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Digital Transport Monitoring Systems

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The digital economy is a new phenomenon that has taken on a lot of importance given estimates of double-digit annual growth around the world. This phenomenon is driven by economic and political factors that are rooted in technological innovation and critical technologies.

In more detail, this includes: datafication or factification, digital transformation (transformation of all parts of the information value chain from analog to digital), virtualization and generation (the use of data and technologies in a way that was not planned at their origin through reprogramming and recombination).

The impact of any digital technology can be understood as a product of the scale of its diffusion and the depth of its effect. With the rapid spread, including in developing countries, and the increase in the depth of the effect of digital technologies, with the increase in consumer accessibility, the impact of digital technologies on the economy is growing rapidly.

The digital economy is the main direction of modern economic development, including the transport sector. Since transport management is spatial and uses spatial information and geodata, in the field of transport, the digital economy is closely related to the spatial economy. The core of the digital economy is the digital IT/ICT sector that produces digital goods and services. The "Digital Economy" (DC) can be

defined as a part of the economy formed solely by information (digital) technologies.

The Central Committee uses business models that use digital technologies and digital services. It consists of the digital sector plus new digital and platform services.

The broadest scope - the use of ICT in all economic areas - is called the "digital economy". The digital economy accounts for about 5% of global GDP and 3% of global employment. Behind this is a significant unevenness: today the lion's share of the digital economy in the world region is global. The digitalization of the economy offers the consumer new high-speed services and speeds up the process of obtaining and using them. The use of digital spatial models and geoinformation technologies provides increased security, automation and integration of technologies and means of transport. Services offered digitally are more powerful than non-digital services. The digitalization of the transport sector increases the capacity of all modes of transport. At the same time, threats such as cyberattacks that threaten traffic safety and life are increasing. The solution of security problems consists in the development of a secure hardware and software control complex.

Digital technologies improve logistics and infrastructure. One example of the digitalization of transport is the digital railway (DR).

Currently, there are more than 150 types of vehicle tracking and dispatching systems in the world, most of which use GPS satellite navigation system sensors. Satellite monitoring of transport is used to solve transport logistics problems in transport management systems and automated fleet management systems.

Depending on the technical solutions used, five generations of GPS monitoring systems for transport can be distinguished.

The very first vehicle monitoring systems did not allow for real-time monitoring.

In the second generation, expensive mobile communications were used to organize communications.

In the third generation, there was a connection to the Internet and the user's local network.

The fourth generation systems also use one of the mechanisms of the mobile Internet as a transport system, but differ from the third generation in the use of web technologies.

The fifth generation monitoring systems represent a global development and centralization of the previous generation systems into a single distributed monitoring center. When building this system, users from different regions, countries, and even continents work with the most closely spaced regional web server with minimal latency.

Features of GPS-monitoring of transport: displaying the location and speed of vehicles on the dispatcher's screen in real time; selection of optimal routes; traffic control on the specified routes; freight traffic control; control of the state of the vehicle; restoration of the history of the location and operation of the vehicle; creation of a database and traffic reports in accordance with the required parameters; traffic safety; possibility of integration with logistics and accounting systems.