GAGAN

Prelims: *Current events of national and international importance | Science and Technology*

Why in News?

Recently, India enabled the country's 1st satellite-based landing system approach on a commercial jet aircraft

- **GAGAN (GPS Aided GEO Augmented Navigation) –** Indigenous Satellite-Based Augmentation System (SBAS).
- It is a technology that improves GPS by providing real-time correction and integrity information.
- **Developed by –** ISRO and the Airports Authority of India (AAI).

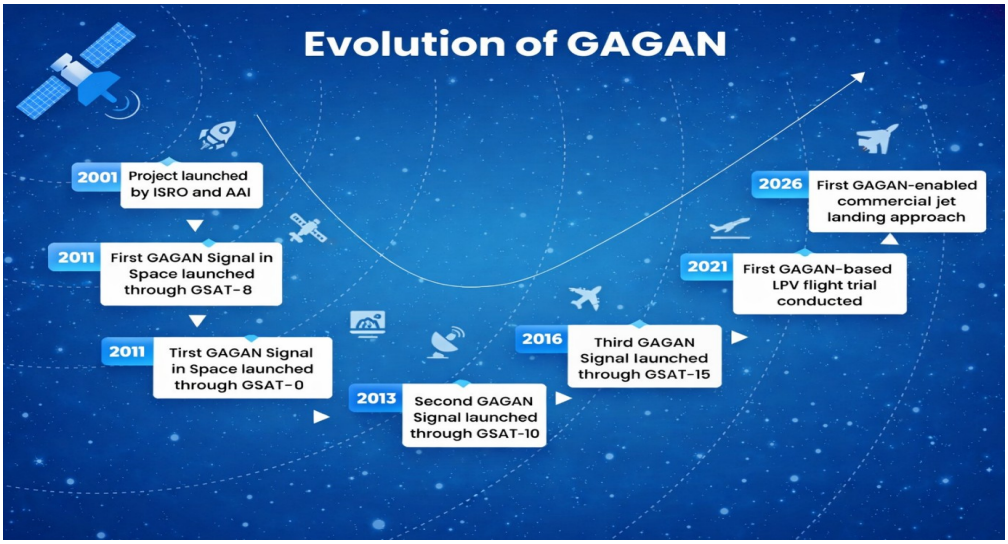


Key Features

- **Infrastructure –**
  - 15 Indian Reference Stations (INRES) – monitor GPS signals.
  - 2 Indian Master Control Centres (INMCC) – process corrections.
  - 3 Indian Land Uplink Stations (INLUS) – transmit corrections to satellites.
  - 3 Geostationary Satellites (GSAT-8, GSAT-10, GSAT-15) – broadcast corrected signals.
- **Unique Achievement –** 1st SBAS certified for the equatorial region.
- **Interoperability –** Compatible with US Wide Area Augmentation System (WAAS), Europe's European Geostationary Navigation Overlay Service (EGNOS), and Japan's

Master Service Agreement (MSAS).

GAGAN	NavIC
Satellite-Based Augmentation System (SBAS)	Independent regional navigation satellite system
Improves GPS through real-time corrections and integrity information	Provides positioning, navigation and timing services
Supports civil aviation across the Indian Flight Information Region	The coverage area includes India and a region up to 1500 km beyond Indian boundary



Applications Beyond Aviation

- **Maritime Navigation –** Accurate positioning in coastal and offshore waters.
- **Road Transport –** Supports intelligent transport systems and fleet management.
- **Railways –** Enhances operational safety and efficiency.
- **Disaster Management –** Enables precise location tracking during emergencies.
- **Defence and Security –** Strengthens navigation for military operations.
- **Telecommunications –** Assists in synchronisation of telecom networks.
- **Surveying and Mapping –** Improves accuracy of land surveys and geospatial mapping.

Quick Facts

• **Geostationary satellites** – Orbit at the same speed as the Earth's rotation.
• GSAT-8, GSAT-10, and GSAT-15 – India's geostationary satellites that carry GAGAN payloads.

Reference

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