



Identifying ITS Opportunities for the HA Location Positioning Newsletter: October 2009

■ ITS RADAR INTERNATIONAL PROJECT

This project is providing intelligence for the Highways Agency on ITS developments in Europe and around the world. It is carried out by TRL and AECOM on behalf of the HA. The project summarises key information for decision makers and practitioners on activities related to Intelligent Transport Systems (ITS). The project covers specific areas of key interest to the HA.

Regular newsletters are being produced, covering information which is in the public domain. For more information about the project and the services provided, the web site can be reached at: www.highways.gov.uk/itsradar.

To contact us and let us know what you would like this project to deliver please email us at: ITSRadarInternational@trl.co.uk

■ ABOUT LOCATION POSITIONING

This newsletter covers key developments in positioning information relevant to ITS, such as GNSS (Global Navigation Satellite Systems), the Global Positioning System (GPS) and Geographical Information Systems (GIS).

The Galileo Programme is a joint initiative of the European Commission (EC) and the European Space Agency (ESA) to provide Europe with its own independent global civilian controlled satellite navigation system. This is a particular area of focus in ITS Radar International news on Location Positioning.

The Galileo system will allow users to pinpoint their location at any time to a high degree of accuracy, and will ensure Europe's competitiveness in a global market in satellite navigation products and services.

When fully deployed, Galileo will consist of a constellation of 30 satellites in 3 orbits offering unprecedented accuracy and reliability of positioning. This allows for a range of many applications, products and services to be developed for use in transport, telecommunications, fisheries and agriculture, civil protection, building, construction etc. Galileo was due to go live in 2008 but it is now predicted to be in operation by 2013.

■ MEETINGS

38th International Loran Association Convention and Technical symposium

Source: [ILA](#)

Loran (LONG Range Aid to Navigation) - a terrestrial radio navigation system is the subject of this event which will be held in Portland, Maine USA, over 13 to 15 October 2009.

Topics to be covered during the event include:

- GNSS Interference and Loran as a Back-up: Also jamming and interference issues associated with electronic navigation systems.
- Loran around the World: Loran stations throughout the world including the Europe, Far East, Russia, and the Middle East. Also considered is un-manning of stations, data transmissions, new transmission, and reception technologies.
- eLoran Novel Applications: Applications of Loran for e911, military, commercial, eLoran integrated with other systems.

Further information on the event can be found in the published [call for papers](#).

NAV09 Conference and Exhibition - Land

Source: [RIN](#)

The event titled NAV09 Land: Location systems for Intelligent Transport Systems and Indoor Guidance applications will be held at the National Physics Laboratory, in Teddington, on 19 November 2009.

This one day event will focus on possible techniques to meet the performance requirements placed on location technologies and systems used for Intelligent Transport Systems & Services (ITS), informed traveller services and asset management. The topics covered by the papers include requirements for location information in intelligent speed adaptation and cooperative vehicle systems, and a discussion of the impact of the European Action Plan for ITS.

Further information can be found on the [event programme](#) and registration for the event can be done by filling out this [registration form](#).

Summary of the second conference on GNSS vulnerabilities and solutions

Source: [GPS World](#)

The conference was held over 2 September to 5 September 2009 at Baska, Croatia, and was a joint venture by the Royal Institute of Navigation, London, and Nottingham University's Institute of Engineering Surveying and Space Geodesy.

GNSS is vulnerable to solar activity, unintentional interference, jamming, and multipath propagation. The conference aimed to disseminate the latest developments in the understanding of these vulnerabilities and discuss potential ways of mitigating them.

One topic that attracted particular attention was the vulnerability of GNSS in the context of GNSS-based Road Pricing systems. It was suggested that in order to enforce charges through the legal system and mitigate the risk of malicious exploitation of the GNSS vulnerabilities, Road Pricing systems may require levels of integrity approaching those of aircraft instrument approach systems.

In a session devoted to ITS applications, a paper presented by TRL Limited highlighted the GINA project (GNSS for INnovative road Applications) which is addressing GNSS integrity in Road Pricing systems.

Furthermore, it was highlighted that in the future there could potentially be 117 navigation satellites (Galileo, GPS, GLONASS, COMPASS) and 29 augmentation satellites orbiting Earth. Such a high number of satellites would mitigate many of the vulnerabilities of GNSS due to propagation effects, but not those due to interference in the frequency bands which they will all share.

■ HOT TOPICS

JAXA unveil a ground station for tracking signals from the Quasi-Zenith Satellite System (QZSS)

Source: [JAXA](#)

The Japan Aerospace eXploration Agency (JAXA) in cooperation with the National Oceanic and Atmospheric Administration (NOAA) of the U.S. has unveiled the first ground station for tracking and monitoring signals from the Quasi-Zenith Satellite System (QZSS).

The QZSS is a proposed Japanese augmentation system that aims to always have at least one satellite directly above Japan. This will ensure that positioning signals transmitted by the system can be received in urban and mountainous regions without obstruction. In doing so, the system is expected to significantly improve the accuracy of GPS positioning signals.

The QZSS programme is a joint government-private venture that involves four government ministries. This research and development by the four government ministries and JAXA is part of a joint research with various research institutes on the High Accuracy Positioning Experiment System.

Research on the Positioning Experiment System is expected to improve the availability of GPS in Japan thus improving benefits for GPS users and expanding more sophisticated utilisation of a future advanced satellite positioning system.

Rubidium Atomic Frequency Standard (RAFS) atomic clocks to be provided for GPS III satellites

Source: [FreshNews.com](#)

Perkin Elmer have been awarded a contract to design and implement several engineering advances into its heritage GPS Block IIR and Block IIF Rubidium Atomic Frequency Standard (RAFS) atomic clocks, and qualify and deliver flight units for the first two GPS IIIA satellite vehicles. The work is due to be completed by March 2012. The contract also includes options to support up to 10 additional satellites.

In addition to providing increased accuracy of navigation signals, the GPS Block III satellites will transmit a new civilian signal that will be interoperable with both Japan's QZSS Quasi-Zenith Satellite System ([see ITS International article](#)) and with Europe's Galileo satellite navigation system.

Lockheed Martin is the programme's Space System prime contractor, and ITT is providing the navigation payload designed to provide improved position, navigation, and timing services. The projected launch date for the first GPS block IIIA satellite is in 2014.

ITS Radar International will continue to monitor GPS developments

Latest GPS IIR(M) satellite declared operational

Source: [GPS World](#)

GPS IIR – 21(M) is the last in the series of eight modernised GPS block IIR satellites. Ten days after its launch, the satellite's status was set to operational.

There are now a total of 30 operational GPS satellites in orbit. According to the U.S. Air Force the current GPS constellation now has the largest number of satellites and the greatest capability since the system's launch. The latest IIR-M satellite provides improved accuracy, enhanced encryption, anti-jamming capabilities, and a second civil signal to provide dual frequency capability and improve resistance to interference.

New GLONASS-M satellites launched

Source: [GPS World, spaceflightnow.com](#)

The three latest GLONASS-M satellites were launched on 25 September 2009. The GLONASS constellation currently consists of 19 operational satellites, with the addition of these three and three more due to be launched in December 2009, the GLONASS constellation could reach 99.97 percent global availability. This would be ahead of the planned date for Full Operational Capability (FOS) for the constellation at the end of 2010.

However, the older GLONASS satellites may continue to fail, thus reducing the overall availability of global service. Three more GLONASS-M satellites scheduled for launch in September 2010 and two more GLONASS-M and one GLONASS-K in December 2010 are expected to achieve the FOC of the constellation of 24 satellites.

The GLONASS-M satellites are second generation GLONASS satellites. They are designed to have a longer lifetime than their predecessors. GLONASS-K satellites are the third generation GLONASS satellites and are expected to be lighter and have a longer lifespan; they will be able to transmit on an L-band frequency.

Two new augmentation services are scheduled to be launched for GLONASS which are expected to improve the positioning accuracy of the system, see previous [ITS Radar International article](#).

ITS Radar International will continue to monitor GLONASS

EGNOS Open Service operational capability planned for October 2009

Source: [GSA](#)

The European Commission is expecting to declare operational use of the Open Service of the European Geostationary Navigation Overlay Service (EGNOS) in October 2009.

The European Commission is expected to state that EGNOS will be able to provide GPS augmentations reaching accuracies of 1 to 2 metres at availability levels greater than 99 percent. According to the EC this will reflect the performance of EGNOS that has been witnessed across Europe during 2009.

The EGNOS Open Service is accessible to any user equipped with a GPS/SBAS receiver within the EGNOS Open Service area in Europe, and it is free to use. This event should mark the beginning of the exploitation phase for EGNOS.

Another key milestone is scheduled for 2010, when the EGNOS Service Provider (ESSP) will become certified and when the European Commission will declare the readiness of the Safety-Of-Life Service.

The European GINA project proposes to use EGNOS in order to ensure GNSS integrity for Road Pricing systems and to guarantee an acceptable level of overcharging, see previous [ITS Radar International article](#).

ITS Radar International will continue to monitor EGNOS

Global positioning using mobile phones

Source: [RIN](#)

A US company has developed software that it claims enables a mobile phone to determine location with better accuracy than GPS. The adaptive software algorithm claims to enable any basic cellular phone to provide location without using GNSS or WiFi to within 1 to 40 m - including indoors and underground.

The concept of Cellular triangulation is not new but this new method claims a large increase in accuracy compared to other methods due to its specific location algorithm that can determine position 'within milliseconds'. It is not yet clear whether the service will be made available to users directly or whether it will be licensed to manufacturers or operators.

More information on the service can be found on the [Glo-Pos web site](#).

■ PROJECTS

No new projects

■ RECENT PUBLICATIONS

No new publications

■ GLOSSARY

EC European Commission

EGNOS European Geostationary Navigation Overlay Service

eLORAN	enhanced LOng Range Aid to Navigation
ESSP	EGNOS Service Provider
GINA	GNSS for INnovative road Applications
GLONASS	Russia's GLObal NAVigation Satellite System
GLONASS-M	Second generation GLONASS satellites, designed to be lighter and to have longer lifespan
GLONASS-K	Third Generation GLONASS satellites, expected to be lighter and have longer life span than 2 nd generation. Will be able to transmit on L-band frequencies.
GNSS	Global Navigation Satellite Systems
GPS	Global Positioning System
GPS II R(M)	Modernised block II R GPS satellites, developed by Lockheed Martin
GPS IIF	Follow on block II GPS satellites, last block II satellites to be deployed before the introduction of next generation GPS satellites - GPSIII
ITS	Intelligent Transport Systems: "The integration of information and communications technology with transport infrastructure, vehicles and users" [ERTICO]
JAXA	Japan Aerospace eXploration Agency
LORAN	Long Range Aid to Navigation
NOAA	National Oceanic and Atmospheric Administration of the U.S.
QZSS	Japan's Quasi-Zenith Satellite System
SBAS	GLONASS Space Based Augmentation System
SDCM	SBAS System of Differential Correction and Monitoring covering the Russian Federation
TRL	UK's Transport Research Laboratory