

THE IMPORTANCE OF USING THE GEOGRAPHICAL INFORMATION SYSTEM (GIS) IN THE FIELD OF ROAD ENGINEERING

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Annotation. *This article describes the results of ESRI's study of ArcGIS software, its software components, road engineering and other applications.*

Keywords. *ESRI, ArcGIS, Geomatics, Geocoding, State Fund, Political Science, Georeference.*

Introduction. The programs are different in the GIS and they perform different tasks depending on their purpose and system, and different programs can be used within the 4 systems mentioned above. This will be explained in more detail in the following chapters. There are a number of benefits to using the GIS in geodesy, especially cartography. This increases the workload and reduces the time spent on data processing and printing. Development of modern road network, taking into account geographical location of the country, is the main task of increasing competitiveness of our economy, development of transport potential of the republic and expansion of export opportunities. Currently, there are a number of problems and shortcomings in the road management system of the republic that impede the creation of a competitive environment and investment in the sector. In order to create a modern road management system, clear control and economic functions, de-monopolization, attraction of private sector enterprises and increasing investment attractiveness, creation of a healthy competitive environment, broad implementation of innovations in road construction in 2017-2021. In accordance with the tasks of the Strategy of Action for the Priority, December 9, 2019 the President of the Republic of Uzbekistan Decree of the President of the Republic of Uzbekistan "On measures to further reform the road industry of the Republic of Uzbekistan" and the Resolution "On measures to further improve the road sector management system" we're passed.

Materials and methods. Methods of comparative analysis, study and nationalization of foreign experience, studying and orientation of computer software capabilities, historical, logic and generalization methods were used in the article.

The main part. The GIS has a wide range of applications, including:

- ✓ health workers to locate new clinics and hospitals in a geographically convenient and convenient way for the population;
- ✓ development and determination of routes and schedules for freight forwarding companies;
- ✓ when choosing the most optimal option for the design of new highways and roads for road construction companies;
- ✓ for geodemographers in the construction of new shopping malls and their location;
- ✓ forestry enterprises in the restoration of forests and the construction of recreation parks;
- ✓ correct and rational calculation of lands in the state fund;
- ✓ finding the right hotel, roundabouts and, of course, the right direction for travelers;
- ✓ it is very useful for farmers in developing new lands, determining the condition of the lands and getting enough information about them.

Geomatics is the sum of the uses of information technology, multimedia and telecommunications in data processing, geosystem analysis, and automated cartography, and the term is also used as geoinformatics or geoinformation mapping.

From ancient times the people have represented geographical information in different ways, and over time the methods of representing geographical information have also improved. One of the first ways to map such geographic information was to map the location. Later, people began to add symbols and coordinates to such cards. If the original cards were hand-drawn and the symbols

were intended to be used in the community in which they lived, then the symbols would be printed on a global scale, not manually, but on typewriters and symbols.

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In GIS, the term geocoding is used to change street addresses to latitude and longitude or other similar coordinate systems. Another name for geocoding is georeferencing. One of the important requirements of geocoding is that the data linked by the object and the table must be unique, so that the information provided on the map does not cause confusion without duplication elsewhere. Geocoding is the process of automatically creating objects on a map based on attribute data. Depending on the purpose, they are divided into coordinate geocoding, object geocoding and address geocoding.

Geocoding in a GIS involves at least two components of a database. They are:

- ❖ a table containing the information required for geocoding (geocoding table);
- ❖ point type of objects placed on a separate layer of cards.

In the field of road engineering. The application of geographic information systems in the field of road engineering is also widely used in solving complex problems, problems and analytical results, as in many other areas. In particular, the design and construction of existing roads will be at the required level, the use of geo-information systems, which are modern technologies in their design and construction, and the teaching of its methods, technology to graduate students and the formation of appropriate knowledge, skills and competencies. . The main task is to implement the use of geographic information systems in the design and construction of roads, taking into account the natural and climatic conditions of the Republic of Uzbekistan.

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Conclusion. Using these systems and programs, you can acquire the following road engineering skills and perform practical work:

➤ Functional capabilities of geographic information systems (GIS), general structure and classification of GIS, GPS and Glonass systems, information model and remote sensing of the earth, methods of digital modeling of the place, functions of information systems, highway objects, GIS software have imagination and knowledge about the minute;

➤ Knowledge and ability to use GIS Indor GIS / Road, technology and organization of GIS in the operation of roads, decision-making and improvement on the basis of collected data and maps to have;

➤ Application of GIS and information technologies of highways, determination of point coordinates on the ground using GPS system, acceptance of geodetic works using GPS base stations, use of GPS technologies in construction and operation of highways, location survey must have.

➤ Must have the competence to briefly systematically analyze the road network, solve problems in manufacturing enterprises, manage maps and projects in the IndorGIS system, solve transport problems, use GIS technologies in the operation of highways.

The process of integration of knowledge has led to the emergence of new directions. One of them is the concept of "Geomatics". The term includes geophysics, mathematics and computer science. The word geomatics is derived from the French word meaning "cartographic analysis of geographical data using computer science." In many cases, the concepts of geomatics and geoinformatics are compatible. Geomatics is a scientific and technical science designed to solve problems based on geoinformatics. Geomatics includes mathematics, physics, computer science, cartography, geodesy, photogrammetry, and remote sensing. Geomatics is a field of activity in science and technology that is used to collect, manage, store, and disseminate spatially coordinated information used to draw conclusions.

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