Spatial change of Lviv in the post-Soviet period and their assessment by the residents

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Abstract. To determine the tendencies of reflection of the socioeconomic and spatial changes of the post-Soviet period in the minds of Lviv residents, to outline the factors influencing the transformations that are taking place. Historical development of Lviv – a multifunctional city with almost 800 years of history, cultural and educational center of Ukraine, was artificially transformed into an industrial center in the Soviet period. Transformations of Lviv image of the post-Soviet period were investigated on the basis of official statistics, analysis of town-planning projects and selective urban inventory. The actions of the authorities in influencing the changes in the image of the city are analyzed on the basis of approved strategic documents of development, as well as the activities of local self-government bodies. During the last three decades, Lviv has lost its competitiveness, and there is a decrease in population due to both natural growth and migration; increasing concentration of people and business functions in its central part; problems of transport and preservation of the historical environment of the city are aggravated; tourist anthropogression on the city is growing and tourist erosion is increasing. Assessments of an image change in residents’ perceptions are analyzed by comparing their own research and questionnaires. 200 surveys were conducted, the results of which are as follows: 1) An increase in the disorder of urban life and an increase in its intensity were recorded; 2) the spatial image of the city is associated mainly with the growing importance of the old part of the city (localization of more and more services); 3) post-industrial territories are treated as places where the crisis of the city is visible; 4) the symbols of the city are unchanged, new ones are not named; 5) areas of high attractiveness in functional, social and aesthetic relations are distinguished, as well as low attractiveness spaces. The spatial changes of Lviv in the post-Soviet period are generally assessed as critical. The residents point out that Lviv does not create a sacred image anymore, it loses the aura of its intellectual and cultural center; the center is not attractive to architecture and history, but to restaurants that have transformed former art salons and bookstores; architectural identity and uniqueness are lost; space polarization is deepening (expensive commercial housing adjacent to neglected public spaces); commerce with a devastating excitement about the existing spatial order burst into the historical environment. The lack of a unified vision of city development and management of urban planning processes «in manual mode» causes chaotic and unsystematic changes that destroy the spatial structure, principles of city development and causes irreparable mistakes in its construction then copy it into the registration web field.
1. Introduction
Lviv is a multifunctional city with almost 800 years of history, a cultural and educational center of Ukraine, a large industrial center and a transport hub in the past. In the post-Soviet period, this city acquired new cultural, political, and architectural-figurative features, which significantly influence the socioeconomic processes in the city and its spatial arrangement. The object of the study is the space of Lviv, the subject of the study is to change the spatial characteristics of the image of the city and its reflection in the minds of the inhabitants. The purpose of the article is to identify trends of objective changes and their subjective-emotional reflection in the minds of residents, to outline the influence of authorities and specialists on the transformation.

Transformations of the objective image of Lviv were investigated on the basis of the study of statistical data on changes in socioeconomic, functional-territorial and architectural characteristics, as well as analysis of town-planning projects and conducted by the authors of the selective architectural-urban inventory [1]. The actions of the authorities and specialists (especially urbanists and architects) in influencing the image of the city were analyzed on the basis of approved and strategic documents of the city development, project materials, as well as the activities of local self-government bodies. Subjective-emotional assessments of changes in the image in the perception of its inhabitants were analyzed by question the residents.

Only cities where people see each other are ready to communicate with each other, according to Copenhagen's chief architect Tina Sobu [2], can be successful. Thinking about a happy city, C. Montgomery [3] suggests that the way we form our cities changes the way we feel, think and behave as individuals and as a society. A. Burden [4], was convinced that urban growth could not be stopped, but offered a network of «heterocycle sites» where human behavior changed. Urbanist shares experience on how to turn abandoned industrial sites into creative clusters and how to revive entire neighborhoods with energy supply strategies and smart systems.

Among Ukrainian researchers’ interaction of social and spatial-territorial factors of urban development are considered by: I. Fomin and Yu. Bilokon [5], M. Diomin and M. Omelianenko [6], M. Habrel [7], V. Tymokhin [8], B. Cherkes [9] and other. Basic research focuses on theoretical aspects and substantiation of urban development strategies, issues of reconstruction and preservation of the historical environment; Soviet heritage and post-Soviet transformations in cities were not systematically considered. The thirty-year period and radical changes in Ukrainian cities indicate the relevance of this study and provide a sufficient information base to summarize the processes that have taken place.

2. Changes in the space of Lviv in the post-Soviet period
Historically, Lviv developed as a non-industrial city, artificially transformed into an industrial center during the Soviet period. A city with post-Soviet political and socioeconomic transformations lost competitiveness. Compared with other major cities of Ukraine, the highest unemployment rate, the lowest economic activity, low sociodemographic indicators, etc. were recorded here (Table 1). Let us dwell briefly on the individual characteristics of post-Soviet changes and transformations.

2.1. The objective characteristics of changes in a city can be summarized as follows:
- there is a tendency of population decline both due to natural growth and migration. Employment structure of the population is characterized by a decrease in the share of persons employed in public production;
| Indicators                                      | Years          |
|------------------------------------------------|----------------|
|                                                | 1985 | 1990 | 1995 | 2000 | 2005 | 2010 | 2015 | 2020 |
| **Social**                                     |       |      |      |      |      |      |      |      |
| Population, thousand people                    | 778.7 | 823.3 | 831.2 | 813.7 | 761.7 | 760.0 | 758.4 | 756.0 |
| Population density, persons per 1 km. sq. m   | 4866  | 5146  | 5195  | 5086  | 4454  | 4458  | 4435  | 4421  |
| Busy, thousands of people industry             | 516.1  | 501.6  | 371.3  | 287.9  | 349.8  | 272.1  | 244.8  | 239.4  |
| Service Industries                             | 258.7  | 231.4  | 197.3  | 97.4   | 78.7   | 57.9   | 157.0  |  |
| Number of preschool institutions, units        | 190    | 181    | 167    | 107    | 107    | 110    | 115    | 119    |
| Number of higher education institutions, units | 10     | 10     | 11     | 14     | 25     | 32     | 29     | 29     |
| Number of hospitals, units                     | 42     | 38     | 34     | 36     | 36     | 37     | 44     | 41     |
| Official unemployment rate, %                  | --     | --     | 0.44   | 2.8    | 2.9    | 4.6    | 5.5    | 5.6    |
| **Economical**                                 |       |      |      |      |      |      |      |      |
| Number of enterprises, units                   | 130    | 1244   | 1974   | 3130   | 10341  | 10236  | 10108  | 1431   |
| industrial trading network                     | 134.4  | 143.3  | 153.4  | 168    | 257    | 1251   |       |       |
| Number of enterprises per 10,000 inhabitants   | 18     | 37     | 78     | 138    | 3      | 135    | 145    |       |
| Capital investment, UAH million                | 389    | 690    | 196    | 571    | 2577   | 4044   | 6698   | 13170  |
| housing                                        | 68     | 90     | 30     | 47     | 237    | 504    |       |       |
| **Spatial**                                    |       |      |      |      |      |      |      |      |
| Commissioning of housing, thousand square meters. | 274.8  | 368.5  | 89.9   | 95.9   | 158.7  | 184.5  | 490.5  | 416.5  |
| Housing stock, million square meters           | 10.3   | 11.8   | 12.8   | 13.8   | 14.1   | 13.8   | 15.3   | 16.4   |
| Provision of housing to the population per person | 13.6   | 14.5   | 14.9   | 16.2   | 17.9   | 18.8   | 20.5   | 22.4   |
| Power, thousand cubic meters. per day          | 452.1  | 425.3  | 371.0  | 179.7  | 179.7  | 179.3  | 179.5  | 179.1  | 179.7  |
| water supply treatment plants, sewerage       | 236.0  | 145.3  | 84.9   | 95.3   | 145.9  | 109.6  | 156.4  | 89.9   |
| Passenger transportation, million people       | 190.7  | 145.3  | 84.9   | 95.3   | 145.9  | 109.6  | 156.4  | 89.9   |
| by electric transport, by buses                | 266.7  | 99.9   | 84.9   | 95.3   | 145.9  | 109.6  | 156.4  | 89.9   |
| Length of electric lines, km of tram, trolleybus | 67.7   | 76.4   | 76.4   | 67.0   | 73.5   | 73.5   | 70.3   | 81.8   |
| trolleybus                                     | 112.9  | 118.9  | 122.3  | 117.3  | 117.3  | 117.3  | 126.2  | 129.3  |
| Number of tram cars, units                     | 209    | 204    | 216    | 187    | 172    | 139    | 124    | 131    |
| Number of trolleybuses, units                  | 247    | 224    | 147    | 119    | 105    | 85     | 124    | 85     |
| Area, hectares                                 | 160    | 160    | 160    | 160    | 171    | 171    | 171    | 171    |
| Built-up land, hectares                        | 8446   | -      | -      | 11600  | 11613  | 11616  | 11718  | 11811  |
| Density of pollutant emissions, ton per 1 sq. km | 91.1   | 84.3   | 36.2   | 123.0  | 16.1   | 11.8   | 15.0   | 23.4   |

* Source: It is compiled according to the Statistical Yearbooks of the City of Lviv of the Main Directorate of Statistics in Lviv region [10–11]
- the spatial unevenness of investment placement is increasing, which is reflected in the increasing concentration of people and commercial functions in the central part. This is also indicated by the high cost of real estate in the center. Priority for private investment in the city center is in the facilities of the hotel and banking, catering and trade. Such concentration exacerbates the problems of transport and the preservation of the historical environment;

- with respect to the peripheral parts of the city there is a more dynamic development of the southern part in connection with the construction of a new stadium and the construction of the airport (there is the potential to create new centers of sports, business, trade, education and entertainment) and some revitalization in the area of Sykhiv in connection with laying the tram line to the center;

- housing is a priority in the structure of business activity and capital investment, while the investment in the development of engineering infrastructure remains insignificant. Lviv is one of the leaders in Ukraine both in terms of construction and its value. New multi-storey residential construction is being carried out within the city, mainly in already formed residential areas, provided with engineering and transport infrastructure, or at the expense of industrial and communal areas of the former industrial development;

- technical infrastructure was hardly developed in the post-Soviet period and is a complex problem of city economy. Expert studies have found that most of technical infrastructure in Lviv networks have exhausted their standard operating life and are in poor condition. During 1990–2019, only the water supply situation improved in the technical infrastructure of the city;

- the level of motorization of the city population has increased (from 100 to over 300 cars per 1000 inhabitants). At the same time, the rolling stock of urban electric transport and the modernization of public transport tracks are poorly updated; the load on the street network of the central and middle parts of the city is increasing;

- the ideas of creating traffic-free zones in the historic part and city center are declared, as well as intercepting parking at the interchanges at the intersections of the main streets with radial streets and public transport lines (with a capacity of approximately 1 and 4 thousand places). During the post-Soviet period, it was possible to transform only the square. Market into the pedestrian area, combining two small fragments of the pedestrian of Krakivska street and Halytska street.

- the high density and historical value of the central part of the building do not allow the reconstruction of streets with the extension of roadways, and the location of the historical part in the Lviv Basin creates problems for the development of underground urbanism. Contradictions between the functional characteristics of the city space (the structure has developed historically and has a mosaic character of interlacing of zones with different functional contents) and the complicated system of public transport aggravate, creating a conflict of efficient use of high-speed transport systems in the future.;

- the inner-city processes and conditions of location of the city in the system of settlement and basic transport communications, as well as the natural environment, have determined the specifics of the processes of suburbanization, change the relations of the city with the environment. The revised Master Plan (2009) considers Lviv in the context of the surrounding territories, which are divided into two zones: suburban settlement within a radius of approximately 30 km and the formation of the Greater Lviv urban planning system within the territory at a distance of 3-5 km from the outer boundary. In the suburban area, there is a growing conflict between the urbanization processes taking place in the area and the future needs of the city center. The surrounding area is considered by the city to solve its own problems and as an opportunity to improve the infrastructure of its territories, but the territorial communities have their own vision of using them;

- tourist anthropogression on the city and its central part is increasing — in the last five years, Lviv is visited by about 2 million tourists annually (6 thousand daily). Along with the small positive effects of this activity, tourist erosion is exacerbated: the city is gradually becoming a «city of waiters and
servants», destroying the centuries-old traditions and values that result from the city's unpreparedness for such processes. Increased disorder of urban life, the increase of its intensity is confirmed.

We note other phenomena in the city space - there are enclaves of trouble and wealth zone, the role of trade is increasing, labor migration is increasing, the «mosaic» of the urban environment is increasing, the process of declining public space is continuing, the share of urban space is decreasing for the integration of residents, (areas where they used to gather, discuss, spend their free time, are now limited).

2.1.1. Socioemotional evaluation of image transformations of Lviv by residents is negative (62% negative, 17 positive, others undecided). Lviv is an example of a city whose social image was not clearly defined in the Soviet period, although in socioeconomic and spatial terms it developed mainly as an industrial one (in space the attributes of industrial content were formed: factories, factories, industrial districts, industrial objects of the relevant scale and architecture, etc.). There is a stereotype of the dual perception and interpretation of the Lviv in the Soviet period: on the one hand, as cities of science, culture, tourism and rich history; on the other side is a negative assessment of the city as gloomy, in particular, due to some dirty and neglected urban fragments.

The authors conducted 200 surveys. Students from the Institute of Architecture and Design, as well as the Institute of Entrepreneurship and Advanced Technologies of the Lviv Polytechnic National University, were involved, who, in the midst of their families and city residents, did the relevant work. The questions were asked about: the objects of the environment and the activity that is connected in the mind of the inhabitant with the changes of the city and the ways of its development; objects and areas that are considered a symbol of the city (or new symbols appear); assessment of new construction, assessment of the state and transformation of Soviet-era objects; according to the highlighted factors that influence change assessment. Among the characteristics of the respondents that influence the assessment of the image and the interpretation of the changes, the decisive influences are: level of education, social status, age and place of residence, mobility of residents (living and working abroad of Ukraine).

The main changes are highlighted: the city has lost intellectual production and cost orders: the quality of human potential is reduced; the transport infrastructure is underdeveloped and the transport problem is exacerbated; the conflict of commerce and the architectural and urban planning sphere is exacerbated, in particular housing construction is on pace, location is determined by commercial interests, not urban planning requirements.

2.1.2. Experts estimate Lviv's transformation in the post-Soviet period is more optimistic. However, there is no single strategy for the development of the city, because over the past 15 years, nearly 120 strategies, programs and plans for Lviv development have been developed, which are partial, contradictory, and ignore the elaboration of previous documents. Specialists identify only two successful documents on the formation of urban space. This is the general plan of Lviv (2010) and the Integrated Concept of Development of the Central part of the city (2011), which defines activities and projects for different thematic groups for the next 10-15 years.

Urban planning documentation (master plan) in the Soviet period was developed over a 20-year perspective for relatively stable and predicted socioeconomic conditions of the city. Now, under new conditions, the city's construction documents are being developed on a methodologically obsolete basis. The documentation approval process was complicated. One reason for this is the lack of interest of the authorities. The master plan, according to the authors, was developed and adopted with delay, the city has been functioning without this document for almost 20 years, and therefore the belief in the admissibility of functioning and development of the city without a master plan has spread. The role and
its contents in the present conditions are not changed, as well as approaches to solving the issues of space development and urban development.

3. Results and discussions
The spatial image of the city in the minds of the residents is associated with the growing importance of the old part of Lviv (localization of more and more services). Access to cultural goods is worsening because of their high cost. The role of mass culture among the younger generation is increasing and older people have nostalgia for concerts in parks, summer venues, etc.

Post-industrial territories are treated as places from which the city crisis is visible. The reasons for the inefficient diversification of the industry and the inefficient transformation of these territories in Lviv were the historical and geopolitical preconditions, the low support of the regions by the state and the unprofessionalism of local authorities.

Separate places that are in the mind of the city, including facilities for Euro 2012 and new supermarkets, revitalized the former industrial territories.

The prospect of Liberty avenue, Rynok square, High Castle, has not been named new. Most respondents expect a new post-industrial image of the city, but at the same time stress the importance of historical identity. Positive evaluations relate to the aesthetic characteristics of individual fragments of city space, negative ones relate to functional.

Estimates of public facilities built during the Soviet period are declining, mainly due to the construction of new shopping, service and entertainment centers (located in the middle and in the centers of the new districts). Soviet public spaces are becoming a «periphery» in new centers.

Areas are attractive in functional, social and aesthetic terms, and spaces of low attractiveness. Disproportions determine: distance to the city center, development (age and standard of building), state of improvement, availability of green areas. There is a «small town egoism» when the place of residence is higher.

There are high reviews about different regions of the city (Briukhovychi, Vynnyky, Rudno) that are located in the area for creating a good communication system in Lviv. Recent daisies have used the tendency to move to the suburban area and have not inhabited living areas but also large service centers.

Assessing the changes as a whole critically, the residents note that Lviv: no longer creates a sacred image, has lost the aura of its intellectual and cultural center; the center is not attractive to architecture and history, but to restaurants; identity and uniqueness are lost; space polarization is increasing (expensive commercial housing and neglected public spaces); commerce with destructive excitement burst into the historical environment. Most estimates indicate the transformation of Lviv into a city of clerks and waiters. In the current situation, residents are accused, among other things, of professional urban education and science, which, in their opinion, broke away from both practice and true theory.

4. Conclusions
Objective changes and subjective-emotional assessment of the image of the city in the minds of the residents are important to take into account in justifying urban planning decisions. This influences the decision to support professional initiatives. Stereotypes should be avoided, territorial communities should be more involved in the urban development process, their culture and understanding of the city's functioning should be enhanced. Increasing the sustainability of the city over time is offered through the
development of the city, not as an adaptation to change the conditions, but as a work to anticipate and predict the dynamics of conditions and resources.

The development of the city must be linked to the disclosure of its uniqueness. The dynamics of change will depend on the actions of local governments, the ability to discover and use the available characteristics and direct them to image formation, enhancing attractiveness and competitiveness with other major cities of Ukraine. Dynamicity of processes requires the development of «flexible» urban planning documents, which provide for constant monitoring of processes in the city and responding to changes.

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