



European
Global Navigation
Satellite Systems
Agency

Econometric models and highlights of GSA GNSS Market Report 2015

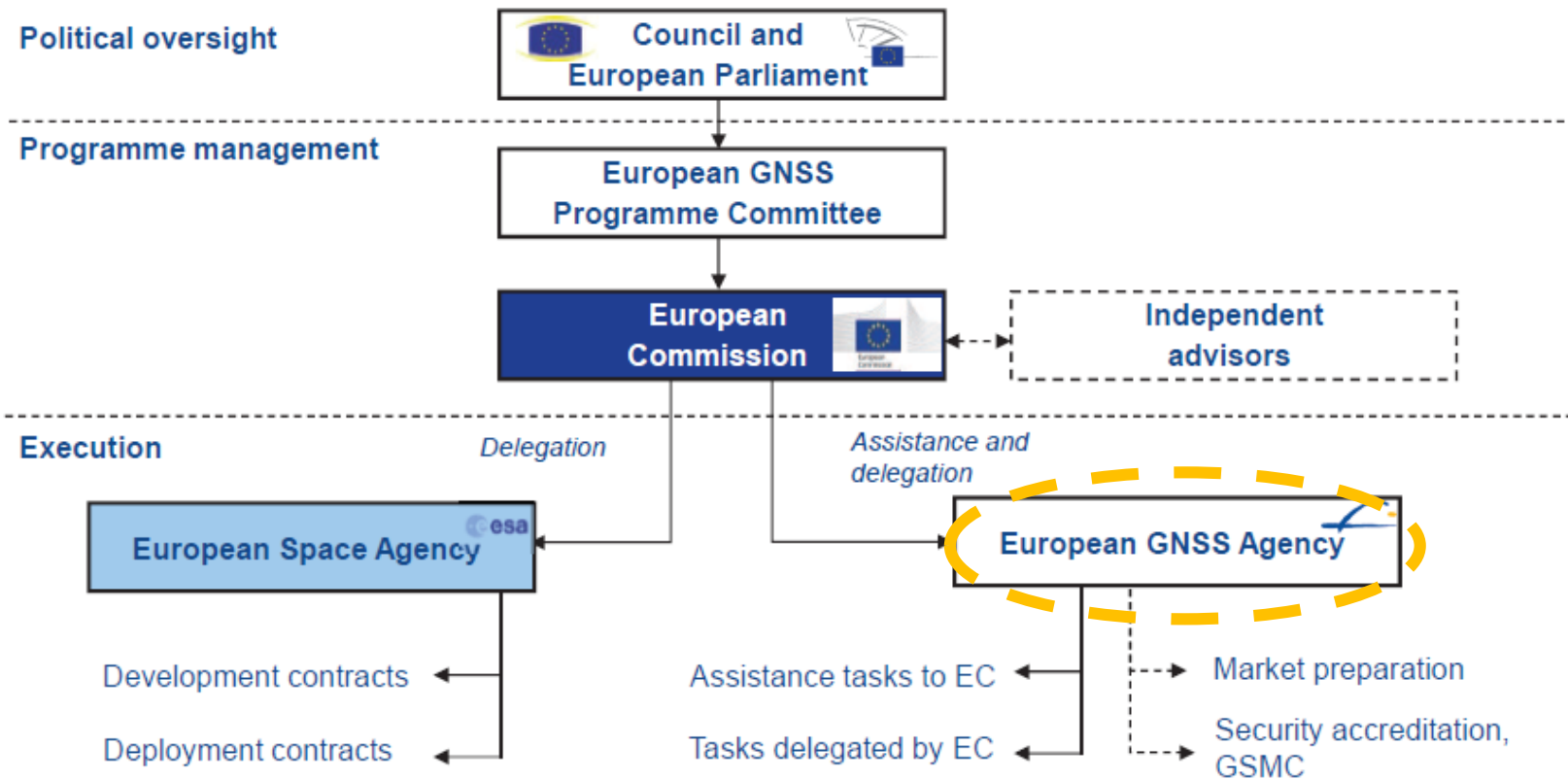
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Market Development Department, European GNSS Agency GSA

Preparatory meeting for the High Level Forum

19 November 2015

Who we are?



GSA in nutshell

- Europe's tool to deliver Galileo and EGNOS services
- 4 Locations, 120 staff, good track record
- Building up the Service and Security hub of EGNSS
- Agency is strong/proven R&D and innovation catalyst



GNSS market and technology monitoring: the basis for market development within GSA service model

| | Market analysis and business planning | Needs by market segment | Service development | Service delivery | Value Chain development | Market stakeholders management |
|------------------------|--|---|---|--|--|---|
| Examples of Activities | <ul style="list-style-type: none"> •Segment size and trends •EGNSS ability to compete •EU industry +strengths +shares •CBA | <ul style="list-style-type: none"> •By segment researches •On-going contacts with stakeholders •Fora •Workshops in key segments' events | <ul style="list-style-type: none"> •EGNSS ability to fulfil needs •Vs other GNSS/ other technologies •Together with other technologies •Define service levels | <ul style="list-style-type: none"> •Operating EGNSS services •Technical assistance and information | <ul style="list-style-type: none"> •Develop solutions •Applications •Receivers •Integration •Commercial service providers | <ul style="list-style-type: none"> •Promotion •Engagement of users, value chain and other decision makers •By segment adoption roadmaps •Partnerships |
| Examples of Results | <ul style="list-style-type: none"> •GNSS Market Report •EGNSS penetration tracking •EU industry opportunities •Market strategies | <ul style="list-style-type: none"> •User needs and requirements •Deep involvement of stakeholders in the value chain | <ul style="list-style-type: none"> •Identification of services characteristics | <ul style="list-style-type: none"> •Users and stakeholder satisfaction monitoring •Identify areas for services' improvements | <ul style="list-style-type: none"> •Application •Products •Patents •Public benefits •Receiver products •Demonstrations | <ul style="list-style-type: none"> •Market adoption •Public benefits |



GSA` s Market Monitoring and Forecasting process

- **GSA`s Market Monitoring and Forecasting Process MMFP** has been implemented to monitor the development of the growing market for GNSS and its evolution and to provide information in support of market development
- Its objectives are to:
 - provide a solid source of market intelligence on GNSS in Europe, notably to **establish the real size of the main downstream market segments**;
 - **measure the impact of the GNSS programmes** and action plans in terms of **economic, social and public benefits**;
 - provide a tool to support policy decisions by responding to requests of **market estimation and scenario analysis**;
 - **forecast market developments** based on present knowledge and be able to compare alternative scenarios that represent different visions on how the market will evolve

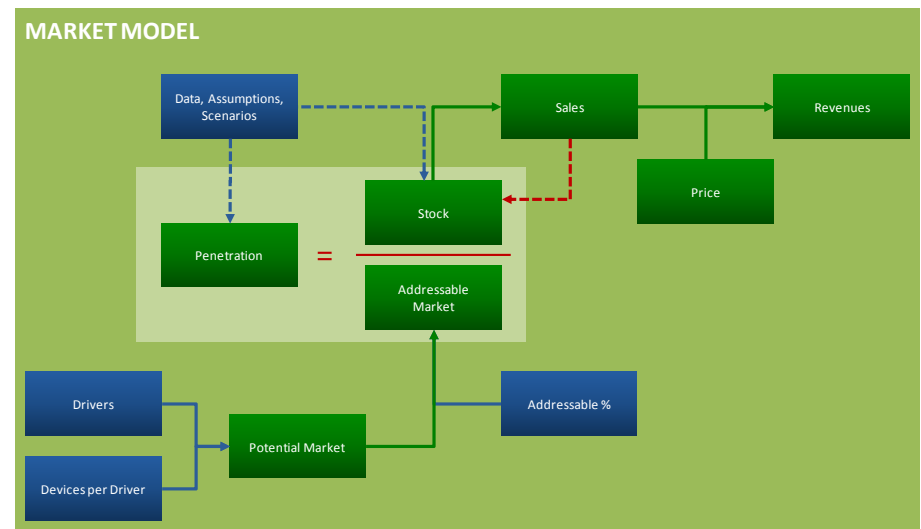
MMFP econometric models (1)

The MMFP contains three econometric models:

- **Market**
and two public benefits models
- **Socio-economic** and
- **Public utility models**

which are built using a selection of best practice economic modelling methodologies, based on drivers and market trends and on the availability of data

There are **three methodologies** used in the **Market Model** depending on data available



MMFP econometric models (2)

Socio-economic model

- Includes taxation (VAT, corporation tax, income tax), producer (after tax profits) and employee benefits (number of jobs supported by GNSS sales, net employee income, multiplier effect on employees spending)

Public utility model

- Includes user benefits (time savings, productivity improvements), benefits for society (e.g. lives saved) and environmental benefits (e.g. reduction in environmental externalities)

| | | Socio-Economic Impact | | | | | | |
|-------------------|--|-----------------------|------|-------------|-----------|------|----------|----------|
| Group | Type of benefit | LBS | Road | Agriculture | Surveying | Rail | Maritime | Aviation |
| Taxation benefits | VAT | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| | Corporation tax | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| | Income tax | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| Producer benefits | After-tax profits | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| Employee benefits | Number of jobs supported by GNSS sales | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| | Net employee income | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| | Multiplier effect on employee spending | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |



4th edition of GNSS Market Report available online

The 4th edition of the GSA's GNSS Market Report is:

- A comprehensive source of knowledge and information on the GNSS global market
- Featuring separate sections on specific market segments

Based on **GSA's Market and Technology Monitoring** and Forecasting Process

- Advanced forecasting techniques applied to a wide range of input data and scenarios
- Insights from the industry experts
- Iterative consultation process with sector experts and stakeholders



The 5th edition of the GSA's GNSS Market Report planned for Oct 2016



Download free of charge at: <http://www.gsa.europa.eu/2015-gnss-market-report>

GNSS is used in a dynamic environment of relevant macro trends

Smart Cities



Thanks to its easy implementation for various smart mobility and LBS applications, GNSS is supporting the smart cities concept.

Big Data



'Big data' refers to large amounts of data produced very quickly by an abundance of diverse sources. Data can either be created by people or generated by machines, such as GNSS receivers or Earth Observation satellite imagery.

Internet-of-Things and Machine-to-Machine communication



As many IoT applications require positioning information of each 'thing', IoT could provide a significant knock-on demand boost for GNSS capabilities in several market segments.

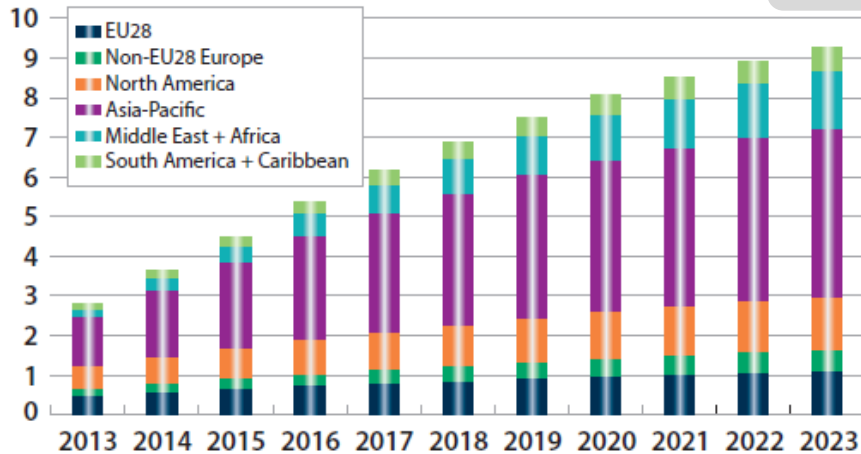
Multimodal Logistics



GNSS-based solutions are particularly well-suited for on-the-route positioning, enabling operators to monitor goods and assets during their transfer between different transport nodes and hubs.

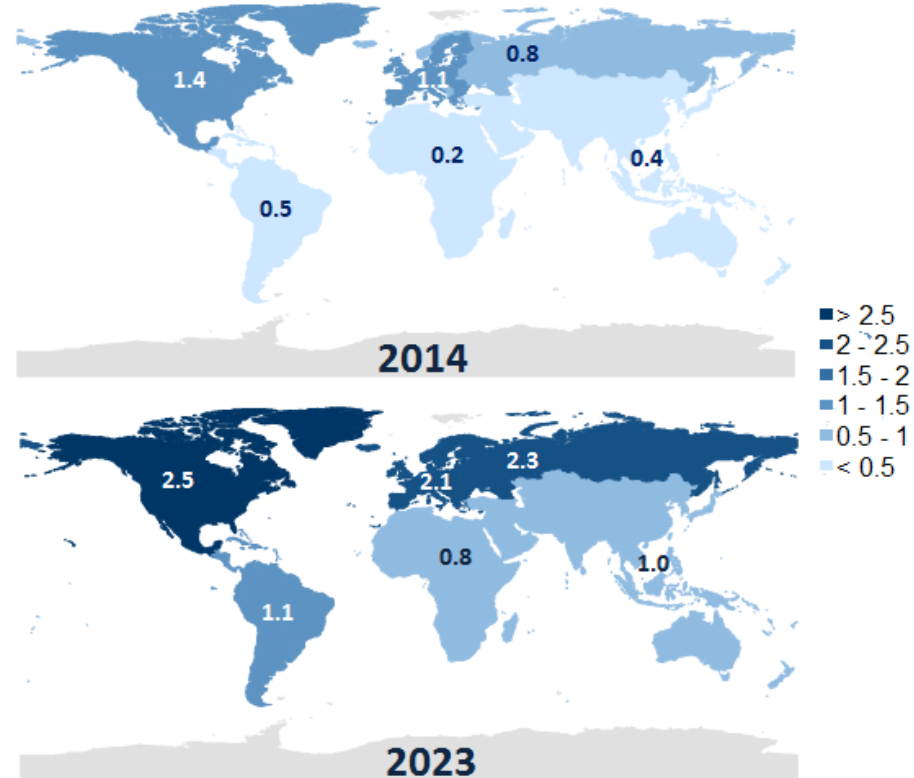
A 4 billion GNSS devices global market, expected to further grow in the future both in volume...

Installed base of GNSS devices by region 12.7% CAGR



Installed base of GNSS devices will triple by 2023

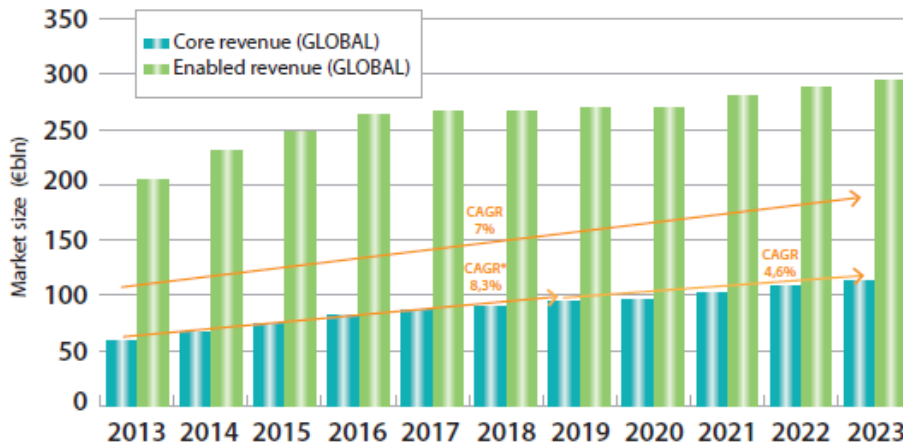
GNSS devices per capita: 2014 and 2023



Growth will be observed in all regions

...and revenues, driven by mass market segments

Global GNSS market size (€bn)

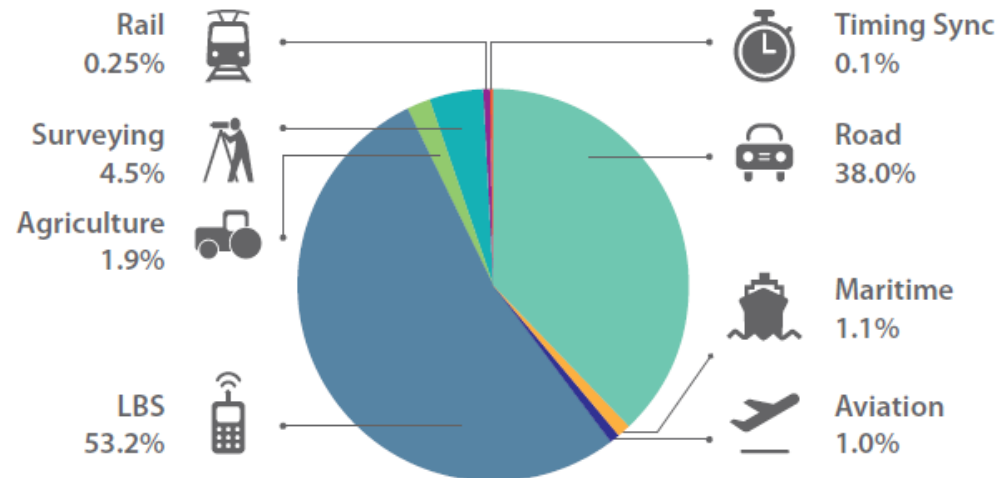


* CAGR: Compound Annual Growth Rate

Both core and enabled revenues slowly mature

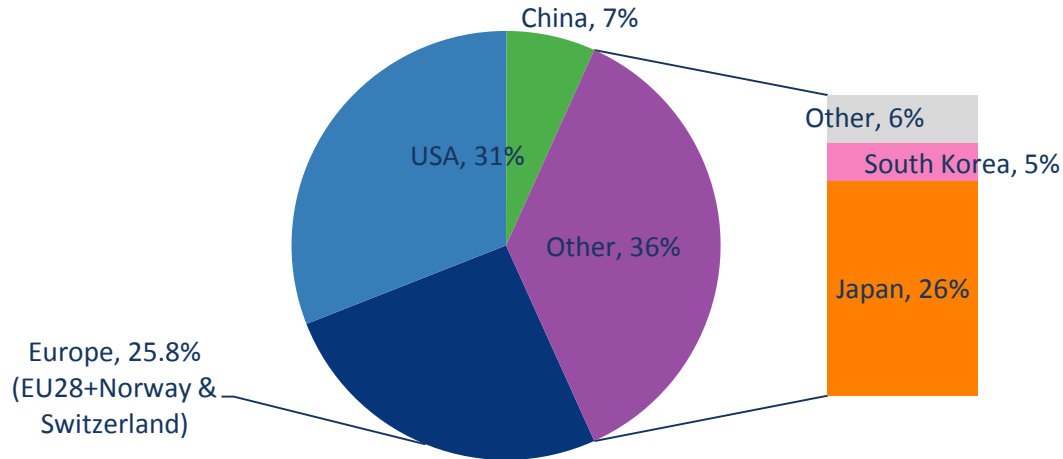
Cumulated revenues dominated by LBS

Cumulative core revenue 2013-2023



The United States continues to lead in global GNSS revenues, experiencing the advantage of being the first mover, followed by Japan and Europe

GNSS Industry Share by Region (% split of revenues; 2012)



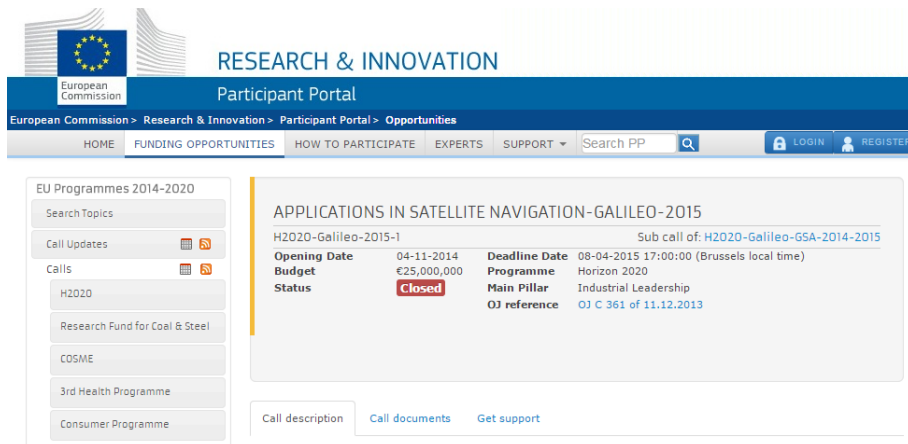
US and Japan are well positioned among larger companies

Europe SMEs play an important role

Top 10 companies in each group based on 2012 revenues:

| Component manufacturers | | System integrators | | Value-added service providers | |
|-------------------------|-----|----------------------|-----|-------------------------------|-----|
| Qualcomm | USA | Toyota | JP | Google | USA |
| Trimble Navigation | USA | Garmin | USA | Pioneer | JP |
| Broadcom | USA | General Motors | USA | Denso | JP |
| CSR | UK | Volkswagen | DE | Clarion | JP |
| Laird | UK | Ford | USA | Here Global | NL |
| Furuno Electric | JP | Apple | USA | Tomtom | NL |
| Rockwell Collins | USA | Samsung Electronics | KR | Microsoft | USA |
| Texas Instruments | USA | Nissan | JP | Jeppesen Sanderson | USA |
| Cobham | UK | China First Automob. | CN | Trimble Navigation | USA |
| Hexagon | SE | Honda | JP | Telenav | USA |

GNSS market growth and innovation is also supported by government funding, such as Horizon 2020 in Europe



The screenshot shows the European Commission Participant Portal interface. The main heading is "RESEARCH & INNOVATION Participant Portal". The breadcrumb trail is "European Commission > Research & Innovation > Participant Portal > Opportunities". The navigation menu includes "HOME", "FUNDING OPPORTUNITIES", "HOW TO PARTICIPATE", "EXPERTS", and "SUPPORT". A search bar contains "Search PP" and there are "LOGIN" and "REGISTER" buttons.

On the left, there is a sidebar for "EU Programmes 2014-2020" with search topics and call updates for "H2020", "Research Fund for Coal & Steel", "COSME", "3rd Health Programme", and "Consumer Programme".

The main content area is titled "APPLICATIONS IN SATELLITE NAVIGATION - GALILEO-2015". It specifies the sub call "H2020-Galileo-2015-1" and "Sub call of: H2020-Galileo-GSA-2014-2015". A table provides the following details:

| Opening Date | 04-11-2014 | Deadline Date | 08-04-2015 17:00:00 (Brussels local time) |
|--------------|---------------|---------------|---|
| Budget | €25,000,000 | Programme | Horizon 2020 |
| Status | Closed | Main Pillar | Industrial Leadership |
| | | OJ reference | OJ C 361 of 11.12.2013 |

Below the table are links for "Call description", "Call documents", and "Get support".

H2020 2nd Galileo Call for proposals closed in April, contracts will be signed in coming weeks:

- 91 proposals received
- 25 m€ of available budget



The need for ubiquitous positioning is fostering the integration of various positioning technologies in one device

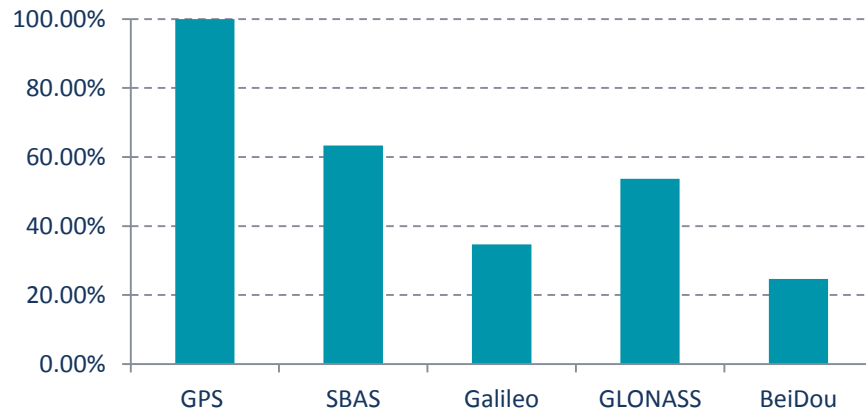
General trends regarding GNSS devices include:



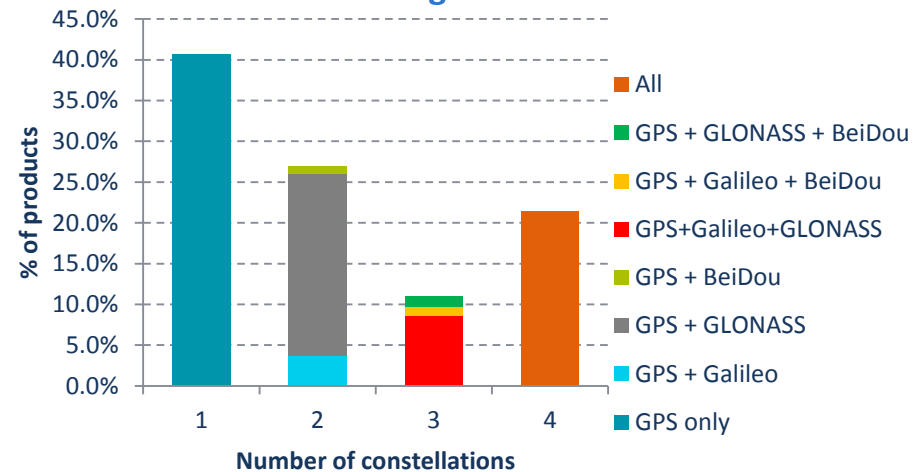
- **Increasingly multi-constellation:** improving availability, robustness and accuracy
- **Multi-sensor:** complementary positioning techniques to help improve the positioning solution
- **More power:** improved batteries and power consumption
- **Smaller:** enabled by miniaturised technology
- **More connected:** with assistance data allowing a faster location fix
- **Multi-purpose:** new software applications are replacing dedicated hardware devices

Analysis of the GNSS receivers' capabilities confirms Galileo encouraging position in a multi-constellation environment

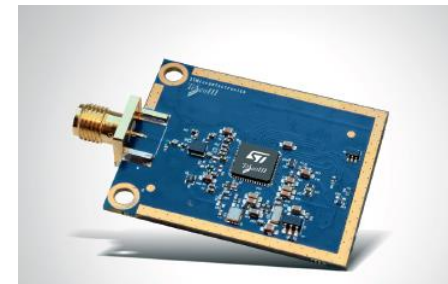
Capability of GNSS receivers - All segments



Supported constellations by receivers - All segments



Capability assessment of more than 300 receivers, chipsets and modules, currently available on the market



For more information download the full GNSS Market Report Issue 4



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The full 80-pages report can be downloaded at the GSA website, as well as by chapter of particular interest.

Download now free of charge at: <http://www.gsa.europa.eu/2015-gnss-market-report>



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THANK YOU

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