Urban environment harmonious development in the pedestrian crossings’ organization process in Yerevan

Anahit Karamyan, Emilia Sargsyan, Lilit Babayan

Abstract. From the beginning of the 20th century to the present day, the intensively developing transport system in the world causes new problems in the organization of the architectural environment. The invasion of vehicles into the urban environment brought about the need for new approaches due to the modern architectural organization of the spatial environment with the requirement to organize conditions that meet the comfort, safety and modern needs of human life activity.

The subject of the study is the new problems generated by the rapidly developing transport system in the issue of comfortable life of the pedestrians in the architectural environment. Vehicles, especially in urban settlements, cause serious difficulties in the movement of pedestrians. As a result, regulated ground and underground crossings have become the main route of interchange in the city of Yerevan, which today need new approaches.

The purpose of the article is to outline new approaches to improving the spatial environment aimed at improving the pedestrian-transportation relationship.

1 Introduction

As a result of the geopolitical events of the last few decades, a significant number of inhabitants with limited mobility have appeared in our country. This fact requires to significantly revise the issues of architectural spatial environment regulation, especially in the process of implementing fundamental changes in the infrastructure of organizing pedestrian unlimited movements [1]. The importance and complexity of the problem also lies in the fact that at the beginning of the last century, according to the first master plan approved for the city of Yerevan, the main road transport routes were provided for 500 thousand residents. Currently, 2/3 of the country’s population lives in the capital (population exceeds one million), where the main resources of the commercial and trade-industrial complex are concentrated.

Despite the fact that the administrative territory of the city has significantly expanded, however, the traffic routes of the center have mostly remained within the previously implemented borders. This has led to the fact that the pedestrian-traffic connection in the...
The urban environment, especially in the center, has caused serious problems today. One of the main ways of solving the problem, in addition to the overpasses regulated by the traffic lights, are the overpasses and underground crossings, which almost universally do not meet the normative requirements that ensure well-being.

Figures 1 show the overpasses existing on the busy streets of Yerevan, and the figures 2 show the underground passages, which, being meant to provide comfortable pedestrian movement, are not satisfactory due to the presence of steep slopes, open platforms, and the absence of elevators and escalators. Not only the disabled, but also the safe and comfortable transitions of a healthy society [2-4].

The current situation creates psychological discomfort and anxiety also for residents of multi-story residential buildings on both sides of the streets. The main way to solve this problem has become to raise the pedestrian above ground or lower underground passages, which are mostly not equipped with comfort elements: escalators, elevators, comfortable ramps.

Fig. 1. Overpasses of Heratsi street in Yerevan, RA

Citizens with severe mobility problems face the reality of independent mobility, as do the elderly, residents with strollers, pregnant women facing serious inconvenience, which is more noticeable in the winter months. As a result, the dynamics of free pedestrian movements were significantly limited, giving the championship to transport flows, which reveals the idea of their greater importance [5-7].
The intensive development of vehicles in the urban environment led to the search for new ways to solve the problem by creating new roads, underpasses, corridors and other means.

Fig. 2 The underground passages at the intersection of Yerevan's Barekamutyun and Kievyan streets in Yerevan

2 Materials and methods

The most important task of the urban spatial development of modern cities is to create the most comfortable living environment for a person, both for living and working, as well as for recreation, entertainment and other interests. Unprecedented developments in technology and industry have led to a severe limitation of the comfortable human activity in the spatial environment, the construction and the road transport system have penetrated the once green areas, strongly removing the person from nature, and pushing him out of the natural environment [8-10].

Since the last century, a new progressive trend has been formed in the big cities of the world to create a compact city model, which is meant to serve the society by making social infrastructure more accessible. Special emphasis is placed on creating a quality green urban environment, giving primacy to pedestrians, cyclists and mobile vehicles. If decades ago, the implementation of overpasses and underground passages in the urban environment gained momentum, now in developed countries this approach is being comprehensively reviewed in the direction of their improvement and creation of new, more comfortable ways of operation, with systemic multi-level planning [11,12].

It is known that overpasses and underpasses were created as a way to ensure the safe movement of pedestrians, but as a result, about 30% of the population is deprived of the opportunity to use this urban infrastructure. It is the lack of ramps, escalators and elevators with an inclination according to the normative requirements, as well as the lack of other means of comfortable furnishing necessary for the mobility-impaired society, which creates discrimination between healthy and disabled people. It turns out that the implementation of underground and overpasses is a result of transport policy, and not an effective way to solve the problem, aimed mainly at avoiding traffic jams. As a result, a contradictory effect is obtained, which undermines people's rights to ensure safety, because a large part of the public, not being able to go down, climb ladders, violate traffic rules, creating accidents (Figures 3).
Fig. 3. Convenient ground transit connections to the center of Paris and the Defense district.

The presence of underground and overpasses in modern conditions is a result of the difficulties of managing the ever-increasing flow of cars, which explains the fact of directing people up and down.

Studying the experience of foreign countries in the design of underground and above-ground areas, the tendency to implement them in harmony with the spatial environment with complex solutions is noticeable. For example, an overpass bridge in an existing residential, public setting in Vancouver engages the surroundings, echoing the contours of the natural landscape, which has become a piece of spatial art. There are no heavy structural elements, ladders or escalators here, but only the ramp, which is in harmony with the environment in terms of its size and shape.

Apart from people's business movements, it has become a favorite place for walking. The best example is also F. Gerry’s Chicago overpass - bridge, which is a ramp for crossing and walking. Sliding sidewalks, outdoor escalators and elevators are also widely used in developed countries. It is interesting to note the examples of Saint Petersburg, Seoul, where underground and overpasses are not planned at all, even on the widest highways.

3 Results and discussion

The urban environment, with its comfort and harmony, is obliged to attract society, to draw it to itself, and not to force it to overcome surgical difficulties by going down, climbing ladders or ramps that do not meet the normative requirements, which are not accessible even for a healthy society. This environment, being the main factor defining the character of the settlement, formed by construction, traffic connections, recreation, entertainment and green zones, is obliged to ensure the comfortable life of the society, where the pedestrian movements are important.

Especially in the city of Yerevan, this function has caused problems, as well as complaints of the population, related to the installation of overpasses. In some streets, they are almost attached to multi-story residential buildings, causing excessive noise, blocking the view of residents and making their daily life visible to passers-by (Figure 4). Despite the fact that they are not worn out and are not in emergency condition, as a result of many complaints of the residents, the overpass and barriers at the Artashisyan-Bagratunyats intersection are being dismantled (Figure 5).
4 Conclusions

- Underground crossings should be carried out in the zone of street crossings, keeping the optional choice.
- Surface and underground passages should best meet the directions of intensive human flows, equipped with the capabilities of modern technologies and information formed by means of architectural design.
- The distance that the pedestrian overcomes underground should not exceed 2/3 of the overpass.

References

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