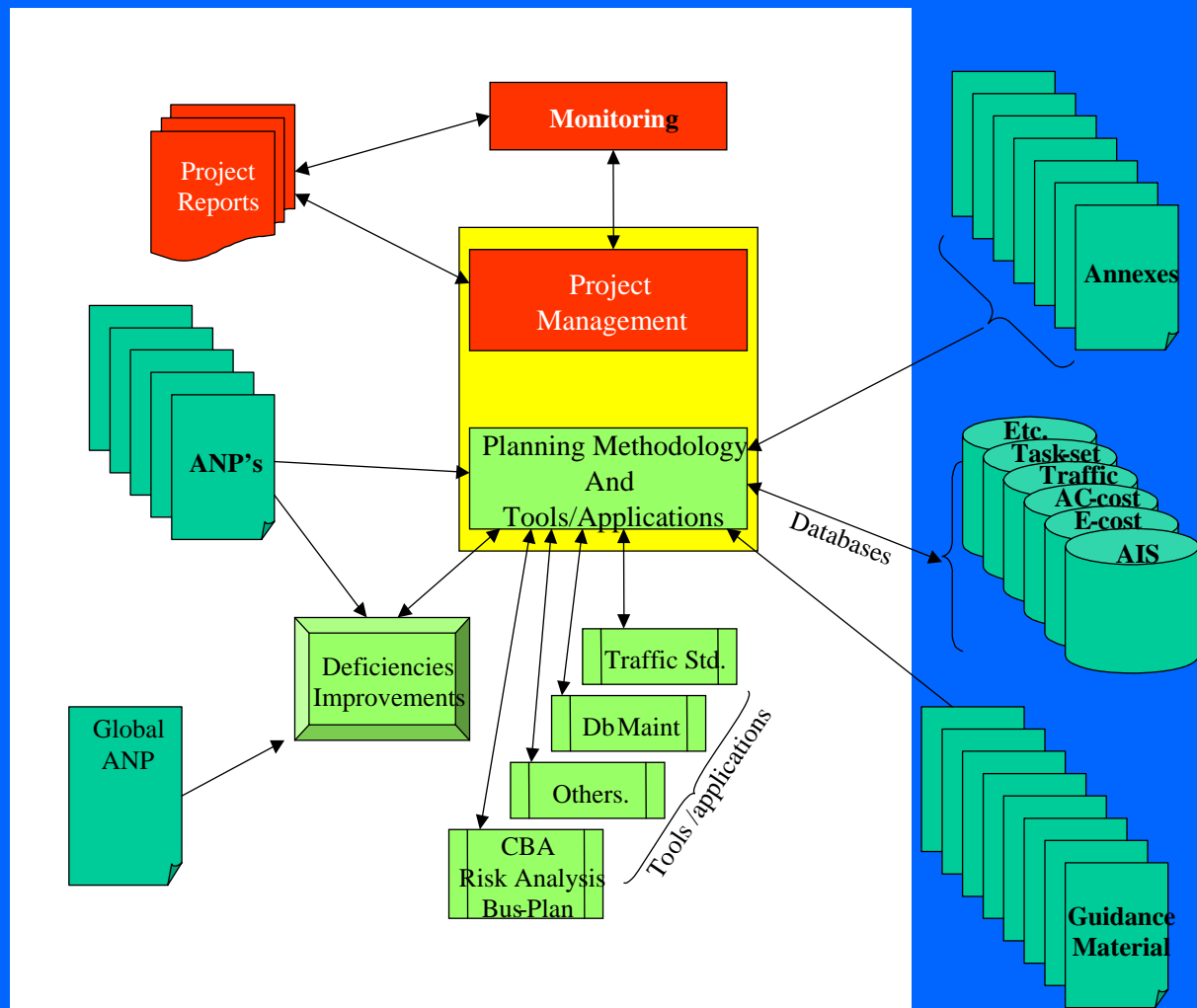
- A common process model template will be available to support implementation efforts
- Interactive guidance and reference material is being incorporated into the process model





# Interactive Planning

- Interactive planning tools to support implementation will require common databases with data integrity.
- A common planning methodology and business planning process should provide an efficiency synergy by allowing Regions and States to share lessons learned and reduce duplication of effort.
- implementation is still based on validated Regional requirements.







# Action by ALLPIRG on WP/3

- note the progress achieved in developing the draft second amendment to the Global Plan
- review and provide comments on the draft second amendment to the Global Plan; and
- adopt the Conclusions cited in paragraph 3 of the ALLPIRG/5-WP/3

*(Conclusions outlined in following slides)*



## **Draft Conclusion 5/X – Workshop on the Global Plan for Regional Offices**

**That, in support of the Global Plan,  
ICAO convene a training workshop  
in Montreal for appropriate  
regional technical officers on  
planning tools and methodologies.**



## Draft Conclusion 5/X –

# Implementation of Global Plan Initiatives (GPIs)

*(cont'd)*

That, recognizing that the evolution continues from a systems-based to a performance-based approach to planning and implementation of the air navigation infrastructure, the regional planning groups:



## Draft Conclusion 5/X –

# Implementation of Global Plan Initiatives

*(cont'd)*

- a) note that the Global Plan is a significant component in the development of regional and national plans and that, together with the global ATM operational concept, it provides an effective architecture for achieving a harmonized and seamless Global ATM system;
- b) identify GPIs that most closely align with the well established implementation plans of their respective regions;



# Draft Conclusion 5/X – **Implementation of Global Plan Initiatives**

*(cont'd)*

- c) choose GPIs that would be most effective in achieving the objectives of the region while ensuring continuation of the work already accomplished;
- d) implement GPIs that take into account the initiatives across regions, to align work programmes and to develop national and regional plans that facilitate achieving a Global ATM system;



## Draft Conclusion 5/X – **Implementation of Global Plan Initiatives** (*cont'd*)

- e) utilize the planning tools as the common planning and implementation mechanism, thereby ensuring proper coordination and global integration; and
- f) review at each PIRG meeting, as a part of its regular agenda, the progress achieved and challenges identified in the implementation of GPIs using a common template.

- Provides consistent information for performance measurement

- Automates & integrates Business Plan processes

**The  
Global Air  
Navigation Plan  
is an Implementation  
Framework  
that ...**

- Produces the baseline for measurable achievements and implementation of the ICAO ATM Operational Concept

- Shares common data & processes

