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Urban Planning Foundations For The Design And Organization Of Recreational And Service Areas Along Intercity Highways

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Abstract: This article analyzes the types of roadside rest areas along intercity highway routes, their functional structure, and the characteristics of their spatial placement from a scientific and architectural perspective. The increasing traffic flow on major highways, the growing demand for safe travel conditions for drivers and passengers, and the rising need for service facilities highlight the necessity of modern approaches to the design of rest areas. The article presents a classification of rest areas (minimum, basic, and comprehensive service zones), their service categories, sanitary and hygienic requirements, transport-logistical placement criteria, and environmental approaches. In addition, urban planning parameters and international practices are examined to determine optimal spacing, capacity, and functional organization of such zones. The study concludes with practical recommendations aimed at improving highway transport infrastructure, modernizing roadside service networks, and enhancing the efficiency of interregional transport connections.

Keywords: Recreational areas, suburban areas, recreational zones, urban planning, landscape architecture, ecological sustainability, transport connectivity.

INTRODUCTION:

The design and placement of rest areas along intercity highways constitute an integral part of the modern transportation system and play an important role in ensuring safe, comfortable, and high-quality travel for the population. The continuous growth of automobile traffic in Uzbekistan and around the world, as well as the increasing functional load on major highways, makes the scientific organization of such areas a highly relevant issue.

Firstly, roadside rest areas are an essential infrastructure element for ensuring uninterrupted traffic flow and the safety of drivers. Research shows that insufficient rest during long-distance travel increases the risk of road accidents by 20–30%. Therefore, determining optimal intervals between rest areas, their capacity, and functional structure requires scientific justification.

Secondly, the development of service, recreational, and logistics facilities along highways enhances not only the efficiency of the transportation system but also strengthens tourism, interregional economic integration, and agglomeration processes. In

particular, the rising traffic flows between Uzbekistan's major tourist cities (Samarkand, Bukhara, Khiva, and Termez) necessitate the development of roadside services in accordance with modern standards.

Thirdly, rest areas along highways are important from the standpoint of sustainable urban planning and ecological approaches. Energy-efficient architectural solutions, green zones, environmentally safe transport services, and clean sanitation systems require special attention in the design of such areas.

Fourthly, the modernization of service infrastructure along international transport corridors (C5+1, TRACECA, the Great Silk Road corridor, and the M39–M37 highways) is one of the key factors in increasing national competitiveness. This calls for a comprehensive study of rest area typologies, their spatial arrangement, as well as transport-logistical and architectural-urban planning characteristics.

Therefore, the scientific study of rest area types, capacity, service levels, geographical placement, ecological requirements, and architectural design criteria is an urgent scientific and practical task aimed at improving the efficiency of highway transport, ensuring passenger safety and comfort, and supporting regional development.

Current urbanization processes and rising living standards amplify the need for recreational spaces, especially in peri-urban zones. Such areas not only help maintain ecological balance but also contribute to public well-being, tourism development, and the improvement of urban environmental quality.

The organization of suburban recreational zones requires careful consideration of natural conditions, population density, transport accessibility, and principles of sustainable development. In Uzbekistan, this direction is supported through national programs, including the "Green Initiative" ("Green Space") and the "Master Plan of Tashkent City," which aim to create ecologically balanced and functionally interconnected recreational territories [1, 2].

METHOD

Urban and peri-urban areas form a unified territorial-functional system based on social, economic, and ecological interconnections. The suburban zones accommodate communal, transport, and industrial infrastructures, as well as recreational areas intended for public leisure and tourism, all of which perform important social and ecological functions.

Modern cities increasingly require well-organized suburban spaces that provide opportunities for short-term recreation, cultural activities, and ecological restoration. The rational planning and compositional organization of such areas contribute to the preservation of natural landscapes, the maintenance of ecological balance, and the enhancement of tourism potential.

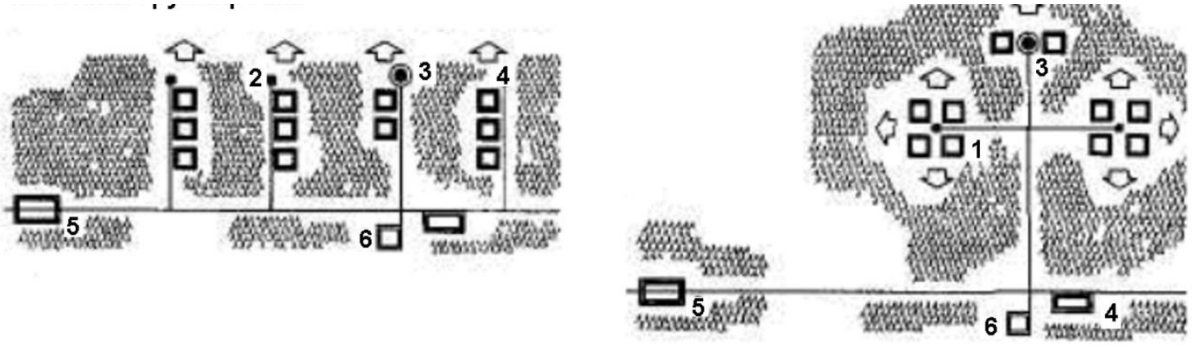
The aim of this study is to identify the types of suburban recreational zones, determine the principles of their planning and architectural-compositional organization, and develop scientific-practical recommendations for urban planning practice.

Growth in urbanization and population density has led to ecological and social challenges such as environmental degradation, increased traffic flows, and a decline in quality of life. Therefore, the creation and development of recreational zones around cities represent a key direction in sustainable urban development.

Suburban recreational areas are organized with consideration of natural and landscape conditions, transport accessibility, demographic characteristics, and the recreational needs of the population. Their structure includes functional zones, service centers, landscaped areas, residential spaces for service personnel, as well as integrated transport and pedestrian networks.

Grouping recreational areas into complexes allows for the expansion of service types and improvement of recreational quality; however, this process requires rational distribution of visitors to preserve the natural and tranquil environment.

Analysis Method: Recreational areas, tourism zones, and their complexes should include rest facilities, service centers, landscaping elements, utility services, accommodation for service personnel, and the necessary transport and pedestrian connections. Grouping individual recreational facilities into larger complexes makes it possible to provide a wider range of services than a single rest area could offer. However, it should be noted that excessive concentration of visitors may reduce opportunities for quiet relaxation and interaction with nature (Figure 1).



"Linear Placement" "Compact Grouping"

Figure 1. Examples of Grouping Recreational Areas and Complexes

1 – Recreational zones; 2 – Center of the recreational zone complex; 3 – Cultural and household service center for a group of complexes; 4 – Service personnel area; 5 – Residential accommodations for staff serving population centers; 6 – Utility zone.

Recreational zones, which are functional areas of recreational and tourist territories, include zones for recreational development, forest parks, natural landscapes, residential areas, and utility zones. The areas of the main functional zones vary depending on the characteristics, profile, and scale of recreational development. In urban settings, resort, recreational, and tourist zones are typically characterized by natural landscapes (25–45% of the territory), forest park areas (10–15%), and recreational development zones (5–10%) (Figure 2).

Recreational zones and their complexes should be separated by green ecosystems that provide visual and acoustic comfort and ensure necessary isolation. The spaces between complexes, as well as interesting recreational objects (water bodies, rivers, scenic views, cultural and historical monuments, etc.), require landscaping and greening [2,5,6,7].

Objective: It is necessary to create entertainment centers in the suburbs of large cities and in population centers that offer a variety of attractions and recreational services. Such facilities serve as attractive destinations for a wide range of residents, helping to redistribute recreational flows and thereby reduce pressure on natural recreational landscapes [3,4,8,10,12,13].

The Master Plan of Tashkent City, approved by the Resolution of the Cabinet of Ministers of the Republic of Uzbekistan, was developed taking into account population growth, environmental conditions, transport infrastructure, the proportion of green zones, and contemporary architectural trends.

As a result, the Tashkent Master Plan integrates the principles of sustainable urban development, ecological balance, and social convenience. It enables the functional zoning of the urban area, ensures the continuity of the transport network, and facilitates the integration of recreational landscapes into the urban environment.

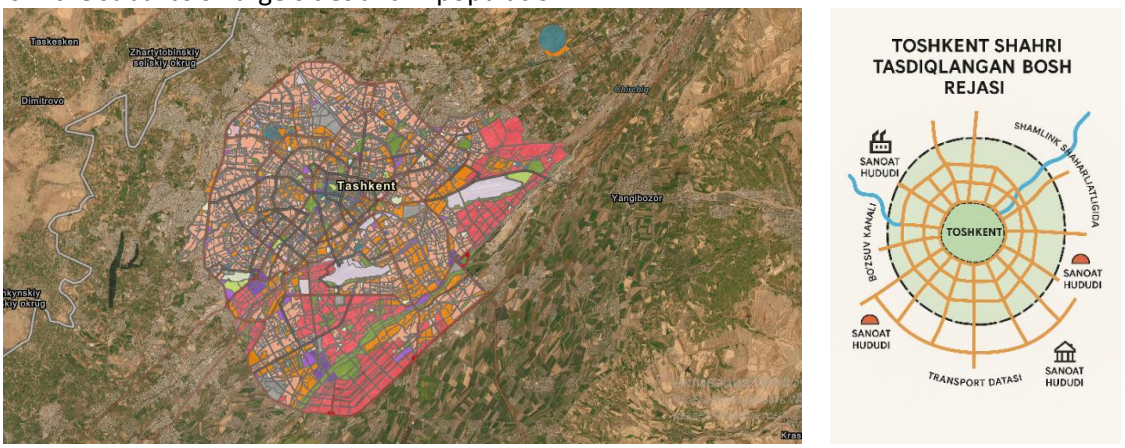


Figure 2. Approved Master Plan of Tashkent City. Main Recreational Zones and Groups of Complexes

Recreational zones are designated in the Tashkent Master Plan according to their functional purpose, capacity, and spatial location. The recreational component of the Tashkent Master Plan is aimed at creating a unified system of recreational zones within the city and the region. Integration with transport, ecological, and social infrastructure ensures the creation of a sustainable landscape-architectural environment.

The recreational system of Tashkent has been

developed as a network of functionally differentiated recreational zones that provide ecological balance and are adapted to meet the diverse needs of the population.

RESULTS

In large cities, the demand for recreational zones is high, leading to active development of park networks. These include multifunctional and specialized citywide parks, as well as parks within residential and planned areas. Creating comprehensive park complexes is advisable, and they should be spatially connected to each other and to suburban recreational landscapes. This allows for the establishment of pedestrian, ski, and bicycle paths from population centers to recreational areas.

In medium and small cities, where the need for urban recreational zones is lower, it is sufficient to create one or two multifunctional parks near the city center, ranging from 5 to 30 hectares. Such planning prevents overcrowding and improves ecological conditions. Green recreational spaces in residential areas should be located within a five-minute walking distance, supporting short-term recreation, social interaction, and a healthy lifestyle.

Other areas—designated for walking, sports, physical activities, and playgrounds for all age groups—should be accessible within a fifteen-minute walk. This distance ensures efficient use of green spaces, taking into account regional transport and logistics opportunities. For city and district residents, recreational parks, cultural and entertainment complexes, and zones for public celebrations, sports, and wellness activities should be located within a twenty-minute walk or a short car ride. These areas are often situated near intersections of interregional highways or close to regional centers, facilitating balanced distribution of recreational flows.

Outside city limits, near main entry points and active recreational zones, 50–70 parking spaces should be provided for every 200–300 visitors [6,7,9,11,13]. As cities grow and demand for recreation increases, suburban recreational zones are continuously expanding and becoming more complex. For small towns, a single fully equipped recreational center is sufficient; near medium and large cities, multiple zones are required, while in megacities, a developed system of recreational zones and facilities must be established.

Optimal sizes for suburban recreational zones are as follows:

- Small towns: 1–5 km
- Medium and large cities: 5–10 km
- Largest megacities: 20–25 km

Currently, visitors use rail transport (with an increasing share of suburban trains), buses, and cars to reach recreational areas, with private vehicle usage steadily growing. According to calculations, in the near future, these modes are expected to account for at least 50–60% of total recreational passenger transport, and at least 60% in large cities. Therefore, it is necessary to significantly increase the density of asphalt roads and develop recreational highways around major cities to ensure stable distribution of transport flows along key recreational routes.

Suburban recreational zones are part of the city's green infrastructure and perform not only recreational functions but also protective roles that affect the urban environment's ecological condition. Their development considers natural and social factors, recreational potential, and ecological sustainability. Regional recreational systems are established in areas with high population density, forming an integrated network that includes recreational zones, natural landscapes, wellness complexes, transport connections, and service infrastructure. In Uzbekistan, such systems are created along interregional highways and cover cities with populations exceeding 100,000. The total national demand for recreational areas is estimated at approximately 0.7 million hectares.

Planning takes into account population projections and the structure of recreational flows. Rational distribution of flows, considering their intensity and seasonality along transport routes, is especially important. This ensures the ecological balance and sustainable development of urban agglomerations. Short-term recreational zones near cities include forest parks, water bodies, summer camps, wellness centers, and garden complexes, providing opportunities for day trips or brief stays, restoring physical and psychological energy. Master plan schemes for suburban areas focus on shaping available forest parks and natural areas for public recreation.

A regional recreational system of significance comprises a network of recreational facilities, natural landscapes, wellness objects, transport-communication infrastructure, and service networks within a specific region (province, agglomeration, or economic district). It is designed based on the area's natural, ecological, economic, and social potential and aims to fully realize the region's recreational capacity.

Rational distribution of recreational flows, considering their frequency and intensity, is

particularly important in areas located along highways. Recreational systems along major highways are formed to balance transport convenience, time efficiency, and ecological requirements for residents [15,16,20]. Short-term recreational zones near cities are typically located along highways and include recreational forests, water bodies, summer camps, wellness centers, and horticultural areas. These zones are accessible by transport and designed to meet daily or weekly recreation needs.

The master plan for suburban areas includes the creation of forest park zones, encompassing territories designated for suburban recreation. Thus, the scientific organization of recreational flows along highways is a key factor in the sustainable development of regional recreational systems, rational use of natural landscapes, and improvement of the population's recreation quality [19,20,21].

CONCLUSION

The effective organization of recreational areas along intercity highways is a crucial factor in enhancing the safety, convenience, and economic efficiency of the transport system. The research results indicate that scientifically classifying roadside recreational zones, locating them at optimal intervals, and designing them according to functional requirements ensures the uninterrupted operation of highways.

The minimal, basic, and complex types of recreational areas differ in their level of service and capacity. Key criteria for their placement include traffic density, road classification, natural-geographical conditions, and safety requirements. Furthermore, ecological approaches, energy-efficient design, integration of green landscape elements, and the development of modern service networks were identified as primary factors determining the quality and functionality of recreational zones.

Properly located recreational areas along highways reduce driver fatigue, lower the risk of road accidents, promote tourism and interregional economic connections, and contribute to the development of urban agglomerations. Therefore, the comprehensive planning of roadside recreational zones, as well as the optimization of their types and locations based on national standards, international experience, and contemporary urban planning principles, is considered a pressing practical task.

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