

## **GINA WORKSHOP**

### **How can EGNOS and Galileo contribute to innovative Road Pricing Policy? Conclusion of the GINA Project**

Lyon, 9 June 2011

Room St Clair 3 A  
CITÉ | CENTRE DE CONGRÈS | LYON  
50 Quai Charles de Gaulle

#### **First findings and proposals from GINA project**

#### **Workshop summary**

##### **Introduction**

Konstandinos Diamandouros (ERF) welcomed participants to the final GINA workshop. A brief tour de table following whereby participants introduced themselves and explained their expectations from the workshop.

##### **EGNOS for ITS: an option now paving the way for Galileo**

Following a brief tour de table by participants, Fiammetta Diani, Market Development Officer at the Galileo Supervisory Authority (GSA), started her presentation by showing participants a short promotional video made by the GSA.

Immediately after, she provided the state of play with respect to the deployment of EGNOS/Galileo. The EGNOS Open Service has been operational since October 2009 and the Safety of Life application available since March 2011. Two Galileo satellites are already in orbit and as of September 2011 additional satellites will be launched with a view to reaching in total 20 satellites by 2015. This will increase significantly the availability of EGNOS and improved the integrity techniques. To complete the Galileo constellation, an additional 12 satellites will be required for which, the financial resources have been secured.

Ms. Diani continued her presentation by describing the opportunities EGNOS/Galileo offered for road pricing. In the last two years, the road industry's awareness of EGNOS and its possibilities has increased dramatically. In 2009, EGNOS was not known in the road sector and very few EGNOS enabled automated receivers could be found in the market. Two years later, leading service and technology acknowledge EGNOS, some companies have already adopted it for the transport of dangerous goods (Eni) and most automotive receivers are EGNOS enabled.

Moreover, results from trials conducted to date, mainly from the GINA project and the EGNOS2road, point to the conclusion that EGNOS provides a better accuracy especially for open sky scenarios. This growing acknowledgement of the added value of EGNOS can also deduced from the fact that that proposed technology by the consortium selected for negotiation in the French ECOTAX is EGNOS enabled.

## **Business Exploitation Plan – GINA as a potential EETS model**

The floor was subsequently given to Mr Paol Cerini from Bain and Company, who presented a Business Exploitation Plan (BEP) of GINA as a potential EETS provider.

To begin with, the GINA service provider offer has been structured as a basic package with of add-on-services that can be purchased separately. Moreover, two customer segments have been identified, a business segment and a private segment.

Given the pan-European nature of EETS, the market penetration strategy looked at all EU countries. A progressive penetration plan has been elaborated based on five geo-clusters. Under current fleet growth scenarios, the EU would have by 2030 approximately 48m commercial and 299 passenger vehicles respectively.

The introduction of GINA as an EETS provider was set at 2015 for commercial vehicles and 2018 for private cars. The initial monthly fee was assessed at € 12 and €4 per month for commercial and private respectively, with the price going down with the passage of time. Moreover, was assumed that the GINA Service provider would capture 30% of the EETS market.

To give the BEP additional credibility, three revenue scenarios were examined, i.e. low penetration, a base and a best-case scenario.

The main conclusion was that, even using conservative estimates, the GINA Service provider could represent a significant opportunity with a good profitability in the long term (EBITDA<sup>1</sup> at a regime condition of about 20% of revenues). However, two main concerns were highlighted: first, the long break-even period that requires a significant start-up financial stress (the cumulative free cash become positive after 10 years) and, second, the high sensitivity to price changes that could have an impact on revenues given that end-user fees are by far the most important source of revenue.

## **GINA innovative approach to GNSS and EGNOS for Road Pricing – Findings & Results from GINA FOTs**

The third presentation was given by Jose Maria Martin Bobin from GMV and coordinator of the GINA project. To begin with, Mr. Martin emphasised that the GINA project was the first large scale nationwide demonstration for EFC+VAS applications based on GNSS, defined by real users and with a performance measured against real user requirement (Dutch ABvM scheme). Subsequently, he outlined that the GINA FOTs consisted of two dedicated trials: the **Exhaustive trials**, which involved 2 vehicles driving in a controlled environment for 4-5 weeks and aimed at assessing the performance of EGNOS vs GPS in terms of accuracy and integrity; and the **End2End trials**, which involved 100 vehicles travelling freely over 6 months and whose objective was to assess the user acceptability of an RUC scheme as well as the impact of differential pricing on driving behaviour.

Concerning **the Exhaustive trials**, three test routes were defined to be representative of the conditions to be envisaged by any Dutch driver, combining a large motorway section with some small roads in urban environment and some tunnels, large numbers of narrow streets and numerous turns in urban roads, some tall buildings and urban canyons, in Amsterdam, the Hague and Rotterdam.. Each route, which was deliberately chosen to challenge

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<sup>1</sup> Earnings before interest, tax, depreciation and amortisation

charging performance, was repeated over 20 times, with some routes performed additional times where possible.

A large amount of data was generated and from the subsequent data processing, the overall conclusion of the exhaustive trials was that; first, GNSS is a **reliable tool** for different RUC schemes, second, the GINA proposed technology allows for distance-based charging with **good performances** and a simple, affordable solution; and third, European GNSS (e.g. EGNOS) and other GNSS centered techniques **improve performances and reliability**.

With respect to the End2End trials, the campaign involved in the end 91 volunteers instead of the 100 planned originally<sup>2</sup> and ran for six months. Four municipalities (Utrecht, Den Haag, Rotterdam and Nijmegen) were defined as large geo-objects and 17 corridor segments indentified. A full set of differential tariffs was put in place depending on the corridor, charging area, day of the week and the hour of the day and at the end of the trial, drivers were asked to complete a questionnaire.

In terms of technical performance, the results from accuracy and charging were similar to the ones in the exhaustive trials with slight worse performance due to the fact that no Odometer based information was available and also the possible errors in distance introduce by the use of maps as a source of geobjects charging distance. From a users feedback point of view the impact of the users opinion was not as big as initially expected due to lack of enough number of inputs due to privacy concerns and the scrap of the Dutch tolling scheme, but not due to technical performance of the proposed system

### **Developments in Standardisation for Road Pricing**

After the coffee break, Jesper Engdahl provided participants with an overview of the latest development in road pricing standardinsation. He commenced his presentation by stating that European Standards are a voluntary mechanism (and not compulsory) intended for repeated use and aimed at promoting an open and competitive market development.

With respect to Electronic Fee Collection, the European Standards can be classified into three categories: first, **architecture and technology independent** standards; second, **Dedicated Short Range Communication** (DSRC) standards; third, **autonomous EFC** standards (**GNSS**).

After providing a brief overview of the numerous Standards in place and the remaining challenges, Mr. Engdahl explained that the European Electronic Tolling Service (EETS) is not strictly in the same scope given that EETS is a single service, while EFC standards support in general broader technical needs. EFC standardisation can support EETS by providing the technical building blocks; however, it is up to the owner of the EETS to deliver 'turn key' standards for this operation.

Overall, 21 standards regarding standardisation have already been published, with 9 more pending approval. This standardisation has no doubt help generate a broad market acceptance for EFC, which for the time being is mainly in the DSRC market, given the autonomous ERF (GNSS) marker is currently developing.

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<sup>2</sup> The problem in the expected number recruiting drivers can be attributed to the political developments in the Netherlands and the abandonment of the road pricing scheme.

## QUESTIONS and ANSWERS

Q. What is the level of guarantee offered by the integrity circle?

The circle is the maximum position of error, in other words, one can be at least 99% sure that the vehicle is within the circle. The integrity can be set from 99 to 99,9999 or similar values and this has a direct impact in the PL (circle radius): the higher the integrity the bigger the circle size. This, however, does not protect against jamming etc

Q. Were the assumptions of the BEP checked with the members of AETIS, the Association for Electronic Tolling and Interoperable Services?

A. No, they were not. However, the figures in the BEP are based on very conservative estimates. For example, a potential alliance between OBU manufacturers and car manufacturers would reduce significantly the cost of OBU and mean a higher profit margin for the business model. The best-case scenario is very likely.

Q. If a public authority wished to include GNSS as an option for a RUC scheme, what CEN Standards could be used as a reference?

The CEN/ISO 17575 Part I, II and III are the ones dealing with GNSS based tolling.

Q. Does Romania have any plans to introduce road charging?

The idea is currently under examination and it seems likely that a charge for HGV could be introduced by 2015.