Agenda

European GNSS Agency

EU-GNSS potential

Market trends and current infrastructure deployed

EU-GNSS Research & Development FP7- experience and results

EU-GNSS Research and Innovation: Horizon2020 opportunities
European GNSS Agency (GSA) – key figures

- Main tasks:
  - **Market Development** for the adoption of EU-GNSS
  - Ensuring the **Security** of the European GNSS Programmes
  - Operation of **Galileo Security Monitoring Centre**
  - Under delegation by the European Commission:
    - Exploitation of EGNOS
    - Exploitation of Galileo

- Staff: ~100

- Headquarter: **Prague, Czech Republic**

- **Security monitoring centres** in France and UK
Integrated market development for E-GNSS adoption

**MARKET SEGMENTS**
- Road
- Aviation
- Maritime
- Rail
- LBS
- Agriculture
- Mapping
- Governmental

**DOWNSTREAM VALUE CHAIN**
- Bodies influencing the market
- Navigation Signal Providers
- Chipset, receiver
- Devices
- Content & applications
- Service providers

**Market strategy**
- Market intelligence:
  - Market and technology monitoring
  - User needs and requirements for service development and evolution
- Economic analysis: socio-economic benefits and CBA
- EGNSS Value proposition/differentiators for market communication

**Implementation**
- Application development R&D
- User technology development
- Engage receiver manufacturers for EGNSS integration
- Involve service providers for services adoption
- Support EC regulations and policy making
- Convince users and decision makers, building adoption roadmaps

**User and value chain management (URM)**
- User and value chain assistance
- User satisfaction measurement towards continuous improvement

**E-GNSS USER ADOPTION**

**EU PUBLIC BENEFITS**
Agenda

EU-GNSS potential
The European GNSS Programmes: EGNOS and Galileo

**Galileo**
- Global Navigation Satellite Systems (GNSS)
- Fully interoperable with GPS
- Currently 4 operational satellites
- Target 30 satellites
- Early services starting late 2014/ early 2015
- Open service free of charge and delivering dual frequencies (better performances)

**EGNOS**
- Satellite Based Augmentation System (SBAS)
- Improves GPS performance
- Sends corrections to users via satellite or terrestrial links (EDAS)
- EU coverage under extension in other regions (North Africa and East Europe)
Galileo is under way

- **4 operational validation satellites** launched and usable as of today

- **The first Galileo-only fixed position** was achieved 12 March 2013

- **All industrial contracts** necessary have been signed to ensure up to **26 satellites**:
  - ✓ Early Galileo services in early 2015
Fugro Seastar AS with 40 sensor stations worldwide; upgraded 16 of these stations with Galileo.

On 18 of March 2013 Fugro demonstrated Real-Time PPP based solely on Galileo signals.

Position errors of the Galileo-only PPP solution comparable to those obtained with the combined use of GPS and GLONASS.

“Noise” on the errors in the Galileo only solution is very low with respect to the GPS+GLONASS combined solution.

Switch-off of the “reception” of the GPS and GLONASS signals (i.e. blue line dropped to 4 Galileo satellites).
### Recent achievements

<table>
<thead>
<tr>
<th>Receivers and Chipsets</th>
<th>Aviation</th>
<th>Road</th>
<th>Agriculture</th>
<th>Surveying &amp; Mapping</th>
<th>Logistics</th>
<th>LBS</th>
<th>Application R&amp;D</th>
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</thead>
<tbody>
<tr>
<td>141 Galileo ready models* (37% penetration) requiring user pull and applications to achieve commercialization</td>
<td>198 EGNOS based procedures in 109 airports in 20 countries</td>
<td>STMicroelectronics first Galileo-compatible chipset ready for eCall triggered by intensive GSA action</td>
<td>EGNOS adopted by 67% of EU farmers using GNSS</td>
<td>SAPOS - leading EU network provider - decided to integrate Galileo</td>
<td>Joint action with GS1, global not for profit organization dedicated to supply-chain optimization, supporting the use of geo-location in logistics</td>
<td>Assisted-Galileo services available on the market ensuring enhanced performance on mobile phones in urban environments</td>
<td>42 products &amp; 10 patents/trademarks from 90 FP7 projects</td>
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* Source: Receiver Survey 2014
Market trends and current infrastructure deployed
• Procedures published as of **March 20\textsuperscript{th} 2014:**
  - 98 LPV serving 70 airports
  - 91 ‘EGNOS enabled’ APV
    - *Baro serving 41 airport*

• Growing availability of SBAS-based procedures in European aerodromes and aircraft equipped

• **New operational and safety requirements driving the growth of GNSS use** (e.g. new PBN specifications, CAP 1145 from UK CAA regarding safety of helicopters usage in offshore O&G operations)
• The number of embedded devices and On-Board Units is growing, replacing and supplementing the traditional navigation solutions (PNDs)

• The majority of GNSS chipset and receiver manufacturers in the ITS/Road are ready to launch Galileo ready products

• GNSS is used in the main Road Tolling schemes in Europe

• GSA is working on E-GNSS integration with key Service Providers and public authorities

• New policies and regulations in Europe are expected to accelerate the business case for Road transportation

*Source: Analysis based upon GPS World receiver survey 2013
Current Situation and Market Trends

- GNSS world shipments in railways grew with **CAGR 29%** from 2006 to 2012 (GNSS technology mainly used for non safety critical applications)

- **GNSS penetration in railways installed base is still below 4%**

- Safety critical applications will complement the traditional rail technologies

- Main applications
  - **Low density line network management and train control**
  - **Level crossing management**
  - **Rolling Stock management**
  - **European Rail Traffic Management System**
Current Situation and Market Trends

- **Land-surveying**: more and more non-traditional surveyors are approaching the market.

- **Hydrographic surveying**: increase usage of GNSS in maritime areas.

- New professional users in environmental and engineering disciplines together with mapping communities are fostering the use of **geo-information** and **new applications’ development**.

- Thematic mapping for:
  - Municipalities
  - Forestry and park management
  - Surveying of utility infrastructures

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**SHIPMENT OF GNSS DEVICES (2012)**

![Graph showing shipment of GNSS devices by region.](image)

**SHIPMENT OF GNSS DEVICES BY REGION**

- Cadastral Mining: 48
- Mapping (Person): 5
- Mapping (Machine): 25
- Constr. Based: 11
- Constr. Control: 42
- Marine Surveying: 1
- Total: 132

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*Source: GSA Market Report 2013*
Market monitoring inputs market strategy and tracks results of implementation.

WHAT IS MARKET MONITORING?

- Market segmentation
- GNSS market size and trends modelling and forecasting
- Analysis of public benefits
- Tracking of Key Performance Indicators

EU-GNSS Research & Development: FP7 results in a nutshell

EU-GNSS FP7 1st, 2nd and 3rd Calls

- 10 Patents/registered trademarks (also on-going)
- 33 Commercialised products/services
- 69 Working prototypes

...and more is expected...

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

- 40% of GNSS funds to Small and Medium Enterprises vs. EU FP7 average <15%

...there are more tangible results...

Visit: http://www.gsa.europa.eu/r-d/gnss-project-portfolio
EU-GNSS Research and Innovation: Horizon2020 opportunities
Horizon 2020 - New opportunities opening up

What’s new

- **A single programme** bringing together three separate programmes/initiatives*
- **Coupling research to innovation** – from research to retail, all forms of innovation
- **Focus on societal challenges** facing EU society, e.g. health, clean energy and transport
- **Simplified access**, for all companies, universities, institutes in all EU countries and beyond.

*The 7th Research Framework Programme (FP7), innovation aspects of Competitiveness and Innovation Framework Programme (CIP), EU contribution to the European Institute of Innovation and Technology (EIT)

Strong participation by SMEs
Horizon 2020 - European GNSS applications developers are invited to apply for H2020

Galileo 1st Call for Proposal topics

1. EGNSS applications (15-20 M€)

2. SME based EGNSS applications (5-10 M€)

3. Releasing the potential of EGNSS applications through international cooperation (5-8 M€)

4. EGNSS awareness raising, capacity building and/or promotion activities in and outside of EU (5-10 M€)

H2020 Website:
http://ec.europa.eu/research/horizon2020/index_en.cfm
THANK YOU!