

MINISTRY OF EDUCATION AND SCIENCE OF UKRAINE

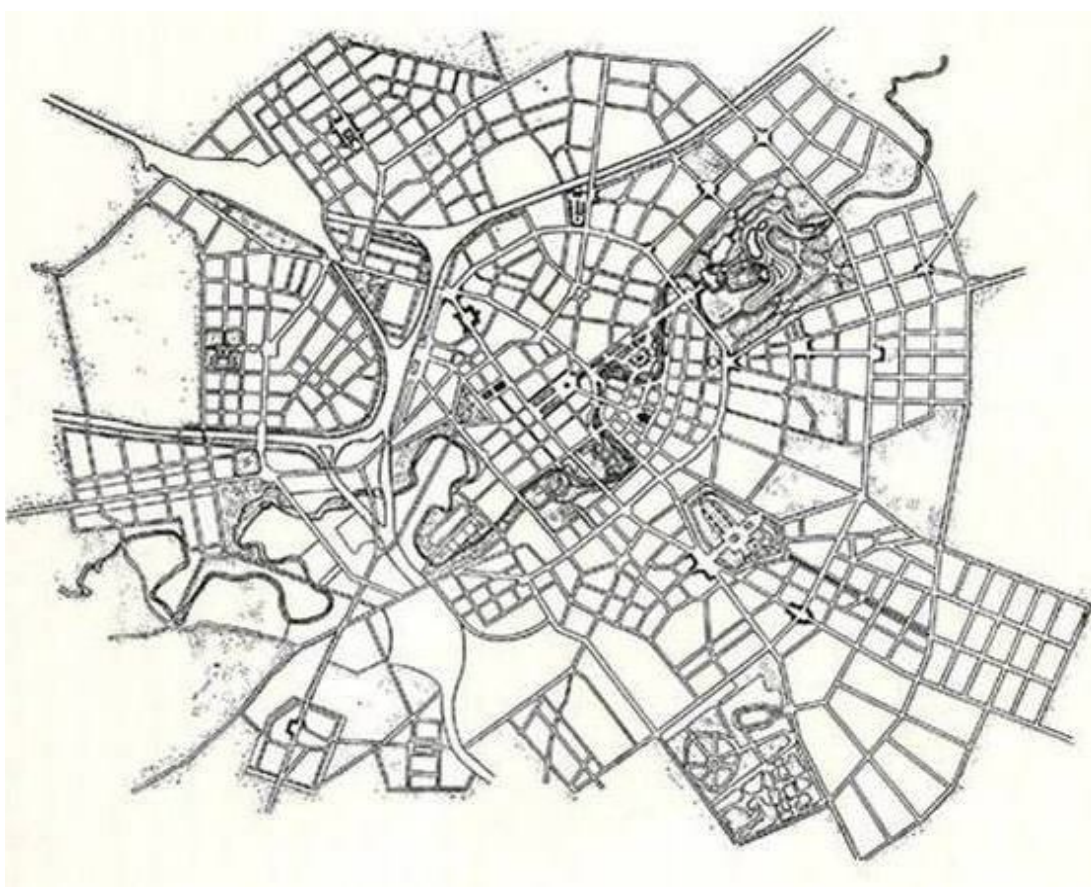
**O. M. BEKETOV NATIONAL UNIVERSITY
OF URBAN ECONOMY IN KHARKIV**

L. Martyshova

FUNDAMENTALS OF URBAN PLANNING

LECTURES

*(for second-year full-time foreigner students first (bachelor's) level
of higher education specialty 191 – Architecture and town planning)*



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The lectures is made for the purpose to help students of architectural and urban-planning specialties of high educational level in preparation for lessons, tests and examinations from the section "Fundamentals of urban-planning" of a course of the theory of urban-planning.

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Cities are the measures of our planet, cities
are the distant past, the present, and our future.

Genghis Aitmatov

The theory grows out of the analysis of urban reality; and this reality contradicts the idea that the proposed functions themselves control the artifacts, and the problem is simply to give shape to a particular function. In fact, the forms in the very act of their creation go beyond the functions they are supposed to serve; they arise in the same way as the city itself.

Aldo Rossi
"City Architecture" –
Cambridge (Mass.), 1989

INTRODUCTION

Cities, the offspring of human society, have been around for thousands of years. The fates of cities are varied and instructive: some have long ceased to exist, others have grown to gigantic proportions; some are forgotten, others have become world famous. "Whatever the city, the character," – says a popular proverb, which best describes the versatility, diversity and variety of cities in general. Cities are different in their geographical location, economic and socio-political significance. For centuries and decades, the appearance of cities has changed, enriching itself with new elements and losing the old ones forever. Urban heritage, representing a great artistic value, today in its "pure form" is functionally unsuitable for the needs of today, new cities are built taking into account these requirements.

Purpose, subject and place of the course

The purpose of teaching the discipline "Fundamentals of Urban Planning" is to form a theoretical foundation for the general training of student-architect, which is based on the formation of a systematic idea of the basics of urban planning. Training of qualified specialists capable in practice to solve a wide range of problems in urban planning, where urban planning is a form of artistic and practical creativity.

Providing students with skills of analytical research on professional issues, acquainting with the aesthetic and regulatory and technical criteria for the development of urban space.

Tasks of studying the discipline:

- determining the place of urban art in urban development and awareness of it in the historical perspective;
- understanding the relationship between urban planning and the development of civilization in different historical periods;
- acquaintance with the most important ideas of town-planning and to explain their origin;
- acquaintance with the thinking of historians and explain the need for historical research in the design process;
- to understand urban planning not only as a planning activity, but also as a set of various problems that are solved by the joint efforts of designers, entrepreneurs, government and citizens.

As a result of mastering the discipline the student must:

- be able to: work with materials on the history of the city; operate with the terminological apparatus of the basics of urban planning, sufficient to understand the processes of urban development; see the relationship between urban planning, economics, politics, city government and other issues related to them;
- have an idea of: the most important artistic ideas and the basic set of aesthetic means of urban planning; stylistic and artistic features of architectural monuments and urban planning of epochs and regions;
- be aware of the need for an interdisciplinary approach and teamwork with specialists in related fields;
- know: regulatory requirements and design features of urban development facilities; the most famous and significant projects and urban ensembles, important for understanding the peculiarities of the formation of the environment and the image of the city, as well as its perception in different periods and in different cultures; key urban concepts and theories of different eras.

1 SETTLEMENT AND DEVELOPMENT OF SETTLEMENT SYSTEMS

1.1 Introduction to urban planning.

Basic concepts, goals and objectives of the course

1.1.1 Basic concepts of discipline.

1.1.2 General idea of urban planning.

1.1.3 New principles of urban planning of the 20th century.

1.1.4 The main tasks of modern urban planning.

Urban planning – the art of designing and building cities, the theory and practice of urban planning and development, is an integral part of architecture, which is formed depending on many socio-economic, engineering and artistic and aesthetic factors.

Urban planning is closely related to:

- natural;
- social and economic conditions;
- the level of development of science, culture and production;
- national characteristics of the country.

Urban planning covers a set of the following problems:

- compositional (architectural and spatial);
- functional;
- aesthetic (architectural and artistic);
- transport.

Urban planning belongs to the multifaceted creative activity associated with the legislative regulation, economic planning and management during the reconstruction of cities or new construction. Urban theory studies the important tasks of creating the necessary order, which provides socio-economic relevance and architectural and artistic expression in the overall construction of the city, its individual parts, as well as in individual urban complexes and buildings.

The first experiments in the arrangement of cities and settlements date back to

middle 3rd – beginning 2nd millennium BC. In ancient Egypt and Mesopotamia, the city was divided into geometrically correct quarters.

In ancient Greece and Rome, the techniques of regular planning developed into a coherent system (called Hippodamus).

Medieval cities with strong walls, on the contrary, had curved and narrow streets around the castle, city cathedral or shopping area. Residential areas outside the city walls were surrounded by a new ring of walls, then in their place were formed ring streets, which in combination with radial streets determined the formation of a characteristic radial-ring structure of cities.

Renaissance, Baroque and Classicism, in turn, were marked by colossal urban compositions.

The rapid growth of cities since the middle of the 19th century, and the rapid development of motor transport contributed to the emergence of colossal urban areas (urban agglomerations), and in turn, led to the search for new principles.

In the last decade, qualitative changes in design approaches have taken place in urban planning. There are new types of urban design, such as zoning, based on which the boundaries of the urban object are those that are accepted at the request of the customer, and not on the basis of general theoretical or legislative principle. Urban planning needs a revival in theoretical, practical and educational activities.

New principles of urban planning are:

- zoning of urban areas;
- district planning of the city road system;
- typology of cities (garden city, satellite city, etc.);
- allocation of structural elements of the city (residential areas and microdistricts).

The main tasks of modern urban planning – the creation of cities and towns with individual appearance, solving urban environmental problems, overcoming the monotony of typical buildings, preservation and scientifically sound reconstruction of old urban centers, careful preservation and restoration of cultural monuments, their combination with modern buildings.

1.2 Features of urban design

1.2.1 Settlement systems. Basic formatting principles, types and forms.

1.2.2 Group settlement systems. Rural settlement.

1.2.3 Regional settlement systems - basis of territorial development of the country.

1.2.4 Agglomerations. Transformation of rural settlement.

Since ancient times, Eastern dynasties, antiquities, the Middle Ages and the Renaissance, the city was perceived and projected as a cosmogonic, philosophical, scientific or religious model of the universe: city-house, city-polis, city-camp, city-space and others. These concepts gradually lost their original meaning, changing within the two antagonistic notions of space and chaos as symbols of order and disorder. In the era of the industrial and scientific-technological revolution, these ideas acquired a tendentious development in the direction of forming pragmatic ideas, everywhere there were cities-factories, cities-ports, cities-resorts, cities-scientific centers, cities-satellites, cities-gardens, cities-ribbons, which did not correspond to a holistic view of the city. In other cases, the spontaneously formed urban area merged with the main city, forming agglomerations, conurbations and megacities. Concepts and ideas about the city were formed as those that lost their independence, dissolving in urban areas. After World War II, world industry took a sharp leap. Industry was supported by the state, which allowed it to concentrate production in cities that began to grow rapidly. Finally, urban planning practice has faced the problem of decentralization of production. England was the first European country to solve this problem. Thus, settlement systems with center cities emerged. The example of England was followed by France, Holland, and later by Sweden, and in the 1960s by the former USSR.

Settlement is a complex system of mutual coordination of spatial and territorial location of the network of cities and other settlements in the country, which includes a network of the largest, large, medium and small cities, as well as a network

of settlements in rural areas. The accumulation and merging of cities formed agglomerations and conurbations of settlements, and the accumulation and merging of agglomerations and conurbations formed megacities.

Settlement systems are formed on the following principles:

- intensity of labor, production, scientific, cultural, administrative, trade and other ties between cities and settlements;
- the level of interconnections of places of residence with the main places of work, public service centers and places of out-of-town rest;
- population density and network density of urban and rural settlements;
- the ratio of population in cities of different sizes.

There are two main types of settlement – urban and rural. According to the administrative-territorial structure, there are three forms of settlement – group, regional and agglomeration. Each settlement system has a city-center and subordinate settlements – cities, villages or towns.

The group system is purposefully formed groups of urban and rural settlements of different size and economic profile, combined with developed territorial and industrial ties, common engineering infrastructure, a single network of services and recreation areas. Group systems by number, composition and size of cities are divided into three main types.

A) small, formed around a small or medium-sized town of 50–100 thousand people. within a radius of 30–40 km (1,5 hours of transport access);

B) medium, formed around a medium or large city numbering 100–250 thousand people. within a radius of 70–80 km (1,5–2 hours of transport access);

C) large, formed around a large or largest city numbering more than 500 thousand people, within a radius of 100-120 km (2–3 hour of transport access). This type of settlement has signs of zonal type.

In group systems that form around the largest cities, large urban agglomerations can occur – settlement systems that include 15–20 settlements, the average distance between which does not exceed 15 km.

The rational type of development of the group system is determined in the

project of district planning by the following indicators:

- volume of investments in industrial and civil construction;
- transport access of the population to places of work, service and rest;
- the amount of investment and operating costs for the formation of the transport and engineering network;
- possibility of an equal choice of places of work, service and rest;
- ecological and sanitary-hygienic living conditions of the population;
- architectural and compositional conditions of planning of separate cities;
- rational development of the planning structure of the whole group of settlements.

Mutual coordination of large, medium and small group systems should be based on the formation of regional systems of settlements that cover the country as a whole or the economic region of the country. In particular, several mutually agreed regional systems can be formed when the territory has a significant size, a large number of group systems and economic areas.

Transport accessibility of the main regional center is 3–4 hours (180–240 km). The regional scheme includes: group systems of settlements of different sizes with their centers and subcenters; the central (the largest) city of the regional system; protected natural landscape areas; centralized engineering structures and networks at the regional level (electricity and telephone networks, sewerage, water supply, gas, etc.); cultural protection zones; urban development restriction zone; urban development containment zone; zone of high-speed intersettlement transport.

The structure of the regional system is formed by group systems of settlements, agglomerations of cities, oasis (center) and rural settlements. The formation of regional systems establishes a path to the integration of urban and rural settlement, to the formation of equally comfortable working, service, living and recreation conditions for both urban and rural populations.

In modern urban planning there are other approaches to the structure of regional systems. The proposals of the Ukrainian urban planning school are to distinguish three levels of settlement: regional systems, zonal systems, urbanized core

of agglomerated systems. In many developed industrial and agricultural countries, there are new ways to transform rural settlements – the formation of mutually agreed groups of rural settlements, which, in turn, form a hierarchy of higher groups in areas of influence of medium, large and the largest cities and agglomerations. Within these local groups there is a process of differentiation, as a result of which rural settlements are formed, different in size and functional purpose – local, industrial, economic and cultural centers. Local groups of rural settlements and agro-industrial complex form small settlement systems – groups of interconnected rural settlements around one or more small towns with a radius of settlement of 30–40 km (1,5 hours of transport access). Such a system concentrates groups of rural settlements and small towns.

In the theory and practice of urban planning, three types of small settlement systems are identified: district – groups of rural settlements around a small town; inter-farm (bush) – around small towns, villages or large villages; domestic – around urban-type settlements. Thus, small settlement systems of the rural population are the primary link in the hierarchical structure of group and regional systems and an intermediate link in the territorial location of these systems.

Urbanization of large economic areas is a process of merging cities of different sizes and the formation on this basis of agglomerations and conurbations of cities. This settlement process is managed by the formation of mutually agreed systems of regional, group and local settlement. Thus, a hierarchical structure of settlement of the country is formed, which consists of regional and group systems, as well as the system of rural settlement. The choice of a rational organization of settlement is decided in projects and schemes of district planning.

1.3 General plan of the city. Typology of cities

1.3.1 Reserve areas for city development.

1.3.2 General plan of the city.

1.3.3 Typology of cities.

The city is a dynamic system that develops in space and time. Territorial, functional and structural reserves are necessary for its development. The reserve of territories, functions and structural elements that are duplicated, is the main features of the open planning organization of the city, which allows significant development of the main functional zones, planning areas and urban engineering and transport networks.

Territorial reserves – plots of land that are reserved for the growth of various functional zones. Functional reserves are reserves of production capacity, reserves of capacity of engineering and transport networks, energy sources and water supply, which are projected. Structural reserves are a duplication of various structural elements of the city and its parts, which allows the creation of elements that will be duplicated in the future: residential, industrial areas, major urban transport and engineering highways, city centers. For these elements, the territory is reserved at the stage of the draft general plan.

The city general plan is the main strategic document, which contains materials of territorial and social development. The general plan is executed after the development of the district planning project.

The most important component of the city is the city-forming base – industrial (production) areas. The profile of the city determines the composition of its production base. Cities by economic profile are divided into industrial, resort, tourist, railway junctions, scientific centers, etc. According to the administrative and cultural significance, urban settlements are divided into regional, district centers, cities of regional subordination, cities, urban-type settlements, settlements.

There are two categories of population that form the city-forming and city-

serving bases. The city-forming group includes the able-bodied population who work at enterprises, not only within but also outside the city. The city service base consists of administrative, cultural, educational and other institutions, as well as the population working in them.

Each city is a complex, functional and planning object. The harmonious functioning and development of the city and its components is ensured by taking into account the category of the city by population.

The following cities are distinguished by population:

small – up to 50 thousand inhabitants;

medium – 50–100 thousand inhabitants;

large – 100–500 thousand inhabitants;

big – 500–1000 thousand inhabitants;

very big – more than 1 000 thousand inhabitants.

In the biggest cities for internal communications is provided, as a rule, off-street transport – subway, railway, monorail. Typically, the big and very big cities are regional and inter-district centers of the settlement system, as well as centers of agglomerations, conurbations and metropolitan areas. Large and medium-sized cities are inter-district and district centers of group settlement systems of various sizes. Small towns are district centers of local settlement systems.

On a chronological basis, we can distinguish two types of cities – historic and new. Historic cities, which developed spontaneously, have the largest specific costs of spatial planning. These cities have a certain specificity: special norms, rules and methods of reconstruction and new construction have been developed for them. New cities are being built according to a single plan.

According to the administrative and political significance, the following cities are distinguished:

– capital;

– centers of regions, region;

– centers of lower administrative districts.

Administrative and political importance affects the size of external relations,

recruitment and number of institutions. Thus, in the capital there is the Verkhovna Rada, the Supreme Court, the Academy of Sciences, ministries, museums, universities, theaters, in regional centers – regional organizations, museums, exhibition centers, theaters, but in smaller numbers.

Since ancient times, several main types of cities are known: fortress city, port city, residence city, trading city, sanctuary city, a type of resort city, whether on the coast or at healing springs. Later, several new types were formed: factory cities, garden cities, and so on.

Port cities are located on the seas, large rivers. Their specificity is a fan-shaped plan of the city, where the city center is located, as a rule, by the sea (river); a railway is required for a cargo port; if there is a resort – a large number of tourists and vacationers; the presence of a large space corresponds to the architectural silhouette, an example of a port city on the sea – Odessa, Kherson and Nikolaev, on the river – Zaporozhye, Kiev.

The city-railway junction, its territory is divided by the railway, which complicates transport communication within the city; usually several railway stations; availability of railway depot, warehouses.

The satellite city, a type that appeared in the 1920s but developed in the 1970s and serves as a "residential branch" near a large city, or in which one type of industry predominates, was designed to solve the problems of development of the largest cities, zones of their influence.

The city-garden, introduced by E. Howard, also became a model for the development of modern urban planning of the time.

University city – Campus, campuses in the complexes of large universities, combining several functions (education, sports, recreation and housing for students and teachers).

Museum cities are well-preserved ancient cities that are interesting in terms of acquaintance with the history of the country. Specifics: a large number of tourists, which determines the number of hotels, service facilities and more. The new building is subject to the historic buildings of the city.

Scientific cities are a new type of cities that emerged in the twentieth century. and demonstrates the growing role of science. Specifics: the size of the city is small; are located in good natural conditions (more often – the forest); in the building a large part of research institutes, houses of scientists, increased demands for silence.

By the nature of the functions performed by the city, we can identify settlements that specialize in:

- industrial production (industrial centers);
- transport services – port city, railway junction (share of those employed in industry below those employed in transport);
- cultural and household services – tourism centers, cities – museums, health centers (more than 10% of the working population is employed in health care);
- research (research centers);
- agricultural production.

Most cities have multifunctionality. As a rule, the functional nature affects the planning of the city, gives it specific features. Thus, on the territory of the industrial city there is a large number of industrial facilities (up to 50% of the territory), as well as railways, freight stations, access roads, sanitary protection zones. The design takes into account the location of the industry, the fight against harmful emissions.

In the theory of modern urban planning, there are many proposals for the division of cities into emerging, developing and stagnant, "optimal" and suboptimal, centered and dispersed. The idea of experimental construction of "ideal" cities and ecopolises is developing more and more; global concepts of "total city", metro and megalopolises are spread, surface, underwater and space settlements are designed, etc. All this suggests that modern classifications and typology in the future should become a systematization of cities, consistent with many features and requirements, able to be an effective means of creating a full-fledged urban environment.

1.4 Transport infrastructure and city-forming systems

1.4.1 History of mass urban transport development.

1.4.2 Transport infrastructure.

1.4.3 City-forming systems.

The history of urban development shows the relationship between urban growth and technical capabilities of means of transportation. With the growth of the population and the territory of cities, the volume of urban transport is growing faster than the urban area, because the "mobility" of the population is growing (average number of trips per capita per year), and the range of travel increases. At the same time, you can trace the feedback: the improvement of transport helps to increase the speed of travel, which, in turn, allows you to expand the urban area.

The need for mass public transport arose in the XVIII century, when the world's largest cities reached significant proportions, and their further development was largely constrained by the lack of vehicles.

The whole history of the development of mass urban transport can be divided into four periods depending on the nature of traction and the type of road devices used.

1. Equestrian traction (until the middle of the XIX century). The small size of the cities allowed the use of this simpler mode of transport, which met the limited needs of travel at the time.

2. The first railway overground and underground rail tracks – steam and horse-iron, subway (late XIX century.). The size of the largest cities reached 10–20 and even 30 km., This is a period of rapid industrial development and urban growth.

3. The period of widespread rail electric transport in many large cities (horse-drawn trams). The first quarter of the XX century has already been marked by successful experiments on the use of electricity for public transport. Electric trams quickly supplanted horse-drawn railways and steam locomotives. The first passenger electric tram was introduced in Kiev in 1892, and in 1906 the first tram line was

opened in Kharkov.

The period of rapid development of road transport is characterized by the emergence and widespread use of buses and various types of high-speed off-street transport and, above all, the subway.

The current stage of development of urban transport is characterized by features:

- integrated use of different types of transport with the advantage of road;
- development of high-speed off-street types of transport;
- exacerbation of the "conflict" between mass and individual transport;
- strengthening transport links between large cities and settlements that gravitate to them; development of urban agglomerations.

Transport infrastructure is a network of streets, roads (including railways), garages, parking lots, as well as a rolling stock. The transport infrastructure provides a connection between the city's planning units. According to territorial features, streets and roads are divided into city, district and residential streets. City highways are outside the districts. In large and largest cities, outside the city planning areas are high-speed city highways and specialized roads for the transportation of goods, for the movement of high-speed types of city transport, and so on. Highways and specialized highways are adjacent to highways of citywide importance. Expressways are laid on the borders of large urban areas, in sanitary protection zones together with railways, monorails and other high-speed transport. District highways cross the territory of a residential area and divide it into microdistricts. Thus, district highways are the boundaries of microdistricts. The main function of district highways is to focus traffic on city highways by the shortest route. Microdistricts, in turn, are divided into residential groups by residential streets, which are the boundaries of residential groups and residential complexes. Public transport is prohibited on residential streets.

Thus, the transport network is a multi-level hierarchical system. According to the speed of traffic, the transport network is divided into high-speed and regulated highways and streets. According to design norms, has turning radii and density of

passage of streets and roads that depends on their category. For example, the distance between residential streets is taken within 400–500 m, between city – up to 1000 m, between highways – up to 3000 m. According to the configuration in the plan, the system of main streets and roads is divided into rectangular, triangular, radial-ring, branched, loop and mixed. According to the categories and streets that intersect or adjoin each other, and the nature of traffic regulation, transport hubs are divided into classes.

In intersections and adjacencies of the highest class, all flows move continuously, without areas of traffic light regulation. As a rule, highways and suburban highways intersect at such junctions. High-class transport hubs are designed in two, three or more levels.

In first-class crossings, the flows are also continuous. This class includes intersections of highways, city streets. These crosses can be solved in two levels.

In intersections of another class traffic light regulation is introduced. City and district streets intersect at the transport hub of another class.

District highways and residential streets intersect at the same level in the fourth and fifth class transport hubs. The transport node in these cases is designed with a circular motion at the same level.

According to the form in the plan and character of the movement cross-knots are divided into ring, like "clover", loop, diamond-shaped, linear and combined. The choice of the type of transport crossing is made in the draft master plan of the city and depends on the design ideas.

2. FUNCTIONAL AND PLANNING ORGANIZATION OF THE CITY

2.1 Architectural and spatial composition and planning structure of the city

2.1.1 Planning structure of the city. Types and forms of city structures.

2.1.2 Compositional structure of the city.

2.1.3 Architectural and spatial environment of the city.

The planning structure of the city is a set of functional zones and planning elements interconnected by a transport network, a network of centers of residential areas and neighborhoods, a network of greenery and recreation areas, as well as utilities.

Planning structures differ in the form of the plan. The oldest cities have a planning structure in the form of a rectangular grid. This city planning is called a hippodame structure. It was used in Ancient Egypt, Sumer, Assyria, China, Ancient Rome and Greece; in modern cities – Washington, New York; in new cities of Europe and Asia: Chandigarh, Togliatti, Brasilia, as well as in new areas of historic cities.

A regular city plan can be built on the basis of an octagonal or hexagonal grid. Such cities include Canberra in Australia, Toulouse le Miray in France. Mesh structures can be regular on the basis of the module and irregular. Irregular and radial-ring structures are characteristic of the cities of the Middle Ages. Almost all the largest cities in Europe at the beginning of their development had a radial-circular structure, for example, Amsterdam, Milan, Paris, Krakow, Kiev, Moscow and others. Later, in larger cities, with the increase of transport problems, the radial-circular structure turned into a mesh.

For large and the largest cities, the type of structures that can be called a mixed structure is important. This structure combines elements of mesh and radial-ring systems, which can be superimposed on each other or can be located in different areas of the city.

According to the shape of the urban area and the nature of zoning, planning

structures are compact, linear and dispersed. In compact structures, the composition of the city revolves around its center, the area is close to a circle, square or regular polygon. In linear structures, the territory (residential, industrial, recreational and other areas) are located in strips along the railway or highway. The linear structure usually has several urban centers. The scattered structure consists of several urban areas, separated by a river, ravines or railways or a road. In dispersed structures there are problems with utilities.

Large and the largest cities, as a rule, have a radial-circular structure in the historic center, and on the periphery – a linear, mesh or scattered structure.

An important role in the composition of the city is played by the system of main streets and roads, which forms a system of composite axes and nodes (at the intersection of streets).

Another important element of the composition is a system of greenery: city gardens, parks, squares and recreation areas. These city-forming objects are placed both along and in the places of intersection and adjacency of the main compositional axes, in a complex with architectural ensembles.

Thus, the architectural and spatial composition of the city includes urban ensembles, a system of greenery and parks located in a system of compositional axes, which are the main urban highways that unite the dominants of the city.

An important task of forming the composition of a new city is to choose a place for its location and to establish the relationship between the landscape and the organization of the architectural and spatial environment. The natural landscape and the results of its assessment should become the basis for the formation of the main compositional axes, panoramas and silhouette of the city, to select the best locations for the dominant in the form of large urban ensembles. The structure of the landscape and relief of the territory determines the location of city gardens, parks, squares, as well as the configuration of city highways, the size of districts, microdistricts and quarters. Thus, the nature of the landscape determines the type of planning structure and composition options of the new city.

An important element of the composition of the new city is the establishment

of proportions between the volume of buildings and the natural environment, between the size of the squares and the ensembles that surround them, as well as between the proportions of the city plan. The nature of the proportions is derived from the nature of the landscape and contributes to the individuality and uniqueness of the image of the city.

The formation and development of the composition of the historic city is based on the imitation of the connection between its past, present and future. Further development of the composition should be based on the continuation of the existing compositional axes and the continuation of the ideas of historical planning, which will be the basis for the compositional placement of new areas and reconstruction of the old quarters of the city. Sometimes the composition of a historic city acquires a new "sound" due to a combination of new images and forms that enhance the significance of the historic city center.

The unification of the scattered structure of large historical cities becomes the main problem in the formation of their composition. This problem is usually solved by the formation of large compositional axes along open green park spaces, water-green diameters of the city, along rivers and embankments. The enlargement of proportions due to the artificially formed landscape is an effective method of forming a holistic composition of a historic big city.

A significant role in the composition is played by engineering and transport structures: viaducts, overpasses, bridges, canals, expressways, etc., which have historically been characterized by large size and scale compared to ordinary buildings.

When developing the composition of the city plan, the architect must pay attention to the nature of the city panorama as a business card of the city. City panorama is a general view of the city from distant entrances, from the side of the river, sea or mountains and other special places of the landscape.

2.2 Functional structure of the city

2.2.1 Functional structure of the city.

2.2.2 Functional organization and zoning of the city.

2.2.3 Service system.

Historically, the city arose due to the desire of man to develop the spatial environment of his home. During the evolution of the city – from the original settlements of prehistoric times – to the formed socio-economic and territorial-planning urban formations of today – there is a need to know the city as an object of observation, evaluation and forecasting. In 1933, in the "Athens Charter" of the IV Congress of the International Union of Architects (SIAM) proclaimed four main functions of urban activity: work, housing, recreation and movement. In modern urban planning, the city is seen as a project of integrated development of these activities. These functions of urban activity form the main functional areas of the city: industrial, residential, recreation area and transport area. Cities are growing rapidly, so in modern urban planning there is a reserve zone for city development.

Further structuring of the territory of functional zones leads to the formation of the spatial structure of the city, the main elements of which are urban areas, residential areas, microdistricts and residential groups. The functional zones of the city are united by the urban planning infrastructure. The main city-forming networks are the transport network, the network of green areas, engineering networks, the network of service centers.

The combination of basic urban functions, functional zones, urban areas and urban networks is called the planning structure of the city. Development and substantiation of the planning structure is carried out in the general plan of the city. Specific landscape conditions determine the individual image of the city.

Work, life, recreation and movement are the main functions of life of the urban population, which are implemented in the city. The territory of the city according to its functional purpose and character is divided into the following main zones:

industrial, residential, communal-warehouse, sanitary-protective, recreational, zone of external transport and zone of the city center. A functional area is a section of urban area with one predominant function.

The industrial zone consists of industrial enterprises and territories, on the basis of production cooperation, technological and transport infrastructure. It must have a convenient connection with the settlement area. The industrial zone with a large cargo turnover should be located near railway stations, river and sea ports. The nature of the production base determines the distance of the industrial zone from the living area.

Sanitary protection zone is established between industrial and residential areas. In addition to greenery, it can house fire depots, parking lots and garages, utilities, administrative and commercial buildings. The purpose of this zone is to ensure the protection of the residential area from the harmful effects of industry. The main sanitary requirements are the location of the settlement zone on the leeward side relative to industry and upstream along the industrial zone.

Recreational area is located in environmentally friendly areas, near rivers, lakes and other bodies of water, near forests, where they create places for daily and long recreation. Parts of the recreational zone can be located inside the city (gardens, parks, squares) and outside it (forest parks, meadows, water parks).

Warehouses, communal enterprises, laundry factories, dry-cleaning factories, public transport depots, garages, and service stations are located in the communal-warehouse zone. This area should be conveniently connected to the industrial area.

The zone of external transport consists of a complex of bus, railway, river and other stations that receive external flows of passenger transport, as well as the network of road infrastructure that serves these complexes.

The residential zone is a multifunctional zone, which includes residential areas, public shopping centers, greenery, places of short-term recreation, main streets and roads of urban and district importance, parking lots, garages. In the largest and large cities, the largest territorial unit is the urban area, which, as a functional entity, may include all functional areas. The approximate population of the urban area for the

largest cities is up to 500 thousand people, for large – up to 100 thousand people.

Thus, functional zones have a hierarchical multilevel structure: residential group, microdistrict, residential districts and urban districts. These structural elements are an important part of the general plan composition. The residential area consists of several residential districts.

In large and largest cities, an area of general city use is organized, which consists of large administrative, commercial and residential complexes. In modern urban planning practice, the center is built on the principle of vertical zoning. The zone of research institutes, laboratories and design bureaus is allocated in the cities of scientific profile and in technopolises.

The city service system should be designed in a complex for residential, industrial and recreational areas. When determining the capacity and location of public centers of the settlement area, it is necessary to take into account its division into urban, residential areas, microdistricts and residential groups. When forming a service network, it is divided into groups depending on the frequency of its use:

- institutions of episodic use are located in city and specialized centers, in the centers of urban planning areas. The time for trips to institutions of occasional use is 25–30 minutes. Institutions of occasional use include theaters, museums, stadiums, houses of culture, exhibition centers, large department stores, large supermarkets, etc.

- institutions of periodic use are located in public centers of residential areas. These institutions include cinemas, libraries, clubs, department stores, laundries, dry cleaners. Travel by transport to these institutions should not exceed 15 minutes;

- institutions of everyday use – kindergartens, schools, sports grounds, clubs, pharmacies, shops – are located in the centers of neighborhoods with a radius of pedestrian access 300-400 m. Some institutions of everyday use can be located directly in residential groups with a radius of access 200–300 m.

Service facilities in industrial areas need to be designed as part of a single urban service system. In industrial areas, service facilities are divided into two main groups:

- I) in-house institutions – canteens, rest rooms, medical centers – with an access

radius of 300-500 m;

2) institutions in the centers of industrial areas with an access radius of 1,5–2,0 km (15–20 minutes) – training centers, clubs, libraries, shops, sports grounds and stadiums, etc.

Service facilities in public recreation areas (parks, beaches, resorts) are also designed as part of the overall city system. They should be placed taking into account the division into two groups. The first group includes institutions in campings, camp sites, boarding houses with a service radius of up to 500 m; to the second – institutions in the centers of recreational areas with a radius of 1–5 km. Sports complexes, cafes, restaurants, shops, cinemas, etc. are located in these centers.

The main link in the service system is the city center, in which there are theaters, circuses, sports arenas, stadiums, large libraries. The city center should be conveniently connected with railway stations, centers of industrial and residential areas, with a city park and a sports complex.

The main areas of the city center are as follows: administrative and business, trade, sports, cultural and educational institutions.

2.3 The residential territory of the city

2.3.1 Urban residential formation.

2.3.2 Spatial organization of territories.

2.3.3 Structural components of the territory.

Urban residential formation is a planned integral part of the living environment, intended or actually used for living. The main types of such formations are: a group of residential buildings – a whole group of houses near each other, often around the yard, the group may not have clear planning boundaries (streets, driveways, fences, etc.); residential quarter – inter-street space, where at least 50% of the territory is occupied by residential buildings and adjacent territories; residential district – a quarter for 6–20 thousand inhabitants, within which there are institutions and enterprises of primary service (warehouse, capacity and accommodation are designed for residents of the microdistrict); residential area – an inter-highway area for 25-80 thousand inhabitants, within which there are residential microdistricts or quarters, a periodic service center, a district park, a communal zone. Residential microdistricts and districts are formed, as a rule, in large and largest cities. The planning organization of urban housing units is significantly influenced by their location in the city plan in relation to the structural-planning zones (central, transitional, peripheral), to the planning axes and nodes of the city level.

Historically, the residential territory of cities was the "lion" part of the city and had its traditional features in different cultures and countries. The first major types of housing appeared in ancient Rome (domus, villa, insula (high-rise building)). Changing over the centuries, these types exist in the modern structure of the city. At all stages of development and development of cities there was a creative search for socialization of the living environment: these are the houses-communes in the 20s, and social towns in the 30s, and houses of new life in the 60s of last century. The growth of industrial production, the emergence of trade and business institutions (shops, restaurants, salons, etc.), led to their blocking and integration into the housing

structure. Thus, the processes that determined the separation of production from housing, later led to the unification and emergence of new types of multifunctional buildings and complexes.

Residential areas – areas built up or intended for development mainly or exclusively by residential buildings. This area is one of the main components of the city structure, located in its several parts like the main element. The residential area is the main element of the planning structure. The function of the residential area is to provide maximum convenience and comfort for the population, to create an architectural and artistic image of the building in compliance with sanitary and hygienic and construction norms and rules.

One of the most important conditions for the urban residential formation is the complexity of the living environment, which is provided by: the presence of an orderly adjacent territory of sufficient size, adapted to all household processes organized near the house (car parking, children's games, adult recreation, garbage disposal, etc.); normative pedestrian accessibility from residential buildings of primary care institutions; convenient transport or pedestrian communication of residential formations with places of employment, centers of periodic service, recreational facilities.

The starting positions of the spatial organization of residential formation are: determining the boundaries and area of formation, as well as the nature of their relationship with other elements of the planning structure of the city; population calculation; determination of the required volumes of residential stock and types of residential buildings, composition and capacity of service facilities, composition of the main functional zones and their share in the overall balance of the territory. The boundaries and, accordingly, the total area of residential formations are largely determined by the type of these formations. These parameters can be quite rigidly set when designing the living environment (for example, for microdistricts and quarters when designing a residential area) or can be clarified and adjusted based on the general plan of the city. The boundaries of a residential area are determined by the presence of obstacles (main streets, railways, rivers), and its area is determined by the

requirements of spatial accessibility of the public center of the area. The area of the microdistrict or quarter – within the red lines of the streets that limit them, and the density of buildings depends on the location of housing in the city plan.

The structural components of residential formations are specialized areas, or zones, in which residential and public buildings, structures and appropriately equipped open spaces are located. Urban housing entities consist of specialized territories, the main of which are regulated. Thus, in residential areas, in addition to the actual residential areas, which occupy about 60% of the total area, there is a zone of the district public center, green public areas, a zone of sports facilities, a communal zone. The list of functions is determined by urban planning regulations, where the primary ones are: residential area, secondary schools, preschools, clinics, pharmacies, trade, catering and consumer services of local importance, post offices and banks, sports facilities, streets of local significance, parking of motor transport. Within residential areas it is allowed to place religious buildings, homes for the elderly, automatic telephone exchanges, boiler houses, other related engineering and technical facilities, as well as small office, industrial, municipal and warehouse facilities, which do not require the installation of sanitary protection zones and activities which do not have a harmful effect on the environment. Industrial, communal and storage facilities are not allowed to be located in residential areas, which require the establishment of sanitary protection zones and whose activities have a negative impact on the environment (noise, vibration, magnetic fields, radiation exposure, air pollution, water pollution, etc.).

2.4 Industrial area of the city

2.4.1 Structural organization of the industrial area.

2.4.2 Urban planning requirements for accommodation.

2.4.3 Functional and planning measures for environmental protection.

Urban planning requirements for the location of industrial facilities are based on achieving optimal sanitary and hygienic characteristics, effective development of the territory and the use of artistic resources of industrial areas in the construction of the city. City planning involves the development of an industrial location system, which should correspond to the general architectural and planning concept. The main structural spatial planning elements of industrial areas are: the production complex of the urban agglomeration, the production area of the city, the urban industrial area, the industrial node (hub) and the industrial site. The urban industrial district is the main structural unit of the city's production zone and is divided into new (projected), developing and reconstructed.

The main requirements are: rational settlement of workers, efficient use of urban territory, restriction of industrial freight turnover within urban settlement and environmental protection. To ensure these requirements, it is necessary to be guided by such indicators as: urban classification according to the degree of harmfulness of production (negative impact on the environment), total and specific employment, territorial capacity, turnover, water supply and sewerage.

According to the specified requirements, it is necessary to solve the following tasks:

- to establish the necessary levels of concentration of production, which affects the degree of its harmfulness, determined by the coefficient of MPC (maximum allowable concentration of harmful impurities in the MPC);
- to form the composition of production, with minimal negative impact on the environment;
- to provide for the re-profiling or removal of industrial area, the harmful

effects of which cannot be avoided;

- to complete the profile of the industrial area on the basis of ecological compatibility of production.

Urban industrial areas are divided into three categories, according to territory, number of workers, sanitary classification and turnover:

- production is located at a distance from the residential area;
- production is located on the border with the settlement territory;
- production is located within the settlement territory.

According to these categories, functional and planning measures for environmental protection are determined:

- removal outside the city of industrial enterprises that pollute the air, water, soil;
- cooperation of industrial enterprises on the principle of waste-free production;
- formation of industrial areas on the principle of ecological compatibility of different enterprises;
- placement of industrial enterprises with high freight turnover near roads and railways.

The main task of urban planning for environmental protection is the integrated use of measures for cleaning and recycling of hazardous waste, the organization of sanitary protection zones, rational planning and improvement of industrial areas. Technological, ecological and sanitary-hygienic requirements and conditions should be taken into account when developing the general plan of the city and the project of planning of the industrial area. Urban planning requirements include a set of measures to improve the planning of industrial areas, compliance with sanitary and hygienic standards and environmental protection of the urban environment from harmful emissions from industrial enterprises. These requirements must be taken into account at all levels of urban design of industrial sites, nodes, districts, zones and industrial complexes.

2.5 The system of the public city spaces

2.5.1 Network of community centers.

2.5.2 Transport and communication centers.

2.5.3 Multifunctional centers.

The cumulative system of urban centers is the basis of social security of the citizen in the needs of various activities and accommodation.

The system of public centers of large and the largest cities includes: city center, centers of planning (urban) areas and districts, centers of residential areas and microdistricts, centers of industrial areas and centers in recreation areas. Public buildings and institutions of various functional purposes – administrative, cultural, educational, entertainment, trade, etc. are located in these centers.

The city center is the main link in the system of centers. In the centers of districts and microdistricts there are institutions of episodic, periodic and daily service. The city center and district centers are interconnected by a transport network into a single system. In modern large cities, this system is complemented by a network of transport and communication centers, which are located at the intersection of major highways and major pedestrian flows.

The network of these centers includes centers of planning (urban) areas, centers of residential areas and microdistricts, centers of industrial and recreational areas, as well as specialized centers.

In the centers of the planning districts there are public buildings that serve the population of several residential districts, as well as workers and employees of the enterprises of the planning district institutions of episodic and periodic service. An hour of travel to the center of the planning area should not exceed 20-30 minutes.

Administrative and business institutions, hotels, exhibition halls, galleries, museums, theaters, cinemas, libraries, sports arenas, stadiums, etc. should be located in the centers of planning districts. The center of the planning district must have a connection with the city center.

Transport nodes (hubs) are the intersection of the main city highways. Stinks include metro stations, railway stations and railway stations, bus stations, river stations, airports, etc .; provide interaction of transport systems of the city and at the same time serve the public and shopping centers which are in a zone of their influence. Transport and communication centers include high-speed land and underground transport stops, a network of underground and overland pedestrian crossings, and public shopping centers.

Cooperation of public and transport service institutions solves a number of problems of the modern city. Transport and communication centers allow to organize transport and pedestrian communications, to save the city territory, to make the city environment more convenient, comfortable and aesthetic.

The creation of transport and communication nodes (hubs) is associated with another problem – the use of underground space. The method of vertical functional zoning allows rational use of underground space and urban area; it is convenient to connect all zones with transport communications.

The use of underground space makes it possible to concentrate service facilities, replace long horizontal connections with shorter vertical connections.

The first underground levels are used for subway lobbies, public transport stops, parking lots, warehouses and other service facilities; the second underground floor is, as a rule, for tracing high-speed transport tunnels (metro, highways, railways).

The buildings of the public shopping center are located on the ground floors. The center is connected to metro stations, transport stops, parking lots by stairs, elevators, escalators and ramps. Residential apartments can be located on the above-ground floors of the public transport and communication center.

The set of transport and communication centers complements the system of district public centers. The network of transport and communication centers are important nodes (accents) of the overall architectural composition of the planning structure of the city.

The idea of spatial integration of various functional objects in small areas of

the city is the basic principle of modern urban planning. Thus, the versatility of community centers is the main characteristic of modern urban complexes.

The centers of districts, microdistricts and complexes, as well as the centers of small towns, satellite cities can be solved in the form of multifunctional centers – residential area, administrative and business area, shopping area, cultural and educational area, sports area and recreation area. Multifunctional centers may also include a production area with small industrial enterprises.

The structure of multifunctional centers can be built on the principle of horizontal, vertical or mixed zoning. The main principles of the organization of multifunctional centers are the cooperation of several functions in one building, the blocking of several multifunctional objects, the combination of several functions on different floors of one building.

The network of public centers of the city includes the centers of planning, residential, industrial and recreational areas. This network is evenly distributed in residential, industrial and recreational areas. The network of district and microdistrict centers is supplemented by specialized, transport and communication and multifunctional centers.

2.6 Landscape and recreational areas of the city

2.6.1 Landscaping system of the city.

2.6.2 Landscape and recreational area of the city.

2.6.3 Urban significance of green areas.

Urban greenery is divided into public greenery and special greenery. These two groups together create a system of greenery in residential and industrial areas. District and microdistrict gardens, squares, boulevards and embankments serve for short-term rest of inhabitants. For each type of landscaping choose special species of trees that provide effective protection against noise, pollen, gases and overheating. The system of park ensembles and garden and park complexes is an important part of the architectural composition and planning structure of the city as a whole. Garden and park complexes of various types, types and sizes include several large parks, gardens, squares, pedestrian boulevards and rivers, lakes and streams, and also park constructions.

Thus, garden and park complexes create a system, which usually includes regular and landscape parks. In modern cities, the garden and park complex is a place of rest for a large number of people. As a result, the complex institutions and enterprises of trade, entertainment and service, attractions and parks for children, parkings and the necessary outbuildings and structures.

In the practice of landscape design there are the following types of placement of greenery: centric, peripheral, group, linear-strip.

Places for daily recreation are located in the village, and places for short-term recreation – in forest parks and suburban areas. City parks provide recreation for the population and are the main areas of greenery in the system of urban recreation. The territory of city parks in the city is: in large cities – 60–100 hectares, in medium cities – 20–40 hectares, in small cities – 35 hectares. The maximum size is a park with an area of 300 hectares, which has a rational planning scheme.

Residential parks are also important elements in the recreation system. The

total area of public greenery is about 20-25% of the city. The system of greenery of a residential area is part of the city system of greenery. The green plantations of the district include: parks and gardens of general use, district and microdistrict use, squares, boulevards and street plantings.

Landscape-recreational zone is a set of all landscape, "green", water spaces of the city and suburban areas, preserved or newly created, in their architectural-planning and compositional unity. These are green areas, often with a unique landscape, the main function of which is the organization of recreation – urban and rural parks, green recreation areas in residential buildings, as well as urbanized recreational areas – areas of entertainment centers, attractions and other recreational facilities, but do not always include green areas. The criterion for classifying recreational areas as landscape-recreational is the share of green spaces – more than 50% of the total area.

The urban significance of greenery is difficult to overestimate, they: regulate the temperature; favorably affect the composition and purity of the air; used in the fight against urban noise; favorably affect the psychological state of man; create landscape attractiveness of the city as a whole and its separate parts; enrich architectural ensembles and play a leading role in the architecture of parks and gardens.

The landscaping system, on the one hand, can be determined by the division of the city into planning elements, and on the other – can determine the planning structure of the city. When forming a system of greenery should take into account the size and functional profile of the city, climatic conditions (rainfall, air temperature, winds, the presence of reservoirs, rivers).

The landscaping system must meet the following main tasks:

- functional organization of urban areas for various purposes, including for outdoor recreation;
- sanitary and hygienic – improvement of the urban environment and improvement of the microclimate;
- architectural and artistic – the formation of a holistic and architecturally

expressive landscape of the city.

The criteria for assessing the option of landscaping system are: the uniformity of their distribution throughout the city, especially in relation to housing, transport and pedestrian accessibility;

- continuity of the system, which depends on the possibility of planning the association of gardens and parks by boulevards, embankments, green streets and alleys;

- complexity of the organization of inner-city and suburban green areas, planning association of inner-city open spaces with suburban forest parks and forests.

The system of green areas should correspond to the planning structure of the city. Each planning unit corresponds to certain green areas: microdistrict – garden of the microdistrict; residential area – garden, boulevard, residential area; planning district – district park; city – city parks, gardens, children's and sports parks, water parks, forest parks, boulevards, squares, embankments.

The structure of the system of greenery depends on the size of the city. A small town is the simplest structure: a city park, boulevards, gardens of microdistricts. The middle city is a city park, gardens of residential areas, squares, boulevards, gardens of microdistricts. Big city – city park, gardens of residential areas, children's and sports parks, water parks, forest parks, boulevards, squares, gardens of microdistricts. In a large city, district parks, botanical and zoological gardens are added to the listed green plantations.

3 PLANNING AND DEVELOPMENT OF RESIDENTIAL AREAS

3.1 District planning is a means of urban planning

3.1.1 Designing features of the city areas.

3.1.2 Public service areas.

3.1.3 Distribution of zones and service radii.

District planning is both a type and a stage of urban planning, it is an important link between the levels of planning and design of individual cities and villages. Its main feature is to determine the best option for the rational location of industrial enterprises, cities and towns, transport and utilities, places of mass recreation. At the stage of district planning, geographical, economic, demographic, environmental, engineering and architectural-planning factors and conditions must be taken into account. The concept of development of the city in group system, perspective population and the size of the territory, the scheme of engineering transport service of the city, etc. develops in district planning.

In modern practice of urban planning the current planning and control – monitoring is used. Thus, the main task of district planning is to develop project documentation that ensures the correct and rational organization of economic activity in the economic district, region or country for a long time. Design work at the stage of district planning is divided into two types: schemes and projects. Schemes differ from projects not only by the size of the planned territory, the detail of development and the order of organization of the design process. District planning schemes are developed for territories covering region or a small country as a whole. The scale of graphic materials is taken: 1:100000, 1:50000. District planning schemes serve as a link between economic – geographical / territorial / and urban planning. The main tasks of developing district planning schemes are to determine: natural, territorial, labor and economic resources; determining the number, size and location of new cities and towns; prospects for population change, the direction of formation of settlement systems; prospects for service and recreation of the population and

providing it with resources (water, energy, development of transport and utilities), identification of measures to protect the environment, improve and preserve the ecology of natural landscapes. And also development of the scheme of functional zoning and complex placement of management projects; substantiation of the boundaries of economic-planning districts for the development of the district planning project; preventing the growth of large and the largest cities.

The district planning project is the next stage of district planning. Graphic materials are made in scales of 1:50000, 1:25000. The project covers part of the region, one or more administrative districts that have a common system of economic and planning relations. The boundaries of districts (planning objects) are determined by district planning schemes. In some cases, district planning projects are implemented for large and the largest cities, as well as for a group of rural settlements, agglomerations, resort areas, etc. The main tasks of development of projects of regional planning are: economic placement of industrial complexes taking into account specialization and cooperation of the industrial enterprises, their association in industrial knots; formation of an optimal system of settlements and local systems of rural settlement; rational tracing of the transport network, utilities; organization of a suburban agricultural base to provide products for the urban population; development of a comprehensive scheme of environmental protection; development of a rational scheme of service and organization of the system of places of mass recreation; substantiation of prospects of development of the city in group system; development of the planning structure of the group system of settlements.

Approaching the city center reduces the geometric parameters of residential formations, increases the height and density of buildings, changes the composition and principles of location of service facilities, the structure of recreational areas, increases the representativeness of buildings. However, in any case, the planning structure of residential formation is created on the basis of the planning framework – the most important planning axes and nodes (transport and pedestrian routes, the main focus of the population). The elements of the structural components are specialized in the functional purpose of the zone, including residential groups, objects

of trade, cultural and household services, schools, kindergartens, parks of residential areas, communal zones.

Planning organization of residential areas is normalized. Thus, the maximum distance from residential buildings to institutions and enterprises of periodic service (the center of the residential area) should not exceed 800–1200 m, while providing a possible access by public transport; distance to objects of daily service (the center of the Microdistrict) – 500 m; to objects of approximate service (primary needs) – 250–500 m. Stops of mass passenger transport should be located at a distance of not more than 400 m from residential buildings. In areas of homestead development, these figures increase by 30–50%. The optimal method of spatial organization of residential areas is the formation of closed or semi-closed collective residential yards, which are formed by several residential buildings. In manor buildings, it is advisable for a group of 10–20 plots to form small green areas of common use, ensuring the implementation of neighborly ties, transport service of residential formations and organization of pedestrian connections. The network of streets and passages in residential formations should provide: convenient external connections with the main nodes of mass attraction in the city and suburbs (places of employment, urban public centers, nodes of external transport, places of recreation and entertainment, etc.); internal connections of all functional zones of residential formations among themselves.

3.2 Residential district

3.2.1 Residential district in the residential territory structure.

3.2.2 Compositional structure of the residential district.

3.2.3 Transport support.

Areas with the most favorable natural and sanitary conditions, if possible near reservoirs and massifs of greenery, are allotted for placement of settlement territories of the city. Dwelling houses, institutions and service enterprises, public and cultural centers, educational institutions, sports complexes, research and design institutes, enterprises that do not cause harmful impact on the environment, as well as greenery, streets and squares are located in the settlement zone.

Convenience of living in the city is determined by the correct placement of residential units (residential areas of the city) in relation to natural factors, places of employment and recreation, communication with the public service system. The nature and structure of the settlement area is closely dependent on the size of the city, its functional characteristics (industrial, resort, city of science, etc.); natural and climatic features. But the general basis for the formation of the spatial structure of the settlement zone is the stepped principle of formation of the public service system, according to which institutions are placed in accordance with their purpose and particular use of the population, which determines the radii of these institution. In addition, the organization of the settlement zone provides for the allocation of compact formations of residential area, isolated from the adverse effects of urban transport and at the same time conveniently associated with its stops. Therefore, given these requirements, the residential area of cities is consistently divided into structural elements: microdistrict (enlarged quarter), residential area, planning area.

The residential area consists of several microdistricts, united by a public shopping center with a park, stadium and sports grounds. The boundaries of the residential area are the main streets – of city or district importance. The settlement zone is divided into the following planning units: urban areas, residential areas,

microdistricts and residential groups. Urban areas consist of residential areas, occupying an area approximately equal to the area of a circle with a radius of 0,8–1, 5 km, ie from 50 to 100 hectares (this distance corresponds to the service radius of the center of the residential area). Residential area is the second largest structural unit of the settlement zone, includes a public shopping center, greenery, highways. The population of the residential area is in large and the largest cities from 40 to 80 thousand people (when building multi-storey buildings), in large and medium – from 25 to 40 thousand people (25–30 thousand people at 5-storey buildings). The size of a compact residential area, as a rule, does not exceed 1,5–2,0 km. In the largest and large cities, the largest territorial unit is the urban area, which as a functional entity may include all functional areas. The approximate population of the urban area for the largest cities is up to 500 thousand people, for large – up to 100 thousand people.

Residential areas, bounded by highways of urban and district importance, are divided by streets (sometimes with public transport lines) into microdistricts and quarters. The latter are isolated from transit transport, which allows to provide visits to institutions and most of the enterprises of daily service without crossing the streets. Transport service of microdistricts and large quarters is often organized by tracing the main internal passage in the form of loops, rings and other forms that exclude transit traffic.

Residential areas contain the territory of microdistricts; areas of public trade, entertainment, sports buildings and structures; gardens and parks, squares and boulevards; parking lots and garages; main and residential streets. The design of the residential area is based on the materials of the general plan of the city. The general plan indicates the boundaries of the residential area, population, defined system of main streets and places for public shopping center, park and sports complex.

The detailed planning project (DPP) determines the general structure of the residential area, the size and number of microdistricts; profiles of main and residential streets are established; "red lines" limiting residential development of streets, defined the capacity of trade, entertainment, cultural institutions, kindergartens and schools are determined; parks and squares are planned and their

sizes are determined; the balance of the territory and technical and economic indicators of building is made; the types of residential buildings for construction are determined.

The basis of the structure of the residential area are: networks of cultural and household services; network of greenery and recreation areas.

The result of the preparatory stage of the formation of residential areas should be expressed in the understanding of specific functional and architectural-spatial tasks. They provide a definition of the place and importance of the area in the city, the conditions of its perception by the main entrances, types of public transport serving the area, the possible location of public transport stops, location of workplaces and the direction of the shortest pedestrian connections to workplaces and transport stops. There is also a study of the terrain, the orientation of the slopes, the location of existing greenery, water surfaces, etc.

Service facilities for residential areas and microdistricts are located in the buildings of shopping and community centers and service units, as well as in outbuildings or ground floors of residential buildings.

Periodic service institutions located in the center of the residential area, it is convenient to place in a complex of buildings-blocks that have a specific purpose: trade, cultural, educational, sports.

3.3 Microdistrict

3.3.1 Microdistrict as part of residential area.

3.3.2 Principles of the residential district formation.

3.3.3 Functional zones of the microdistrict.

The microdistrict was developed as a structural social and housing unit of the residential area, which is located within the streets and unites residents with social services. In the spatial sense, the idea of the microdistrict is based on the following principles: the territory of the microdistrict is limited by streets, which allows residents not to cross the road for shopping, and children – not to cross the road when going to school or kindergarten; the spatial core of the microdistrict is a park, which is connected by pedestrian alleys with the city's landscaping system: parks of other microdistricts and city parks. Thus, a network of green strips is being formed in cities, which connects all residential yards, parks and squares and forms a system of landscaping and recreation areas; – residential buildings are represented by cozy residential courtyards formed by a group of residential buildings – the primary center of the city structure. The microdistrict structure of a residential area is generally accepted, but other solutions are quite possible. It is worth noting the increase in residential groups so that the residential area, bypassing the division into microdistricts, consisted directly of such large residential groups. In this case, each is designed with an extended service unit.

The first microdistricts appeared in the United States almost 100 years ago. These were houses with plots. A church and a school were located in the residential district, the territory was fenced off, and only residents and their guests were allowed to enter the residential district. Thus, the first microdistricts were complex and autonomous residential and public areas. In modern urban planning, the microdistrict is the main planning unit of a residential area, consisting of residential groups. Microdistricts have a population of 25 to 40 thousand people, depending on the category of the city.

The microdistrict has largely eliminated the shortcomings of the quarter, which has historically been the basis for urban development: its area is much larger – up to 50 hectares; therefore it is possible to place institutions of daily service; increase the number of storeys and length of buildings; increase the distance between street intersections, which increases traffic safety and helps reduce gas pollution. All houses and constructions of microdistrict construction are connected among themselves and a natural environment, and also are provided with the most favorable conditions for life. However, the microdistrict has its drawbacks: it is a difficult orientation due to the depth of development, as well as a social factor – the microdistrict depersonalized the system of human relations, while being a complete architectural organism.

Theoretical provisions of the hierarchical structural construction of urban planning were developed in the early 30s in England and the United States. There is a serious interest in the problem of residential housing in terms of rational organization of the transport system in the modern city. The city was invaded by high-speed road transport, cluttered the city streets, threatening the safety of pedestrians, breaking the silence and polluting the city. The modern city, which is not adapted to such a powerful and intense traffic, complicates the latter, hinders its development, reduces its speed. These circumstances encourage planners to look for ways to divert traffic to special highways, protecting residential areas of the city from transit. Urban planners took into account the postulate that the main problem of forming the residential area of the city in the twentieth century, there is an organization of living conditions of the population within the territories limited by highways. And in the late 50s, when the Soviet era began the era of construction industrialization, the scale of which required the development of free territories, the search for concepts of urban organization of areas of mass residential construction forced to return to the theory of microdistrict. All-Union competitions were held for the experimental residential area, for the idea of planning and construction of residential microdistricts.

The microdistricts has taken a strong place in urban planning as an object of design and construction, which is based on the main principles of microdistrict:

1. The principle of integrity, that considered the microdistricts as a whole, its

functional and planning elements constitute an organic unity of the population with its daily needs and living environment, which ensures the realization of these needs.

2. The principle of clear functional zoning, the meaning of which is strict, where necessary, specialization of the microdistricts on the basis of the predominant activities.

3. The principle of providing the population with a full range of cultural and social services within a radius of pedestrian accessibility (including public transport stops) – 300–500 m.

4. The principle of division of pedestrian and transport ways excludes entrance to the territory of the residential district of all types of transport, except for special.

5. Industrial or business institutions and enterprises, public institutions that do not belong to the system of service of the population of this microdistrict may not be located on the territory of the microdistrict.

These principles, as well as the rules of mutual location of functional areas, buildings and structures in the microdistricts, including driveways, playgrounds for physical education, recreation of children and adults, parking, garbage cans, elements of landscaping; established technical and economic indicators, the structure of the balance of the territory are strictly regulated by the official State Building Standards (SBS).

Ideas and principles of micro-zoning are extremely simple and clear, which allow to connect into a single functional-planning system the parameters of the main network of transport-planning structure and networks of public service – social-planning structure.

The compositional construction of the microdistricts, its visual perception, consists of external spaces that reveal the specific prospects of entry and entry into the microdistricts, and the prospects that open when moving towards school, children's institutions, shopping and utilities. The size of the microdistricts depends on the size and planning structure of the city. And the population of the microdistricts depends on the size of the city and the microdistricts and its number of storeys.

The boundaries of the microdistrict are the main and residential streets, and the

territory is divided into functional zones:

1) residential, which occupies 60-70% of the territory of the microdistrict and is located on the edge of the microdistrict, forming a street building;

2) schools, mainly located in the central part of the microdistrict, sometimes near the red lines of the streets;

3) children's preschool institutions, which are designed to accommodate kindergartens and nurseries, which are located in the depths of the territory, often near the houses that they will serve;

4) recreation – a garden of microdistrict significance, a boulevard or a system of boulevards passing through the territory of the microdistrict with accommodation near recreation and sports facilities;

5) service enterprises, for placement of trade and household enterprises of daily service of the population (food and manufactured goods stores, points of household service, etc.), located separately or united in the public trade center of the microdistrict;

6) economic, where garages for individual cars are located, economic block.

Not all of these areas are always available in microdistricts. Sometimes there is no garden or one economic zone can be designed for several microdistricts. The pedestrian alley is the basis of the whole composition. The principle of micro-zoning is based on the organization of the optimal system of public service – the most convenient organization of his life. Group construction of the microdistrict corresponds to the organization of everyday processes, brings clarity and regularity to its functional and structural organization, determines the overall three-dimensional architectural composition as a whole.

3.4 Residential group

3.4.1 The composition of the residential group.

3.4.2 Means of architectural expression.

3.4.3 Architectural organization of space.

Residential buildings are represented by cozy residential yards formed by a group of residential buildings (residential groups) – the primary center of the city structure. The yards are spatially separated from the microdistrict park and have their own spatial structure of functional zoning; – the residential group includes a landscaping area, elements for recreation of the population: children's and sports youth playgrounds, playgrounds for quiet recreation of residents, places for knocking out carpets, walking dogs, parking and a laundry area; – the spatial structure of residential groups is opened towards the microdistrict park or external recreation area (river, lake, city park) and is connected with the microdistrict center by alleys. Also, residential groups at the entrance to the microdistrict park include conveniently located kindergartens. Kindergartens are located at the exits of residential groups to the park; – in the green strip of the microdistrict park there are shopping centers of daily service, schools, sports establishments, stadium, clubs. Community centers are tied to public transport stops. Schools, sports grounds, objects of cultural, household and trade service are located in a compositionally significant place and are provided with necessary conveniences; farmyards, entrances and approaches to the areas in front of the building. A group of squares and public buildings connected into a single space is included in the compositional node of the center of the microdistrict (most often the whole is located at street intersections). The formation of a system of centers of microdistricts associated with the system of centers of residential areas and urban centers, ensures the unity of the compositional solution of the entire residential area. When planning the spatial structure of the microdistrict and residential groups, effective wind protection and insolation of buildings and residential yards should be provided.

Simultaneous application of different types, different storeys and three-dimensional characteristics (length, configuration, plasticity of facades, etc.) in residential buildings is a compositional technique and principle of modern housing construction. Mixed development allows to better meet the needs of different groups and categories of the population. The most characteristic feature of modern practice of layout of multi-storey residential complexes is orientation on the closed and semi-closed planning schemes that, in turn, demands various decisions of a kind of building from external borders (highways, embankments, etc.) and its "interior" – internal spaces of housing groups – "yards", which form a functionally and psychologically necessary spatial layer between the "house" and the "street".

The compositional combination of residential buildings and structures of different storeys should correspond to a certain height ratio and be quite contrasting. The optimal ratio is 1:3, a ratio of less than 1:2 can be used only in exceptional cases, for example, if the increase in the contrast of heights contributes to the steep terrain.

When creating a living environment, it is necessary to ensure that it is large-scale for a person, convenient and dimensional to a person and free spaces, volumes of houses, buildings, etc. elements. When forming a new living environment, it is necessary to take into account the general, historically formed urban scale of the city. This refers to the large-scale ratio of building elements, storeys and lengths of buildings, the division of facade elements, the combination of landscaping elements, small forms, and others.

The problem of superficial housing in modern urban planning practice is complex and controversial, which requires a serious theoretical, comprehensive justification of economic, functional, engineering and medical, medical, sanitary, environmental and, of course, compositional and architectural urban planning positions. The placement of multi-storey tower-type buildings, which act as compositional accents in the construction of housing, highways, can be a regular system in a row, in a checkerboard pattern or freely, obeying the harmony of the compositional combination of volumes and space in which they are located.

The development of urban planning practices in recent decades has led to two

coexisting negative provisions: monotony, on the one hand, and the desire to make everything, even adjacent houses – different, on the other (the latter largely refers to selective construction in the formed part of the city). At the same time, the possibility of realizing the whole building as a system of interdependent ensembles, which require a reasonable restriction in the use of different components of objects (their relationship), is lost, while the difference contradicts their integrity. Finding the right balance between the necessary compositional and stylistic community and the much-needed uniqueness (rather than diversity), the individuality of a single house, housing or the whole city – this is one of the main tasks of today.

A group of residential buildings creates the primary spatial structure of the composition. The combination of houses of different purpose, configuration and different in number of floors and creates the character of the composition: silhouette, rhythm, color ensemble, the type of connection of external and internal spaces of residential yards and microdistrict. The combination of residential groups and public buildings of the microdistrict creates a composition of the highest level of the residential complex. At this level, architectural dominants are revealed, the silhouette of the ensemble, the rhythm of groups of houses is solved. Here, individual volumes of buildings and pedestrian and transport communications take part in the composition, which allow directing the movement of people so that their paths pass through the points of best view and perception of architecture.

The composition of the microdistrict and the residential group can be built on the harmonious relationship of quiet equal in height volumes or on the contrast of linear and point height volumes of residential buildings, as well as on the opposition of simple and complex objects. Great importance in the composition of the microdistrict and residential group is given to the perspective of the ensemble, which can be open, sequentially transitional from one object to another or closed. The mutual location of houses in the microdistrict and in the residential group depends on the terrain and the general composition or an obtuse angle to each other, parallel, curvilinear, free or mixed.

No less important than the volume in the composition of the microdistrict and

residential group is the organization of space, which can be simple – single and complex – divided, multifaceted, dismembered. In architecture find nuance and nuanced relations between floors of houses that does not shock with the contrasting sizes. For example, the exit of the residential area on the highway dictates the need for a closed compositional structure, which contributes to the isolation of the space of residential groups to the adverse effects of the street, and also contributes to the regular construction of the street. The location of a residential area near a park area or pond, on the contrary, dictates the use of the reception of the location of buildings that have interior spaces open to the external natural landscape. An important means of achieving artistic expression in the architecture of residential buildings are the proportions: the relationship between parts and whole, the relationship between parts, and the relationship between man and parts of the building – the conformity of part – the whole and human perception. Proportions determine the rhythm and harmony of form and the harmony and compositional structure of the architectural environment.

Methods of organizing residential construction are extremely diverse, as the housing units themselves are different in size, situational and other conditions of construction. Common to the composition of residential complexes is their artistic and figurative content: in each case, their space should be a comfortable and cozy environment for everyday life. Harmony and unity is a prerequisite for building any architectural ensemble; greater opportunities in the composition of residential areas opens a variety of plastics and shapes of houses.

3.5. Residential complex and residential section

3.5.1 Residential complex.

3.5.2 Types and kinds of residential buildings.

3.5.3 Residential section.

The processes that historically determined the separation of production (industrial area) from housing (residential area), later led to the unification and emergence of new types of multifunctional buildings and complexes. The projects of the first residential complexes provided for the construction of schools, preschools, shops, houses of culture in the immediate vicinity of housing.

The basis of the general compositional idea of any residential complex is often the need to identify the means of architecture of functional, residential and public areas and ways to move to them. In modern urban planning practice, such communications are interpreted as the basis of the internal structure of the residential complex. In this regard, the compositional spatial connections of the residential complex are organized in accordance with the main directions of pedestrian traffic. Compositions of new, most interesting residential formations are based on this principle, where public spaces and services – parking, shops, households – are located in the structure of the complex, often in the underground level and on its first floors. Thus, the basis of the architectural organization of the residential complex is the organization of structural forms based on the terms of the functional process, its elements and connections and, as a result – the plasticity of the architectural form, architectural expressiveness and harmony of the whole.

In this regard, it should be noted that there is no alternative to the question of whether the spaces of residential complexes should be closed or open. Their form is formed under the influence of a functional task and conditions of its decision. For example, planning structures are different for different climatic conditions: the northern areas are characterized by compact planning of housing with small enclosed yards, protected from wind and snow, for the south – requires mostly open, well-

ventilated spaces.

The composition of residential complexes, combined into a district, should be built on the principle of separate completed formations. The connection of houses into groups enlarges the scale of construction, the unit of which is not a single house, but a group of houses. Forming a single whole with the city, these formations inevitably acquire individual features depending on their location in the city, topography, construction zoning.

Residential development consists of residential buildings and mass types of public buildings. Thus, a modern residential building is only part of a complex three-dimensional structure of the building. It can no longer be considered as an independent object, included in different types of groups or in a new type of housing structure, different in length and number of storeys, including service facilities. Therefore, the issue of unification of residential buildings and their blocking is becoming increasingly important. In general, housing consists of buildings of various types. To meet the needs of the population, housing should include a set of apartments that meet the demographic characteristics of the population: the number and age of families, the degree and nature of employment of family members in social production, the nature of life, national traditions.

Until recently, each district of our country had its own type of development. For the middle lane the main type are sectional and partially tower houses; for areas with mild and hot climates – galleries; corridor houses are convenient for placement of small one-two-room apartments; blocked houses were built in small towns and urban-type settlements, in cities with hot climates, in seismic areas. Low-rise buildings have not yet become widespread in our cities, due to its low density. Recently, the picture is changing – low-rise buildings are becoming increasingly popular, especially in areas with temperate and warm climates.

In general, the number of storeys of residential buildings is divided into low-rise (1–2), medium-rise (3–5), multi-storey (6–9), high-rise (10–16), altitude (more than 16). In our country, housing mostly consists of houses of different storeys (5, 9, 12, 18, 24). The choice of residential buildings for this development is based on the

principles of satisfaction of different families with full-fledged apartments, rational use of the territory, compliance of buildings with climatic and other regional conditions and, finally, the possibility of creating the most favorable environment.

The means of solving the problems of mass construction, given the ever-increasing volumes and rates of construction is the industrialization of construction while standardizing the factory production of building elements and structures. In the process of development of industrialization of construction the ways of standardization of elements, and consequently, also ways of designing influencing architecture and planning composition of housing development change.

In the second half of the 1950s, typical housing construction was aimed at meeting society's housing needs as soon as possible. At that time, the massive invasion of typical cities into historically established cities, the huge scale of growth of new cities and towns, created on the basis of a narrow range of typical buildings, led to uniformity, almost complete loss of individuality and originality of cities and towns. In terms of planning capabilities, the typical house used in those years did not have enough flexibility to create a variety of spatial systems, and the introduction of fasteners did not improve the situation. Later, a more rational blocking method of design appeared. The block-section method has significantly expanded the possibilities of creating a variety of spatial planning solutions. This method is based on the principle of typing not whole buildings, but sections. The set of sections – ordinary, angular, rotary of various configuration and superficiality – allows to compose from them buildings of various contours, to give them a difficult silhouette and plasticity.

TEST QUESTIONS

1. What is the subject of the discipline?
2. What are the basic principles of formation of settlement systems?
3. Describe the difference between group systems of settlements, regional systems and agglomerations.
4. Name the types and forms of settlement.
5. Define the concept of "settlement".
6. Identify the disadvantages of agglomeration.
7. Name the problems of territorial organization of cities.
8. What are district planning schemes and projects? What are the types and tasks of district planning?
9. What is the peculiarity of urban planning from other areas of production?
10. Name the main components of the "Concept of the general plan".
11. Identify current trends in urbanization in Ukraine.
12. Describe the urban planning of ancient Egypt.
13. Name the periods of development of ancient Greece.
14. Describe the urban planning and architecture of ancient Rome.
15. Name the architectural achievements of the Roman state.
16. Describe the projects of "ideal cities" of the Renaissance.
17. Describe the architecture and construction of Western Europe and America.
18. Describe the architecture and urban planning of the USSR.
19. Determine the state of construction and the nature of housing in Ukraine.
20. Determine the classification of cities by population.
21. Determine the classification of cities by administrative and political significance.
22. Determine the classification of cities by the nature of the functions of the city.
23. Determine the population structure of the city.
24. What factors are guided by determining the priority areas of urban development and city-building base?

25. What traditional functions of the city are taken into account in its spatial organization?
26. What is the evolution of concepts of urban development over the past 100 years?
27. Name the characteristics of the terrain by the degree of suitability for construction.
28. Name the urban factors that determine the climate of the city.
29. Name the urban methods of solving problems of optimization of insolation and aeration of the building.
30. What factors influence the formation of the form of the city plan?
31. What forms of city plan are distinguished in planning practice?
32. Define the concept of "architectural and planning structure of the city."
33. Provide differentiation of city functions.
34. Name the factors that significantly affect the assessment and functional zoning of the territory in terms of different types of functional use.
35. What factors must be taken into account when choosing a site for the construction of a new city and the expansion of existing ones?
36. Formulate the importance of the planning structure taking into account the further development of the city.
37. What are the main streets in large and the largest cities?
38. What are the requirements for main streets?
39. How does the scheme of the road network affect the load and capacity of the streets?
40. Name the main indicators that characterize the transport system of the city.
41. How does the level of motorization affect the development of public passenger transport?
42. What determines the capacity of urban passenger transport?
43. By what criteria can we compare different types of transport in the city?
44. Name the new types of transport. Identify their advantages and disadvantages?

45. Where are the high-speed passenger transport routes?
46. Name the types of external transport; identify their main features.
47. Determine the impact of rail transport on city planning.
48. Name the main structures of road transport and their location.
49. Name the requirements for the location of air transport facilities.
50. Identify the features of port city planning.
51. The value and composition of the production area.
52. Requirements for the choice of territory for the location of the industrial zone.
53. Classification of industrial enterprises.
54. Characteristics and functional purpose of the sanitary protection zone.
55. Principles of territorial location and composition of the communal-warehouse zone of the city
56. Name the general planning methods of construction.
57. Name the requirements for the location of the settlement zone.
58. How does the size of the city affect the structure of the settlement zone?
59. Name the principles of formation of a residential area.
60. Name the features of the planning organization of the microdistrict.
61. Name the types of transport in the microdistrict?
62. Name the factors that are taken into account when tracing the driveways and pedestrian network of the city?
63. Identify the role of greenery in the environment improving.
64. Define the principles of building a system of landscape and recreational area.
65. Provide a classification of greenery.

TERMINOLOGICAL DICTIONARY

Building area – an area occupied by buildings or planned for construction according to the master plan, including the street network, landscaped and open spaces directly related to the building.

City – one of the types of social and spatial organization of the population, which arises and develops on the basis of a combination of industrial, scientific, cultural, administrative and other functions. As a rule, the population in cities exceeds 10,000, the vast majority of whom are employed in non-agricultural sectors.

City boundary – the outer boundary of the city, which defines its territory and separates urban lands from other categories of land. City boundary – the boundary of the city as an administrative-territorial unit.

City center – a part of the city where public, administrative, economic, cultural and other buildings and structures of city and state importance are concentrated, as well as demonstrations, rallies, public holidays and mass spectacles take place.

Climate – a set of atmospheric conditions over a long period, typical of a particular area, depending on its geographical circumstances.

Functional zoning of the territory – the division of the territory into functional zones, in which each allocated zone is assigned a certain mode of urban development and the predominant direction of economic use in the long run.

Garden city – a city that is designed for healthy living and work, no bigger than providing a full social life surrounded by a rural landscape. The idea of the garden city is to combine the positive features of the city and the village: all its land is in public ownership or assigned to the community.

General plan – the basic town-planning document which defines in interests of the population and the state conditions of a living environment formation, directions and limits of urban and rural settlements territories development, zoning of territories, development of engineering, transport and social infrastructure, town-planning requirements for preservation of historical and cultural objects, heritage and

pecially protected natural areas, ecological and sanitary well-being.

Homestead construction – construction of one-apartment or two-apartment houses with plots for each apartment directly next to the house, which are used for a garden or vegetable garden.

Industrial production zone – a functionally specialized part of the city territory, which includes the volumes of material production, communal services, production infrastructure, science and scientific services, training, other objects of the non-production sphere that serve material and intangible production.

Landscape – a territorial system consisting of natural and anthropogenic components and complexes that develop in interrelation.

Public center – a complex of institutions and public service buildings in the city or urban, residential and industrial areas.

Relief – a set of irregularities on the surface of the earth's crust, varying in scale and shape.

Residential area – a structural element of the residential area of 80-400 hectares, within which residential quarters are formed, institutions, enterprises, objects of urban importance, the boundaries of the residential area – main city streets, natural and artificial boundaries.

Residential quarter (residential complex) – the primary structural element of the living environment, limited by main or residential streets, driveways, natural boundaries, an area of 20-50 hectares with a full range of institutions and service of local enterprises.

Residential territory – a zone of housing, public centers and recreation areas.

System of green plantings – organized placement of green plantations for various purposes in terms of the city and the natural area, agreed with the general structure of the city and the system of cultural and household services.

Urban agglomeration – a compact spatial grouping of settlements united by intensive industrial and cultural ties into a complex multicomponent dynamic system. The boundary of urban agglomerations is determined by the end points of pendulum migration. There are monocentric and polycentric agglomerations.

Urban lands – all lands within city boundaries.

Urban landscape – a landscape that combines natural factors: landforms, reservoirs, vegetation; with urban development: buildings, roads, highways, engineering structures; – is a dynamic functional-spatial system of cultural complexes, including natural components and urban environment.

Urban development – a change in the urban environment due to the implementation of urban and other activities, which has the purpose and result of improving the quality of life in the city and sustainable development of the city.

Urban planning regulation – the activities of public authorities, local governments to ensure the preparation and approval of documentation for spatial planning, as well as the activities of local governments to prepare, adopt and apply the rules of land use and development.

Urban reconstruction – a purposeful activity to change the previously formed urban system, or its constituent elements, due to the needs of improvement and development of this system.

Urbanization (from the Latin. Urbanus – urban) – in a broad sense – the process of increasing the role of cities in society. Urbanization – in the narrow sense - the growth of cities, increasing the share of urban population

LIST OF RECOMMENDED LITERATURE

Methodical support

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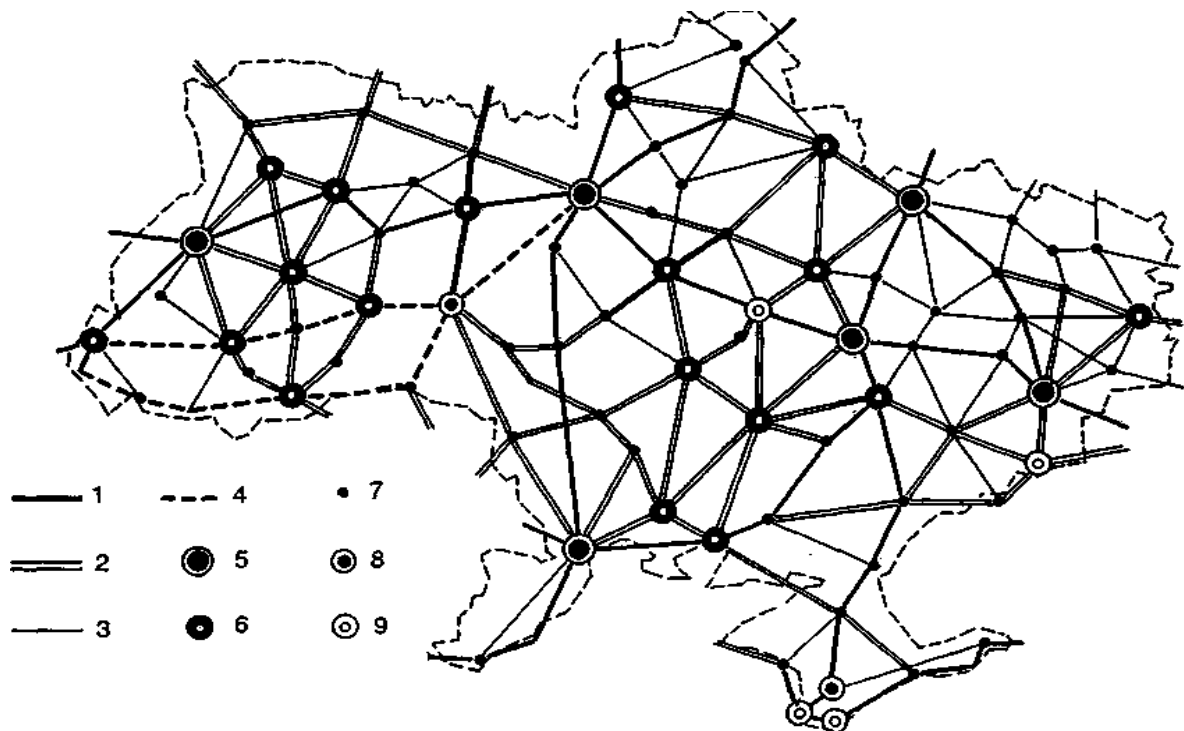
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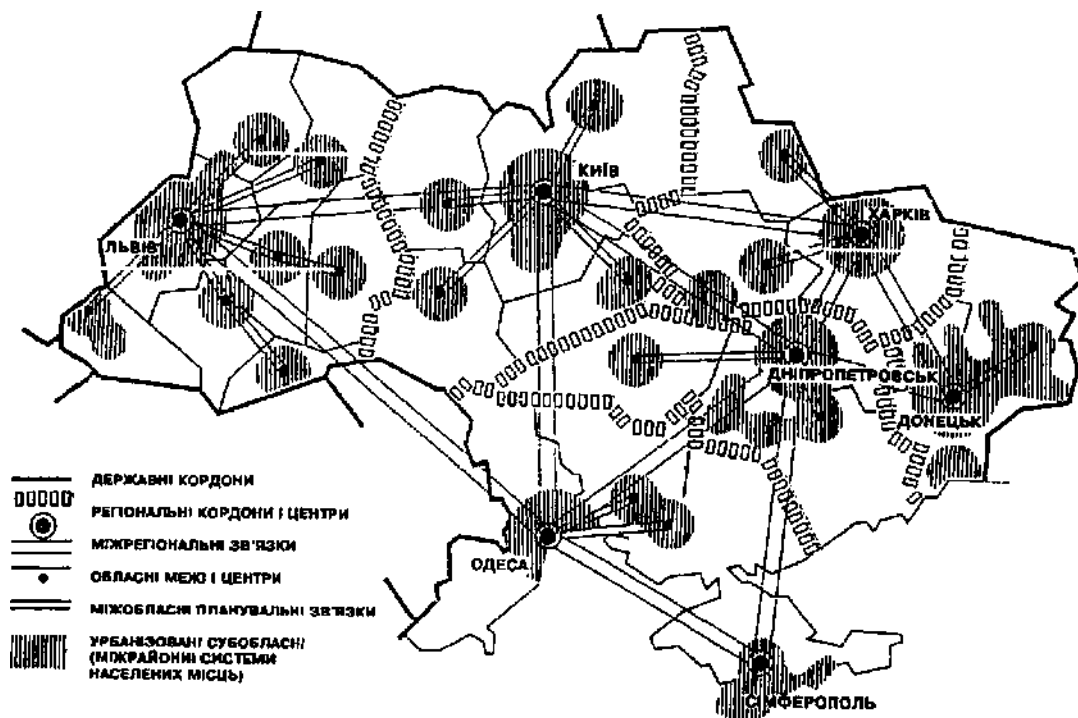
APPENDIX A

Illustration for the course materials

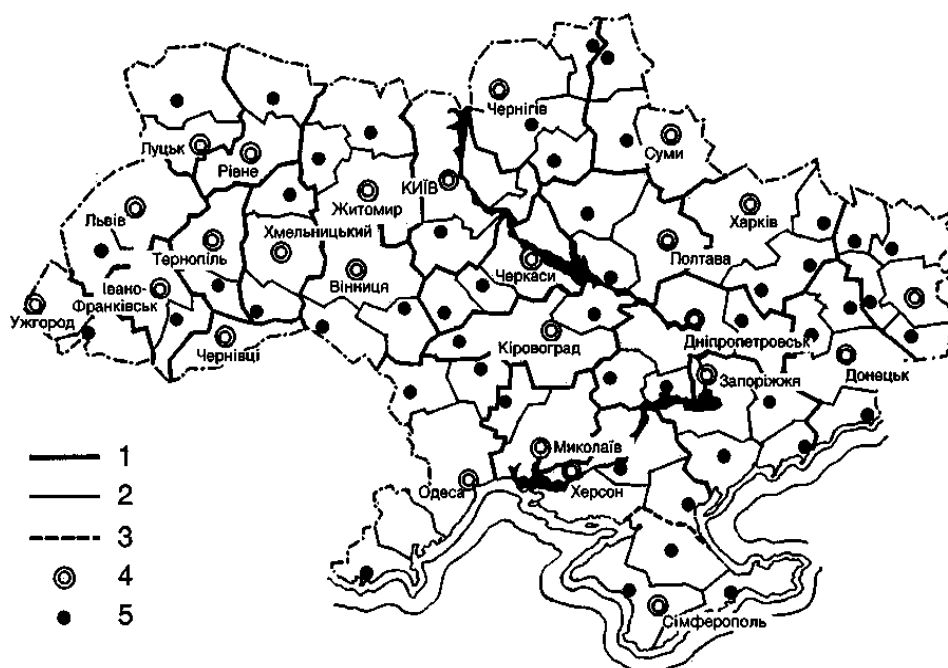


Base plane of the Ukraine territory. The formed linear planning axes:

1 – interstate level, 2 – interregional level, 3 – regional level, 4 – linear planning axes of the interstate level that are formed; point-node planning centers; existing centers: 5 – interregional level; 6 – regional level; 7 – interdistrict level; perspective centers: 8 – interregional level; 9 – regional level

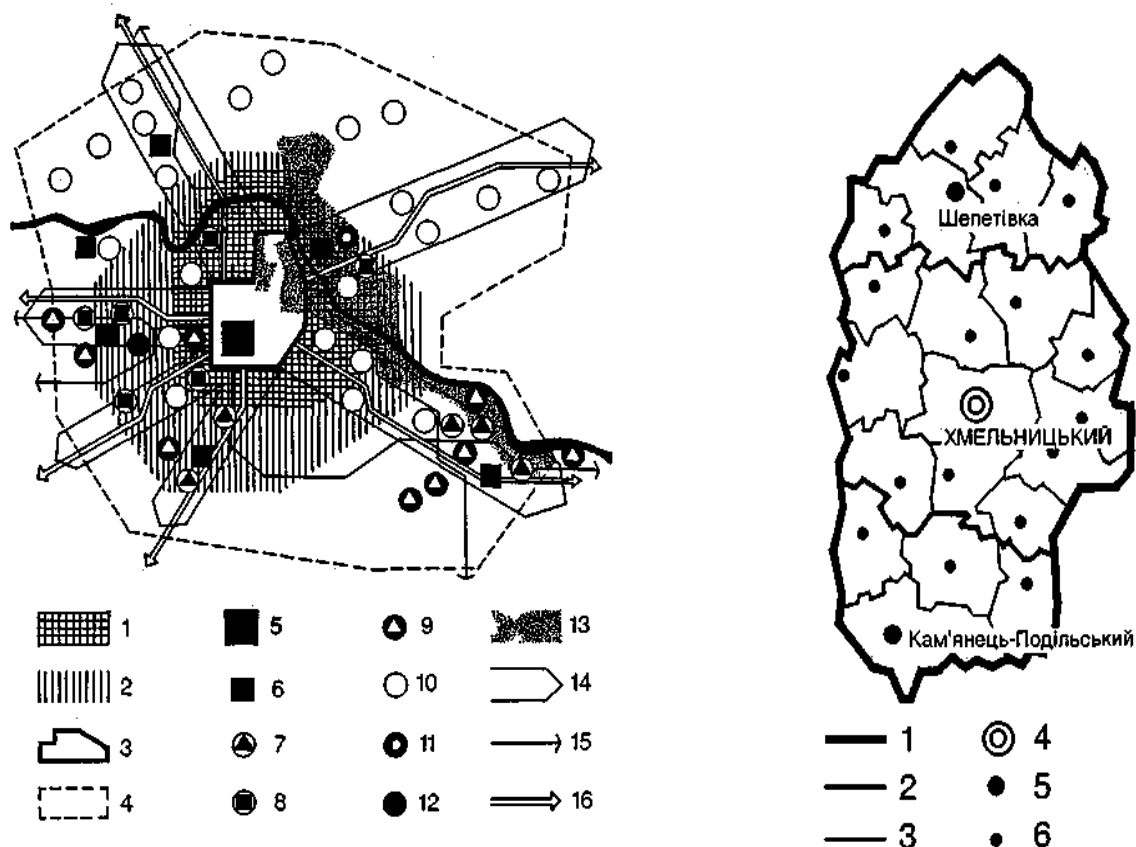


Ukraine. Scheme of urbanized zones (according to I. Fomin)



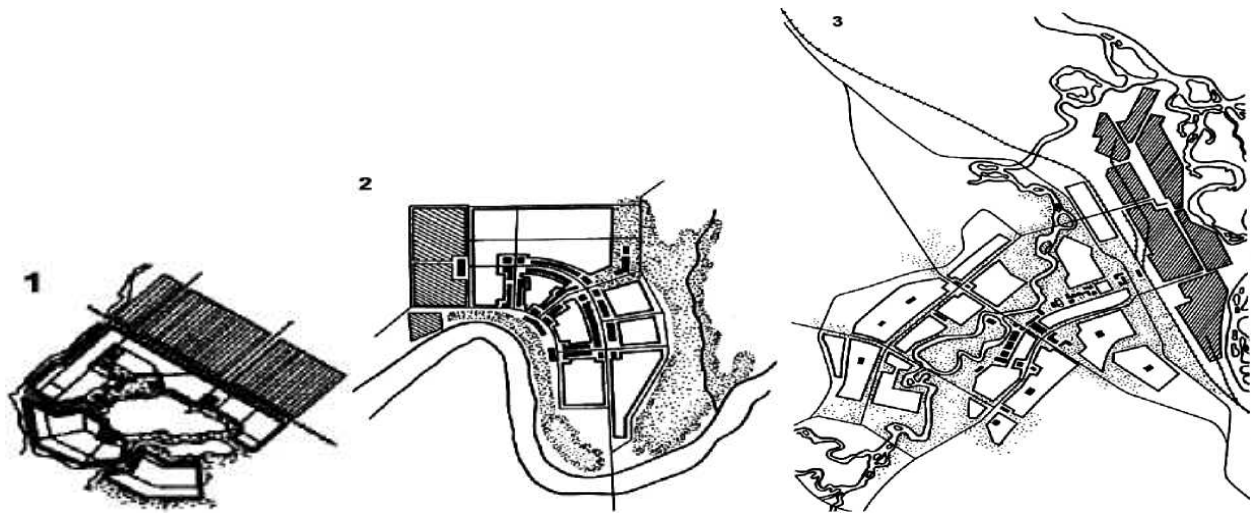
Settlement systems on the territory of Ukraine:

1 – the boundary of the regional system of settlements; 2 – the boundary of the inter-district system of settlements; 3 – the border of the Autonomous Republic of Crimea; 4 – the center of the regional system of settlements; 5 – the center of the inter-district system of settlements

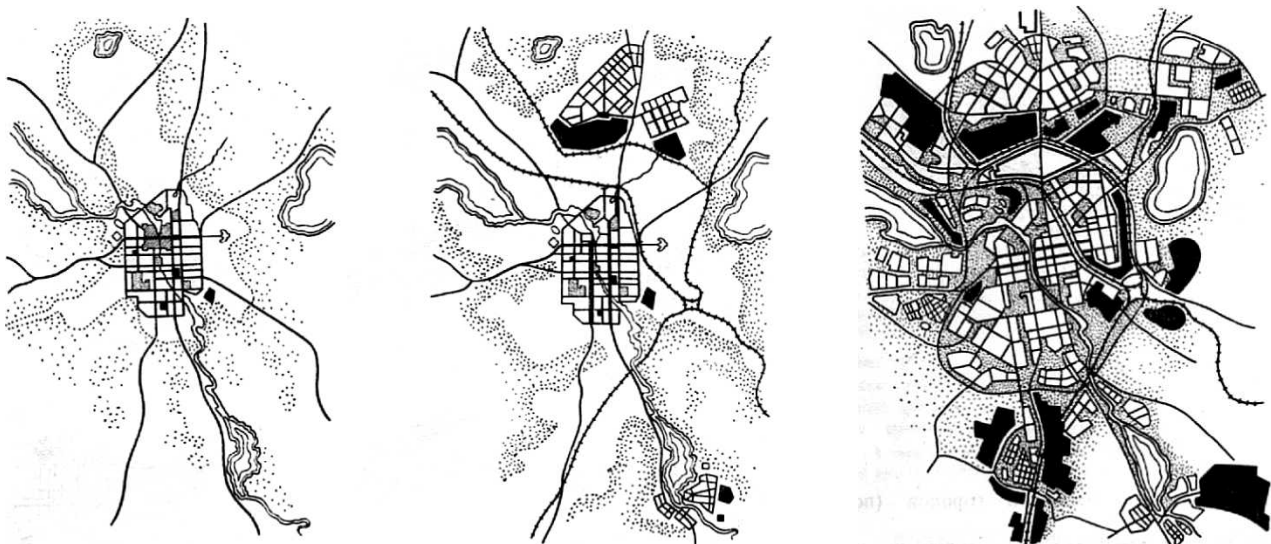


System of settlements on the territory of the region:

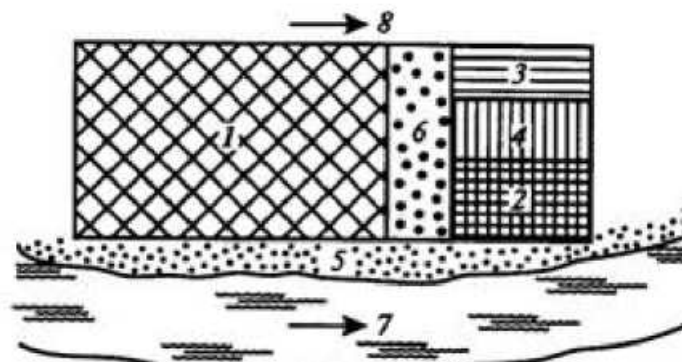
1 – border of the regional system of settlements; 2 – the boundary of the inter-district system of settlements; 3 – the boundary of the district system of settlements; 4 – the center of the regional system of settlements; 5 – the center of the interdistrict system of settlements; 6 – the center of the district system of settlements



Classification of cities by size: 1 – small town, 2 – medium, 3 – large.

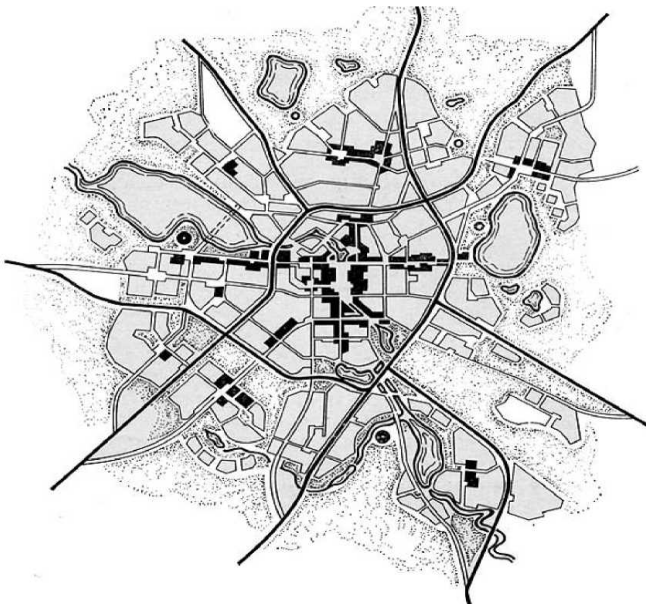


Compact-concentric development of the city.

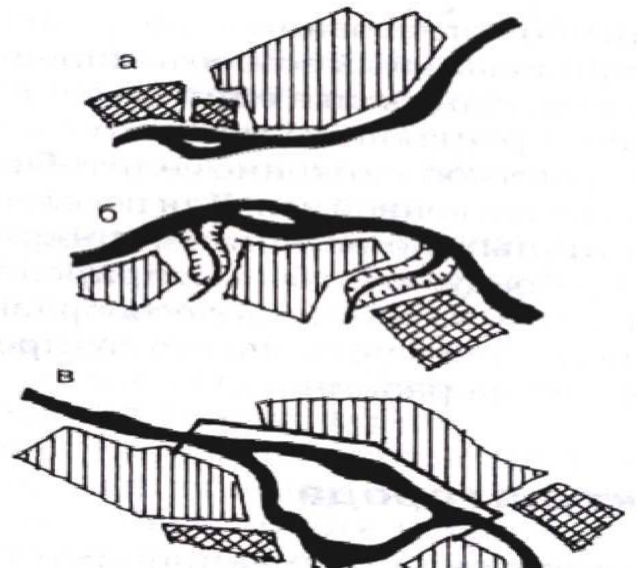


Conceptual scheme of mutual location of the main functional zones of the city:

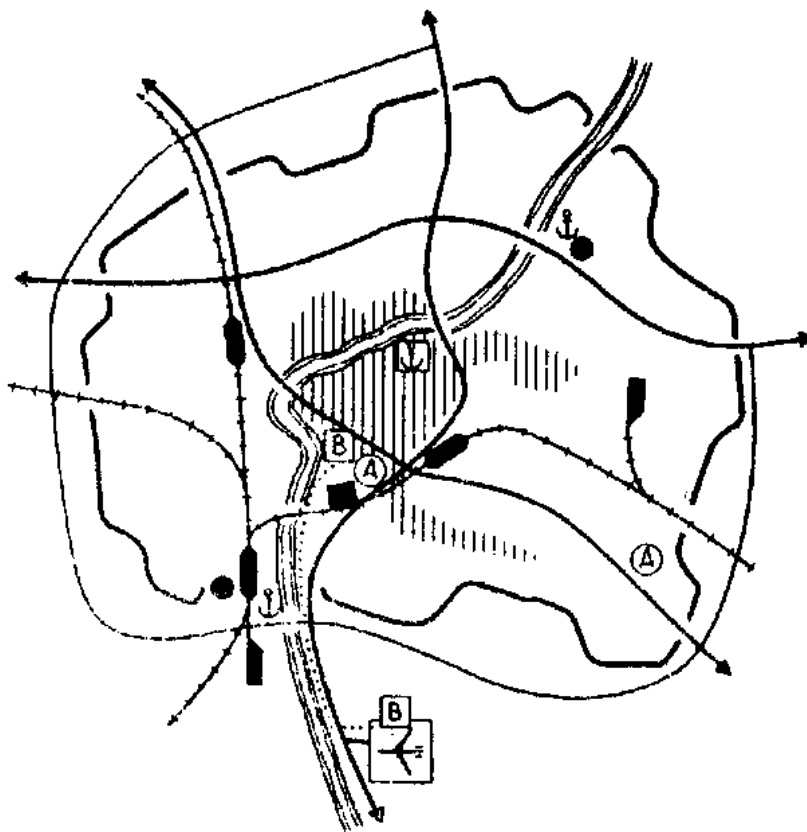
1 – settlement territory; 2 – industrial zone, 3 – warehouse zone; 4 – external transport area; 5 – green recreation area; 6 – sanitary protection zone; 7 – the direction of the river; 8 – the direction of the prevailing winds.



Scheme of the planning structure of a large city

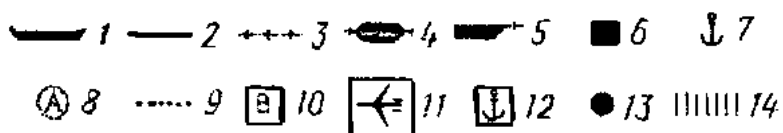


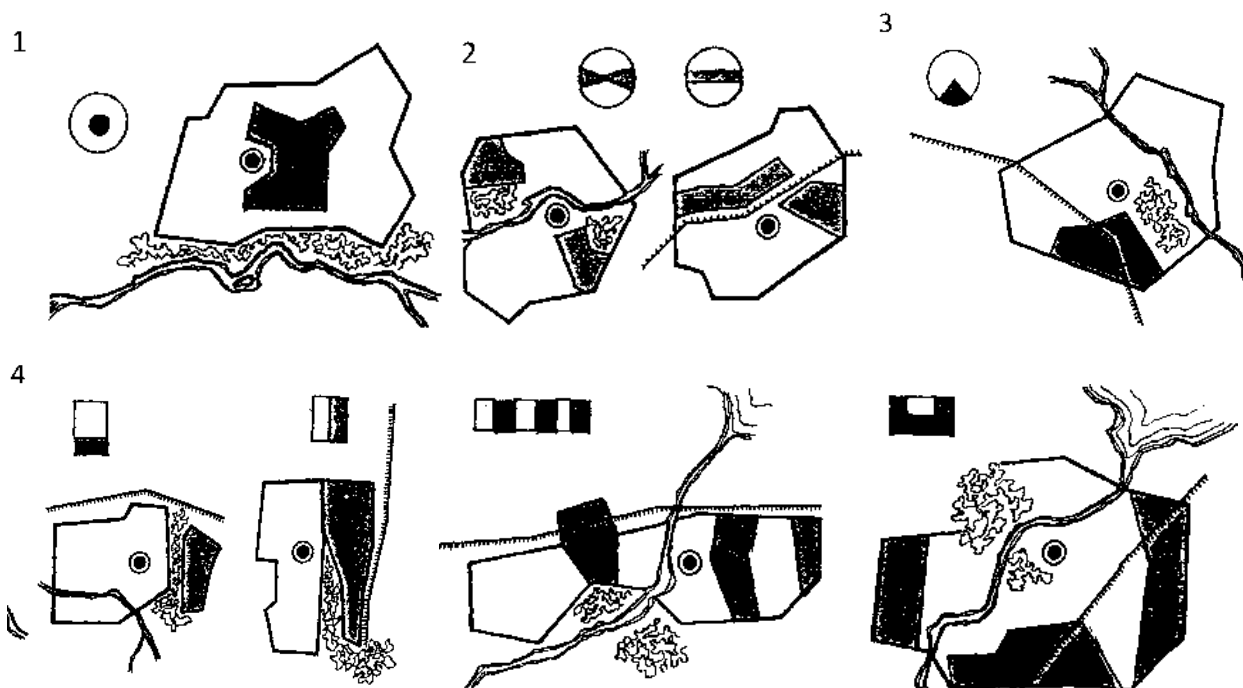
Compact, fragmented, scattered forms of the city plan



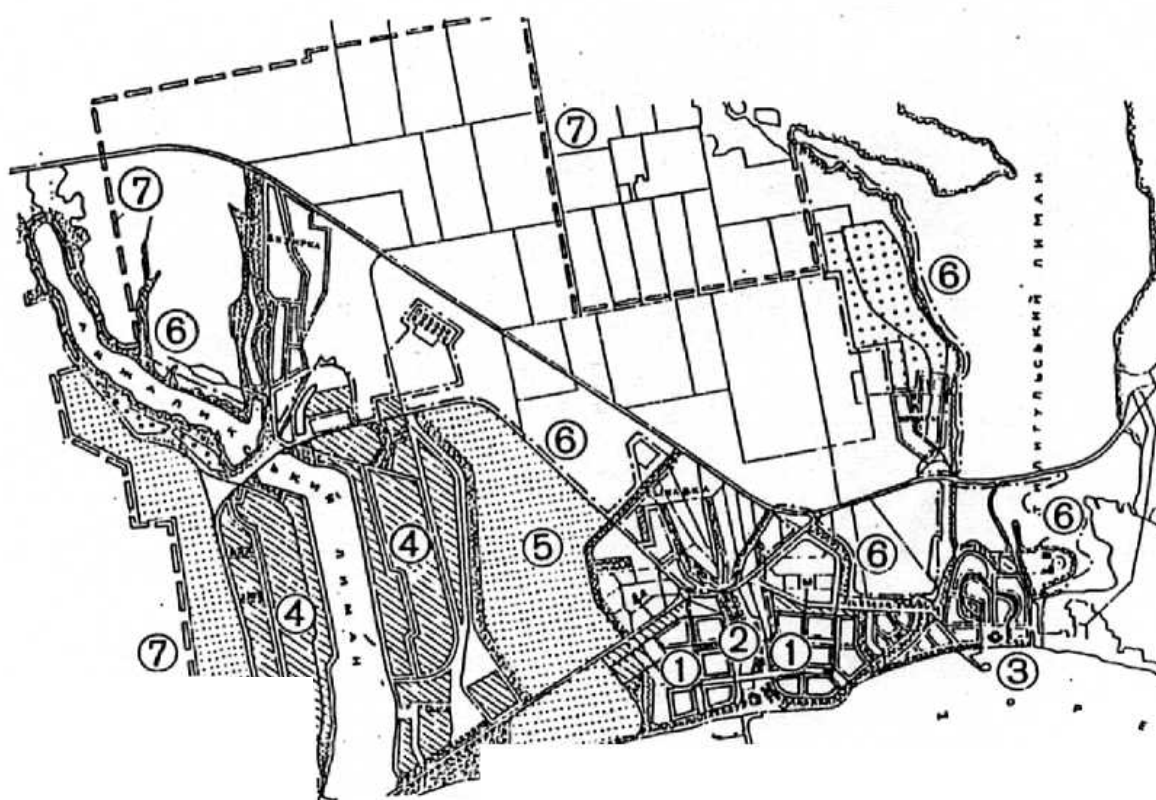
Schematic diagram of the city transport hub, which is served by different types of transport:

- 1 – the city border;
- 2 – speedway;
- 3 – railway;
- 4 – railway station;
- 5 – cargo yard;
- 6 – railway station;
- 7 – river port;
- 8 – bus station;
- 9 – helicopter runway;
- 10 – railway station;
- 11 – airport;
- 12 – river station;
- 13 – freight bus station;
- 14 – city center

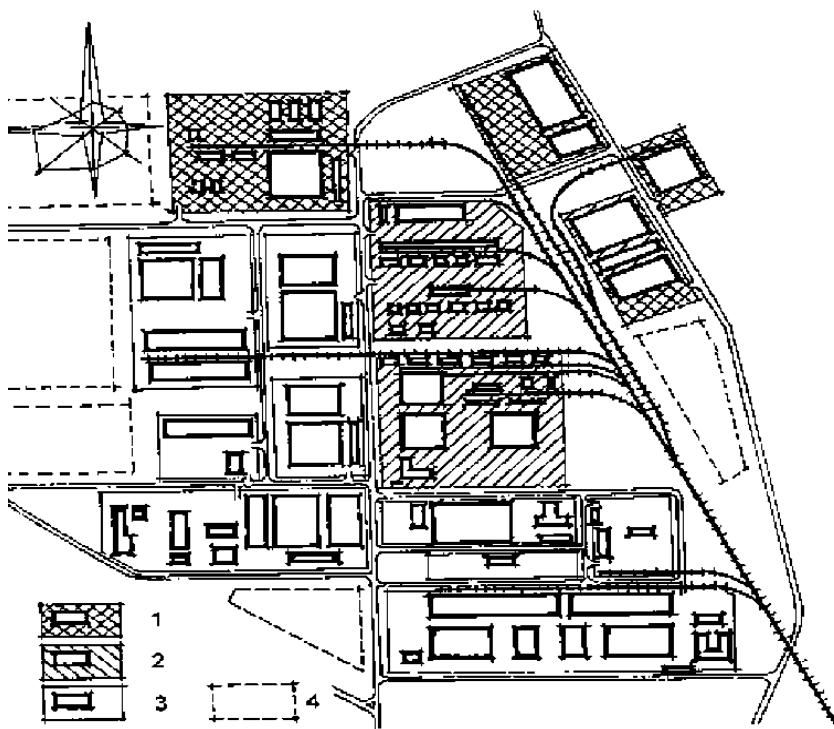




The most common examples of the mutual location of residential and industrial areas of the city. Every schemes has its own specific characteristics:



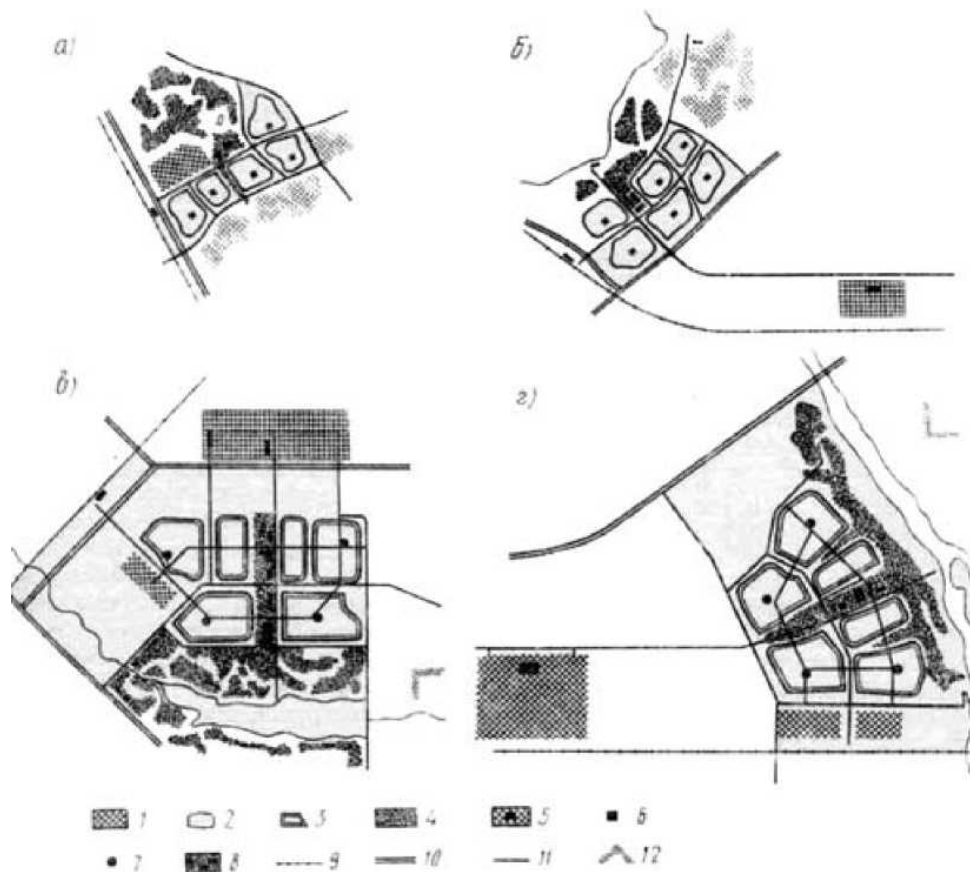
Principles of organization of functional-planning structure of intensively developing new cities (on the example of Yuzhne): 1 – residential area, 2 – city center area, 3 – resort area, 4 – industrial zone, 5 – sanitary and protective zone, 6 – city border, 7 – zone of city influence.



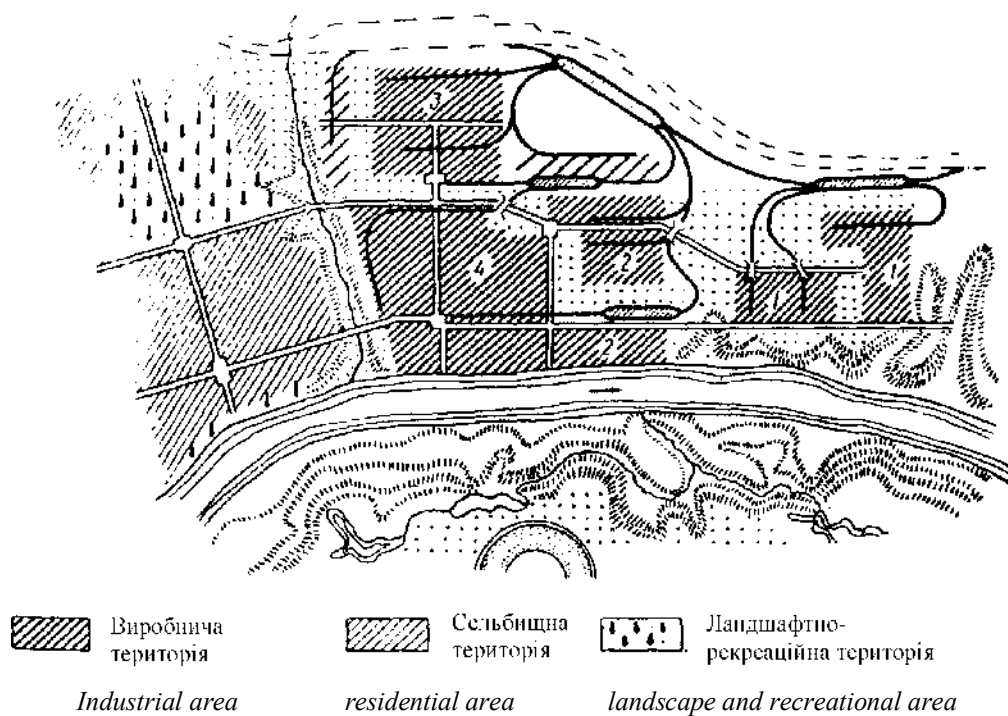
Industrial hub.

General plan scheme:

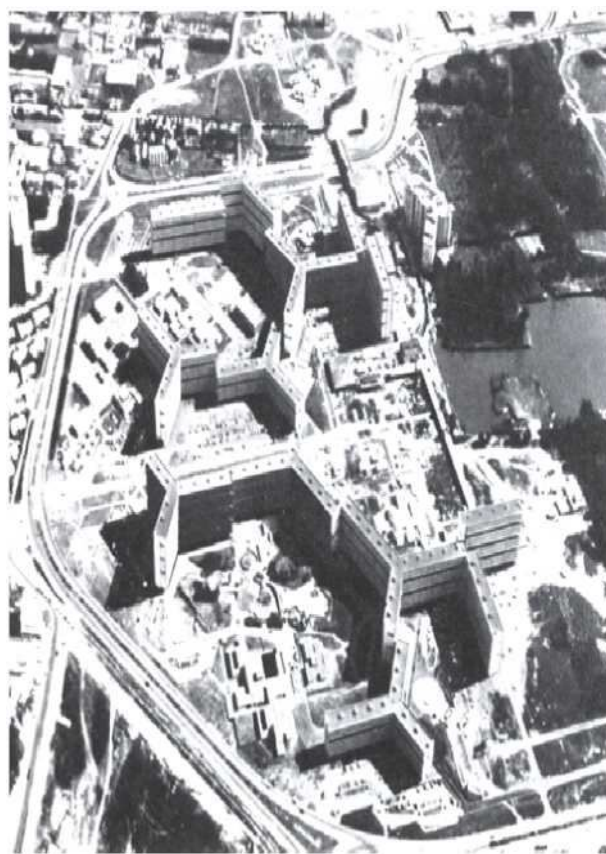
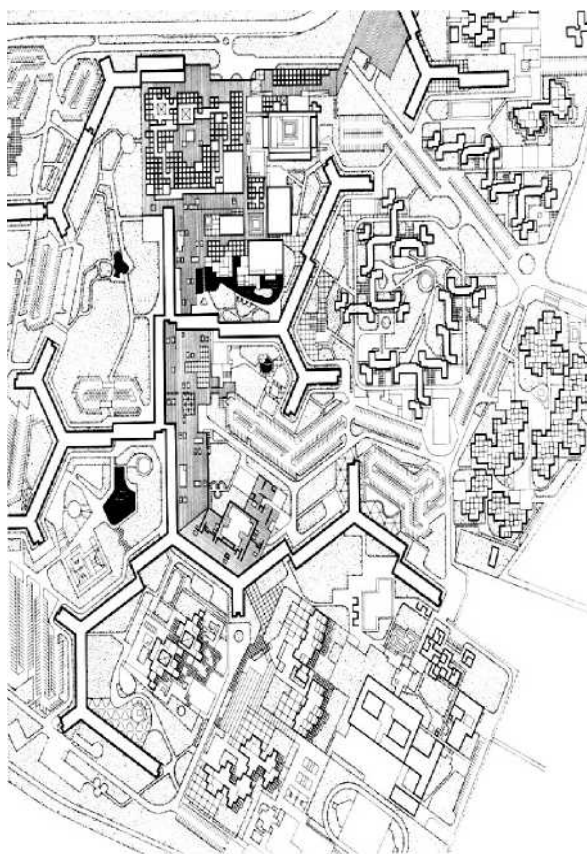
- 1 – enterprises of the construction industry (harmful emissions into environment);
- 2 – utilities and energy;
- 3 – enterprises without harmful emissions;
- 4 – reserve territory.

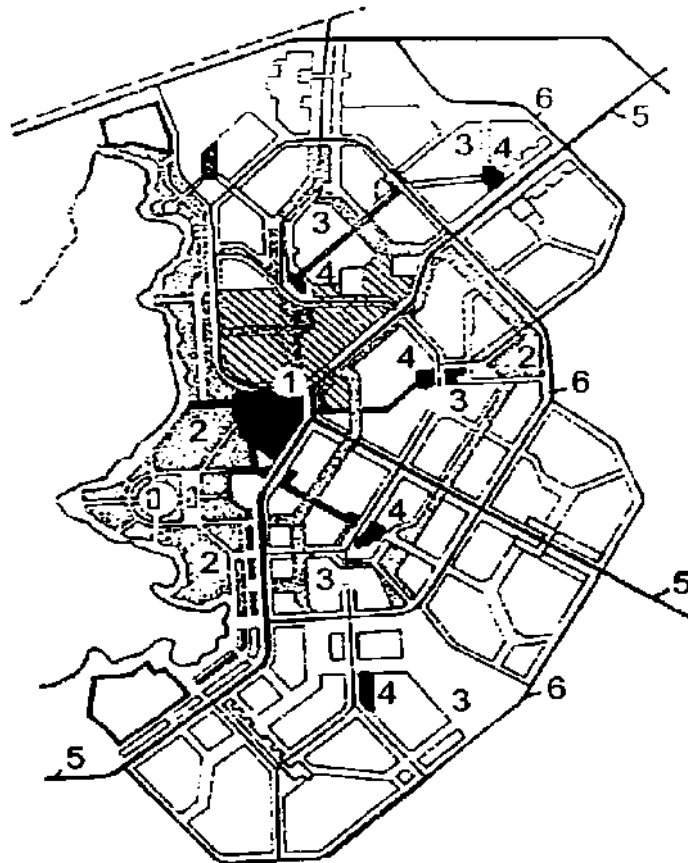


The scheme of industrial areas organization in cities of different sizes: a) in a small town with industry without sanitation; b) the same with significant harm; c) in a large city with enterprises that are not harmful and enterprises separated from the city by a sanitary protection zone; d) the same with various harms, including significant; 1 – industrial districts, 2 – residential districts, 3 – residential districts, 4 – green areas, 5 – industrial district center, 6 – residential district center, 7 – residential district center, 8 – city center, 9 – railway, 10 – roads, 11 – city streets, 12 – the direction of the dominant wind

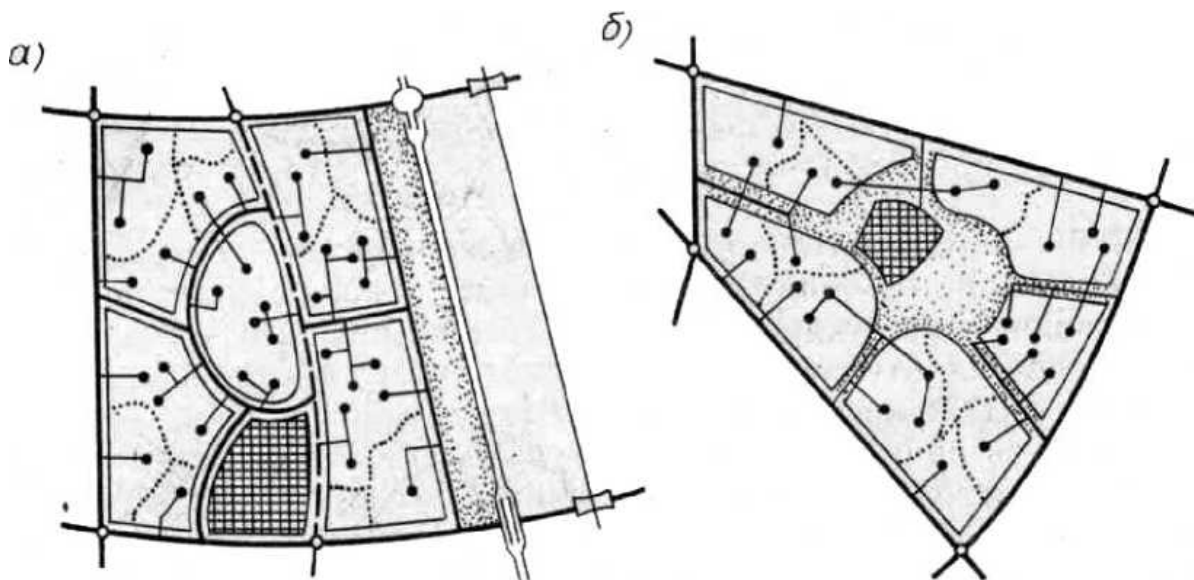


Layout of industrial enterprises of different hazard classes: 1 – enterprises of I class, enterprises of II class, enterprises of III class, enterprises of IV and V classes

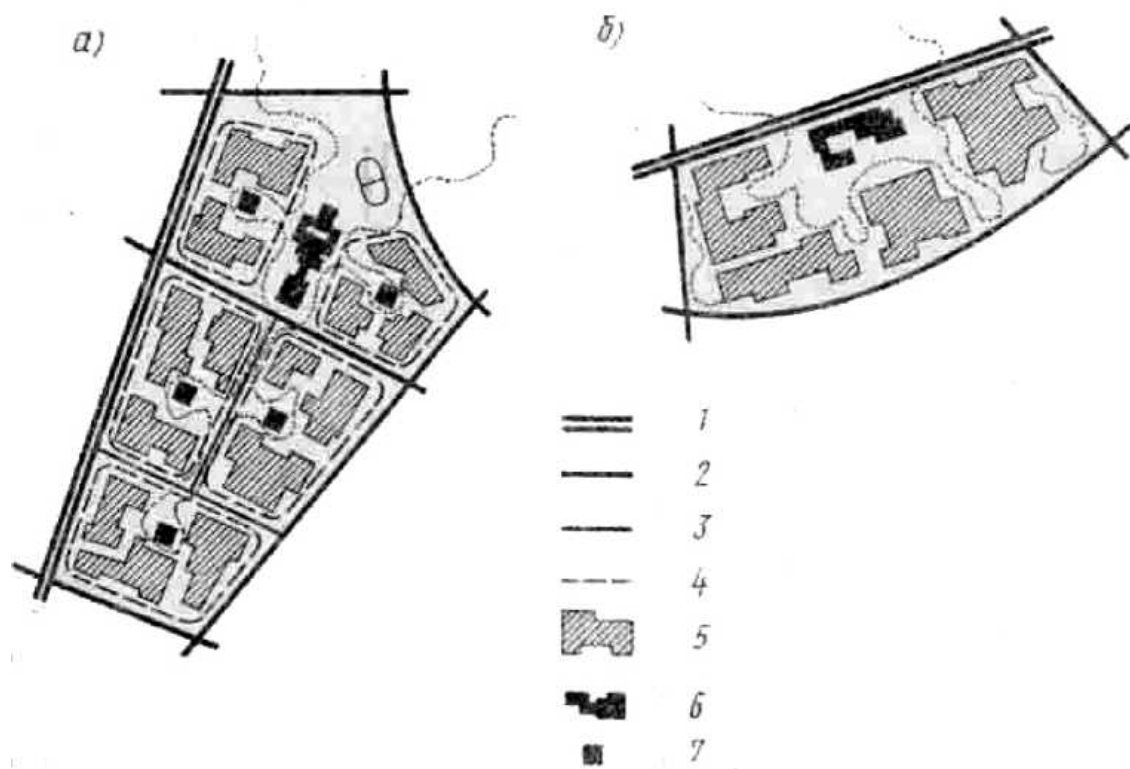




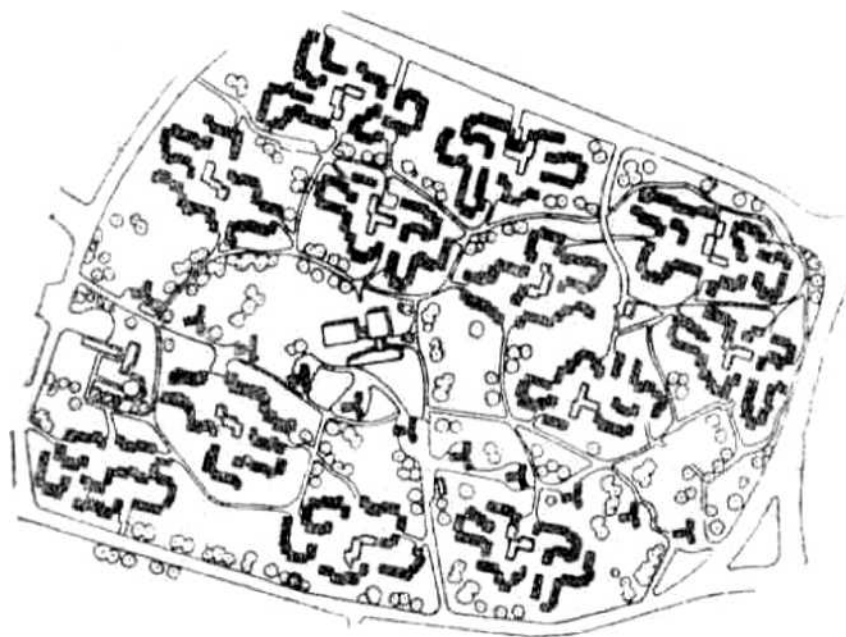
Planning structure scheme of the city residential territory, according to V. Anikin: 1 – city center; 2 – park area; 3 – residential area; 4 – the center of the residential area; 5 – highway of citywide significance; 6 – highway of district significance



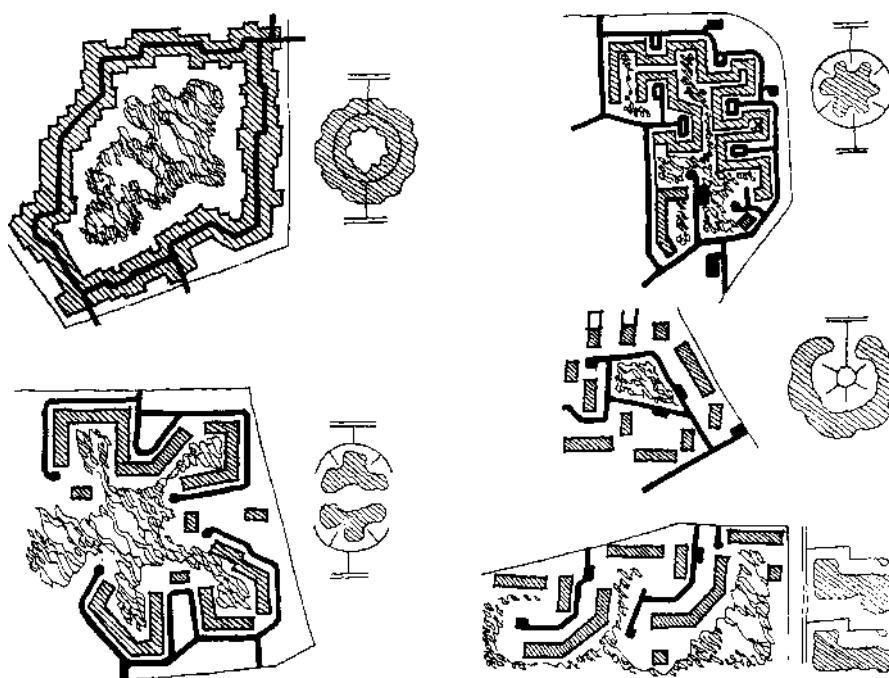
Road network scheme of residential areas: a) residential area, which is divided into microdistrict; б) residential area in the form of an enlarged microdistrict; 1 – city highway, 2 – the main city street, 3 – the main regional street, 4 – residential street, 5 – microdistrict driveways, 6 – pedestrian ways, 7 – the territory of the residential area center, 8 – greenery



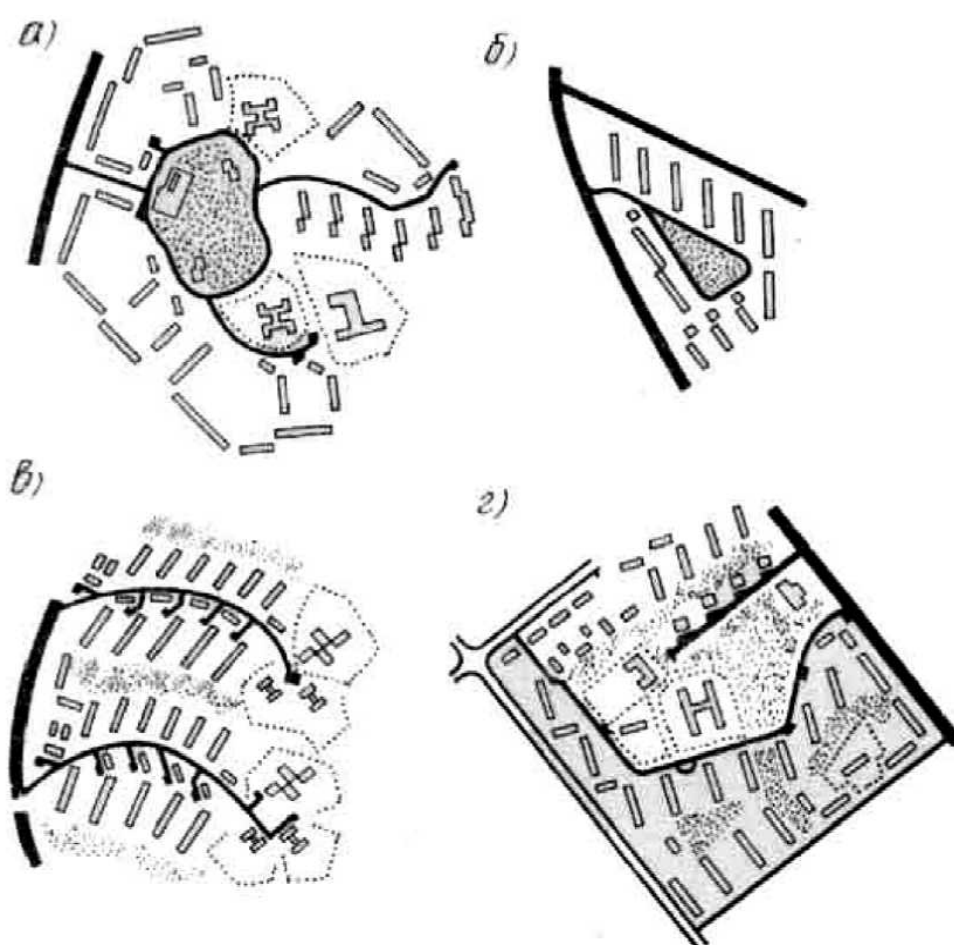
Schemes of the residential area structure: a) for 50-60 thousand people. with division into microdistricts; б) for 25-30 thousand people. in the form of an enlarged microdistrict; 1 – main city streets, 2 – main district streets, 3 – residential streets, 4 – border of residential districts, 5 – group of houses, 6 – center of residential district, 7 – microdistrict center.



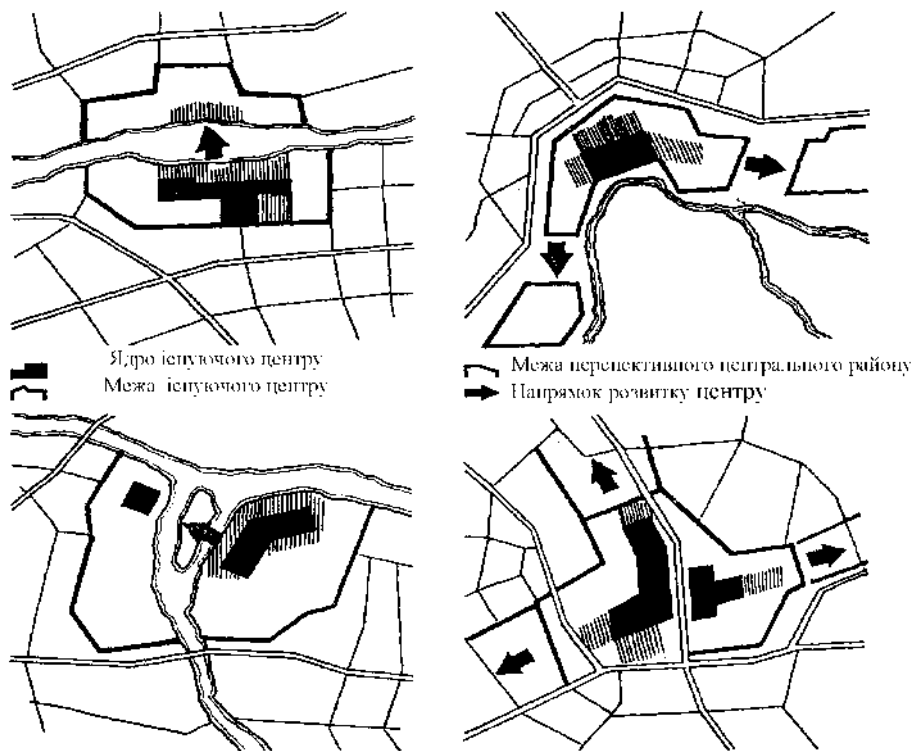
Free location of residential groups among greenery. Venusio district development project in Matera (Italy).



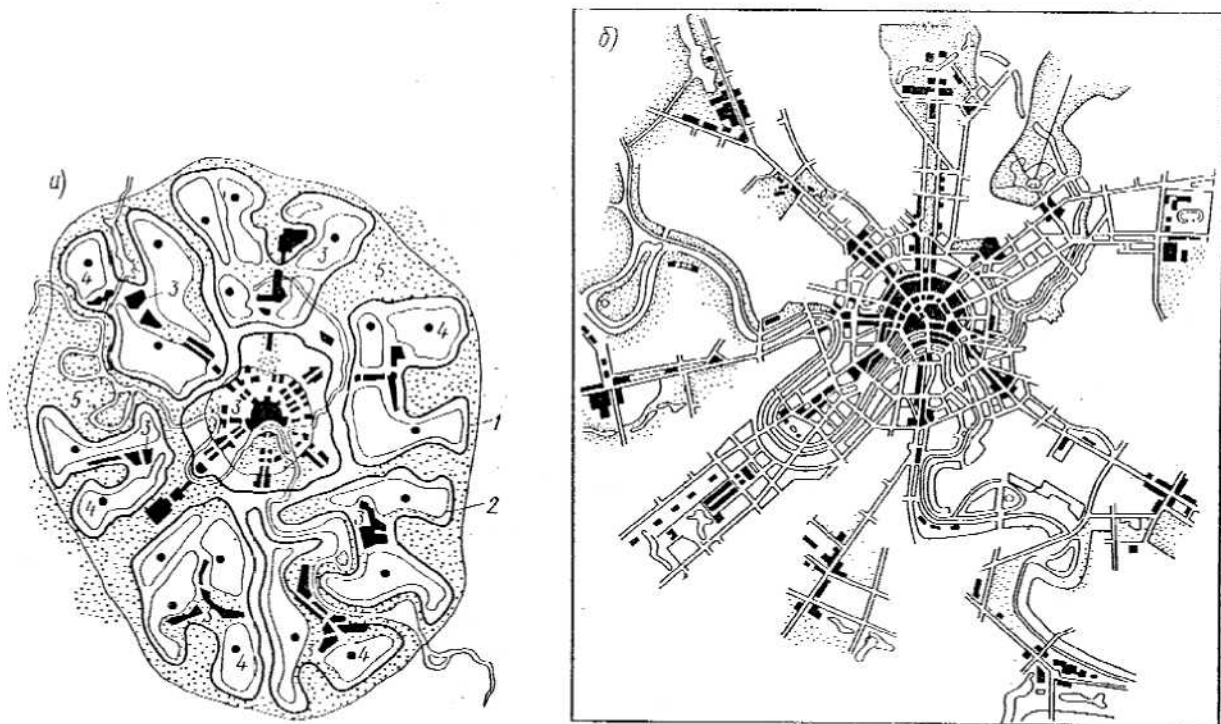
Organization of passages and pedestrian ways in residential formations.



Schemes of the main residential district driveways: a) ring, b) loop, c) dead end, d) mixed.

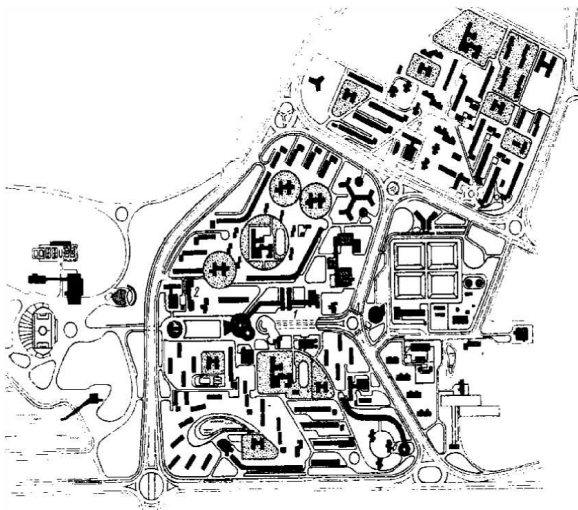


Schemes of formation and development of public centers in cities with different spatial planning structure.

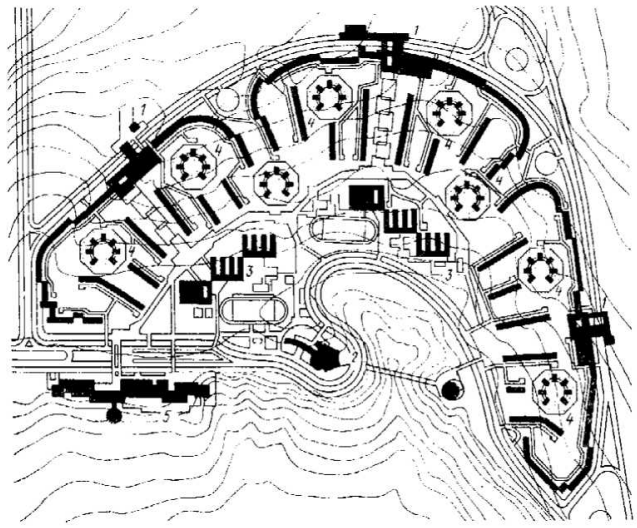


System of big city centers:

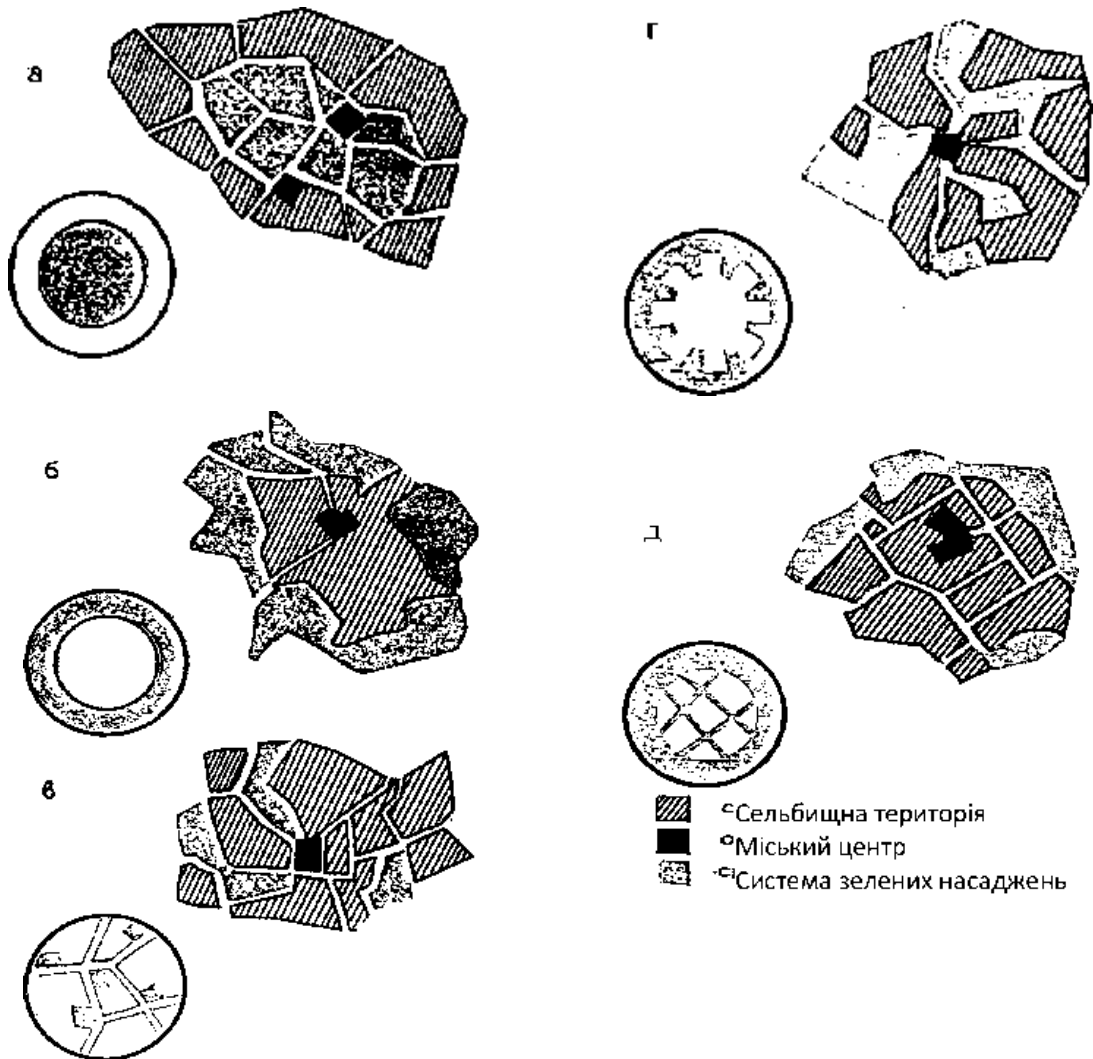
- a) the system of planning structure; b) the scheme of the city center; 1 – boundaries of planning zones; 2 – the same areas; 3 – central district and centers of planning zones; 4 – centers of planning districts; 5 – green areas of public use



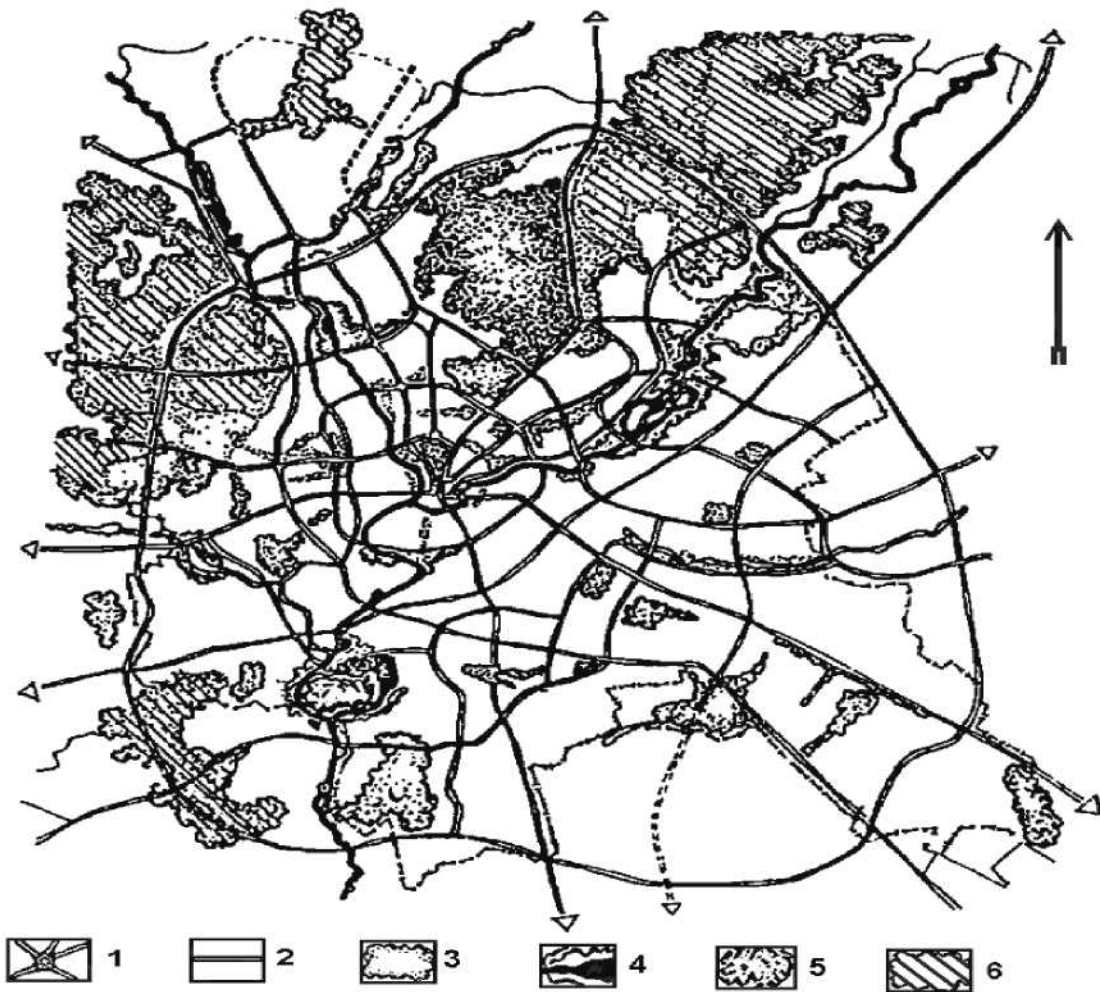
Residential area in Kyiv (project):
1 – the center of the residential area,
2 – the center of the microdistrict.



Baku residential district project: 1 – centers serving the district, 2 – cultural center, 3 – schools, 4 – children's institutions, 5 – district center.

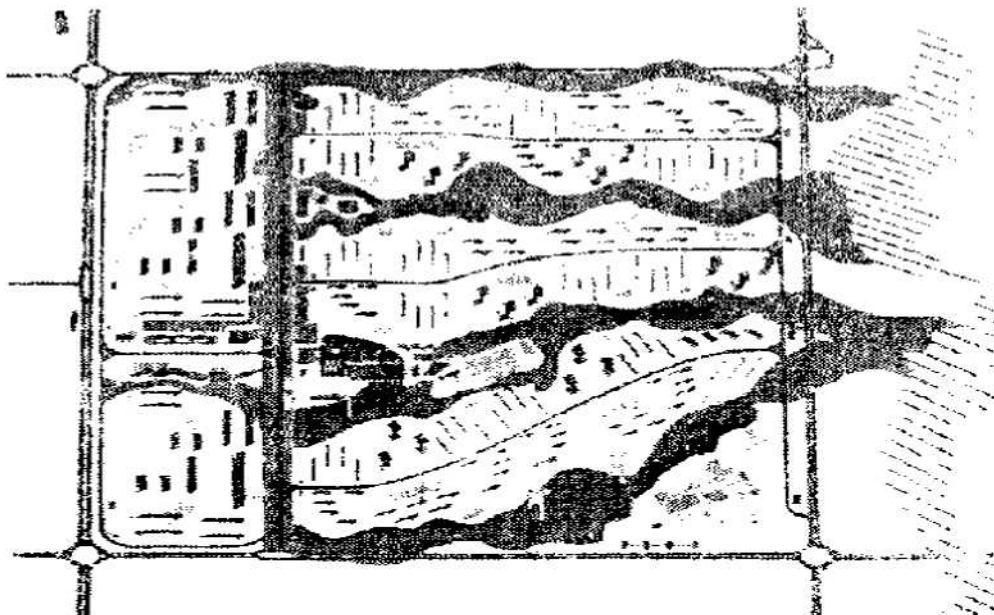


Exemplary schemes of urban landscaping structures: а – centric; б – peripheral; в – group (spots); г – wedges; д – linear-

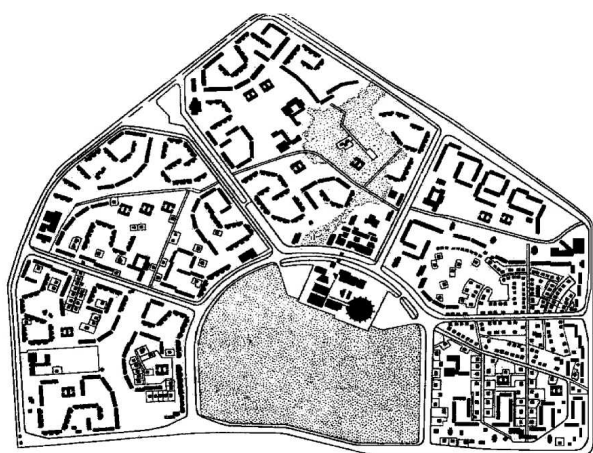


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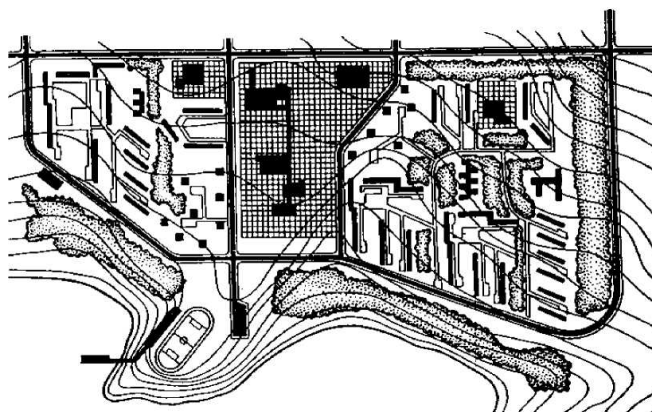
Landscape and recreational areas in the planning structure of Kharkiv: 1 – city center, 2 – highways, 3 – city PC&R, 4 – hydro parks, 5 – forest parks, 6 – recreational areas of long-term development



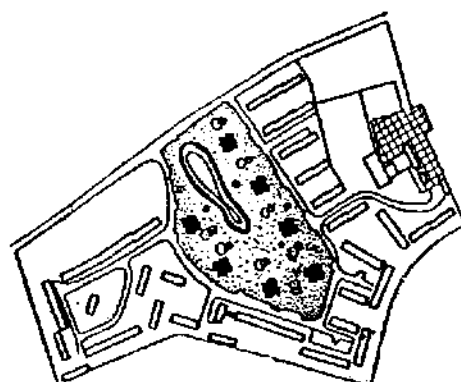
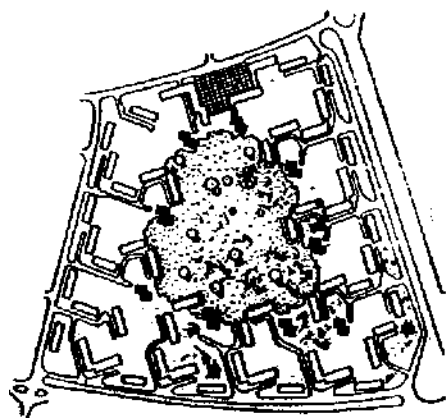
Introduction from the park (from the east) strips of greenery into the depth of the building.



Imanta residential area in Riga

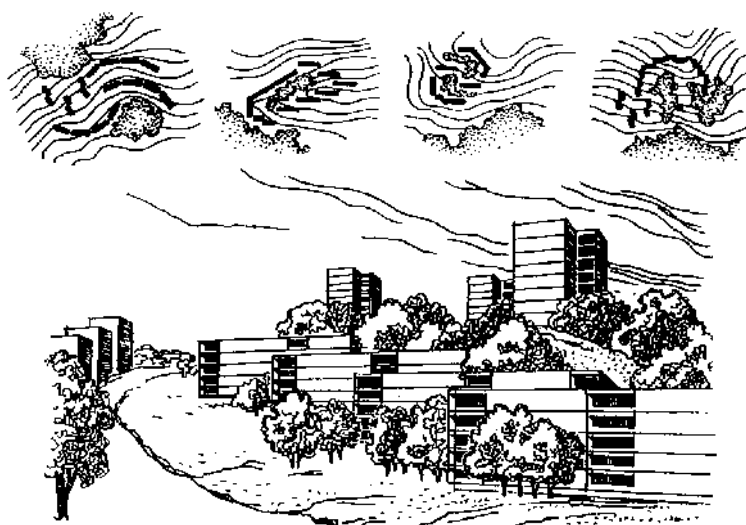


Development of the microdistrict on the reservoir shores

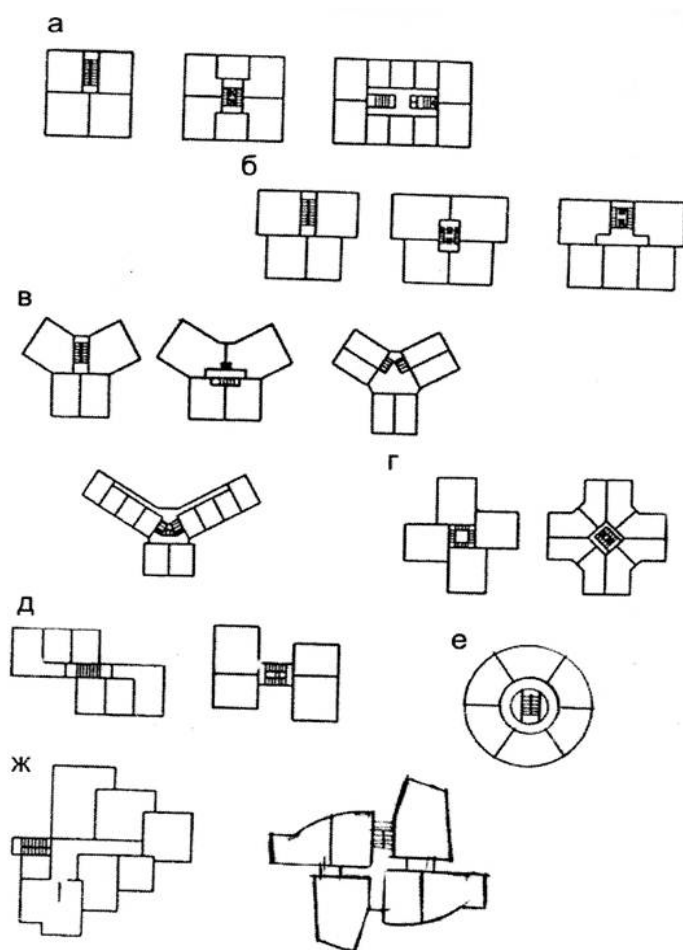


Examples of the location of buildings with internal green areas:

a) the microdistrict plan in Sweden, b) the Brookland Park microdistrict plan (England)



Methods of building in conditions of difficult terrain: a) plan, b) perspective.



Schemes of one-section residential building:

а – square and rectangular;

б – T-shaped;

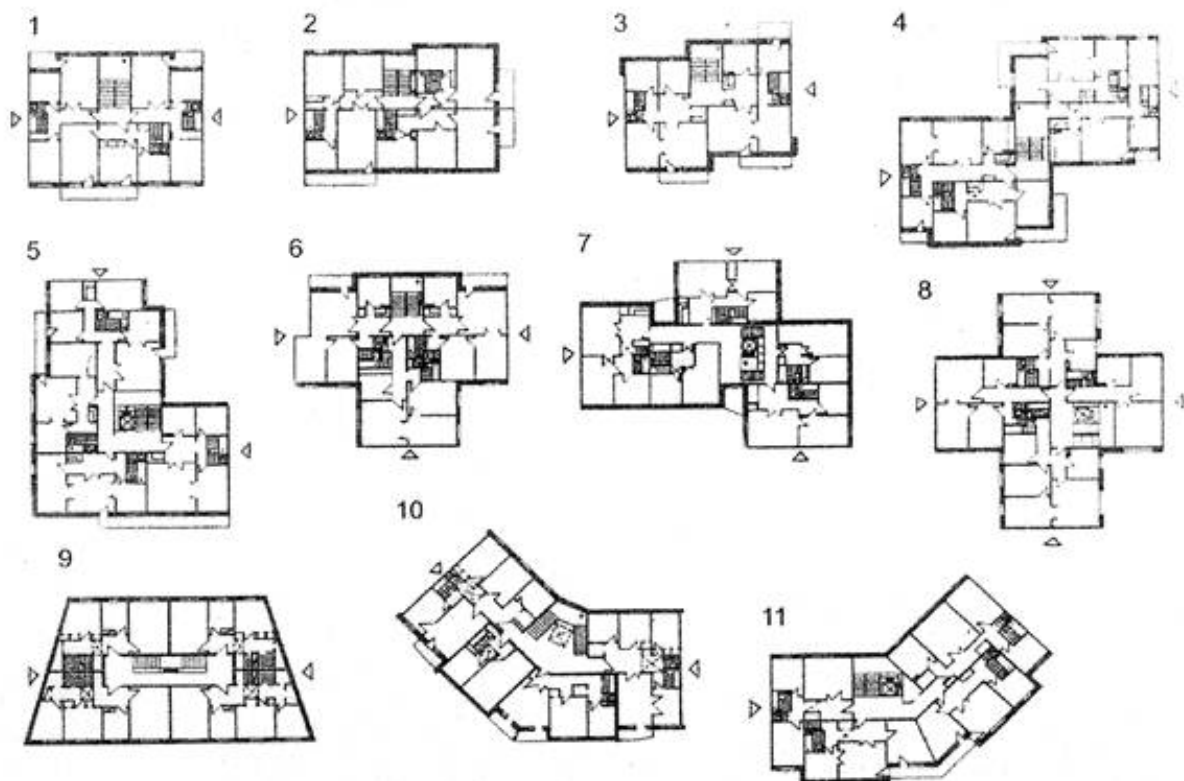
в – three-beam;

г – cruciform (tower);

д – pair-block;

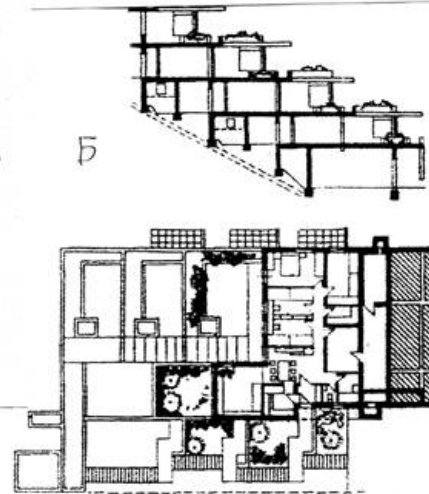
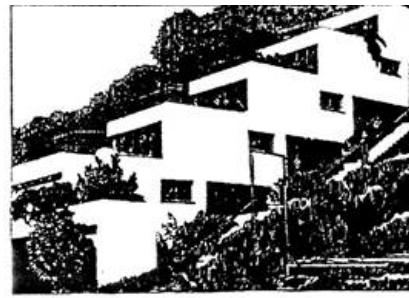
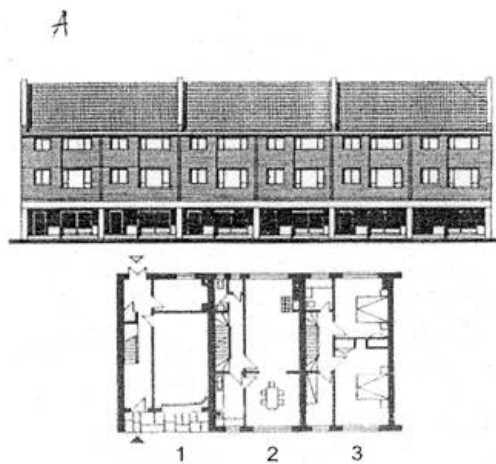
е – round;

ж – complex configuration

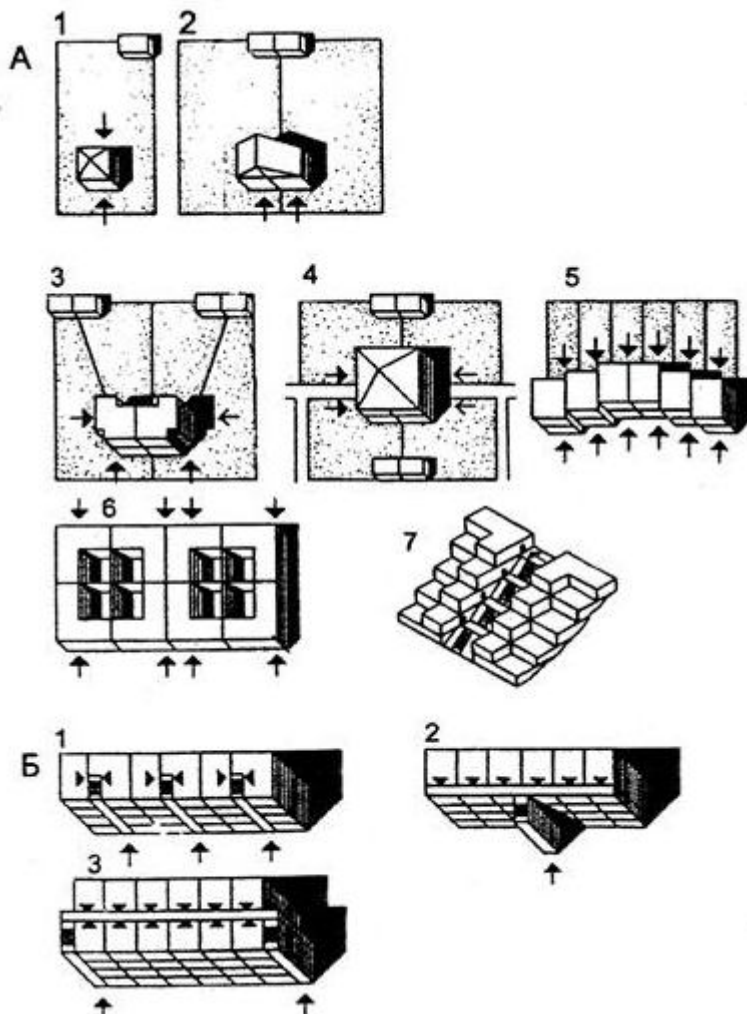


Nomenclature of multi-storey residential buildings sections:

1 – ordinary; 2 – end; 3, 4 – ordinary Z-shaped; 5 – angular; 6, 7 – three-beam; 8 – cruciform; 9, 11 – rotary



Blocked manor houses (A). Terraced residential houses (B)



Types of houses depending on type of outside communications:

A – Manor houses:
 1 – one-apartment;
 2 – pairs;
 3,4 – four-apartment;
 2 – blocked;
 3 – locked with patio;
 4 – terraces;

B – multi-storey:
 1 – sectional;
 2 – gallery;
 3 – corridor

Навчальне видання

МАРТИШОВА Лариса Сергіївна

ОСНОВИ МІСТОБУДУВАННЯ

КОНСПЕКТ ЛЕКЦІЙ

*(для іноземних студентів другого курсу
денної форми навчання першого (бакалаврського) рівня вищої освіти
спеціальності 191 – Архітектура та містобудування)*

(Англ. мовою)

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Комп'ютерне верстання *Л. С. Мартишова*

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