

## EUROPEAN PRINCIPLES OF UNIVERSAL DESIGN AND THEIR APPLICATION IN THE ARCHITECTURE OF UKRAINIAN CITIES

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**Abstract.** The values of a solidary and democratic society, based on the principles of equality, significantly influenced the conceptual and practical principles of design throughout the Modern era. To a large extent, the formative base of modernism – the leading worldview trend that defined the architecture of the 20th and early 21st centuries – is connected with them. One of the important stages in the development of this process was the spread since the 1980s "universal design" concept that aimed at creating a more inclusive space, avoiding various forms of isolation and inequality depending on the physical abilities of a person.

Currently, theoretical and practical achievements in this area make it possible to talk about a holistic system of views on design, which, however, still remains largely unrealized to the extent that the goals of universal design can be considered generally achieved. Nevertheless, thanks to the implementation of a number of initiatives and programs, inclusive and friendly environments for different groups have begun to emerge in many European cities, which testify to the benefits of the "design for all" concept. In addition to the purely humanistic aspect, it also gives cities advantages in terms of a more complete use of human potential, maintaining a high economic and social attractiveness, which ultimately increases the competitive indicators of the city.

This article consists of three principle parts, two of which are reflective and one analytical. In their sequence, they have the following form: a) an outline of the current concepts of universal design, which are present in various initiatives and programs of the European Union and a wider range of sources that create the relevant discourse; b) assessment of issues related to the equality of space in domestic analysis and practice; c) determination of the local specificity of Ukraine, which determines the perspective of applying the principles of universal design.

Based on the analysis, have been outlined the main features of a possible strategy for the development of universal design principles in Ukrainian cities, including taking into account the consequences of full-scale russian military aggression, which began in February 2022.

**Keywords:** universal design, Ukrainian cities, European initiatives, inclusiveness, barrier-free, user-centered design, integral accessibility, post-war reconstruction.

**Introduction.** The concept of universal accessibility, which has developed over the past decades, is currently a multifaceted system of views on design, the relevance of which is constantly growing due to many factors. First of all, it is an increase in life expectancy, which has the consequence of an increase in the number of elderly people. The resulting concepts of age inclusiveness and friendliness to different age groups are one of the examples of how urban planning concepts and social behavioral models are transformed under the influence of changing age demographics. However, the category of universal design is a wider ecosystem of outlook on the environment, which requires much greater efforts, including implementation into mass culture and lifestyle. In this regard, various forms of institutionalization, legislative fixation and authoritative constitution of universal design has a great importance, due to which special attention belongs to various programs and acts that have been developed or supported at the level of the European Union, as well as by full and associated members. In view of the European integration strategy of Ukraine, an important topic of the architecture theory is the development of a strategy to involve the aforementioned array of deterministic foundations and practices into the reality of domestic science and project outlook. The architecture of Ukrainian cities,

especially in view of the consequences of full-scale russian military aggression, will require a significant conceptual rethinking, and one of its leading directions should be the strategy of implementing the principles of universal design.

**Publications and sources analysis.** The main document of the European Union in the field of universal design can be considered the publication named "Achieving full participation through universal design" [1]. It, on the one hand, synthesizes current ideas about the concept and principles of universal design, and on the other hand, much attention is paid to the practical aspects of its implementation in various contexts. A feature of the presentation of the material is its interpretation within the value framework of the European Union based on the equality and equal value of all members of society. Therefore, universal design is seen not only as a strategy for caring for the disabled, but also as a concept of blurring the perceptual difference between members of society depending on their physical condition.

In addition, universal design has become the subject of many well-founded scientific studies, among which books can be highlighted E. Steinfeld та J. Maisel "Universal Design: Creating Inclusive Environments" [2], S. Goldsmith "Universal Design" [3], S. Burgstahler "Universal Design: Process, Principles, and Applications" [4], R. Null "Universal design: Principles and models" [5], A. Hamraie "Building access: Universal design and the politics of disability" [6], J. S. Kim and Y. J. Byung. Universal safety and design: Transition from universal design to a new philosophy [7], K. Carr and others "Universal design: A step toward successful aging" [8] etc. In most of these and other similar works, one can trace the common structure of the presentation of the material, which consists of three principle parts: a) a historical excursion about the emergence of the concept of universal design; b) justification of its compliance with the values of an inclusive and solidary society; c) outline of a number of practical directions and methods of its implementation.

It is important to note that it is characteristic of European initiatives related to the subject of universal design to associate it with the category of "quality of life" [9], as well as the competitiveness of urban collectives.

**The goal of the article** consists in outlining the specifics of the potential for the implementation in Ukraine of the principles of universal design, which are defined by the documents of the European Union.

**Objectives of the study.** Given the special relevance of the theme of universal design for Ukraine, which became a victim of russian military aggression, an important task of the theory of architecture is to determine effective ways of forming the National Strategy for the Development of the Environment, which is based on the values of barrier-free and integral accessibility, strengthening factors that contribute to the solidarity of society regardless of age and functional characteristics of citizens.

In connection with this task of the research, there is an outline of a number of prerequisites that can significantly improve the quality of inclusiveness based on the already existing world experience, among which the European experience represents the greatest value. This is due to two main factors – territorial proximity and the status of an associate member of the European Union. For this, it is necessary to perform the following consecutive steps, which are related to the comparative analysis of current European developments and special features that determine the Ukrainian specificity of this issue. It is assumed that preliminary analytical work in this direction will provide an opportunity to move to the stage of developing practical recommendations both at the national and regional levels.

**Research materials and methods** have a two-syllable character and correspond to his tasks. At the first stage has been carried out, an analysis of theoretical and practical material related to the determination and implementation of the concept of universal design based on its interpretation by the institutions of the European Union. On the second, there is a comparison of the obtained results with the current state of the architectural living space in Ukraine with an emphasis on its compliance with the values of integral accessibility.

**Results and discussion.** The concept of universal design encompasses a wide interdisciplinary discourse and also touches on fields of knowledge that are not directly related to

architectural design and urban planning, such as education, web design, employment, etc. Therefore, the attention in this article will be focused only on those aspects that relate to the physical living space on the scale from premises to urban formations.

On the basis of the above-mentioned sources and, above all, the publication "Achieving full participation through universal design", it is possible to single out the following areas of development of universal design, which have a priority status and relate to the thematic boundaries of this article: a) ensuring equal access to civic activity, implementation of political rights and freedoms, demonstration of one's opinion on various aspects of social life, etc.; b) ensuring equal access to places of leisure, culture and neighborhood communication; c) the development of such standards of living that will make it impossible to differentiate accessibility to any benefits depending on the user's physical condition; d) ensuring the same level of mobility within the urban space.

In general terms, the ergonomics of universal accessibility can be systematized according to the following large-scale circles: a) universalization of personal space (furniture, planning, landscaping, etc.); b) universalization of pedestrian accessibility (shops, parks, leisure, sports infrastructure, etc.); c) universalization of urban transport infrastructure (stops, tracks, parking, etc.); d) universalization of places of city-wide interaction (theaters, museums, central squares, botanical gardens, etc.). The structure indicated here is complemented by other directions of achieving equality of opportunities in the field of media [10], education [11], etc.

In view of the above outlined directions of development of universal design in architectural design and urbanism, which have also received approval in a number of municipal projects of European cities, it is worth focusing on the state of correspondence between existing experience and the imagined ideal of an environment of universal accessibility. Examples of the implementation of certain local initiatives are mostly of a limited nature and serve only as "signal" markers for further dissemination. The paradigm of spatial equality and equality of opportunities, which is seen as a leading feature of the architecture of the 21st century [12], faces the problem of the nature of constitution. As a certain total feature of the space, universal accessibility has often been perceived within the framework of the "progressive" worldview, as a new ideology framework that replaces outdated, limited and erroneous views that should remain in the past. At the same time, the practice of various initiatives has shown that instead of a "progressive" vision of implementing the concept of universal design, a "performative" approach is more effective. It involves flexible work with the existing environment, which is gradually transformed by layering various transformative changes, as a result of which the universal design achieves its goal.

The performative framework also allows for the creation of a realistic strategy for the implementation of spatial equality in Ukraine, which has developed its own urban specificity, which will be discussed further. In contrast to most European cities (especially Western European), the following features of the architectural and urban planning environment can be noted: a) a significant legacy of the typical design of the Soviet era of the 1970s and 1980s; b) the spread of high-density buildings in the 2000-2020s period (primarily in large cities). Spatial formations of both these types have different performance potential and require separate consideration. In addition, there are common features between European and Ukrainian cities, especially those related to the historical area, suburban areas of low-rise buildings and objects of moderate modernism (which differs from the heritage of construction according to typical projects).

Next will be considered the potential of realizing each of the four generalized directions of universalization corresponding to the documents of the European Union with the just mentioned features of the urban specificity of Ukrainian cities. The universalization of personal space within the legacy of the typical built-up of the Soviet era of the 1970s and 1980s is one of the most difficult tasks, since this type of objects is characterized by extreme pragmatism in terms of space saving [13]. In this regard, two possible scenarios of actions can be distinguished – minimalist and maximalist. The first should include the strategy of transformation of this kind of entities in the direction of reducing the number of residents and increasing the living space per person. This will make it possible to implement ergonomic techniques of universalization and improve the level of

inclusiveness. The maximalist scenario includes programs to replace areas of typical development with new ones, more adapted to improved conditions of presence. The universalization of pedestrian accessibility for this type of environment should be based on the use of a significant reserve of territory, which is an inherent feature of typical built-up areas. It should be used to deploy additional equal opportunities equipment and infrastructure, which also includes the provision of additional elevators, entrances, ramps, safe leisure areas, etc. The universalization of urban transport infrastructure for this type of architectural and urban planning environment should probably take into account the need not only for the proper arrangement of public transport stops, but also for the transformation of access routes to them. This is due to the fact that the norms, in accordance with which such housing units were designed at the time, were aimed at physically healthy people of working age. Therefore, using the already mentioned potential of a large supply of in-house and intra-neighborhood spaces, it is necessary to create individual projects of paths for movement on wheelchairs, with the help of means for the blind, elderly people and children, etc. In addition, it is necessary to pay attention to the intersection of communication elements. An example can be underground pedestrian crossings, which were initially designed without taking into account the interests of people with special needs. A similar specificity is also characteristic of larger transport hubs, such as railway stations, complex interchanges of public transport. In all these cases, the functional modernist morphology allows introducing elements of universal design at a level sufficient for its full functioning. The universalization of places of city-wide interaction is considered here not on a city-wide scale, but in the context of a residential area and therefore concerns local places of attraction such as cinemas, churches, natural objects of general attraction (lake and river embankments, hills with a panoramic view, etc.). Very often, these zones underwent changes during the period of the late 20th and early 21st centuries and lost the initial potential that made it possible to effectively implement the program of diversity of opportunities. However, in those cases where the authentic environment is preserved, it is necessary to use the already existing accessibility infrastructure as a starting point for full universalization of the environment. As a rule, in the era of late Soviet modernism, wide staircases, deep niches, various methods of accentuating the features of the object by increasing the scale of certain details were used in the objects according to the so-called individual projects. All these elements can be used to accommodate the infrastructure of equal opportunities.

Given the similarity of the environments created as a result of construction according to typical projects, it is worth considering the possibility of developing a series of unified recommendations and block design solutions that will simplify the process of developing working documentation and reduce the overall costs of implementing projects implementing the principles of universal design in these cases. At the same time, it should be understood that the very "typicality" of one's living space is mostly perceived by residents as a disadvantage, therefore, the implementation of such strategies should involve a significant level of variability and creative interpretation in each individual case. It should also be borne in mind that a typical Soviet building often arose as a result of the construction of one or another factory or enterprise to house its employees. As a result, large solidarity communities of residents emerged, which are connected not only by a common neighborhood, but also by former joint activities. This, in turn, improves the prospects of their participation and participation in the development of initiatives regarding the implementation of the principles of universal design in their own living space. Although at the moment, given the disappearance of most of the former enterprises of the planned economy, this potential has probably decreased, nevertheless, the tradition of shared life experience, which took the form of transmission between generations, should be considered as a valuable factor in the further urban performance of this kind of residential environments.

The concept of implementing the principles of universal design in the conditions of high-density buildings of the 2000-2020s period is a more difficult task for theoretical reflection, because of their greater heterogeneity and spontaneity. Although many construction objects of that time had a modernist character [14], the principles of their design often differed significantly from the basic principles of socially responsible calculation of functional rationality. The dominance of the

commercial settlement and the erosion of the complex principles of the arrangement of the living space resulted in a decrease in the number of nearby accessible green areas, residential areas, educational institutions and leisure facilities. In addition, closed, isolated environments began to appear, which significantly changed the parameters of accessibility and equal accessibility [15].

With this in mind, the universalization of personal space for this type of environment consists in an individual search for an appropriate planning solution in the conditions of a flexible structural system of buildings, among which the absolute advantage belongs to frame structures. A much more difficult task is the transformation of residential areas, which are mostly small and filled with cars that lack parking spaces. Many examples of this type of building can be recognized as suitable for non-discriminatory transformation only under the condition of very significant changes in the strategy of treating individual transport. Instead, the universalization of pedestrian accessibility here, as a result of higher density, has a more favorable character. The practice of locating commercial real estate at the ground level significantly improves universal and quick accessibility to many benefits. At the same time, the low level of greening and recreational areas indicates the need for a more systematic approach to the perspective transformation of buildings in the years 2000-2020. The universalization of urban transport infrastructure should take into account the fact that the residential structures of that time arose without reference to the complex calculations that were inherent in the age of advanced modernism. Herewith, the objects that arose during this period can be both well located in relation to the city-wide transport network and almost completely disregard it, focusing on private vehicles. Therefore, the strategy for achieving equality of opportunities should focus on laying new routes and diversifying types of mobility. The universalization of places of city-wide interaction is one of the most difficult tasks given their small presence in this type of development. This is due to weak state regulation and the priority of commercial calculations of developers, who primarily preferred the construction of residential areas for sale. Therefore, in certain cases, even those public spaces that already existed disappeared. In this regard, it is worth talking about several ways to solve this problem, the main of which is the improvement of the currently existing service centers by providing them with more diverse functions and missions. This can happen as a result of coordinated activities of local communities with authorities, including through the implementation of special programs for the humanization of the urban environment. Studies of recently built complexes testify to the existence of a rather one-sided approach to the universalization of this kind of residential environment. It consists in concentrating attention only on the formal arrangement of playgrounds, often without accompanying infrastructure. This leads, in particular, to the fact that children remain in the danger zone even while on such sites, and the special needs of older residents are not taken into account at all. In addition, the lack of a sufficient number of places for vehicles significantly changes the nature of those minimal efforts to ensure equality of opportunities, which are implemented in certain places.

Taking into account such circumstances, the implementation of the values of equal access in the built-up spaces of 2000-2020 requires a complex mechanism of transformation, which may, among other things, require some changes in the planning and spatial structure and, probably, a change in the functional purpose of living spaces. Friendly spaces for different ages and physical conditions will require the restructuring of a larger urban area, with the possibility of access to it by residents of different buildings and a rethinking of the principles of gated communities. A special task is the transformation of approaches to vertical communication, which arose as a result of the development of high-rise residential construction and often does not take into account the needs of universal design [16]. Two approaches can be distinguished: radical and moderate. As part of the first, some of the highest levels are reimagined as zones of general accessibility, recreation and leisure, with the possibility of getting there by both existing and new means of vertical transportation. Probably, some apartments or technical premises should change their functional status. In a moderate version, it is possible to limit yourself only to the installation of new elevators, with a greater degree of equality of access, which allow overcoming the currently existing restrictions.

**Conclusions:**

1. The following priority directions for the development of universal design in the field of architecture and urbanism, which are supported by EU documents, have been identified: a) ensuring equal access to civic activity, exercising political rights and freedoms, demonstrating one's opinion regarding various aspects of social life, etc.; b) ensuring equal access to places of leisure, culture and neighborhood communication; c) the development of such standards of living that will make it impossible to differentiate accessibility to any benefits depending on the user's physical condition; d) ensuring the same level of mobility within the urban space. In accordance with these directions, large-scale circles of ergonomics of general accessibility are outlined: a) universalization of personal space (furniture, planning, landscaping, etc.); b) universalization of pedestrian accessibility (shops, parks, leisure, sports infrastructure, etc.); c) universalization of urban transport infrastructure (stops, tracks, parking, etc.); d) universalization of places of city-wide interaction (theaters, museums, central squares, botanical gardens, etc.).

2. The general features of the "performative" approach to the probable national strategy for the implementation of the principles of universal design are formulated, in connection with which two specific features of Ukrainian cities are highlighted, in relation to which European documents in this field should be adapted in a special way, namely: a) significant the legacy of the typical design of the Soviet era of the 1970s and 1980s; b) the spread of high-density buildings in the 2000-2020s period (primarily in large cities). A brief description of the design action strategy for each of the general accessibility ergonomics circles is provided for these two specific features.

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## ЄВРОПЕЙСЬКІ ПРИНЦИПИ УНІВЕРСАЛЬНОГО ДИЗАЙНУ ТА ЇХ ЗАСТОСУВАННЯ В АРХІТЕКТУРІ УКРАЇНСЬКИХ МІСТ

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**Анотація.** Цінності солідарного та демократичного суспільства, ґрунтованого на принципах рівності, впродовж всієї Сучасної епохи суттєво впливали на концептуальні та практичні принципи проектування. З ними, значною мірою, пов'язана сама формотворча база модернізму – провідного світоглядного напрямку, який визначив архітектуру ХХ та початку ХХІ століття. Одним із важливих етапів розвитку цього процесу стало поширення з 1980-х років концепції «універсального дизайну», спрямованого на творення більш інклюзивного простору, уникнення різних форм ізоляції та нерівноправності залежно від фізичних здатностей людини.

На даний час, теоретичні та практичні здобутки у цій царині дають можливість говорити про цілісну систему поглядів на проектування, яка, однак, досі залишається, значною мірою не реалізованою у тій мірі, коли цілі універсального дизайну можуть вважатись загалом досягнутими. Тим не менше, завдяки реалізації ряду ініціатив і програм, у багатьох європейських містах стали виникати інклюзивні та дружні до різних груп середовища, які свідчать про переваги концепції «проектування для всіх». Крім суто гуманістичного аспекту, вона також дає містам переваги з точки зору більш повного використання людського потенціалу, підтримки високої економічної та соціальної привабливості, що зрештою підвищує конкурентні показники міста.

Дана стаття складається із трьох принципових частин дві з яких рефлексивні і одна аналітична. У своїй послідовності вони мають наступний вигляд: а) окреслення актуальних концепцій універсального дизайну, які присутні у різних ініціативах і програмах Європейського Союзу та ширшого кола джерел, котрі творять відповідний дискурс; б) оцінка проблематики, пов'язаної із рівноправністю простору у вітчизняній аналітиці та практиці; в) визначення локальної специфіки України, котра визначає перспективу застосування принципів універсального дизайну.

На основі проведеного аналізу, окреслено головні риси ймовірної стратегії розвитку принципів універсального дизайну в українських містах, в тому числі, з врахуванням наслідків повномасштабної російської військової агресії, котра розпочалась у лютому 2022 року.

Сформульовано загальні риси «перформативного» підходу до ймовірної національної стратегії впровадження принципів універсального дизайну, у зв'язку з чим виокремлено дві специфічні риси українських міст, щодо яких слід розглядати європейські документи у цій сфері. особливим чином адаптовано, а саме: а) суттєва спадщина типового дизайну радянської доби 1970-1980-х років; б) поширення щільної забудови в 2000-2020-х роках (насамперед у великих містах). Короткий опис стратегії проектування для кожного із ергономічних кіл загальної доступності надається для цих двох конкретних функцій.

**Ключові слова:** універсальний дизайн, українські міста, європейські ініціативи, інклюзивність, безбар'єрність, користуваче-центричний дизайн, інтегральна доступність, повоєнна відбудова.

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