

Formation of pedestrian street network system planning structure of historical part of city of Astrakhan

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Abstract. In historically developed cities, the urban environment is of particular value, it is determined by significant historical and cultural objects of the city-forming environment, a planning framework with a system of streets, squares, park spaces. For the development of formation of the modern living standards and the relevant requirements of a given level of urban life it is necessary to make changes in the urban planning structure. The historical part of the city of Astrakhan, which has preserved its volume-planning structure to the present, does not meet the requirements of modern comfortable and safe pastime. Based on the studied domestic and foreign experience and taking into account the existing historical town planning layouts, the transport and pedestrian network, the reorganization of pedestrian spaces is proposed. The results of the analysis and suggestions of project experience can be implemented in the design process in the city of Astrakhan. The reorganization of the pedestrian spaces system in town planning decisions of the central historical part of the city of Astrakhan will make it possible to form a safe, favourable environment and will improve the quality of life of citizens and visitors of the city.

1. Introduction

The central historical part of the city of Astrakhan has a significant number of architectural monuments that are distinguished by their architectural solution and formed color in conditions of tolerant residence of multinational nationalities, whose traditional way of life and morals manifested itself in architectural and compositional and space-planning decisions. The architectural environment of the central historical part of the city is interesting for studying and staying in it [1,2].

Considering the most significant contemporary problems, we can distinguish the following aspects:

- there are no comfortable pedestrian spaces, the streets are narrow due to the existing historical development, they do not have a green zone, the construction line coincides with the red line;
- the environment becomes oriented to the economic component of business sales, therefore, it integrates the means of information transfer, depriving it of its original individuality;
- The number of large-scale sales of products leading to the concentration of certain points in the urban centre of cars is increasing, while car parks in this part of the city are not sufficient in capacity;



- The influx of consumers and visitors to the historical administrative centre causes a large accumulation of vehicles, in the absence of parking lots, narrow streets and lanes become oversaturated because of the heap of transport;
- Elements of park spaces due to lack of financing and the difficulty of maintaining them in the proper form are eliminated; in this area shopping centres are being built - economically important for attracting funds, but harmful for the ecology of urban space;
- The remaining single park areas are poor for comfortable landscaping and the presence of a green landscape, the elimination of plantations and the covering of the areas of restored quays with a stone create a comfortable stay only in the spring and autumn periods of the year, summer stay on the embankment causes discomfort and the risk of deterioration of well-being from an excess of solar radiation.

At present time, cultural transformations take place in the country, there is an awareness of the need to create a favorable environment for the urban space, as a component of the architecture of buildings, and general improvement of the streets, an understanding of a comfortable stay in an urban environment that requires security and comfort.

The aim of the study is the possibility of reorganizing the historical part of the city with the creation of pedestrian spaces designed to increase comfort and improve the ecology of the environment by removing transport from potential walking streets.

To achieve this goal, the following tasks are defined: to make an analysis of the historical formation and development of pedestrian areas, for the period of the late XIX century; to interlink pedestrian directions with landmarks of the city; determine the architectural and town-planning patterns of the formation of streets, squares and embankments; determine the functional component of pedestrian areas.

2. The main part

The central part of Astrakhan was formed long before the appearance of modern modes of transport, this can be traced from the stages of development of Astrakhan as a whole. The active development of the historic nucleus of Astrakhan - the White City in the first half of the XVII century gave the initial formation of the urban planning structure. Formation of the main city street now bearing the name of the Soviet, in the past –Bolshaya, Ekaterininskaya, Moscow, this was the first step towards the development of the planning structure of the city. In parallel to Bolshaya Street, there was another street with a longitudinal destination–Akhmatovskaya (formerly called Spassakaya), running from west to east. Further, streets were formed that intersected with cross streets running from north to south. All this is clearly visible on the Olearius plan [3-5].

The network of streets, most of which have survived to the present, have preserved the existing structure and historical appearance. The commercial significance of the city was determined by the development of foreign farmsteads, the Russian Gostiny Dvor and the square with trade rows.

In the conditions of development of town-planning formation of Astrakhan, as a city on the trade route, areas were gradually formed on which sales, sales and exchange of products were realized. Such areas intended for trade were conventionally called cages, later this term was transformed into the name of the trading market areas of the city: the Big Isads, Selensky Isads, which have retained their functional importance[3]. Many shopping areas eventually became gardens and squares, creating the first recreational areas of our city, for example, Fruit Garden, from the name of the products of sale - trade in fruit, later becomes a place of rest for the city residents, now the Sea Garden. During the XIX century, park areas for walking and resting townspeople are being designed by Mykolayiv Park, Garden of Colosseum, Garden of bicyclists, Arcadia Park, which give people the opportunity to take refuge in the summer heat of Astrakhan [6,7].

To date, the streets of Kirov, Akhmatovskaya, Teatralny Lane, Volodarsky retain the functions of providing services to the townspeople and the dominant sphere, undoubtedly, is trade. The existing filling of the territory refers to objects that are socially significant and unique, as it is located in the zone of monuments of cultural significance and is saturated with trade, public entertainment,

educational and administrative functions. The mediocre filling and visual condition of the environment does not correspond to the status of the historical centre of the city, visual communications (store signs, banners, entrance groups to shops, the absence of small architectural forms, etc.) are knocked out of the common historical environment.

The obsolete street network does not correspond to the modern intensive pedestrian and active traffic, leading to a decrease in the efficiency of the streets and their congestion, to the discomfort of movement of pedestrians. The lack of full parking places leads to this state not only Theatre Lane, but also Akhmatovskaya and Sovetskaya streets (Figure 1).



Figure 1. Str. Soviet. View of the Kremlin.

New conditions for social and business life require solving the problems of organizing the spatially developed polyfunctional structure of the city centre, organically connected with the historical core and incorporating new polyfunctional complexes—offices, banks, administrative and managerial, commercial, entertainment centres, hotels, etc [8-10].

The analysis of the existing state of the historical part of the city allows us to draw the following conclusions: the street network of the historical core has been almost completely preserved to the present day; the appearance of the building reflects the features of the architecture of the XVII-XIX centuries; the formation of pedestrian areas is one of the ways to preserve the historical heritage of Astrakhan.

Based on this, it is possible to draw conclusions about the need to create interlinked pedestrian paths that allow you to connect pedestrian directions with landmarks of the city and determine their functional orientation.

Competent formation of the living environment in the central historical part of the city will mainly give an advantage, both within the interests of the population, as well as in the interests of the Astrakhan region at the regional level, because such problems as:

- zoning and modernization of the functional-spatial structure in the "Historical City", which will enable this part of the city to reach a higher level of quality of service to the population;
- preservation of historical and artistic values of the city, by creating pedestrian areas, retail areas, embankments, overlapping streets with the passage device, which will allow buildings to be least affected by the environment;
- the introduction of new facilities for enriching the compositional connection of the central part of the city in the planning structure, thereby making pedestrian directions serve as spatial dominants in the public administration centre;
- the placement of parking lots, including underground parking, in close proximity to pedestrian streets, will lead to the liberation of the streets of the city centre;
- turning a shopping street into an equipped pedestrian zone by reconstructing and further using cultural facilities to create an original architectural museum.

The solution of these problems can be the creation of modern pedestrian zones, which are non-transport, comfortable city streets and multifunctional spaces in the structure of the modern city, enlivening the traditional urban spaces [11-13].

Analyzed pedestrian spaces of the historical part of the city of Astrakhan are differentiated according to their belonging to this or that planning scheme:

- pedestrianized street;
- open pedestrian zone (embankment and boulevards);
- the pedestrian zone is closed (passage);
- pedestrian area.

Pedestrianized street. It is proposed to consider streets for the device of pedestrian streets on the territory of historical buildings - Soviet, International, Kirov.

To achieve effective use of the pedestrian shopping street, several main tasks can be formulated:

- Firstly, the creation of places of parking of vehicles in the immediate vicinity of the pedestrian shopping street;
- Secondly, turning a shopping street into an equipped pedestrian zone by reconstructing and further using cultural facilities to create an original architectural museum.

Consider the pedestrian directions on the street. Soviet and 3-International. (Figure 2).

Sovetskaya Street, along which the historical and architectural dominants are located, is changed to pedestrian. At the same time, to consolidate the image of the urban tradition as a historic trading city, it was important to continue the pedestrian direction along the street. 3- International, connecting the city centre with the territory of the bazaar "Big Isad". Near the embankment of the river. Kutum organized an area that plays the role of the final node in the decision of the pedestrian space of this tourist route.

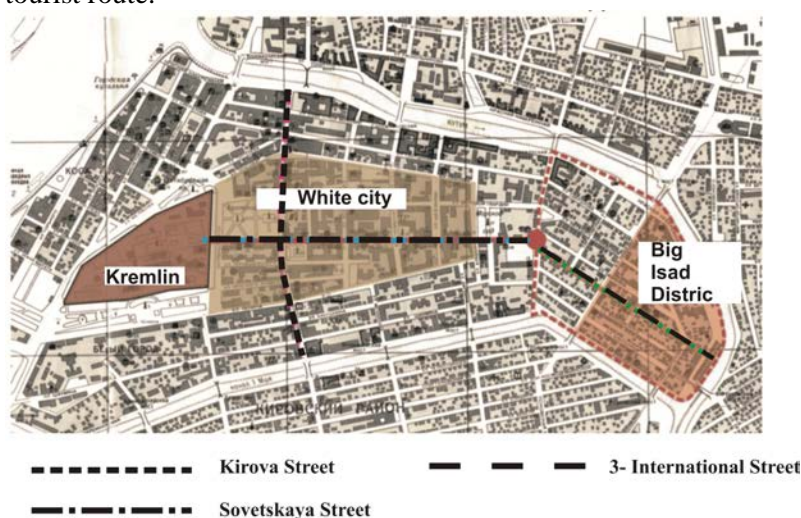


Figure 2. Pedestrian direction on the street.

The traffic will be carried out on the outside of the territory, or rather through the streets of Sverdlov, Chalabian, Nogin and in part Mayakovsky. It is proposed to change the categories of streets: the Soviet and the 3rd International from the transport and pedestrian streets of regional importance to the trade and pedestrian street.

The first floors of existing buildings along the streets in question are supposed to be occupied by commercial premises, and the second floors by museums and exhibition halls. In addition to these functions, there is also administrative and public catering.

Due to a change in the category of streets from the road to pedestrian, pedestrian communications will be made with the centre and the Kremlin across Sovetskaya Street, and in the opposite direction—with the Red Embankment and access to the Kutum River. In the conditions of historical development, a significant role is played by the facades and the volumes of the designed buildings [14] (Figure 3, 4).



Figure 3. Sovetskaya Street.



Figure 4. Street 3-International.

Pedestrian open areas are represented by embankments and boulevards. Astrakhan is located in the delta of the Volga River and has an extended coastline. The main compositional role is played by a branched network of canals and banks of the Volga. Thus, embankments are an integral part of the city's pedestrian space. It is possible to single out the embankment in the central part of the city and the opposite Trusovskaya embankment. Communication between them is carried out through the "new bridge", passing through the City Island. Thus, a single continuous network of pedestrian spaces is created.

At the moment, the left-bank part of the embankment is pedestrian, and the territory of Trusovskaya embankment is not well-equipped. It is necessary to create a comfortable pedestrian zone. The concept of the development of the recreational zone of the Trusovskaya Embankment is based on the solution of two main tasks: the construction of the embankment itself and the organization of the territory adjacent to it for the recreation of the population (Figure 5).



Figure 5. Trusovskaya embankment of the city of Astrakhan.

Following the main goal—to connect the urban space with the space of the river, determines the formation of the pedestrian and transport framework of the territory, directing the main traffic from the existing residential development and highway to the embankment. The territory of the recreational zone has a functional division into zones: the zone of water transport, the embankment zone, the central square, the children's and sports zones, the zone of quiet rest and walks, the creative eco-centre, the economic zone [15].

Pedestrian zone closed (passage). Creation of covered pedestrian space is possible in the alley of Teatralnoye. At the moment the territory of the lane. Theatre is used as one of the streets of local importance and the main function is the sphere of providing services to the population. It is proposed to close the lane. Theatrical translucent design for the organization of the covered space, which will allow using more ergonomic space of the street. The active areas of the street are located in the entrance areas of the passage, which further under the scenario allows to develop a zone of secluded communication and an exposition zone. (Figure 6).

Exclusivity and novelty of the concept is that the passage will provide an increase in social comfort and high cultural urban potential in the historic part of the city space. As a result, there will be space, between street and interior.

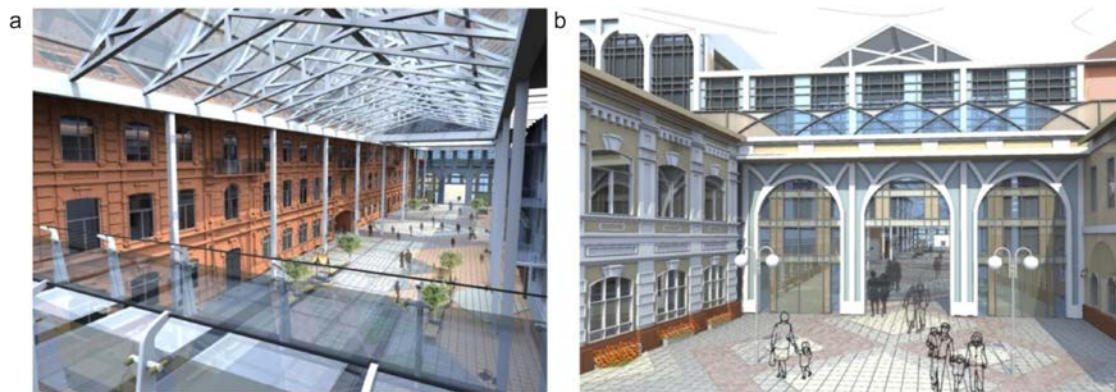


Figure 6. Lane Theatrical. Passage.

Pedestrian area. In the central part of the city, the squares are historically formed within the boundaries of the Kremlin, along the embankment of the Volga River, religious and shopping complexes. It proposes the creation of areas according to the concept of pedestrian spaces for recreational, commercial, religious and memorial purposes [16].

Increasing the intensity of urban life by creating good conditions for pedestrian movements, comfortable places for various types of leisure activities in the open air and conducting public events in urban areas [2] contributes to the recreation and improvement of the individual [17].

The conducted researches have allowed to allocate the general decisions, suitable for all kinds of considered pedestrian spaces:

- pedestrianized street: creation of recognizable streets in every district of the city; development of city streets: complex streets, passages, boulevards, shopping;
- pedestrian zone open (quay and boulevards): development of the recreational potential of embankments with the help of landscape design;
- pedestrian zone - covered (passage): development of a compact urban environment in which all functions and services are in pedestrian and bicycle availability;
- pedestrian area: the creation of a connected network of public spaces and the formation of boundaries between public urban spaces: creation of recognizable areas in each city's district.

According to the Concept of development of pedestrian areas Astrakhan historic centre identified species pedestrianization movement - landscaped streets and thoroughfares, within which are held organizational measures to improve the safety of pedestrians: the expansion of sidewalks, speed limit, traffic on the transit restrictions, a ban on unauthorized parking of vehicles, the allocation of and improvement of certain parking lots [4]. The concept is a compound of pedestrian spaces in a single continuous chain, to create a comfortable environment for a pedestrian [18] (Figure 7).



Figure 7. The concept of the interconnection of pedestrian spaces in Astrakhan.

3. Conclusion

The general theory of pedestrian spaces can fulfill four main conditions: safe, comfortable, interesting and useful. The safe is pedestrian isolated from transport. Comfortable means: such as landscaping, sun protection, the scale of the architectural environment of buildings. Interesting space means only interesting historical buildings. Useful means that most of the objects of social and cultural destination are nearby and placed in such a way that it is accessible to a pedestrian [19].

In general, the formation of the urban environment must be dictated by the demand of society, people themselves determine what they need and can choose the right one from what they are offered in the improvement of the city [20]. A person is not created for a city, but a city can be created for a person.

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