



European
Global Navigation
Satellite Systems
Agency



GALILEO **EGNOS**
NAVIGATION SOLUTIONS
POWERED BY EUROPE

R&D opportunities: H2020 and Fundamental Elements

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21st September, Lisbon

R&D: H2020 for EGNSS Applications complemented by Fundamental Elements for EGNSS receivers...



Supporting the EU competitive offer of services, applications and receivers



- **3 calls for proposals** on GNSS Applications
- Portfolio of **~90 R&D** projects with a budget of **~70€M**

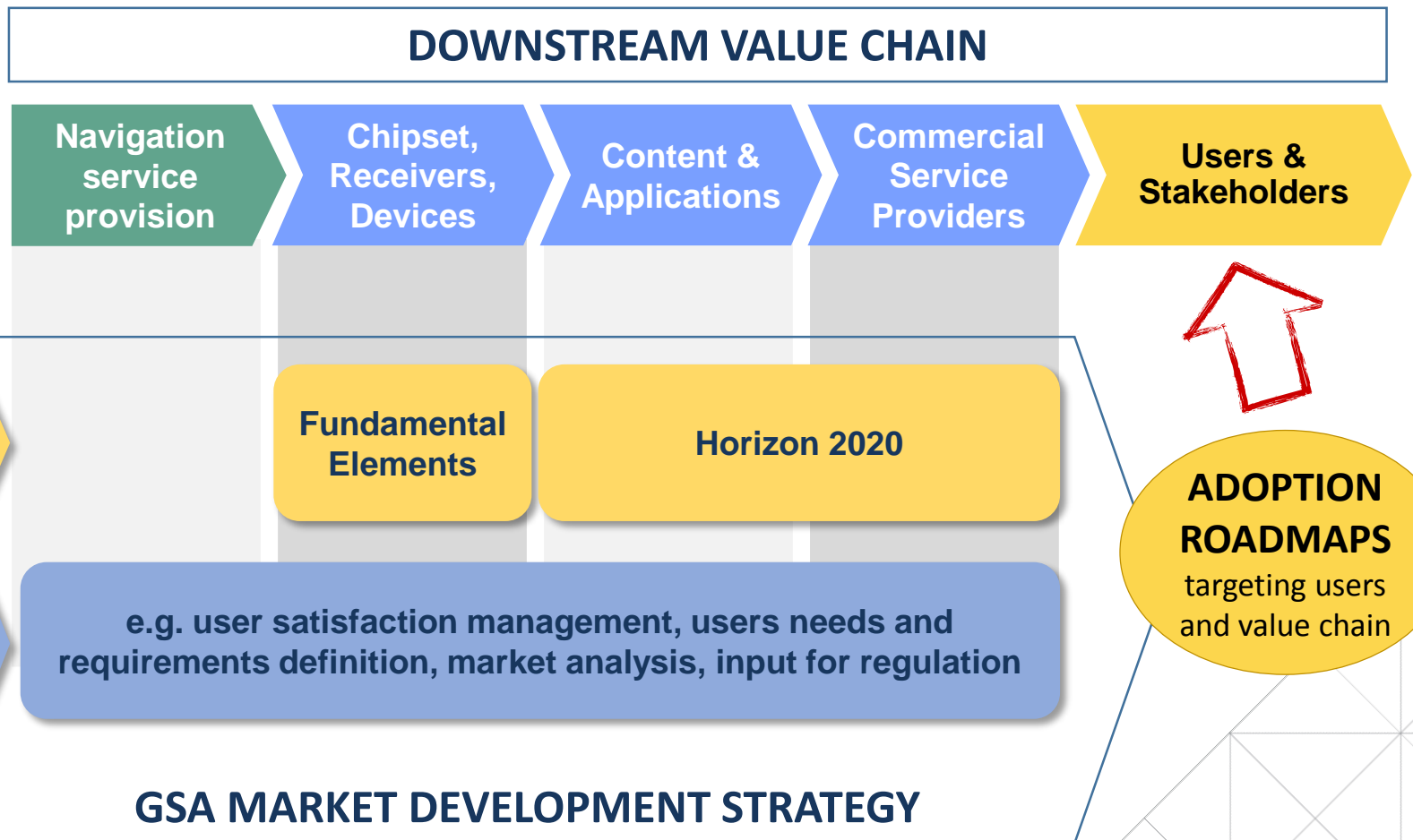


- GSA entrusted by EC to implement the **2014-2015 and 2017 Work Programme part regarding Horizon 2020 EGNSS Applications (~100€M already allocated)**



- Programme created by the **2013 GNSS Regulation**
- **Budget envelope of 111.5€M to be spent between 2014 and 2020**
- **High-level objectives:**
 - Promote the **development of Galileo-enabled chipsets, receivers and other associated technologies** that will facilitate the adoption of the European GNSS
 - Develop **receiver technology** addressing user needs in priority market segments
 - **Contribute to the economy** by creating technologies that can be commercialised by the industry to produce revenues

...addressing different elements of the value chain and have different objectives



H2020 Galileo running calls



GSA is managing H2020 under the Delegation Agreement from EC



☞ Call handling under the delegation from the European Commission

☞ Receipt of proposals

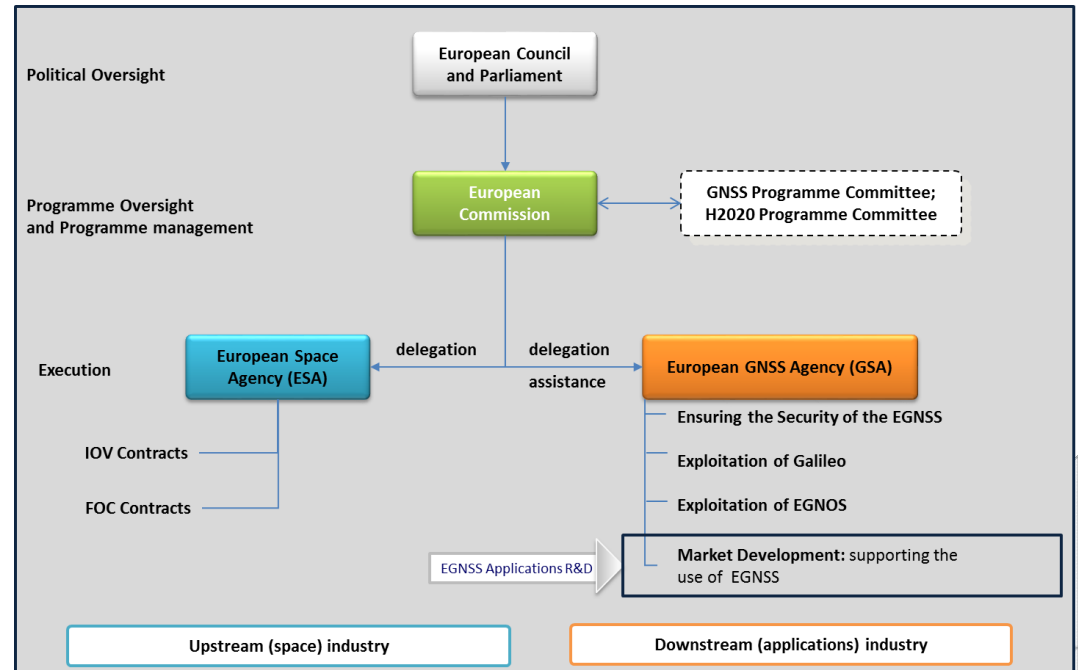
☞ Evaluation process

☞ Grant agreement preparation

☞ Grant agreements signature

☞ Receipt of reporting

☞ Reviews, payments, audits



H2020 Galileo 2014-2015 Calls



	1 st Call	2 nd Call	TOTAL
Budget available	40.4 mln EUR	24.9 mln EUR	65.3 mln EUR
Budget requested	174.3 mln EUR	192.2 mln EUR	366.5 mln EUR
No of projects granted	27	13	40
No of proposals submitted	105	89	194
No of applicants	775	634	1 409
No of beneficiaries	221	100	321

26% success
rate

15% success
rate

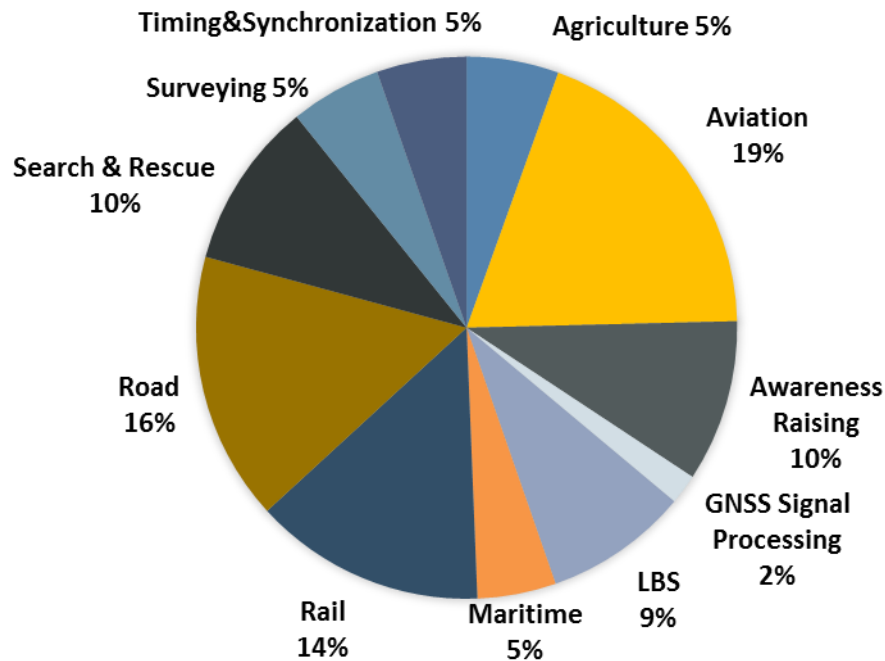
21% success
rate

Horizon 2020 Application R&D portfolio (1st + 2nd call)

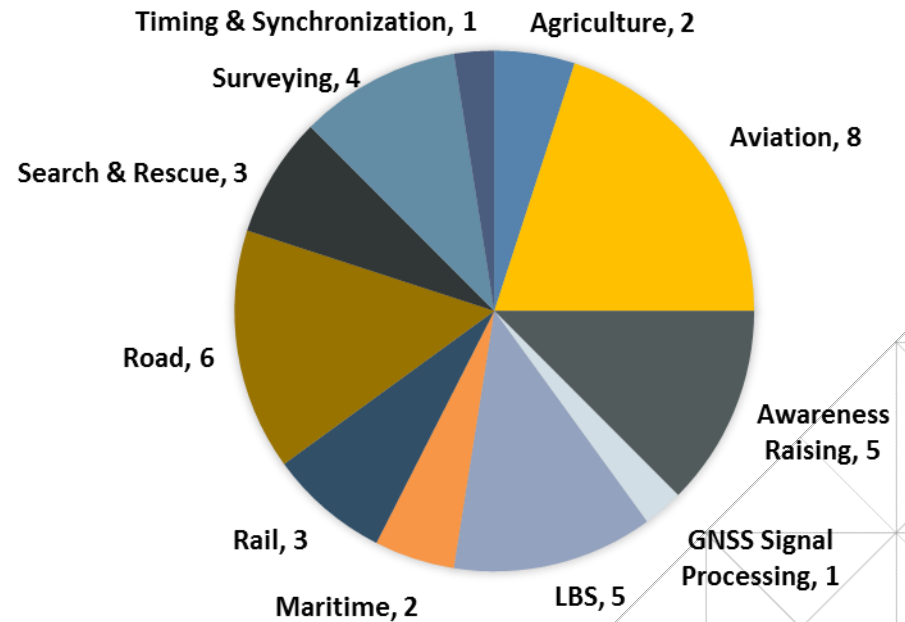


Horizon 1st and 2nd call – Application Projects by market segment

Budget split by market segment



of selected projects by market segment



H2020 1ST and 2ND Calls Results in numbers



15 products developed

- **Aviation:** GNSS performance monitoring system (*GMCA*), Solution for navigation aid and surveillance of airport surface movements (*MAGNIFIC*), **integrated airport operations monitor application (*e-Airport*)**, Helicopter Visual RNAV with EGNSS for rotorcraft operations (**5 LIVES**)
- **Road:** **Monitoring of freight transport flows and targeting efficient last-mile delivery (*GALENA*)**, Galileo-Enhanced electric scooter sharing service for sustainable urban mobility (*GMOTIT*)
- **Maritime:** Personal Location Beacon (*SAT406M*)
- **LBS:** Galileo enabled Location as a Service (*ELAASTIC*); 3 applications for efficient communication during humanitarian disasters (*GEO VISION*); Application for Smart Cities- to detect infrastructure anomalies (*GHOST*)
- **Timing:** Time & Frequency Distribution over Optical link; Certified Trusted Time Distribution using NTP (*DEMETRA*)
- **Surveying & Mapping:** **Positioning platform used for carbon mapping and land management (*COREGAL*)**



6 patents granted

- **Maritime:** 3 in *SAT406M*: Single Burst Single Satellite Beacon Localisation; Tracking a Radio Beacon from a Moving Receiving Device; Communication of Plain Information during Channel Access
- **Surveying & Mapping:** 2 in *MapKITE*: Spanish and US patents for Method for the acquisition and processing of geographical information of a path
- **Surveying & Mapping:** **1 patent process has been initiated to protect some elements of the receiver IP developed within *COREGAL***



62 prototypes ready

H2020 Projects Examples



Product n the market!

G-MOTIT - Galileo-Enhanced electric scooter sharing service for sustainable urban mobility



MOTIT is a unique and innovative **Galileo/EGNOS enabled electric scooter** sharing service, in which users may pick / drop off vehicles wherever and whenever they want.



environmental friendly
specifically designed for this service



reduces time
faster location of the scooter



precise location
better and continuous monitoring



no link to stations
easy to find for the next user



Precise navigation module for an electric scooter

SAT406M - Application providing an end-to-end solution based on the SAR/Galileo service using the Return-Link-Message (RLM)

The project develops an **EGNSS application to improve the Search and Rescue** of people in distress, comprising:

- An improved **Personal Locator Beacon (PLB)**
- A **new communication method** enhancing the standard communication **between the PLB and the SAR/Galileo system.**



Achievements so far:

- **PLB beacon prototype successfully tested**
- **MEOLUT** ground infrastructure **successfully tested**
- **PLB and MEOLUT- fully integrated** via Galileo satellites
- **3 granted patents** on EIB technology

3 Patents

H2020 Projects with Portuguese participation



COREGAL - Combined Positioning-Reflectometry Galileo Code Receiver for Forest management

Innovative platform enabling **low-cost**, **high-accuracy** and **unprecedented use** of airborne GNSS-Reflectometry (GNSS-R) for biomass retrieval and related and relevant applications as **carbon mapping and land management**.

- ✓ New positioning techniques enabled by **E5 signals** and modulations in an emerging market



Achievements so far:

- Successful trials of **GNSS-P+R receiver**
- Data Processing **Algorithms** for **biomass data** developed
- Data Processing **Algorithms** for **Carbon stock estimation** developed

Portuguese coordinator: DEIMOS ENGENHARIA

mapKITE – EGNOS-GPS/GALILEO-based high-resolution terrestrial-aerial sensing system

- MapKITE is a tandem system composed by an **Unmanned Aerial Vehicle (UAV)** and a **Terrestrial Vehicle (TV)** equipped with remote sensing technology (cameras and LiDAR) and operating as a virtual kite (the UAV follows the TV by receiving its navigation information).
- By placing a fiducial optical target on the TV roof, mapKITE introduces a novel element for the aerial image orientation: the Kinematic Ground Control Points (KGCPs).
- Potential game-changer for **operational simplicity and cost savings**.

mapKITE is
protected by the
Spanish patent,
no. ES239454!



H2020 Projects with Portuguese participation (Aviation)



Enhanced navigation concepts for Rotorcraft emergency missions in 5 scenarios



Working group for the harmonisation of PinS implementation in Europe



Project duration: 24 months
EC contribution: 1,573,875 €



Satellite based
Navigation Services
(GPS and EGNOS)



Satnav
Equipped &
IFR certified



Point - in - Space
(PINS)
procedures



600
flights/year
cannot be
performed to
patients in need of
urgent care



7.350.000
of profit/year
is not perceived

Many lives cannot
receive appropriate
help when needed



H2020 Galileo 3rd Call



H2020 3rd Call

79 proposals submitted



GALILEO-1-2017 EGNSS Transport applications (IA)- **35** proposals

Covering the **aviation**, **road**, **maritime** and **rail** market segments. Proposals should build EGNSS based *pilot projects* and *end-to-end solutions*, exploit the EGNSS signals and operational advantages as well as synergies with other positioning and navigation systems and techniques.

Indicative budget: 14.50 mil EUR



GALILEO-2-2017 EGNSS mass market applications (IA)- **13** proposals

Applications that foster the adoption of EGNSS in such mass markets as **Internet of Things**, **Smart Cities**, **Emergency Services** and **Commercial and Social LBS**.

Indicative budget: 9.00 mil EUR



GALILEO-3-2017 EGNSS professional applications (IA)- **23** proposals

Maximizing EGNSS differentiators in such professional segments as **agriculture**, **surveying and mapping**, **timing and synchronization** and other professional applications.

Indicative budget: 8.00 mil EUR



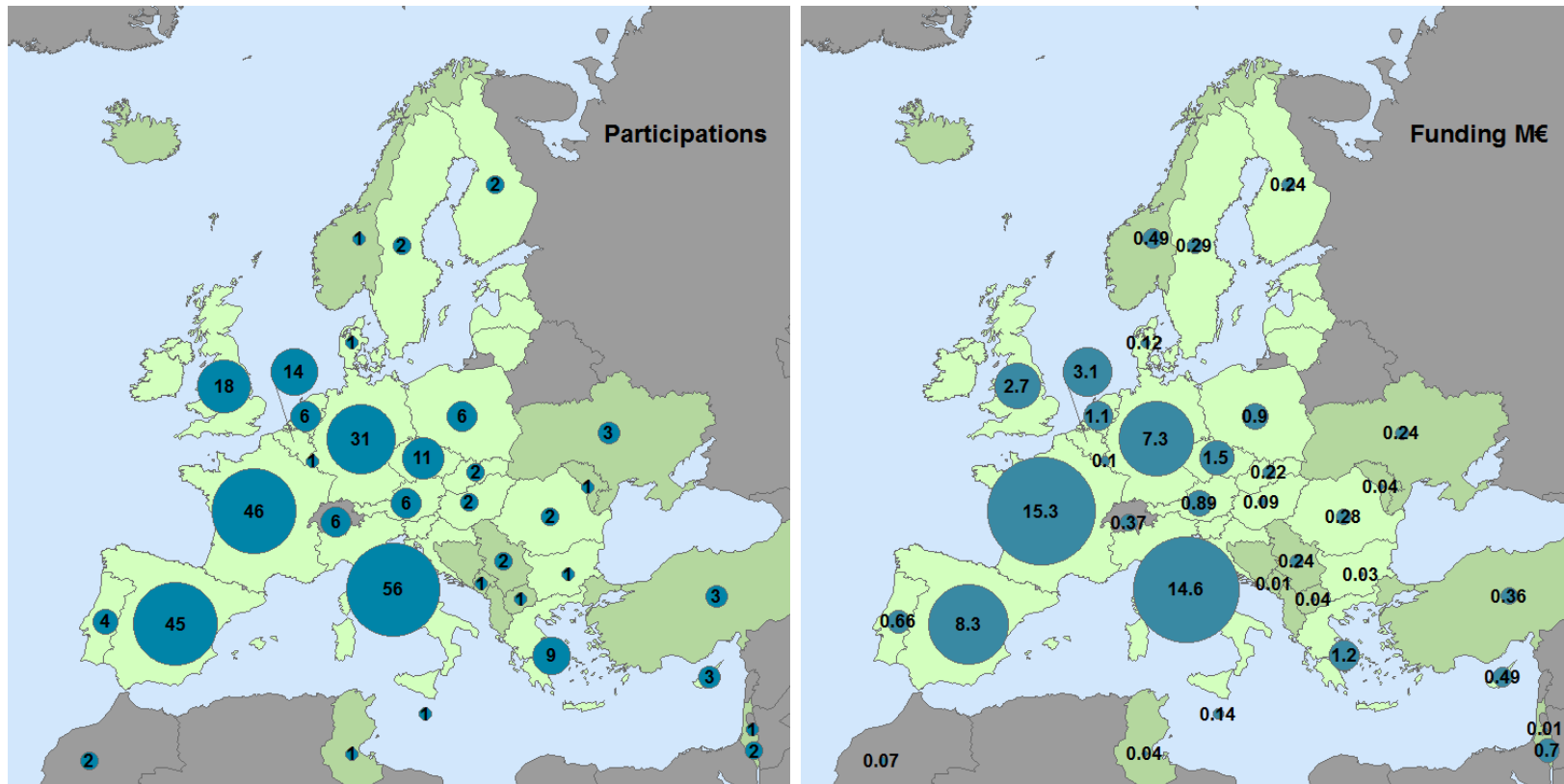
GALILEO-4-2017 EGNSS awareness raising and capacity building (CSA)- **8** proposals

Activities to support the **building of industrial relationships**, the **competitiveness of EU industry** and the **creation of incentive schemes** in order to develop market opportunities and foster the emergence of new downstream applications.

Indicative budget: 1.50 mil EUR



H2020 3rd Galileo call involved participants from 21 Member States and 21 Associated and Third Countries



Future H2020 Space Work Programme 2018-2020



- **H2020 Space WP 2018-2019 Timetable:**
 - Q1-Q3 2017 - Consultation with Programme Committee configurations on Work Programme drafts
 - Q4 2017 - Adoption of the Work Programme 2018-2020
- **Next Galileo Call(s) is expected within the H2020 Space WP 2018-2019**
 - EGNSS: Activities will continue to address the market uptake activities of EGNSS applications via calls for proposals

Be ready!

Download the GALILEO & EGNOS R&D app and check our portfolio



GALILEO & EGNOS R&D app

Results of the 7th Framework Programme (FP7) & H2020

<http://www.gsa.europa.eu/rd-for-galileo-egnos-app>



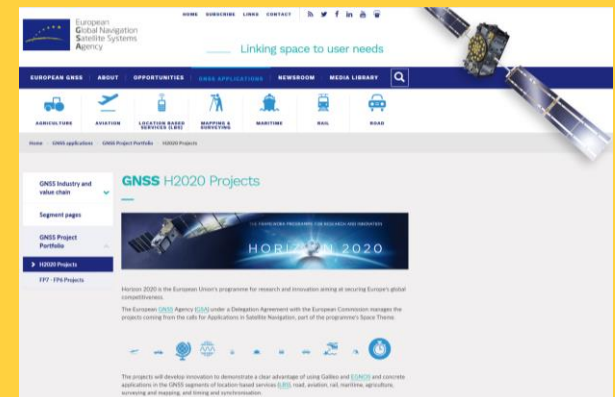
GNSS Projects' Portfolio

<http://www.gsa.europa.eu/r-d/gnss-project-portfolio>



http://www.slideshare.net/EU_GNSS/h2020-2014-1stcallgnssprojectsportfolio

http://www.slideshare.net/EU_GNSS/h2020-projects-2nd-call



FUNDAMENTAL ELEMENTS



Fundamental
Elements

Fundamental Elements (non-PRS) status:

3 on-going projects



Safety critical E-GNSS engine

- Segment: Autonomous vehicles, Road segment
- Acronym: ESCAPE
- Consortium: Renault, Ficosa, IFTTAR, GMV (TRM&ASP), STMicro, IFSTTAR and ISMB

High-end professional receivers and corresponding antennas

- Segment: High-precision
- Acronym: FANTASTIC
- Consortium: Septentrio, Fraunhofer IIS, ISMB, Universitat Autònoma de Barcelona and GMV

Double-frequency multi-constellation (DFMC) receiver

- Segment: Aviation segment
- Acronym: DFMC
- Consortium: Primes: Thales Avionics, ATR and Thales Alenia Italy
Subcos: AKKA, Dassault Aviation, DSNA

**Total budget committed:
14 M EUR**

Fundamental Elements under evaluation



OS-NMA user terminals for the road segment



Market segment:

Deadline for submission of proposals:

EU budget:

Road, smart tachograph

29 May 2017

EUR 2.50 mln (100% funding)

[Apply here](#)



Advanced RAIM Multi-constellation Receiver



Market segment:

Deadline for submission of proposals:

EU budget:

Aviation

31 May 2017

EUR 2.50 mln (70 % co-funding)

[Apply here](#)

SBAS-enabled ship-borne receivers



Market segment:

Deadline for submission of proposals:

EU budget:

Maritime

30 June 2017

EUR 1.00 mln (70 % co-funding)

[Apply here](#)

MEOSAR beacons for search-and-rescue related applications



Market segment:

Deadline for submission of proposals:

EU budget:

Transversal

31 May 2017

EUR 4.00 mln (70 % co-funding)

[Apply here](#)

Fundamental Elements status (Non-PRS): upcoming projects



4 topics to be published in 2017

Total budget planned for 2017
12.7 M EUR

- Timing receiver for critical infrastructure (Timing & Synchronisation)
- Enhanced consumer goods GNSS devices (Mass market)
- RX for IOT applications (Mass market)
- Advanced Interference detection and robustness (Transversal)

2 projects in 2018-2020 timeline

Total budget planned for 2018/2020
32 M EUR

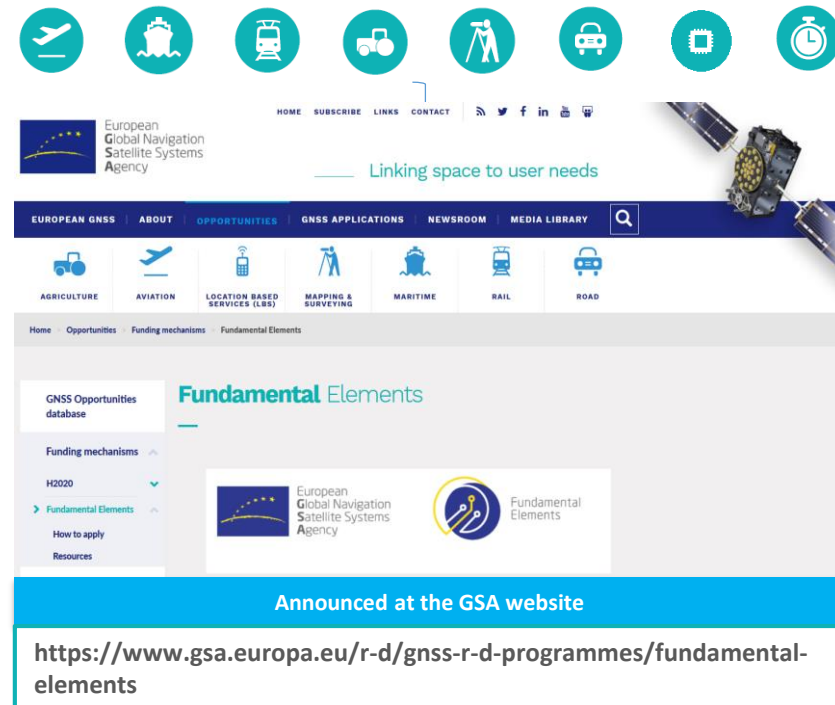
- Multi-Frequency multipurpose Antenna for Galileo (Transversal)
- **Commercial Service user terminal** (Professional)

Grants:

- Up to 70% co-funding; 7% indirect costs
- IPR with the beneficiaries

Procurements:

100% funding
IPR with EC/GSA



Linking space to user needs



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