

## THE IMPORTANCE OF USING GPS TECHNOLOGIES TODAY

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**Abstract:** This article covers the role of GPS technologies in modern society, their operating principles, and their application in various fields. The advantages of the GPS system, its significance in the field of economics, transport, agriculture, and cadastre were also analyzed. The article specifically highlights the role of GPS technologies in improving accuracy, speed, and efficiency, and substantiates its relevance today.

**Keywords:** GPS, navigation system, satellite, geodesy, cadastre, logistics, agriculture, monitoring, coordinates, technology.

### **Introduction.**

In today's era of rapid development of modern information technologies, geographic location determination systems are widely used in various fields. One of such advanced technologies is the Global Positioning System (GPS), which is a modern satellite navigation system that allows determining the exact geographical coordinates of objects on the Earth's surface. Although this technology was initially developed for military purposes, over time its scope of application expanded and began to play an important role in the civilian sphere. Currently, the GPS system is effectively used in many areas, including transport, geodesy, cadastre, agriculture, logistics, cartography, and tourism.

GPS technology is based on the principle of signal transmission through satellites. Signals sent from satellites moving in Earth's orbit are received through special receiving devices, and on this basis, the exact location, speed, and direction of the object's movement are determined. Due to the high accuracy of this process, GPS technology serves as an important

source of information in various scientific, economic, and practical processes. In particular, GPS data is widely used in territorial planning, mapping, and monitoring.

Today, the use of GPS technologies makes it possible to significantly accelerate various processes, increase the level of accuracy, and facilitate human labor. For example, GPS technology is an important tool for determining the boundaries of land plots in the field of geodesy and cadastre, conducting topographic measurements, and creating digital maps. In addition, this technology plays an important role in such tasks as improving navigation processes in the transport system, controlling cargo transportation processes in the field of logistics, and monitoring agricultural land.

At the same time, GPS technology is becoming an integral part of modern management and planning processes. Because accurate and prompt information obtained through this system helps to make effective management decisions in various fields. As a result, it will be possible to rationally use resources, save time, and optimize production processes. The development and widespread use of GPS technology is of great importance in modern society, which is an important factor in increasing the efficiency of various industries. Therefore, the issues of studying the capabilities of the GPS system, its widespread implementation in practice, and its effective use are considered as one of the most relevant scientific and practical areas today.

#### **The essence of GPS technology.**

GPS (Global Positioning System) is a global navigation system operating with the help of satellites, which allows you to determine the exact geographical coordinates of any point on the Earth's surface. This system is one of the most important technologies for modern navigation and determination of geospatial data. With the help of GPS technology, it is possible to obtain accurate information about the location, direction of movement, and speed of objects. Therefore, it is widely used in geodesy, cadastre, transport, the military sphere, agriculture, and many other areas.

The GPS system consists of three main parts. The first part is a complex of satellites moving in Earth's orbit. These satellites constantly send signals to the Earth's surface and provide global coverage. The second part is ground control stations. These stations monitor the movement of satellites, monitor their operating status, and ensure the stable operation of the system. The third part consists of user devices, namely GPS receivers, which receive signals sent from satellites and determine location based on this. The GPS receiver receives signals from several satellites simultaneously. By calculating the arrival time of these signals, the device determines its exact location. In this case, using special mathematical calculations, the

user's geographical coordinates - latitude, longitude, and altitude - are determined. The system operates based on data from at least four satellites, thereby determining location with high accuracy.

Modern GPS devices are technologically advanced and capable of working with high accuracy. While the accuracy level in regular navigation devices is several meters, in geodetic or professional GPS devices, this indicator can reach several centimeters. Therefore, GPS technology is widely used in scientific research, mapping, land surveying, and regional monitoring processes. GPS technology plays an important role in the processes of identifying and managing modern geospatial data, which allows obtaining accurate and fast information in various fields. Therefore, the use of the GPS system is considered one of the important directions of modern technological progress today.

#### **Fields of application of GPS technologies.**

Currently, GPS technologies are widely used in various fields and have become one of the important technological tools of modern society. Through this system, it is possible to determine the exact location of objects, track their movement, and analyze regional data. The widespread use of GPS technologies contributes to increasing the efficiency of various processes, saving time, and improving control systems.

First of all, GPS technologies are of great importance in the transport system. Navigation systems are widely used in modern vehicles, through which it is possible to accurately determine the direction of movement of cars, airplanes, and sea vessels. With the help of GPS, the location of vehicles is constantly monitored, optimal directions of movement are determined, and the possibility of ensuring road safety is created. In addition, the processes of traffic management and control through the use of GPS technologies are being implemented more effectively in public transport systems.

GPS technologies also play an important role in the field of geodesy and cadastre. GPS devices are widely used in determining the boundaries of land plots, conducting topographic measurements, and creating digital maps of territories. With the help of this technology, the accuracy of measurements will be significantly increased, and as a result, it will be possible to obtain geodetic and cadastral data quickly and reliably. GPS data is also important in the planning of construction projects, the development of territories, and the placement of infrastructure facilities. GPS technologies are also effectively used in agriculture. In modern agricultural systems, using GPS-based technologies, fields are accurately mapped, sown areas are analyzed, and agrotechnical measures are effectively planned. For example, the processes

of crop placement, irrigation system management, fertilization, and pesticide application are optimized based on GPS data. As a result, it will be possible to rationally use land resources, reduce production costs, and increase yields.

In addition, GPS technologies are widely used in the field of logistics for monitoring cargo transportation processes, monitoring the movement of vehicles, and effective management of delivery systems. In emergency management processes, rescue services can quickly identify necessary areas and take prompt measures through the GPS system. In environmental monitoring, GPS technologies serve as an important tool for monitoring natural resources, analyzing environmental changes, and identifying environmental problems. The importance of the GPS system is also great in the field of tourism and mobile technologies. GPS technologies are widely used in providing navigation services for tourists, determining maps and routes, and providing location-based services in various mobile applications. Thus, GPS technologies play an important role in various spheres of modern society and serve as an important technological tool for the effective organization of various processes.



**Advantages of GPS technologies.**

GPS technologies stand out among modern information systems for their high efficiency and wide application possibilities. One of the most important advantages of this technology is its high accuracy. With the help of GPS, the geographic coordinates of objects are determined accurately and reliably. While the accuracy is only a few meters for regular devices, in professional GPS systems, it can reach centimeters.

Another important aspect is the system's speed and ability to work in real time. With the help of GPS devices, the user can determine their location in a short time. This is of great importance in transport, logistics, and rapid decision-making in emergency situations.

Another advantage of GPS technologies is their global coverage. Thanks to satellites in Earth's orbit, this system can operate in almost all regions of the world. This allows it to be widely used internationally. In addition, GPS technology facilitates human labor and increases labor productivity. Measurements and observations, which were previously complex and time-consuming, are now performed quickly and easily using GPS. As a result, time is saved and production efficiency increases.

The GPS system also plays an important role in ensuring security. The importance of this technology in monitoring vehicles, improving road safety, and providing emergency assistance is invaluable. GPS technologies are an important tool that allows for efficient use of resources, saving time, and improving management in various fields.

### **Conclusion.**

In conclusion, GPS technologies have become an integral part of modern society. This technology creates the possibility of obtaining accurate and prompt information in various fields and serves the effective organization of management processes. The importance of the GPS system is especially great in the spheres of transport, geodesy, cadastre, agriculture, and logistics, which helps to optimize work processes and rationally use resources.

As a result of the widespread use of GPS technologies, various processes are being automated, the influence of the human factor is decreasing, and the accuracy level is increasing. This not only increases economic efficiency, but also leads to savings in time and resources. At the same time, GPS technologies also serve as an important tool for ensuring security, conducting environmental monitoring, and taking prompt measures in emergency situations.

In the future, as a result of the further development of GPS technologies and their integration with other information systems, its scope of application is expected to expand. Therefore, the effective use of this technology, its widespread introduction into various spheres, and improving the qualifications of specialists are one of the important tasks of today.

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