

**RETROSPECTIVE ANALYSIS
OF IMAGES OF LARGE URBAN AREAS
ON THE EXAMPLE OF THE CITY OF TAMBOV**

**V.A. Nemtinov, A.A. Gorelov,
P.A. Ostrozhkov, Yu.V. Nemtinova**

Tambov State Technical University, Tambov

*Represented by Doctor of Pedagogical Sciences,
Professor E.A. Rakitina*

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Abstract: The paper presents the detailed analysis of large urban areas under development in the retrospective view up to the ancient clans of the fortress “Tambov”. Their positive and negative sides for the application of GIS-technology designing technique have been identified.

Due to increasing interest to historical past and modern history of many cities of Russia, a huge amount of research on depicting large urban areas is conducted nowadays. There is no doubt that visual information provides better understanding of the city as a whole and its parts. It allows a person to comprehend real situation without using his/her spatial imagination. The latter, in turn, always accompanies mental activity of a man, when he/she is working with text information. In this case, his/her mind creates images he/she had seen earlier, he/she inadvertently starts to associate the text content with familiar images suggested by person’s visual memory. This often creates a false picture of an object that can be different from the one described in the text. It is possible to avoid this negative phenomenon by including visual information into the text itself.

Different types of images of the city or its sites are frequently added to text messages about these objects. Positive effects achieved by combining textual

Немтинов Владимир Алексеевич – доктор технических наук, профессор, заведующий кафедрой «Автоматизированное проектирование технологического оборудования», e-mail: nemtinov@mail.gaps.tstu.ru; Горелов Александр Алексеевич – кандидат технических наук, доцент кафедры «Прикладная геометрия и компьютерная графика»; Острожков Павел Алексеевич – кандидат педагогических наук, старший преподаватель кафедры «Прикладная геометрия и компьютерная графика»; Немтинова Юлия Владимировна – кандидат экономических наук, старший преподаватель кафедры «Автоматизированное проектирование технологического оборудования», ТамбГТУ, г. Тамбов.

and visual information cause the increase in research aimed at identifying the best variant of large urban areas visual representation.

Considering historical perspective of this process, we would first mention drawings used for these purposes during the Renaissance epoch. As a rule, they were done in the form of a perspective picture. Point of sight was adjusted so that the painting reflected the whole city or a part of it. However, perspective pictures, which reflected visual perception of an individual, have significant inaccuracies in terms of its informative value. Perspective pictures with high resolution can only show those objects that are in close proximity to the main point of the picture plane. Object which are in remote location from this point are viewed poorly, and the farther they are, the more inaccurate are their images, and sometimes it is practically impossible to depict them. In order to overcome these negative effects, many architects neglected the ancient laws of geometrical perspective and depicted individual objects using drawing techniques and applying drawing skills. As a result, an image represented objects located at a distance from each other, but general pattern of a perspective image was violated. This technique led to development of a panoramic system, where each object of interest has optimal representation, as like the main point of the picture is focused at it. As a result architectural objects that are actually away from each other appeared on a picture plane in a straight line. These kinds of images of large urban areas are often called scanning. A number of similar examples of ancient cities' images can be found in historical and architectural literature. There is also one depicting old Tambov.

This drawing was made by an architect Usachev in 1799. Its aspect angle was taken from the territory across the river. As a result, the city is shown from the east side, and those buildings and structures located along the river bank or near it were on the line of panoramic scan. It contains some of those constructions built back in the 18th century and preserved until present. These are Spaso-Preobrazhensky Cathedral and Church of Kazan monastery. All other objects shown in the picture are difficult to be identified and correlated to present-day buildings. Most likely this was a background addition to aforementioned dominant features depicted on a panoramic scan.

Among other images of old Tambov made as drawings, we can name two works by famous Russian poet V.A. Zhukovsky in 1837. They are currently stored at the State Literary Museum [1, p. 60]. Their connection to Tambov can only be traced by author's records, as it is hard to find resemblance to present-day Tambov.

Other drawings of Tambov dated back to 18th – early 19th centuries were not found.

The second option to depict large urban areas and entire cities is to draw their plans. They are as widely used as perspective and panoramic images; however, they are different in a number of features. The undeniable advantage is the possibility of orientation on the terrain. In addition a plan (horizontal projection) of large urban areas reveals qualitative and quantitative characteristics of the city. For example, only using scaled plans we can clearly define linear and angular dimensions of various elements of an urban area (length of streets' segments, corners of their intersections, perimeters of blocks, their sizes, etc.), distance from one object to another or locate a specific object.

Topographic maps of cities and their sites provide information about various characteristics of a particular terrain.

The oldest extant plan of the city of Tambov dates back to the beginning of the 18th century [2, p. 32]. It is stored at the Central State Military and Historic Archive. It contains marks of a fortress and settlements around it and major facilities: monasteries, churches, guard rooms, shops, warehouses, private households. This plan is a sketch without a scale, thus, no metric observations can be conducted on its base.

“Plan of the principal city of a province of Tambov” developed in 1781 by officials of the Commission on the stone structure of St. Petersburg contains more detailed information. According to the plan, Tambov received 4402 acres of land, which roughly corresponds to 48 square kilometers. Another feature of this plan is that it had set a new lattice system of Tambov urban development. For the first time in 145 years of Tambov history, rectangular building of blocks was introduced. At the same time, this plan did not reject the existing main road, which passed through the city linking it to Moscow in the north-west and Astrakhan in the south-east. Moreover, according to the plan, Astrakhan road had become the main street in town. New streets were drawn parallel and perpendicular to this street. As Astrakhan road followed the bend of Erik (canal of Tsna River), all lengthwise streets in the southern city were oriented to the line of the river’s west bank.

The plan was influenced by the new European traditions introduced by the Russian emperor Peter at construction of St. Petersburg. Authorship of this drawing belongs to a state official Yuri Saimonov [3, p. 32; 4, p. 26].

During 19th and the first years of the 20th century four other plans of Tambov were developed. In 1840s a new urban plan, which was approved by the highest governmental authorities, showed developed neighborhoods in the southern and western parts of the city. The preceding plan of Catherine’s the Great epoch labeled these territories as expected to be developed [5, c. 58]. The next two plans were developed in the late 1870-s and in 1906–1908. They reflected dynamics of city’s development, but lacked information value and accuracy [5].

All shortcomings of the plan of the city of Tambov were examined and corrected on the plan designed by the construction and technical office of Tambov in the first half of 1914. This project was supervised by A.Yu. Koknevich, who directly participated in gathering and reviewing of all materials and publication of the plan. Employees of the office conducted overall screening throughout the urban area and surrounding communities. This work had to be done, because architects of construction department of the city council didn’t have overall information about the entire city. The plan was accompanied by a brief history of the city and a complete list of streets and squares. It reflected not only public buildings, but all stone buildings of two stories or higher. It clearly outlined boundaries of 3 administrative districts of the city, marked house numbers, highlighted construction areas based on the cost of buildings. This plan is still used nowadays by people who deal with issues of urban development in Tambov. Judging by its information value, the urban plan by Koknevich is the best pre-revolutionary plan of the city of Tambov [6, L. 1].

It was printed and distributed by a private publisher Moskalev in large quantities.

The first Soviet era urban plan of Tambov was completed in 1925. It was based on a previous plan by Koknevich. It should be noted that during those 10–11 years separating these two plans, there was almost no new construction in Tambov. As a result, the plan of the Soviet period was copied from the one done by Koknevich, but it had some noticeable changes. They concerned renaming of streets, squares, urban public facilities and other structures made by new city government. Apparently, new version of the plan that appeared shortly after the preceding was due to these changes. Only a thousand of copies were printed, and the plan is a rarity nowadays.

In the prewar and early postwar years of the 20th century there were no printed plans of the city of Tambov available to a wide range of its residents and visitors. This was a period of strict military censorship, when such information materials were classified as secret.

The first post-war printed and widely distributed image of the city of Tambov represents a scheme of the city. Formally, this was called a plan of the city, but the scheme had no scale dimension and images of urban neighborhoods, although depicted proportionally to its original size, contained significant discrepancies. This document is dated as of 1958 and was designed as an illustrative appendix to the book “The City on Tsna” [7, p. 172]. The latter, in turn, was the only printed edition dedicated to 325th anniversary of the city of Tambov.

In 1960–1980s large-scale construction of urban and industrial areas took place in Tambov. During these years total area of the city doubled in comparison to its mid-20th century state. This work was conducted according to the general plan of the city. It was not available to general public and it was for “official use only”. Detailed, exact scale maps and plans of the city of Tambov were only available to institutions of military departments and services and to the chief architect of the city, but there they were in utmost secrecy. Other organizations of Tambov, whose activities required city maps, used such documentation, but their access was limited to official use only. However, these community organizations became sources of distribution of copies of Tambov maps, made in 1969 with numbered houses plotted on it and showing the whole territory of the city. This scheme (with no scale dimension) was developed for the Bureau of Technical Inventory of the city.

In the late 70s an image of the city of Tambov (made in the form of a plan) appeared at the historical and architectural monuments preservation service in the town hall. It was a time when misuse of such documentation was not followed by harsh consequences, and these schemes became available to people, who were interested in regional studies and issues of the city's development.

The subsequent plan of the city of Tambov, which had widely available to general public, was again timed to the anniversary of the city. In the mid-80s before the 350th anniversary of Tambov «Atlas of the city of Tambov» was published [8, p. 29]. However, this edition also lacked precision and did not meet the demand for detailed presentation of the city. At the same time, this atlas included charts representing social, cultural and economic growth of the city.

Following retrospective history of the process, it can be argued that subsequent images of the city of Tambov appeared only during the second half of the 90s of the XXth century. These were also schematic images, but this time with improved quality of printing and its information content. In the second half of 90s such plans of the city of Tambov were designed and published in over 20 thousand copies and in five different versions. The first and most easy-to-use plan of the city of Tambov was located on the last page of the atlas, “Topographical Map of Tambov region” [9]. It was on a scale of 1:60000, but its small size was offset by high accuracy, information value and breadth of coverage including the whole city and its surroundings. Subsequent plans were issued with a certain bias, for example, “Industry and business scheme”, a city plan with public transport routes, etc. This necessity was dictated by demand, which, in turn, is determined by economic needs.

As a result of this research on retrospective history of images of the city of Tambov, we can make a conclusion that planned (horizontal) projections were and still are the most widely used. However, their use in different historical periods had limitations; thus, profound work on restoration of such information losses has to be conducted.

Analysis of modern images of the city of Tambov is a separate research topic aimed at finding of an optimal variant. The results of this research using mathematic methods described in [10, 11] will be presented in further publications.

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Ретроспективный анализ изображений больших участков городских застроек на примере города Тамбова

**В.А. Немтинов, А.А. Горелов,
П.А. Острожков, Ю.В. Немтинова**

*ФГБОУ ВПО «Тамбовский государственный технический
университет», г. Тамбов*

Ключевые слова и фразы: графические изображения; зрительная информация; исторический аспект; ретроспективный анализ, хронология.

Аннотация: Дан подробный анализ изображений больших участков городских застроек в ретроспективном рассмотрении до самых древних кланов крепости «Тамбов». Приведены их отрицательные и положительные стороны исходя из последующего применения их для построения изображений с использованием ГИС-технологий.

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