MINISTRY OF CIVIL AVIATION, GOVERNMENT OF INDIA

ICAO APAC SBAS-GBAS IMPLEMENTATION WORKSHOP FOR AIRSPACE USERS
"Enhancing airport accessibility and safety on final approach with SBAS and GBAS"

14th to 16th October 2025
Bengaluru, India

CNS/ANS implementation in India

Vision, Mission & Way Forward

M. Suresh

Member(ANS), AAI

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ABOUT AAI

AIRPORTS AUTHORITY
OF INDIA

Airports Authority of India (AAI) is a Government of India statutory body responsible for creating, upgrading, maintaining and managing civil aviation infrastructure in India, including airports and air navigation services'.
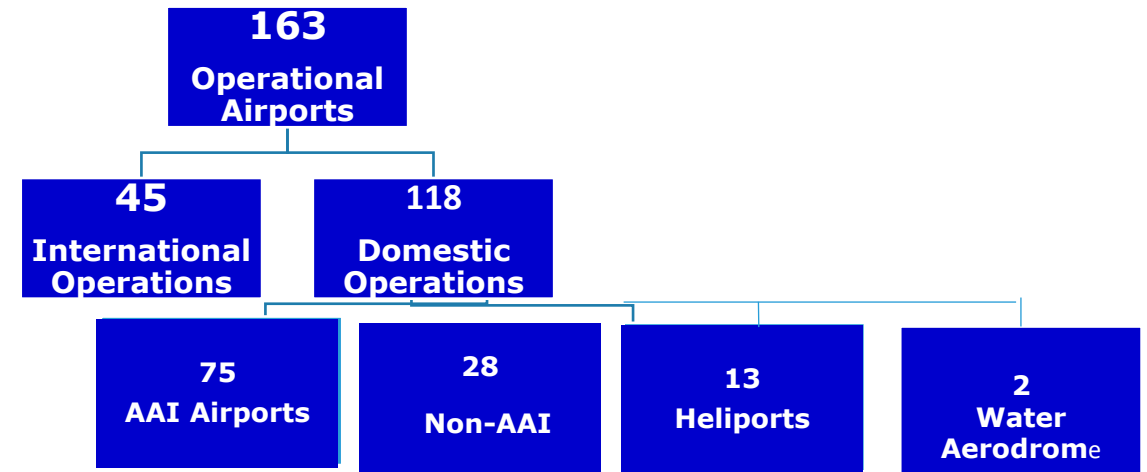

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Roles of AAI

Airport Developer: **Total Operational Airports : 163**

```
            163
        Operational
          Airports
         /        \
       45          118
  International   Domestic
   Operations    Operations
```

75	28	13	2
AAI Airports	Non-AAI	Heliports	Water Aerodrome

Air Navigation Service Provider

Over 2.8 million square nautical miles of air space as per ICAO.

Ensure flight safety & efficiency

Provide advanced CNS technologies

AAI Vision and Mission

Vision

To be world's leading Airport Developer, Operator and Air Navigation Services provider.

Mission

To enhance air connectivity across the nation and be an environment conscious sustainable organization using the state of the art and indigenous technology for cost effective, modern, safe airport operations and air navigation services.

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Economic Strength, Demographic Dividend

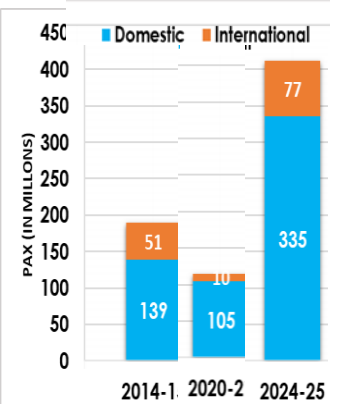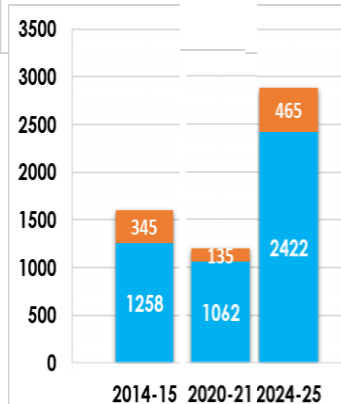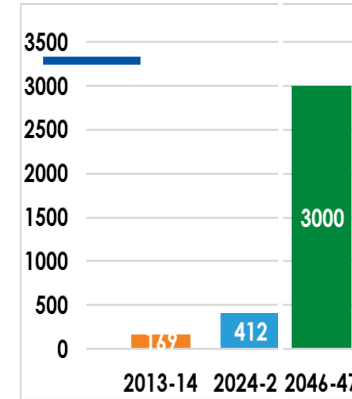|	
5th **Largest Economy**	**Globally, with GDP of ~USD 4.1 trillion (2025 est.)**
7 % **Annual Growth**	**Consistent growth for the last 10 years, projected to continue**
$10T **GDP Target**	**Expected to reach USD 10 trillion by 2035**
65%+ **Young Population**	**Under 35 years age passenger category, driving consumption, tourism, and air travel demand**

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GROWTH IN INDIAN CIVIL AVIATION

Passenger Movements (All Indian Airports)

Compound Annual Growth Rate (CAGR) –
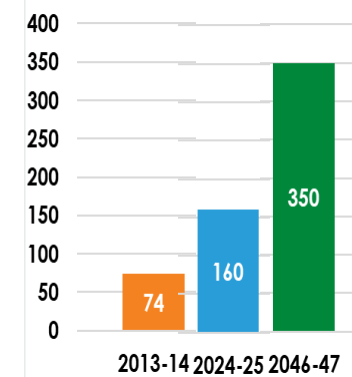**PAX: 8.05%** from FY 2014-15 to FY 2024-25

Passenger Growth (in million)

Expected Growth–
PAX: 628% from FY 2024-25 to FY 2048-47

Aircraft Movement (All Indian Airports)

Compound Annual Growth Rate (CAGR) –
ACM: 6.06% from FY 2014-15 to FY 2024-25

No. of Airports

Plan to increase–
Airports: 118.75% from FY 2024-25 to FY 2048-47

Target: 350–400 operational airports (from ~163 in 2025)

Passenger Growth: 6× increase

- Driven by rising middle class, regional air travel demand, and economic growth.
- Connectivity to Tier 2/3 cities, unserved and underserved areas.

Training infrastructure will scale 3–4× by 2030

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India's Aviation Revolution

Rising Demand

Young population and economic growth driving unprecedented travel demand

Massive Connectivity

1,800+ aircraft orders and 637+ new routes transforming accessibility

World-Class Infrastructure

162+ airports with open FDI policies attracting global investment

Sustainability Focus

SAF initiatives, AAM development, and digital solutions leading innovation

India's aviation sector is entering a transformative growth phase – driven by rising demand, massive connectivity expansion, world-class infrastructure, and sustainability initiatives. With GDP projected to double to USD 10 trillion by 2035 and strong policy support, India offers one of the largest and most dynamic opportunities for global aviation stakeholders.

COMMUNICATION
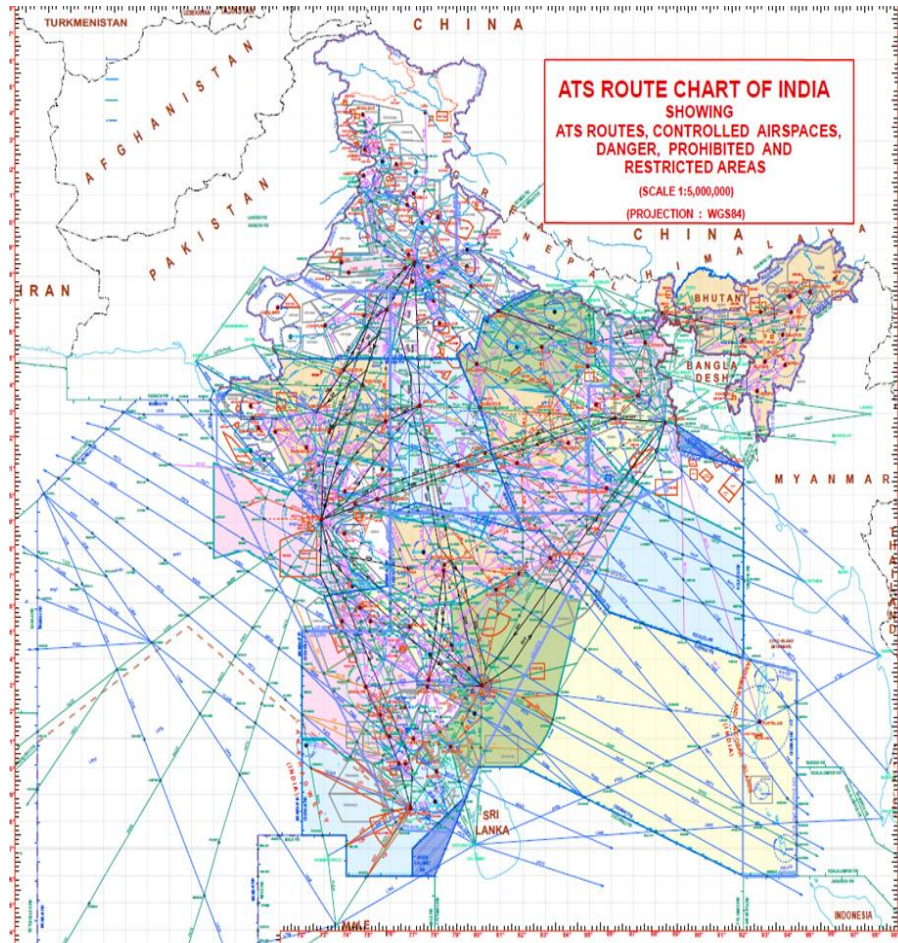
- ➢ **VHF Radio Telephony: 131 VHF stations +**
- ➢ **RCAG links: 50**
- ➢ **HFRT : 4 stations (Delhi, Mumbai, Chennai, Kolkata)**
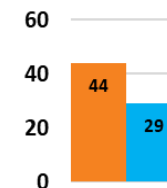- ➢ **CPDLC + ADS-C: Mumbai, Chennai & Kolkata OCCs**

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NAVIGATION

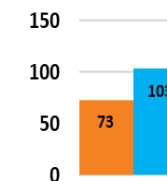AIRPORTS
AUTHORITY OF
INDIA

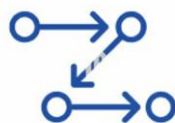> **NDB**
Decreased by **34%** NDB in 10 years
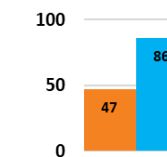
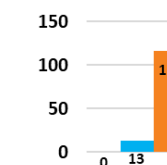> **DVOR**
Increased about **41%** DVOR in 10 years

> **ILS**
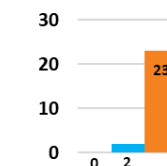Increased about **82%** ILS in 10 years

> **PBN Procedure**
AAI has published **116** PBN Procedures for **64** Airports. Approximately **792%** increased.

> **LPV (GAGAN) Procedure**
> AAI has published **23 LPV** (GAGAN) Procedures for 15 Airports & **26** are in pipeline. Approximately **1050%** increased.
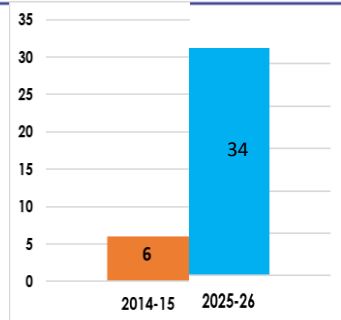
■ 2014-15
■ 2025-26

NDB chart: 44 (2014-15), 29 (2025-26)
DVOR chart: 73 (2014-15), 103 (2025-26)
ILS chart: 47 (2014-15), 86 (2025-26)
PBN chart: 13, 116
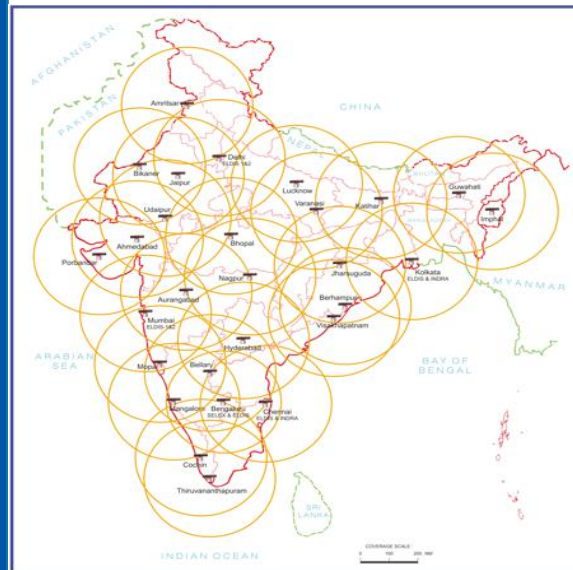LPV chart: 0, 2, 23, 26

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SURVEILLANCE

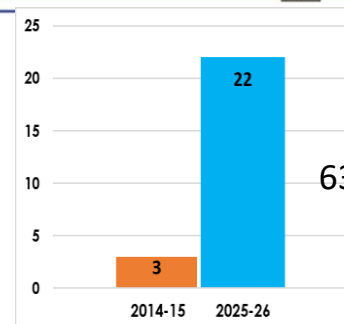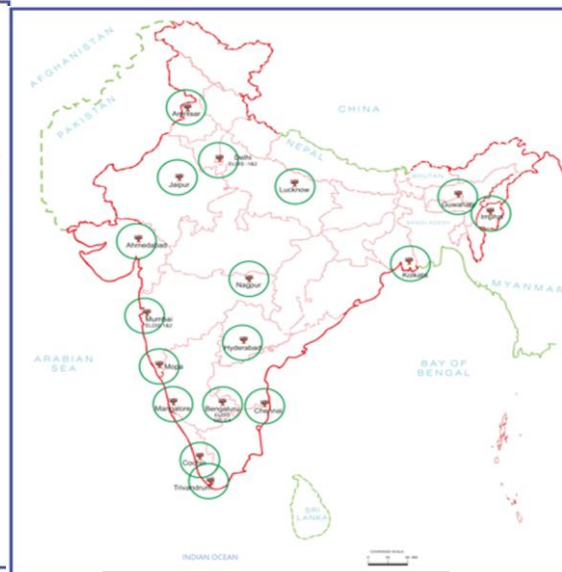AIRPORTS AUTHORITY
OF INDIA

MSSR Coverage
Total MSSR : 34
(Standard Coverage : 200 NM)

466 %

ASR Coverage
Total ASR : 20
(Standard Coverage: 60 NM)

633 %

ADS-B Coverage
Total ADS-B: 36
(Standard Coverage : 200 NM)

3500 %

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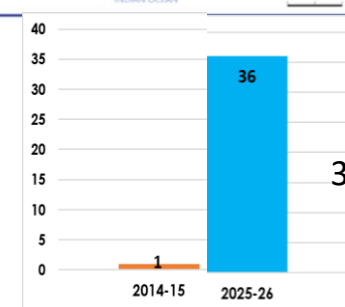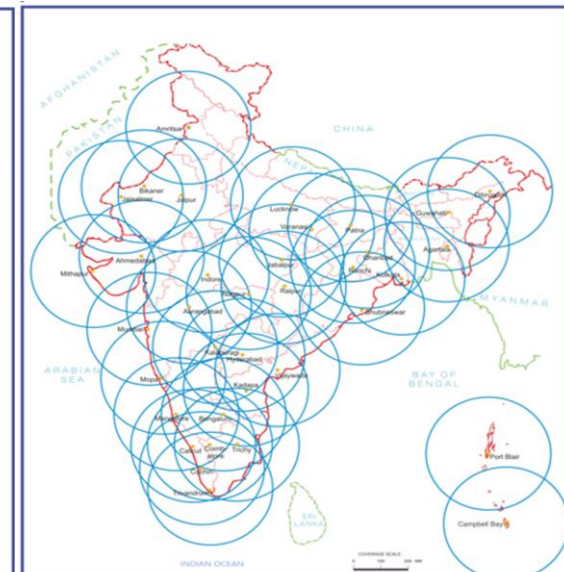
Space-Based ADS-B Implementation in India for oceanic coverage

India
Service Volumes A, B, C, D, & E
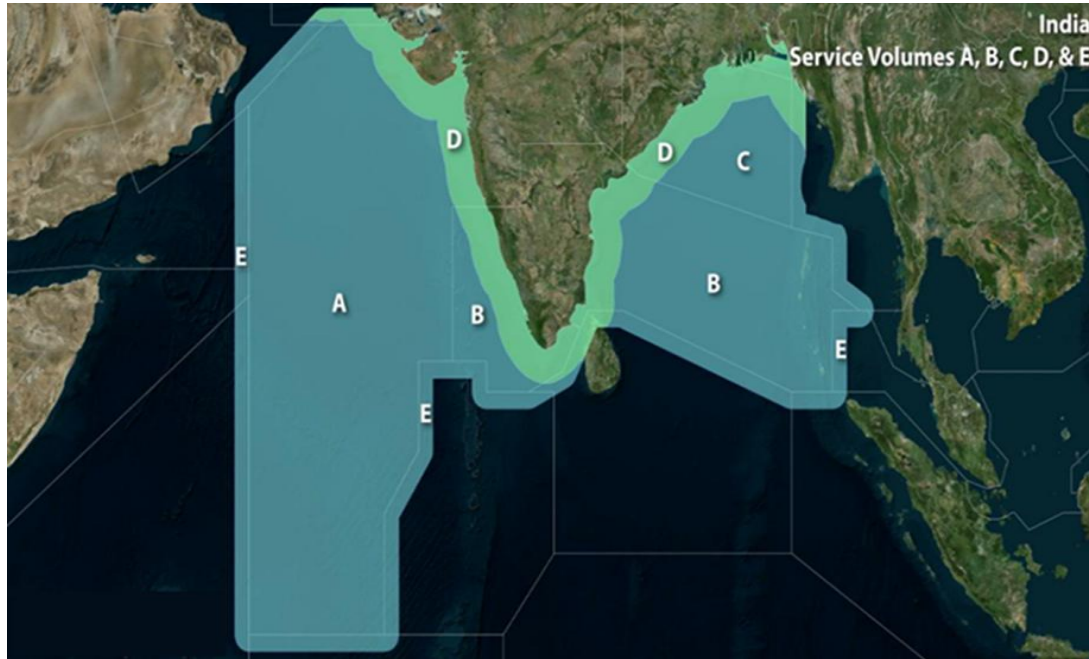
Coverage:

Oceanic regions of Indian FIRs

- **Mumbai**
- **Kolkata**
- **Chennai**

Remote Areas

- **Sub-FIR Guwahati**

Operational since 2021

Key Highlights

- Real-time aircraft tracking over **oceanic/remote areas**
- Enhances **safety**, **efficiency** & **situational awareness**
- Enables reduced **separation minima**
- Complements **ground-based ADS-B & RADAR**

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AUTOMATION

AIRPORTS AUTHORITY OF INDIA

➢ **ATM Automation System**

- Total Automation System at **44** Airports

➢ **Simulator**

- AT3+: **01**
- IATS : **04**
- Procedural Approach and Area Control Simulator : **02**
- Integrated Aerodrome Control Visual Simulator : **02**
- FSTD (Flight Simulator Training Device) : **03**

➢ **Central Air Traffic Flow Management**

- CATFM-CCC : **01**
- CATFM-FMP : **41**

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TRAINING
(ATSEP & ATCO)

ANS TRAINING INFRASTRUCTURE & PROGRAMS

		ATSEP	ATCO
07 **TRAINING** (ATSEP & ATCO)	**Centers**	➤ CATC Prayagraj, ➤ 5 RTCs, ➤ HTC Hyderabad, ➤ NIATAM Gondia	➤ CATC Prayagraj, ➤ HTC Hyderabad, ➤ NIATAM Gondia
	Training Types	✓ Ab-initio, ✓ CBTA / STP, ✓ Specialized Maintenance, Refresher, ✓ Revalidation/ Conversion, ✓ Cyber Security	**ICAO-standard approved programs-** **Regulatory:** ➤ ADC, ➤ APP, ➤ ACC, ➤ SCC, ➤ AELP **Non-Regulatory** • AIS, • PANS-OPS, • SAR, • ITC)
	No. of Trainees	2022–23: 1206 2023–24: 933 2024–25: 1092	2022–23: 1153 2023–24: 1573 2024–25: 1019

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India's Safety Performance

ICAO GASP [Global Aviation Safety Plan] Target:
Accident rate < 2.5 per million departures by 2030.

India's Status:

- ✓ **Accident rate** already below global average.
- ✓ **Decline in CFIT [**Controlled Flight Into Terrain] **and LOC-I** [Loss of Control In-flight occurrences] due to PBN/LPV & ATFM.
- ✓ **ICAO USOAP CMA (2023) [** Universal Safety Oversight Audit Programme- Continuous Monitoring Approach] **–**
    - ❖ >85% Effective Implementation (above APAC average).
- ✓ **RASG-APAC SPIs [**Regional Aviation Safety Group – Asia and Pacific] Safety Performance Indicators]**:**
    - ❖ India compliant on Runway Safety, CFIT prevention, and Mid-air collision risk mitigation.

ICAO Council President Certificate (2025)

In September 2025, India received the ICAO Council President Certificate in recognition of its progress towards establishing an effective aviation safety oversight system and improving its implementation of ICAO standards & recommended practices (SARPs).

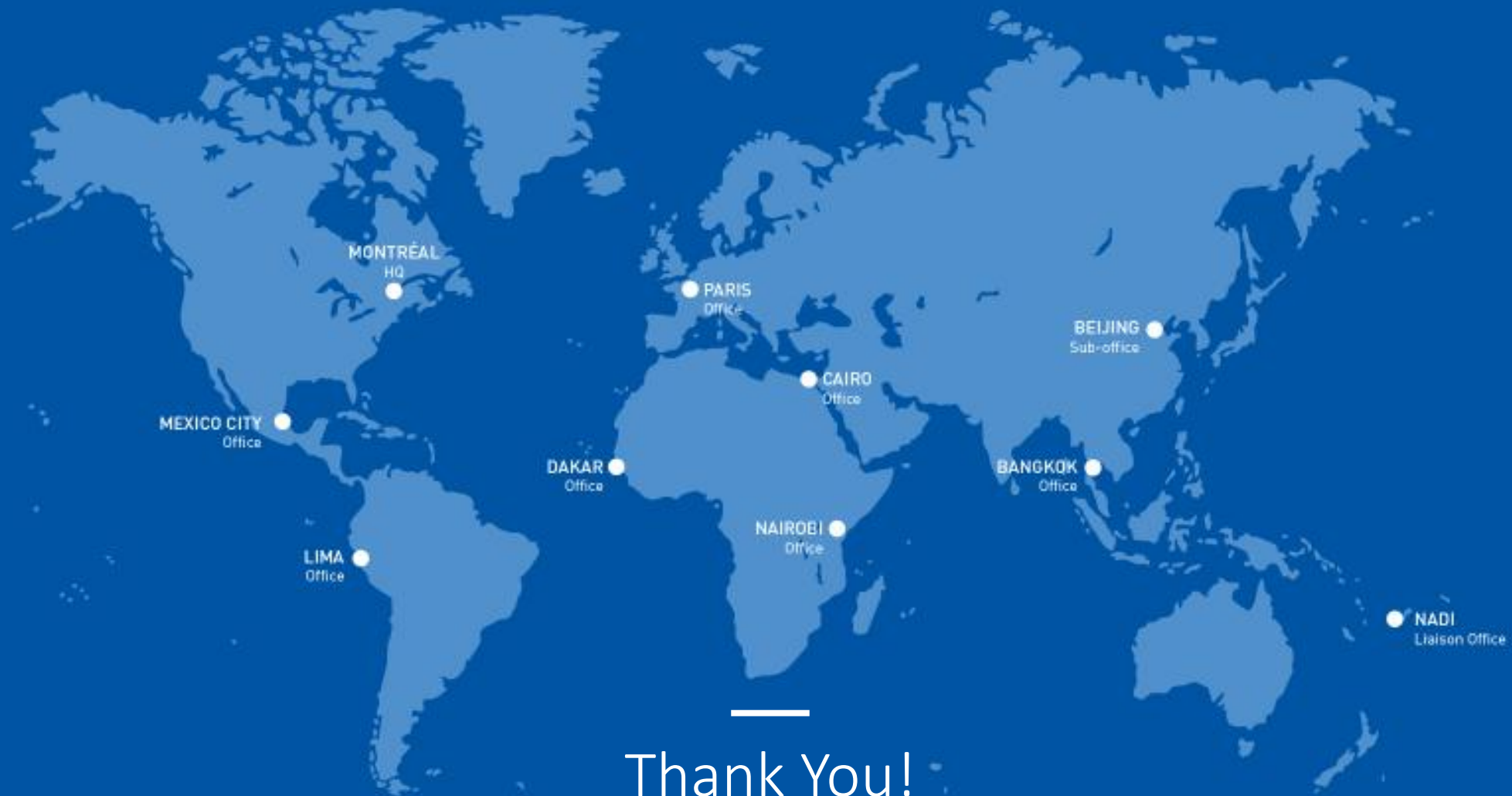# 9. GANP / ASBU Implementation – India (AAI ANS Alignment)

ICAO's Global Air Navigation Plan (GANP) provides a harmonized roadmap through Aviation System Block Upgrades (ASBU)

Block	Status	Implemented Blocks
B0 2013	Achieved	India has fully implemented core modules. These include PBN/APV with GAGAN SBAS, oceanic CPDLC/ADS-C, nationwide ADS-B/Mode-S, national ATFM system, and A-CDM at metro airports.
B1 2019	Mostly achieved	Implementation is substantial and ongoing. AAI has operationalized network-centric ATFM , A-CDM integration with ATFM DPI (Departure Planning Information) exchanges, expanded RNP procedures, digital AIM (eAIP), and Increase in ADS-B coverage.
B2 2025	Preparatory work ongoing	Foundational steps are underway. Pre-SWIM (System Wide Information Management) data exchanges via AIM, ATFM, and A-CDM are functional. Full SWIM and Trajectory-Based Operations (TBO) remain on the roadmap beyond 2025.
B3 2031	Planned	India's strategy foresees advanced automation, full SWIM, TBO, and enhanced surface management systems for maturity.

India is among the leading ANSPs in the APAC region, fully compliant with B0, largely aligned with B1, and building capability for B2/B3.

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Way Forward

- ❑ **Seamless Indian Sky: ATFM harmonization with APAC neighbours**

- ❑ **Full digital AIM/AIXM & SWIM integration**

- ❑ **Integration of drones, UTM, urban air mobility**

- ❑ **Green CNS/ATM initiatives (lower fuel burn, reduced emissions)**

- ❑ **India as a global model of safe, efficient, inclusive ANS**

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Thank You!