



## EGNOS Grant Plan 2020

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1.0	First release	16/12/2019
2.0	Added Capacity Building Project, contribution of UNOOSA	26/06/2020
3.0	Modified "Acceleration of EGNOS adoption in civil aviation" to "acceleration of EGNOS adoption in transport".  Introduction of eligibility, exclusion, selection and award criteria, as well as timetable for UNOOSA grant	05/11/2020

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## 1 Introduction

The Agency's 2020 grant plan for European Geostationary Navigation Overlay Service (EGNOS) exploitation contains 2 calls for proposal:

1. Acceleration of EGNOS adoption in transport.
2. EGNOS Service Performance Monitoring Support from Member States

## 2 Acronyms and Abbreviations

Table 1 - Abbreviations

Abbreviation	Definition
ATC	Air Traffic Control
EGNOS	European Geostationary Navigation Overlay Service
EGNSS	European Global Navigation Satellite System
GPS	Global Positioning System
GSA	European GNSS Agency
IFR	Instrument Flight Rule
LPV	Localizer performance with vertical guidance
PBN	Performance Based Navigation
RNP	Required Navigation Performance
SBAS	Satellite-based Augmentation System

## **3 Acceleration of EGNOS adoption in transport**

### **3.1 Legal basis**

The legal basis for this grant is Regulation (EU) No 1285/2013 of the European Parliament and of the Council of 11 December 2013 on the implementation and exploitation of European satellite navigation systems and repealing Council Regulation (EC) No 876/2002 and Regulation (EC) No 683/2008 of the European Parliament and of the Council and Delegation Agreement between the European Union, represented by the European Commission and the European GNSS Agency on the Exploitation Phase of the EGNOS Programme signed on 16 April 2014.

### **3.2 Budget line**

The budget line is 3920.

### **3.3 Background**

The European Global Navigation Satellite System (EGNSS), operated under civilian control, encompasses satellite radio-navigation system established under the Galileo programme and European Geostationary Overlay System (EGNOS). The EGNOS Safety of Life service was certified for use in aviation in March 2011 and today all European Air Navigation Service Providers (ANSPs) are enabled to implement EGNOS based approach procedures.

EGNOS operational implementation is also increasing in other transport means. EGNOS is as source of differential corrections in IALA beacons and AIS stations to provide a DGNSS service, which is especially relevant in cases of limited visibility of satellites such as Inland waterways. All vessels in their waters can benefit from this service, with an IALA beacon or AIS receivers on board.

In railway, EGNOS can improve safety and reduce the cost of signalling with very few or no lineside infrastructure components. The EC and GSA are working together with all rail stakeholders along a shared roadmap for E-GNSS introduction in rail signalling.

To meet the overall objectives of the EGNOS programme, the uptake in transport applications is vital. This call should result in the implementation of EGNOS based operations in civil aviation, inland waterways and rail, increasing safety and efficiency for the benefit of European aerodromes and airspace users.

### **3.4 Priorities, objectives pursued and expected results**

Operational implementation of EGNOS in transport is a strategic goal to ensure the success of the programme. In this context, the objective of this activity is to foster EGNOS adoption in the European aviation, inland waterways and railway, enabling on the one hand, users to get equipped with Global Positioning System/Satellite-based Augmentation System (GPS/SBAS) enabled terminal, on the other hand, Air Navigation Service Providers and airports/heliports, Maritime authorities and Rail stakeholders to implement and test EGNOS based operations.

In the case of aviation, the implementation actions includes approaches benefitting from the Localizer performance with vertical guidance 200 (LPV200) service level, PinS LPV procedures and low level Instrument Flight Rule (IFR) routes in Europe, as well as other advanced operations such as Required Navigation Performance (RNP) AR using SBAS. It will also consider pilot cases on advanced navigation operations benefitting from EGNOS, assessment of new operational scenarios, such as implementation in aerodromes with limited infrastructure and activities promoting the use of EGNOS for other communication and surveillance applications in all phases of flight.

The Performance Based Navigation (PBN) regulation published by the EC in July 2018, mandates RNP APCH down to LPV minima to all EU airports by 2024 and paves the way to full PBN environment by 2030, with rationalisation of conventional navigation procedures. The activity aims at facilitating airspace users to get ready for such change, encouraging SBAS equipage in commercial, regional, business (corporate) aviation, general aviation (training, emergency services) and rotorcraft. OEMs and avionics manufacturers interested in benefitting from EGNOS are also encouraged to apply to the call.

The result of this activity will be a wide scale operational implementation of the EGNOS based operations throughout European airports and airspace users.

With respect to Inland waterways, the objective is to facilitate operational implementation of EGNOS in shore stations and user terminal equipment. New commission implementing regulation 2019/838 on Vessel tracking and tracing systems establishes the technical specifications to improve efficiency of transport and safety of navigation in inland waterways. Considering that EGNOS is a cost effective solution to provide differential corrections for accurate vessel tracking, actions in this segment shall target deployment of shore stations equipment that enables transmission of EGNOS corrections over IALA and AIS stations. On the final user side,

the activity aims at increasing the use of terminals (AIS and VDES equipment) on board of vessels. It also targets the operational introduction of EGNOS in port operation, such as development and use of EGNOS capable Portable Pilot units to assist local pilots in the safe navigation of the piloted vessel.

In the case of rail, the action aims at facilitating introduction of EGNSS in rail safety critical applications. On one hand it enables demonstration of EGNSS-based train localization safety for future inclusion in ERTMS, by installing the necessary equipment in pilot lines. On the other, the action enables early EGNSS operational introduction in rail signaling by focusing on non-interoperable railway lines.

### **3.5 Description of activities to be funded under this call for proposals**

Proposals submitted to the call for proposals should cover at least one of the activities described below:

#### **Aviation:**

- Pilot cases aiming at assessing new operational scenarios, such as LPV to aerodromes without Air Traffic Control (ATC) or non-instrument runways.
- Installation of GPS/EGNOS enabled avionics and granting of airworthiness certification for RNP APCH procedures down to LPV minima, including PinS.
- Development of retrofit and forwardfit solutions including LPV capabilities.
- Development of enablers and other EGNOS based operations, such as, but not limited to simulators, validation tool, training materials or drones.
- Design, development and operational implementation of EGNOS LPV/LPV 200 approach procedures, PinS, low level IFR routes at different European airports/heliports/routes.
- Design, development and operational implementation of other operations with EGNOS and assessment of operational benefits, such as RF legs and RNP AR.
- Design and implementation of other communication, navigation and surveillance applications benefitting from EGNOS for all phases of flight.

#### **Maritime and inland waterways**

- Upgrade of shore infrastructure (IALA beacons and AIS stations) with EGNOS/EDAS as a source of differential corrections to be transmitted to increase safety in Inland Waterways.

- Design, development and installation of EGNOS enabled user terminals, such as AIS/VDES and Portable Pilot Units.

## **Rail**

- Installation of EGNSS equipment such as receivers, antennas or augmentation system components for onboard and trackside GNSS-based signalling solutions within pilot lines and trial sites, aiming to demonstrate EGNSS-based train localization safety for future inclusion in ERTMS.
- Installation of EGNSS equipment such as receivers, antennas or components of augmentation systems within projects deploying GNSS based signalling solutions at non-interoperable railway lines.

## **3.6 Eligibility, exclusion, selection and award criteria**

### **3.6.1 Eligibility**

The proposal may be submitted by entities fulfilling all the criteria below:

- a) Legal persons established<sup>1</sup> in and/or natural person(s) who is national of one of the following countries, are eligible:
  - EU Member States
  - Switzerland, Norway

### **3.6.2 Exclusion criteria**

Article 136 of Financial Regulation shall apply.

### **3.6.3 Selection criteria**

The technical capacity of the applicant to perform the proposed activities

The financial capacity of the applicant to perform the proposed activities

### **3.6.4 Award criteria**

- Relevance of the proposal to the objectives of the call and credibility of the proposed approach;
- Impact in terms of economic and public benefits derived from the proposal;

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<sup>1</sup> Established should be understood as having a registered office, central administration or principal place of business in one of these countries.



- Coherence and effectiveness of the work plan, including appropriateness of the allocation of tasks and resources.

### 3.7 Indicative timetable and amount of the call for proposals

Indicative amount: € 3,000,000 with the possibility to extend to € 10,000,000 pending budget availability.

Indicative number of projects: 6 with the possibility to extend to 20 pending budget availability

	<b>Stages</b>	<b>Planning (possible subject to updates)</b>
a)	Publication of the call	December 2020
b)	Deadline for submitting applications	April 2021
c)	Evaluation period	June 2021
d)	Information to applicants on the outcome of the evaluation	July 2021
e)	Signature of the Grant Agreements	August 2021

## **4 EGNOS Service Performance Monitoring Support from Member States**

### **4.1 Legal basis**

The legal basis for this grant is Regulation (EU) No 1285/2013 of the European Parliament and of the Council of 11 December 2013 on the implementation and exploitation of European satellite navigation systems and repealing Council Regulation (EC) No 876/2002 and Regulation (EC) No 683/2008 of the European Parliament and of the Council and Delegation Agreement between the European Union, represented by the European Commission and the European GNSS Agency on the Exploitation Phase of the EGNOS Programme signed on 16 April 2014.

### **4.2 Budget line**

The budget line is 3920.

### **4.3 Background**

The Commission has delegated tasks related to the EGNOS Exploitation programme to the European GNSS Agency. This agreement entrusts the Agency with the management of operational activities relating to the exploitation of the Programme, including infrastructure management, maintenance and continuous improvement in accordance with the Programme Management Plan.

In line with article 30 of the GNSS Regulation<sup>2</sup> the Agency may have recourse to technical assistance, particularly from national agencies competent in the space sector. It also may have recourse to the assistance of independent experts and bodies capable of providing impartial analyses and opinions on the progress of the programme.

In this framework, the Agency wishes to launch a call for proposals for the establishment of a stable and structured partnership between itself and national agencies, institutions, independent experts and/or bodies from EU Member States, and from third countries participating in the GNSS Programme. These entities shall commit themselves to establish, maintain and implement an EGNOS performance monitoring network. The

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<sup>2</sup> Regulation (EU) No 1285/2013 of the European Parliament and of the Council of 11 December 2013 on the implementation and exploitation of the European satellite navigation systems and repealing Council Regulation (EC) No 876/2002 and Regulation (EC) No 683/2008 of the European Parliament and of the Council, OJ L 347, 20.12.2013.

objective is threefold: (1) to guarantee analysis and investigations independent of the service provider and of other stakeholders; (2) to establish a relationship with not-for-profit partners; (3) to benefit from, and contribute to, long-term key expertise, continuity and competences for the programme. Additionally, this activity takes advantage of past public investments and of existing capacities available at Member States level.

In September 2015 the Agency signed a Framework Partnership Agreement (FPA) with a Consortium coordinated by CNES for a period of 7 (seven) years to establish cooperation between itself and the partners. The first specific grant was signed on 10 November 2015 for a period of 12 months to initiate the activities defined for such cooperation. It was followed by a second specific grant of a duration of 24 months and a third grant which is on-going and will run until 10 November 2020. Considering the need to ensure continuity of the above activities after this date, the Agency plans to launch the fourth specific grant during 2020.

#### **4.4 Priorities, objectives pursued and expected results**

The fourth Grant shall, in accordance with the FPA's Strategic Plan, address:

- 1) Continuity of the SPMS expertise network.
- 2) SBAS Service and Signal Performance Watch: to monitor and compare SBAS signals and service performance (addressing all available SBAS: EGNOS, WAAS, SDCM, GAGAN, MSAS, etc. and all available services). Some of the parameters to be monitored are: ICAO SARPS compliance, analysis of potential configuration changes in the SBAS or GPS, evaluation of SIS availability, local assessment of accuracy, integrity, availability and continuity, global assessment of the availability and continuity of the different SBAS, etc.
- 3) To investigate abnormalities in EGNOS Service performance (e.g. signal anomalies, service underperformance, etc.)
- 4) To support EGNOS programme activities as per Agency requests (e.g. to contribute to EGNOS service provision technical reviews; to participate in boards and workings groups; to perform specific analysis, simulations or investigations; etc.)

#### **4.5 Description of activities to be funded under this call**

The high-level activities are described below:

1) Maintenance of the SPMS expertise network established since the first specific grant.

The SPMS network was created to fulfil the FPA objectives. It is now a well-established network of committed experts in the field of GNSS, with the ambition to drive, stimulate and coordinate the EGNOS performance monitoring. The network relies upon individuals with a high level of specific knowledge and expertise in EGNOS performance monitoring who are backed and supported by relevant organisations in the field and/or by national authorities. The SPMS network shall be maintained to the same level to allow the implementation of the objectives of this fourth specific grant.

2) SBAS Service and Signal Performance Watch

To monitor and compare SBAS signals and service performance addressing all available SBAS: (EGNOS, WAAS, SDCM, GAGAN, MSAS, etc.) and all available services. The monitoring shall be based on real data collected from multiple reference stations spread over the coverage area of each SBAS system in a representative way. The network of reference stations shall be independent from EGNOS system.

The monitoring shall address:

a) Signal/message configuration:

- Analysis of compliance of the broadcast SBAS messages to the ICAO SARPS and of the GPS navigation message to its Interface Control Document;
- Analysis of potential changes in the SBAS or GPS.

b) Service performance:

- SBAS satellites SiS Availability
- Local assessments of the accuracy, integrity, availability, continuity, of the different SBAS systems and their OS and SOL services;
- Global assessment of the availability and continuity of the different SBAS systems and their OS and SOL services over their coverage area.

c) Surveillance of new GEO-SBAS and issue of warnings and recommendations about potential impacts on EGNOS.

d) Issue of anomaly reports upon detection of any unexpected result from the monitoring.

3) To investigate EGNOS Service performance abnormal events

The Agency may require independent SPMS investigation of abnormal events in EGNOS Service performance through the activation of specific tasks to be agreed with the consortium (objectives, efforts, schedule, outputs) depending on the particular investigation. Such events may be signal in space anomalies or service underperformances (due to internal system anomalies, due to ionosphere conditions or any other external factor). Sensitivity analysis of the impact of changes in the system or the environment may also be considered under this task (examples: different RIMS configuration, reduction of GPS constellation, etc.).

4) To support EGNOS programme activities as per Agency requests

The Consortium is expected to support the Agency in different EGNOS programme activities when needed. Such activities may include, but are not limited to, the contribution to EGNOS service provision technical reviews, the participation in boards and workings groups and the execution of analysis, simulations or investigations.

5) For the SPMS coordinator, coordination of SPMS activities:

- a) Act as the Agency's interface for all matters related to the grant activities, the submission and publication of deliverables, the organisation of internal checkpoints with the partners, the organisation of progress meetings and of the yearly review, etc.
- b) Administrative and technical supervision of the fulfilment by the partners of their respective role and responsibilities.

## **4.6 Eligibility, exclusion, selection and award criteria**

### **4.6.1 Eligibility**

Not applicable since this is a Specific Grant under a Framework Partnership agreement

### **4.6.2 Exclusion criteria**

Not applicable since this is a Specific Grant under a Framework Partnership agreement

### **4.6.3 Selection criteria**

Not applicable since this is a Specific Grant under a Framework Partnership agreement

#### 4.6.4 Award criteria

- Understanding of the tasks, completeness and credibility of the proposed approach
- Background and experience of the team proposed and adequacy of facilities
- Cost-effectiveness

#### 4.7 Indicative timetable and amount of the specific grant

Indicative amount: € 1,000,000

	Stages	Planning (possible subject to updates)
a)	Publication of the call	April 2020
b)	Deadline for submitting applications	June 2020
c)	Evaluation period	July /September 2020
d)	Information to applicants on the outcome of the evaluation	October/November 2020
e)	Signature of the Grant Agreements	November 2021

## 5 Capacity Building Project, contribution of UNOOSA

### 5.1 Legal basis

The legal basis for this grant is Regulation (EU) No 1285/2013 of the European Parliament and of the Council of 11 December 2013 on the implementation and exploitation of European satellite navigation systems and repealing Council Regulation (EC) No 876/2002 and Regulation (EC) No 683/2008 of the European Parliament and of the Council and Delegation Agreement between the European Union, represented by the European Commission and the European GNSS Agency on the Exploitation Phase of the EGNOS Programme signed on 16 April 2014.

The direct grant tool is proposed to cover the contribution of UNOOSA in the Capacity Building project to be executed by the GSA in 2020.

UNOOSA possess numerous and unique features that set it apart from other organizations:

- UNOOSA is the only intergovernmental body dedicated exclusively to space matters in the UN system, the Committee on the Peaceful Uses of Outer Space (COPUOS). This unique responsibility places UNOOSA at the centre of space affairs for all the space-related applications at the UN level, providing a privileged view on the interests and needs of all 193 UN Member States.
- UNOOSA is leading the International Committee on GNSS (ICG), facilitating the global dialogue on compatibility, interoperability, and transparency amongst the global providers of GNSS. As the lead of the ICG Working Group C on Information Dissemination and Capacity Building, it works on global GNSS education development and capacity building of developing countries in using GNSS technology for sustainable development and has a unique position to present activities to participants in this WG.
- UNOOSA developed and is responsible for the education curriculum on GNSS used by the Regional Centres Affiliated to the United Nations and located in India and China for Asia and the Pacific, in Morocco and Nigeria for Africa, in Brazil and Mexico for Latin America and the Caribbean and in Jordan for West Asia.

Within the space downstream no other organization could be identified that would represent a similar network of global contacts and have the tools to shape global capacity building in GNSS.

## 5.2 Budget line

The budget line is 3920.

## 5.3 Background

In line with the mission statement, the GSA is engaging market stakeholders to develop innovative and effective applications, value-added services and user technology that promote the achievement of full European GNSS adoption. In this context the capacity building activities address the shortage of skilled workforce that is able to implement the technologies based on EGNSS and support to expand the supply side of EGNSS based solutions.

## 5.4 Priorities, objectives pursued and foreseen results

The objective of the Capacity Building project is to develop and launch an online learning platform containing educational material in various forms, addressing the application areas of European GNSS. The capacity building actions will target professionals and students as well as other interested parties engaged in use of space technologies, with major focus on EGNSS, thus fostering the development of EGNSS applications and solutions on global scale.

## 5.5 Description of the activities to be funded

The activities to be funded under this direct grant shall encompass:

- Support in the selection of the priority EGNSS application and technological areas that would be the basis for the development of the educational content.
- Review of educational material to be launched on the online training platform (developed outside of the scope of this grant).
- Participation in events to present and promote the above mentioned educational material.
- Incorporation of the educational material in the syllabus of a subset of the United Nations-affiliated Regional Centres for Space Science and Technology Education and promotion of this material for its use by Universities worldwide.
- Presentation of the educational material in the working group C of ICG and in related capacity-building activities organized by UNOOSA.

## 5.6 Eligibility, exclusion, selection and award criteria

### 5.6.1 Eligibility

- Not applicable since this is a direct grant (see above)

### 5.6.2 Exclusion criteria

Article 136 of Financial Regulation shall apply.



### 5.6.3 Selection criteria

The technical capacity of the applicant to perform the proposed activities  
The financial capacity of the applicant to perform the proposed activities

### 5.6.4 Award criteria

- Relevance of the proposal to the objectives of the call and credibility of the proposed approach;
- Impact in terms of economic and public benefits derived from the proposal;
- Coherence and effectiveness of the work plan, including appropriateness of the allocation of tasks and resources.

## 5.7 Indicative timetable and amount

Indicative budget: € 100.000

	<b>Stages</b>	<b>Planning (possible subject to updates)</b>
a)	Publication of the call	December 2020
b)	Deadline for submitting applications	April 2021
c)	Evaluation period	June 2021
d)	Information to applicants on the outcome of the evaluation	July 2021
e)	Signature of the Grant Agreements	August 2021



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