

## THE GREEN SYSTEM AND THE CONNECTION WITH THE STREET NETWORK

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**Abstract:** The green system is a spatially connected green areas with a specific functional purpose (biological, recreational and aesthetic, etc.) and with a significant role in the macrostructure of the city.

The current stage of development of human society is directly related to the rapid development of scientific and technological progress. This has led to a very serious and dangerously disturbed ecological balance between man and the environment in which he lives. Undoubtedly, the basis of these statements is the conflict "man - car - environment", which finds appropriate solutions in connection with the overall change of urban concepts.

**Key words:** park, design, street, ecology, green system

The functional-territorial organization of the green system aims to link all green areas, to categorize them by various criteria and to regulate them through certain indicators. *Such an organization is based on several basic principles:*

- All existing and project green areas to be connected in a complete spatially connected system;
- The territorial organization of the green system to be in unity with the other settlement functions and systems - to separate the incompatible and to connect the compatible ones;
- The development of the linear objects and the pedestrian zones to be created in directions and to be connected with the traditional routes and the service zones;
- Green areas for short-term recreation to be arranged near or in the directions of pedestrian flows and around public centers;
- The suburban parks and forest parks to have opportunities for organized connection both with the urban green system and with the natural environment;

*The territorial organization aims to determine the most appropriate territorial structure of the green system, observing the following principles:*

- uniformity in the location of large green areas;
- territorial connection of the existing and the designed green areas in a complete spatially connected system, harmonizing with the settlement;
- continuity of the green system in the urban and suburban area with penetration to the central urban areas;
- complexity in solving the system of urban and suburban green areas, united in one whole;
- territorial orientation of the parked pedestrian zones in directions with traditional routes;
- quantitative norms with derivation of relevant indicators in accordance with the complex requirements of the housing environment, the market economy and the restitution of the land.

The green system as an element of the living environment affects the individual settlement functional systems - labor, housing, recreation, transport, public services and others.

*The requirements for the transport and communication system are:*

- not to violate the integrity of the green system of the settlement;
- to preserve the territories with valuable landscape and vegetation from large transport

communications;

- to ensure conflict-free pedestrian access to kindergartens and schools;
- to provide the necessary easement for different classes of streets;
- to separate the pedestrian from the traffic with plant scenes (rows, vegetation and screens).

The green system as an element of the urban landscape includes the aesthetic and compositional requirements for the formation or more precisely the criteria for aesthetic evaluation of green areas in the settlement.

The green system as a structuring element in the settlements includes:

- the green system as structuring;
- the green system as a necessary environment for the development of other functional systems;
- the green system as a specific environment for the development of leisure subsystems.

In the formation of the planning structure of a city involved a system of main streets, which are the backbone of the overall urban planning decision. In the process of development of settlements under the influence of a complex set of natural and geographical conditions and socio-economic factors, the main street network is developed and transformed.

**Areas for greenery.** The greenery on the streets is used to cover the dividing and securing strips, as well as independently for decorative and hygienic purposes. The use of tall vegetation on the streets is possible on sidewalks over 4.00 m wide.

If the street is narrower, the trees can be located in front of the plots, and accordingly the construction line is moved further into the plots. The distance between the trees in the longitudinal direction of the street depends on their size, but should not be less than 6.00 m.

It should be borne in mind that the conditions for the development of greenery in the streets have deteriorated due to waterproof pavements and air pollution from cars. That is why sustainable crops are usually chosen. Account should also be taken of the location of underground engineering networks that interfere with tree roots.

Landscaping of streets can be done through single trees and shrubs or groups of them, arranged in a row or placed freely.

**Ecological and aesthetic parameters.** The development of cities in the country raises the need for well-thought-out urban planning solutions related to the construction of housing and transport networks and systems. All this has an impact on the application of vegetation in the park arrangement of the streets in the settlements.

The park structure in the range of traffic along the streets must perform a number of urban planning, sanitary-hygienic, communication-technical, bioclimatic and aesthetic tasks.

Today's roads have far better parameters, are expanding, improving the quality of the road, regulating the increase of lanes, but the problem with green areas from their design does not change much.

Safety and comfort are important goals when designing a highway landscape. Therefore, when designing the landscape, you must fully take into account the visual effect of space, color and size of objects, the diversity of sensations of the road, visually oriented and visual continuity of road psychological factors.

We can fully combine the highway with regional characteristics and cultural characteristics to create a road landscape with a distinctive style.

Also, drivers and passengers are in a good transport environment.

The streets are against the maintenance of the main elements of the urban landscape, and for the normal functioning of this landscape it is necessary All its components to be in

ecological unity.

**Ecological parameters.** The construction of roads in our country is in a stage of development, the speed with which we build the infrastructure is also growing rapidly. At the same time, we must protect the environment and the environment as an important task and a powerful guarantee.

We can combine function and landscape to create a path that meets the needs of modern life. Then we can make the way to have the main function of modern transport, and also to be a perfect art.

With the proper design of the green system along the roads, several main groups of tasks are solved: ecological-biological and aesthetic.

In the broadest sense, the ecological-biological task of the green system consists in: improving the microclimatic conditions in the urban part; ensuring good air exchange and ventilation; stimulating the penetration of mountain air into the urban fabric.

Analyzing the current state of the green road system, it can be established that it does not fully perform the specified tasks. The main reason can be found in the insufficient planning and spatial structure of the system, in the lack of specific and appropriate landscaping around the roads, in the imperfect structure in terms of vegetative volumes of each individual element of the green system.

Vegetation can perform its functions for many years (and trees after 10 years), so we must seriously take care of this problem and create conditions for its growth and development.

Designers need to know that vegetation is a living and changing material that responds responsibly to all negative phenomena.

The disturbance of the beauty and picturesque motif of the landscape, as a result of improper planning and construction of the road network can impoverish the natural, cultural and aesthetic heritage.

Therefore, in the process of studying the road route, special attention should be paid to data collection, analysis and evaluation of all natural and artificial conditions, values that affect conflicts, in order to form different solutions. This complex design process requires a larger team of professionals of various profiles, for whom the place of the landscape architect is important.

He has to consider the area for the next route from several aspects: from the standpoint of natural conditions, in particular the suspension of flora and fauna, geomorphological and hydrographic characteristics within the limits of important historical aspects and landscape features.

All these assessments and analyzes are aimed at preventing the disappearance of the beautiful and bright visual appearance and their filling in the future landscape.

Roads, not just motorways, are becoming increasingly important communication systems, not only from an economic point of view, but also for personal use.

Many people spend most of their time on the road. Therefore, without neglecting the condition of roads and highways and especially how to eliminate harmful aspects.

The shape and composition of the natural landscape through which the road passes technically requires a certain speed of traffic, largely determines the form and nature of the landscape intervention. Their significance is more functional and depends on their future composition of the landscape composition.

It can accommodate the following five groups:

*Transport-technical (safety) tasks:*

- increasing traffic safety and improving road use conditions;
- marking the direction of the road, reasonable approach to intersections, curves, hills and slopes (optical guidance);

- wind protection;
- protection against glare from car lights;
- separation of the road surface from the surrounding landscapes and pastures;
- sun protection;
- protection against shock waves during overtaking;
- orientation in fog and at night;

*Engineering technical tasks:*

- securing and fixing rocks;
- protection against water and erosion;
- protection from snowfall;

*Land reclamation tasks:*

- restoration of destroyed or damaged vegetation during the road construction process;
- reclamation function of trees on wet terrain, where stability on the road is endangered
- strengthening the steepness obtained during the construction of canals and embankments;

embankments;

- fixing of rolling sand, landslides, etc.
- maintenance of snow in places threatened by avalanches;
- reduction of excess surface water with the help of mesophilic root crops;
- improving the microclimatic conditions in places along the way of agricultural and other crops;
- reduction of the noise level emitted by the roads in the surrounding areas.

*Landscape aesthetic tasks:*

- integration of the technical part of the road to the landscape (improves the inorganic connection between the road and the natural landscapes);

- highlighting natural and other components of the landscape in the road areas - the relief of the environment, plant groups, water surfaces, certain buildings, architectural complexes, historical monuments, etc.

- enrichment of the road and some of its landscapes, as well as enrichment of the winter landscape;

- formation of stops, places for rest and good-looking places that are placed on the road;

- improving the appearance of abandoned roads, rock mines, sand, etc .;
- masking of visually impaired objects with unattractive appearance, etc.

*Biological ecological tasks*

- Protect the current appearance of the landscape and, within the possibilities of its improvement, in order to achieve a biological balance of the landscape.

Quality and efficient construction of green areas is unthinkable without taking into account their biological nature. Tree and shrub species are the main building material, but they have their own characteristics and specific interactions with the environment, which should be taken into account when planning a green system.

Road design is an important part of a sustainable construction strategy. To promote the development of the economy and the population, resources and the environment.

Landscaping should pay attention to the following principles.

**1. Ecological principle.** Protecting the urban landscape must adhere to environmental priorities in order to ensure biodiversity. However, this is a natural landscape. Thus, on the one hand, the city building must protect the city's natural resources, and on the other hand, we must compensate for the inevitable destruction of natural resources in the process of urbanization and create the city's artificial ecosystem to ensure sustainable development.

The extremely fast pace of development in urbanization in large cities and the associated industrialization and transport have a largely negative impact on the ecological situation in the urban environment, and an established trend of continuous growth of

anthropogenic impact. In these conditions a complex conflict situation is created between the environment and vegetation.

Environmental factors have a great influence on the development of plant organisms. The growth and longevity of the species are directly dependent on environmental factors and the mode of their manifestation.

Vegetation suffers from the adverse effects of highly altered environmental factors. On the other hand, the ecological plasticity of the species allows them to grow and develop under changing environmental conditions.

An ecological factor is any element of the environment that has a direct impact on living organisms throughout their life cycle or some of the phases of individual development.

It is known that the phenological development of ornamental vegetation on the streets is a complex reflection of their general condition, which is determined by environmental conditions.

**2. Principle of coordination.** The link between environmental, social and economic benefits should be coordinated to ensure that the environmental benefits are fully reproduced in the design of urban roads.

Although we need to coordinate the many relationships between conservation and development, ecology, entry and exit, construction and maintenance, to ensure the sustainable development of the ecosystem.

**3. The principle of services.** The landscape of the city road provides services to the inhabitants of the city, the design of the landscape should reflect the people-oriented and fully touch the deep historical cultural and geographical features of the city, meet the needs of all emotions, try to be a natural set of design, combined with kit planning.

Environmental disturbances. Road transport is a major polluter that acts constantly in the operation of roads. Exhaust gases containing toxic substances are carried away by air currents at different distances from the edge of the banquet and pollute the air, soil, vegetation, water, and through them - people, food and animals. There is a cycle of pollutants with the accumulation of harmful substances in the soil.

Road transport pollutes the environment with about 200 different pollutants. A particularly large percentage (up to 93%) are heavy metals: lead, zinc, cadmium and their compounds. At the same time, lead and cadmium pollution is considered by the UN to be one of the 16 most dangerous pollution that requires first-hand monitoring.

In today's world, car traffic is a vital part of modern life, but a burden on the environment. Therefore, it is necessary to find a solution to the conflict between the need for movement and the harmful effects it has on the environment, and they are: the release of exhaust gases, noise, dust and others.

**Aesthetic parameters.** Effectively help reduce the concentration of harmful atmospheric emissions and urban noise, regulate the microclimate, have bactericidal properties, enrich the air with oxygen, actively participate in the fight against water and wind erosion.

The aesthetic and psycho-hygienic influence of the plantations on the emotional state of the person and his vital tone is also huge.

These qualities can be divided into two directions - environmental and aesthetic impacts on the living environment.

Other main functions of the ornamental vegetation on the streets in the settlements are architectural-compositional and aesthetic-artistic.

The plantations along the flows of traffic and pedestrian traffic serve as a means of architectural and spatial planning of the urban area and increase the artistic expressiveness and aesthetics of urban development, ensuring proper regulation, direction and separation of traffic from pedestrians.

The streets form the skeleton of the city and create the conditions for orientation in the overall urban landscape.

The shape of the streets needs to contain both kinetic qualities imposed by the transport tasks and architectural and spatial qualities for the manifestation of the purpose of the street and the connections with the settlement.

Of the natural components of the urban landscape, green plantations are of particular importance, which are considered to be an integral and most important component of the same set of activities for planning, construction and improvement of settlements.

The green connections penetrate the settlement in a ribbon-like way as an interconnected system, built on the basis of natural resources and the requirements to connect the residential areas with the places for work and trade, with the central green areas and the recreation centers.

The purpose of the park arrangement of highways, boulevards, streets and pedestrian alleys is to create favorable conditions, environment and environment for the movement of vehicles and pedestrians in view of the requirements of security, safety, convenience and aesthetics.

In many cases, these green areas connect the main elements of the urban areas, as well as the areas between them, and in particular the green and vacant areas of the above categories. They give characteristic striped "ribbon-shaped" or wedge-shaped shapes that penetrate the central parts of the city.

The artistic functions of the plantations on the streets are related to the general compositional design, the volumes, the shapes and the color of the vegetation. It contrasts with the architectural lines and serves as a ribbon connection between the urban and natural landscape.

Thanks to the plant diversity, a large number of frontal, volumetric and spatial compositions can be created.

Green connections frame the main transport arteries and separate the adjacent terrains of the village from the influence of traffic: dust, noise, glare, gases, etc.

Park areas are an important element of urban planning. The contrast between the shapes and colors of the built-up volumes and the vegetation and their harmonious combination determine the visual appearance of the settlements.

Aesthetically designed vegetation contributes to the high quality of living in interaction with other elements: architecture, relief, park elements, water effects and fine arts.

Through their structure, silhouette, colors, species composition and composition, the park areas create a specific look of the village ensembles and bring the moving silhouette into the volumes of the settlements and the natural environment.

Frontal plantations have their own decorative effect, but are also used as physical and optical insulation of unaesthetic views, direct and guide the movement.

The effect of reducing harmful emissions from the street can be enhanced by well-landscaped embankments or ditches or by modeling the terrain and harmoniously connecting with the surrounding parked living environment.

In the plantations on the streets, where there are opportunities (boulevards, city highways, etc.), convenient traffic for pedestrians and cyclists is provided, as well as places for waiting and rest.

The park arrangement of the streets is actively included in the general green system of the settlements.

- The impact of the vegetation shaping the streets is due primarily to the good composition of the individual species with their shapes and colors.

- Through the plant compositions perspectives are formed, which create the impression of approaching or moving away of characteristic urban elements in the range of streets.

- Properly selected tree species also play an architectural and spatial role, in many cases connecting the different architectural styles of buildings and conveying the aesthetic appearance of the street.

- The vertical landscaping of the buildings tangential to the street design with vegetation repeatedly enhances the aesthetic impact of the linear objects in the settlements.

- With the help of the compositional ways and means of the vegetation participating in the landscaping of the streets, the comfort of the environment during the movement of pedestrians and motor vehicles is ensured.

Emotional - a well-formed highway, boulevard or ordinary street affects the emotional state of pedestrians and drivers.

### Conclusion

In conclusion, it should be emphasized that the landscaping of city streets and boulevards requires a search for unity between architecture and parking. The effect of reducing harmful emissions from the street can be enhanced by well-landscaped embankments or ditches or by modeling the terrain and harmoniously connecting with the surrounding parked living environment.

The plantations along the flows of traffic and pedestrian traffic serve as a means of architectural and spatial planning of the urban area and increase the artistic expressiveness and aesthetics of urban development, ensuring proper regulation, direction and separation of traffic from pedestrians.

The location and design of the street network is of major importance for the architectural, artistic and aesthetic design of the appearance of the settlement.

The streets must be designed in such a way that a landscape architect must be involved in their design, who will comply with the elements and principles for a correct compositional solution.

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