

Satellite-based Approach Procedures (by Procedure Type)			
	Procedures (Part 139 Airports)	Procedures (Non-Part 139 Airports)	Total Number of Procedures
LNAV Procedures	1,775	3,811	5,586
LNAV/VNAV Procedures	1,308	1,606	2,914
LPV Procedures (LPV w/200' HAT)	1,310	1,719	3,029 (760)
LP Procedures	53	342	395
GPS Stand-Alone Procedures	17	175	192

*Note: Number of GPS Stand-Alone will continue to decrease as they are replaced by RNAV procedures (Data as of December 13, 2012)*

November, the number of WAAS LPVs alone also crossed this same threshold. As of December 13th, 2012, there are 3,029 WAAS LPVs available in the U.S. LPVs can be found at small rural airports, regional airports, and even major metropolitan airports. At these locations, WAAS LPVs and other WAAS-enabled approach procedures are helping to improve access to the airport when visibility is limited due to the weather or other conditions. This provides both safety and capacity benefits.

Overseas, the number of LPVs enabled by the European Geostationary Navigation Overlay Service (EGNOS) also continues to grow. EGNOS, like WAAS, is a Satellite-Based Augmentation System (SBAS) that improves the accuracy and provides integrity to GPS signals for most of Europe. In December, Italy received their first LPV at Milano-Linate Airport. France, Switzerland, Guernsey, Germany, and Italy all have LPVs. More LPVs are planned for Europe. Information about EGNOS and European LPVs can be found at <http://www.essp-sas.eu/>.

For the U.S., the tables compare the number of satellite navigation approach procedures to those based

Instrumentation Approach Procedures (IAPs) Based on Conventional NAVAIDS	
ILS	1,281
ILS (CAT II)	159
ILS (CAT III)	113
NDB	824
VOR	1,302
VOR / DME	959

*(Data as of November 15, 2012)*

Table truncated for publication. Full table available at Instrument Flight Procedures (IFP) Inventory Summary

on ground-based navigation systems.

More detailed information on GPS/WAAS Approach Procedures can be found at [http://www.faa.gov/about/office\\_org/headquarters\\_offices/ato/service\\_units/techops/navservices/gnss/approaches/index.cfm](http://www.faa.gov/about/office_org/headquarters_offices/ato/service_units/techops/navservices/gnss/approaches/index.cfm).

- Mary Ann Davis, FAA AJM-321/NAVITAC

### Towards a Full Scale LPV Implementation in Europe

Recent data indicates that the European Geostationary Navigation Overlay Service (EGNOS<sup>1</sup>) implementation in European airports is growing slowly but firmly. Further expansion is expected in coming years. EGNOS is the first pan-European satellite navigation system. It augments the US GPS satellite navigation system and broadcasts signals with accuracy suitable for safety critical applications such as flying aircraft or navigating ships through narrow channels.

On March 2, 2011, the European Satellite Services Provider (ESSP), as EGNOS Service provider under contract with the European Commission, officially declared the start of the EGNOS Safety-of-Life (SoL) Service for aviation. Since that date European Air Navigation Service Providers (ANSPs) have been authorized to publish EGNOS-based procedures, in line with the International Civil Aviation Organization (ICAO) Assembly recommendations. Pau, in southern France, was the first airport with an operational Localizer Performance with Vertical Guidance (LPV) procedure published on March 17, 2011.

Business and general aviation operating at small and medium airports are the key niche markets for introducing EGNOS-based operations at this early stage. Today, almost all new navigation equipment sold by general aviation manufacturers is SBAS capable and pilots using Instrument Flight Rules (IFR) can decide to install a stand-alone SBAS enabled receiver for a relatively small price.

On the other hand a survey performed by GSA<sup>2</sup> confirmed that the vast majority of the European general aviation IFR community (85%) is interested in installing and using EGNOS or have at least considered it before. Indeed, approximately 48% of participants indicated that their aircraft are already SBAS approved, although this does not necessarily imply that they have operational approval to fly LPV approach procedures.

In fact, the still low availability of EGNOS-based approach procedures and the equipage/certification costs are the main barriers dissuading General Aviation users not equipped with EGNOS from upgrading.

To publish an LPV procedure, an ANSP under the EGNOS service area needs to sign an EGNOS Working Agreement (EWA) with ESSP the EGNOS Service Provider. This agreement defines the required framework (coordination processes, information sharing, etc.) between both entities using and providing the EGNOS service, establishing a fair and equitable approach for all ANSPs over Europe.

Actually, there are 7 EWAs signed in Europe, which have driven to the publication of the EGNOS-based approach procedures shown in Table 1. These pioneer EGNOS-based operations implementations are paving the way for the coming ones generating a

Country	Airports	LPV Procedures	APV Base Procedures
France	24	27	8
Switzerland	2	2	0
Guernsey	1	2	0
Germany	38	2	82
Italy	1	1	
<b>Total</b>	<b>66</b>	<b>34</b>	<b>90</b>

Table 1: EGNOS based operations already in place (13 December 2012)



snowball effect that will be extended soon all across Europe and that should boost the number of procedures published in the short term.

As support to the LPV implementation process, ESSP is also in charge of the EGNOS NOTAM<sup>4</sup> Proposal service that provides information on planned EGNOS service outages to those ANSPs with published EGNOS-based procedures.

Other interfaces with EGNOS users are the EGNOS Helpdesk available 24H / 7D (egnos-helpdesk@essp-sas.eu / +34 911 236 555) and the EGNOS User Support website (www.egnos-user.support.essp-sas.eu) where to consult EGNOS daily and real-time performance and LPV availability in airports with published EGNOS-based procedures.<sup>5</sup>

<sup>1</sup> EGNOS is the European SBAS system, equivalent to the American Wide Area Augmentation System (WAAS)

<sup>2</sup> GSA is the European GNSS Agency

<sup>3</sup> Approved to be flown with EGNOS vertical guidance

<sup>4</sup> NOTAM: Notice To Airmen

<sup>5</sup> This information is only provided for further awareness but should be never used for flight planning purposes

- European Satellite Services Provider (ESSP SAS)

Current and forecast EGNOS implementation status over EGNOS service area in Europe (2012-2013). Updated information and a full-size version of this chart above available at: (<http://www.essp-sas.eu/>)

## Clarification of Des Moines Project Article

An article in the Spring 2012 edition of SATNAV News, "Des Moines IFR Low Level Helicopter Infrastructure," named some, but not all, of the participants in the government-industry project that brought about the new Instrument Flight Rules (IFR) helicopter infrastructure in Des Moines, which is enabled by the Wide Area Augmentation System (WAAS). Specifically, we did not mention Hickok & Associates and the University of Oklahoma (OU). We regret this oversight. As such, we wish to extend recognition to these two organizations.

Handouts, based on this SATNAV News article and distributed at the October 2012 Air Medical Transport Conference (AMTC), also did not mention the contribution of Hickok and Associates and the University of Oklahoma to this pioneering project. We regret this omission as well.