



## **Galileo Services Position Paper on the main priorities of the Horizon 2020 Space Work Programme 2018-2020**

To: European Commission, DG Internal Market, Industry, Entrepreneurship and SMEs  
Unit II – Space Policy and Research

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Subject: Galileo Services Answer elements to EC stakeholder consultation on “the main priorities for the next programming cycle of the Space part of Horizon 2020”

Attachment: Slide presentations of the meeting between the EC and GS “Space Strategy for Europe - Views from the EU GNSS Downstream Industry”, 16.02.2016, Brussels

**The Commission is authorized to share GS position paper with Horizon Space Programme Committee national delegations.**

### Scope of the document

This document provides the European Commission with Galileo Services views on the main priorities of the Horizon 2020 Space Work Programme 2018-2020.

Given the area of expertise of Galileo Services association, this position paper focusses on **Satellite Navigation**, and more specifically, on **applications and user uptake**.

It aims at showing the crucial importance to secure substantial funding to support the development of added-value applications and services, it takes lessons from the past, highlights some of the most promising applications and makes recommendations.

### About Galileo Services

Galileo Services is a non-profit organization founded in 2002 as a major partner for the Galileo programme and GNSS application development. Having merged with Oregin (the Organisation of European GNSS Industry of equipment and services) in 2009, Galileo Services network represents now more than 180 member organisations (from Europe, North America and Asia) ranging from SMEs to large companies.

The organization's mission is to support and assist the Programme implementation and to stimulate GNSS downstream technology and business development (terminals, applications and services) as well as contribute to partnerships, advertise EU Industry competencies all over the world, support on-need EU institutions and express industry views.

### Contact

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## **Space Strategy**

As stressed recently by Gard Ueland, Chairman of the Galileo Services association: “To succeed Europe needs to boost the development of European industry that develops products and applications using Galileo and satellite navigation”. “Europe is at a crossroad where it really needs to decide if it wants to do what it takes to harvest the potential of the investments made in Galileo – and the time is now!”

The global market of GNSS-based products and services – called “downstream” market – was worth EUR 200 billion in 2013. It continues to be one of the most promising markets in terms of European growth, with an annual growth rate of +7% until 2023 (see GSA's GNSS Market Report 2015). However, Europe is today in a critical situation in this market – with a share of about 20% compared to a traditional European share of 33% in any other global high-tech sector.

In the US, Russia, China, and Japan, dedicated national strategies exist to support competitiveness of their downstream industry and enhance GNSS market take up.

The Space Strategy for Europe is crucial to restore a level playing field and “reap the economic and societal benefits of Europe's investments in space infrastructure” (see EC Space Strategy Roadmap 2015).

**The socio-economic benefits of Galileo – growth and employment – are mostly expected from the success of the European industry in the global market of GNSS-based user equipment, applications and services.**

This Space Strategy must support the development of a competitive GNSS downstream industry in Europe. It must include massive funding for R&D to manufacturing capabilities, regulations, public procurement, education, awareness, etc.

EU's effort to gain its independence as regards GNSS by building its own infrastructure will be pointless if it is dependent on foreign applications, receivers and devices.

In the years 2014-2020, the Union will invest around EUR 8 billion in the European GNSS infrastructure compared to around EUR 200 million in the development of value-added applications and services which corresponds to a ratio of 40 to 1. The paradox is that it is the latter that generates jobs. In comparison the US spent similar amounts on space infrastructure and downstream development – i.e. a ratio of 1 to 1.

**Much more public incentives are needed to unleash the Satellite Navigation downstream potential and Galileo Services recommends starting with an additional EUR 2 billion.**

GNSS-based applications and services development can bring about immediate benefits, namely the creation of new industrial activities in Europe and, with them, hundreds of thousands of jobs – but Europe has to act now.



## **Horizon 2020**

### *H2020 is essential*

Horizon 2020 and its instruments are key pillars of the Space Strategy. They support European Industry in investing in R&D, encourage the emergence of innovative ideas, and strongly contribute to European GNSS market uptake. They are in particular essential for:

- Encouraging research in key enabling technologies, such as clocks, improved antennas or signal processing technologies for European GNSS receivers
- Developing critical technologies, applications and services based on end user requirements, such as reliability, robustness, security and high performance where European GNSS has a unique value proposition
- Strengthening the European Industry competitiveness, especially on emerging and promising applications as well as on important and strategic application domains
- Making sure that technology is there to ensure that Galileo uptake will actually happen, and as swiftly as possible
- Making sure that the specificities of Galileo design in terms of signals and services are effectively implemented at user equipment level and used

### *Lessons learnt*

**A major mistake was made with FP7 when the earmarked budget for GNSS applications was suddenly cut off**, leaving only EUR 100 million in the GNSS FP7 budget line, instead of the EUR 350 million agreed at the outset, with a total lack of FP7 R&D budget for GNSS applications from 2011 to 2014. This stopped the momentum, at a time when industrialists from other continents, continuously supported by their institutions through several means, were winning market shares in particular on promising markets.

Fortunately, Europe came to their senses with H2020. But again, one may be tempted by breaking again the small momentum under recovery. At a time when, on one hand, Galileo Initial Services are about to be available, and on the other hand, when substantial R&D funding (in particular from H2020) is dedicated to infrastructure evolutions, it would be a double mistake to abandon again the downstream segment which could generate wealth in Europe. It would be directly detrimental both to the potential Galileo market uptake and to the European economy, burying hopes regarding infrastructure investments recovery and jobs potentially created by the European GNSS programmes.

**The absence of H2020 calls dedicated to GNSS in 2016, and the lack of visibility after 2017 is particularly worrying.**



### *General recommendations*

It is crucial that:

- **H2020 R&D budget for GNSS applications and services recovers a correct level.** The required budget has been estimated between EUR 200-400 million/year (see Galileo Services 2011 Position Paper)
- **Calls are launched on a yearly basis**, in particular to ensure European industry presence on emerging and fast evolving markets

In addition, **continuous open calls dedicated to innovation and breakthrough technologies, with a certain freedom in terms of targeted topic**, would be perfectly appropriate to encourage the emergence of innovative ideas and foster technology research, whatever the domain and the technology area.

It is very worthy and well appreciated that a parallel programme of “Fundamental Elements” is developed to complement support that can be provided by H2020, for a list of crucial technical issues further from the market. However, it is not understood why the funding and contractual rules are so different from the H2020 ones (e.g. grants: maximum EU financing rate of 60% of eligible costs; flat rate of 7% for indirect costs, different IPR rules). In particular, especially because it concerns elements further from the market, it is not understood why EC funding contribution could be weaker than for H2020 projects. It obviously limits the number of bidders and thus weakens the quality of results that can be expected.

### *Towards GNSS applications*

**Supporting the development of GNSS applications and services**, and consequently the development of European businesses in these promising sectors, is certainly the most crucial action expected from H2020.

Galileo Services identified, in its 2015 position paper “Europe must succeed in the global navigation market race”, a number of key GNSS applications and services markets – including the most promising services and applications markets in terms of growth potential and strategic markets – in which European Industry must position itself, and thus where H2020 may have a role to play to sustain European economy growth and industry competitiveness. They comprise:

- Road: e.g. connected vehicles and autonomous / automatic driving vehicles
- Agriculture : e.g. autonomous vehicles
- Maritime : e.g. autonomous vessels / intelligent ships / sensor fusion
- Civil Remotely Piloted Aircraft Systems (RPAS)
- M2M & Internet of Things: e.g. smart grids, energy management, smart cities
- Indoor navigation
- Big data: e.g. data position and time stamping
- Rail: e.g. GNSS into ERTMS-ETCS railways train control system
- Timing & Synchronization for Critical Infrastructure
- Protection and efficiency of critical transport network infrastructure
- Multimodal logistics: e.g. fleet and asset management



- Defence
- Offshore infrastructure
- And many other GNSS applications and services markets...

It is worth noticing that European equipment and industries have a strong reputation for quality and reliability, which is crucial in today's and tomorrow's markets. **The leading position of Europe in GNSS security and resilience domains must be strengthened** with the support of H2020.

Galileo Services is frequently exchanging with DG-GROW Unit J3 and organised a one day workshop on February 16, 2016 with them to present a sample of applications, highlighting European GNSS added value for each application, presenting the related market and making recommendations specific to each selected application. The domains covered during this meeting were **LBS/Internet of Things, Road, Aviation, UAV/RPAS, Maritime, Rail, Space, Logistics and Security**. These recommendations were not intended to be exhaustive and spread beyond R&D and H2020 (e.g. tackling also need for regulation). These presentations are attached and Galileo Services would be delighted to provide any further information which may be needed. Recommendations on the **Timing and Synchronisation** segment were prepared after the meeting and are also attached (presentation n°11 of the attachment). Recommendations on **Professional & Scientific applications** segment will be provided as well, in the coming weeks.

#### *Towards multi-constellations*

The capabilities of all GNSS established constellations, namely GPS, Galileo, GLONASS and BeiDou make multi-constellations receiver becoming the trend for GNSS user equipment. However, a lot of R&D remains to be done to decide on the optimal way to combine these constellations. Trade-offs to be made by equipment developers depend on the application requirement and constraints (e.g. accuracy, integrity, time to first fix, consumption) and will impact directly on whether Galileo would become essential for the application and the market or considered unnecessary. A support from H2020 is therefore essential to ensure that Galileo will be properly used in different applications domains, leveraging in particular its key differentiators (improved performance, authentication, high precision, robustness and security) in a multi-constellation environment. At the same time, it will help European industry winning back market shares worldwide and will help Galileo regaining the enviable second place in the heart of most of the users, despite a latest arrival, knowing that two constellations may suffice to most of the applications. **A leadership on multi-constellation equipment by the European industry would offer opportunities that Europe must not miss.**

#### *Towards Galileo infrastructure evolutions*

Moreover, it is worth noticing that **R&D related Galileo evolutions must not be considered without a significant involvement of the downstream industry**. It would risk investing European funds in designing new system features far from actual user interest or hard to implement in user equipment, and thus with sparse market uptake opportunities. At a minimum, downstream industry must contribute to ensure that user equipment technology exists to implement such new features, at a cost and constraints (e.g. equipment consumption, weight) acceptable by the market. It would be even wise to **assign a leading role to the downstream industry in proposing the Galileo service and mission evolutions**.



### *H2020 for capacity building*

Besides technology, H2020 can efficiently support a number of essential enabling activities to foster market penetration and development such as:

- **Market analyses and business cases**
- **Promotion and awareness activities**
- **Standardization** in relevant domains, proposing new standards putting Galileo at the forefront in promising application domains such as security of ITS or railways
- **Support for Certification** process for safety/security critical application
- **Demonstrations** and operative **Pilot Projects**, focusing on implementation of GNSS solution tightly integrated in the real operative user workflow, involving all value chain actors

H2020 could also contribute to the **establishment of a Forum providing a continuous opportunity to the European Institutions to discuss with European industry**, to inform them of European GNSS plans and instantaneously get their opinion on hot topics of the moment.

H2020 can also support **international cooperation**, but **only when obviously favouring European industry interests**, for instance involving non-EU partners only providing either opportunities for market penetration beyond the EU boundaries or specific skills and/or technology not available in Europe. This would also require to be backed up by **setting up adequate IPRs policy**.

### *Further H2020 instruments*

In addition to the R&D effort, it is essential to set up inception procurement from the public sector of European products and applications in emerging and risky domains to build the confidence in these products and applications. Massive procurement of European products and applications must also be achieved in strategic domains. Public Institutions in the US, Russia or China are spending EUR Billions to procure equipment from their industry. To that aim, **further H2020 instruments could certainly help and be contemplated in the field of GNSS**, e.g. Public Procurement (PCP/PPI), at least to support the **federation or coordination of local, regional and national procurement plans**. This can help European industrialists to achieve the critical mass essential to become competitive on the worldwide market. As a matter of consequence, this would also radically boost private investment in GNSS technology.



## **Conclusions**

To secure a substantial earmarked budget for the GNSS applications and services development within Horizon 2020 programme is essential to reap the socio-economic benefits of Europe's investments in Galileo infrastructure.

They are a number of key GNSS applications and services markets in which H2020 has a role to play to sustain European economy growth and industry competitiveness.

A full use of H2020 instruments – from R&D to Public Procurement – building on the European GNSS competitive advantages, and at the same time recognizing multiconstellation opportunities, would definitely provide the downstream industry with the means to achieve excellence, to become competitive in the global market and to create industrial leadership – together with hundreds of thousands of jobs.

Galileo Services recommends that the Union invest from now an additional EUR 2 billion in the development of value-added GNSS applications and services.