9. Urban planning in post-Soviet Novgorod

Introducing a western legal system

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9.1 THE RATIONAL FOR A NEW SYSTEM OF CITY PLANNING

9.1.1 The golden principles – democracy and participation
In the new political system in Russia the main principles for city planning are self-government and democracy.

Development and implementation of a program for rational use of the land of the city has become first priority for ensuring self-government and democracy in Veliky Novgorod. It is seen as the first step towards a system of sustainable city development. Local self-government and democracy include public discussions on the program with participation of experts, representatives of public and political organisations, and citizens. A geographic information system (GIS) has been introduced.

The development and enactment of the "Rules for Land Use and Construction" has become an important stage in the rational use of city land. The Rules have allowed a departure from rigid city planning traditions, which assigned only one kind of use to a specific land area, to an effectively regulated but flexible construction system, which is natural for self-government. In the new system both the distinctive features of Veliky Novgorod as a historical city, and the importance of ecological factors can be accepted. The preservation of both the cultural and natural heritage are taken into consideration. In accordance with the principles of democracy, the Rules determine the order in which planning decisions are made. These assign types of land use, the legal boundaries and the arrangements of obligatory public discussions.
The legal basis for town and country planning in Western Europe

Owning properties – the cadastre system
The legal basis for town and country planning in Western Europe is based on the right to own a legally defined property or lot. The measurement of properties is a special skill, geodesics, taught as an engineering science. The system of properties covering an entire country is called a cadastre.

Names and borders of farms and lots in towns and cities dates back to Medieval times. At least in the Nordic countries up to the beginning of the 1600s land was in principle “owned” by the king and only used and administered by the so called owner. In its proper sense the right to own land is thus a modern phenomenon. Nevertheless, regardless if the legal rights referred to administration or ownership, properties has been dealt with in documented court cases since a thousand years.

Real estate market
The cadastre systems of identified properties – real estate – with owners forms the basis of economic transactions. Most importantly properties can be inherited, they can be sold and bought, and used as security for loans. They are also the basis for taxation. In e.g. the United Kingdom property taxation is basic for the fiscal (state) economy. It is recently becoming more important also in other countries to counteract tax evasion. Lots and buildings are not possible to move to other countries.

The real estate market is a major market in the west since ancient times. It can be very dynamic. The value of properties changes dramatically with the development of societies. As cities grow lots which once was found in a deserted countryside may end up in strategic places in cities and be many times more valuable. The same applies to areas where summer houses become very valuable as these become popular summer resorts, for example along the coasts or in the archipelagos of the Baltic Sea.

Restrictions in owners legal rights
The rights of a property owner are restricted in legal documents in various ways. Someone else may own a building on the property (the building is then said to be on non-free ground) and then of course also have the right to trespass the property to be able to have access to the building. Others may have the right to use a road on the property or use water on a well. Such rights are called easement. In the countryside rights on somebody’s forests and fields (not build property) might include the right to pick berries, flowers or mushrooms, or just walking and staying over night. Rights to hunt and fish normally belong to the land owner. The right to intrude on someone’s land in this way is characteristic for the Nordic countries and is much less extensive on continental Europe and in the United States.

Code of town and country planning
However the most basic restriction on how to use ones property or land is the fact that planning is not made by individual owner but by public authorities. How to use land – planning – is determined in special documents made up by the local authorities in accordance with the Code of Town and Country Planning a basic part of the law of the country.

Since the introduction of a rather far-reaching municipal law in the Nordic countries from the 1860s, the local authorities have a planning monopoly. This may only be taken over by State if national interests intervene, such as building of an interstate road or railroad or other facility of national interest. In these instances the state has the right to buy the properties or land that will be used, also against the will of the owner, so called expropriation.

Detailed plans and legal zones
The municipality makes up two kinds of planning documents, a general plan and a detailed plan. The detailed plan has the status of law and is thus legally binding. An area in which a detailed plan has been approved may be called a legal zone, an expression, more common in American than European jargon.

The detailed plans are established according to a defined order in which the municipality has to publicly exhibit the proposal for the plan during a certain period and take advice from the inhabitants – a very old participatory right – before it is legally approved. In case the interest of a particular land-owner is violated in the detailed plan this owner may also appeal – complain – to a higher court where the local administration and the individual are the two parties in the court process.

The detail plan normally defines areas of public access, such as roads, parks, schools etc. It also limits and defines the character of the buildings in the area, for example their maximum height. It is common that the activity in an area also is defined, for example as industrial or as residential areas. This functional zoning is becoming abandoned as discussion of sustainable urban development is recognizing that mixed functionality often is preferable. It should not be mixed with the expression legal zoning used in the article on a new order of town planning in Veliky Novgorod.

Building permits
Also the construction of buildings is legally regulated in building laws. Each building thus has to be accepted, receive a building permit, in a document by the municipal authorities. Especially the outer character of buildings are important since they are seen by everyone living in the city. Decisions on building permits may be appealed by those living around, perhaps the most common kinds of appeals in this area. All drawings of buildings and plans are stored and documented by local authorities. They are used for example in connection with work on common infrastructures such as water and sewage nets, eclectic grids, and telephone and Internet lines. Computer systems used for this work include Geographical Information Systems, GIS, or rather the corresponding programs used for a scale of meters that is more suitable for this planning, called Local Information Systems, LIS.

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9.1.2 Comparing the old and the new system

The essence of transition to the new systems of city development and construction may be summarised with reference to a few basic features.

The old system was turned “upside down”. Properties and other real estate were built up or changed to a category of use not necessarily natural for the real estate. In the new system (which is normal for civilised actions in a market economy), long-term rights for the lots are obtained first, and then they are prepared for construction which is then carried out.

The old system was a multi-stage system of city planning documentation. It created, on one hand, a constant legal uncertainty: It was impossible to obtain unequivocal answers concerning the purpose of using a particular land site within the territory of the city and the corresponding building parameters. On the other hand, after development and approval of a project and establishment of construction documentation it resulted in a rigid assignment of the purposeful designation of each land area. The new system on the contrary provides precise legal restrictions for the types of allowed use and parameters for construction in each area of the city.

The old system was closed. Decision-making, due to the legal uncertainty of the city-planning documents, was “handed over” to officials. The new system is rather open where decisions are made according to a legally established procedure. The steps are the following:

a) Decision making is made in conformity with the well defined instructions of the local normative legal act: “Rules of Land Use and Construction”;
b) The public (previously excluded from the decision-making process) has an opportunity to participate, for instance, through public hearings;
c) Consistent improvement of the “Rules of Land Use and Construction” becomes possible through periodic changes and additions while maintaining the validity of the document;
d) Opportunities for appeals against illegal decisions exist (due to precise criteria for the legality of actions concerning real estate).

9.1.3 Organisation

A body of corporate character has been created in Novgorod to work with the new system. It includes representatives from the administration and the residents of the city. This body

- controls the implementation of the Rules, including granting approval for construction, and arrangements of public hearings;
- monitors the situation with regard to supply and demand of land for construction,
- monitors the introduction of amendments and additions to the Rules, as a document which is constantly in force.

The further development of the system is connected with the integration of other, rather independent systems, for regulating land use and construction. These include systems for the protection of historical and cultural monuments, protection of the natural environment and maintenance of an ecologically acceptable environment. This integration will be carried out by converting existing requirements and recommendations into concrete parameters assigned to defined territorial zones.

Novgorod State University, named after Yaroslav-the-Wise, takes an active part in the work of the city administration on the introduction, development, and further perfection of the Rules of Land Use and Construction in Veliki Novgorod. So far the experience of development and introduction of the Rules is unique in Russia, where traditions of rigid planning in city development and construction impede the development of self-government.

One of the purposes of city development and construction is to achieve a socially, economically, ecologically, and culturally sustainable city development. This aims at the harmonious coexistence of people and nature, a high level

<table>
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<th>Stages</th>
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<th>System based on legal zoning which exists under the conditions of a real estate market</th>
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<td>Application for allocation of the land area for project development; compilation, coordination, approval of the act of preliminary selection of the particular use; authorisation of project development; cost of using the land area during the period of project development.</td>
<td>Purchase (by means of auction/tender or without them) of land areas with the right of long-term ownership – property, long-term rent.</td>
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<td>Development of architectural and planning assignments for the object.</td>
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<td>Development, coordination, approval of the design estimates; application for allocation of the land area for construction; the decision about granting permission for construction on the land area.</td>
<td>Submission of the project for approval; issuance of the approval for construction.</td>
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<td>4</td>
<td>Determination of actual land lot boundaries at the site; the contract for land rent for the period of construction; authorisation for performance of construction work.</td>
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<td>Construction.</td>
<td>Construction.</td>
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<td>6</td>
<td>Acceptance of the constructed object; registration of object.</td>
<td>Acceptance of the object; registration of the object.</td>
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<td>7</td>
<td>Issuance of documents concerning the right to ownership of the land area.</td>
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9.2 REORGANISING THE SYSTEM FOR CITY PLANNING

9.2.1 The legal basis of the new system
The city planning code of the Russian Federation which was enacted in April 1998, allows a considerable step forward in the implementation of reforms in the area of city planning. It concretises provisions of the Law of the Russian Federation “Concerning the main principles of organisation of local self-governmental bodies in the Russian Federation,” which defines the power of local authorities for city planning and construction, and introduces the concept of “legal zoning” as part of local self-governmental bodies’ activity for development and implementation of rules for building up and using land.

In the transition to a market economy, the City Administration has already carried out extensive work by taking a different direction in the area of city regulation aimed at attracting domestic and foreign investments (private, bank and other capital). In particular, reforms in Veliky Novgorod have created a new system based on market principles including:

1. A system for the regulation of land use and construction (in American terminology: legal zoning);
2. An improved system for taxation of real estate
3. A uniform city cadastral information system.

All these systems are closely inter-connected and should be adjusted at the local level according to the Law “Concerning the fundamentals of local self-government in the Russian Federation.”

In addition, the Administration of Veliky Novgorod is now working in the direction of developing a real estate market and involvement of land into a system involving transactions. A concept of land transactions in the real estate market has been developed (Figure 9.1). To develop this concept, normative legal documents will be prepared, which will regulate land relations and establish a normative purchase price for land, and a basic amount for land rental in Veliky Novgorod.

9.2.2 The master plan of the city and its role in the system of regulating land use and construction
Former general plans were designed for use under the centralised planning system. Their operation scheme was presented quite clearly, though, as we know, not a single general plan was realised, not even the main parts.

For instance, an analysis of the implementation of the last general plan for Veliky Novgorod revealed a significant lag in the development of engineering and transport infrastructure, and defects in territorial development. The industrial, auxiliary and warehouse territories occupied an area

of culture and education and good maintenance of the cultural heritage. An important aspect of the work is to provide the community with the opportunity of receiving information, expressing its point of view and actively participating in the planning process. Participation in the implementation of plans for concrete areas and the involvement of all population groups in this work is most valuable.

Formation of a normative legal base for city planning

Using the legislative and normative base of the Russian Federation, methodical documents and recommendations from Gosstroy of the Russian Federation, the administration of Veliky Novgorod, within the framework of powers delegated to local authorities, performs the purposeful work for formation of a local normative legal base, including city regulation. In particular, this includes:

The Statutes of Veliky Novgorod,
(decision of the City Duma of 23.04.98 _ 368)

The Rules for Land Use and Construction in Novgorod with the legal zoning map of the territory of Novgorod, which took effect on January 1, 1997. At present, work on the development and supplementation of the Rules is being conducted.

The normative legal document (Rules) for zoning in the suburban territory of Veliky Novgorod – The draft version of the document is being developed under a tripartite agreement between the administrations of the Novgorod region, Veliky Novgorod and the Novgorod district, for participation in financing of the project.

The provisional regulation about the Commission for land use and construction (approved by the decision of the city administration of 15.04.97 _ 46).

The provisional order of activity of the Commission for land use and construction (approved by the decision of the city administration of 30.04.97 _ 53).

Regulation about the registration certificate for the outside finish on building facades,
(decision of 17.10.97 _ 128).

Regulation about the address plan for the city of Novgorod,
(decision of the City Duma of 30.10.97 _ 227).

Regulation about the distribution of outdoor advertising and advertising information in Veliky Novgorod,
(decision of the City Duma of 28.05.98 _ 411)

Regulation about city planning activity on the territory of Veliky Novgorod,
(decision of the City Duma of 24.09.98 _ 447)

For creation and maintenance of the city planning cadastre of Veliky Novgorod the following documents have been developed:

Program for creation of the city-planning cadastre of Novgorod,
(approved by the decision of the city administration of 13.05.96 _ 195).

Regulation about the city-planning cadastre of Novgorod,
(decision of the city administration of 29.10.96 _ 248).

Regulation about the service of the city-planning cadastre of Novgorod,
(decision of the city administration of 29.10.96 _ 249).

The work for the creation and maintenance of the city-planning cadastre as part of a uniform, multi-purpose, information and legal city cadastre system is ongoing.
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Figure 9.2

The generalised scheme of consistent improvement of procedures concerning the initial granting of the right for long-term ownership of land lots.

Procedures which existed before enactment (since 01.01.97) of the "Rules of land use and construction in Veliky Novgorod"

1. Application
   Authorisation of project development. Short-term land lease agreement for the period of project development

2. Architectural and planning assignment.
   Development and approval of the architectural and construction documentation. Actual siting of the boundaries of the land site. Agreement concerning the short-term lease of the land lot for the construction period. Construction permission.

3. Construction.
   Acceptance of the object. Registration of the object.

4. Registration of the right for long-term ownership of the land lot

Provisional procedures existing after enactment of the "Rules of land use and construction in Veliky Novgorod"

1. Application
   Authorisation of project development. Short-term land lease agreement for the period of project development.

2. Architectural and planning assignment.
   Development and approval of the architectural and construction documentation. Actual siting of the boundaries of the land site. Agreement concerning the short-term lease of the land lot for the construction period. Construction permit.

3. Construction.
   Acceptance of the object. Registration of the object.

Proposals for further improvement of the provisional procedures

1. Application
   Preparation of the Certificate of the authorised use of the land lot (see the form). Issuance of the document giving the right for long-term ownership of the land lot

2. Development and approval of the architectural and construction documentation. Construction permit.

3. Construction.
   Acceptance of the object. Registration of the object.
twice as large as the required optimum for cities such as Velikiy Novgorod with a population of 243,000 people. The capacities of many industrial enterprises do not match the area of the occupied land sites. As a rule, the areas are considerably bigger than necessary due to reservation of land for prospective (future) development. These prospects, as we know, collapsed together with the centralised planning system. Analytical audits of the use of the land areas in industrial zones is now required. Such work is already being conducted in the city.

Today, practically all cities have to change to an effective policy of economy of territories, as the land acquires tangible value. Along with this change, it is necessary to create a new system for the regulation of land use and construction on the basis of legal zoning. The territory of the city and its suburbs need to be carefully analysed and adapted in light of changes in the economy and technology in the next 10-15 years.

The basis for these rules is a set of legal regulations and zoning maps, to which these rules are applied. The fundamental concept of this system is that rules are created for each type of zone and are applied uniformly to all land sites within the limits of each zone. Establishing the necessary restrictions by parameters, form and other characteristics, thus limiting the land use possibilities, zoning rules allow a certain choice within these limits, as expressed by the strict and at the same time flexible regulation of city planning activity.

Thus, for real estate owners, builders and investors (and for people who wish to act as such) the following applies:

- First, the legal situation should be normalised – at first, a land site will be obtained with a “package” of clearly outlined and guaranteed usage rights, and then, the site owner will develop the project and carry out the construction work (Figure 9.3).
- Second, the number of fixed property objects will grow faster as a result of the development of an open real estate market. Real estate owners will go through the precise and transparent approval system without waste of time and money;
- Third, the investment activities will increase, the risk of investing in real estate will decline, and it will become possible to choose the most profitable and efficient way to use it and quickly respond to the market conjuncture.

In the situation where legal zoning applies, some administrative services will lose the opportunity to make unreasonable decisions during the coordination and approval of projects, as all decisions may be challenged in court on the basis of precisely defined legal criteria. Besides, with the introduction of zoning plans, the part of routine work of these services will prove to be unnecessary.

9.2.3 Introducing the new system

The city administration of Velikiy Novgorod, for several months, worked on the creation of a new system for regulating land use and construction. For this purpose the city studied and used the zoning system, which has been used in many Western European and American cities, as well as in other parts of the globe.

In February 1996, the work of creating a legal zoning system at the local level started in Velikiy Novgorod. The system included the following elements:

- The zoning documents;
- The local body of zoning regulations;
- The zoning procedure.

The local normative legal act “Rules for Land Use and Construction in Velikiy Novgorod” and the Map of legal zoning of the territory of Velikiy Novgorod (Table 10) were developed by a City Administration workgroup and were approved by a decision of the Novgorod City Duma on December 19, 1996. This system was based on the main conceptual rules of the basic plan for the development of Velikiy Novgorod. The basic plan is a sort of preparatory document in the system of city regulation, its first stage.

The second stage was the creation of documents, i.e. the legal zoning map and the Rules for land use and construction. The purpose is that good city planning would direct the growth and development of the city, maintain its historical heritage, and make possible large investments in the creation of workplaces, in housing construction and in the service sector.

The new system gives the municipality an opportunity to more effectively carry out strategies for improving the territory and the local social programs. The basic components of the strategy are as follows: Assigning to municipalities the land area required for providing transport, engineering, technical, and social infrastructure (including land for the construction of municipal housing), with simultaneous public presentation of those land areas which municipalities are ready to transfer to private persons.

Initiating the privatisation of municipal land which is in excess of that required for municipal use, including the sale of land to private enterprises, the organisation of competitive and auction sales of land for private housing construction and for realisation of investment projects.

The concentration of budget assets for social programs through the use of a cumulative zoning effect. This effect appears as a kind of chain reaction, an impetus for which are the legal guarantees of ownership and the use of the real estate. Such guarantees reduce the risk of investments in construction, and increase the opportunity to obtain credit against real estate mortgage, and revive construction activity. The increase in the value of real estate results in an increase of revenue for the local budget. Expansion of construction increases the fixed capital of enterprises, their ability to increase production of competitive products and to create new workplaces, etc.

9.2.4 How zoning provides for clear management and, satisfies the needs of inhabitants and investors.

Zoning establishes legal rules which regulate the use of land and construction of real estate on it (buildings, structures, elements of improvement, engineering and transport infrastructure). These rules are created on the basis of the process of good planning, during which the basic plan of the city, the concept of development, the plan for zones of protection of historical and cultural heritage and other city-planning documentation are carefully studied. The committee for architecture and city development organised public hearings
and discussion of the zoning documents with representatives from various sectors of the city’s population prior to the consideration of these documents in the City Duma.

After their approval by the Duma, the information about the “Rules for Land Use and Construction in Velikiy Novgorod” was published in the local press. The local body for zone regulation is the Commission for Land Use and Construction in Novgorod, which was formed by order of the city administration in January, 1997. The Commission carries out its activity according to the temporary regulations for the Commission and the temporary rules of activity for the Commission approved by the decisions of the city administration.

9.2.5 Cooperation with foreign partners and experts

Apart from the joint work of the city administration with USAID, the US agency for International Development, on the above zoning documents in April 1997, the city administration, together with advisers from the firm PADCO (USAID), have developed the concept of the formation of a real estate market and involvement of land in the turnover, having defined the basic directions for the administration’s activity towards realising market principles in the regulation of land use and construction.

With the assistance of USAID experts, within the framework of the project for creation of a modern system for land use and construction, a draft regulation about water protection zones and coast protective strips has been developed. With the assistance of the USAID advisers under the program “Partnership for Freedom - Velikiy Novgorod”, the following work is being conducted:

- Revealing and formation of land sites suitable for industrial investment projects;
- Zoning the suburban territory of Velikiy Novgorod.

During 1998, as a result of cooperation with the city administration of Strasbourg, France, within the framework of the UPSILON project, a program of TACIS – “Twin cities,” experts from Strasbourg and Velikiy Novgorod developed conceptual, methodical projects for improvement of the city environment. It was done with the involvement of investors for three pilot sites in the city, as well as for the introduction of energy-saving technologies successfully used in Strasbourg.

Finally the project “Proposals for establishment of parameters of the authorised construction in special historical zones” was developed under the aegis of USAID, in close cooperation with PADCO, the Institute for city economy and the International institute for development of legal economy.

9.2.6 Contemporary city-planning tendencies in development of Velikiy Novgorod

Despite the difficulties related to financial problems, Velikiy Novgorod continues with development, construction and improvement. During the development of the city, both positive and negative tendencies have been revealed with regard to the regulation of city planning activity. As a result of the creation of a normative legal base which provides a clear picture of the rights and restrictions for the investor/builder and provides certain guarantees to real estate owners, the interest of foreign investors in the city has increased considerably. Businessmen, individual builders, and local investors have become more active.

The construction of single family dwellings and commercial housing (low-rise apartment buildings) has increased considerably. Also, the quality of construction and architecture has improved. Effective modern finishing materials, joiner’s items, and roofing materials which meet world standards have begun to be widely applied which serves to lower the operation costs significantly.

Gravitation of trade, business, and financial structures to the historical city centre has resulted in the replacement of first floor housing by shops, offices, banks, and service enterprises. This has had a positive effect on the aesthetic quality of the city environment, advertising design, and repair and renewal of city facades at the expense of the real estate owners. It also became necessary and possible to construct mansard floors in the sloped roofs of existing buildings, which will favourably affect the dull architecture from the years 1960-80. As a result of the systematic, consistent work of the city administration on replacing outdated kiosks, street trade stalls for modern, more aesthetic pavilions, as well as replacing old bus stop pavilions for new ones, the quality of design of the city’s open spaces has improved considerably.

The traffic problem in Velikiy Novgorod is similar to the traffic problem in many Russian cities. It is especially difficult for historical cities with an existing road and transport infrastructure of narrow streets and small back yards not adapted to the large number automobiles which are on currently on the roads (in Velikiy Novgorod the number of cars has increased by almost 2.5 times). It seems that the experience of foreign historical cities can offer solutions for this problem. A solution implies reconsideration of the normative acts, reconstruction of the transportation and pedestrian network, construction of multi-level above ground or underground garages or parking lots, strict control of adherence to parking regulations. These measures are currently rather problematic for the city budget.

Thus far, investors have taken the least expensive course – temporary constructions, metal or ferro-concrete boxes and, most unpleasantly, single storey garage complexes, which are expanding and eating up valuable city property, but resolving the problem because of their remoteness from housing. The city administration is working on a solution to this problem at the expense of investors, but it is necessary to find a way to interest investors for this purpose within the framework of the law of the Russian Federation.

9.3 THE LAND CADA斯特RE AND DEVELOPMENT OF A GEOGRAPHIC INFORMATION SYSTEM (GIS)

9.3.1 Creation and maintenance of the city planning cadastr e

In August 1996, when there was as yet no experience in Russia of creating a city planning cadastr e, the city administration of Velikiy Novgorod began work on the municipal level on the creation of a city planning cadastr e, at the same time as similar work began in several Russian cities.
Already at that time there existed in Veliky Novgorod significant experience in the creation and maintenance of a land cadastre. This considerably facilitated the task of selecting and using computer information technologies and cartographical information on the geotopographic basis created by the land committee for a significant part of the city territory (in scale 1:2000 and 1:500). This work is still in progress. The work of creating and maintaining the city planning cadastre of Veliky Novgorod will be carried out within the framework of formation of a city GIS (geographic information system). The system of legal zoning will be the ideological basis for this work.

The work on creating a uniform multi-purpose information and legal system at the city level is coordinated by the information committee, in whose structure the city cadastre department is created. Its responsibility includes selection of software and definition of the general approaches to creation of branch cadastres. The land cadastre is maintained by the land resources and land use committee, the city planning cadastre is maintained by the committee for architecture and city development, the Cultural heritage cadastre of Veliky Novgorod is maintained by the cultural committee, etc. In this way, a relative actualisation of information is achieved, since each division is responsible for its relevant part.

In the administration, the electronic computer network with the database is functioning for real estate objects, for their privatisation, for land sites, for city planning rules and restrictions. All of the administration committees can access the required data using the network within the limits of their competence. At present, the work on creating and maintaining the city planning cadastre is moving in the following main directions:

- Formation of a database of city planning information;
- Organisation of the monitoring of the process of city planning activity;
- Development of the order of distribution of cadastre documents and their forms.

9.3.2 The development of a GIS based cadastre system

The first stage of introducing an information system was to create an inventory of addresses of land areas. A map in scale 1:500 showing all underground communications was selected as the geographical basis, on which all cadastres (resource and functional) were maintained. Since 1995, the office of the Novgorod aerogeodetic enterprise has prepared and updated plans within the city limits and the built-up lands beyond the city limits. The work was completed by the middle of 1999.

As a result of this work, the Committee performs digitizing of all the obtained graphic information and its input into the automated system. This information consists of about 40 layers. It includes basic and attached buildings, construction, coating (streets, roads, pavements) relief, hydrographic and hydrotechnical engineering structures, underground and above ground communications etc.

Updating of the plan is carried out in the mode of so-called “paper-free technology”. All changes during field work are carried out using electronic tachometers on magnetic media and are added to the electronic plan by means of computer. As a result, the committee, using this technology, obtains the electronic plan with the introduced current changes without production of intermediate materials on paper or other hard medium. This results in a savings in the city budget for maintenance of the land cadastre.

Superposition of the digital plan and results of the land surveys allows consideration not only of the site’s parameters, but also of its qualitative characteristics. For example, automating data about the structure of a site (explication), or documenting the easements (charges) of the land area and usage restrictions, and defining other characteristics required for manufacturing the cadastre plan of the land area.

With completion of the digital plan with a scale of 1:500 and finalisation of the land surveys, basically, creation of the automated system of the land cadastre has been finished.

9.3.3 Maintaining and using the cadastre

The cadastre of buildings, construction and structures is maintained by divisions of the Administration of the Municipal department of the Bureau of Technical Inventorisation, the Municipal Property Committee, the cultural heritage department. The Land Committee has access to the database maintained by these organisations.

The cadastre of underground and above ground communications is maintained, or prepared, by their operating organisations on the basis of a contract for exchange of information between themselves and the city administration free of charge, for the mutually beneficial conditions.

As a result of maintaining these resource cadastres, the cadastre plan of the land area may include building characteristics of construction located on the land area. The
avaiability of information with regard to communications’ engineering on the land area determines the protective and repair zones for these communications, which, in turn, imposes charges for the land area within the limits of these zones, provides permission for other people to perform repair work and restricts land use in connection with a security procedure.

9.3.4 The functional cadastres
The functional cadastres are formed as thematic maps with separated layers of information. The main map of the town planning cadastre is the zoning map, which serves as an appendix to the rules of land use and building in Veliky Novgorod. The rules determine the following:

- The order of regulation of land use and construction on the basis of the legal territory zoning;
- Characteristics of territorial zones by type and parameters of the allowed use of land areas;
- Maps of restricted land use and construction.

These rules are intended for:

- Ensuring realisation of plans for development of the city territory;
- Establishment of legal guarantees for owners for changing the real estate;
- Increasing efficiency of the use of land areas;
- Providing easy access for citizens of information about land use;
- Effective control by the supervisory bodies.

Presence of a system for regulating land use and construction provides conditions for attracting investments in construction and improvement of the city territory and the participation of legal entities in decision making with regard to land use and construction.

The next thematic map is the historical and archaeological basic plan, which allows assessment of the archaeological features of the subsoil cultural layer of the territory, enabling decision making regarding issues of its protection during construction and other economic activity.

The map of restrictions concerning the requirements for protecting historical and cultural monuments contains information about all buildings, constructions, and structures which are monuments, and the security procedure for the adjacent territory, which imposes some restrictions on land use in such territories.

The map of height restrictions for buildings, constructions and structures connected with historical documents imposes additional restrictions on land use in the area inside the zones determined by the zoning map and the rules of land use and construction in Veliky Novgorod.

The map of engineering and geological conditions consists of four thematic maps and the information contained in them in addition to information from the cadastre plan of the land area is necessary for a land user to determine whether the conditions are favourable for construction on the land area.

The water cadastre, ecological cadastre and other functional cadastres refer to other cadastres, which the city administration’s departments as well as certain state structures are involved in maintaining, with the possibility of adjustment of information exchange provided by contracts.

The municipal geographic information system (GIS) is now at the development stage, and involves new subjects, but the significant part of it has already been implemented and is working in practice.

9.4 SOLVING CITY PLANNING PROBLEMS

9.4.1 Reforming the methods for addressing planning problems
The changes in the social and economic, political and investment policy of Russia require that the approaches to the city planning process is reconsidered. The existing technique, with a complex analysis of natural, economic and city planning conditions, is too awkward and frequently does not ensure concrete results. Within the program “Sustainable city development” the development of a new technique for the analysis of how various factors influence city development is of great importance.

Today in Russia the four-step project development system is used to work with planning problems. The lack of specific results when using this technique is the outcome of insufficient coordination between different research disciplines. For example, in order to correct the general plan of the city, it is necessary to carry out a complex analysis of all factors influencing structural changes within the boundaries of the city territory. Currently, the technique for analysing city planning factors is poorly coordinated with techniques for analysing economic, social, ecological and other factors. A special work is required to make the obtained results “compatible” with each other. The city planner frequently gets conflicting recommendations and has to make unfounded decisions.

This absence of working methods creates a chain of new problems. In addition the complex analysis with participation of experts from different fields is rather expensive, and in the contemporary economic conditions, often unrealistic. Besides, in any city the factors influencing specific sites are special and requires a non-standard study. But, as a rule, there are no specific studies on the urgent problems of the city. In practically any city there are sites, such as transportation junctions, industrial and recreational zones, etc., whose problems were solved by architects and city planners of different generations, during different time periods, by various methods and techniques of project development. Today, these sites may remain problematic for the city, despite the existing projects.

9.4.2 Tension knots
Let us consider city development from the standpoint of solving concrete problems on concrete sites. As a basis, the following two conditions will apply:

1. In the city there are no problems connected with all aspects of the life of humans. There are concrete problems in concrete places. Not all city development factors have an influence on the process of development of the city.
2. The city development process is not always connected with changing the city as a whole. It happens through improvement of concrete places.
The sites of a city can be split into those with favourable and those with unfavourable environment habitats. It is the latter which are of interest when developing a program for improving city development and should be carefully studied. To solve city planning problems we need a new technique for analysing which factors influence the city development. We suggest, as a first step, the indentification of sites, which requires special attention of city-planners. We will call these "tension knots".

The name "tension knot" will refer to a site in the structure of a city, in which a qualitative change of environment occurred under the influence of a "critical load" (concentration of influence) of adverse city development factors during the evolution of the site.

A "knot" is a site in a critical environmental condition, that is with a weakened biotic basis of self-regulation, restoration and stabilisation. It is not capable of independent restoration of the condition of the environment. Restoration of its ecological system offers an opportunity to control and rationally use its potential.

With this technique we may reveal major factors which are present in the "tension knot". Analysis of the environment before and after the critical condition allows us to discover structural changes in the evolution of the site and discover the causes of the change. The technique allow us to:

- discover, define and classify "tension knots"
- define factors causing tensions in the "knots"
- revealing major factors causing changes in the city
- substantiate ways of city development

We will have a new and efficient method to make effective city planning decisions for city development practice.

9.4.3 Three examples from Veliky Novgorod

We shall take Veliky Novgorod as an example of determining "tension knots." Let’s look at the diagrams (Figure 9.6). "Knot I" informs us of the total re-planning of city streets, which was carried out in the 18th and the beginning of the 19th centuries. The practice of graduation project development at the department of architecture at the Novgorod State University at times demonstrates fascinating solutions. Especially interesting are the temple square planning projects. The temples of 14th/15th centuries have remained at their original locations, but part of them turned out to be inside the block, part of them goes beyond the red line, etc. As well, they are located off the axis of new blocks.
The students are tempted to plot crooked (old) streets wherever possible, even inside the block. Temples, as reference points, as the keepers of the original layout, force the city planners to come back to the structure of the city which had been lost. This is surprising, but sometimes a problem is solved in concrete areas, on concrete streets. Restoration of the temples of Veliky Novgorod restores the city’s picturesque arrangement, which was characteristic of Russian cities. One should note that nobody sets a task of recovering the former layout, which is impossible to achieve. We speak of nuances and local sites.

The second revealed “knot” – “Knot II” – is located on the axis of the street which passes over Fedorovsky canal, which was filled with earth in the first half of the 20th century. The canal connected the rivers Kopan and Volkov. Also this street leads to the Moscow highway, and at its other end, gives access to the bridge over the Volkov river, which makes it a very intense street. The enterprises located on the bank of the Volkov, a place of ancient habitations, where rich merchants resided, add to the critical condition of the environment. Here, a circle of problems is outlined, which can be solved either by the method of changing the typology of buildings, or by other known methods.

“Knot III” demonstrates the desire of contemporary city planners to obtain an axis of squares important for the city and to extend this axis to the railway station. The railway station is the “tension knot,” because a direct connection with the city centre has not been resolved.

The “tension knots” listed above are of different scales, levels and types. Therefore, it is possible to create a classification of “knots” and to decide upon a decision sequence. A big help in defining “tension knots” can be provided by the stock of non-implemented projects. The non-implemented project decisions of architects of different generations are organically incorporated into the offered technique, not only as knowledge on their own, but also as the component of an already performed analysis.

The revealed “tension knots” allow concentration on concrete territories, which results in an economy of resources and effective decisions. It should be stressed that the improvement of the habitat is done through implementation of project decisions on concrete sites in the city. The offered technique of revealing “tension knots” should be approved, analysed and generalised.