Transport applications of the Global Navigation Satellite Systems - short and medium term EU policy

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PURPOSE: to present an Action Plan on Global Navigation Satellite System (GNSS) Applications.

CONTENT: EGNOS (European Geostationary Navigation Overlay Service), the European satellite-based augmentation system that paves the way for GALILEO, has been in service since 1 October 2009. Six months before, on behalf of the EU, the Commission took over from the European Space Agency (ESA) ownership of the system. With its three geostationary satellites and 40 ground stations spread over Europe and North Africa, EGNOS supplements the Global Positioning System (GPS), to which the US provided access for civilian use, with no guarantee of service, back in 2000. EGNOS offers free enhanced satellite navigation signals over Europe which are **ten times more precise than GPS**. All application domains which use positioning and velocity information can benefit from this improved accuracy: all transport modes through the management of infrastructure and the provision of geo-localised information, logistics, precision agriculture, civil protection and emergency management, mapping and land registry, fisheries, energy, management of natural resources, mining, Earth sciences, meteorology, the modelling of climate change, environment, justice and law enforcement, border control, etc.

Another advantage EGNOS can offer civilian users is integrity, i.e. a measure of the trust which can be placed in the correctness of the information supplied by the system, with the user being automatically alerted whenever an error made by the system is beyond a certain confidence limit. Integrity plays an important role in Safety of Life applications in transport (all modes of transport, airport management, automatic vehicles), sensitive commercial applications (high-precision oil platform location, logistics, transport of dangerous goods), or liability-critical applications needing legal recourse (reconstruction of road accidents, road user charging, synchronisation of electrical or telecommunication networks).

Together with the GPS signal, EGNOS today, and later GALILEO, strengthens the infrastructure leading to a global market for GNSS products and services, called downstream GNSS applications. In 2008, this was worth EUR 124 billion. The market is founded primarily on basic positioning and timing signals, but is expected to benefit from the planned introduction of authentication and encryption of signals. Experts predict that, in volume, 75 % (52% in revenues) of this market will come from products and services linked to mobile telecommunications and personal handsets, with a further 20 % (44% in revenues) from intelligent transport systems for road and the remaining 5 % (4% in revenues)from other domains of application.

Despite Europe’s investment in its GNSS infrastructure and the availability of EGNOS, **European industry has only a low share of the global GNSS applications** market compared with what it is capable of achieving in other sectors of high-technology (a good third). This is a problem since:

- applications based on EGNOS and subsequently on GALILEO would make a **decisive contribution to the development of a knowledge-based society** and the creation of high value jobs in the EU. Europe will therefore be missing a huge opportunity if it does not take an appropriate share of the economic benefit expected from GNSS applications. Also, if GALILEO and EGNOS do not become the underlying GNSS standard in Europe, many application domains may remain shackled with technologies which prevent them from benefiting from the added-value of new advanced services;
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- the limited use of applications based on EGNOS and GALILEO leads to **critical dependencies** as GNSS are very pervasive, providing vital position, navigation, and timing information for a whole range of daily-life activities and for Europe's security and social and economic development. By relying only on GPS-based applications, the **EU would be exposed to the potential non-availability of the GPS signal**, which is beyond the EU's control since its primary objective is to support the military operations of a third country. In the same way as the Internet, the pervasiveness of GNSS services is huge.

The most recent and conservative estimates of the overall benefits of EU GNSS programmes to EU industry, citizens and Member States are put at between EUR55 and EUR 63 billion over the next 20 years, with most important benefits arising from indirect revenues in the downstream industry (between EUR 37 billion and EUR 45 billion). As a consequence, the low uptake of applications based on EU GNSS is a problem that affects European society in general, and in many ways.

A **detailed action plan** is called for, to boost people's confidence in the programmes, to foster the development of EGNOS and GALILEO downstream applications, and to achieve the quickest, deepest, broadest development of applications across all domains so to reap maximum benefit from the EU's infrastructure.

The Commission believes that European industry should reap maximum benefit from the investment made in the programmes. Coordinated action by the European Commission among Member States will draw as much attention as possible to the necessity of investment in research, ensure the widest possible dissemination of vital information and optimise awareness raising activities. This will avoid a conflict of standards and a duplication of efforts if undertaken by individual Member States.

Main action points

Through the 24 actions points listed in the plan, the Commission will co-ordinate activities in this domain. This process has led to focusing the action plan, for the period up to 2013, on the following domains in particular to take advantage of the improved accuracy of EGNOS: applications for individual handsets and mobile phones; road transport; aviation; maritime transport and fisheries; precision agriculture and environment protection; civil protection and surveillance.

Among other things, the Commission will:

- allocate EUR 38 million worth of FP7 funding to a broad spectrum of research proposals on GNSS application in 2011;
- seek certification of EGNOS for aviation including Safety of Life; in conjunction with Eurocontrol target aircraft manufacturers, general aviation and small airports;
- investigate possibilities for Advanced Driver Assistance Systems (ADAS) and seek certification of Galileo for Intelligent Transport Systems while also targeting the road transport community;
- promote Galileo and EGNOS-enabled chips and handsets;
- establish an International EGNOS & Galileo Application Forum where users, developers, infrastructure managers and systems providers can exchange views on feeding into the evolution of the GNSS project.

The focus of the GNSS Applications Action Plan is from 2010-2013 – though objectives extend beyond 2020. It clearly underpins official Commission priorities as laid out in the EU2020 Strategy and the EU flagship initiative 'An industrial policy for the globalisation era'.

The Commission also emphasises the need for further EU R&D funding for GNSS applications in order to foster the development of applications based on EGNOS and Galileo, thereby ensuring Europe's independence from foreign, military-controlled systems.