



## Galileo Exploitation 2018 Grant Plan

### 1. Multi-frequency multipurpose antenna for Galileo (GEX.0034)

#### LEGAL BASIS

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 Galileo Programme signed on 2 October 2014.

Call for proposals

#### BUDGET LINE:

3922

#### BACKGROUND:

- The modernisation of existing GNSS constellations and the arrival of new GNSS systems have increased the number of bands to be covered by GNSS antennas. Both the mass market and the professional applications will benefit of the improvement in positioning and navigation performances derived from this multi-frequency concept, bringing the need for antennas that can support a wider bandwidth.
- Users groups from different GNSS markets have particular needs, such as operational requirements, regulations or environmental conditions. Enabling multi-frequency capabilities requires the antenna to cope with, on one hand, higher bandwidth requirements and on the other hand with the constraints imposed by the platform on which the antenna operates.
- Advances in antenna design enable the emergence of multipurpose antennas, able to cooperate with various type of receivers and to be used in heterogeneous applications and market segments. This may maximise in this way the advantages of the economies of scale. Enabling multipurpose capabilities requires coping with different user needs and allowing a smooth integration with very heterogeneous platforms and receivers.

#### Objectives pursued and foreseen results:



- To invest further in Galileo-ready multipurpose multifrequencies antennas, developing a common technology multi-frequency antenna for Galileo professional and mass-market users.

#### Description of the activities to be funded under the call for proposals:

The call for proposals is intended to fund up to two (2) projects with the following activities:

- Develop and test of a common technology multi-frequency antenna for Galileo professional and mass-market users.
- The advanced antenna shall be multi frequency-capable (e.g. L1/E1, L2, L5/E5, E6) antennas and adaptive in order to support professional/mass market and potentially governmental applications requiring high accuracy, high robustness and high reliability.
- The antenna shall be commercially ready with a competitive cost.

#### Essential eligibility, selection and award criteria:

##### 1. Eligibility

- The proposal may be submitted by entities fulfilling all the criteria below:
  - 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,
  - Applicants must correspond to the definition of the following target organisations: active in the development, integration and/or manufacturing of GNSS antennas, components, receivers and/or expert in the field of GNSS Research and development (R&D)

##### 2. Non-exclusion criteria

Article 105a, paragraphs 1 to 4, 6 and 7, except point (b) of the first subparagraph and the second subparagraph of that paragraph, paragraphs 8, 9, 11 and 13 to 17 of Article 106 and Article 108 of Financial Regulations shall apply to grant applicants and beneficiaries. Article 107 shall apply to applicants. Applicants shall declare whether they are in one of the situations referred to in Article 106(1) or Article 107 and, where applicable, whether they have taken remedial measures as referred to in point (a) of Article 106(7).

##### 3. The applicants must fulfil the following selection criteria:

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

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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.

4. **Main award criteria:**
- Relevance of the proposal to achieve the objectives of the call, credibility of the proposed approach, and innovation of the solutions proposed;
  - Impact in terms of economic and public benefits derived from the proposal including but not limited to a coherent business plan for the exploitation of the results of the grant;
  - Credible and effective dissemination plan for the results in the best interest of the European Union;
  - Quality of the implementation: coherence and effectiveness of the work plan, including appropriateness of the allocation of tasks and resources.

**Indicative timetable and indicative amount of the call for proposals:**

- Allocated budget for the Call for Proposal: € 2,800,000 (up to 2 (two) projects to be granted, depending on the quality of the proposals received)

	<b>Stages</b>	<b>Planning (possible subject to updates)</b>
a)	Publication of the call	Q1 2018
b)	Deadline for submitting applications	Q2 2018
c)	Evaluation period	Q2 2018
d)	Information to applicants on the outcome of the evaluation	Q3 2018
e)	Signature of the Grant Agreements	Q1 2019

**Maximum possible rate of co-financing of the eligible total costs:**

Up to 70% funding of the eligible total costs.



## 2. Safety of Life for localisation in train signalling (GEX.0066)

### LEGAL BASIS

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 Galileo Programme signed on 2 October 2014.

Call for proposals

### BUDGET LINE:

3922

### BACKGROUND:

- E-GNSS serves the rail sector in various ways: from the well-known applications such as passenger information, asset management to High and Low Density Command & Control Systems.
- GNSS enabled signalling applications provide increased safety and reduce costs of infrastructure management and operations compared to legacy signalling solutions.
- The European signalling industry is in strong competition from other countries, which invested in the past into GNSS based railway signalling solutions.

### Objectives pursued and foreseen results:

- Development of reliable train positioning solution to ensure presence of European products for the future signalling solutions based on E-GNSS.

### Description of the activities to be funded under the call for proposals:

The call for proposals is intended to fund up to one (1) projects with the following activities:

- Development and qualification of a Safety of Life multiconstellation receiver for use in Safety critical railway signalling applications according to the user requirements and train positioning system architecture and according to the performance specification, based on previous related projects and initiatives
- E-GNSS performance test in railway specific environment and development of Minimum Operational Performance specification



## Essential eligibility, selection and award criteria:

### 5. Eligibility

- The proposal may be submitted by entities fulfilling all the criteria below:
  - o Legal persons established<sup>2</sup> in and/or natural person(s) who is national of one of the following countries, are eligible:
    - EU Member States
    - Switzerland, Norway,
  - o Applicants must correspond to the definition of the following target organisations: active in the development, integration and/or manufacturing of GNSS components, receivers, antennas and/or expert in the field of GNSS Research and development (R&D)

### 6. Non-exclusion criteria

Article 105a, paragraphs 1 to 4, 6 and 7, except point (b) of the first subparagraph and the second subparagraph of that paragraph, paragraphs 8, 9, 11 and 13 to 17 of Article 106 and Article 108 of Financial Regulations shall apply to grant applicants and beneficiaries. Article 107 shall apply to applicants. Applicants shall declare whether they are in one of the situations referred to in Article 106(1) or Article 107 and, where applicable, whether they have taken remedial measures as referred to in point (a) of Article 106(7).

### 7. The applicants must fulfil the following selection criteria:

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

### 8. Main award criteria:

- Relevance of the proposal to achieve the objectives of the call, credibility of the proposed approach, and innovation of the solutions proposed;
- Impact in terms of economic and public benefits derived from the proposal including but not limited to a coherent business plan for the exploitation of the results of the grant;
- Credible and effective dissemination plan for the results in the best interest of the European Union;
- Quality of the implementation: coherence and effectiveness of the work plan, including appropriateness of the allocation of tasks and resources.

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<sup>2</sup> Established should be understood as having a registered office, central administration or principal place of business in one of these countries.



**Indicative timetable and indicative amount of the call for proposals:**

- Allocated budget for the Call for Proposal: € 5,000,000 (up to 1 (one) projects to be granted, depending on the quality of the proposals received)

	<b>Stages</b>	<b>Planning (possible subject to updates)</b>
a)	Publication of the call	Q4 2018
b)	Deadline for submitting applications	Q1 2019
c)	Evaluation period	Q2 2019
d)	Information to applicants on the outcome of the evaluation	Q3 2019
e)	Signature of the Grant Agreements	Q4 2019

**Maximum possible rate of co-financing of the eligible total costs:**

Up to 70% funding of the eligible total costs.



### 3. Filling the gaps in E-GNSS receivers and associated technologies (GEX.0206)

#### LEGAL BASIS

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 Galileo Programme signed on 2 October 2014.

Call for proposals

#### BUDGET LINE:

3922

#### BACKGROUND:

- GNSS market and technology is rapidly evolving, following on one hand the pull of increasingly sophisticated technologies and employing of complementary techniques and, on the other hand, the push from the users that have growing demands in terms of positioning accuracy, continuity, availability and interoperability with other systems. Additionally, the prices of the GNSS user equipment is reportedly decreasing.
- The Fundamental Elements scheme is funding the development of E-GNSS-enabled chipsets, receivers and antennas for dedicated user groups and the on-going projects cover the distinctive GNSS markets such as aviation, maritime, road, rail, LBS, agriculture, surveying and mapping, timing and synchronisation.
- One of the objectives of the Fundamental Elements is to strengthen the European manufacturers, integrators by enlarging the offer of European GNSS products.

#### Objectives pursued and foreseen results:

- To invest in close-to-market GNSS receivers and associated technologies that are not developed by the FE other projects



### Description of the activities to be funded under the call for proposals:

The call for proposals is intended to fund up to five (5) projects with the following activities:

- The applicants shall identify technology gaps and propose receivers and/or associated technologies to optimally leverage Galileo and EGNOS differentiators
- Develop and test Galileo-enabled GNSS receivers and/or underlying technology for key user applications not covered by any other Fundamental Elements project
- The receivers and/or associated technologies shall be aligned with the market trends for the specific user segments and target competitive prices
- The applicants shall include a business plan detailing on how the developed technologies will be brought into the market

### Essential eligibility, selection and award criteria:

#### 9. Eligibility

- The proposal may be submitted by entities fulfilling all the criteria below:
  - Legal persons established<sup>3</sup> in and/or natural person(s) who is national of one of the following countries, are eligible:
    - EU Member States
    - Switzerland, Norway,
  - Applicants must correspond to the definition of the following target organisations: active in the development, integration and/or manufacturing of GNSS components (either HW or SW) and/or GNSS receivers and/or antennas and/or expert in the field of GNSS Research and development (R&D)

#### 10. Non-exclusion criteria

Article 105a, paragraphs 1 to 4, 6 and 7, except point (b) of the first subparagraph and the second subparagraph of that paragraph, paragraphs 8, 9, 11 and 13 to 17 of Article 106 and Article 108 of Financial Regulations shall apply to grant applicants and beneficiaries. Article 107 shall apply to applicants. Applicants shall declare whether they are in one of the situations referred to in Article 106(1) or Article 107 and, where applicable, whether they have taken remedial measures as referred to in point (a) of Article 106(7).

#### 11. The applicants must fulfil the following selection criteria:

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

#### 12. Main award criteria:

- Relevance of the proposal to achieve the objectives of the call, credibility of the proposed approach, and innovation of the solutions proposed;

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<sup>3</sup> Established should be understood as having a registered office, central administration or principal place of business in one of these countries.





- Impact in terms of economic and public benefits derived from the proposal including but not limited to a coherent business plan for the exploitation of the results of the grant;
- Credible and effective dissemination plan for the results in the best interest of the European Union;
- Quality of the implementation: coherence and effectiveness of the work plan, including appropriateness of the allocation of tasks and resources.

**Indicative timetable and indicative amount of the call for proposals:**

- Allocated budget for the Call for Proposal: € 5,000,000 (up to 5 (five) projects to be granted, depending on the quality of the proposals received)

	<b>Stages</b>	<b>Planning (possible subject to updates)</b>
a)	Publication of the call	Q4 2018
b)	Deadline for submitting applications	Q1 2019
c)	Evaluation period	Q2 2019
d)	Information to applicants on the outcome of the evaluation	Q3 2019
e)	Signature of the Grant Agreements	Q4 2019

**Maximum possible rate of co-financing of the eligible total costs:**

Up to 70% funding of the eligible total costs.

## 4. Enhanced RX for autonomous driving/navigation (GEX.0220)

### LEGAL BASIS

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 Galileo Programme signed on 2 October 2014.

Call for proposals

### BUDGET LINE:

3922

### BACKGROUND:

- Within the context of road transportation, safety-critical applications are defined as those applications that possess the potential to, directly or indirectly, avoid causing harm to humans, destroying the vehicle or damaging external property or the environment. Autonomous driving and cooperative positioning are both included in this group.
- Autonomous driving and connected vehicles are the most relevant trends in the automotive sector, which rely on accurate and reliable positioning information.
- Driving automation is increasing over time and the full automation (Level 5) will soon become reality, thanks to positioning and communication technologies. Vehicles connectivity is also part of this process, making a large amount of information available to the vehicles and thus improving the achievable positioning performance.
- Future positioning techniques are therefore expected to deviate from the traditional way of providing positioning information (i.e. multiple sensors data including expensive radar/LIDAR-based sensor and cameras). Innovative positioning, based on high speed connectivity (e.g. 5G), vehicle-to-vehicle (V2V) and vehicle-to-infrastructure (V2I) communication enabling the sharing of large amount of information and the exploitation of relative positioning will be specifically designed for automotive applications.
- GNSS-based positioning, including optimised algorithms making an efficient use of PPP and RTK (or a combination of the two) and the exploitation of wide-band signals, are increasingly used for getting the required positioning accuracy and integrity necessary for safety-critical applications. In addition new signals providing higher chip rate already enabled better multipath mitigation, which is necessary to support such operations in urban environment.
- In this context Galileo with its differentiators plays an important role and, when used in a hybridised technology mix integrated with other sensors, it can further boost the technologies for safe autonomous cars.



### Objectives pursued and foreseen results:

- To develop of an innovative close-to-market GNSS-based On-board-Unit (OBU) suitable for fully automated driving and/or cooperative positioning, integrating a GNSS receiver and possibly additional sensors and communication modem to enable the target applications' performance.
- The receiver OBU shall leverage the E-GNSS differentiators. This may include, in addition to double-frequency E1/E5 or triple-frequency E1/E5/E6, the wide band E5 AltBOC, the use of pilot signals, the Open Service Navigation Message Authentication (OS-NMA), the use of Precise-Point-Positioning (PPP, (e.g. from the Galileo commercial service) and in general the optimal exploitation of the Galileo full operational capability (i.e. full constellation deployment).
- The developed receiver OBU shall be cost efficient and shall be compliant with the specific application constraints.

### Description of the activities to be funded under the call for proposals:

The call for proposals is intended to fund up to two (2) projects with the following activities:

- Design, development, testing and demonstration of dual- or multi-frequency GNSS OBU for fully autonomous driving and/or cooperative positioning to be embedded on autonomous vehicles.
- Tight integration of the GNSS receiver with other sensors to reach the application needs.

### Essential eligibility, selection and award criteria:

#### 13. Eligibility

- The proposal may be submitted by entities fulfilling all the criteria below:
  - Legal persons established<sup>4</sup> in and/or natural person(s) who is national of one of the following countries, are eligible:
    - EU Member States
    - Switzerland, Norway,
  - Applicants must correspond to the definition of the following target organisations: active in the design, development, integration and/or manufacturing of GNSS related products (i.e. components, receivers, On Board Units, etc.) for automotive applications and/or knowledgeable about safety-critical applications and/or connectivity concepts applicable to automotive and/or expert in the field of GNSS Research and development (R&D).

#### 14. Non-exclusion criteria

Article 105a, paragraphs 1 to 4, 6 and 7, except point (b) of the first subparagraph and the second subparagraph of that paragraph, paragraphs 8, 9, 11 and 13 to 17 of Article 106 and Article 108 of Financial Regulations shall apply to grant applicants and beneficiaries. Article 107 shall apply

<sup>4</sup> Established should be understood as having a registered office, central administration or principal place of business in one of these countries.

to applicants. Applicants shall declare whether they are in one of the situations referred to in Article 106(1) or Article 107 and, where applicable, whether they have taken remedial measures as referred to in point (a) of Article 106(7).

15. The applicants must fulfil the following selection criteria:

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

16. Main award criteria:

- Relevance of the proposal to achieve the objectives of the call, credibility of the proposed approach and innovation of the solutions proposed;
- Impact in terms of economic and public benefits derived from the proposal including but not limited to a coherent business plan for the exploitation of the results of the grant;
- Credible and effective dissemination plan for the results in the best interest of the European Union;
- Coherence and effectiveness of the work plan, including complementarity of the participants within the consortium and appropriateness of the allocation of tasks and resources.

**Indicative timetable and indicative amount of the call for proposals:**

- Allocated budget for the Call for Proposal: € 4,000,000 (up to 2 (two) projects to be granted, depending on the quality of the proposals received)

	<b>Stages</b>	<b>Planning (possible subject to updates)</b>
a)	Publication of the call	Q2 2018
b)	Deadline for submitting applications	Q3 2018
c)	Evaluation period	Q4 2018
d)	Information to applicants on the outcome of the evaluation	Q1 2019
e)	Signature of the Grant Agreements	Q2 2019

**Maximum possible rate of co-financing of the eligible total costs:**

Up to 70% funding of the eligible total costs.



## 5. Enhanced GNSS user terminal (GEX.0216)

### LEGAL BASIS

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 Galileo Programme signed on 2 October 2014.

Call for proposals

### BUDGET LINE:

3922

### BACKGROUND:

- The Open Service is the Galileo program's free service for positioning, navigation and timing, accessible through the signals E1, E5a and E5b, providing both data and pilot components.
- The Galileo programme will soon provide innovative features which are expected to enhance the performance of Open Service users. Such features will consist of:
  - Navigation Message Authentication (NMA), known as OS-NMA, allowing users to verify that a navigation message is actually broadcast by a Galileo satellite and not by a potentially malicious source;
  - Upgraded Signal-in-Space (SiS) Interface Control Document (ICD), including additional data transmitted over the I/NAV message improving the Galileo positioning solution in user devices
- By the time Galileo OS-NMA and I/NAV improvements will be fully operational, a new generation of enhanced receivers must be developed, tested and implemented.
- In the recent past, the GSA has launched a procurement to develop a close-to-market Galileo OS-NMA user terminal suitable for the Smart Tachograph application.



### Objectives pursued and foreseen results:

- To build close-to-market (i.e. min TRL 7) OS-NMA enabled receivers or terminals suitable for additional target application domains, such as Logistics (e.g. proof of delivery), consumer location based services (e.g. mobile payment) and/or specific maritime applications. The receivers and/or terminals shall be fully compliant with the updated ICD also receiving and processing I/NAV improvements data.
- The enhanced receivers and/or terminals shall aim at optimising the level of protection at least against those spoofing attacks that are specific to the target application.
- The enhanced receivers and/or terminals shall make optimal use of the additional data transmitted over the I/NAV.
- The developed receivers and/or terminals shall be cost efficient and compliant with the specific application constraints.

### Description of the activities to be funded under the call for proposals:

The call for proposals is intended to fund up to two (2) projects with the following activities:

- Design, development, test and demonstration of a close-to-market enhanced GNSS user terminal suitable for one or more applications to be selected among a list (proposed by the GSA).
- GNSS user terminal maturity demonstrated in an operational environment.
- Execution of performance tests to assess the actual performance improvement reached by the user terminal.
- Implementation of the user terminal market uptake strategy in the selected applications' segment

### Essential eligibility, selection and award criteria:

#### 17. Eligibility

- The proposal may be submitted by entities fulfilling all the criteria below:
  - Legal persons established<sup>5</sup> in and/or natural person(s) who is national of one of the following countries, are eligible:
    - EU Member States
    - Switzerland, Norway,
  - Applicants must correspond to the definition of the following target organisations: active in the design, development, integration, test, demonstration and/or manufacturing of innovative GNSS-based products, including knowledge in signal processing, cryptography techniques and/or assessment of anti-spoofing capability.

#### 18. Non-exclusion criteria

Article 105a, paragraphs 1 to 4, 6 and 7, except point (b) of the first subparagraph and the second subparagraph of that paragraph, paragraphs 8, 9, 11 and 13 to 17 of Article 106 and Article 108 of Financial Regulations shall apply to grant applicants and beneficiaries. Article 107 shall apply

<sup>5</sup> Established should be understood as having a registered office, central administration or principal place of business in one of these countries.

to applicants. Applicants shall declare whether they are in one of the situations referred to in Article 106(1) or Article 107 and, where applicable, whether they have taken remedial measures as referred to in point (a) of Article 106(7).

19. The applicants must fulfil the following selection criteria:

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

20. Main award criteria:

- Relevance of the proposal to achieve the objectives of the call, credibility of the proposed approach, and innovation of the solutions proposed;
- Impact in terms of economic and public benefits derived from the proposal including but not limited to a coherent business plan for the exploitation of the results of the grant;
- Credible and effective dissemination plan for the results in the best interest of the European Union;
- Coherence and effectiveness of the work plan, including complementarity of the participants within the consortium and appropriateness of the allocation of tasks and resources.

**Indicative timetable and indicative amount of the call for proposals:**

- Allocated budget for the Call for Proposal: € 3,000,000 (up to 2 (two) projects to be granted, depending on the quality of the proposals received)

	<b>Stages</b>	<b>Planning (possible subject to updates)</b>
a)	Publication of the call	Q4 2018
b)	Deadline for submitting applications	Q1 2019
c)	Evaluation period	Q2 2019
d)	Information to applicants on the outcome of the evaluation	Q3 2019
e)	Signature of the Grant Agreements	Q4 2019

**Maximum possible rate of co-financing of the eligible total costs:**

Up to 70% funding of the eligible total costs.

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