

ELABORATION OF THE CADASTRAL PLAN FOR THE TOWN OF PAZARDZHİK

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Abstract

The aim of this paper is to provide an overview about creating of cadastral plan of the city of Pazardjik for The municipal administration needs.

1. Methods of work, used software.
2. Problems appeared with creating of cadastral map’s model during the work and its support.
3. Problems with updating of data-base.

INTRODUCTION

With the rapid development of the information technologies and the up-to-date methods of work and design, it became necessary to upgrade the services delivered to the citizens and to automate the process of work and design. The new technologies undoubtedly require the necessary attention and adequate reaction on the part of the employers in view of their possible implementation.

During the summer 2002 a team of specialists was set up and a little bit later, within the department “Management of the territory and the localities” of Municipality of Pazardzhik, the Directorate “Geographic Information Systems” was set.

The main task assigned to the Directorate was to elaborate the digital cadastre layout of the town and its maintenance in digital format with the aim to substantially optimize the quality of the service delivered to the citizens, the companies and institutions, while providing the technical services. It was also aimed to achieve an easier development of different project variants at the pre-project state. The elaboration of such a layout was imposed by the necessity that the Municipality of Pazardzhik has a digital model because of the growing investor and citizen interest in the economic development of the town.

According to what the Chief Executive of the Cadastre Agency said, 70% of the real estates in the country will be covered by a cadastre plan in the next five years. The priority will be with the attractive areas with investor interest i.e. the Black sea area, the winter resorts, the border areas. For the municipality of Pazardzhik, this was too long as a period. Our town develops at a speedy pace, a lot of construction takes place, there is definite investor interest regarding the central part of the town, and regarding the Industrial zone in its periphery.

On the other side, the cadastre plan and the cadastre records attached to it, that we still expect that the Cadastre Agency submits to us, require some technological time and procedures in view of their approval.

Therefore, what the Municipality did, was going some steps forward. The map had to comply with the regulative and legal requirements and with the legislation of the Republic of Bulgaria.

The dynamic development of the town necessitated the establishment of a digital working model in view of drawing up-to-date information from it at any time. This is especially important for making efficient decisions regarding the territory management and the economic development of Pazardzhik.

Due to the cadastre layout that we prepared, the Municipality already has the possibility to:

- submit data in digital format to the architects and engineers elaborating the new detailed master plans and the plans for the built at present and future built territory.
- manage the digital information within the created model.

In 2006 the plan for regulation and for the built at present and future built territory for the district “Stefan Karadja” - part I was adopted. Part II for the same district will be adopted in 2007 as well as the project for a plan for changing the regulation and future built territory for quarter 420 in district “Iztotchen”. It constitutes a very important part of the district area, because it borders Plovdivska street, one of the entry axes to the town from east. The administrative and the commercial centre of the district are within this quarter. At the same time partial changes to the regulation and the filling in of the cadastre layout with information in a real coordinate system are being entered.

WORKING METHOD

1. Information analysis

The first step was to collect and analyse the information the Municipality had at its disposal. We received data from direct measurements done for the town centre by the Cadastre Agency Pazardzhik – a digital model with a coordinate beginning in 1970.

For the rest of the town, we had to create a digital model for the cadastre layout of the town. We decided that this be done through scanning the original plan sheets in the appropriate ***TIFF** format and vectorizing them. The next step was to integrate the two models, the one from the scanned sheets and the other from the direct measurements, and thus, practically –to obtain the cadastre layout for the whole town.

2. Scanning and levelling

After the scanning of the originals we obtained images from the vectorizing on which the working coordinate beginning of the digital model was 1930. Were obtained coordinates of points in Coordinate System 1970 after Helmert’s transformation of the created digital model.

Our software provided possibilities with two options for levelling:

- along peripheral “crosses” in width and height
- along all “crosses” in width and height

In the area “first cross” the coordinates **X** and **Y** are being entered into the upper left corner of the scanned map – through using the keyboard or through pointing with the mouse. The plan sheets are being levelled along “all” coordinate crosses. Thus the levelling error is being minimized and the “elongation” of the scanned image is being avoided, granting a maximal approximation of the model to what it really represents. With the carrying out of this levelling the “matching” of the maps became possible together with their integration along coordinate crosses. After the levelling and scaling of all the scanned maps, they were calibrated i.e. by way of it their precise coordinate beginning has been identified; the initial coordinates of all the maps are precise to a metre along the **X** and **Y** axes. The work with the scanned images during vectorizing and creating the digital model of the town was very

precise. The coordinate beginning is the same as that within the digital model based on direct geodetic measurements. Thus the integration of the ready made model and that obtained from the scanned maps is along one common coordinate system.

3. Vectorizing

While starting the work on the vectorizing of the scanned images, we divided the town into cadastre areas and thus, the work for the vectorizing of the cadastre layout was launched. Elaborating the model took us about one and half year .

We used the necessary cadastre signs – pointed and linear as approved by “Regulation No 14” following art. 31 from the Law on the Cadastre and Record of the Real Properties from 23.07.2001 /abrogated/ and “Regulation No 3” from 28.04.2005 of the Ministry of Regional Development and Public Works. These signs are being divided in specialized tables i.e. “linear” and “pointed” and represent in themselves the library of the conventional signs, as devised for the used software.

After entering the linear and the pointed sites, we undertook the vectorizing of the real estates of the cadastre.

The real estate that we created represents a closed poly-line and is being identified by a cadastre and identifier layout number, representing the factory number of the used software. By way of this identifier we grant the unique identification of the real estates. The inscription that follows after the generating of the real estates from the cadastre serves for exemplifying the layout number of the real property, as well as for selecting it within the programme.

A building site corresponds to a building in the CADASTRE and represents a closed poly-curve with the respective designation, and having also a unique designating number for buildings i.e. “SB (Solid Building)” – “МЖ”/ *Bulgarian signs* / , “SBciR (Solid Building, Concrete Iron, Residential)”- “МсбЖ” / *Bulgarian signs* / , “WDB (Wattle and Daub Building)”- “ИИ”/ *Bulgarian signs*/ , “3SR (3 floors, Solid Residential)”- “3МЖ” / *Bulgarian signs*/ . The inscriptions correspond to the designations of the buildings. The number of floors is written with the respective index prior to the verbal part of the inscription.

After the vectorizing of the real estates we started working on entering the cadastre changes. They contain technical protocols for filling in the cadastre and protocols for discarding errors and incomplete data in the cadastre layout, according to art. 53 paragraph 1 from the “Law on the Cadastre and Record of the Real Estates”. This includes real estates in the sense of the cadastre that have been restituted in accordance with the restitution laws. It includes also their designation with the respective cadastre number and the designation of the restituted area, certificates for demolition of buildings in relation to new constructions, geodetic surveying of new or existing buildings or installations missing from the cadastre layout.

The working method regarding the scanned layouts of the underground infrastructure is similar.

PROBLEMS WITH THE UPDATING OF THE DATABASE

Despite the fact that we tried to minimize the errors resulting from the scanning of the respective part of the layout, one basic problem, precision, persists. It varies within acceptable limits i.e. between 20 cm and 48 cm. Given the speedy development of geodesy and geo-informatics, it is not a great precision but we always bear in mind that part of the cadastre has been actually built on the scanning of original sheets of plans. It was due to the fact that an overall cadastre model was missing, which should be provided by the Cadastre Agency.

At present at the Cadastre Agency the zones of contact are being discussed, i.e. how to integrate the building limits of the town of Pazardzhik from the digital model with those according to the map of the restituted real estates (from the land management and partition plan). The issue is either to include or exclude real estates from the regulation and putting them either within the limits of the locality, or within the scope of the agricultural lands. Representatives from the Cadastre Agency, the Regional Directorate "Agriculture and Forestry", the municipal service "Agriculture and Forestry" and of the Municipality take part in these discussions. The decisions made are valid for all interested parties.

The Cadastre Agency is still not ready to provide us with the approved cadastre map and the cadastre records to it.

With the entry of the newly recorded cadastre into the model, our aim is to have a maximal approximation to the real situation. The information coming from real geodetic measurements is of great value for us. There are instances when vectorized peripheral areas of the town of Pazardzhik are being totally updated with geodetic information coming from real measurements. Scanning is being overcome by real recording of the actual state.

We perform controls and checks in situated elements on the vectorized cadastral plan, after we identify disparities that are bigger than their required standard.

Depending on the degree of gravity of the problem, different procedures as of Territory Management Law for the discarding of major errors i.e. change of the detailed management plan and regulation plan, are being applied.

In the course of our work we have also come across some minor errors, much smaller than is required for scanned images, and we had rectified them, thus deriving satisfaction from a job well done.

The digital model of the cadastre and regulation plan that we created and we maintain is being used solely for the needs of the Municipality. Despite the difficulties and errors, we can mention in modesty of the fact, that the Municipality of Pazardzhik is the only one in the Pazardzhik region having an updated digital model of the cadastre and regulation. We can also mention that the Municipality is one of the few such in Bulgaria with a digital model of the underground communications. The cadastral plan of the underground equipments and infrastructure was similarly obtained through vectorizing of the original plan sheets of the underground communications. Its updating is made through incoming information from geodetic records and specialized detailed management plans. Even if there is an error in the vectorizing, it is being discarded through coordinating the data from the issued scheme with the respective instance. In this sense, the Municipality does not make the final decisions with regard to the underground circuits. The problem here is that the corrected information does not always reach us, with the exception of the instances when the geodetic surveying of the infrastructure is obligatory.

In general this is how, with its initiative and creative thinking the Municipality of Pazardzhik has at its disposal a digital model of its cadastre plan. The Municipality has been working on it since middle 2003, years ahead of the creation of a Unified Cadastre of the Territory of Bulgaria and expecting the approval of the new cadastre map and cadastre records.

Abstrakt

VYTVOŘENÍ KATASTRÁLNÍHO PLÁNU MĚSTA PAZARDŽIK

Cílem tohoto příspěvku je poskytnout přehled o vytváření katastrálního plánu města Pazardžik pro potřeby městské správy.

1. *Methody práce, použitý software.*
2. *Problemy vzniklé při vytváření modelu katastrální mapy během prací a podpora.*
3. *Problemy s obnovou báze dat.*