

KAPITEL 10 / CHAPTER 10¹⁰

THE CONTEXT OF THE SPATIAL ENVIRONMENT IN A MODERN CITY

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Introduction

Recently, global society has been facing new challenges that have caused changes in all spheres of human life and activities without exception. The pandemic has led to the development of new opportunities for communication and information exchange, and the terrible war on the territory of Ukraine has reminded of the relevance of special urban planning and architectural volumetric-spatial requirements for the construction and functional distribution of all urban areas without exception. Recently, world society is facing new challenges, which cause changes in all areas of life and human activities without exception. The pandemic has led to the development of new opportunities for communication and information exchange, while the terrible war in Ukraine has reminded us of the urgency of special urban planning and architectural spatial requirements for the construction and functional distribution of all areas of the city without exception.

Not only are specially equipped shelters and protective facilities vital in the development structure today, but the very structure of transport and pedestrian links and public spaces, which is the basis for communication spaces in the city, also requires a certain degree of multi-layered 'protection'.

Cities play a crucial role in today's world and are not only a concentration of resources but also the engine of the modern economy. Sustained urbanization trends lead not only to a concentration of population in cities, but also to the corresponding development and saturation of their spatial, communication and transport-pedestrian systems as major determinants of urban quality of life [1].

Architects and urban planners around the world have been making great efforts for centuries to solve the problems of urban structures associated with the growth and development of infrastructure and communication systems of modern megacities and major cities of the world. To this end, projects are being developed to optimise spatial

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structures, options for intelligent transport systems, restrictions are being introduced for the functioning of engineering systems of various kinds, but all of them together are still far from a universal system capable of solving the problems of spatial and communication structure of modern cities and making it safer.

This means that, in general, one of the most important urban planning tasks of a modern city today is to improve not only the conditions of transport accessibility, unification of urban space, reduction of structural-planning contradictions, but safety, which is becoming urgent day by day. Town-planning structures of large cities have a complex infrastructure that integrates separate subsystems: compositional, spatial, functional, transport, etc. into a single harmonious whole, where the safe and reliable mobility of residents is one of the main objectives. In this system, both buildings and structures and the space of streets, intersections and squares interact equally, where the street is an extended, traffic-oriented, dynamic space which contrasts with the enclosed, intimate space of the courtyard or the open space of the square [2].

The modern city is rapidly growing and developing from megacity to gigacity, and the latest technologies immediately find their application in it, facilitating the life of the city dweller. However, the undeniable improvement of life invariably leads to globalization and the loss of environmental integrity and, as a consequence, the human scale in the structure of urban spaces.

The environment forms the human being, but contemporary architects focus most often on shaping or integrating architectural volumes into the space of the city, which in turn is structured by urban planners, combining the elements of the city into a coherent ensemble that form the way of life of the person. Urban structures are based on a system of links between infrastructures and various types of traffic flows, where intersection points determine the location of spatial nodes - the most important elements of the city. In the spatial equivalent of links (flows) - streets, alleys and boulevards of the city, while nodes (intersection of flows) - squares. The basic units of the urban environment are the street as a space for movement and the square as a space for impressions. Thus, streets suggest a dynamic exploration of space, while squares are static, suggesting stopping and looking what is going on around.



Recent studies consider public space by analysing its quantitative and functional characteristics. Researchers focus their attention on the multidimensionality of public space, considering it from different sides and guided by certain characteristics. For example, such authors as: Cherkes B. S., Fedak A. and Stender A., in their studies emphasise the geometric characteristics of public space [3]. Another group of authors: Feshchur R. and Sosnova N. evaluate public space by many other criteria, in particular: economic, social, environmental and security [4]. These authors include the activity of the territorial community to social criteria, but social contact between people is not regarded as the most important element of public space that contributes to communicability.

10.1. Public spaces

The problem of a comfortable street environment dates back to the ancient city. Transport constantly put pressure on a pedestrian, causing him difficulties, and as soon as the car appeared - it became the absolute master of the city, dictating its requirements [5]. By the mid-twentieth century, the pedestrian connections that had been developed over the centuries were disrupted. Historical purposes, types, and classifications of streets had evolved, traffic and information saturation had increased, and compositional, spatial, and functional connections had become more complex.

The street is a spine of urban life, and a unified public space with established and enforced urban common public rules. Streets are embedded into the system of various public spaces, which are sensitive to the competition within the city center. A modern street is a multilevel phenomenon, as it forms a system of interrelated spaces; it is a complex structure of micro-spaces with its inner ways and vectors, life paces, as well as information and time perception [6].

Street space in the structure of modern city environment is not only an integral element of the compositional, functional, transport and aesthetic structure, but also the most important element of its communication structure [7]. Architects have been



looking for solutions of urban planning problems in projects of cities of the future for a long time. Already in XV century Leonardo in his project of an ideal city, on the example of reconstruction of Florence, for the first time divide the street into several levels for rational distribution of functions and safety both of engineering communications, and of the pedestrian and transport movement. This idea has been taken up by the leading creators of the following periods, for example, Ludwig Hilbersaimer in the design of the city of the future actively develops the idea of the 'vertical' street.

The idea of a multi-level, rationally designed safe street space is even more relevant nowadays and still excites the minds of the creators of the modern urban environment. Multilevel street structures offer an opportunity to meet the needs of rapidly developing and expanding cities. It is a complete solution that meets the needs of contemporary urban planning and the "challenges" of the present [8]. The multi-level space of city streets is an architectural, urban planning and volumetric-spatial complex of mutually related elements, diverse in function, meaning and origin.

10.2. Information

The modern city today is not only a hub of functions, whose complex transport and spatial structure tirelessly seeks to introduce new achievements of science and technology, it is a cluster of heterogeneous and diverse information that is sometimes difficult to make sense of, even for a modern person who keeps up with the times. The complexity and multilayeredness of information is due to the fact that urban space is formed and develops not only in space, but also in time [9]. Ultra-modern cities, such as Dubai, Masdar, Songdo, Astana, etc., designed and built already in the 21st century, certainly do not yet have the complexity of perception, unlike cities laid down in ancient times yet.

Urban environment is a complex functional spatial system of inherently interrelated parts of the city. This system involves equal interaction among buildings



and facilities, as well as the space of streets, crossroads and squares, where the street, as a long, city traffic oriented space, contrasts to the closed intimate space of the yard. For a long time the street performed purely functional duties in shaping the urban environment. Historically, it was the trajectory of the transport and people flows, but not only, since the street symbolized the border between the private home space and a variety of public urban spaces. It was conventionally responsible for the links between major city spaces, connecting functions and social groups [6].

The structure of urban space formed and established over the centuries, has universal principles of construction. However, the problems of ideological and artistic expression of cultural traditions, the harmonization of the interaction between the natural landscape and the architectural environment, the preservation of the appearance of the historic city centers and the use of historical heritage and national traditions to create a complete urban environment, the creation of comfortable and safe urban public spaces, etc. are still not solved. The city centre as a dominant element of the spatial structure of the city is not only a highly urbanized environment where the main urban functions are concentrated and the main compositional units are formed, it is the focus of the main, the most important and interesting public spaces of the city [10]. The specifics of the formation of these spaces is that they usually have a "rich" history, expressed by the architectural and spatial language.

A street is a communicative form of an urban space, which has its own configuration, architecture and history, as well as serves a meeting place. It is impossible to realize the meaning and spatial composition of a modern street ignoring the consideration and analysis of its history, partially determined by its function (commercial, craftsmen, office etc.), even if it has changed with time

Complex, dynamic and sometimes contradictory conditions of the modern city "impose" new requirements for the formation of public spaces of the city centre. The diversity of functions, the development of all types of infrastructure require the consideration of the city centre as a complex system in the overall architectural and spatial system of the city, solving a set of measures to optimise its organisation and construction. In this "perspective" the reference to the past and its creative rethinking



contributes to the search for the new, and the application of the principle of successive development helps to combine the established functional-spatial structures of the historic city centre with the new "inclusions" of modern ensembles and individual objects in the whole [11]. The peculiarity of each city is conditioned by the differences in the distribution of functional and structural-planning elements, their hierarchy, individual characteristics of the landscape and architectural-artistic image of the centre. Thus, the centre of any city forms its individual and unique image, taking into account the natural and landscape characteristics of the area.

10.3. City center

The city centre is, above all, the historical environment shaped in the process of its evolutionary development, which is relentlessly layered. It is the carrier of the 'spirit of place' and the image of the city. The public centre of the city is a system of different spaces (squares, streets, squares, boulevards, embankments, etc.) different in function, construction, structure, stylistics, composition, etc. The unique environment of the historic city centre formed by the centuries-old "additions" of both ordinary buildings and special, dominant objects and spaces has a unique aesthetic expressiveness which distinguishes the area of the historic core of the city centre not only in its general structure but also in the general composition of the city [12]. The insufficient consideration of historical conditions in the development of planning and development and the leveling of landscape features causes the loss of individuality and scale of the inner spaces of the city, as well as the depersonalisation of the central ensembles.

The most common form of existence of public spaces are the so-called stable spaces, in which the process of shaping is completed to the last detail. It should be noted that the stability of such formations is far from being absolute, because the life of the city, changes in its social reference points make adjustments in their formation, information provision, changing individual elements, and sometimes compacting the development and complementing the environment with new buildings. All these



changes "provoke" the formation of a new, modern perception of public space taking into account the "changed" modern view, because a modern person cannot perceive the historical structure of the city as it was typical for a contemporary of these objects, because the perception of a modern person is a "product" of synthesis and layering of centuries-old information of different kinds [1]. For example, the "spirit of place", which refers to a special form of perception of an object, a unique sense of identity and individuality of the environment, its conformity with the historical features of the development of this territory is formed in the mind, a combination of elements of natural and anthropogenic landscape, characteristic environmental details, colour scheme, reinforced by cultural and historical associations related with this place, which is unique to this territory [13].

In many cities at different stages of development of public spaces of the centre its integrity has been preserved. The means of achieving this integrity and originality is an ensemble of buildings - a harmonious set of structures with landscape elements, creating a complete spatial composition, with high artistic expression and stylistic unity and imagery. With the modern functional saturation of the urban environment and its spatial development, we are talking about a system of architectural ensembles with artistic diversity, representing the works of urban art, the appearance of which is unique [14]. The basis for the integrity of the city's appearance in this case, is the architectural and spatial composition, dictating the placement of objects and a system of visual relationships: a system of planning and visual axes, nodes and accents, combining primary and secondary, natural and man-made elements of the architectural and spatial environment. A special role in the enrichment of the image is performed by historical, architectural, cultural and urban planning heritage, the presence of which is inherent in most major cities, especially historic. The individuality and even uniqueness of the face depends on the degree of integrity and value of existing heritage sites, by the way they include not only architectural monuments (artificial environment), but also the unique structure of the cityscape (natural environment), which actually "created" the environment of the architectural [15]. In some cities, historic planning and development form integral core zones of the centre, clearly readable in the new



architectural and spatial environment.

The structure of public spaces and the appearance of the centre are significantly influenced by the principles of transport and pedestrian communications, which organise the environment and its perception. The main transport communications bounding the territory of the centre, including large transport facilities and constructions (transport interchange hubs, multilevel interchanges, overpasses, flyovers, etc.) serve as an area of dynamic instantaneous overview of the development, set a large urban planning scale of spatial organisation and require the integrity of its perception [16]. The system of pedestrian routes, on the contrary, unites the local spaces of the centers, contributes to a slow dynamic view of the objects, both from external directions and from internal (deep) points.

What are the secrets of cosiness and attractiveness of old city quarters, streets and squares compared to modern urban spaces, and what exactly determines the level of comfort of the architectural space of a city? Why do travelling through Venice, Melbourne, Copenhagen or other cities with intricate street and square structures leave a feeling of satisfaction and a desire to return there again? The answers to these questions can be found by understanding not only the spatial organisation of the city centre, but also the processes that influenced its creation.

Public spaces are not only the most important structural elements of modern cities, but also a real stage of urban life. Volumetric forms of architectural structures are a kind of stage backstage, represented by the volumetric and spatial forms of streets and squares, where various events actually take place. Streets and squares differ from each other on a number of parameters. The first ones are mostly characterized by movement and, in fact, are dynamic urban spaces [6]. The latter, squares, with the exception of transport and pre-bridge squares, characterise a static state, a holistically perceived fragment of the urban environment that forms the image of the city.

The spatial composition of any city, like architecture in general, is perceived in motion and in time. The integrity of the composition is created and therefore perceived as a system of changing spatial impressions, based on the alternation of accents and pauses, static and dynamic, objects of different functions and scales. The dynamic



spaces of the streets play a role of extended horizontal links-corridors, uniting the central public spaces in a coherent system, where the static spatial elements become elements of the reference system from one urban space to another, bringing liveliness and diversity to the urban environment. Dynamic space is replaced by static space, where one feels that one part of the journey has ended and the next part is yet to come. An integrated image of the city emerges from the fusion of the perceptions of its large urban ensembles, which are usually located in squares, obtained in the process of movement [17].

Public spaces reflect the history of the emergence and evolutionary development of the city, where along with the historical squares in the process of development there were also modern spatial objects with different purposes and often combining several functions [18]. The variety of planning and spatial solutions of public spaces has been formed over the centuries in different cultural traditions, landscape, political, social and other conditions, but it is possible to identify common techniques of their formation in different historical periods.

The first public space in human history was the square. It was formed as the main structural element of the urban environment in Ancient Greece in the 4th century B.C. The organisation of such an open public space was due to the structure of society and the development of a regular, rectangular layout of cities. The agora, the main public space of a city, becomes the main architectural object of a Greek city. Over the centuries, the Greek agora underwent a series of modifications from an enclosed courtyard to a town square connected with the streets and belonging to the whole city.

The Romans, taking the structure of the Greek agora as their starting point, developed it considerably, from a rectangular square surrounded by porticoes to an elongated square with a temple standing in the back. However, developing the composition of the elongated square, they discovered a new principle - they applied a system of squares arranged on one deep axis, complicating the structure by transverse spaces of exedra.

The Middle Ages took a step back in the development of the public space of the square, but 'gave' already a three-part division of the public spaces of the city, in



contrast with the two-part antique division [19]. This is how the Cathedral Square, Town Hall Square and Market Square appeared, which were developed during the following historical periods.

The Renaissance and Baroque periods became the peak of development, when public squares became the main object of town planning. This importance of squares can be explained by the fact that squares are the centre of social life of the city, where all the most important events take place: mass meetings of people, carnivals, tournaments, laws were pronounced and sentences were carried out.

With the increasing importance of public spaces of the city, the town square stood out as a separate town-planning object that had a special compositional meaning and received theoretical justification as a public space of the city [18]. In the process of the development of urban public spaces by the mid-twentieth century, a significant experience in their formation had been accumulated and a number of theoretical works on the solution of urgent urbanistic problems had appeared.

Up until the Modernist period, capital buildings in the oldest settlements appeared along roads, trade routes and market squares. In other words, cities grew by building around public areas, shaping them.

The contemporary period treats the public space of the street and square as multifunctional, but housing developments are often constitutes random clusters of spectacular, freestanding buildings between car parks and motorways. Living in a modern city implies not only the ability to navigate its structure and read information in the forms and symbols of architectural objects, but also the skill to communicate with people and interact with the urban environment.

Summary and conclusions

Modern urban planning practice presents many interesting examples of multi-level structures, increasingly using the underground space of the city, where not only different levels of the city with a specific function are combined, but also infrastructure



networks for almost any purpose. Some examples represent solutions in difficult landscape settings, while others address the challenges of historic cities.

Traditionally, public spaces have 'gathered' large numbers of people. Since the need for communication has not disappeared today, just as in the ancient period, the public spaces of the city serve as a place for meetings, communication, walking, expression of public opinion (rallies), festivals and cultural events.

Intensive urban growth in the 20th century led to a redistribution of the functional structures of public spaces in squares [20]. Thus, today there are far fewer opportunities for communication and interaction between people in the structure of the city than a hundred years ago, when the square was a place for fairs, processions, popular festivities, proclamation of decrees, etc. More often than not, modern squares turn into spontaneous or legalised car parks, losing their main function and, most importantly, their architectural-spatial, informational and figurative potential.

The public spaces of the historic centre are complex in structure, multifunctional and multivalent, but they are the ones that increase the architectural and artistic attractiveness of the city and have a psychological and emotional impact on the outlook of residents, especially young people. They are an integral part as a system of public spaces of the city, have a bright artistic image with a certain functional content. The variety of processes characteristic of public spaces makes them the most complex and visited, emotionally rich and aesthetically expressive.

The town-planning environment of the city centre is formed and develops as a multi-level structure. Its development and perception is conditioned by the activity of human flows, as well as the peculiarities of their life activities, such as the need for orientation not only by functional and utilitarian features, but also in terms of information characteristics (degree of information saturation, recognisability, etc.). Individuality and uniqueness of the architectural environment is one of the methods of identifying the environment, an important role in this is played by national originality, unique conditions and landscape forms.

Urban squares emerged as monofunctional in the process of the centuries-old development and got polyfunctional features. Diverse in plan form, stylistics, spatial



and compositional solutions, modern public spaces increasingly aspire to multifunctionality and universality, in an attempt to meet the growing needs of modern man. However, the primary function of public space, embedded in the very first structures of the square, dialogue and communication, is still relevant and is structurally determining.

The spatial composition of the modern urban environment is an integral structure - the ensemble of the city. Richness and complexity on the one hand and clarity, based on the interconnection of the main spatial elements - streets and squares on the other, create prerequisites for sustainable development of the spatial structure of the modern city. Despite the constant development, change and growth, the system of public spaces strengthens the links not only between the parts of the city, making its organisation structured, understandable and recognisable, but also reveals the context.