Airlines Requirements
“Obtaining Operational Improvements”

enabled by GANP/ASBUs

Outline

- What is an Operational Improvement?
- What is a GANP and an ASBU?
- Roadmap to success

Operational Improvement…

- A change to the way aircraft operate
  - On the airport surface
  - In the air
- That improves
  - Flight efficiency
  - On time performance
  - Etc.

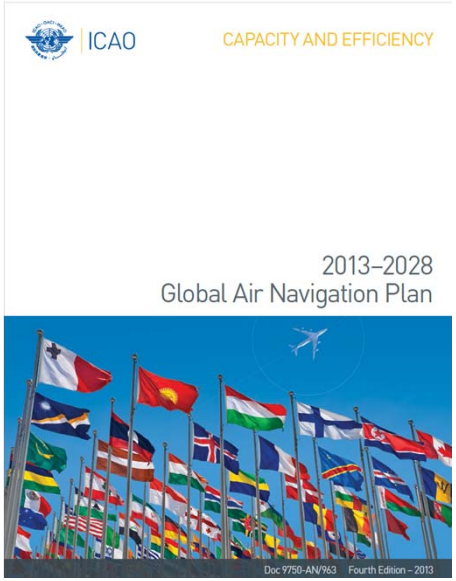
Improvements…

- … come from airline internal processes
- … come from airline's service providers
- … come from airports
- … come from Air Navigation Service Providers (ATC)
- … come from CAA (regulations)

Airline's Need

- Predictability for Network Operation:
  - Aircraft (OpSpecs, ETOPS, NAV-COM-SUR capabilities, etc.)
  - Cabin crew
  - Air crew
  - Passengers
  - Cargo
- System level Efficiency and Safety

Global Air Navigation Plan…

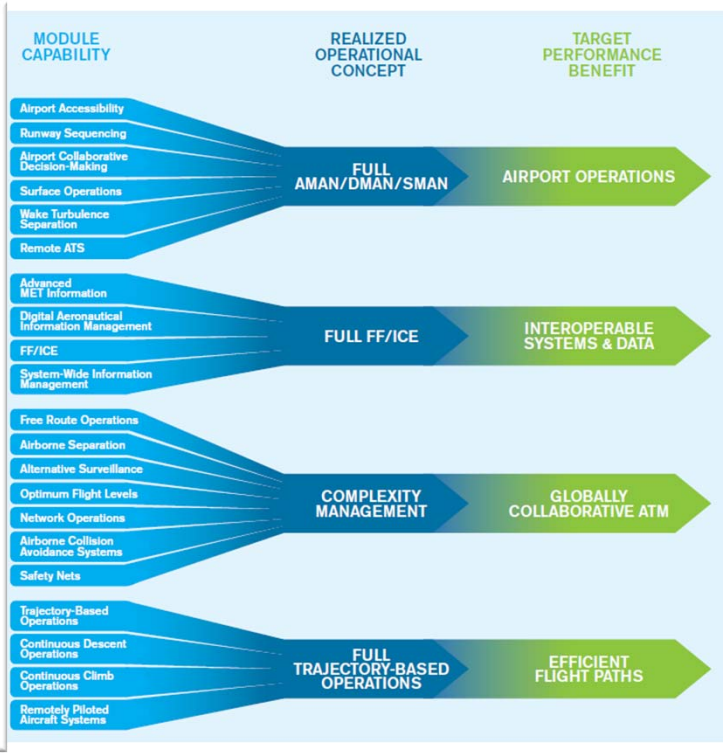


- The GANP represents a rolling, 15-year strategic methodology which leverages existing technologies and anticipates future developments based on State/industry agreed operational objectives.
- The Block Upgrades are organized in 6 year time increments starting in 2013 and continuing through 2028 and beyond.

ASBUs – Menu of Operational Improvements

- ASBUs are the *menu* of operational improvements
- Modern ATM Concepts are focused on Performance
  - Surveillance
  - Communications
  - Navigation

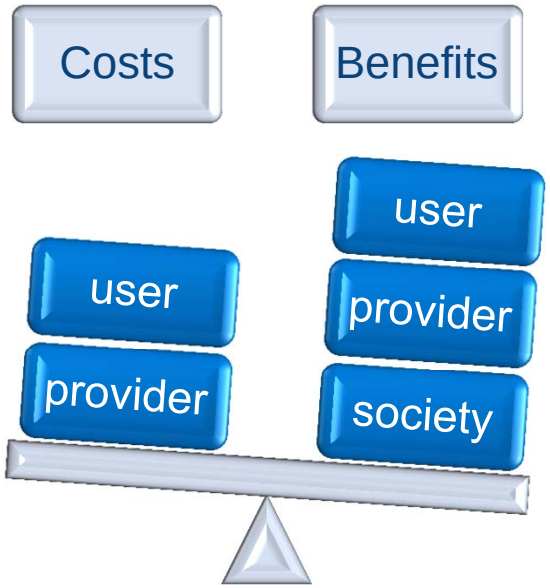

ICAO
CAPACITY AND EFFICIENCY
2013–2028
Global Air Navigation Plan


MODULE CAPABILITY
REALIZED OPERATIONAL CONCEPT
TARGET PERFORMANCE BENEFIT
Airport Accessibility
Runway Sequencing
Airport Collaborative Decision-Making
Surface Operations
Wake Turbulence Separation
Remote ATS
FULL AMAN/DMAN/SMAN
AIRPORT OPERATIONS
Advanced MET Information
Digital Aeronautical Information Management
FF/ICE
System-Wide Information Management
FULL FF/ICE
INTEROPERABLE SYSTEMS & DATA
Free Route Operations
Airborne Separation
Alternative Surveillance
Optimum Flight Levels
Network Operations
Airborne Collision Avoidance Systems
Safety Nets
COMPLEXITY MANAGEMENT
GLOBALLY COLLABORATIVE ATM
Trajectory-Based Operations
Continuous Descent Operations
Continuous Climb Operations
Remotely Piloted Aircraft Systems
FULL TRAJECTORY-BASED OPERATIONS
EFFICIENT FLIGHT PATHS

ASBUs – Menu of Operational Improvement

- Airlines do not need or want you to implement ASBUs [including PBN]…
- UNLESS the results brings operational improvements
  - … have achievable operational benefits
  - … that deliver tangible cost offsets

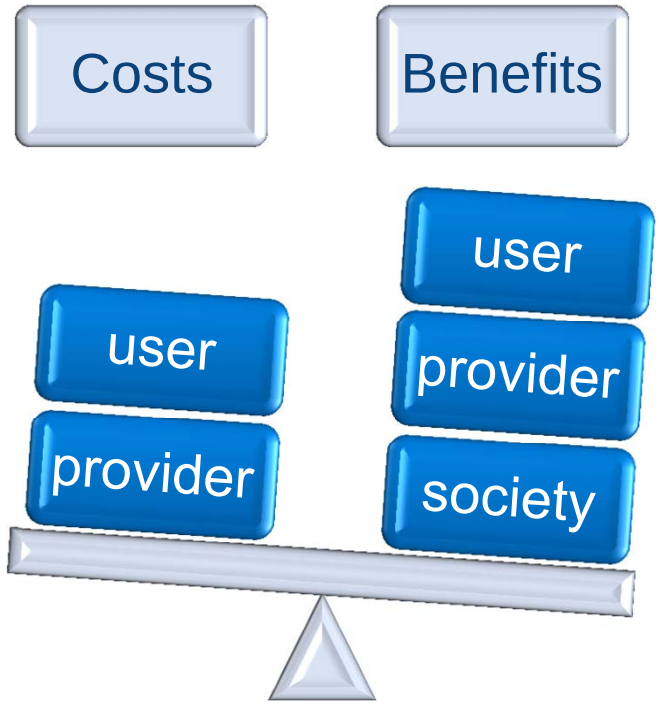
Calculate costs and benefits (all domains)



- Sum the costs to:
  - Service providers
  - Airspace users
- Sum the benefits to all parties
- Remember to **factor in time**

Operational Solutions

- Your benefits must **equal** or **outweigh** their costs to the overall system
- If not, the solution should not be implemented



Our Philosophy - Collaboration

- Collaborative Decision Making
- Operations Concept
- How do we deliver the Ops Improvement?
  - ASBU Enablers
- Assess
  - Validate
  - Cost effectiveness
- Select & Implement

Decide Objectives

Collaborative Decision Making

Operations Concept

Use Multidisciplinary [Project]Teams

- ANSP Management
- Operational experts from ATM and airlines
- (**regulator?)**
- Representation as affected by the potential changes
- ……

Pick Scenarios

Collaborative Decision Making

Operations Concept

How do we deliver the Ops Improvement?

- ASBU Enablers

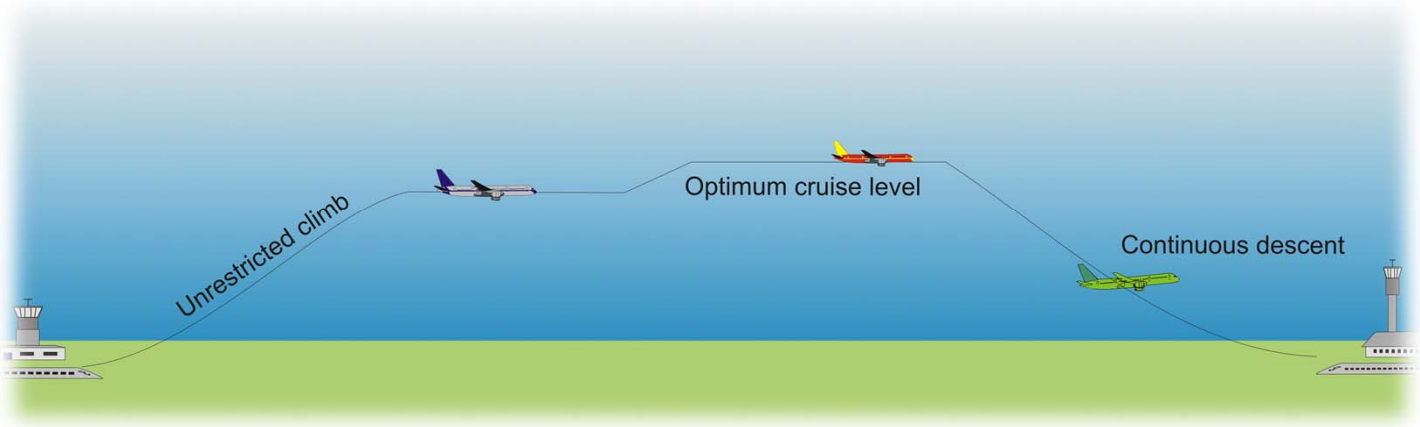
Options Selection

- What can you do with the tools and capabilities that are in place?
- Procedures
- Airspace
- Does the potential solution fit the environment?
- Are you surrounded by lower capability areas?
- Will the efficiency gains be possible?
- Are the aircraft capable of the required performance?
- Is the service provider (Airport, ATC) capable?
- Is the potential solution within the project scope?

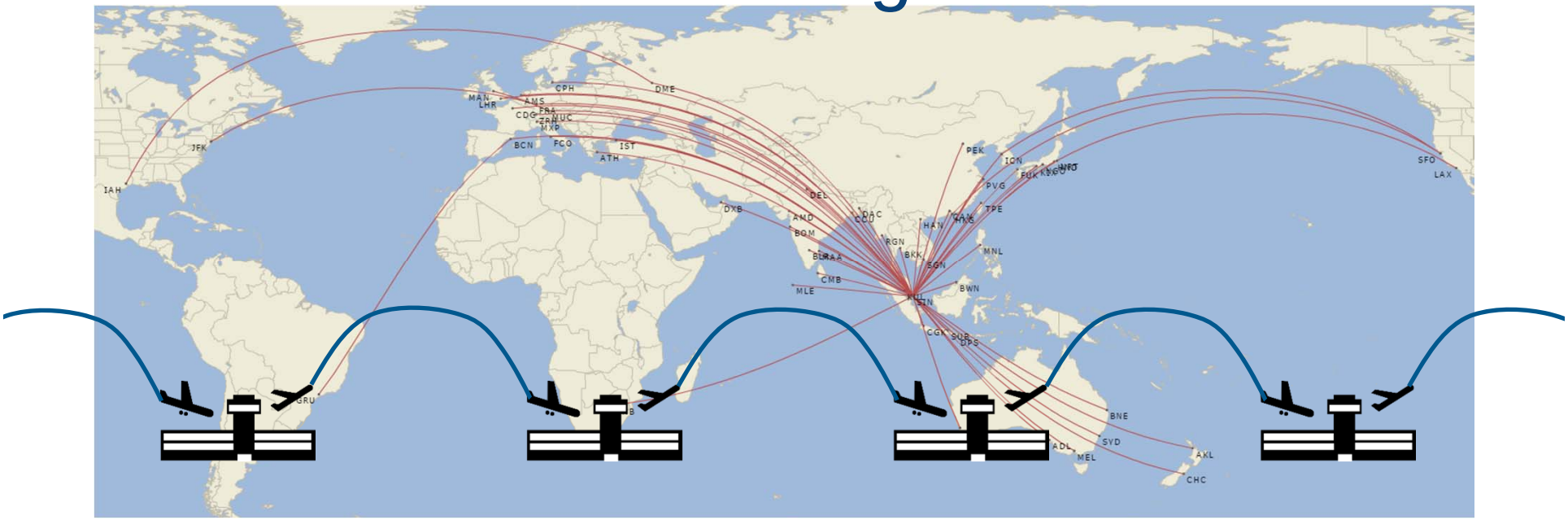
Options Selection (cont'd)

- Do you need technological change?
  - Pick from the ASBU modules
- Target the right Block (0 – 3)
- Consider phasing the implementation
- Target early benefits
- **Interoperability / Harmonization**
  - Avionics RQS
  - Regulation
  - Regional coordination (Eg. Separation)

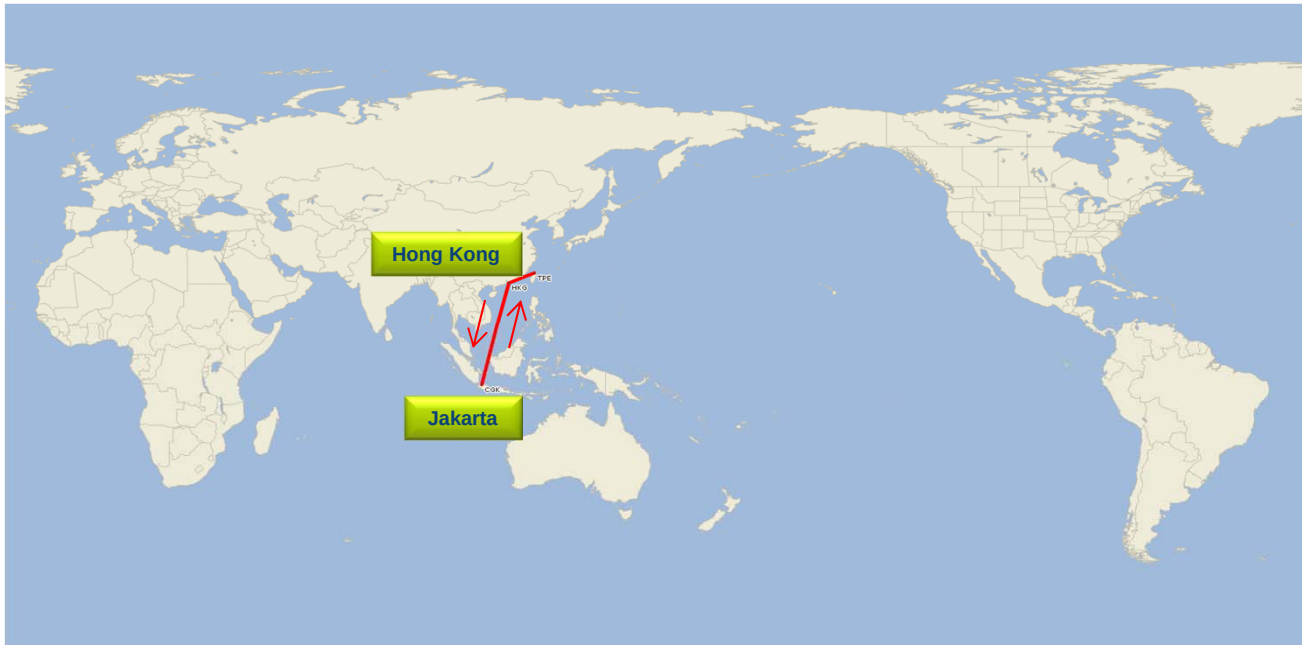
Perfect Flight – Vertically & Laterally



But it’s not about one flight…




Taipei
Hong Kong


Hong Kong
TPE
HKG
CGK
Jakarta


Beijing
Hong Kong
PEK
TPE
HKG
CGK


Hong Kong
Los Angeles
PEK
TPE
HKG
CGK
LAX


Hong Kong
New York
PEK
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London
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LHR
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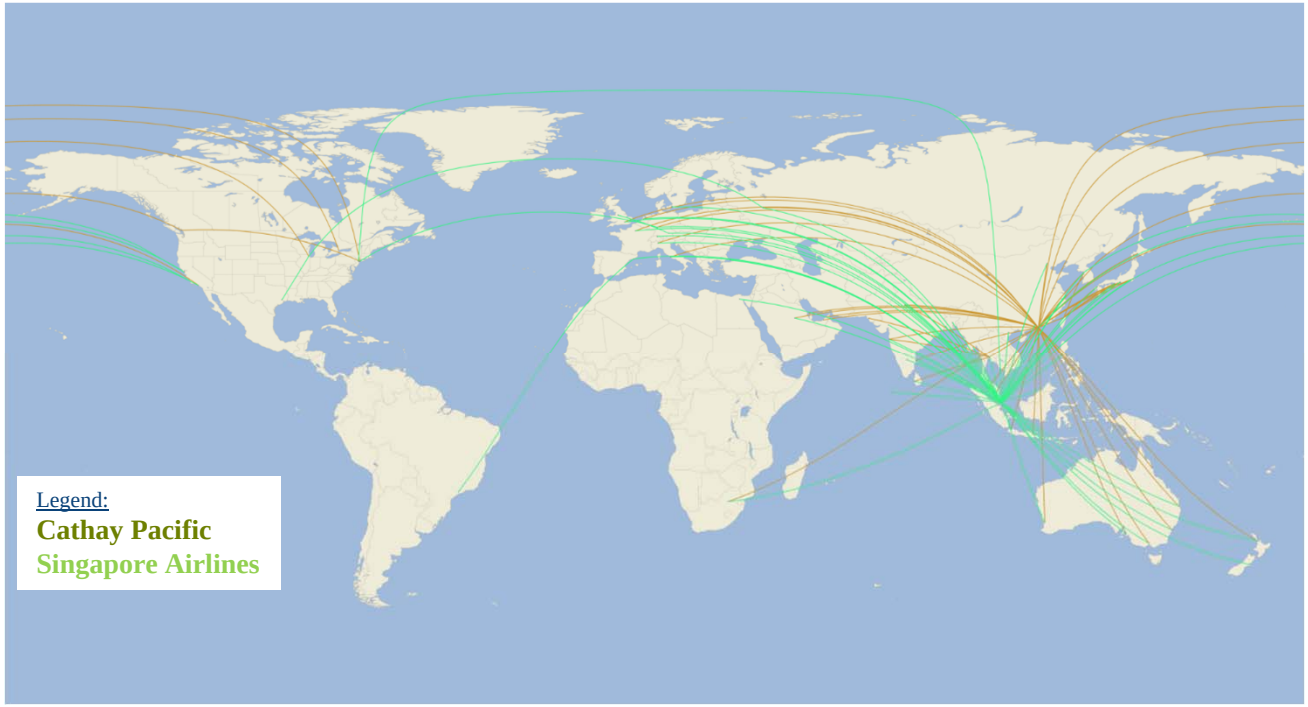
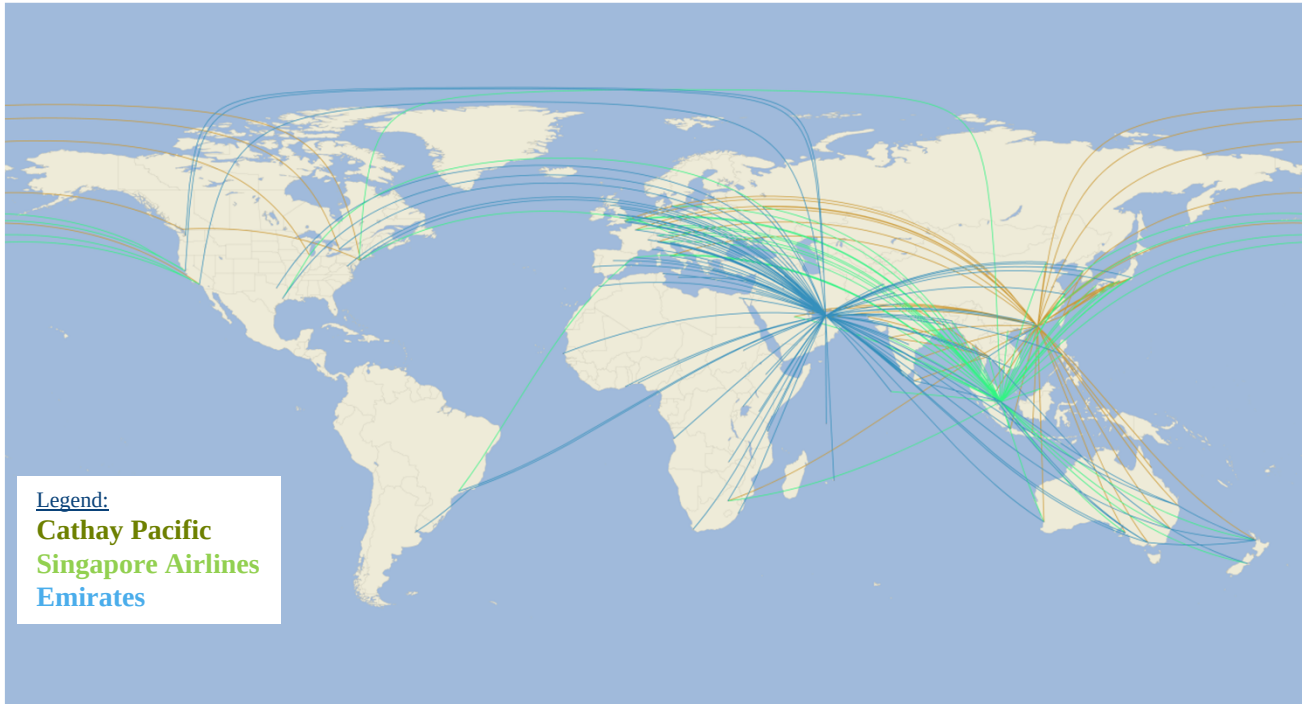
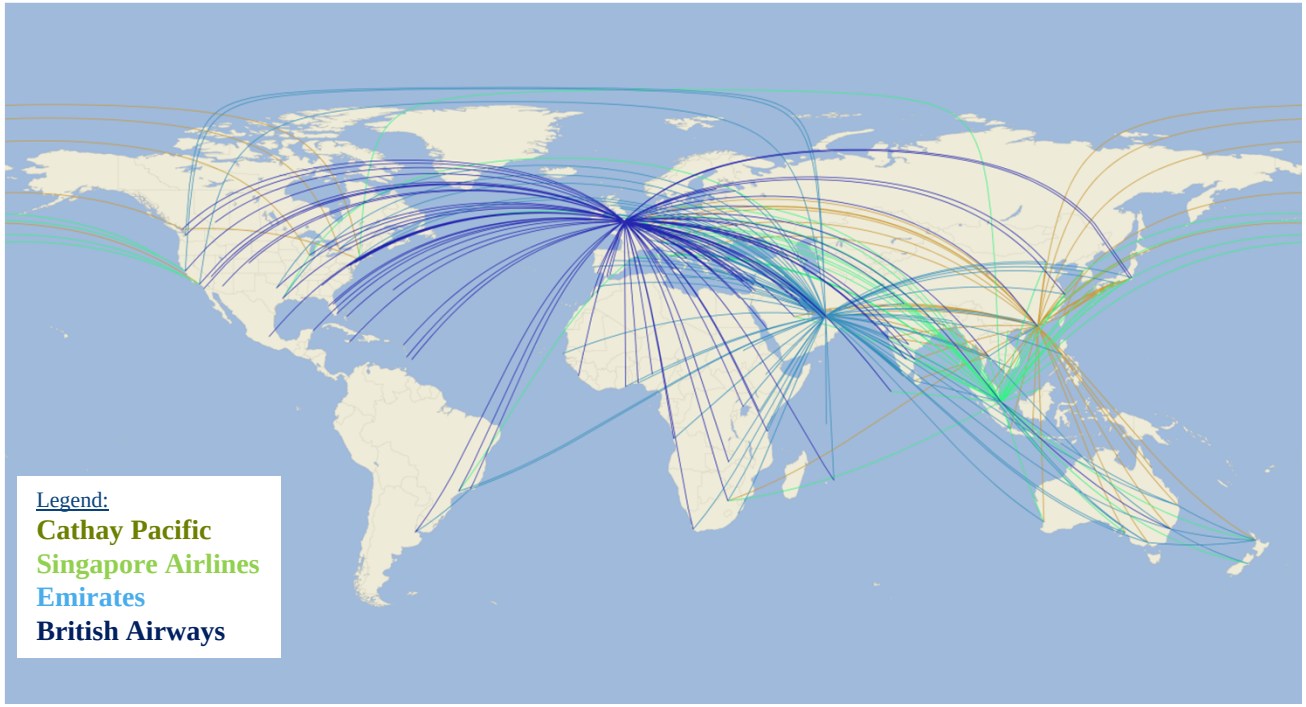
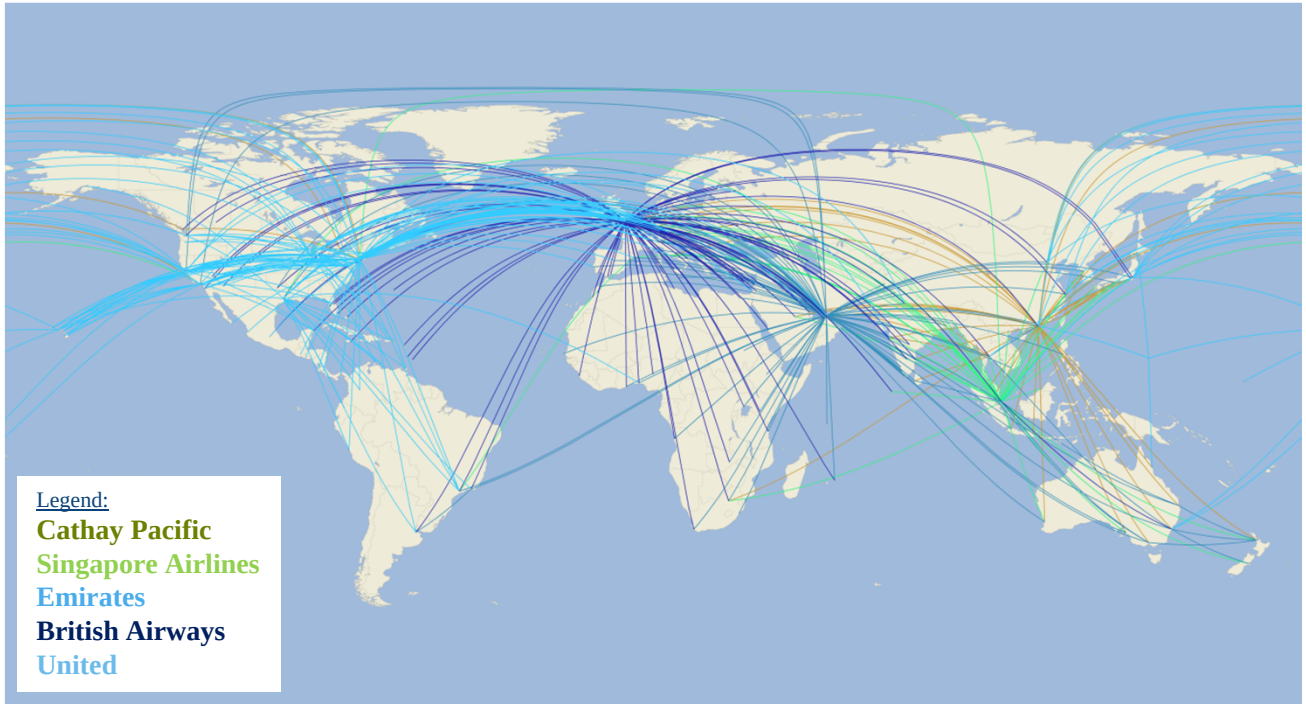

Legend:
Cathay Pacific
Singapore Airlines


Legend:
Cathay Pacific
Singapore Airlines
Emirates

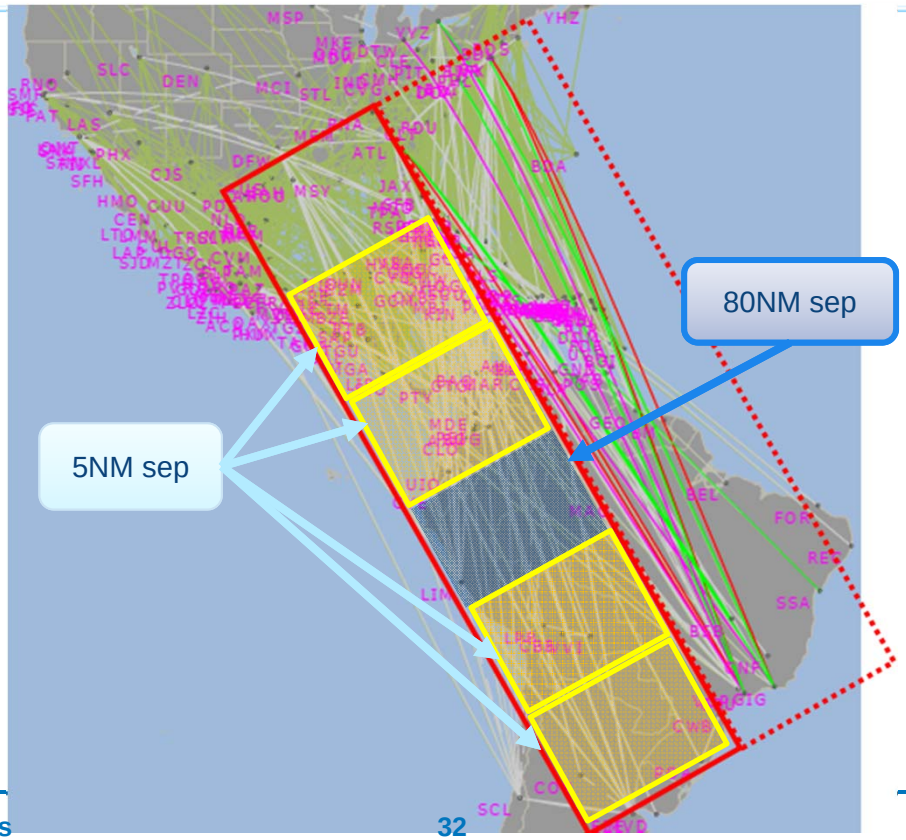

Legend:
Cathay Pacific
Singapore Airlines
Emirates
British Airways


Legend:
Cathay Pacific
Singapore Airlines
Emirates
British Airways
United

- "**More/less restrictive** black hole effect"

Regional coordination

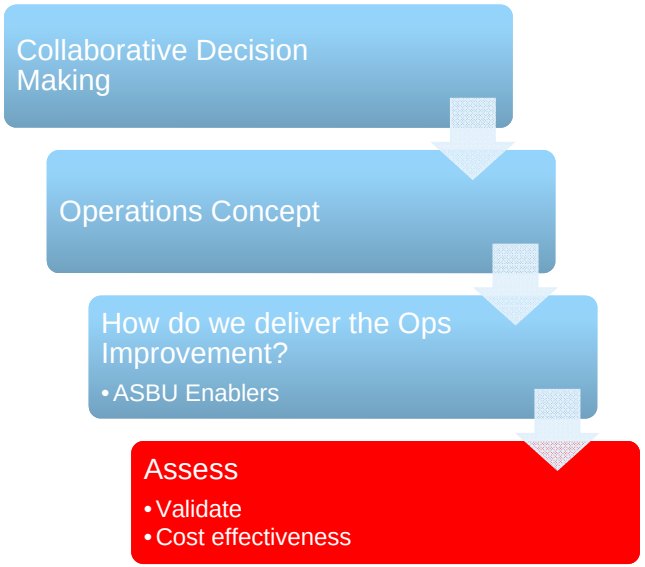
- "**More/less restrictive** black hole effect"



Regional coordination

Regional coordination

Assess Scenarios



Define KPIs & Metrics

Costs

- Equipage
- Infrastructure
- Systems
- Training
- Qualifications

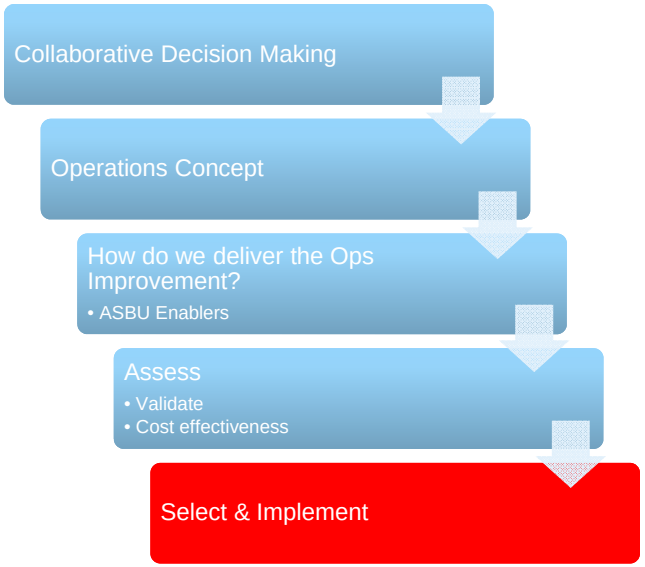
Benefits

- Reduced fuel burn
- Reduced aircraft Time in System
- Reduced noise
- Reduced complexity
- Increased predictability
- Increased Safety
- Increased use of capabilities

Failure / success criteria

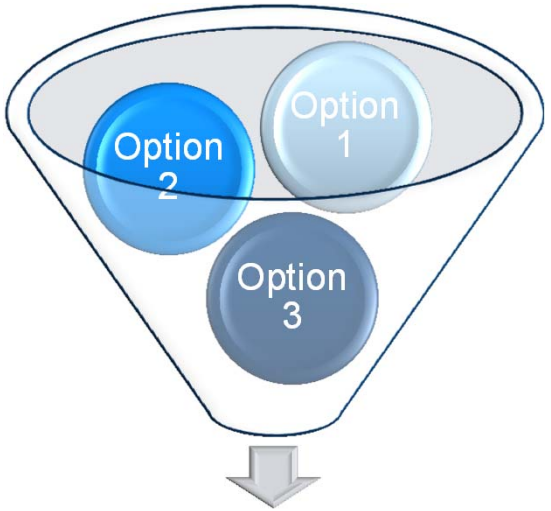
- Option must result in ….
- Option must NOT result in…
- Consider Interoperability and Harmonization
  - Does your option require greater capability than the other places the aircraft operate?
  - Does your option require a different ‘box’ than the other states?

Select & Implement

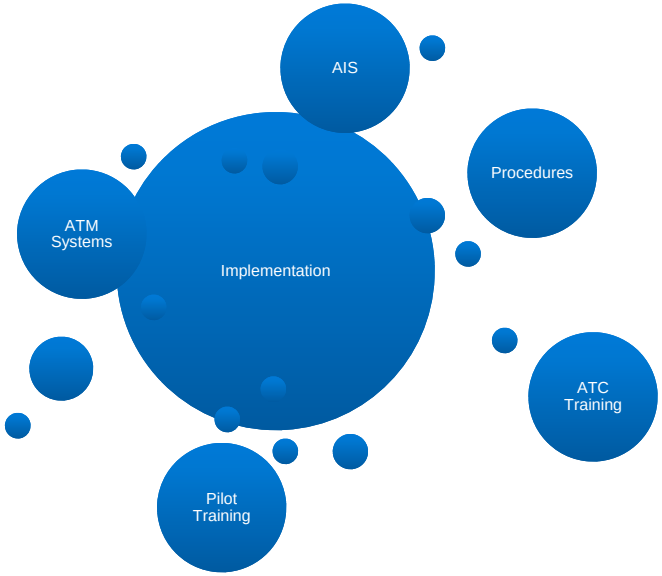


WHAT TO PICK?

Pick the best Option



Implement


AIS
Procedures
ATM Systems
Implementation
ATC Training
Pilot Training

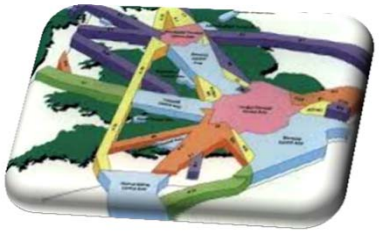
USING ‘AIRSPACE’ AS A CASE STUDY

What is an Airspace Concept?

- An airspace concept is a master plan of the intended airspace design and its operation

What is an Airspace Concept?

- Describes in detail the **airspace organization** and its **operations**,
- Addresses all the **strategic objectives** identified for the project,
- Addresses all **CNS/ATM enablers**,
- Identifies all **operational and technical assumptions**.



Why Develop an Airspace Concept?

An Airspace Concept provides a structured and systematic process:

- For the setting, review and tracking of goals and objectives.
- For communication of goals and objectives.
- To justify and track resources used for implementation.
- a baseline reference upon which to measure improvements.

How to Create an Airspace Concept?

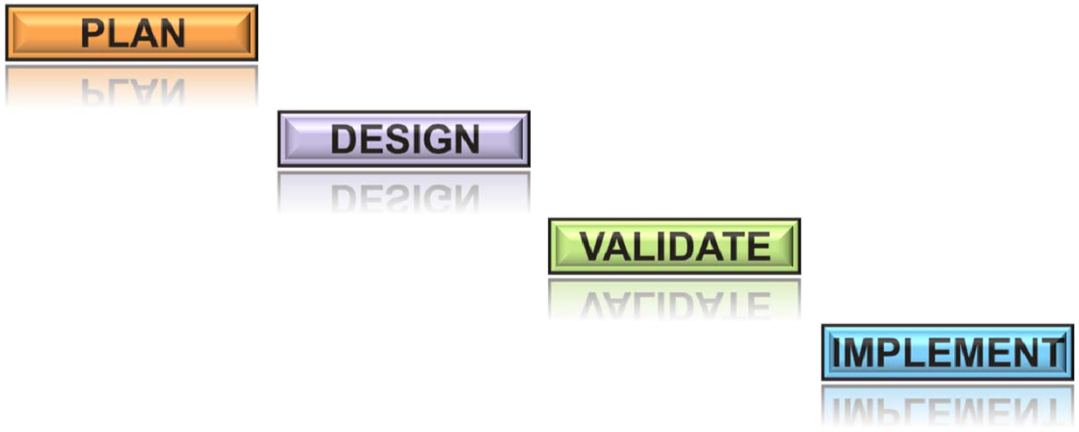
- The process of developing an Airspace Concept is described in ICAO DOC 9992:

The tool was created with Navigation in mind but it is broadly applicable in all circumstances

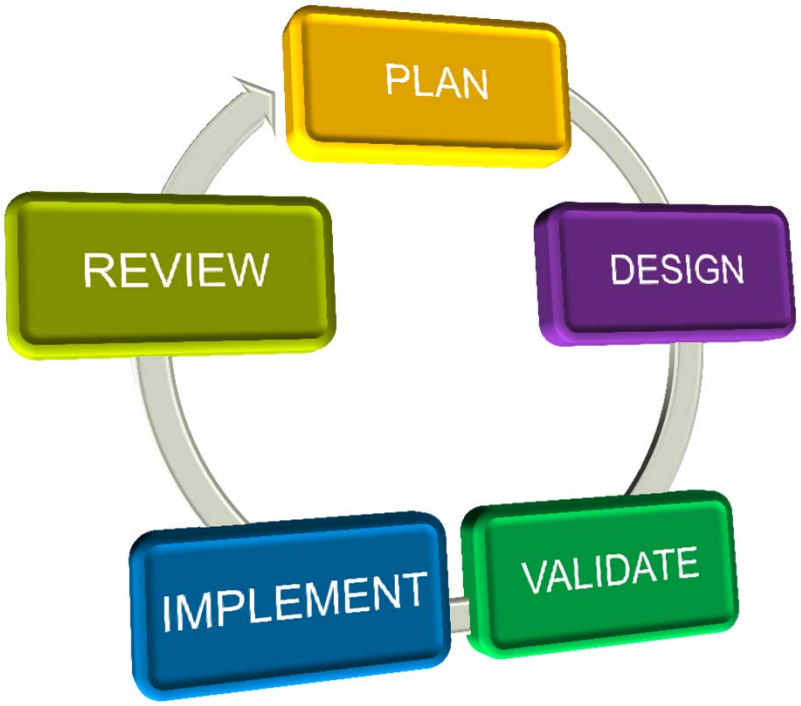
Manual on The Use of Performance-Based Navigation (PBN) in Airspace Design

How to Create an Airspace Concept?

- Airspace Concept development uses a high level sequential outline of processes:



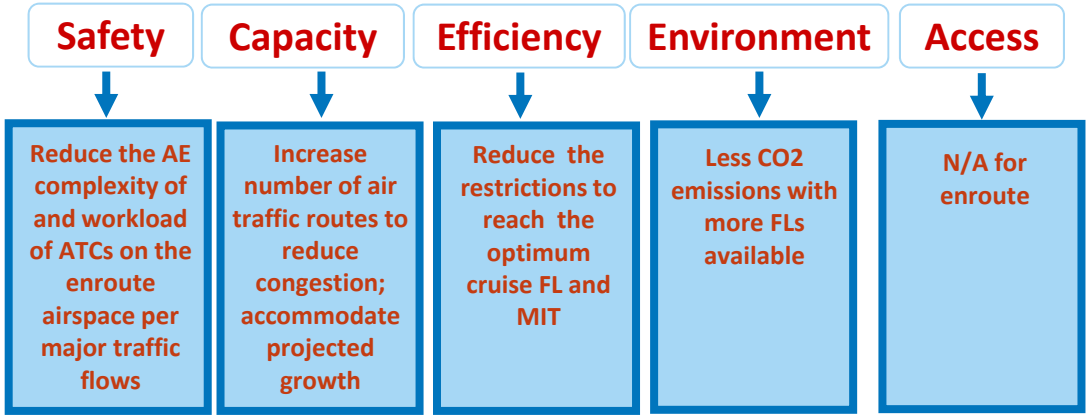
Improvement Cycle



Define Operational Requirements

- What do we want to accomplish?
- categorized in terms of:
  - safety,
  - capacity,
  - efficiency,
  - environment, and
  - access.

Define the Concept



PLAN

Establish a Solution Design Team

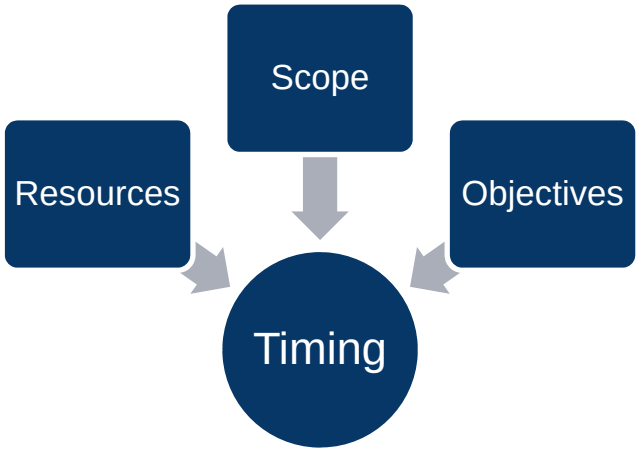
- Based on needs of the project.
  - Project leader
  - **Airspace user representatives (pilot)**
  - **ATC experts**
  - Procedure Designers,
  - Airspace Planners,

Add or consult members as necessary.

PLAN

Agree on Objectives, Scope, Timeline

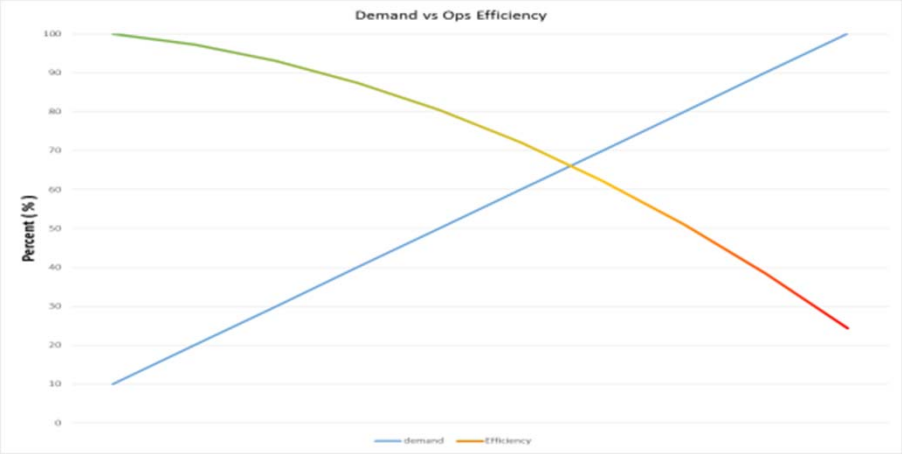
- Objectives from Operational Requirements
- Scope sets the limits of the project
- timeline + end date.



Strategic Objectives

STRATEGIC OBJECTIVES

Safety Capacity Efficiency Environment Access



- Strategic objectives may be in conflict!
- Need balance

Key Performance Objectives

- FUEL/TIME TAXI OUT
- FUEL/TIME CLIMB
- FUEL/TIME CRUISE
- FUEL/TIME DESCEND
- FUEL/TIME TAXI IN
- ACFT TYPE
- PLANNING TRIP FUEL/TIME
- PLANNING TAXI OUT FUEL/TIME
- PLANNING AIR DISTANCE
- PLANNING GROUND DISTANCE
- ACTUAL AIR DISTANCE
- ACTUAL GROUND DISTANCE
- FLIGHT LEVEL (TOD)

Questions??