



INNOVATIVE SOLUTIONS TO CURRENT PROBLEMS IN CREATING SUSTAINABLE ARCHITECTURE

M.A. Kholiyorova

(TUACE)

mtoshpolatova221@gmail.com

<https://doi.org/10.5281/zenodo.17500831>

ARTICLE INFO

Received: 26th October 2025

Accepted: 30th October 2025

Online: 31st October 2025

KEYWORDS

Innovative designs, maintaining a harmonious balance of the ecological environment, waste of energy resources, environmental sustainability.

ABSTRACT

This article analyzes the problems of dolzarm in modern urban planning based on the experience of Uzbekistan and foreign countries. In the process of urbanization, issues are analyzed aimed at the correct planning of the territory, the construction of infrastructure and the creation of favorable conditions for the survival of the population. Against the background of the inextricable interconnection of the interests of the state and society, aspects such as urban planning and management issues are analyzed and suitable proposals and recommendations are made.

Introduction

The concept of urban planning began to emerge in the middle of the 3rd millennium BC - the beginning of the 2nd millennium BC, that is, from the beginning of systematic planning practice in the construction of settlements with a large population in the ancient civilizations to the 21st century, human civilization has been experiencing a period of rapid development of cities and acceleration of the urbanization process. In the natural processes of this, the increase in the world population, the centralization of economic activity and the deepening of environmental problems constantly pose new challenges to urban planning. Therefore, architecture and urban planning have become multidisciplinary fields that require not only aesthetic, but also ecological, social and technological solutions. Urban planning, in turn, is not only a complex of buildings, but also a socio-economic, ecological and cultural system.

The main part. Today, in addition to providing comfortable living conditions, the field of urban planning poses many challenges to humanity, the most pressing of which we will consider below:

- **Maintaining a harmonious balance between the modern appearance of cities and the ecological environment**- one of the main issues, where the loss of natural landscapes as a result of urbanization is leading to a decrease in green areas.
- **Traffic jams**- Due to rapid population growth and high demand, many large cities are emerging due to the speed of construction, which is not fully adhering to planning standards.
- **Waste of energy resources**- Energy consumption for cooling in hot climates and heating systems in cold periods is high, and buildings currently account for about 40% of the energy consumed worldwide, leading to the depletion of natural non-renewable energy resources.
- **Environmental hazards of building materials** - Designs that do not take into account local climate and traditions, and the excessive use of materials such as concrete, plastic, and



asphalt, increase the carbon footprint, which worsens the urban warming effect, leading to thermal imbalance and deterioration of the microclimate in large cities.

These pressing issues are negatively affecting air pollution and the quality of life of the population.

In addition, it is appropriate to acknowledge the problem of preserving the national architectural heritage. Modern buildings and structures often do not fit into the historical environment, which leads to situations where the cultural identity of cities is undermined.

If we focus analytically on the conditions of Uzbekistan, the geographical location and climatic conditions of our country directly affect urban planning policy. A large part of the territory of the republic consists of desert and steppe zones, where in summer the air temperature rises to +45°C, and in winter there are severe frosts. In such a climatic condition, the planning of buildings, transport systems and green areas requires a specific approach.

In recent years, urbanization processes have accelerated, with new residential areas, industrial zones, and transport infrastructure being built. However, this process often occurs without sufficient consideration of climatic features. In particular, in large cities such as Tashkent, Samarkand, and Bukhara, the air temperature in the summer months is 4–6°C higher than in other regions. This situation is mainly due to: the reduction of green spaces; the absorption of heat by asphalt and concrete surfaces; and the high level of automobile emissions.

Uzbekistan is one of the countries with water shortages. The growth of cities is sharply increasing water consumption. Interruptions in drinking and technical water supply remain a problem in many new areas. In such conditions, we can witness the use of drinking water for secondary purposes in new construction sites. The dry climate and the large number of windless days lead to the accumulation of dust and debris in the atmosphere. In particular, road transport and construction work are the main sources of air pollution. In addition, Uzbekistan is located in a seismically active region, and its seismological quality is assessed as follows:

- Geological conditions: The territory of Uzbekistan has a complex geological structure, intersected by several seismically active zones. The Central Asian seismic zone is strongly influenced here, as well as movements in the northwestern part of the Tien Shan mountain range.

- Seismic hazard level: A large part of Uzbekistan is at risk of strong earthquakes, in particular, the Fergana, Zarafshan, and Chatkal valleys, as well as the Tashkent, Samarkand, and Bukhara regions, are areas of high seismic activity.

- Earthquake characteristics: Earthquakes occurring in these regions are mostly of medium depth and can have a strong impact on the earth's surface.

To solve such urgent problems in architecture and urban planning, a comprehensive, systematic and sustainable approach is necessary. Ensuring harmony between man and nature, combining national architectural traditions with modern technologies, as well as ensuring environmental safety are the main directions of development in this field.

Principles of sustainable development:

The concept of sustainable urban planning includes three main areas:

- Environmental sustainability - using green energy sources, reducing waste, and conserving natural resources;



- Social stability - comfortable living conditions, inclusive infrastructure, and the availability of public spaces;
- Economic stability - attracting long-term investments, developing affordable housing policies.

The concept of "Smart City" is increasingly being used in modern projects, adhering to the principles of sustainable development. This approach focuses on information technology, digital infrastructure, transport management, and energy efficiency.

It is also noteworthy that the regulation of urban planning is strengthened by numerous norms at the level of legal statehood, in particular, the Urban Planning Code of the Republic of Uzbekistan. Chapter 6 emphasizes public control over urban planning activities, and this code According to Article 35, "Public control in the field of urban planning activities shall be carried out in the form of public discussions, public expertise, and other forms that do not contradict the legislation.

Based on the results of public oversight, a final document will be prepared containing informational and recommendatory proposals.

The information, recommendations and proposals set out in the final document shall be considered by the state administration bodies in the field of urban planning activities in a mandatory manner and appropriate decisions shall be made on them," it is stipulated, and this norm certainly strengthens the circumvention of the law in urban planning through public control. In addition, Article 36 of this Code defines the subjects of public control in the field of urban planning activities and their rights, according to which "Citizens' self-government bodies, non-governmental non-profit organizations, the media, as well as citizens are subjects of public control in the field of urban planning activities, with the exception of cases where the subjects of public control participate as customers.

Subjects of public control have the right to receive reliable and timely information about the master plans of settlements. The participation of subjects of public control in the public discussion and adoption of decisions on the approval of master plans of settlements is ensured by local executive authorities.

The following may be established to implement public control: public oversight commissions; public expert commissions; public control groups; other organizational structures of public control.

During the public discussion and adoption of decisions on the approval of master plans of settlements, subjects of public control have the following rights: to discuss decisions on the approval of master plans of settlements, to make proposals on them and to participate in their preparation in other ways; if necessary, to organize a public examination of the master plan of a settlement at the expense of funds not prohibited by law before its approval.

"Subjects of public control may also have other rights in accordance with the law." Based on this norm, it is especially important for each person to actively participate in public control, based on his or her civic position, and to do so responsibly and conscientiously.

Turning to the latest changes in our legislation in this regard, we should also mention the adoption of the Resolution of the Cabinet of Ministers of the Republic of Uzbekistan No. 192 dated March 28, 2025 "On Measures to Introduce a New Mechanism for Implementing State Architectural Control". This regulatory legal act reflects important issues related to urban

planning and architecture. It is especially gratifying that the main purpose of this resolution is to ensure strict compliance with legislative acts on urban planning in the reconstruction and improvement of settlements and the placement of social infrastructure facilities, as well as to strengthen measures to identify and eliminate arbitrarily constructed buildings, as well as to ensure the execution of court decisions related to the demolition of illegal installations in the protection zones of communication networks and to take necessary measures to prevent possible emergencies in these areas. It is clear from this those efforts aimed at preventing existing and future problems in architecture and urban planning will remain relevant in a continuous and systematic manner.

Foreign experience. Here, we will provide information about several countries that have achieved high results in modern architecture and their successes.

1. *In the case of Singapore-* Singapore's architecture is a unique blend of modern architecture, environmental approaches, and globalization, featuring numerous vertical gardens, innovative designs, and "cultural heritage" objects. Traditional [schools](#) while traditional architectural styles are based on modern building-gardens, futuristic and skyscrapers like Marina Bay Sands are adapted to the climate and blend in with nature. Singapore is a leader in integrating urban planning, landscape design, and modern architecture. Projects like Gardens by the Bay and Marina Bay Sands are not only aesthetically pleasing, but also environmentally sustainable and innovative in design.





Gardens by the Bay



Marina Bay Sands



Green garden at Singapore Airport



2. *Capita Green Building*: The unique project includes a green roof, viva-landscape elements, a "sky forest", and ventilation systems that take into account wind and sun.



Capita Green Building

3. *In the case of the Netherlands*- The concept of "New Dutch architecture": Cities such as Rotterdam, Eindhoven, and Amsterdam are leaders in sustainability, public spaces, infrastructure, ecological materials, and reuse projects.

New Dutch architecture



3. *Japan is modern* Japan is strong in combining technological innovation, materials and cultural heritage in architecture. Architects such as Tadao Ando, Kengo Kuma, Shigeru Ban are known worldwide. Japan is also known for the "Metabolism" movement, which focuses on modular projects, flexible urban areas, and variable infrastructure concepts.

4. *United Arab Emirates (UAE)*, especially Dubai. Dubai and other cities have the most advanced projects in futuristic architecture, skyscrapers, innovative technologies (tall buildings, huge glass facades, LEDs and interactive elements). For example, projects such as the Museum of the Future can be examples in terms of design, technology and sustainability.

5. *Modern in India* Architects are noted for their attempts to combine international style and cultural identity. Projects such as the Indian Institute of Management Ahmedabad, Capitol Complex, Chandigarh are known as examples of global processes in architecture and urban planning.

6. *Azerbaijan*. For example, projects such as the Heydar Aliyev Center in Baku (designed by Zaha Hadid) have combined elements of culture, art, and modern architecture. Such buildings also serve as national symbols.

Why are these countries successful? Investment and funding - at the state level, large funds are being allocated to the field of architecture and urban development, in particular for infrastructure and transport, street reconstruction, and environmental projects. Culture and education - events such as architecture and design academies, international competitions, biennials, and expos are becoming platforms for architects. Technological innovations - new materials, fuel efficiency, digital design (BIM), environmental certifications (LEED, BREEAM, etc.) are being used. Development of the regulatory framework - requirements such as sustainability, energy saving, and environmental safety are being strengthened legally and normatively.



Defining modern architecture. Modern architecture is evidence of the creative use of new materials and technologies that emerged during the Industrial Revolution. It departs from historical architectural styles and emphasizes simplicity and functionality.

Design principles of modernism. The main rule is minimalism, where less is more. This principle is manifested in clean lines, open floor plans and the avoidance of decorative details. The approach of functionality over form prioritizes efficiency and practicality in design decisions. Another important aspect is the connection with nature; large windows create transparency between the interior and the outside world. The integration of buildings into the environment allows natural light to play a decisive role in the interior aesthetics.

Materials that shaped the era. The innovative use of steel, glass, and reinforced concrete defined the aesthetic of modern architecture. Pioneers like Ludwig Mies van der Rohe used these materials not only for their structural benefits but also to push the boundaries of design—think skyscrapers with sleek glass facades or houses that blend into rocky landscapes. New construction techniques gave rise to forms previously unimaginable: cantilevers extended buildings horizontally into space, and curtain walls suspended from skeletal frames allowed architects like Philip Johnson to challenge traditional notions of enclosure in his famous Glass House.

Frank Lloyd Wright's organic principles. The term “organic” in architecture finds one of its most profound expressions through the work of Frank Lloyd Wright. His philosophy went beyond design; it was about harmonizing structures with humanity and their environment. The Fallingwater House is a lasting symbol of this principle, seamlessly integrated into the landscape to create a symphony between man-made forms and nature.

Solutions to problems

- Integrated urban planning;
- It is necessary to conduct a modern urban development policy based on preliminary analysis of urbanization processes, forecasting and planning population growth.
- Expanding green infrastructure. Ecological balance can be maintained by establishing ecological zones around cities and building gardens and parks.
- Development of public transport;
- It is urgent to develop metro, bus, and bicycle infrastructure to reduce the number of cars.
- The use of information technologies (the concept of smart cities) "Smart city" technologies create the opportunity to effectively manage transport, energy supply, and other sectors.

- Strengthening the legal framework

Illegal construction can be reduced by improving legislation on construction and land use, and strengthening control mechanisms.

Conclusion. Urban planning occupies an important place in the life of modern society. Its proper organization is an important factor for the well-being, health and safety of the population. The elimination of urban planning problems should be carried out not only by state bodies, but also in cooperation with all strata of society. What should be understood by the interests of society and the state in urban planning? The right of citizens to a comfortable living environment, the prevention of harmful effects of economic and other activities on the environment, the improvement of the ecological situation, the development of engineering,



transport and social infrastructure of settlements and adjacent territories, the preservation of cultural heritage sites, as well as the openness and transparency of urban planning activities are the main factors of society's participation in the field of urban planning. [are the interests](#). The interests of the state in the field of urban planning are to ensure the conditions for the sustainable development of settlements and inter-settlement territories, the functioning of engineering, transport and social infrastructure systems, the preservation of natural resources and cultural heritage sites, as well as the prevention of conflicts of interest. The interests of legal entities and individuals, society and the state in the field of urban planning are ensured by observing the requirements of urban planning legislation, urban planning norms and rules, urban planning documents, as well as by exercising state and public control over their observance. After all, if urban planning activities contradict the interests of legal entities and individuals, society and the state, such activities must be terminated.

References:

1. Isamuhamedova, D. U., M. K. Mirzayev "Theory of Modern Urban Planning". Textbook. Tashkent-2015 (12-13 p.).
2. Isamukhamdova D. U., Adilova L. A. "Fundamentals of Urban Planning and Landscape Architecture". Textbook. Part 2., Tashkent, 2009.
3. Sheng, Y., Jackson, T., & Lawson, K. (2018). Evaluating the benefits from transport infrastructure in agriculture: a hedonic analysis of farmland prices.
4. Statistical Agency under the President of the Republic of Uzbekistan
5. National Encyclopedia of Uzbekistan 2000-2005.