



TRANSFORMING
GLOBAL ATM PERFORMANCE



Progress Report: Promoting ADS-B in the Asia-Pacific



April 2011

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1. Background Note

In 2002, ICAO designated ADS-B as a “Key Priority” for implementation within the Asia/Pacific Region.

IATA’s policy recognises ADS-B as “the preferred surveillance technology to replace radar for the air transport industry”. Airlines can expect a return on their equipment investment in terms of safety, efficiency and the increase of airspace capacity.

Following the establishment of the CANSO Asia Pacific Office in 2008, CANSO and IATA agreed to establish a working relationship to promote, facilitate and endorse the implementation of ADS-B and the sharing of ADS-B data between ANSPs within the Asia/Pacific region.

2. Memorandum of Understanding for a Joint Cooperative Effort by CANSO and IATA

- A Memorandum of Understanding for a joint cooperative effort by CANSO and IATA was signed in June 2008.
- Under the MoU, CANSO and IATA agreed to cooperate closely in the ICAO regional ADS-B planning and implementation process through active participation in relevant meetings such as those of the ICAO ADS-B Study and Implementation Task Force and its South East Asia Sub-Regional ADS-B Implementation Working Group.
- A goal for such co-operation is to keep up the momentum so that the Working Group can establish, monitor and deliver concrete outcomes according to agreed timelines.

3. Focus on High Density Routes

- Initial phase involving two trunk routes L 642 and M 771 over the South China Sea. ADS-B data and VHF communications sharing among the ANSP of Indonesia, Singapore and Vietnam.
- Expansion to other trunk routes over the South China Sea – Philippines & Brunei?
- Potential for ADS-B in Bay of Bengal Area – Myanmar, India etc.?

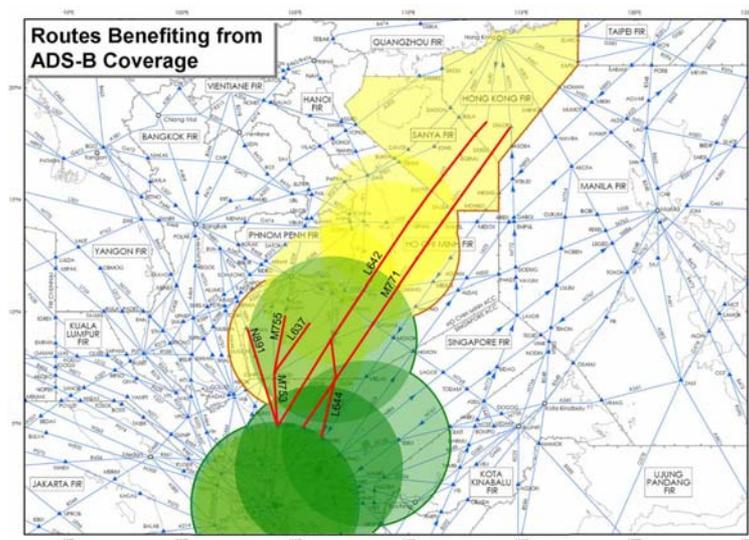


Figure 1: ADS-B Implementation over the South China Sea

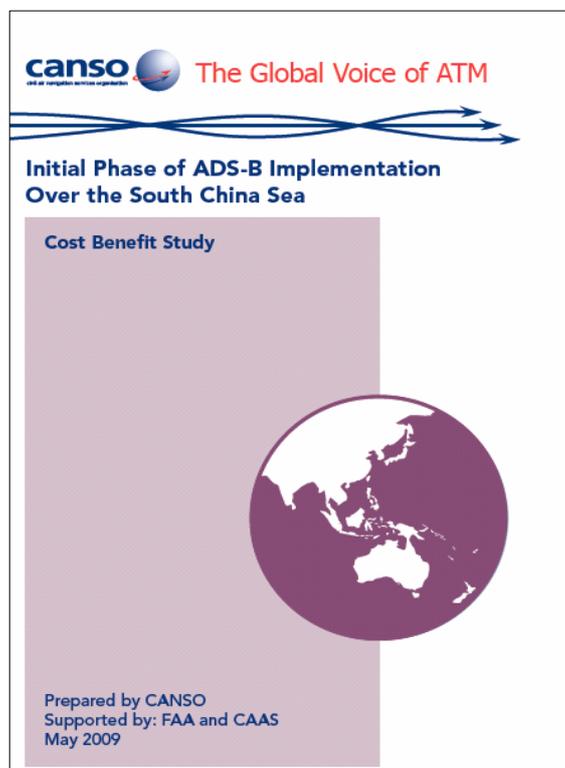
4. Participation in ICAO ADS-B Meetings

- **April 2008** – ICAO ADS-B Task Force Meeting in Chengdu China. First meeting attended by CANSO.
- **July 2008** – CANSO joined ICAO ADS-B SEA WG meeting in Kuala Lumpur. Recommended adoption of sharing of DCPC and ADS-B data as regional policy. Subsequently approved by APANPIRG. WG requested CANSO and IATA to develop cost benefit study for the South China Sea project.
- **February 2009** - CANSO presented methodology for Cost Benefit Study and Concept of Operations at the ICAO WG meeting in Melbourne.
- **May 2009** – CANSO published and presented results of Cost Benefit Study at ICAO Task Force Meeting in Hanoi.
- **January 2010** - In coordination with CANSO, CAAS presented a project milestone paper agreed with Indonesia at ICAO WG meeting in Jakarta.
- **August 2010** - Presented outcome of CANSO ADS-B seminar for CAAP at the ICAO SITF meeting in Jakarta. Called for expansion of ADS-B coverage.
- **April 2011** – Presented outcome of CANSO ADS-B seminar for DCA Myanmar at ICAO WG meeting in Singapore. Noted potential for ADS-B project over the Bay of Bengal. CAAS tabled latest project milestones agreed with Indonesia and Vietnam.

5. Cost Benefit Study for South China Sea Project

Study completed and results published in May 2009.

Available to download from www.canso.org/asiapacific



5.1. 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

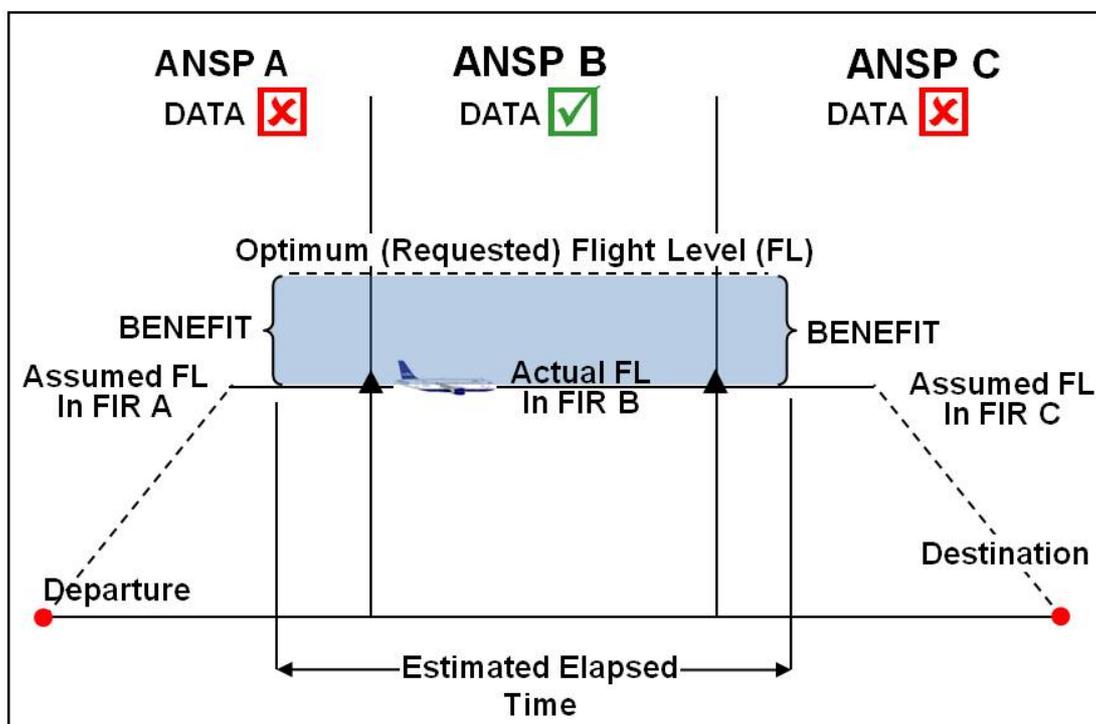


Figure 2: Benefits Optimum Flight Altitudes

5.2. Economic Analysis

Business Case

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

	Most Likely Estimate		
	3%	5%	7%
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

Figure 3: Most Likely Estimates

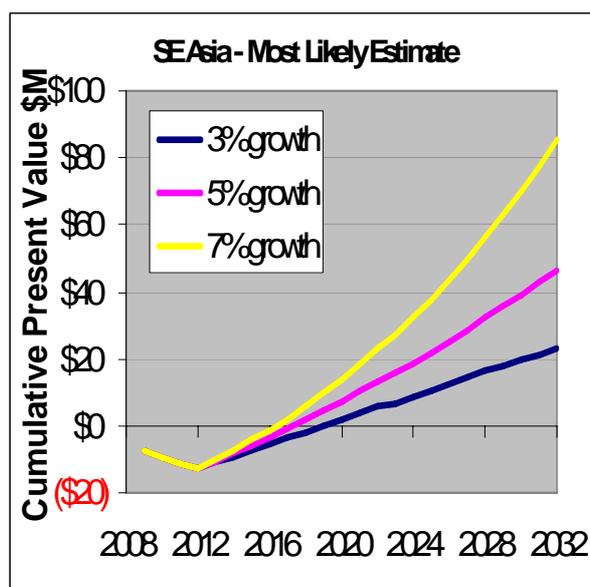


Figure 4: SE Asia Most Likely Estimates

5.3. Results of Cost Benefit Study

(for a medium 5% traffic growth scenario)

- Annual savings of nearly 3 million lbs of fuel burn
- Annual reduction of 10 million lbs of CO2 emissions
- Total Economic savings of over US \$ 4m annually
- IRR of 22 % for 5% traffic growth scenario
- For just only 2 trunk routes L642 and M771...

6. Project Milestones for Initial Phase of ADS-B Implementation over the South China Sea

A) Installation of ADS-B ground stations

Natunas and Matak

-completed

Singapore

-completed

Con Son

-2H2011

B) Installation of VHF stations and links

Natunas and Matak

-2H2011

Conson

-2H2012

C) Signing of ADS-B data and VHF radio facility sharing agreement

i) Between Indonesia and Singapore

-2H2010 completed

ii) Between Vietnam and Singapore-

-2H2011

D) Signing of LOA between Ho Chi Minh and Singapore ACCs

-1H2011

E) Issue AIC on aircraft equipage mandate

-2H2010 completed

F) Conduct of ADS-B monitoring + safety assessment

-1H2011

G) Operational trial without priority

-2H2011

H) Priority for suitably-equipped aircraft and Phase II

-2H2012

I) Implementation of ADS-B operations

-2H2013

6.1. Going Beyond the Initial Phase – South China Sea

- South China Sea - In addition to L642 and M771 to include N884 and M767. This would require suitably sited ADS-B stations in the Philippines and Brunei
- CANSO called on CAA Philippines in April 2010
- CANSO conducted on-site ADS-B seminar for CAAP in Manila in August 2010
- 33 participants from the ANS, ATS and regulatory divisions of CAAP and 3 Philippine carriers attended. Seminar identified the need to have an ADS-B station in South Philippines e.g. Quezon Palawan
- Outcome of CANSO seminar presented to ICAO Meeting in Jakarta in August 10
- CANSO called on DCA Brunei in August 2010



Figure 5: CANSO ADS-B Seminar for Civil Aviation Authority of the Philippines, 11 August 2010, Manila

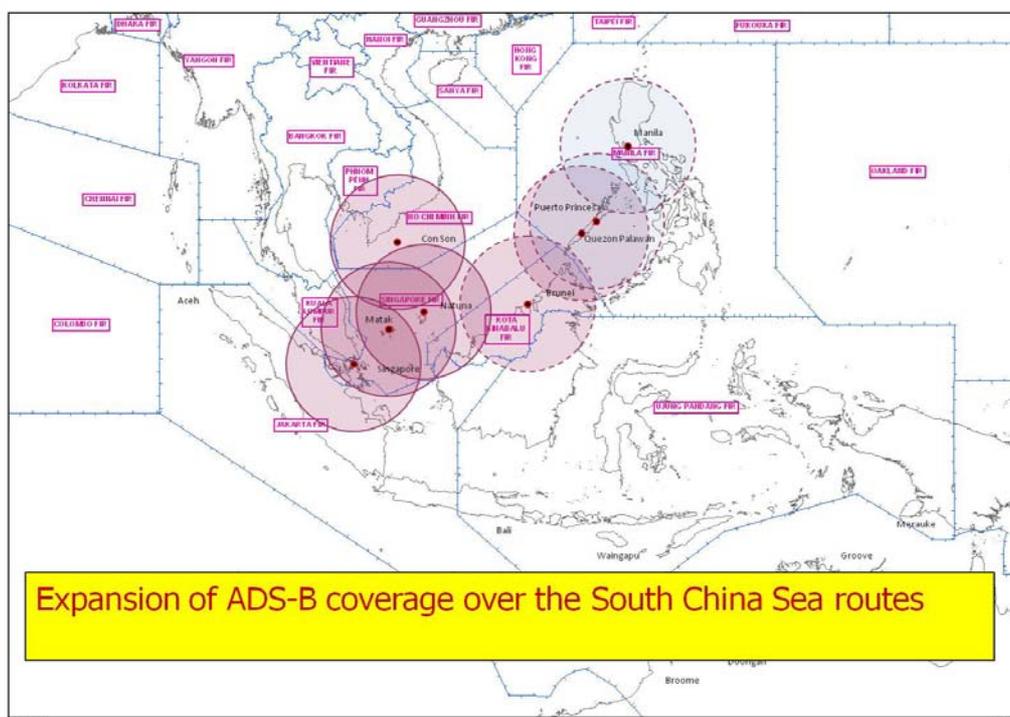


Figure 6: Expansion of ADS-B coverage over the South China Sea routes

6.2. Going Beyond the Initial Phase – Bay of Bengal

- Potential for ADS-B coverage of high density routes over the Bay of Bengal
- October 2010 – discussion with DGCA Myanmar at sidelines of DGCA conference
- February 2011 – CANSO conducted on-site ADS-B seminar for DCA Myanmar in Yangon
- 48 participants from the CNS, ATM and regulatory divisions of DCA Myanmar as well as all the Myanmar airlines
- Seminar discussed Myanmar's ADS-B masterplan 2012-2015 and noted the importance of optimising the locations of Myanmar's future ADS-B stations
- Outcome of the seminar was reported to the ICAO WG meeting in Singapore in February 2011 which saw Myanmar's participation



Figure 7: CANSO ADS-B Seminar for Civil Aviation Authority of Myanmar, Civil Aviation Training Institute, Yangon, 22 February 2011

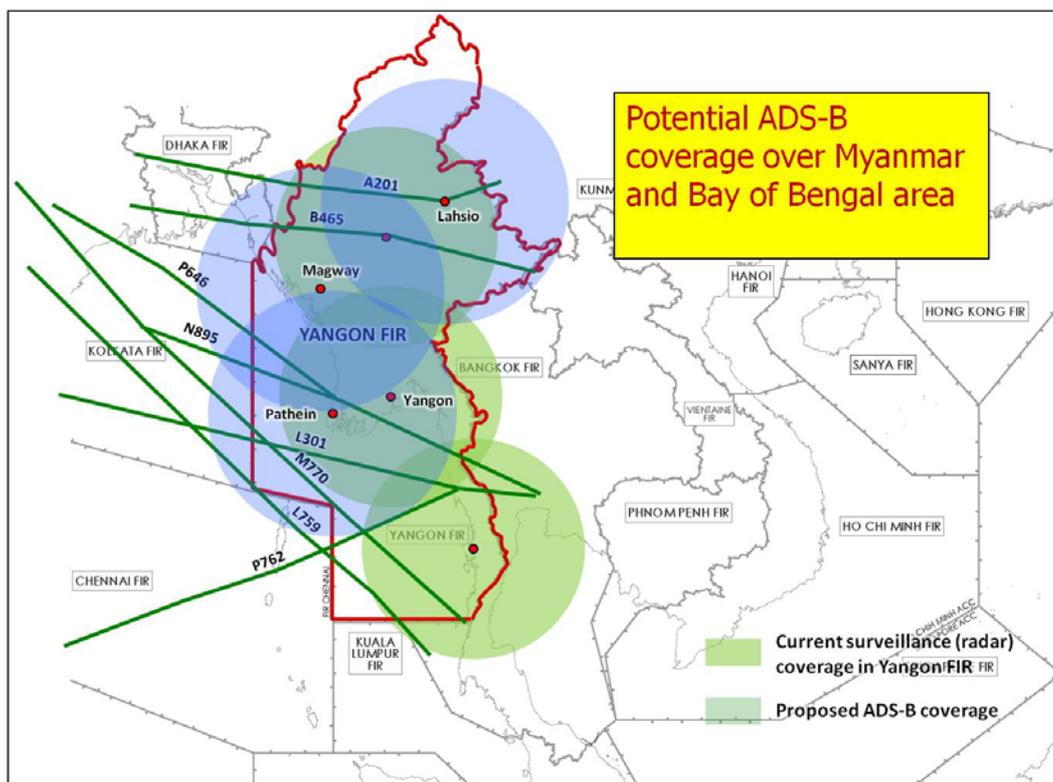


Figure 8: Potential ADS-B Coverage over Myanmar and Bay of Bengal Area

7. Next Steps

- Continue to work closely with IATA, ICAO and the relevant ANSPs to ensure that the 1st phase of ADS-B implementation over the South China is successfully completed
- Continue to focus on high traffic density areas outside radar coverage where maximum benefits can be derived. In particular, to promote expansion of ADS-B coverage over the South China Sea and ADS-B implementation over the Bay of Bengal
- Continue to emphasise the need for regional collaboration among ANSPs through the sharing of ADS-B data and VHF communications
- Continue with selective on-site ADS-B seminars to get more ANSPs, airlines and their regulators on board
- Consider usefulness of a technical working group to provide technical assistance to ANSPs in the planning, procurement and deployment of ADS-B stations

Notes

Notes

CANSO Members

CANSO – The Civil Air Navigation Services Organisation – is the global voice of the companies that provide air traffic control, and represents the interests of Air Navigation Services Providers worldwide.

CANSO members are responsible for supporting over 85% of world air traffic, and through our Workgroups, members share information and develop new policies, with the ultimate aim of improving air navigation services on the ground and in the air. CANSO also represents its members' views in major regulatory and industry forums, including at ICAO, where we have official Observer status.

For more information on joining CANSO, visit www.canso.org/joiningcanso



Lighter areas represent airspace covered by CANSO Members

Full Members - 61

- Aeronautical Radio of Thailand (AEROTHAI)
- Air Navigation and Weather Services, CAA (ANWS)
- Air Navigation Services of the Czech Republic (ANS Czech Republic)
- Air Traffic & Navigation Services (ATNS)
- Airports Authority of India (AAI)
- Airservices Australia
- Airways New Zealand
- Austro Control
- Avinor AS
- AZANS Azerbaijan
- Belgocontrol
- Bulgarian Air Traffic Services Authority (BULATSA)
- CAA Uganda
- Civil Aviation Authority of Singapore (CAAS)
- Civil Aviation Regulatory Commission (CARC)
- Department of Airspace Control (DECEA)
- Department of Civil Aviation, Republic of Cyprus
- Deutsche Flugsicherung GmbH (DFS)
- DSNA France
- ENAV S.p.A: Società Nazionale per l'Assistenza al Volo
- Entidad Pública Aeropuertos Españoles y Navegación Aérea (Aena)
- Estonian Air Navigation Services (EANS)
- Federal Aviation Administration (FAA)
- Finavia Corporation
- GCAA United Arab Emirates
- General Authority of Civil Aviation (GACA)
- Hellenic Civil Aviation Authority (HCAA)
- HungaroControl Pte. Ltd. Co.
- Irish Aviation Authority (IAA)
- ISAVIA Ltd
- Kazaeronavigatsia
- Latvijas Gaisa Satiksme (LGS)
- Letové prevádzkové Služby Slovenskej Republiky, Štátny Podnik
- Luchtverkeersleiding Nederland (LVNL)
- Luxembourg ANA
- Maldives Airports Company Limited (MACL)
- Malta Air Traffic Services (MATS)
- NATA Albania
- National Air Navigation Services Company (NANSC)
- NATS UK

- NAV CANADA
- NAV Portugal
- Naviair
- Netherlands Antilles - Curaçao ATC (NAATC)
- Nigerian Airspace Management Agency (NAMA)
- Office de l'Aviation Civile et des Aeroports (OACA)
- ORO NAVIGACIJA, Lithuania
- PNG Air Services Limited (PNGASL)
- Polish Air Navigation Services Agency (PANSNA)
- Prishtina International Airport JSC
- ROMATSA
- Sakaeronavigatsia Ltd
- SENEAM
- Serbia and Montenegro Air Traffic Services Agency (SMATSA)
- Serco
- skyguide
- Slovenia Control
- State Airports Authority & ANSP (DHMI)
- State ATM Corporation
- The LFV Group
- Ukrainian Air Traffic Service Enterprise (UkSATSE)

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- GE Aviation's PBN Services
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- HITT Traffic
- Honeywell International Inc. / Aerospace
- IDS – Ingegneria Dei Sistemi S.p.A.
- Indra Sistemas
- Inmarsat Global Limited
- Integra A/S
- Intelcan Technosystems Inc.
- Jeppesen
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