

UKRAINE

UKRAINE project identifies promising applications for EGNSS



HORIZON 2020



The following is the second part of an [overview of the results of the study](#) aimed at identifying the most promising applications belonging to relevant fields for GNSS.

Maritime and inland waterways

Water transport is of utmost importance for the Ukrainian economy. This is why many projects, such as ADRIANA, have been launched within this topic area with the specific purpose of addressing the value of EGNOS for maritime and inland waterways applications.

The Ukrainian Ministry of Infrastructure chose to increase the level of control over the sea safety of navigation, in particular in the Azov and Black Seas. These activities are supported by GNSS-based systems, including [Automatic Identification System \(AIS\)](#). This application calculates the vessels position and periodically broadcasts it, helping maritime authorities, as well as infrastructure managers and operators, to increase the safety and security of operations at sea. This generates public benefits including reducing human injuries and preventing environmental and economic damages.

Concerning inland navigation, [River Information Services \(RIS\)](#) are GNSS-enabled information technology services designed to optimise traffic and transport processes, enhancing a swift electronic data transfer between water and shore through in-advance and real-time exchange of information. This useful application has been adopted on the Danube and Dnieper rivers, where three and six control centres have been created respectively, as well as twenty-four AIS stations on the Dnieper river and two on the Danube river. The main advantages of RIS include the ability to provide and display on electronic maps the information about the current fleet deployment on the waterway, schemes and location of ports, locks, bridges, hydroelectric power stations, registration of the voyagers and recording of the passages of control points on the inland waterways, which allows the collection of statistics on traffic and freight flows.

Railways

Ukraine has a highly developed railway network: two-thirds of its railways lines are equipped with modern management facilities, dispatcher's centralization and automatic block systems. Since 1991, the Ukrainian railway network, the fourth largest in Eurasia for traffic flow, has been managed by the state enterprise Ukrzaliznytsia, which became aware of the benefits brought by the introduction of the GNSS in the sector.

As an example, [High Density Command & Control Systems](#) enable automatic generation of operations that previously were not subject to accounting, enhance rolling stock effectiveness, centralise traffic control, monitor the schedule of trains and inform the dispatch centre. In the long run, the EGNOS system will be used in an intelligent supervisory system, in which the safe conduct of automatic train functions will be implemented on the basis of full information about the location of all trains and on the state of the roads.

With the [Tracking and Tracing of Dangerous goods](#) application it is possible to detect the exact position of the train, (in some cases also wagons or containers when they are equipped with GNSS receivers) containing DG in case of incidents, providing useful information to infrastructure management and railway transport operators, in addition to offering significantly improved emergency management.

Mapping and others

GNSS is used in [Land Surveying](#) in Ukraine since the 1990s; currently more than 3,000 officially registered GNSS surveying instruments are used for geodetic works in the fields of land cadastre, land management as well as in the construction and mining industries. By providing a sub-meter level accuracy with minimal investment, EGNOS in the future can represent a cost-effective entry-level solution.

The state service of Ukraine on geodesy, mapping and cadastre performs coordination of activities in Ukraine related to [Mapping](#). This activity enables the creation and the updating of maps (topographic, administrative, political, historical, and

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educational), and the development of plans of various territories. Map updating is carried out on the basis of satellite images and airborne images. Reference points on the earth's surface, the coordinates of which are determined by a GNSS-receiver, are used for high-precision snapshots of these images, as well as for the definition of points of interest. Refined and updated maps are the basis for the creation of thematic maps in various branches of science and real-world uses. Using EGNOS system in cartography can be useful in the case of significant increase of requests for prompt updating of maps and plans.

Future developments

In light of the interesting applications characterised by high potential raised by the study on applications, the State Space agency of Ukraine (SSAU) is now exploring the optimal legislative and non-legislative tools to enhance the uptake of GNSS-based applications in order to maximise economic and social benefits deriving from those powerful technologies.

In the coming months, a follow-up article will present the outcomes of the identification of the optimal actions to promote the uptake of the aforementioned GNSS technologies.