



GBAS – Quick Facts

The Ground Based Augmentation System (GBAS) augments GPS to provide precise navigation service for an airport and surrounding airspace using a Very High Frequency (VHF) data link. GBAS supports navigation and precision approach operations within 23 nautical miles from the GBAS reference point, typically located on the airport within three nautical miles of all supported runways, resulting in approach guidance within 20 nautical miles of runway thresholds. The U.S. version of GBAS was initially referred to as the Local Area Augmentation System (LAAS).

Current GBAS Status:

- Honeywell International's SLS-4000 SmartPath GBAS system received initial System Design Approval for Category I Precision Approach operations from the Federal Aviation Administration in Sept 2009. The FAA approved subsequent updates in Sept 2012 (Block I) and Oct 2015 (Block II).
- Several manufacturers have approved Category I avionics equipment (e.g. Honeywell International and Rockwell Collins).
- GBAS is either standard or available for most new commercial transport aircraft, including Boeing 737-NG, 747-8 and 787 and Airbus A320, A330/340, A350, and A380.
- GBAS has received full operational public approval at two US airports--Newark Liberty International Airport (EWR) and Houston George Bush Intercontinental Airport (IAH). Several international airports including Bremen and Frankfurt in Germany, Sydney Australia, Malaga Spain, Zurich Switzerland and 15 Russian locations also have public operational GBAS in use.
- Many airlines have operational approval to fly GLS in the United States. These include United Airlines, Delta Airlines, British Airways, Emirates Airlines, Lufthansa, and Cathay Pacific. Additional airlines fly GLS internationally--Qantas, TUIfly, Swiss Air, Air Berlin and various Russian airlines.

GBAS International:

- The FAA and EUROCONTROL co-chair the International GBAS Working Group (IGWG). The IGWG is a forum for international exchange of technical and operational information related to GBAS. Participants include governments, ANSPs, industry, airlines and airports.
- Currently 14 nations have some form of GBAS-related activity including implementation, research activities and/or concept development.

Benefits of GBAS

- A single system is able to support multiple runways/ approaches at the installed airport. The individual procedures are published as GBAS Landing System (GLS) approaches. Each approach has a unique channel number identifier.
- GBAS siting eliminates critical areas which impede aircraft/ equipment movement around an instrumented airfield. This can improve airport capacity during low-visibility conditions.
- Demonstrated accuracy of GBAS is less than 1-meter in both vertical and horizontal directions.
- GBAS uses less radio frequency spectrum, with a single frequency supporting all system approaches.
- GBAS is able to support use of displaced thresholds and/or variable glide slopes.

Future GBAS Capability

- GBAS is the only feasible satellite-based navigation capability for Category II/III precision approach operations to permit low visibility operations to touchdown and rollout.
- The FAA and other States are in the process of incorporating Category II/III requirements in the ICAO Standards and Recommended Practices (SARPS).
- RTCA plans to complete in 2017 an updated GBAS Minimum Operational Performance Standards (MOPS) to capture updated Category II/III avionics requirements.
- The FAA has agreements with United Airlines, the Port Authority of New York and New Jersey, Houston Airport System and the Boeing Company to gain experience from current CAT-I GBAS operations to identify requirements, costs and benefits of GBAS.

For more information, please visit <http://gps.faa.gov>



**Federal Aviation
Administration**