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CITY LANDSCAPE REORGANIZATION WITH PEDESTRIAN PRIORITY

REORGANIZACJA STRUKTURY MIASTA Z UWZGLĘDNIENIEM PRIORYTETU RUCHU PIESZYCH

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ABSTRACT

The article shows that the process of urbanization (especially in large cities) often develops automobile traffic and does not give proper development for the comfort of people in an open urban space. The article shows basic problems of city landscape and defines main principles of effective and modern open urban space. The example of the reconstruction of the city square the reorganization of city landscape with pedestrian priority is discussed in detail.

Key words: city landscape, urbanization, urban space, pedestrian, transport.

1. INTRODUCTION

Any city is a constantly changing, evolving living organism that obeys town-planning norms and rules. Big cities have great potential for a comfortable city life. Public spaces are an integral part of the urban structure. Comfortable public spaces can make a profit, revitalize the business and cultural activity in the city, improve the microclimate and add value to urban lands. The city center usually consists of cozy squares, narrow streets, low-rise buildings, embankments and parks.

Often city authorities do not use the potential of such spaces. They expand roadways, narrow sidewalks, demolish historic buildings. Pedestrians who use urban space are hundreds of times more than cars. That is why we must pay more attention to such spaces and make the city comfortable, firstly, for people (Gusiev M.O, 2016).

Pedestrian spaces are the main spaces from which a person perceives a city and interacts with it. City landscape not only provides movement around the city but also plays a serious role in the life of cities and their communities. This is because of the main communication happening in this architectural environment (Woolley H., 2003). People spend in public spaces free time they walk, chat, have fun and meet for business purposes. Accordingly, an organization of open public spaces has a significant impact on living comfort person and his emotional state (Krashennikov A.V, 2005).

This is a kind of communicative structure that permeates the city. Pedestrian spaces are used to organize people's traffic and improve the social, functional and aesthetic characteristics of the urban environment. The priorities in the city should be comfort, safety, attractiveness and continuous improvement of pedestrian spaces, which are tools to improve the quality of life in cities and a means of solving the social, economic and environmental aspects of their sustainable development.

Due to the growing number of cars, big cities are becoming less and less comfortable for living. Cars became the sovereign master of the city, dictating its requirements, claiming vast territories not only for movement but also for parking (Peters E.V., 2005). In addition, cars divide city territory into isolated areas, bring noise, vibration, reduce the area of green spaces and make worse the condition of air, soil and water.

The central part of historically developed cities is not adapted for car traffic. That is why pedestrian streets and entire zones are organized, first of all, in this part of the city. Objects of pedestrian infrastructure include pedestrian streets and squares, sidewalks, pedestrian paths and pedestrian galleries and pedestrian bridges. Main purpose of pedestrian infrastructure facilities is to ensure affordable and safe conditions for the independent movement of people. City landscape can be turned into a powerful center of attraction for mass events and different social groups. Such spaces should be convenient for barrier-free transit and comfortable pastime.

The main problems of city open spaces in the era of urbanization are the imbalance of the territory (most of the space is occupied by cars, the smaller part is for pedestrians), chaotic parking lots, traffic jams, unsafe crossings, miss or lack of green spaces, high noise level under the windows of residential buildings, lack of convenient pedestrian traffic, lack of infrastructure for public functions. As world experience shows, all these problems are solvable and require quick intervention, as they develop at a high speed.

2. PURPOSE OF WORK

The purpose of this article is to show how it is possible to solve the problem of fast urbanization and its bad influence on city open spaces with the reorganization of them, first of all, for people. In addition, to show on a concrete example, how reorganization of city square in different levels can help to divide car traffic and pedestrian flows and improve the quality of this space for both – pedestrian and cars.

3. MATERIALS AND METHODS

The work is based on the study of native and foreign theoretical works, analysis of design and architecture practice materials, comparative analysis and generalization. The proposed project of Lvivska square reconstruction in Kyiv (Ukraine) was carried out after pre-project studies using generalization and theoretical modeling.

4. RESULTS AND DISCUSSION

The process of uncontrolled interference with the pedestrian infrastructure that has been formed for centuries has a negative impact on architectural heritage and reduces the comfort of movement (Kutsyna I., 2018). The main objective of the pedestrian organization of the city open urban spaces is a physical, psychological and visual separation of pedestrians from vehicles (cars, public transport). This goal is due to the need to ensure pedestrian safety and proper hygiene of the environment, which is especially important for the city landscape, which is characterized by an excessive concentration of vehicles and pedestrians.

The main principles that define an effective and modern city landscape are: prioritization of pedestrians over cars and vehicles; differentiation of flows of people and transport; barrier-free environment for all groups of people; organization of street food spots; easy navigation and lighting (illumination) for safety; organization of different places for activities (playgrounds and sports grounds); development of bicycle rental, eco-friendly transport, and other service functions; organization of green spaces and water activities; development of the history of the place (Gusiev M.O., 2018).

A number of advantages of pedestrian zones made them popular and widespread in foreign practice. The experience of the use of objects of this type in our country is insignificant in comparison with foreign. The basic type of open urban space are squares, which is quite diverse in its functional purpose. As the city develops, their existing spatial structure becoming less reliable in terms of point of view. To separate the traffic in space, isolated areas in one or several levels are necessary. This can be fully implemented in new cities. As for the built-up cities, large investments are required to completely separate the traffic of pedestrians and vehicles in their territories. The historical parts of the cities further limit the implementation of these activities.

Pedestrian zones have to be properly arranged to attract visitors. There have to be interesting activities demanded in proper location of the city (Czekiel-Świtalska E., 2010). Pedestrian spaces are located mainly along the streets in the form of sidewalks, without taking into account the necessary directions for pedestrian traffic, without providing connections of major urban areas with the city center and recreation areas (Kyrhzybaieva I., 2018). Thus, it can be argued that the separation of flows in the horizontal plane is used in cases where the size of the territory allows to organizing traffic at one level. It is also possible when the number of cars in this territory can be limited. In all other cases, we should organize the space at several levels. Based on the existing methods, reconstruction of Lvivska square in Kyiv (Ukraine) was proposed.

Square is historically formed open urban space in the city center that needs reorganization. This is one of the most problematic areas not only in city center, but also in the whole city. Now the area is divided by streets into several small parts, it is also very hard to get to the main part of the square (because it is surrounded by roads from every side). It complicates the movement of pedestrians and also splits the square into parts that have complex connections. The solution to this problem is an organization of open urban space in two levels. In this case, the ground level can serve for cars and transport, and the level above it - for the barrier-free movement of people.

For historically formed city center, this is the only way to solve many problems of this area without demolition and destruction of architectural and cultural heritage. The reconstruction needs significant funds (it includes reconstruction of the square in two levels with building of the first entrance to Lvivska Brama metro station (not working yet, despite the platform and metro line already exists underground), car parking, supermarket and all the facilities, that are really needed in this area). This renovation will "activate" the space for pedestrians and will make it better for any type of vehi-

cles (private cars and public transport). In my opinion, this is a very good example, so I want to mention it in my article.

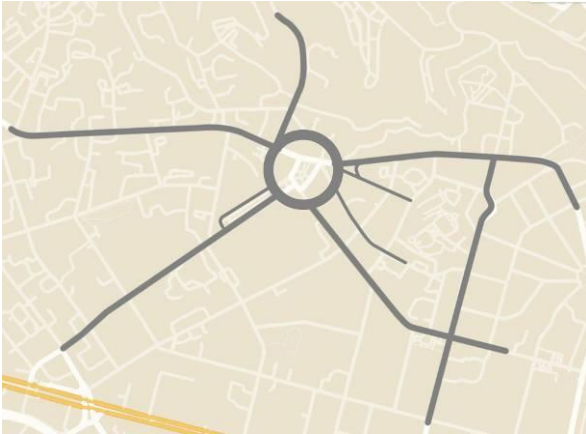


Fig. 1. Main vehicles flows of Lvivska square in central part of Kyiv, Ukraine. Author basic scheme.



Fig. 2. Main pedestrian flows of Lvivska square in central part of Kyiv, Ukraine. Author basic scheme.

The square is situated at the interjunction of many streets and pedestrian ways. Junction of such streets as Yaroslaviv Val, Velyka Zhytomyrska, Bulvarno-Kudryavska, Stritenska, Reytarska and Voznesenskiy descent from the territory of square (Fig.1). All of them are very important city transport routes despite the fact that they are old and narrow streets. Also, Lvivska square is interjunction of pedestrian ways from Peyzazhnaya alley and Andriyivskyy descent to Peremohy, Sofiyivska, Mykhaylivska squares and the main public space not only of Kyiv but of all country – Independence square (Fig.2). Superimposition of all pedestrian and car flows makes the public space of this square very intense and extremely disorganized.

Lvivska Square is located in one of the central areas of Kyiv, in the historical district. This area is extremely busy, especially at workdays. Many offices and workspaces are situated exactly in this area. Because of lack of space it is impossible to get rid of traffic jams and fit all needed facilities in one level. Solution to this problem is to reconstruct it in different levels with separation of vehicles and pedestrian flows.

The ground level of Lvivska Square should serve for convenient passage of cars and public transport, as well as have a parking zone for cars since this is the central part of the city, which needs additional parking spaces (Fig. 3). Nowadays people who work in central part of Kyiv don't have enough parking lots – wrong parking of private vehicles causes a lot of traffic jams on the roads. Organization of the area in two levels helps to significantly increase the area of open urban space and the number of its useful functions in a dense building environment. The main goals are creation of an artificial relief, separation of flows (car traffic and pedestrians in different levels), reorganization of car traffic, organization of car parking under pedestrian level.

The first level of Lvivska Square is assigned only for pedestrians and for convenient transit of people in the central part of the city and communication between different parts of the square and the surrounding buildings (Fig. 4). It helps to improve car traffic in this part of the city (where traffic jams are often) by the removal of traffic lights and pedestrian crossings. In addition, the space becomes safer for pedestrians. The main goals are connecting all pedestrian parts in one level, organization of barrier-free pedestrian movement and pedestrian service functions.

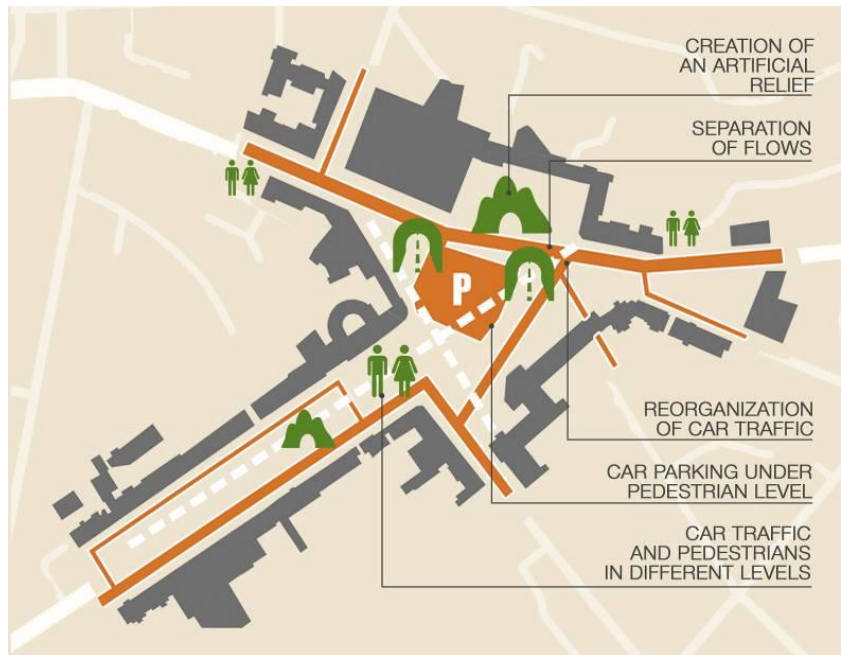


Fig. 3. Ground level of Lvivska square in Kyiv, Ukraine. Project. Author basic scheme.



Fig. 4. First level of Lvivska square in Kyiv, Ukraine. Project. Author basic scheme.

For the safety of being in an open city space, a pedestrian needs an easy and accessible orientation in space with the help of signs, a visual communication system between city open spaces, illumination of space at nighttime and clear guidelines for movement in space (Lynch K.A., 1982).

It must be a basic, common space, in which a person can decide whether he wants to stay in this space and what format to choose. There should also be a meeting space in this structure - any simple landmark. The main place of communication is the seating area - benches of different types and sizes or a multi storied structure. For presentations, fairs or performances by musicians, a

public area should be assigned. In contrast, there should be a quieter place in the open space - where you can be secluded while remaining in public space. It is also good when the open space is complemented by other elements - places for trade, food, and culture. Unfortunately, the growth of urban space development simply displaces these spaces where a person could rest comfortably and be separate from noise, dust and an aggressive urban environment. That is why an open urban space must be properly planned, considering all the needs.

Since the main level of the square is above ground level, it requires additional landscaping for the comfort of people in this space. Additional lawns, flowerbeds, bushes, and trees in special tubs are located all over the space of the upper level of the square. For the development of pedestrian traffic in large cities, we must understand how it is possible to reduce car traffic. One of such ways is the development of bicycle infrastructure. Special paths, bicycle parkings and a convenient grid of connections all over the city can improve the situation. The project includes several bicycle paths at the ground and upper level. Unfortunately, Kyiv is only on the path to the development of cycling, but thanks to individual projects, there are more and more places with the necessary infrastructure.

The places already historically famous all around the world are the sign of their place itself (Czekiel-Świtalska E., 2008). Any architecture does not exist outside the place. And this is always a specific, definite place - it has not only objective and fixed parameters, the presence or absence of history, but also a personal character, a spirit that can only be felt. Architect's special sensitivity and attention to the specifics of a particular place, to its landscape, cultural, historical, social and other contexts are required.



Fig. 5. Ground level of Lvivska square in Kyiv, Ukraine. Project. Author plan

Lvivska Square in Kyiv (Ukraine) has several historically prevailing dominants, including the building of House of Commerce and House of Artists. To make the spirit of the place stronger, it is necessary to emphasize them during the reconstruction of the square – that is why the new level of the square should be much lower than existing dominants and all monuments of architecture in this historical city center area.

The ground level of Lvivska Square is made for traffic flows, urban public transport and parking. Public transport stops have a convenient connection with the main, pedestrian level of the square. Also at this level is the entrance to the metro station (located underground), which is connected with the upper level of the square as well. Also, at ground level, there are a supermarket, grocery stores, small cafes, coffee points, souvenir points, tourist infocenter, different types of shops and an interactive modern library (Fig.5). Ground level should be used as a connecting level to the all surrounding buildings. Since the square is located in the central area of the city, this place has a dense system of buildings and an intense network of connections between buildings. They include not only residential apartments, but also offices, restaurants, cafes, theaters, retail spaces, and supermarkets. The number of cross walks is reduced, they are left in the most necessary places. Number of traffic lights has also been reduced as well.

Analysis of a barrier-free urban environment formation for people with limited mobility has shown that the creation of barrier-free space is one of the most important problems of current urban planning (Shostak H.S., 2018). People can use stairs, escalators, elevators or ramps to get to the upper level. This provides the simplest and fastest connection between different levels of the square. To make people feel comfortable and safe at ground level, part of the first level of the square is made of glass structures, which allows light to pass to the lower level.

Fountains, pools and other bodies of water make the open urban space more attractive to people. Unfortunately, this area does not have a natural river or lake. Nevertheless, a shallow pool is made on the ground level, which in summer plays the role of a decorative structure and in winter can turn into an ice rink (Gehl Y., 2010).

The first level of Lvivska Square is raised above the ground and occupies almost the entire space. It is made not only for the transit of pedestrians but also for short or long stay of people in this open space (Fig. 6).

To attract more people into this space, it must be multifunctional. Most of the level is occupied by lawn, trees, bushes (important environmental function in the city center) and a space for rest with equipped places for sitting and lying (recreational function). The serving function is represented by the food court area. For outdoor activities (sports function) at this level, there is a skatepark and a small outdoor sports ground. The cultural function is represented by an amphitheatre where small concerts and performances can take place.

The main part of the first level is connected by pedestrian bridges to the surrounding buildings. Also at this level, there is a small 20 meters long observation deck above the street and amphitheater for street performances. There are about 300 seats at the amphitheater, and it connects the upper level with the ground level.

The way public space is used is changing: there is a push to make optimal use of the space already available in cities all over the world. The regeneration of urban spaces, such as Lvivska square in Kyiv (Ukraine) provides opportunities to create cultural and recreational functions (the conversion of abandoned areas into playgrounds, sports grounds, theatres, exhibition areas, parks, skate parks, food courts), reduce transport and car flow and promote walking and cycling. Increasingly, citizens are also being involved in the decision-making process, art is being incorporated, and existing public spaces are being used for a multitude of simultaneous purposes (Hobub K., 2011).

Both levels of the area should have good connections between each other and smoothly flowing space. It is possible thanks to good vertical communication and artificial terrain, which connects levels in certain places (Fig. 7).

The figure also shows that the rise of the first level of this square is very insignificant (only 5 meters) compared with the height of the buildings surrounding it (from 26 to 94 meters). This does not spoil image of the city and does not create the impression of being detached from the ground. The entire space of the square is organically integrated into the environment.



Fig. 6. First level of Lvivska square in Kyiv, Ukraine. Project. Author plan



Fig. 7. Section of Lvivska square in Kyiv, Ukraine. Project. Author section

The area has a rather complicated structure of flowing spaces, the main role of which is given to the pedestrian. The secondary place is occupied by public transport and cars (Fig. 8). You can see planting of greenery on the both levels – ground level and first level of Lvivska square in Kyiv (Ukraine). It makes the space more cozy and ecological, protects people from sun and wind. The proposed project of the reconstruction of the area makes it more integral and convenient for pedestrians, and also simplifies the movement of vehicles (cars, public transport) in this territory of Lvivska square and all surrounding areas in this district (Fig. 9).

All the vertical communications – stairs, elevators, lifts and ramps are also shown on the figure. In the center of the square, there is an oval light well - it illuminates the parking zone at ground level with natural light and makes this space more safe and comfortable.



Fig. 8. Bird's-eye view from south of Lvivska square in Kyiv, Ukraine. Project. Author scheme.



Fig. 9. Bird's-eye view from North of Lvivska square in Kyiv, Ukraine. Project. Author scheme.

5. CONCLUSIONS

The shown experience can be used in practical activities in the formation of new pedestrian urban spaces, as well as the reconstruction of old open urban spaces, taking into account the priority of pedestrians. This approach helps to solve a variety of problems: from the safety of the urban environment to the development of the creative potential of society. Proposed scientific approach of separating flows is very important in reconstruction of old squares in historical parts of the city and in building of completely new public spaces as well (due to growth of urbanization and technical progress). In addition, this approach attracts people to the public space and make it more economically alive and aesthetically and logistically organized. Intersection of pedestrian and traffic flows is completely excluded.

The above-mentioned project of Lvivska square reconstruction in Kyiv (Ukraine) is an example of how to divide car traffic and pedestrian flows to make city landscape more comfortable. It shows

how to improve city open space quality and how to make it more safe and comfortable for citizens. Also this project will help vehicles to pass this territory faster and to solve the situation with traffic jams in this part of the city. Pedestrian communications between different blocks around the square will also be more convenient.

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