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GEOGRAPHIC INFORMATION SYSTEMS FOR RAILWAY AND ROAD

Abstract*: The work deals with the benefits of GIS system. It is also discussed in terms of the construction and design of the roads and railways of this system. The important factor is that GIS's new software data and the need to improve, Because the system is based on data collection and analysis. But in spite of this it is quite popular in different directions.*

Key words*: Railway, Motor road, GIS, Database.*

Language*: English*

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Introduction

GIS includes possibilities of the database management systems (DMS), editors of raster and vector graphics and analytical means and are applied in cartography, geology, meteorology, land management, ecology, municipal management, transport, economy, defense and many other areas. The unique system for conducting control over creation of GIS at all its stages allowing to watch the volume and speed of the performed works on filling of layers of GIS and to make the timely effective decisions connected with process of creation of GIS.

Materials and Methods

Any construction consists of a set of stages, beginning from planning, design, coordination and a statement, before finishing commissioning of the object. Than construction is larger and more large-scale, that all its participants should deal with a large number of documentations. It is clear, that with arrival of electronic CAD, creation systems of projects considerably became simpler and accelerated. However, without geographical binding, without a set of natural, communication and social factors any modern building cannot be carried out.

And in this regard geographic information systems in construction cannot be considered how the separate tool used only to the analysis of arrangement of objects on the card. On the present, application of such GIS which will become one of the major links in the general system of planning and control at all stages makes sense.

At a design stage and the choice of sites for railways and roads you will be able to consider all details connected with a supply of communications, a geological condition of soil, questions of environmental protection, gardening, welfare development, etc. Possibilities of GIS to do selections and to reflect various indicators in different layers of the card give you in hands flexible tools which allow to estimate a situation both by certain criteria, and in a complex. You will be able to model various scenarios according to construction standards, standards and rules, requirements for use of water resources and energy saving. In advance you will calculate economic, environmental, natural risks and threats (flooding, landslides, a karst, etc.) and also the total costs and the operating management and operating costs. Model and combine options and

use methodology of the spatial analysis for development of optimal solutions.

By means of a geographic information system for railways and roads construction it will be easier for you to adjust objective control of consumption of materials and financial means, behind distribution of labor and technicians. To make estimation of cost and amounts of completed work. To quickly provide relevant and reliable data in control authorities and managements. To improve management of service staff (department of supply, maintenance of freights, etc.). To provide the general information field between divisions via mobile applications. To operate effectively resources and assets.

It has been for many years, since then GIS system has been widely used in different spheres, including the direction of construction and transport constructions. Besides, by providing the software it is available to make as a road as railway transport network planning and its further analysis for its prospective development considering accompanied hindering or contributing factors.

GIS system can integrate all data of any section or research region in the same space related to the start of new construction. All this makes available for the personnel included in the project to perform correct access to the necessary materials without wasting any access time, what is obvious will be important for reviewing stages of pre-project or detailed designing.

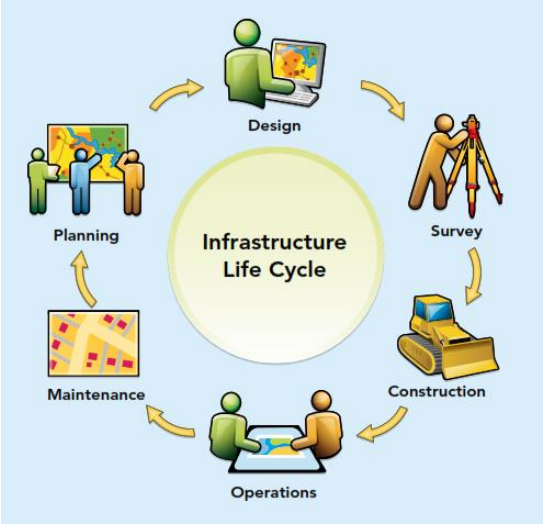
One of the main components of the railway and motor road is the land plots, the sustainability of which depends heavily on the sustainability and durability of the above-mentioned engineering structures. Therefore, it is necessary to take into consideration many factors during the design.

While preparing the project, this should be beforehand protected from various natural disasters, which, needs preliminary study of the location, and the recent period natural disasters (floods, avalanches, etc.) At the stage of the pre-project review, it is desirable to use existing geological, hydrological, seismic and other necessary funding materials on the base of which will be performed the selection of benchmarking directions and afterwards followed by a detailed study of all the above.

Various special program modules, which allow carrying out geological data and processing base, the in order to identify landslide areas, to develop study of water collectors, also possible to make design bridges and tubes, to prepare hydrological report, which all will be presented as geospatial data. Consequently, the availability of such base and free access to the project engineers is another key factor for successful implementation of the project.

Nowadays there is a new innovation the release is devoted to broad scope of application of geographic information systems (GIS) in the solution of problems of city planning and an architectural and construction complex, their integration with other IT the technologies used in the field. This direction of application of GIS wins more and more strong positions and, in many respects thanks to emergence of new, including 3D functionality, shows more and more obvious progress, offering many advantages earlier not available to schedulers, builders, developers and experts of adjacent activities.

The GIS technology is specially developed for identification of spatial interrelations and their analysis, it provides a set of advantages to the professional community occupied with questions of design, construction and maintenance of buildings and constructions in which we spend the most part of time (Pic. #1). It is quite natural that for management, modeling and formation of these artificial ecosystems it is expedient to use the same approaches which and with success are applied long ago to a research and understanding of traditional (natural) ecosystems.



Pic. #1 – Transport infrastructure life cycle

Conclusion

Functionality of GIS can be involved at all stages of life cycle of real estate objects: from the choice of the place for construction, design and installation, commissioning and service before closing, conversion or elimination. Use of GIS as a basis for construction projects gives additional opportunities for different conducting examinations, the automated search and correction of the mistakes arising both at design stages and upon transition from one stage to another.

In the latest version of ArcGIS models of data, including for the urban environment (model 3DCIM) and 3D - instruments of geoprocessing are significantly expanded that allows to work with IMZ and other representations of 3D buildings. 3D extends to all platform of the Esri company, and it means that 3D - opportunities become more available to our users, than ever before. 3D - mapping enters daily practice. If still rather recently it was applied most often as a certain exotic as the curious picture drawing attention, then now it became rather initially expected. It means that people include 3D maps in the general business processes more and more even if several years ago they used only 2D. And if you need to perform 3D works, you will be able to make it irrespective of in what of ArcGIS platform products you work.

One of the most important concepts helping to be informed in respect of application of 3D cartography in the sphere of urbanistic is that the most different types of cards – depending on requirements of concrete applications and intentions of their authors can be created and submitted and also how they are supposed to be used. Some 3D maps and the corresponding models of buildings are no more than photorealistic images of buildings within some geographical area and thereof, their application is limited to a possibility of receiving a picture of concrete parts of the displayed city at the moment of time. It is enough for simple visualization, but cannot satisfy the requirements arising at intention to execute many types of the spatial 3D analysis. Other opportunity is creation of 3D models which will not always be so visually attractive as photorealistic representations, but allow to include various attributes (descriptions and values of many parameters) and to solve various analytical GIS of a task on their basis.

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