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# INTERNATIONAL CIVIL AVIATION ORGANIZATION

A UN SPECIALIZED AGENCY



# Outcomes of
# GBAS SBAS ITF8 May 2026
# &
# ADB workshop
# on SBAS implementation in ASEAN Oct 2026

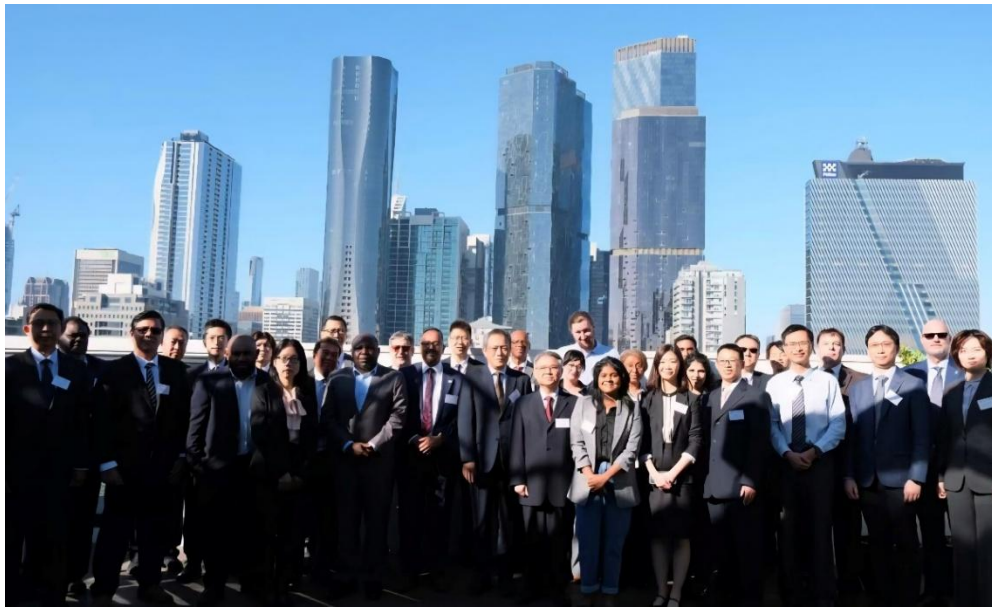
Raphael GUILLET

Chief of the ICAO Asia Pacific
Regional Sub-Office

ICAO

# Outcomes of Summary of GBAS SBAS ITF8



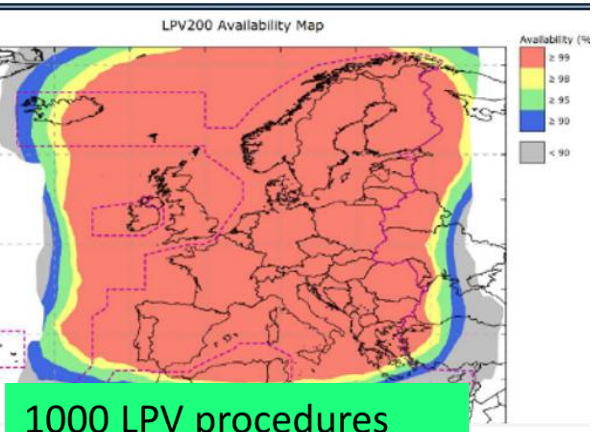


- 8th meeting in Melbourne, 12-14 May
- Participants from Australia, China, Hong Kong China, India, Japan, New Zealand, Pakistan, Philippines, Republic of Korea, Singapore, South Africa, USA, IFALPA, ADB, and ICAO ( including FPP CTA)
- 6 SBAS systems in APAC ( Gagan, MSAS, KASS in operations, then BDSBAS, SouthPAN and Pakistan in development, ASEAN SBAS in feasibility study)
- 3 GBAS stations in operations ( Sydney, Melbourne, Tokyo) and R&D in Singapore, Thailand

# SBAS Concept : around the world

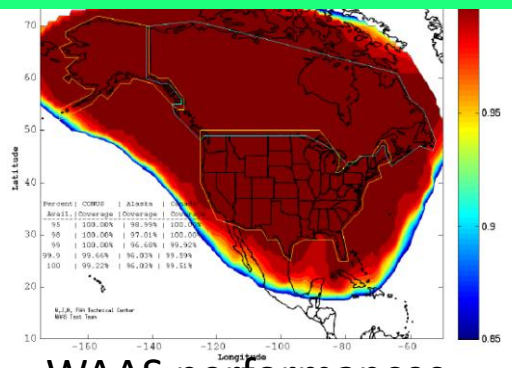
PAK-SBAS

EGNOS performances



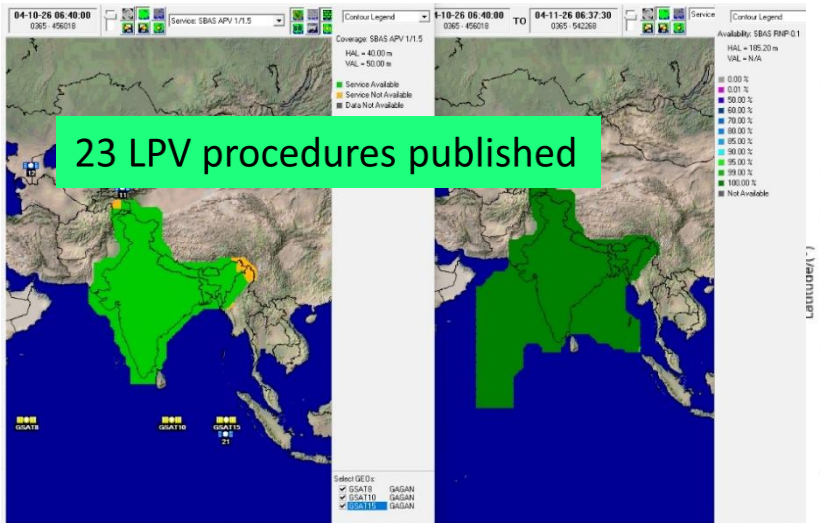

1000 LPV procedures published

4200 LPV procedures published



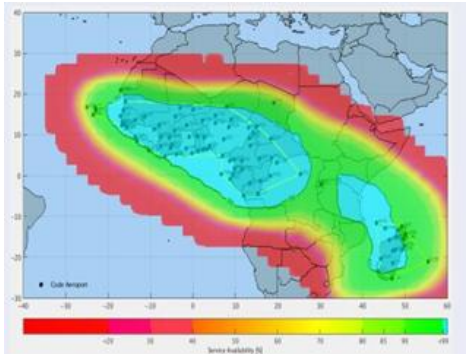
WAAS performances

SDCM



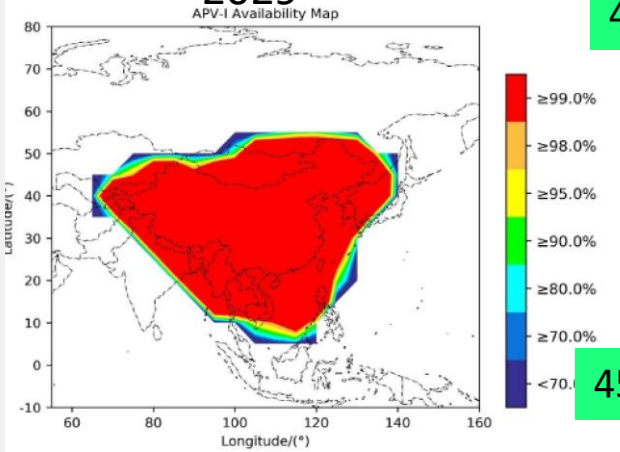
23 LPV procedures published

GAGAN performances



ANGA performances in 2030

BDSBAS Performances 2029



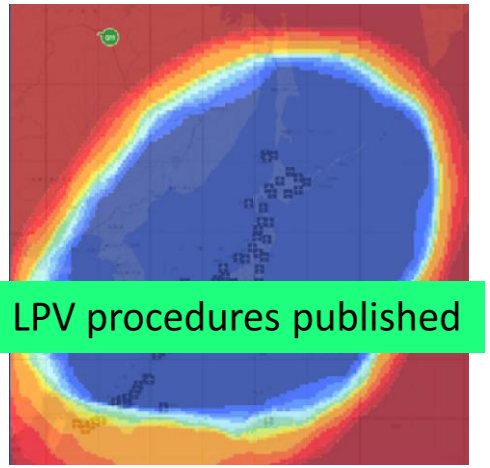

?

ASEAN

KASS performances

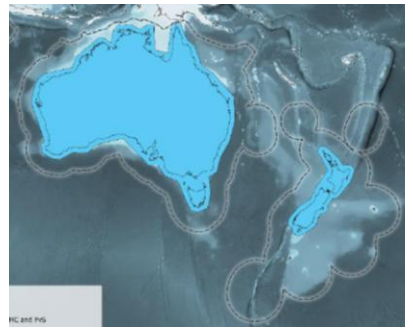



4 LPV procedures published



45 LPV procedures published

MSAS performances



SouthPAN coverage 2028

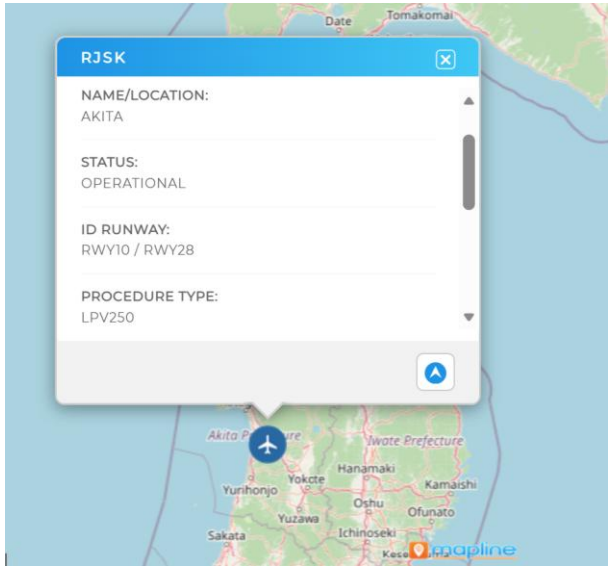
# LPV procedures in APAC




LPV procedure MAP ( last update April 2026)

**LPV Operational**

**LPV Planned**



# Outcomes : GBAS





GBAS stations
in Australia
(Sydney and Melbourne)



(courtesy of NEC)

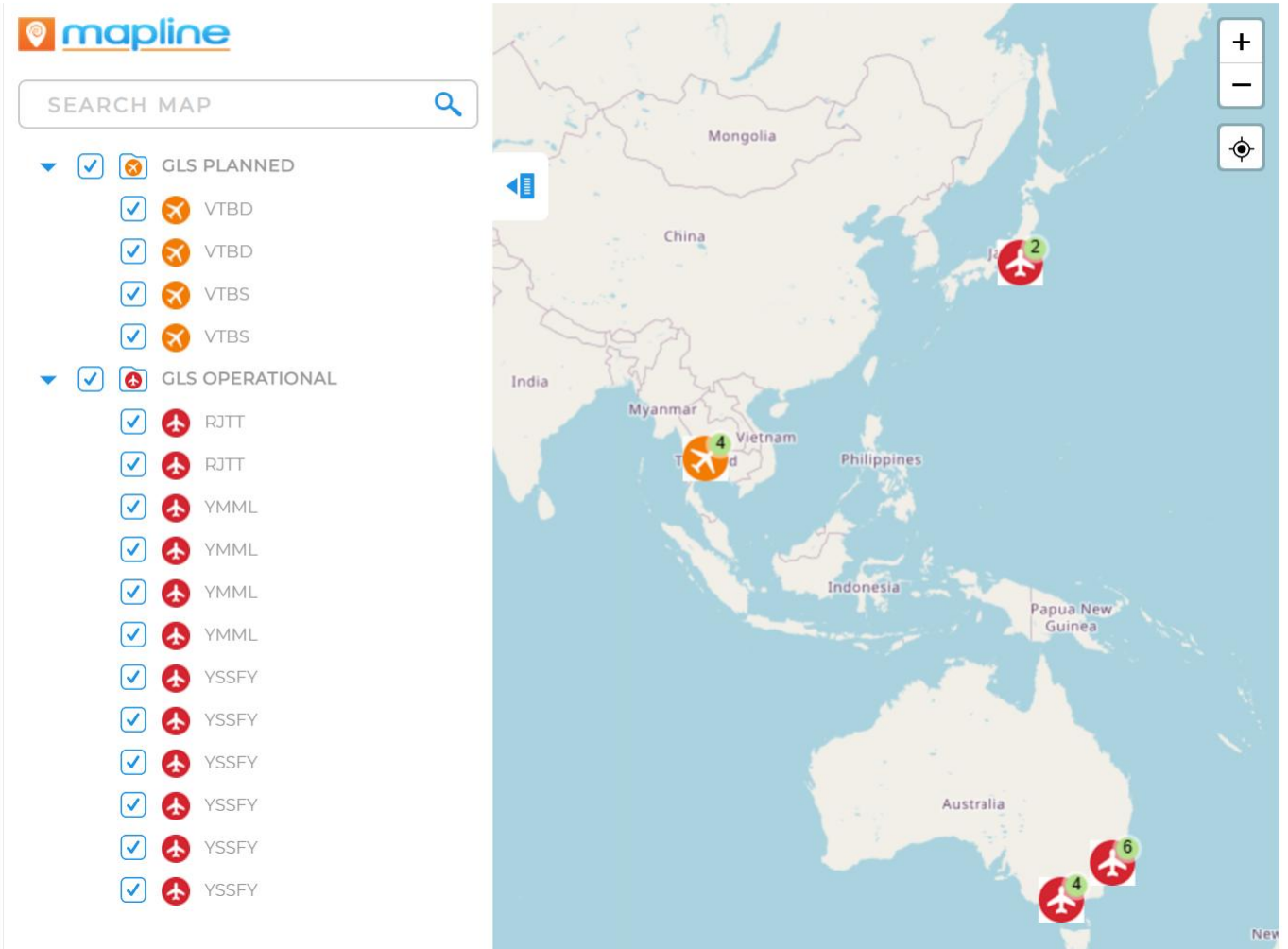
GBAS station
in Japan
(Tokyo)



GBAS stations
in China
(Tianjin and Lhasa)

# GLS procedures in APAC

| GLS Planned | GLS Operational |
| --- | --- |
|  |  |



# Summary of GBAS SBAS ITF8



- **Main topics :**
  - SBAS implementation guidance document
  - Electronic Bulletin 2026/13 : Reassess SBAS procedures
  - GNSS RFI
  - Demonstration of GBAS and SBAS performances for certification
  - Safety assessment of introducing a new procedure (LPV /GLS) into local ATM environment
  - Interface for ATC :
    - SBAS : no need as the ground can not see what the aircraft is receiving and capable of
    - GBAS : reporting to the ATCO in the tower
  - Ionospheric threat model
  - Discussion with Chief Pilot of Qantas
  - Discussion with ADB for a possible SBAS in ASEAN countries
  - Presentation by FPP CTA on GBAS SBAS procedure design courses

# Summary of GBAS SBAS ITF8



- **Future of this group :**
  - Most of the tasks defined in the first meeting of the task force have been completed
  - The participating States asked the Task Force to become a Coordination Group
  - The proposal was submitted to CNS Sub Group in early July

- **Key future activities :**
  - Certification/Safety assessment/performance demonstration
  - Sharing of experience in implementing these systems ( ionosphere, satellite monitoring,..)
  - Follow up of ICAO standards ( current and new ones : DFMC, authentication, …)

# Outcomes of ADB workshop on SBAS implementation for ASEAN



- Asian Development Bank (ADB) and JICA are launching a feasibility study for an SBAS system in ASEAN States
- The workshop was organized by ADB in Da Nang on 7-8 Oct 2026 with representatives from ASEAN States, in conjunction with ASEAN Air Transport meeting.
- ICAO delivered a 1h presentation on SBAS standardization and training.
- JRANSA has conducted surveys in interested States and organized several sessions to brainstorm on key points

# Outcomes of ADB workshop on SBAS implementation for ASEAN



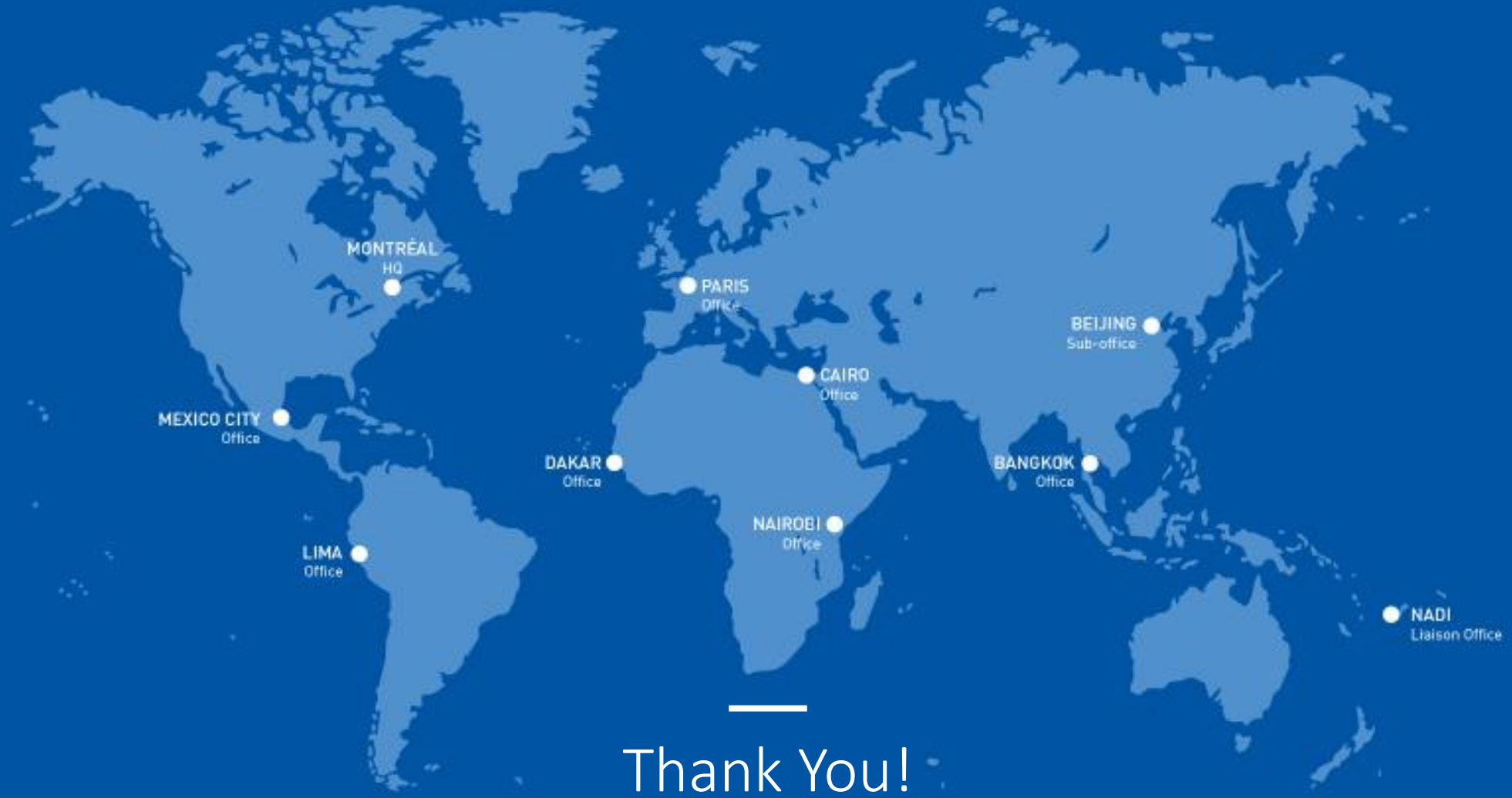
- **Main discussions were on :**
  - **Which SBAS architecture/target performances would be the best for part or all of ASEAN States:**
    - **Case A : A new SBAS system for ASEAN**
    - **Case B : Extension of existing SBAS ( from India, ROK, Japan, Australia/New Zealand)**
  - **How to fund such an SBAS sytem ? Which equation to share the cost among interested States?**
  - **How to convince decision makers?**
  - **What would be the governance for the project development and for the operations ?**
  - **How to certify such system?**
  - **How to combine with DFMC?**
  - **How to develop a cost benefit study? What would be the "costs/drawbacks" of no doing an SBAS?**
  - **How to get PRN id for Geo satellites?**
  - **Corrections provided by internet in complement to the Geo satellites to reach other users**
  - **How to get non aviation modes of transport on board for a SBAS system for ASEAN? ESSP (European SBAS provider) provided a very detailed presentation of the different performance requirements and applications for non-aviation users**

# Outcomes of ADB workshop on SBAS implementation for ASEAN



- **My main comments were about :**
  - proposal to have software simulation to assess the different possibilities of SBAS performances and architectures in ASEAN,
  - Consider regional airports and airlines as a key target
  - APV SBAS offer a vertical/horizontal geometric guidance on final approach, much safer than APV Baro VNAV which is sensitive to QNH mis setting and Temperature variation

- **What's next ?**
  - Feasibility study to be completed by mid 2027
  - Then a Master Plan will be drafted
  - Second workshop in Q2 2027
  - ICAO will support these activities




# Thank You!

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