Aviation increasingly relies on global navigation satellite systems (GNSS) for navigation, communication and surveillance, and European GNSS (E-GNSS) systems are contributing to more efficient and safer air operations. The European Geostationary Navigation Overlay Service (EGNOS) was designed for aviation and is compliant with International Civil Aviation Organization (ICAO) Annex 10 requirements for Approaches with Vertical Guidance (APV-I) and Category I precision approaches. This enables instrument approaches down to localiser performance (LPV) with decision heights as low as 200 feet (depending on geography) without the need for expensive ground infrastructure. Galileo, the European Global Satellite Navigation System, is now delivering initial services, giving users around the world more accurate and reliable positioning reports. Both European systems serve the aviation community, enabling different applications and providing operational, safety and economic benefits.

The number of airports with EGNOS procedure is growing. As of May 2017, 440 EGNOS-based approaches were operational at 235 airports across Europe. The European GNSS Agency (GSA) supported the first implementation in most countries and contributed to over 100 of the procedures operational today via funding and training programmes. Such figures are expected to dramatically increase in the coming years with more than 900 procedures planned across Europe. Balkan countries planning EGNOS approaches are also interested in our capacity-building programmes.

Looking at the airborne side, many new aircraft models come equipped with LPV capabilities, such as the Airbus A350, Bombardier Dash 8 and ATR-600 series. Retrofits and European Aviation Safety Agency (EASA) approved modifications are becoming increasingly available. The GSA is working with major operators to increase the availability of avionics for those flying to LPV destinations. Providing financial support is important but so, too, is sponsoring cost-benefit analyses and technical support for development of supplemental type certificate/service bulletins and equipment upgrades, which are key to helping with the decision-making process. We are proud to cooperate closely with airspace user associations such as the European Business Aviation Association (EBAA), the European Regional Airlines Association (ERA), the European Helicopter Association (EHA) and the Aircraft Owners and Pilots Association (AOPA) to ensure European GNSS keeps answering their requirements and that the tools we put in place meet their needs.

The rotorcraft community finds EGNOS-based solutions to be the right ones for their demanding operations. EGNOS leads to a substantial reduction in the landing-decision height, making heli-pads accessible in poor weather conditions and thus enhancing safety – of particular importance to medical and emergency operations. GSA is supporting implementation of more than 20 PinS (Point in Space) LPV and RNP 0.3 routes, while working together with EUROCONTROL.
and EASA to harmonise implementation. In particular, GSA funded the first helicopter PinS LPV in Europe, to Insel Hospital in Bern in June 2014, which is now used daily by Swiss Air Ambulance. NorksLuftambulance recently obtained operational approval for RNP 0.3 operations within a GSA-funded project, preparing to fly PinS LPV.

Looking ahead, EGNOS could be of particular interest to contribute to surveillance and communication technologies such as automatic dependent surveillance-broadcast (ADS-B) and datalink, providing precise position and time stamps. Many airlines supported within GSA programmes are including EGNOS for navigation and surveillance purposes, improving their overall business case.

And with the addition of Galileo to the GNSS scene, operational, safety and economic benefits from EGNOS continue to grow. The launch of Galileo Initial Services in 2016 went together with the launch of the Galileo Search and Rescue (SAR) service, which is Europe’s contribution to the MEOSAR international emergency beacon locating system within the Cospas-Sarsat programme. Galileo-based ELT-DT (Emergency locator transmitter distress tracking) beacons are a response to the ICAO request to develop a new Global Aeronautical Distress Safety System (GADSS). This will address all distress flight phases. A deadline for the capability for in-flight activation of aircraft SAR beacons has been set for 2021. Major European beacon manufacturers are developing such user terminals under the GSA H2020 Research and Development programme and are looking at further advanced uses of Galileo services in this domain. In particular, work is ongoing to develop an operational concept and in-flight tests to enable automatic activation of the beacon, a trigger, in abnormal flight conditions.

Beyond manned aviation, accurate positioning provided by EGNOS and Galileo are key for drones. The number of such devices exceeds all other aviation user groups combined, by an order of magnitude. While the regulatory framework and airspace integration aspects are being defined, research and testing campaign on E-GNSS is ongoing to support the development of geo-fencing and smooth integration of drones into non-segregated airspace.

The GSA is committed to fostering the development of E-GNSS applications and has put in place targeted support initiatives. The European Union’s Horizon 2020 programme is funding GSA work in innovative application development in all user segments, including aviation, with a total budget of €98 million. The GSA has set up a specific Aviation Grants programme, providing up to 60% of funding for EGNOS operational implementation in civil aviation, covering both procedures and aircraft equipage. A total of €12 million was allocated to 27 projects in 2014 and 2015, funding more than 100 EGNOS procedures involving 70 aircraft, rotorcraft and drone operators and manufacturers in 14 countries. A third call for proposals is expected to open in the last quarter of 2017. On-going projects include fleet upgrades of major airlines such as Hop!, airBaltic and Eastern Airways, large-scale procedure implementation projects in Ireland, Sweden and the UK, plus targeted implementations in Austria, Slovakia, Spain and Norway.

The GSA looks forward to continuing its support of airspace users, air navigation service providers, civil aviation authorities and other stakeholders in leveraging EGNOS and Galileo benefits towards safer and more efficient air transport, and hopes to see in the near future an even wider variety and higher number of E-GNSS users and applications.