Indian Regional Navigation Satellite System (IRNSS) is an independent regional navigation satellite system developed by India. It is designed to provide accurate position information service to users in India as well as the region extending up to 1500 km from its boundary, which is its primary service area.

IRNSS will provide a position accuracy of better than 20 m. So far, ISRO has already launched 3 satellites. The constellation of 7 satellite is expected to be operational by 2015.

**MAJOR HIGHLIGHTS**
- An indigenous, independent regional navigation satellite system for providing location and time information
- Service Area – Indian landmass & surrounding 1500 km
- Location accuracy better than 20m
- Navigation Services: Standard Positioning Service (open to all users), Restricted service (to authorised users only)
- IRNSS space segment: 4 GSO (Geo-synchronous) + 3 GEO (Geo-stationary) satellites
- Navigation Payload: L5 & S Ranging Payload: C x C, Atomic Clocks: RAFS

**MAJOR BENEFITS**
- Terrestrial, aerial & marine Navigation
- Location based services, fleet management
- Geographic data collection & surveying
- Disaster management, etc.
GPS AIDED GEO AUGMENTED NAVIGATION (GAGAN)

GPS Aided Geo Augmented Navigation (GAGAN) is a Satellite Based Augmentation System (SBAS) implemented jointly with Airport Authority of India (AAI). The main objectives of GAGAN are to provide Satellite-based Navigation services with accuracy and integrity required for civil aviation applications and to provide better Air Traffic Management over Indian Airspace. The system will be interoperable with other international SBAS systems and provide seamless navigation across regional boundaries. The first GAGAN navigation payload was flown on GSAT-8 which was launched on May 21, 2011 and the second on GSAT-10 launched on Sep 29, 2012.

MAJOR HIGHLIGHTS

- A joint initiative with Airport Authority of India
- Developed to provide Satellite-based Navigation services with accuracy and integrity required for civil aviation applications
- Interoperable with other Satellite Based Augmentation System (SBAS) to provide seamless air navigation across the World
- GAGAN Payload in GSAT-8, GSAT-10, GSAT-15
- SBAS Signals in L1, L5 band

MAJOR APPLICATIONS

- Vastly improved GPS accuracy with GAGAN
- Navigation and safety enhancement in civil aviation, railways, ships, spacecraft, etc.
- Geographic data collection
- Location based services, etc.