



European  
**G**lobal Navigation  
**S**atellite Systems  
**A**gency

# **E-GNSS IN RAIL / H2020 2<sup>ND</sup> CALL**

# Europe's contribution to satellite navigation

## Galileo

- Worldwide navigation system “made in EU”
- Fully compatible with GPS\*
- Early services starting from 2014
- Open service free of charge and delivering dual frequencies (better performances)



## EGNOS

- Augmentation system of GPS
- Improves GPS performance
- European coverage (but under extension in other regions, e.g. North Africa)
- Available NOW, free of charge and widely available. Certified for civil aviation in 2011.



# GSA supports European Commission on market preparation, exploitation and security

Political Oversight

European Council and Parliament

Programme Oversight

European Commission

Implementation

European Space Agency (esa)

delegation

European GNSS Agency (GSA)

IOV contracts

FOC contracts

Security accreditation  
Systems Exploitation  
Market monitoring  
Applications R&D

Upstream (space) industry

Downstream (applications) industry



# EGNSS value proposition for Rail

To improve availability and deliver integrity and accuracy for safety critical applications and specific transport/logistics applications



# Potential E-GNSS applications in Rail

Signalling

**E-GNSS can provide benefits in combination with**

- sensors for precise train positioning relevant for signalling applications
- conventional communication technologies for logistics applications.

Logistics

Low density lines

Improve safety / reduce operational cost of low density lines

Improve monitoring of the railway assets both for operators and IM's

Asset management

Main lines

Improve the precision of the odometry and eventually enable reduction of number of physical balises

Improve availability of the supply chain visibility information to the LSP/LSC.

- Georeferenced cargo status monitoring
- Corridoring, Geofencing

Cargo monitoring

In line with the **MoU between EC, ERA and the rail industry association** from 2012 E-GNSS can play a major role in rail safety (signalling and train control).

The possible **benefits of E-GNSS for signalling and train control depend on further evolutions of ERTMS specifications.**

Improve precision and availability of positioning for on board passenger information systems

Passenger information systems

# Next steps

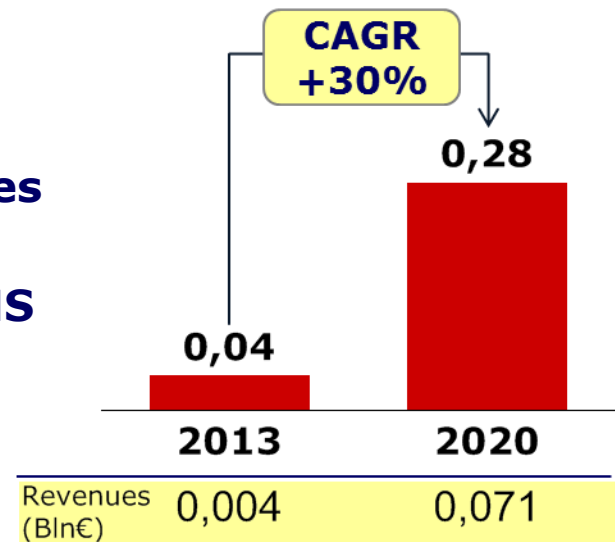
## Where we want to be

- E-GNSS adopted as one of the key elements of the train **command and control solutions** enabling safe and efficient operations **on low density lines**
- E-GNSS adopted for **train positioning subsystem** fostering adoption of **ERTMS Level 3 on main freight lines**
- **Multi-constellation use of GNSS for multimodal logistics applications**

## How to get there

- Support UNISIG in drafting rail requirements and defining virtual balise
- Cooperate with railway initiatives and EC to **foster the role of E-GNSS in the evolutions of ERTMS standard**
- Support EC in the **standardization and certification of EGNOS receivers** as a component of the **train positioning subsystem**
- Collaborate with **logistics industry associations** supporting the role of E-GNSS in **supply chain standards**

## INSTALLED BASE (M UNITS)





# FP7 2nd and 3rd call in Rail



**GRAIL-2** → define, develop and validate an ETCS application in high-speed railway lines based on GNSS. The proposed system is based on Enhanced Odometry, in a context of high speed lines.



**GaLoROI** → development of a certified, safety relevant satellite based on-board train localisation unit suitable for low density railway lines.



**SATLOC** → development and demonstration of innovative GNSS Safety of Life rail application for the train control, speed supervision, traffic control and traffic management on low density lines.

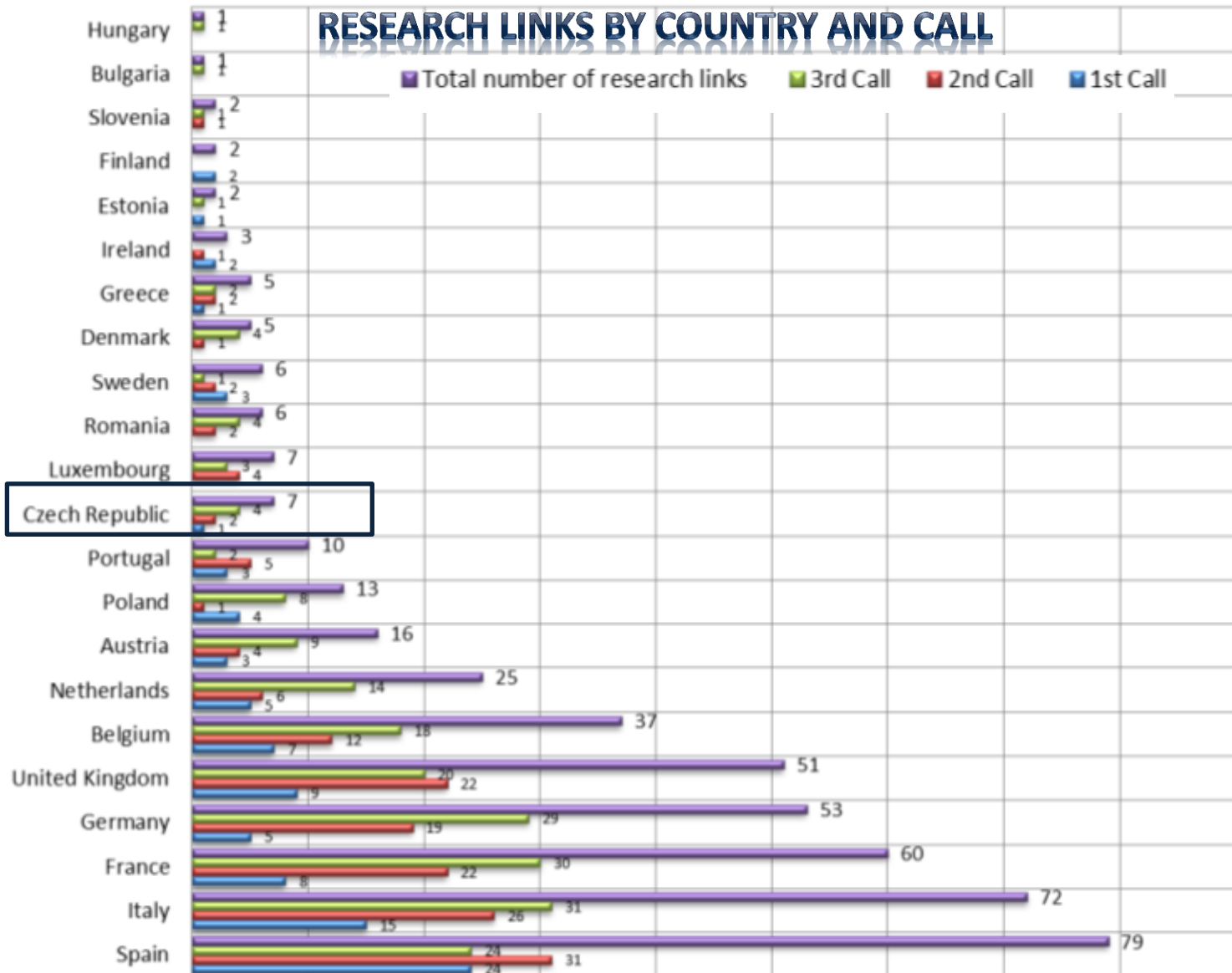
# Areas of interest for GNSS research in rail

- Mature GNSS-enabled products for low density lines signalling
- Use of E-GNSS to complement ERTMS
- Evolutions of non-safety critical applications
  - Passenger information services
  - Driver assistance
  - Track Maintenance
- Multimodal applications and asset management/logistics solutions for improving supply chain visibility





# GNSS FP7 in numbers: Countries participation



# Horizon 2020: The new EU Framework Programme for Research and Innovation



Simplified list of  
**types of action**

with strong emphasis on  
**expected impact**

and broader **topics**

## One project – one funding rate

Up to 100% of the total eligible costs for CSA  
Up to 70% for IA (profit making entities)

Key elements of **what is expected to be achieved** in relation to the specific challenge.  
Expected impact is described for each topic in the WP.

**Considerable freedom** to come up with innovative solutions.

# H2020 1<sup>st</sup> Call:

## First statistics on proposals submission

A total of **109 proposals** were submitted in response to this call.

The number of proposal for each topic is shown below:

- GALILEO-1-2014: EGNSS applications: **40**
- GALILEO-2-2014: Small and Medium Enterprise (SME) based EGNSS applications: **35**
- GALILEO-3-2014: Releasing the potential of EGNSS applications through international cooperation: **11**
- GALILEO-4-2014: EGNSS awareness raising, capacity building and/or promotion activities, inside or outside of the European Union: **23**



# Applications in Satellite Navigation-Galileo H2020 Call

Participant Portal: 2<sup>o</sup> Call will be opened in November 2014!

h2020-galileo-2015-1.html

The screenshot shows the European Commission Participant Portal for the H2020 Galileo call. The page is titled "RESEARCH & INNOVATION Participant Portal" and includes a navigation menu with options like HOME, FUNDING OPPORTUNITIES, HOW TO PARTICIPATE, EXPERTS, and SUPPORT. A search bar and login/register buttons are also present. The main content area features a section for "APPLICATIONS IN SATELLITE NAVIGATION-GALILEO-2015" with a sub-call of "H2020-Galileo-2015-1". A table provides details for this call, including the publication date (2013-12-11), budget (€25,000,000), deadline date (2015-02-04 +17:00:00), main pillar (Industrial Leadership), and OJ reference (OJ C 361 of 11.12.2013). The status is marked as "Open". Below the table, there are links for "Call description", "Call documents", "Get support", and "Subscribe to Notifications". A section titled "Topics and submission service" lists three bullet points: "GALILEO-2-2015: Small and Medium Enterprise (SME) based EGNSS applications", "GALILEO-1-2015: EGNSS applications", and "GALILEO-3-2015: Releasing the potential of EGNSS applications through international cooperation". The left sidebar contains sections for "Horizon 2020", "Other EU Programmes 2014-2020", and "FP7 & CIP Programmes 2007-2013".

H2020-Galileo-2015-1		Sub call of: H2020-Galileo-GSA-2014-2015	
<b>Publication date</b>	2013-12-11	<b>Deadline Date</b>	2015-02-04 +17:00:00 (Brussels local time)
<b>Budget</b>	€25,000,000	<b>Main Pillar</b>	Industrial Leadership
<b>Status</b>	Open	<b>OJ reference</b>	OJ C 361 of 11.12.2013

- GALILEO-2-2015: Small and Medium Enterprise (SME) based EGNSS applications
- GALILEO-1-2015: EGNSS applications
- GALILEO-3-2015: Releasing the potential of EGNSS applications through international cooperation

Deadline for  
submission: April 2015



# Indicative Projects Size and Funding

## 1 - EGNSS applications (15 m€)

Indicative projects size: 1.5 - 4 m€

## 2 - SME based EGNSS applications (5 m€)

Indicative projects size: 0.5 - 1 m€

## 3 - Releasing the potential of EGNSS applications through international cooperation (5 m€)

Indicative projects size: 0.5 – 1.5 m€

E-GNSS Apps  
development

**Innovation Action\*: up to 70% funding**  
(exception: up to 100% for non-profit)

\* for indirect cost: **flat rate of 25%** with some exceptions e.g. subcontracting

**25 m€ for Second Call**





**THANK YOU FOR YOUR  
ATTENTION**

Daniel Lopour  
European GNSS Agency

