canso

civil air navigation services organisation

The Global Voice of ATM

OVERVIEW OF ADS-B COST BENEFIT STUDY

Presentation Outline

- Background & Objectives
- Project Scope
- Study Assumptions
- Traffic Forecast & Aircraft Equipage
- Benefits & Costs
- Results & Conclusion

Background

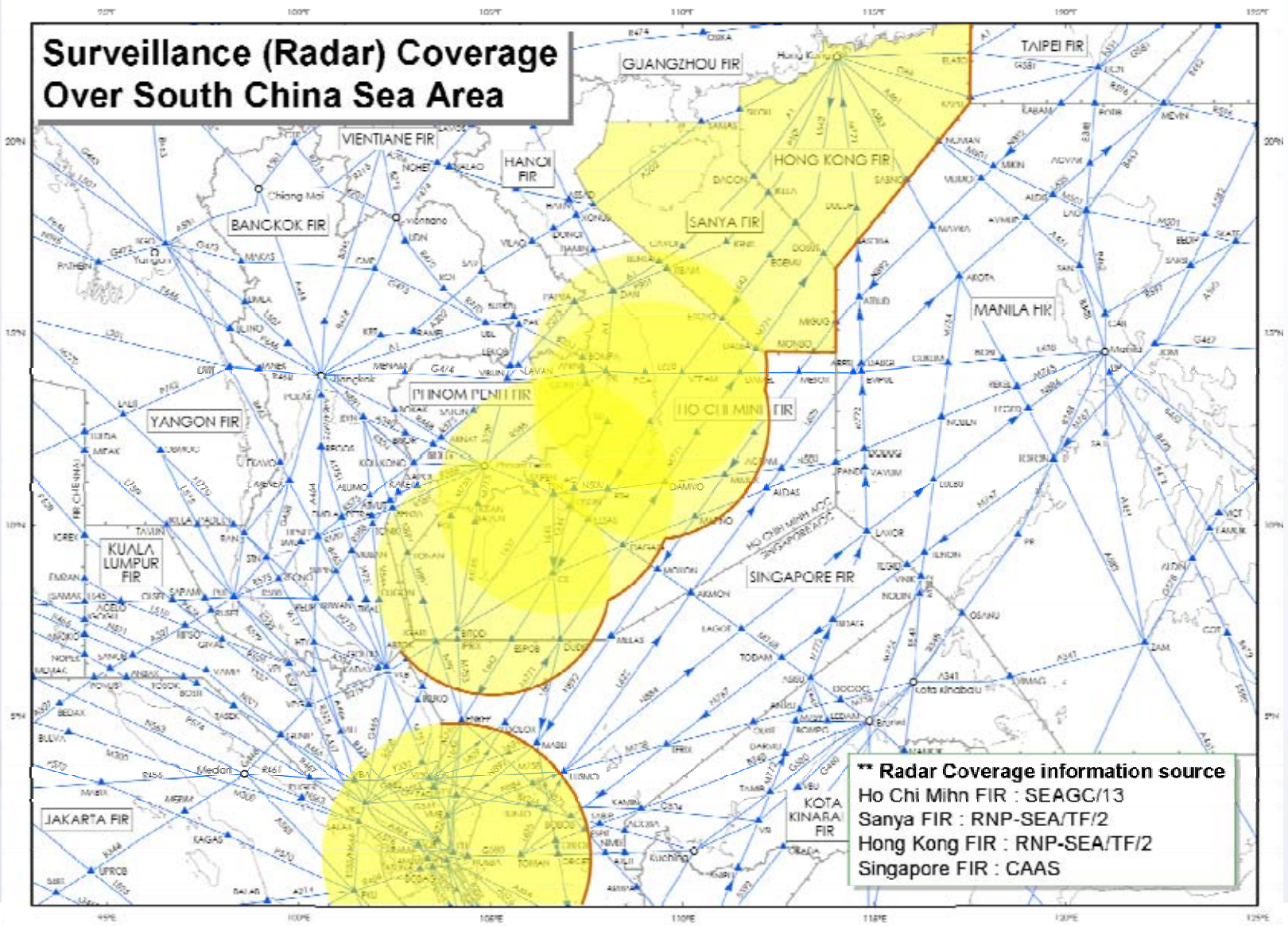
- At the 3rd SEA ADS-B WG Meeting in July 08, CANSO and IATA were requested to conduct a Cost Benefit Analysis for the SEA ADS-B project undertaken by Indonesia, Vietnam and Singapore over the South China Sea.

- The study conducted with the support of CANSO APAC members, FAA and CAAS was completed in 2009.

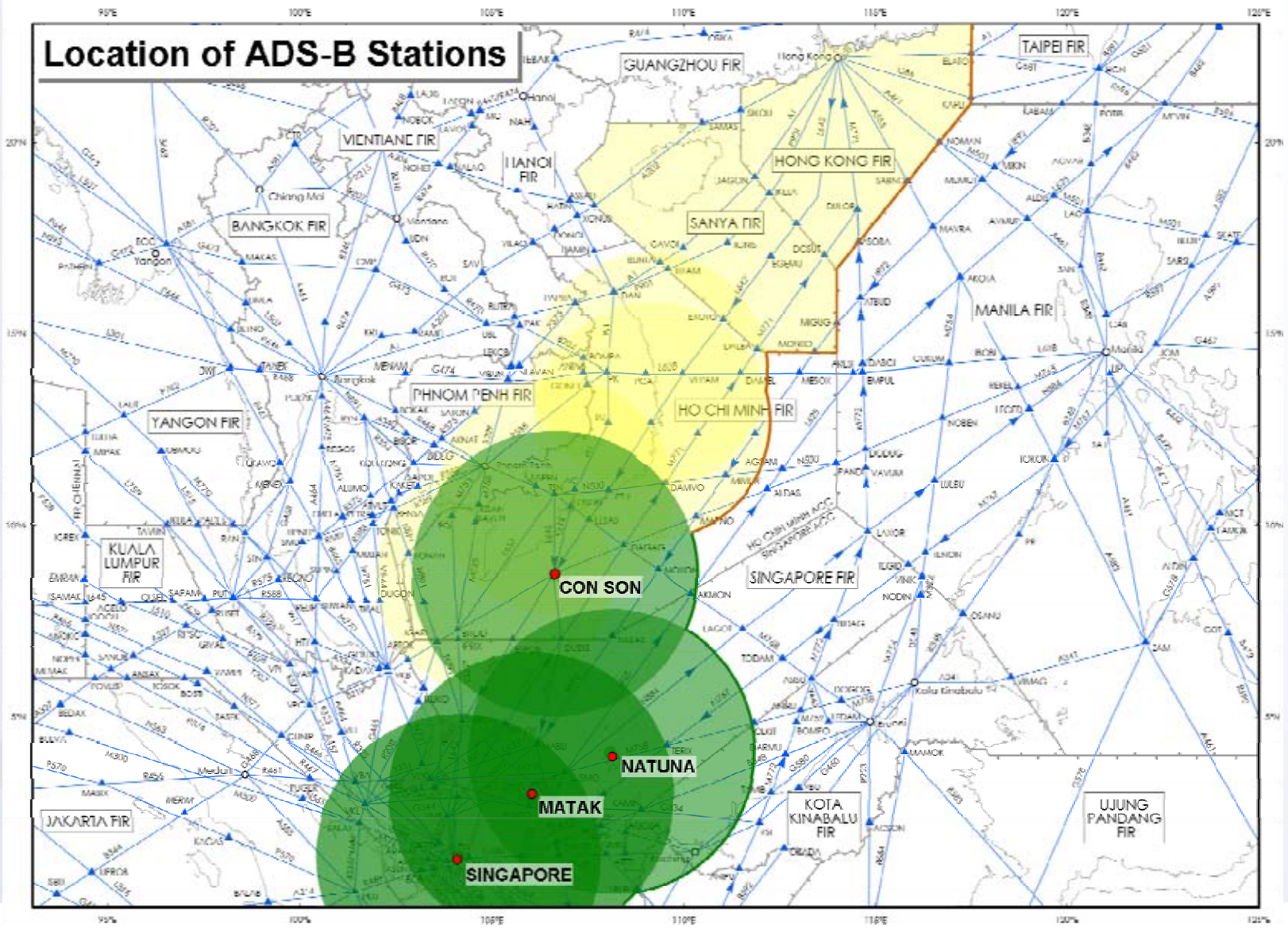
Objectives

- To determine the benefits & costs of ADS-B implementation for the project
- As an example of good governance in developing a business case for the project
- To promote regional collaboration and harmonisation among ANSPs and users

Project Scope



Project Scope



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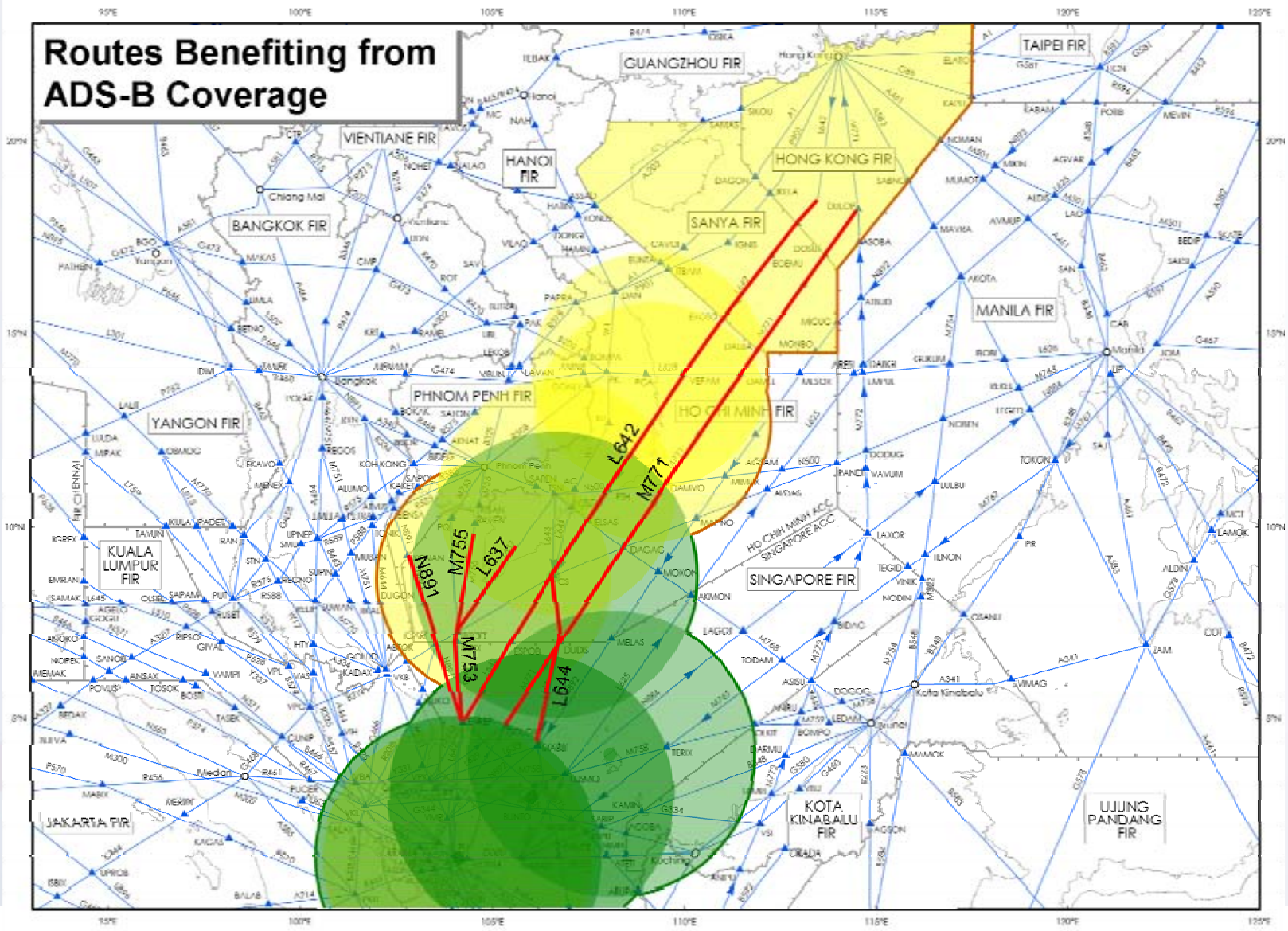


Study Assumptions

- ADS-B data sharing across FIRs
- Provision of VHF communications to adjacent States as required
- Provision of radar-like separation in restricted airspace
- Analysis based on extrapolation of CAAS traffic data and IATA's demand projections
- Estimated infrastructure cost

Traffic Demand Forecast

- Given the recent economic downturn and the volatility of projections, we conducted a sensitivity analysis based on the following scenarios:

  Low: 3% growth

  Medium: 5% growth

  High: 7% growth

  Note: The medium and most probable growth rate for air traffic is set at 5% based on IATA's Forecast AAGR (2007-2011) for APAC which is 5.9% for pax and 5.4% for freight.

Aircraft Equipage

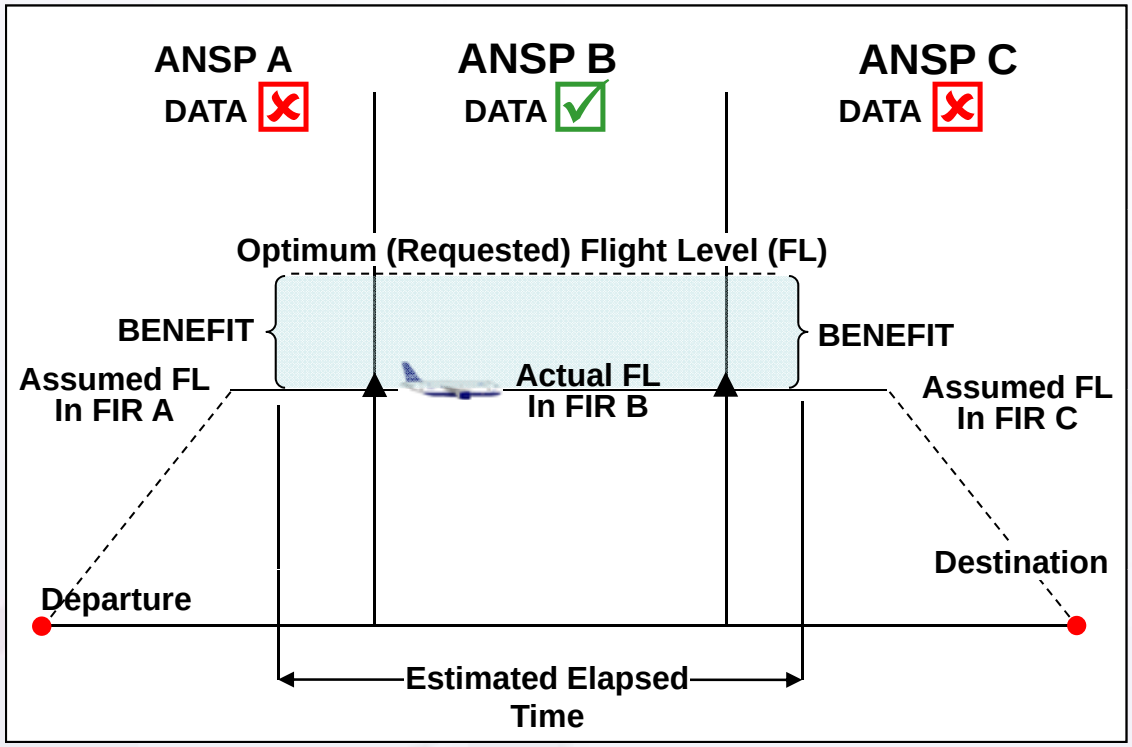
- Information presented at SEA ADS-B WG/1 in 2007 showed that about 60% of aircraft in the area were transmitting ADS-B data although this does not take into account the certification or accuracy of the data.
- A review of flights operating in the area from Jul- Oct 2008 reinforced this point, where 61.9% were assessed to be ADS-B capable.
- 25% of the remaining were assessed as retrofit ready (during scheduled maintenance)

Aircraft Equipage

- New aircraft delivered are all ADS-B capable
- Fleet retirements due to economic climate will enhance capabilities
- Retrofit timelines would be encouraged by an effective mandate
- With an effective mandate, more than 85% of aircraft would be ADS-B (Out) capable

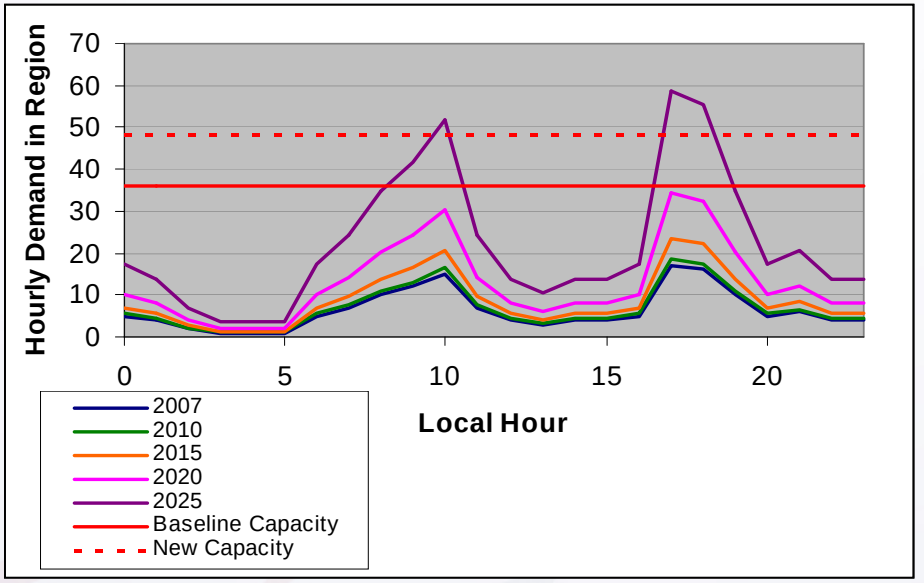
Benefits - Optimum Flight Altitudes

- Examine fuel savings for flights that currently do not receive optimum altitude
- Examine flights that are currently delayed before receiving optimum altitude.



Benefits - Capacity Increase

- Examine delays due to limited capacity vs. the demand forecast.
- Examine hourly demand vs. hourly capacity and run a queuing model to estimate delay difference between baseline capacity and new ADS-B enabled capacity
- Monetize delay savings benefit in terms of reduced Aircraft Direct Operating Costs and Passenger Value of Time



Example of Hourly Demand

Costs - Infrastructure

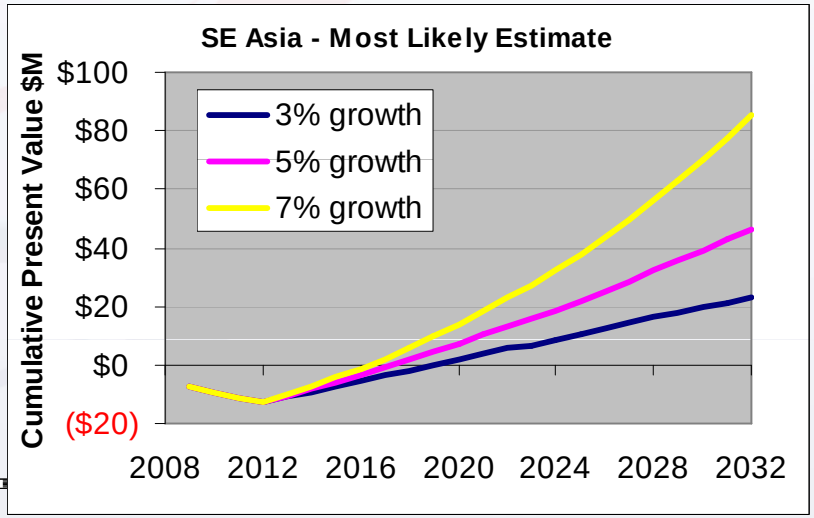
- ADS-B stations
- VHF radio & communications circuits
- ATM system upgrades where applicable
- Project management & training
- Recurrent costs e.g. maintenance and spares
- Supporting infrastructure if needed

Economic Analysis

Business Case

- Net Present Value (NPV) [> 0]
- Benefit to Cost Ratio (B/C ratio) [> 1]
- Internal Rate of Return (IRR) [> Cost of Capital]
- Payback Year

	Most Likely Estimate		
Demand Growth	3%	5%	7%
Costs FY09 $M	$45.66	$45.66	$45.66
Benefits FY09 $M	$127.96	$200.47	$328.11
IRR	17%	22%	27%
Costs PV	$27.17	$27.17	$27.17
Benefits PV	$50.29	$73.60	$112.43
NPV	$23.12	$46.43	$85.26
B/C Ratio	1.9	2.7	4.1
Payback Year	2020	2018	2017



Results of Cost Benefit Study

- Annual savings of nearly 3 million lbs of fuel burn
- Annual reduction of 10 million lbs of CO_2 emissions
- Total Economic savings of over US $ 4m annually
- IRR of 17% to 27%

Other Benefits

- Improved safety – enhanced tracking of aircraft, weather deviations etc
- Improved surveillance facilitates Search and Rescue efforts
- Environmental benefits – greater operational efficiency leading to lower carbon emissions
- Improved flight data collection for analysis and planning

TASKS & PROJECT MILESTONES

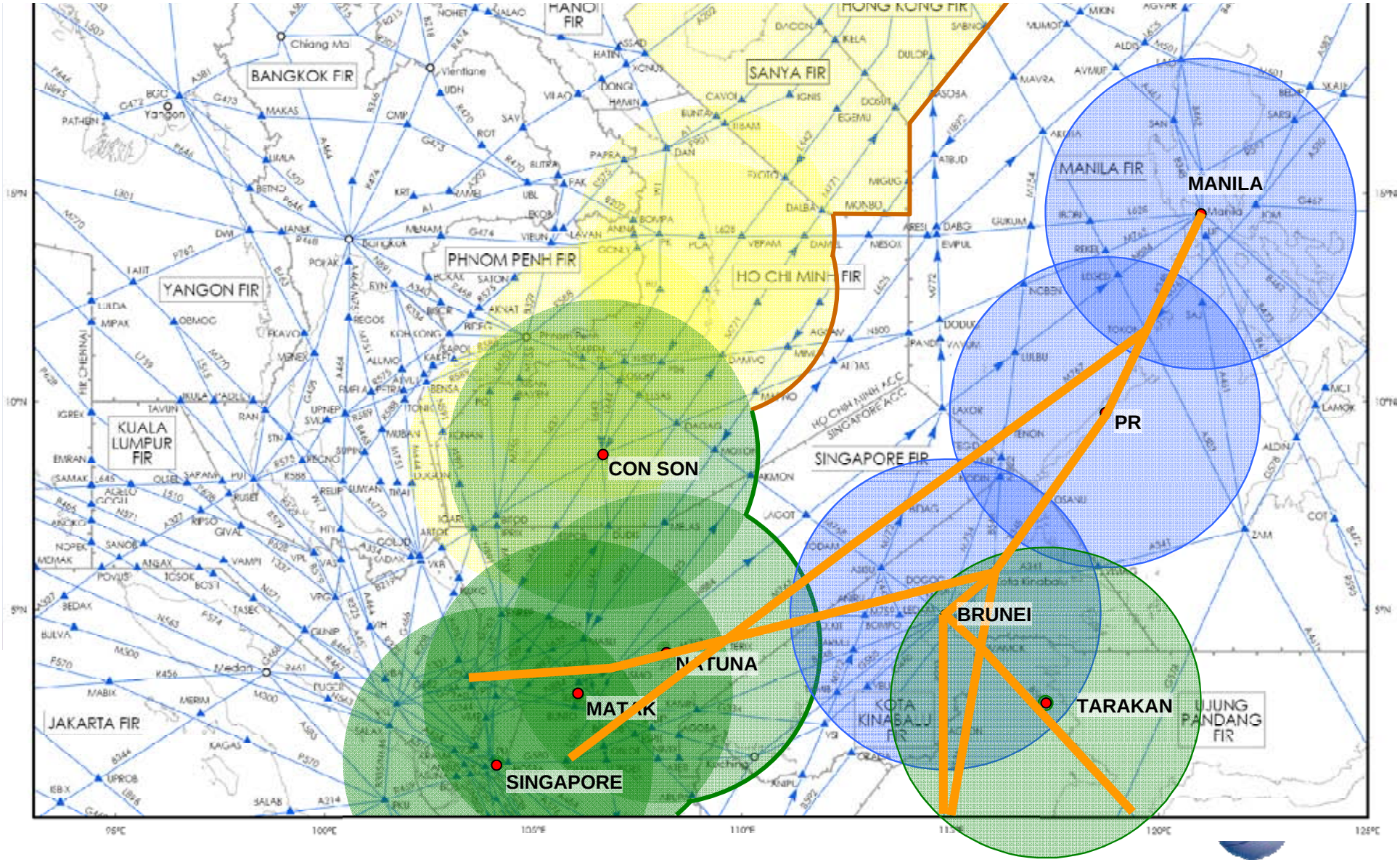
(Presented at ICAO SEA ADS-B WG meeting in Jakarta in Jan 10)

- A Installation of ADS-B ground stations
  - Natunas and Matak - completed
  - Singapore - completed
  - Con Son - 2H 2010
- B Installation of VHF stations and links
  - Natunas and Matak - 2H 2010 (1 frequency without equipment redundancy) 1H 2011 (2 frequencies with equipment redundancy)
  - Conson - 2H 2010
- C Signing of ADS-B data and VHF communications sharing agreement
  - i) Between Indonesia and Singapore - 1H 2010
  - ii) Between Vietnam and Singapore - 2H 2010
- D Conduct of Safety Assessment - 2H 2010

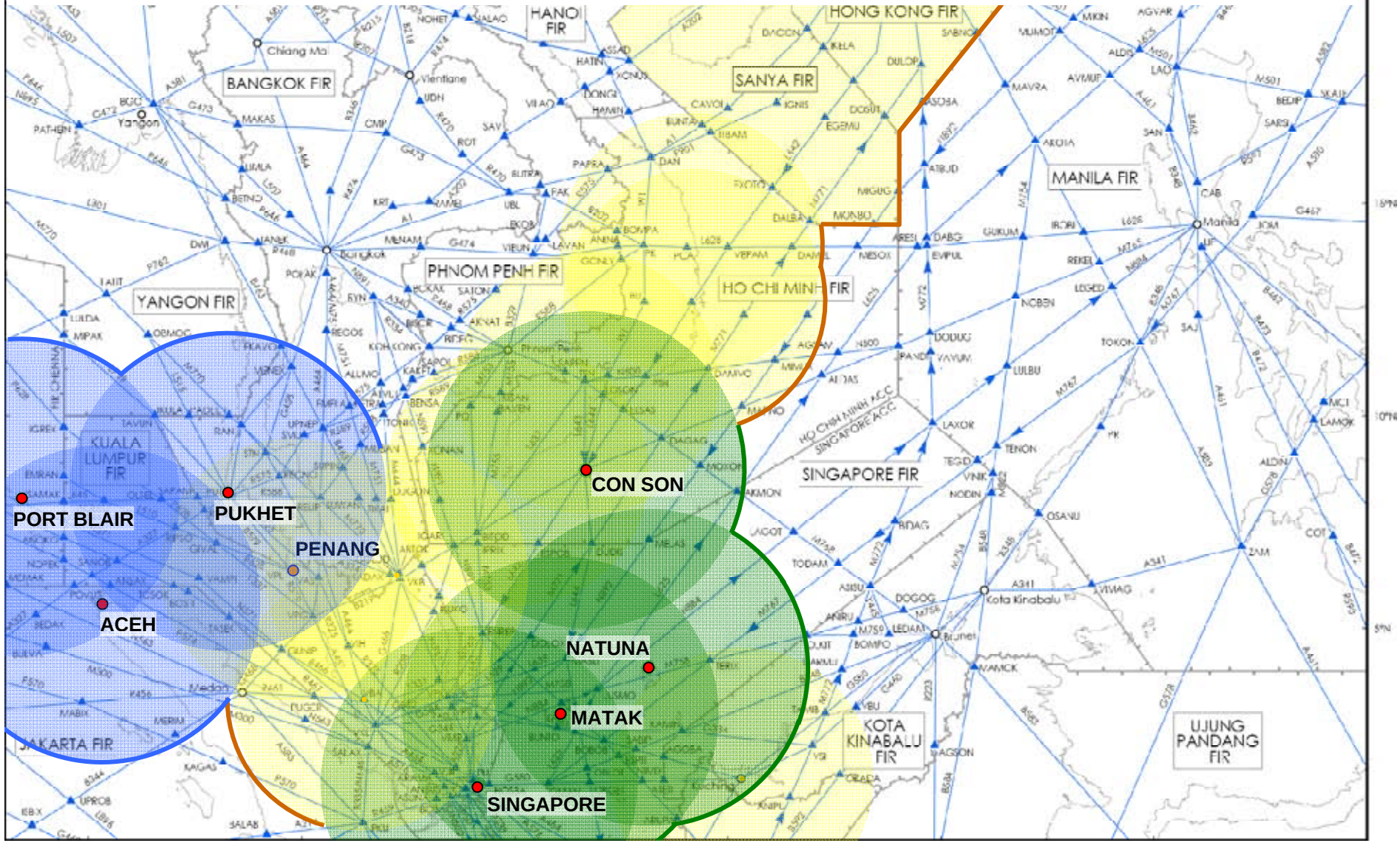
TASKS & PROJECT MILESTONES

- E - Signing of LOA between Ho Chi Minh and Singapore ACCs - 2H 2010
- F - Issue AIP Supplement on aircraft equipage mandate - 2H 2010
- G - Integration with ATC system - 2H 2011
- H - Conduct of ADS-B monitoring - 1H 2011
- I - Operational trial without priority - 2H 2011
- J - Priority for suitably-equipped aircraft - 2H 2012
- K - Implementation of ADS-B operations in exclusive airspace - 1H 2014

FUTURE COLLABORATION INVOLVING THE PHILIPPINES, INDONESIA, MALAYSIA & BRUNEI ?



FUTURE ADS-B COLLABORATION OVER THE BAY OF BENGAL?



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