

Modern Embankments: Integration of Architecture and Public Spaces

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Abstract: This article focuses on the role of embankment design in the formation and development of public spaces. Key aspects of successful embankment design are considered, such as multifunctionality, integration with nature, organization of social and cultural events, accessibility and safety, aesthetic appeal, as well as creating conditions for social interactions. Examples of successful embankments in various cities around the world illustrate how thoughtful design can transform urban spaces and improve the quality of life for residents. Special attention is given to modern trends and innovative approaches to embankment design, highlighting the relevance of this topic in the context of urbanization and sustainable development.

Keywords: Urbanization, social interactions, urban space, infrastructure, differentiation, revitalization, integration.

Introduction:

Currently, cities place high demands on the improvement of public spaces: safety, conditions for rest, leisure, and sports, as well as aesthetic appeal and environmental sustainability. Embankments, as an integral element of the urban environment, play a vital role, as they facilitate the close interaction between the natural landscape and urban infrastructure. Therefore, it can be said that the role of waterfront urban areas, their proper organization, and the architecture of surrounding buildings are of utmost importance in the modern world.

Embankments are not only aesthetic spaces but also places for public interactions, cultural exchange, and recreation. Furthermore, the transformation of these zones can involve combining traditional elements with modern innovations, reflecting the unique cultural context of the region.

The rapid development of cities and the growth of urban populations create a need for the creation of public spaces that offer residents comfortable areas for relaxation and communication.

Embankment design often includes landscaping, water purification systems, and other environmentally sustainable solutions, contributing to the improvement of the surrounding environment and addressing climate change. This aspect is directly related to the fact that 2025 has been declared the Year of Environmental Protection and the "Green Economy" in Uzbekistan. This was announced by President Shavkat Mirziyoyev on November 20, 2024, during a speech at the Legislative Chamber of the Oliy Majlis, highlighting that "today, the negative consequences of climate change are being felt not only in Uzbekistan but also in many countries around the world" [1].

The transformation of embankments can stimulate economic development by attracting tourists and investors, creating jobs, and supporting local businesses.

Public spaces such as embankments contribute to social interactions and the improvement of urban life quality. They become places for cultural events and

meetings.

Incorporating historical and cultural elements into embankment design helps preserve and emphasize the unique identity of the place, which is particularly important in the context of cultural heritage preservation.

Embankments often provide opportunities for sports activities, walks, and outdoor recreation, promoting a healthy lifestyle and improving the physical and mental health of the population.

Thus, the design and transformation of embankments is an important issue today, considering its impact on the environment, economy, social interactions, and quality of urban life.

Embankments are an integral part of the urban environment, as they ensure close interaction between the natural landscape and the urban environment. Therefore, the role of waterfront urban areas, their proper organization, and the architecture of surrounding buildings has reached its maximum significance in the modern world.

References

Many architects and designers who have studied embankment design, from its history to contemporary trends in the development of waterfront spaces, agree that the role of these areas has now reached its peak significance.

For example, Anna Evgenievna Nevokshenova and Yulia Mikhailovna Zharkikh, in their article "The Role of Embankments and Trends in Their Design in the Modern World," discuss approaches to the improvement of embankment areas and identify principles for forming the architectural component of embankments and their interaction with the surrounding environment [2].

Georgy Goltz, in his article "The Architecture of Embankments," discusses the principles of the reconstruction of the Moscow River embankments, including the overall architectural appearance, the scale relationship, and thematic differentiation of the embankments [3].

Researchers from St. Petersburg, in the article "Designing the Embankment as an Element of Comfortable Urban Environment," explore the main theses of research and development projects related to the territories of St. Petersburg, as well as examples and analyses of global practices in the revitalization of embankments [4].

MAIN PART

METHODOLOGY

The topic of embankment improvement has always

been relevant for designers and architects because it brings together several important aspects of the urban environment:

- Embankments serve as natural boundaries between urbanized areas and water bodies. Their development allows for the integration of nature into urban life.

- Embankments often become public spaces for walks, recreation, and events. A well-designed embankment attracts people and creates a comfortable urban environment.

- Thoughtful embankment design can contribute to ecosystem protection, improvement of the microclimate, and reduction of the negative impact of the city on water bodies.

- Embankments can include bike paths, running zones, and pedestrian routes, thus improving transportation accessibility and reducing the load on road networks.

- Thoughtful embankment design can become a city's calling card, creating a unique landscape and enhancing tourist appeal.

- Well-designed embankments increase property value, attract investment, and support local businesses.

Architects and designers strive to find a balance between functionality, beauty, and environmental sustainability, creating spaces that serve the city and its residents. First and foremost, this is, of course, multifunctionality.

"The main trend in the development of embankments is their saturation with various functions that can attract visitors and diversify their activities. Embankments must meet the needs of different groups of the population, be equally comfortable and convenient for all. At the same time, the embankment should fit into the architectural appearance of the surrounding buildings, maintain the compositional integrity of the environment, and complement the city's image" [2].

Many examples of successful embankments can be cited, which, as a result of thoughtful organization, have become important public spaces.

For instance, the Hudson River Waterfront in New York, USA, features a design that includes numerous parks, pedestrian and bicycle paths, as well as recreational and entertainment areas. The embankment has become a popular place for both residents and tourists. (Pic. 1)



Pic.1 the Hudson River Waterfront in New York, USA

The Hafencity Embankment Area in Hamburg

The redevelopment of the former port transformed this area into a modern district with residential and commercial buildings, parks, and embankments.

Hafencity has become a tourist attraction and an example of successful integration of architecture and public spaces. (Pic. 2)



Pic. 2 Hafencity in Hamburg, Germany

The Pavshinskaya Floodplain Embankment in Krasnogorsk transformed a wasteland into a modern public space with promenades, green zones, and

places for recreation. The embankment has become a popular place for walks and meetings. (Fig. 3)



Pic. 3 Pavshinskaya Floodplain Embankment in Krasnogorsk, Russia

Brooklyn Bridge Park in New York, located on the waterfront of the East River near the Brooklyn Bridge, has become a popular spot for relaxation and

entertainment, offering a variety of activities and beautiful views of Manhattan. (Pic. 4)



Pic. 4 Brooklyn Bridge Park in New York, USA

These examples demonstrate how thoughtful embankment design can transform urban spaces and improve the quality of life for city dwellers.

Each of these embankments has its unique features that contributed to their popularity and success.

Here are some key success factors:

- **Multifunctionality:** Embankments offer a variety of activities and zones for different user groups. For example, the Hudson River Embankment includes parks, sports grounds, bike paths, and restaurants, attracting various groups of people.
 - **Integration with Nature:** The inclusion of green spaces and water elements creates a pleasant and relaxing atmosphere. Brooklyn Bridge Park, for instance, offers beautiful views of the water and greenery, making it a popular spot for relaxation.
 - **Social and Cultural Events:** The organization of events such as concerts, festivals, and exhibitions helps attract people and create an active public space. Hafencity in Hamburg often hosts cultural events, making it a hub of public life.
 - **Accessibility and Safety:** All of these embankments are designed with the needs of all users in mind, including people with disabilities. Lighting, safe walkways, and convenient access make these spaces attractive to all segments of the population.
 - **Aesthetic Appeal:** Architectural elements, sculptures, fountains, and art installations adorn the space and make it unique. For example, Hafencity attracts attention with its modern design and integration with historical elements.
 - **Public Spaces and Places for Socializing:** Cozy seating areas, picnic zones, and cafes foster interaction and meetings between people. The Pavshinskaya Floodplain Embankment, for example, offers many places for relaxation and communication.
- These factors together create a harmonious and

attractive space that encourages social interactions and improves the quality of life for residents.

Such spaces can become 'attraction points' for city dwellers, where they can spend time outside their homes, and the variety of types of public spaces and functions presented will make cities more attractive not only for residents but also for visitors. Special attention should be paid to the fact that public spaces within the urban fabric should develop systematically, linking together urban transportation hubs, subway stations, major landmarks, business and shopping centers, thus creating continuous pedestrian routes [5].

In Uzbekistan, work is also underway to improve the embankments of canals in order to create comfortable and attractive public spaces.

On the initiative of the Tashkent City Administration, a conference was held, during which more than 12 projects aimed at further improving the image of Tashkent, enhancing the area, and creating additional recreational zones for the population were presented. Among them, the embankments of canals became a separate topic for discussion.

It is expected that the areas along the canals will become attractive places for both tourists and city residents. Therefore, in addition to other developments, the plans include the construction of cafes (with an emphasis on using lightweight structures), musical fountains, Wi-Fi zones, bike paths, sports grounds, outdoor cinemas, book cafes, artificial beaches, and extreme sports facilities (such as skate parks, etc.).

Among the proposed projects, the "Novza" project stands out, which includes the creation of a walking zone along the embankment, which will become a popular place for relaxation and walks. (Fig. 5)



Pic. 5 Proposal for organizing a walking zone along the Karasu Canal embankment.

Pic. 6 Preliminary concept for the embankment improvement project.

Plans were made for the improvement and creation of walking zones along the embankments of the Karakamysh, Karasu, and Jun canals.

«Tashkent Invest» JSC initiated a project to strengthen, improve, and create walking zones along the canal embankments in Tashkent. A proposal from a private partner was received to update pedestrian walkways, install navigation, benches, canopies, food outlets, and other elements that would make the project self-sustaining and maintain the embankments in a well-kept condition. A preliminary concept was provided for review. (Pic. 6)

These projects are aimed at improving the quality of

the urban environment, creating comfortable areas for relaxation and walks, as well as attracting tourists and investors. The improvement of the embankments in Tashkent contributes to the development of the city and the enhancement of the quality of life for its residents.

In total, Tashkent plans to modernize twelve embankments, particularly the new embankments along various sections of the "Karakamysh" collector, the "Salar," "Karasu," "Bektamir," "Bozsuu," "Jun," and "Burjar" canals (Pic. 7, 8).



Pic. 7, 8 Small models in the Soy Buyi Park.

But is everything going well with the improvement of the embankments? Are there abandoned embankment areas that require improvement?

Despite the active work being done in Tashkent to improve the embankments, with many projects already implemented or in the process of implementation, like in any large city, there are areas that require additional attention and improvement.

For example, the embankments of the Karakamysh, Karasu, and Jun canals, included in the improvement plans, still need enhancement. (Fig. 9, 10) There are also abandoned and unused areas that require reconstruction and integration into the city's infrastructure.



Fig. 9, 10 Karakamysh Canal embankments



Fig. 11, 12 Burjar Canal embankment (before and after reconstruction)

Taking the Burjar embankment as an example, the authors of the project note that, unlike other walking areas, this one will feature, for instance, street escalators. Additionally, multi-level benches will be installed. However, according to surveys of residents and users of these embankments, the situation is not in favor of the presented projects. «Given our climate, we need more trees and green zones. We don't need open areas; who will stay in +50 on an open, even if beautiful, area? We need green zones, small alleys, paths, so it's quiet and cool. We should not chase

after beauty and grandeur, but focus on convenience and comfort. And with our climate, that means green spaces...» [6].

In general, both city authorities and private companies are actively working on improving the embankments to create comfortable and attractive public spaces for the residents and visitors of Tashkent. A positive example of this is the reconstruction of the Anhor embankment (Pic. 13, 14).



Pic. 13, 14 The Anhor embankment before and after reconstruction.

However, the improvement process requires time and significant investments, which is why some areas still remain abandoned and need attention. Moreover, according to the city's residents, the embankment reconstruction projects do not fully align with their vision of what recreational areas should look like. «...the number of plantings should greatly exceed the designs presented above; no empty concreted areas, decorative trees, shrubs, and flowers should be the dominant feature. Benches should be placed in the shade of trees, around them, rather than by the sidewalk. In the open area (lawn) under the open sky, a screen with a projector can be installed to show movies in the evenings, and during the winter, this same area can be equipped with a deck, a canopy made of lightweight materials, and a small cafeteria, thus encouraging people to gather in parks even in the winter» [6].

CONCLUSION

Landscape design of embankments is a complex and multi-step process. The design project for the improvement of an embankment necessarily takes into account its historical context and the surrounding urban development. For example, an embankment near a residential area will not be the same as one near public buildings or along a roadway. An active embankment complements the function of the buildings, and its design and architecture form a cohesive whole, enhancing each other.

It is also important to remember that nature is the main resource of the area, which must be developed and integrated into the city's life, making it accessible and comfortable for the population. This is also evidenced by the fact that the embankment serves as a climate-forming object, which directly influences the daily life of the residents: on a hot summer day, the embankment is a favorite spot for locals.

Furthermore, the integration of local culture not only gives the embankments uniqueness but also creates a space for dialogue between generations. This can become an inspiring moment for young people, not only to learn more about cultural values but also to see how they can be relevant and modern. Therefore, during the reconstruction and improvement of embankments, the following aspects should be considered: creating interactive walking zones with QR codes leading to videos, podcasts, or texts about the cultural values and history of the region; organizing events where young people can participate in traditional crafts, arts, or cuisine, combining these with modern design; involving young artists to create street art based on local myths, legends, or historical events, showing cultural

heritage through modern aesthetics; organizing open stages for traditional and modern performances inspired by local culture; involving students from architectural or design universities in the development of embankment elements, so they can actively participate and offer their creative ideas.

For tourists, embankments decorated in a national style can become a unique attraction. This not only emphasizes the region's identity but also gives visitors the opportunity to learn more about the cultural heritage.

Elements of traditional architecture, such as arches, ornaments, and characteristic building forms inspired by historical styles from our region; resting areas decorated in folk motifs, using traditional materials such as wood and clay; cultural pavilions where tourists can try national dishes or participate in craft workshops; thematic routes telling the story of the area, possibly with augmented reality, to bring the images of the past to life. This combination of functionality and aesthetics can make the embankments not only a place for walks but also gives visitors the opportunity to learn more about the cultural heritage.

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