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INCLUSIVITY & ACCESSIBILITY of Historic Public Spaces

Approach & Digital Tool



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Inclusivity and Accessibility of Historic Public Spaces

Kyiv National University of Construction and Architecture, Ukraine

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I. CHARACTERISTICS OF PUBLIC SPACES IN HISTORICAL CITIES

Public spaces in historic cities are unique architectural and spatial formations that have been shaped over a long period of time by historical, socio-cultural, political and economic processes. Their significance goes far beyond their functional use — they are carriers of identity, spaces for interaction, and symbols of historical memory. In order to properly understand the tasks facing designers in ensuring the inclusiveness and accessibility of public spaces in historic cities, it is necessary, first of all, to understand the main functional, social, societal, and cultural characteristics of their existence.

According to recent studies [1-3], public spaces are seen as parts of the urban planning system, characterised by their integration into the urban fabric, multifunctionality, and high level of social activity. The defining elements of such spaces are a combination of a specific territory, architectural objects, amenities, the people who inhabit and visit it, as well as the main meaning of their activities (i.e., the purpose of using these spaces), which together form the meaningful, functional, and emotional solution of the public space.

There are many definitions that characterise the concept of public space from the point of view of both the intangible aspects of its influence on personality formation and the physical, territorial and functional aspects of its use [4-12]. According to UNESCO, the concept of public space is a place that is open and accessible to all people, regardless of gender, race, nationality, age and socio-economic status. These include both "gathering places" - squares, parks, and "connecting spaces" - sidewalks and streets [13].

The concept of public spaces is characterised by a certain two-dimensionality: on the one hand, it is a purely territorial concept (an area limited by certain objects (natural or architectural) used for public use), on the other hand, it is a spatial-philosophical concept (a place where a person realises themselves as a personality, an individual in informational, dispositional, communicative, socio-normative and mental dimensions [14]). The spaces of the Old Town are both an environment for interaction and a bearer of historical and cultural heritage. They should be analysed not only as a set of individual elements (squares, streets, fountains, sculptures), but also as an integral system that forms an architectural and landscape ensemble [14].

Public spaces are part of the common space of cities, which must be open and accessible to all its users for communication, meeting social and public needs, organising leisure and recreation, holding mass events, etc. According to the wording given in the "Regulations on public space in the territorial community and participation of community residents in its planning", developed within the framework of the Council of Europe Project "Promoting citizen participation in the democratic decision-making process" [15], *public spaces in cities include*: squares, boulevards, avenues; streets, roads, alleys, slopes, driveways, pedestrian and bicycle paths; parks (water parks, meadow parks, forest parks, culture and recreation

parks, parks that are monuments of landscape architecture, sports, children's, historical, national, memorial and other parks) recreational areas, gardens, squares and playgrounds; areas of cultural and historical heritage sites; buildings and structures specially designed for use by an unlimited number of people for public events (forums, basilicas, community centres, amphitheatres, etc.); as well as beaches, cemeteries and other areas of public use [15]. In most cases, public spaces are municipally owned, but with the consent of the owners, private spaces may also be included. Public spaces in historic cities have been shaped by buildings and structures, as well as the natural landscape of the area, over a long period of historical development. Some of them were specially planned, while others were created as a result of the gradual historical evolution of urban spaces under the influence of various formative factors.

At the same time, public spaces in historic cities are characterised by physical, semantic (meaningful) and social hierarchies. Many works note the city-forming role of open spaces. Thus, in the dissertation by O. P. Oliinyk [1], such open spaces are defined as city-forming elements that have undergone significant transformations throughout their historical evolution (from the agoras of Ancient Greece to modern integrated spaces), but have always been characterised by a significant influence on socio-political, public and other processes of urban community life, with an emphasis on pedestrian accessibility and the overall preservation of the cultural context. In scientific publications by N. O. Leshchenko [16], the processes of transformation of historical urban spaces are considered. In particular, the author introduces the concept of "restoration and reconstruction transformation" as a complex, multi-level process that encompasses the preservation, enhancement, correction and change of the spatial and functional characteristics of the historical environment. Within this approach, public space is not only preserved but also given new life through the implementation of modern usage scenarios that take into account the context, traditions, and needs of residents [17].

The spaces of historic city centres should be perceived as a single organism, a single whole, as they shape the overall impression of historic city centres and significantly influence the perception of historic buildings, architectural monuments and cultural heritage sites. At the same time, public spaces are not static, as they must ensure the functioning of the urban community and are therefore used by many users constantly, intensively and in many ways. In addition, it is worth noting the need to involve the urban community in the formation of such public spaces in their cities, the importance of public consultations, transparency of processes, and the preservation of cultural and historical heritage. This also applies to issues of accessibility and inclusiveness of such spaces: identifying barriers that limit the inclusiveness and accessibility of public spaces, ways to overcome them, and directions for infrastructure development should be determined on the basis of surveys, public discussions and consultations with the community. The Council of Europe's provisions on public space in local communities [15] also emphasise the importance of public consultations, transparency of processes and community involvement in planning.

The article by O.P. Oliinyk examines the formation of urban spaces in the context of postmodernism [18]. The renowned architect Rem Koolhaas [19] considers such a space to be a non-standard urban space

built as a conglomerate of ideas, concepts and dreams. It is designed to appeal to people through whimsical and exaggerated elements: neon lights, casinos and buildings that combine architectural elements of all ages [19].

Barbaga Barreiro notes that: "Postmodern cities are not designed for disabled people to live in, but instead aim to distract society. They are a sequence of diverse, unreal spaces that embody imposed dreams, distracting people and making them believe that this place is a utopia created in their image and likeness" [20].

Based on postmodernism, a new concept of ironic, commercial, entertaining architecture has been formed. As a result, we are faced with timeless, fictional spaces with ephemeral aesthetics that draw visitors into a new dimension. The postmodernist environment is perceived only as an element of entertainment.

The problem of forming public spaces and their identification, using the example of the city of Lviv, is addressed in articles by Onishchenko-Shvets A. [21], Zimorovich B. [22], and Shnyur-Peplovski S. [23].

In M. O. Gusev, dedicated to the directions of formation and development of open spaces in cities, and his scientific publications [4, six key principles of the functioning and transformation of modern public spaces are highlighted: multifunctionality, inclusiveness, comfort, hierarchy, contextuality, and public openness. The principle of multifunctionality emphasises the ability of a space to provide various functions — recreational, communicative, cultural, commercial — which, in turn, contributes to the formation of close social ties and the diversification of the experience of using public spaces. The principle of contextuality is particularly valuable for historic cities, as it emphasises the importance of the "spirit of place" — the tangible and intangible heritage that shapes the uniqueness of each space. Architecture does not exist outside of context, so changes in space must be sensitive to history, landscape, and cultural and social context. Hierarchy allows for the organisation of a network of spaces — from central squares to local intra-neighbourhood areas — into a single coherent system. The principle of public openness determines the transparency, accessibility and openness of space for all population groups — at any time, without restrictions. It also emphasises the importance of clear landmarks, visual communications and ease of navigation, which is particularly relevant in the dense fabric of historic cities.

The functional content of public spaces plays an extremely important role in their formation and development. *The main functions that provide public spaces in historic cities include: communication* (pedestrian, public and private transport); *creating conditions for leisure, recreation, physical and creative activities* for children and adults; *the opportunity to view historical sites*, architectural monuments, and cultural heritage sites; *representative and informational* (installation of information media, display cases); *commercial* (markets, kiosks, street trading); *social and communicative* (holding public discussions, meetings, rallies, votes, etc.); *engineering and technical* (underground, above-ground and aerial cable channels, lighting, waste collection, etc.); *provision of basic needs* (public toilets, drinking water, etc.) and many others. It is on the basis of an understanding of the functional characteristics of the use of public

spaces in historic cities that requirements for ensuring their accessibility and inclusiveness should be formulated.

It should be noted that these functions change over time, and the requirements, standards and emphases in their use are constantly shifting, depending on the socio-economic, socio-political, cultural, technological and other conditions of society's development. This, in turn, has a significant impact on the structure and appearance of public spaces.

For example, changes in the development of transport over the centuries have influenced the width and surface of roads, squares and streets. At the same time, the emphasis in the use of public and private transport has constantly shifted: at the end of the 19th and beginning of the 20th centuries, horse-drawn vehicles, which were the main form of transport until the mid-19th century (carts, sleighs, phaetons, horse-drawn carriages), were replaced by railways, and later by electric ground and underground transport (trams, metros) and cars. The emergence and spread of motor transport significantly changed the public space of historic cities (road widening, the formation of a public transport network, the establishment of stops, and the placement of parking lots and parking spaces along streets). In the middle and late 20th century, motor transport dominated, displacing pedestrians from public spaces. At the beginning of the 21st century, pedestrians are gradually regaining the upper hand in urban spaces (especially in their historic parts), and the use of bicycles, electric scooters and other types of individual transport is expanding. All this has a significant impact on the appearance and structure of public spaces and the requirements for their use.

The works of Ukrainian researcher M. Bevz provide a classification of public spaces in historic city centres based on their *communicative component*, nature of use (pedestrian traffic, transport and pedestrian spaces, individual and public transport networks) and traffic intensity. Quantitative indicators of "optimal urban space" have been determined, taking into account the current conditions of its functioning and the characteristics of the historical environment [25, 26].

The standards for engineering and technical support of the urban environment are also changing (lighting, technologies for laying engineering communications, rainwater collection, heating, etc.), sorting and collection of household waste (which affects the location and size of waste bins); installation of visual information devices, compliance with environmental, safety and other requirements for sustainable development of society.

Modern approaches to the organisation of public spaces should be based on the principles of sustainable development, which include: environmental friendliness, adaptability, preservation of identity, inclusiveness, and flexibility of functions [14]. Requirements for ensuring environmental friendliness, energy efficiency in the use of natural resources and in the development of architecture in general, and the creation of a safe and barrier-free people-centred space have a significant impact on public urban spaces. There is a need to ensure unhindered access for city residents to all public places, access to civil facilities for various purposes, in particular, to cultural and historical heritage sites. The creation of public

spaces where the main element is the person, regardless of their age, gender, origin, social affiliation, physical and mental abilities, is the main task of modern society.

In new construction, the basic principles of such public spaces can be laid down at the design stage. As for reconstruction, this process is much more difficult, as the designer has to deal with an already established environment. This raises the complex issue of adapting and rebuilding it into a people-friendly space, creating the most equal conditions possible for its use by people with different abilities and needs.

At the same time, in the context of the globalisation of modern society, there is a threat of losing the uniqueness of historical spaces due to the standardisation of design, the uniformity of architectural solutions and so-called commodification [2]. Commodification is the process of transforming something that previously had no commercial value into a commodity that can be bought, sold or used for commercial purposes. From the point of view of public spaces, this term can be used to describe processes whereby spaces that should be open to all and serve public purposes (communication, leisure, participation in community life) gradually acquire a market-based logic of use: commercial facilities, paid services, access restrictions, advertising appear there, and in general, the space begins to serve consumption rather than the urban community. That is why it is particularly important to preserve the social significance of public spaces in the life of modern cities — as special carriers of historical memory, important architectural symbols that ensure the recognition and continuity of historical evolution, and therefore have extraordinary social significance.

With the start of military operations on the territory of Ukraine, the requirements for the safety of public spaces have changed significantly. Air raid sirens, bombings, and shelling of Ukrainian territories have raised urgent questions about the creation of safe places within public spaces that would provide safe and comfortable conditions and could be reached within a relatively short period of time in the event of a threat. The construction of shelters, bomb shelters and other means of protecting the population, including within public centres in historical environments, may be a matter for separate fundamental research. At the same time, ensuring at least minimal means of protection for users when visiting public spaces must be implemented in the shortest possible time. Today, it is important to ensure safety conditions — the construction of shelters, evacuation routes, and the provision of real-time information. The space must remain accessible, but with threats in mind — this is a new requirement for its functionality in the Ukrainian context.

Public spaces in historic cities occupy a special place in the structure of urban public spaces, as the historical and cultural value of the objects that form them is undeniable, and all human efforts must be directed towards preserving them in the most authentic environment possible and passing them on to future generations in an unchanged or maximally preserved state. Thus, society faces an extremely difficult and responsible task of ensuring the accessibility, inclusiveness, environmental friendliness and energy efficiency of modern urban public spaces in historic cities — to preserve their historical and cultural value and ensure access to them for as wide a range of the population as possible.

Particular attention should be paid to analysing the successive layers of architectural eras and styles that have shaped the spatial structure of the city over the centuries. This allows not only to preserve the chronological integrity of the environment, but also to avoid destructive interventions that erase the unique features of the cultural landscape. Preserving the authentic character of a space involves preserving the scale, textures, traditional materials and even the colour scheme that shape the identity of a place. Avoiding excessive intervention should be based on the principles of "light touch" — minimal, delicate renovation to ensure the accessibility and inclusiveness of the GP, with maximum respect for the existing structure and symbolism of the environment.

It is important that residents and visitors to the city receive clear information about the city itself and the specific place where they are at that moment. With such feelings and knowledge, people will relate differently to themselves and the city in which they grew up, and visitors will be able to properly appreciate the land they have come to. The article by Kryvoruchko Yu., Kryvoruchko O., and Petryshyn H. [27] is devoted to the formation of art clusters in historic cities.

The world, particularly Europe, has accumulated considerable experience in presenting historical and cultural potential, elevated to the level of a city-forming factor and a significant item in city budgets. Although the history of North America is more modest than that of Europe, its practices of using heritage as a modern tool for urban development are worthy of close study by our specialists in city management and development.

Museum Island on the Spree River in Berlin is designed to display archaeological collections and contemporary art concentrated in five museums. In 1999, this architectural and cultural centre was added to the UNESCO World Heritage List. The project by David Chipperfield Architects was planned for implementation by approximately 2020. The reconstruction and renovation of Museum Island is the most expensive cultural project in Germany: more than 600,000 years of human history are represented on an area of about 1 km². The archaeological museums are spatially and thematically united by a promenade — the main axis of the complex, which offers panoramic views of the museum buildings. Along the promenade, there will be a network of cafes, shops, and auditoriums — a service infrastructure for the entire island and space for temporary exhibitions and presentations. Technical services, administration with libraries and archives, student repositories and restaurants were planned to be moved to the new Museum Courtyard (Museumshobe) on the other side of the river to free up space for infrastructure and services on the island itself. Individual buildings are oriented in different directions: the Pergamon Museum plays a key role; the Old Museum was conceived as an analogue of the former city palace; the Old National Gallery and the New Museum form an ensemble facing south. They implement a fragment of F. A. Stüler's 1841 master plan for a "forum of arts and sciences" on the Spree Island. Museum Island is considered a unique educational landscape: each historical building, while remaining distinctive, becomes part of a large complex with cultural, artistic, educational, cognitive, and tourist service functions. (Fig. 1).



Fig. 1. *Museum Island. Berlin. Germany. Berlin, S. M. Z. (n.d.). Staatliche Museen zu Berlin. Staatliche Museen Zu Berlin. <https://www.smb.museum/en/museums-institutions/museumsinsel-berlin/about-us/museumsinsel-master-plan/>*

The ideas that ensure the spatial and artistic integrity of Museum Island are as follows: interconnection of museums by basic levels of space and theme; creation of a forum for arts and science; giving new buildings the role of open-air chamber halls (concerts, film screenings); use of inner courtyards as additional exhibition spaces; creation of a visitor route with a noticeable alternation of heights, shapes and spaces under the influence of light; opening of museum interiors and vaults for public viewing.

In Birmingham, on Curzon Square, the Ikon architectural group proposes to create a museum quarter that will combine a museum of contemporary art, a space for temporary exhibitions, a museum of photography and a building for the national art collection. The implementation of the project will strengthen the cultural component of urban life. Similar to examples in Berlin, Abu Dhabi, Barcelona, São Paulo and Shanghai, Curzon Square will increase the city's tourist and business appeal and contribute to improving the quality of life for its residents. The transformation of this area is intended to become for Birmingham what the Tate Modern has become for London — a source of new impetus for urban development.

Next to the planned HS2 railway terminal, Curzon Square will become a cultural oasis — an architecturally distinctive space with a powerful artistic aura. It will feature areas for free-access exhibitions, performances, music and dance events, film screenings and various open-air events. The second largest city in the United Kingdom currently has the characteristics of a provincial centre, but the new district will change this perception. The location is convenient not only for the approximately six million residents within a 30-minute reach, but also for visitors from across the country and abroad. Excellent pedestrian

connectivity and proximity to public transport, including the future HS2 terminal, make Curzon Square an ideal location for a museum hub.

Birmingham's growing creative communities — Digbeth, The Bond, Minerva Wharf (on the site of a former bakery and adjacent industrial areas) — are within easy walking distance. The architectural language of the space will reflect openness and combine green spaces with the urban context, creating a welcoming environment that encourages people to come, stay and explore the place. (Fig. 2).



Fig. 2. Birmingham. Curzon Square. Museum Quarter. Wikimedia, U. P. (2025, October 5).

In Brussels (Belgium), the Mont des Arts (Kunstberg) urban multifunctional cultural centre is being developed on the Hill of Arts, combining landscape architecture and spatial art. Once upon a time, the Saint-Roch district was densely built up. At the end of the 19th century, King Leopold II decided to transform the hill into Mont des Arts and bought up the surrounding land. After the old houses were demolished, the area lost its appearance because funding for the project was discontinued. To give the space between the Royal Palace and the Grand Place a dignified appearance for the 1910 World's Fair, the king commissioned landscape architect Pierre Wacherot to create a "temporary" garden. This is how the park with its monumental staircases and cascading fountains on the slope from the Royal Square to Boulevard des Kaisers came into being. Despite its temporary nature, it became a cosy green oasis in the city centre.

When the idea of Mont des Arts was revived in the 1930s, the existing park was demolished to create a new square as the core of a renewed urban project. Between 1956 and 1958, the park and its surroundings gave way to a series of restrained geometric neoclassical buildings, including the Royal Library of Belgium and the Palace of Congresses. The new formal garden was designed by architect René Pechere. The Royal Museum of Fine Arts, the Museum of Musical Instruments, the Royal Palace, the city cathedral and a number of other museums are located on the slope of the Hill of Arts.

The key spatial ideas for the Hill of Arts include: thematic design of facades in accordance with changing exhibitions; creation of public places for meetings and communication (in particular, the Square centre); strengthening of planning axes through landscaping, which simultaneously directs and orients human flows (Fig. 3).



Fig. 3. City of Brussels (Belgium). Arts Hill. <https://trips.com.ua/podorozhi/scho-vidvidaty-v-bryusseli-nasampered/>

Among national examples, it is worth mentioning Kyiv's Mystetskyi Arsenal. The National Cultural and Art Museum Complex is currently one of Ukraine's most promising cultural projects and is set to become one of the world's most powerful museum and exhibition centres in the future. Its mission is to bring together a wide range of the country's cultural initiatives and achievements into a single conceptual project in order to present Ukraine's historical and artistic heritage as an integral part of world culture.

The international architectural competition revealed a number of original solutions and practical ideas for the further development of the complex. In particular, A. Myrhorodskyi's project proposes a pedestrian connection between the Kyiv-Pechersk Lavra and the Arsenal, the creation of underground parking lots, the restoration of redoubts and earthen ramparts with a panoramic tourist route. It also envisages a Shevchenko House with archives, educational and cultural institutions, a tourist complex with a hotel and a multifunctional hall for concerts and meetings (Fig. 4).



*Fig. 4. Kyiv (Ukraine). Mystetskyi Arsenal. <https://book.artarsenal.in.ua/pro-nas/istoriya-festyvalyu/>
https://artarsenal.in.ua/wp-content/uploads/2019/08/20190514-142343_Popenko.jpg*

Modern cities are growing rapidly [28]. In such conditions, it is difficult to implement the aforementioned principles; at the same time, neoliberal logic gives rise to both P. Marcuse's "citadel," which subordinates public space [29], and the "centre-periphery" axis, which in fact results in "spatial segregation" [30].

The development of communication technologies contributes to the dominance of capital. Social control in cities is increasingly exercised through digital tools, leading to the collapse of public spaces [5]. Instead, "pseudo-public" locations are spreading, further isolating their users. The obsession with functional zoning, the cult of movement, transparency and the separation of human flows is creating a more sophisticated way of displacing the public sphere than direct privatisation. Another type of pseudo-publicity is consumer spaces, where the sense of community is reduced to shared involvement in the purchasing process [31].

At the same time, the local is being eroded: a "synthesis of the global and the local" is taking place, with the emergence of communities that are tied to a place but bear global traits and practices [32].

In response to these challenges, tools are being sought to mitigate the negative effects. K. Georgie proposes a method of integrated urban development based on the 2030 Agenda for Sustainable Development, which envisages a diverse urban fabric with proportionally divided neighbourhoods [33]. But is such a model possible under the given conditions? Experts see a way out in the "decentralisation" of the city: the development of remote areas, increasing their attractiveness for social initiatives and business. Bringing places of residence and work closer together and prioritising public transport will reduce unproductive time and transport fatigue [34]. A post-industrial approach is also proposed — rethinking neglected industrial and infrastructure areas as new public spaces. Although industrial aesthetics appeal to a relatively narrow audience, this is compensated by a sense of freedom and the dominance of initiative [35].

At the same time, one thing remains unchanged: "creating and ensuring spatial justice is a political process that requires a struggle for transparent and dynamic decision-making mechanisms; at the same time, the basic spatial literacy of the population must be developed — and this is the immediate task of urban planning in an open society" [30].

The urban structure and planning of Ukrainian settlements have always been oriented towards the church, which was their architectural dominant feature. The dominance of churches in urban development was ensured by their location at key points on high river banks, hills, and squares, as well as by their own spatial composition: monumental forms, verticality, silhouette, significantly greater height relative to surrounding buildings, etc. The opening of previously functioning churches, the reconstruction of destroyed ones, or the restoration and reconstruction of historic churches adapted for various functions, the design and construction of new churches, as well as related facilities, will have a certain impact on changing the urban planning situation and the formation of sacred and public space in cities adjacent to churches, as well as the infrastructure of settlements as a whole.

The artificial interruption of the centuries-old tradition of Ukrainian temple building led to society demanding that architects create temples to replace those that had been destroyed. As a result, the problem arose of finding an adequate response to the demands of the time, which gave rise to a whole new direction in the architecture of public buildings and structures: sacred architecture. Spontaneous efforts to revive the art of temple building often meant a return to the point in space and time when the mass destruction and demolition of sacred architecture took place, which manifested itself in a threefold role: an important layer of material culture, an urban framework, and a bearer of spirituality [36].

In recent decades, the Church of the Assumption of the Blessed Virgin Mary in Podil, the monument to Princess Olga, St. Michael's Golden-Domed Monastery, the Assumption Cathedral of the Kiev-Pechersk Lavra, and St. Vladimir's Cathedral in Chersonesos have been restored in Kyiv. These churches from the Old Russian period were repeatedly destroyed and rebuilt over the following centuries, undergoing various layers of influence from the 17th-18th centuries and the 19th-early 20th centuries. Therefore, when restoring partially or completely destroyed objects, the concept of restoring the external and internal appearance was

adopted, taking into account all periods of the monument's existence as of the period of its maximum prosperity.

It should be noted that the use of typological analysis of antiquities recorded by artists of the 17th-19th centuries in Ukraine and other countries made it possible to create a basis for the restoration of architectural monuments. This direction of restoration activity is considered in the dissertation work of Berezina I.V. "The Architectural Heritage of Ukraine in the Work of Napoleon Orda: Iconography and Principles of Use" [37]. This study evaluates N. Orda's work in the field of recording and regenerating architectural heritage for use in restoration and monument preservation practices.

An example of the application of this method is the reconstruction of Warsaw's Old Town. Restorers successfully used 22 cityscapes of Warsaw created by the Venetian painter Giovanni Antonio Canal, known as Canaletto, the court painter of the 18th-century Polish king Stanisław August Poniatowski [38]. The reconstruction of the Old Town gave Warsaw residents back their historic public space.

A study by Arzili G.Yu. [39] analyses the current state of the formation of public spaces, taking into account intangible cultural heritage, in accordance with existing international agreements on the protection of cultural heritage, international and Ukrainian legislation in the field of urban planning and the protection of intangible cultural heritage, materials from conferences, forums, provisions of the regulatory and methodological framework, scientific literature on the accounting of intangible cultural heritage and the "spirit of place" in architectural and urban planning activities, and it was established that the concepts of intangible cultural heritage and "spirit of place" are used and actualised, at the same time, the criteria for assessing and modelling the mytho-toponymic potential of the environment have not been disclosed. Architectural and urban planning activities are not considered as a method of preserving, recording and popularising intangible cultural heritage, there is no understanding of its consideration as a factor in the formation of public spaces, which plays a decisive role in the choice of functional zoning of land use, in the choice of architectural and artistic solutions for public spaces, as well as a city-forming and city-building factor. For the first time, urban planning protection of intangible cultural heritage is indicated as a guarantee of the further development of cultural diversity in territories.

The method of scenario modelling of rituals in public spaces contributes to the presentation and popularisation of mytho-toponymic potential; processes of familiarising the population with it; physical and intellectual access and contact of the population with it; the transmission of its socio-cultural significance for the development of the tourism industry, increasing the influx of tourists and financial flows into the country's economy. Mytho-toponymic potential, by optimising communication processes at various levels, can visualise the environment (region) in the media as effectively as possible, acting as one of the leading factors of social integration and a carrier of ideology. Methods for managing the processes of spatial organisation of public spaces have been developed, taking into account the factors of mytho-toponymic potential, aimed at improving urban planning documentation at various levels of the complex of design and planning works.

Today, public spaces are not just about benches and litter bins, but about the experience that shapes the environment around us. Each element affects the comfort, atmosphere and accessibility of the space. The layout of an area is a combination of furniture and amenities that we encounter every day in parks, squares, gardens or embankments, and they must be not only functional but also attractive. Why is this balance so important to us? Functionality is, of course, very important, but form can enhance function. Carefully thought-out design takes into account ergonomics and accessibility, while worn-out or uncomfortable furniture not only spoils the impression but can also cause injuries. Visual appeal for visitors is no less important; the design should not be too intrusive or random, but should fit in with the surroundings. It is also important to target the design at a specific audience: what appeals to teenagers may be completely inappropriate for older people, but a competent approach allows for an inclusive compromise. The balance between functionality and aesthetics is a prerequisite for a high-quality public space. Where comfort is combined with visual appeal, an environment is created that people want to return to.

Public spaces in historic cities also have a special significance: they combine preserved and authentic historical and cultural heritage with active use by all members of the urban community, regardless of their age, gender, cognitive abilities, and other characteristics. All visitors and residents of historic cities should have equal, comfortable and safe access to its public spaces.

2. METHODOLOGY AND EFFECTIVE PRACTICES FOR ENSURING THE ACCESSIBILITY OF PUBLIC SPACES IN HISTORIC CITIES

2.1. CURRENT REQUIREMENTS FOR THE ACCESSIBILITY OF PUBLIC SPACES

The importance of public spaces for shaping people's lives in modern cities is due to their significant role in shaping residents' self-identity, sense of community, expansion of social contacts and mutual understanding. Public spaces in historic cities are characterised by an even deeper level of penetration into people's consciousness, a kind of bridge between the past and the present, a bearer of national cultural memory. The possibility of equal and barrier-free access to historical heritage is of paramount importance. At the same time, the historical authenticity of the preserved historical heritage, its authenticity, and the possibility of passing it on unchanged to our descendants are also extremely important. Architects and designers of public spaces in historical environments must act as mediators between three goals: preserving the authenticity of heritage, respecting human rights to access public spaces, and ensuring the vitality of historic city centres.

Over the last decade, the concept of accessibility of public spaces has expanded significantly. Previously, this concept was almost automatically equated with physical accessibility for people with disabilities and was associated exclusively with ramps, lifts, lowered kerbs, etc. Today, however, it covers a much broader range of requirements: informational, digital, socio-economic, cultural and security. International documents describe accessibility as a key condition for people to participate in community life: without an accessible environment, people can't "enter" public spaces — physically, informationally, or socially. This is how accessibility is interpreted, for example, in the document "EU Disability Strategy 2021-2030" [???], where accessibility is seen as an "enabler" — a prerequisite for inclusion in all areas of life. According to modern approaches, the accessibility of public space is the ability of a person to reach, understand and fully use the space and related services, regardless of their physical, cognitive, socio-economic or cultural characteristics. This refers not only to infrastructure, but also to policies, services and ways of organising urban life that can either include or exclude people.

For Ukraine, the issue of accessibility of public spaces is particularly acute. This is due to certain factors, such as the increase in the number of citizens with reduced mobility due to war injuries, the introduction of international standards for barrier-free spaces and requirements for public spaces and shelters. However, accessibility is not only the ability to physically or cognitively use a place, but also fair access to ways of shaping space — participation in design, planning, decision-making, and full communication with the community.

Let us take a closer look at the differences between the concepts of "accessibility" and "inclusiveness." These terms are often used together, sometimes as synonyms — "accessible and inclusive spaces". But there is a fundamental difference between them. **Accessibility** is more of a property of the environment, which does not create barriers and provides the opportunity to use space and services for people with different physical and cognitive characteristics. **Inclusiveness** is primarily a value and principle of organising space and interactions that guarantees the "inclusion" of people from different social groups in the common life of the city. Inclusiveness is a principle that guarantees access for all categories of citizens to urban spaces and services and their participation in public life.

Modern public spaces are created according to the principles of universal design. The overall goal of universal design is to create a space where the main element is the person, regardless of their age, gender, origin, social affiliation, physical and mental abilities. Such a human-centred space is the main task of universal design.

The seven principles of universal design were developed by architect Ronald Mace and his colleagues at the Center for Universal Design at North Carolina State University in the late 1990s. Ronald Mace was a pioneer of universal design who sought to create an environment accessible to all people, regardless of their age, abilities or health status. Seven basic principles of universal design were identified:

1. Equitable Use - design should be useful and accessible to people with different abilities.

2. Flexibility in Use - design should accommodate a wide range of individual preferences and abilities.
3. Simple and Intuitive Use - design should be easy to understand, regardless of the user's experience, knowledge or language skills.
4. Simple and Intuitive Use - Design should be easy to understand, regardless of the user's experience, knowledge, or language skills.
5. Tolerance for Error - the design should minimise the danger and negative consequences of accidental or unintentional actions.
6. Low Physical Effort - the design should be efficient and comfortable to use with minimal effort.
7. Size and Space for Approach and Use - the design should provide sufficient space for approach, reach, manipulation and use, regardless of the user's body size, position or mobility.

The implementation of inclusive design principles offers numerous benefits. Its use contributes to the overall accessibility of public spaces, which become suitable for use by everyone, including people with disabilities, older people and families with young children. Well-thought-out design also has a positive effect on a person's psychological and mental state, reducing anxiety and increasing the feeling of safety in a space, which is especially important for vulnerable groups. An inclusive environment promotes interaction between different social groups, strengthens community ties and reduces social isolation. In addition, it also contributes to the economic viability of public spaces, as inclusive spaces will be able to attract more visitors and tenants, contributing to their economic sustainability. Adaptability, environmental friendliness, convenience and safety in use will contribute to the longevity of their further operation without significant reconstruction.

In global practice, the inclusiveness and accessibility of public spaces is based on international universal design standards, in particular ISO 21542:2021 "Building construction — Accessibility and usability of the built environment" [40], which sets requirements for access to buildings, movement inside, safe evacuation, legible navigation (visual, tactile, audio) and comfortable use of space for the widest possible range of people — regardless of age, mobility or sensory limitations. These standards view accessibility not as a special solution "for specific groups," but as a basic quality of a sustainable, safe, socially inclusive urban environment that allows people to independently obtain services, navigate, participate in community life, and evacuate in case of an emergency.

In a broad sense, the accessibility of public spaces today includes both spatial and physical accessibility (barrier-free movement, convenient routes, the ability to reach all key areas of the space) and informational accessibility (the installation of understandable navigation systems, adapted forms of information presentation (in simple language and contrasting fonts, easy to read, audio duplication, etc.); socio-economic accessibility (reasonable cost of transport and services, opening hours that allow visits to attractions outside working hours, rules of use that do not exclude some residents); cultural and symbolic accessibility (creating a sense of security, hospitality, respect for different identities; absence of spatial and

visual practices that "block" certain groups (young people, homeless people, parents with children, etc.); procedural and political accessibility (opportunity to participate in decision-making through open hearings, participation in planning and transparent procedures). It is precisely this multidimensional approach that is gradually becoming the standard in contemporary urban planning and accessibility policy.

Current requirements for the inclusiveness and accessibility of public spaces in Ukraine are regulated by State Building Standards DBN V.2.2-40:2018 "Inclusiveness of buildings and structures. Basic Provisions," taking into account the latest official changes, in particular Amendment No. 2, approved by Order of the Ministry of Regional Development No. 1460 of 20 December 2024, which came into force on 1 May 2025 [40]. In addition to DBN, the requirements of regarding inclusiveness and accessibility are also based on national legislation (the Constitution of Ukraine [41], the Law on Social Protection of Persons with Disabilities [42], Law No. 4219-IX of 15 January 2025 (which improves mechanisms for the social protection and employment of persons with disabilities) [44]) and international documents (UN Convention on the Rights of Persons with Disabilities [45]). These standards are designed to ensure barrier-free access for people with reduced mobility, including persons with disabilities, persons with visual and hearing impairments, and other categories requiring special attention.

The accessibility and inclusiveness of public spaces in Ukraine is regulated by the current state building standards DBN V.2.2-40:2018 "Inclusiveness of buildings and structures. Basic provisions" (taking into account official changes, including Amendment No. 2, approved by order of the Ministry of Regional Development in December 2024) [41]. These standards are mandatory for the design and new construction, as well as for the reconstruction, restoration and major repairs of public buildings, structures and adjacent public spaces. Despite the title "inclusiveness of buildings and structures", Ukraine's state building standards actually enshrine accessibility requirements: accessibility of places of intended visit, unimpeded movement, safety of traffic routes, possibility of evacuation, etc. They require the provision of barrier-free routes, accessibility of services, tactile and visual navigation, safety of movement and "smart adaptation" of existing facilities to the needs of people with reduced mobility.

Regulatory documents in Ukraine are constantly being improved in line with the general policy of ensuring comprehensive inclusivity of spaces. In new construction, the basic principles of such universal design are laid down at the design stage. As for reconstruction, this process is much more difficult, since we are dealing with an already formed environment: streets, pavements, buildings, structures. Architects and designers are faced with the difficult task of adapting and rebuilding such an environment into a people-friendly space, creating the most equal conditions possible for its use by people with different abilities and needs.

The main requirements of such standards concern: the approval of an official orientation towards universal design (subordination of all processes and management to this strategy); the continuity of "accessibility chains" (accessible routes and coverage along all possible routes of movement); consideration of the interests of people with reduced mobility, visual/hearing impairments, and cognitive characteristics; universal recreational spaces (including playgrounds, sports and recreation areas); systematic navigation: (clear

pictograms, tactile diagrams/signs at key points; digital information — accessible according to the principles of plain language); hygiene issues (public toilets, cleaning); lighting, acoustics, microclimate; safety of evacuation routes for all users (visual/acoustic warnings, safe places to wait for evacuation, solutions for people who cannot use stairs).

The planning and implementation of architectural and planning solutions are regulated to ensure minimum accessibility standards. This includes: technical characteristics of barrier-free elements (ramps, lifts, passage widths, equipment for people with visual impairments, etc.); visual and tactile information aids (Braille, pictograms, tactile indicators); equipment for public spaces and public transport, taking into account the needs of people with reduced mobility (comfortable seats, toilets, accessibility of public transport for people with disabilities).

Functional requirements for the accessibility and convenience of the entire environment, including open urban spaces, are defined by European standard EN 17210:2021 [46], which is based on the principles of universal design (Design for All) and aims to ensure equal and safe conditions for use of the environment for a wide range of users, including persons with disabilities. This standard covers the design, construction, renovation and maintenance of buildings and urban spaces, including pedestrian areas and urban areas. Many European organisations, including the European Disability Forum (EDF) and the European Commission, participated in the development of this standard. EN 17210:2021 has been in force since 2021 and is a key document in the field of barrier-free architecture in the EU.

Detailed requirements for building elements: routes, entrances, ramps, controls, evacuation – are defined by ISO 21542:2021 [47] — an international standard covering the design, construction, management and maintenance of buildings to ensure equal access and usability for all categories of users, including persons with disabilities. The standard covers aspects of access to buildings, internal circulation, evacuation and building equipment, as well as characteristics of the external environment relating to access to the building. The two standards complement each other, with EN 17210:2021 [46] defines the main directions of development and sets functional requirements for the entire built environment, including public spaces, while ISO 21542:2021 [47] is a more detailed technical document that specifies the technical aspects of construction.

When constructing and renovating public spaces in Ukraine, DBN V.2.2-40:2018 "Inclusiveness of buildings and structures" (current; published amendments No. 2 of 2024) [40], which contains specific geometric parameters (widths, heights, turning areas, etc.). DBN V.2.2-40:2018 establishes comprehensive requirements for both the physical accessibility of facilities and the information and educational environment, ensuring universal design and equal rights for users to comfortably carry out activities in residential and public buildings and structures. The main accessibility parameters according to DBN V.2.2-40:2018 include: barrier-free access for people with reduced mobility (people with disabilities, the elderly, pregnant women, people with prams); requirements for building entrances: ramps with standard angles of inclination, handrails, door width; passageways and corridors with a width that ensures free movement, including for wheelchair users;

technical means of information: tactile indicators, Braille, audible and visual warning systems; ensuring the possibility of evacuation of people with reduced mobility in case of emergencies; organisation of interior spaces with consideration of spatial standards (size of bathrooms, toilets with facilities for persons with disabilities); contrast, lighting and colour schemes for ease of orientation; universal design that takes into account the individual needs of different users. These parameters are aimed at creating equal and safe conditions for all users of buildings and structures based on the principles of inclusiveness and universal design.

In general, Ukrainian building codes comply with international standards for inclusivity and accessibility of public spaces, but there are certain differences and clarifications. ISO 21542 has an international focus and a broader technical range of solutions, containing a broader and more detailed approach, while Ukrainian standards are focused on specific technical parameters in accordance with local characteristics. For example: according to ISO 21542:2021, the maximum permissible slope of a ramp is 8% (1:12), with the need to provide horizontal platforms after each rise and user safety requirements. According to DBN V.2.2-40:2018: for outdoor ramps, the slope should also not exceed 8%, but the maximum height of the rise is specified as 0.8 m. At greater heights, horizontal platforms with a depth of at least 1.5 m are required, or the ramp must be replaced with lifting devices. DBN V.2.2-40:2018 establishes a minimum width of 1.2 m for one-way traffic and 1.8 m for two-way traffic on ramps (Figs. 5, 6).

Regarding the surface of ramps, DBN and ISO 21542 regulate surface characteristics to ensure safety and comfort of movement (non-slip, rough surface with contrasting markings). The requirements for handrails and ramp sides have similar basic values for height, safety and tactility (handrail height - 0.9-1.1 m with safe surfaces, side height - 0.05 m (50 mm), rails must be visible (contrasting) and have rounded edges to reduce injuries), but ISO 21542 provides broader recommendations on contrast, continuity of handrails and safety of ends, which together create a more universal and inclusive approach.

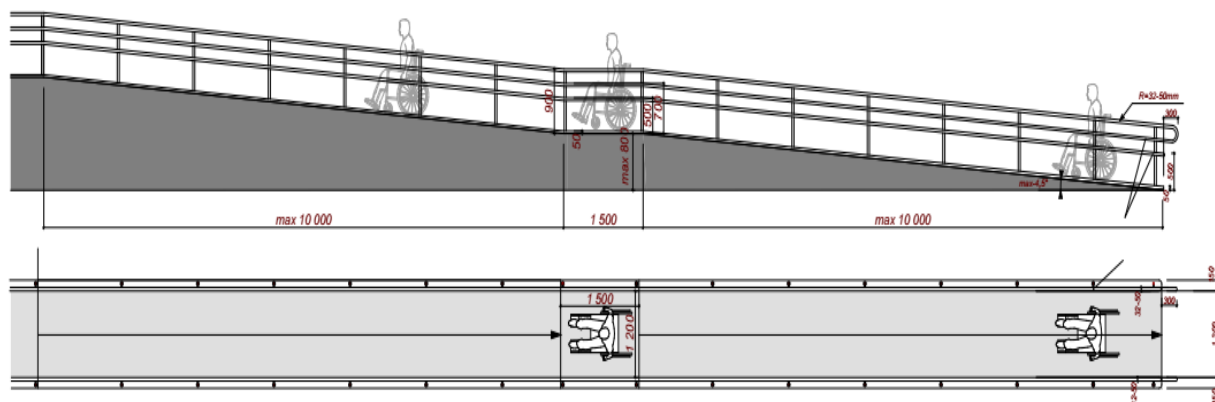


Fig. 5. Ramp solutions for movement in one direction. Author's diagram

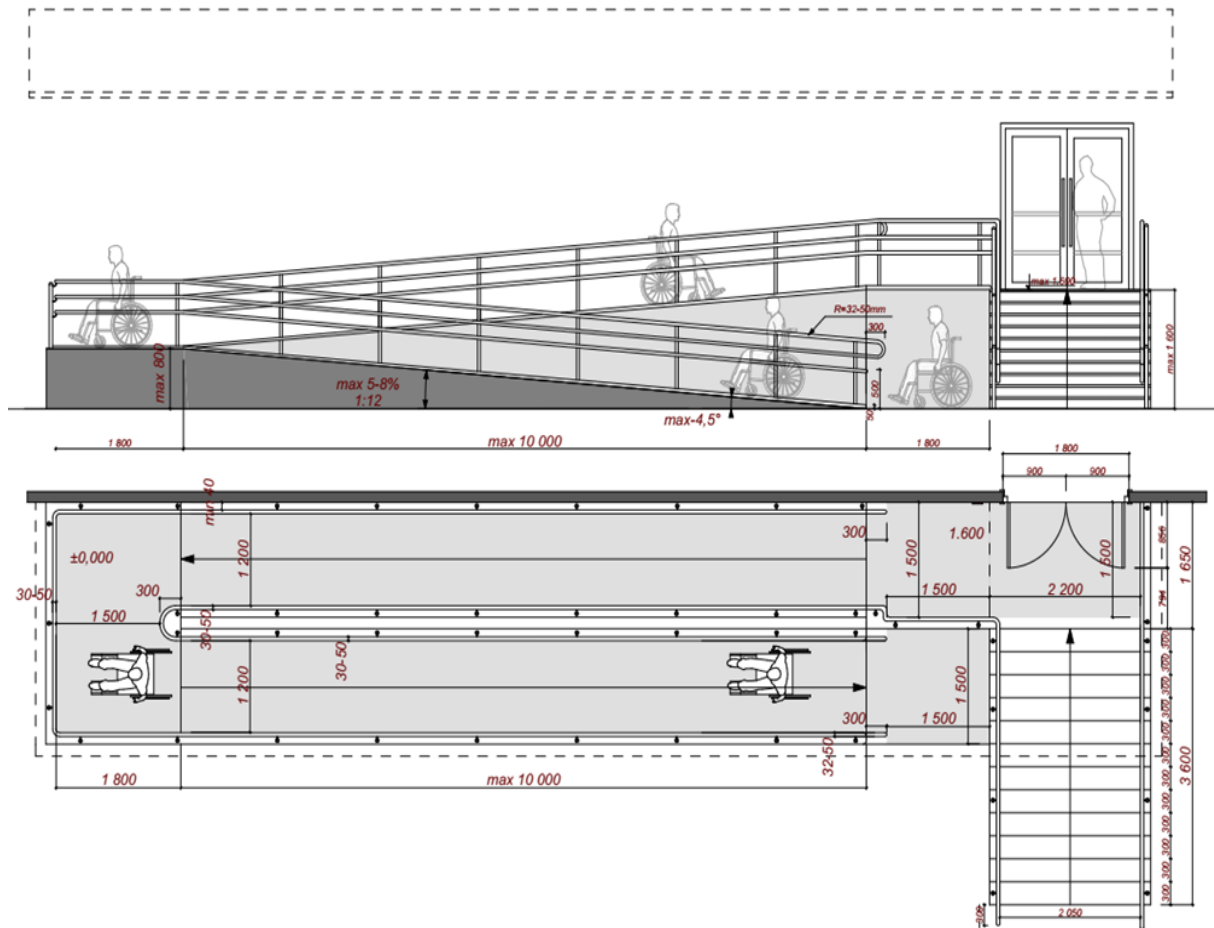


Fig. 6. Two-flight ramp solution. Author's diagram

The requirements for parking spaces for people with reduced mobility (PRM) are generally the same in DBN V.2.2-40:2018 and ISO 21542: they provide for a width of 3.5 m, placement next to building entrances, and equipment with tactile markers and appropriate markings. However, ISO 21542 regulates facilities for different user groups in more detail, especially in the context of safety and tactile markers, while Ukrainian standards focus on specific indicators regarding quantity and location (Fig. 7, Fig. 8).

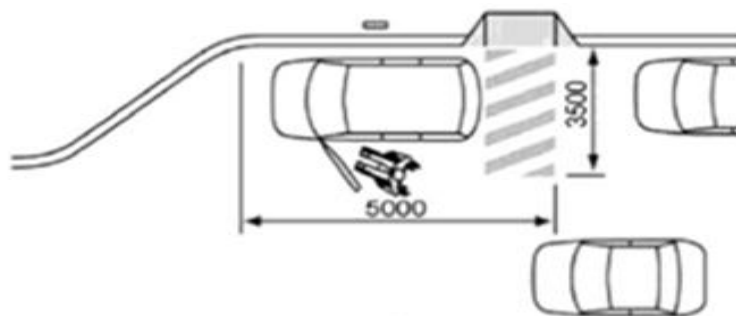


Fig. 7. Parking space for cars of people with disabilities. DBN V.2.2-40:2018 (as amended)

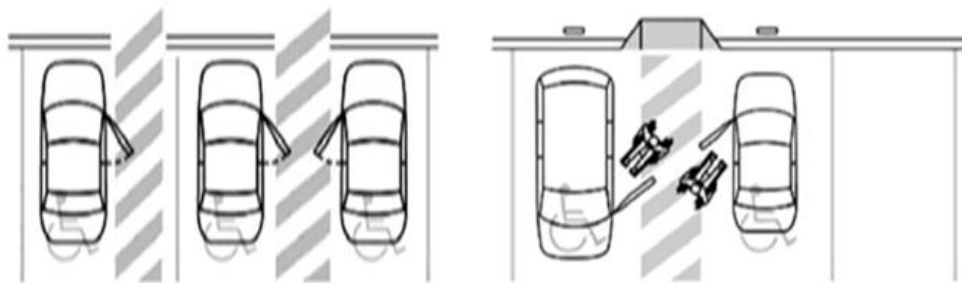


Fig. 8. Organisation of parking spaces for people with disabilities. DBN V.2.2-40:2018 (with amendments)

The minimum dimensions of a space for a wheelchair according to DBN V.2.2-40:2018 and ISO 21542 differ slightly. According to DBN: the minimum width of a space for a wheelchair is 0.9 m, and its minimum length is 1.5 m. At the same time, according to ISO 21542, the area of influence of a wheelchair is 0.8 m (width) and 1.3 m (length). The parameters for wheelchair movement are generally the same: for turns, the following areas are provided: 90° — 1.3×1.3 m, 180° — 1.3×1.5 m, 360° — 1.5×1.5 m. (Fig. 9, Fig. 10), although ISO 21542 provides broader recommendations for different types of wheelchairs and users, and also combines these parameters with the technical conditions of universal design.

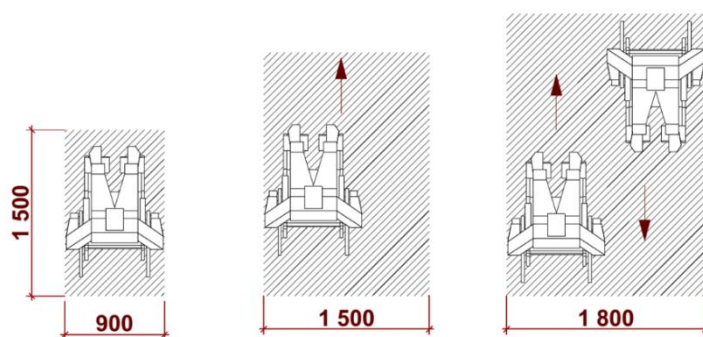


Fig. 9. Dimensions of a wheelchair for people with disabilities. DBN V.2.2-40:2018. Author's diagram

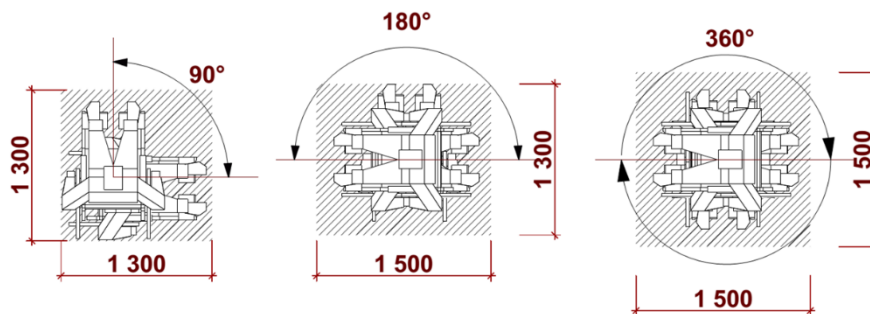


Fig. 10. Wheelchair turning and turning areas. DBN V.2.2-40:2018. Author's diagram

Both standards aim to create the most accessible, comfortable and safe bathrooms in public spaces, taking into account the principles of universal design and full user inclusivity. The requirements for public bathrooms according to DBN V.2.2-40:2018 and ISO 21542 have the following main characteristics: ensuring barrier-free access for people with reduced mobility (PRM), including a sufficiently wide door (at least 90 cm) for a wheelchair to pass through; the dimensions of the toilets must allow for wheelchair manoeuvring inside the room, with a minimum turning radius of 1.5 m; equipping toilets with handrails on both sides for additional support, placed at a height of 0.85–0.95 m; install sanitary equipment at an accessible height and convenient for use; provide tactile, visual and audible information for people with visual and hearing impairments; the floor should be non-slip and have a contrasting colour scheme; take into account the needs of people with different types of disabilities so that bathrooms are as universal as possible (Fig. 11). ISO 21542 further emphasises the importance of ergonomics, ease of use of all elements and the ability to use the bathroom independently without assistance, as well as recommendations for universal signalling and marking of bathrooms.

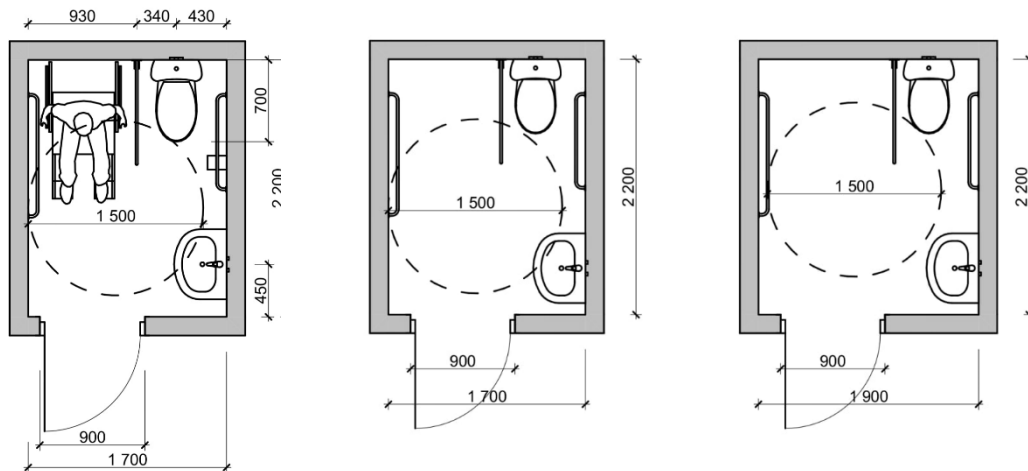


Fig. 11. Universal sanitary facilities. DBN V.2.2-40:2018 Author's diagram

All of the requirements described relate specifically to physical accessibility parameters. At the same time, according to DBN V.2.2-40:2018 and modern international approaches, the inclusiveness of public spaces is considered not only as physical accessibility, but as a comprehensive approach that includes ensuring equal rights and opportunities for all categories of users, including people with disabilities, the elderly, parents with children, etc. It is also envisaged to develop a spatial organisation that promotes social interaction and the inclusion of different social groups, and to implement the principles of universal design that takes into account the sensory, cognitive, motor and communicative characteristics of users. Attention is paid to providing comfortable conditions for orientation in space, using visual, tactile and audio information, and organising safe and convenient routes for movement, taking into account different needs.

To ensure the inclusiveness of the public environment, the use of support technologies, inclusive navigation and information, and minimisation of barriers to access to cultural, social, educational, commercial and recreational infrastructure is envisaged. DBN V.2.2-40:2018 specifically regulates the need for unified standards and requirements to implement these principles in the design of buildings and public spaces. In general, modern requirements emphasise that inclusiveness is a way to make public spaces comfortable, safe and welcoming for everyone without exception, going beyond purely physical accessibility parameters.

2.2. BARRIERS THAT LIMIT THE ACCESSIBILITY OF PUBLIC SPACES IN HISTORICAL CITIES

The inclusiveness of public spaces in historic cities is now seen not as an "added comfort" but as a basic condition for the realisation of human rights. The UN Convention on the Rights of Persons with Disabilities emphasises that accessibility is a prerequisite for independent living and full participation in society on an equal basis with others. International studies emphasise that architectural barriers in historic environments significantly limit the participation of people with disabilities and other groups with reduced mobility in the cultural and social life of cities.

This issue is particularly relevant for Ukraine in view of the European integration processes, which require the implementation of international accessibility standards, the updating of national regulations, in particular DBN V.2.2-40:2018 "Inclusiveness of buildings and structures" [41], and the introduction of a national accessibility strategy. In Ukraine, a significant proportion of historic cities are characterised by valuable buildings and cultural heritage sites. At the same time, it is in historic centres that barriers are most acute: physical limitations of old buildings, complex terrain, conflicts between heritage protection and the need for modernisation, financial and managerial constraints. This makes the issue of barriers that limit the inclusiveness of public spaces in historic cities a key one for contemporary urban planning and architectural practice.

An inclusive public space is a space in which the physical environment, information, services and social practices are organised in such a way that every person, regardless of age, health, mobility, sensory or cognitive characteristics, can safely and dignifiedly stay, move around, orientate themselves and participate in the life of the community. Historic cities have a number of features that shape their value, but at the same time often pose a problem for inclusiveness. These include irregular planning structures, narrow streets, dense buildings, relief differences, cobblestones, stairs, arches, passageways, and a significant number of protected architectural monuments. In historical environments, there are strict restrictions on interference with the appearance and construction of heritage sites. Through its Historic Urban Landscape (HUL) Recommendation, UNESCO emphasises the need to balance the preservation of authenticity with the needs of sustainable development and local communities. It is at this point of "balance" that numerous barriers are concentrated.

In order to identify the main barriers to the inclusiveness of historic public spaces, a questionnaire was

developed for different segments of the population of Ukrainian cities, for district and city administrations, and separately for the most vulnerable categories of visitors (people with disabilities, parents with small children, etc.). (See Appendix 1). The surveys and observations showed that there are a large number of barriers that differ significantly. These barriers can be divided into those that hinder the inclusiveness of public spaces (mostly physical barriers) and those that hinder the accessibility of public spaces in general. In this section, we will focus specifically on barriers to the inclusiveness of public spaces in historic cities.

Physical and spatial barriers are the most visible group of barriers, directly related to a person's ability to physically enter certain spaces, move around there and use them without hindrance. Such barriers include: vertical differences in height and stairs without alternatives (stairs to temples, town halls, museums, administrative buildings located in historic buildings, steep terrain (Fig. 12, Fig. 13)); high kerbs, thresholds in doorways; narrow passages, arches, doorways; problems with two-way traffic (historical dimensions do not meet modern requirements for the width of traffic lanes for people with mobility impairments and wheelchair users). (Fig. 14). In addition, physical barriers also include uneven, slippery, injury-prone surfaces (paving stones with large joints, uneven blocks, slopes; smooth pavements that become slippery in rain or snow; paving stones with large joints, uneven blocks, slopes; lack of anti-slip measures in areas of heavy traffic) (Fig. 14).

For people with visual impairments, insufficient tactile and visual structuring of space can be a significant barrier: the absence of tactile tiles, visual contrasts on stairs, crossings, platform edges; the chaotic location of small architectural forms, summer terraces, and parking, which turns the pavement into a continuous "obstacle course". There are also issues of transport accessibility, in particular the lack of barrier-free connections between public spaces and public transport stops; the low level of adaptation of the transport itself (lack of lifts, low floors in public transport, visual and audio announcements). Modern historical spaces often provide insufficiently adapted information for people with visual and hearing impairments: Braille is almost completely absent from signs, plaques, museums and public buildings; sign language interpretation and subtitling are rarely used.

At the same time, there are a number of socio-cultural barriers related to the inclusiveness of public spaces, which are less visible but very influential. They are linked to certain attitudes, stereotypes and practices in society. Tourist appeal often becomes a priority.

Commercialisation of space, car-oriented design. Sometimes accessibility is seen as an extra option rather than a basic requirement for quality space. Spaces are formally declared inclusive, but the community and users themselves aren't involved in the discussion, and design decisions are made without consulting organisations for people with disabilities and community initiatives. Sometimes there may be talk of the "inappropriateness" of inclusive solutions in a historical environment (for example, fears that ramps, lifts or tactile elements will "spoil the appearance" of historical buildings; the perception of accessibility as a threat to authenticity rather than as a tool for actualising heritage).



Fig. 12. The historic town of Gubbio (Italy). The steep terrain makes it difficult for people with reduced mobility to get around. Hidden lifts located at different levels of the mountainous terrain could be a solution. (Larysa Bridnya, 2015)



Fig. 13. The historic city of Matera (Italy). High entrances to temples and historical monuments. A solution could be the smooth terracing of the square in front of historic buildings and the installation of alternative entrances using ramps and lifts. (Larysa Bridnia, 2019)



Fig. 14. The historic city of Odessa (Ukraine). Obstacles to movement: high kerbs, narrow pavements, obstacles in the form of trees, posts on pedestrian walkways, uneven or slippery surfaces. (Larysa Bridnia, 2025)

To a certain extent, these concerns are indeed justified: society's historical responsibility to pass on the cultural heritage of the past to future generations requires maximum preservation of its integrity and authenticity, which often conflicts with the need to create unhindered access to such monuments for all segments of the population without exception. Architects, designers and administrators face the difficult task of finding solutions that would not harm the authenticity of historical heritage or spoil its visual perception, but at the same time would significantly expand the range of its use and provide access to it for people with disabilities, parents with small children, the elderly and other vulnerable groups.

Economic factors are often used as an argument against the rapid and comprehensive adaptation of historic public spaces. Indeed, such adaptation of spaces involves fairly high construction costs and the need for individual, technically complex solutions (installation of ramps, lifts, internal elevators, adaptation of entrances). There is often a need to use expensive specialised materials and technologies that do not compromise the authenticity of historic spaces. The limited financial resources of local communities and building owners cause some resistance to the implementation of measures to ensure inclusiveness. For private owners of historic buildings (cafes, shops, hotels), inclusivity often seems like a "costly burden" rather than an investment in the quality of the space. For municipalities, "quick" visible projects often take priority over systemic barrier-free transformations. At the same time, studies show that the correct application of appropriate measures is a significant factor in community development and attracting a wider range of users,

which in turn ultimately also ensures economic growth.

One of the key barriers is the perception of authenticity and accessibility as mutually exclusive values. From a heritage conservation perspective, any intervention in facades, staircases, stone pavements, and historic entrances can be seen as a threat to historical value. From the point of view of human rights and inclusiveness, the absence of such interventions deprives a significant part of the population of the opportunity to use this space. The Historic Urban Landscape approach proposed by UNESCO suggests viewing the historic city as a living organism in which heritage protection must be combined with sustainable development and the needs of local communities. This opens up opportunities for delicate but effective engineering solutions (hidden lifts, integrated ramps, platform lifts); the use of modern materials and technologies that minimally alter the visual perception; and the development of special recommendations and "catalogues of solutions" specifically for historic sites. However, until these opportunities are transformed into widespread practice, conflict remains a significant barrier to an inclusive historical urban environment.

The combination of the barriers described above means that people with disabilities, older people, parents with prams, and people with temporary health impairments are effectively excluded from full use of central historical spaces; cultural heritage becomes a closed resource for a significant part of society; social inequality and segregation are exacerbated: the city centre, as a key public space, is only accessible to the "relatively healthy" part of the population; the state's international obligations to ensure accessibility, as enshrined in the UN Convention on the Rights of Persons with Disabilities and other documents, are violated. Thus, barriers to inclusiveness in historic public spaces are not only a technical or aesthetic problem, but also a matter of human rights, social justice and a modern understanding of the role of urban heritage. Overcoming these barriers requires a comprehensive approach: updating the regulatory framework to take into account historical environments, developing engineering solutions, changing management practices, involving communities and organisations of persons with disabilities in planning, and recognising inclusiveness as a key value of the modern city.

2.3. METHODOLOGY AND EFFECTIVE PRACTICES FOR ENSURING THE ACCESSIBILITY OF HERITAGE SITES IN HISTORICAL CITIES

2.3.1. METHODS FOR ENSURING THE ACCESSIBILITY OF PUBLIC SPACES IN HISTORICAL CITIES

Universal design is not based on average norms and hypothetical users, but on the full range of physical, sensory and cognitive characteristics of human beings. This implies intuitiveness, ergonomics, simplicity and flexibility of use for any person, regardless of age, physical or cognitive characteristics. Formal compliance with building codes is not enough to create a truly barrier-free environment. Standards only outline a general framework, but effective solutions must take into account the specific needs of users and

the context of the object and require a flexible, thoughtful approach. A thoughtful and contextual approach allows standards to be transformed into effective tools for inclusion. An important part of mastering universal design is analysing and modelling situations in which its principles are translated from theory into spatial and organisational solutions.

In European practice in historic cities, several key approaches can be identified to ensure inclusive use: creating barrier-free "key" routes in historic centres; creating "minimally invasive" interventions in historic sites (using solutions that do not destroy authenticity but add accessibility); combination of permanent and temporary solutions. It is not always realistic to make everything accessible at once, so, first of all, the main barrier-free routes are planned: from train stations and transport stops to main squares, museums, cathedrals, and parks. For such routes, a continuous pedestrian level without high kerbs is provided; lowered crossings, safety islands; minimal ramp slopes, rounded thresholds; tactile and visual markings (Fig. 15, Fig. 16). For historic public spaces, solutions are used that do not destroy the historical integrity but ensure inclusive access: hidden platform lifts in temple portals; ramps integrated into existing stairs (with partial preservation of stone); transparent or light metal structures that are perceived as modern additions rather than "historical fakes" (Fig. 17).

A separate technique can be considered the reconstruction of coverings without losing the image: instead of completely replacing the historic paving, it is planned to re-lay it, grind it, and combine materials, which allows the visual structure to be preserved but creates smoother, less vibrating surfaces. In some cases, strips of smoother material are added to create paths for wheelchairs. Historic cities often use temporary ramps (wooden, metal) for seasonal events, festivals, fairs, when the flow of people increases and major changes are difficult to agree upon. In addition, such lightweight, "non-invasive" additions can be provided to enable visits to historical sites (Fig. 18, Fig. 19, Fig. 20).

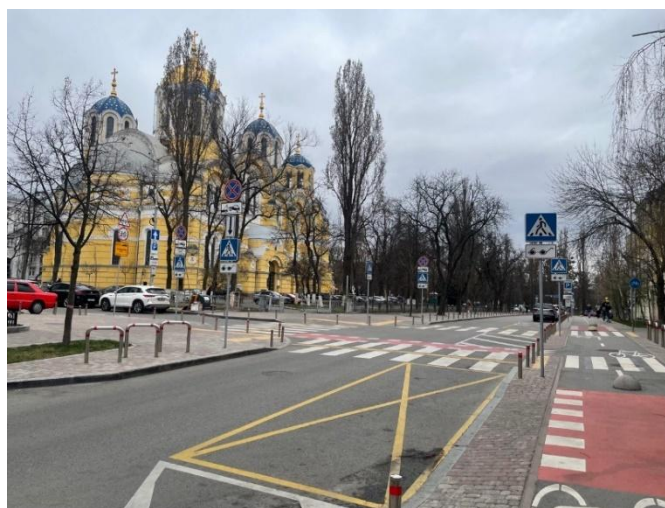


Fig. 15. Kyiv (Ukraine) Continuous pedestrian level without high kerbs on the way to the historical monument – St. Vladimir's Cathedral (Larysa Bridnia, 2025)



Fig. 16. Rome (Italy). Tiburtino bus station. Tactile and visual route markings (Tetiana Kashchenko, 2025)



Fig. 17. Warsaw (Poland). Warsaw University. Entrance to the Institute of International Law (Larysa Bridnia, 2025)

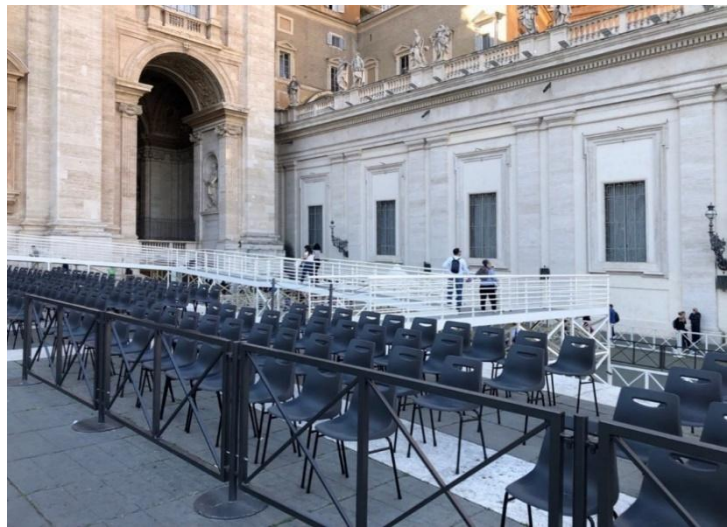


Fig. 18. Vatican City. Square in front of St. Peter's Basilica (Tetyana Kashchenko, 2025)



Fig. 19. Rome (Italy). Sightseeing routes among historical excavations (Tetyana Kashchenko, 2025)

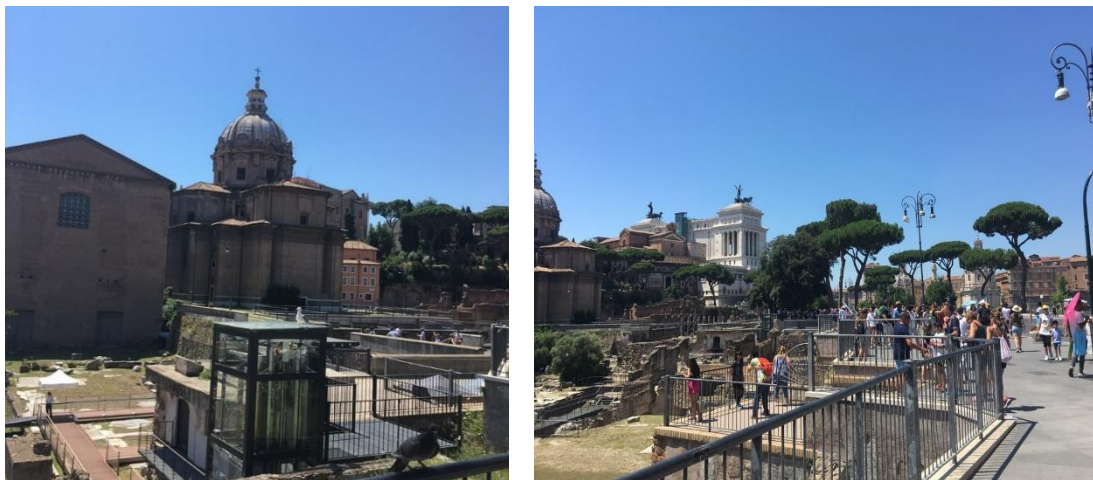


Fig. 20. Rome (Italy). Roman Forum. Sightseeing routes, lifts, ramps (Tetyana Kashchenko, 2025)

Technical means (lifts, elevators, funiculars) also help to address the issue of inclusiveness in historical public spaces (Figs. 21, 22, 23, 24).



Fig. 21. Paris (France). Public lifts in the historic centre (Larysa Bridnia, 2023)



Fig. 22. Milan (Italy). Public lifts in public spaces (Larysa Bridnia, 2019)



Fig. 23. Lisbon (Portugal). Historic public lift in the city centre. Santa Justa Lift (Elevador de Santa Justa) (Photo from open sources)



Fig. 24. Kyiv (Ukraine). Funicular connecting the Upper Town and Podil. (Photo from open sources)

In some cases, full accessibility is not achieved, but solutions are used that significantly facilitate the use of public spaces (low, smooth stairs; ramps that allow wheelchairs to be moved with the help of accompanying persons (Fig. 25), etc.).

Another important component is providing people with special needs with universal public toilets located in historic centres (Fig. 26, Fig. 27) and creating inclusive playgrounds (Fig. 28).

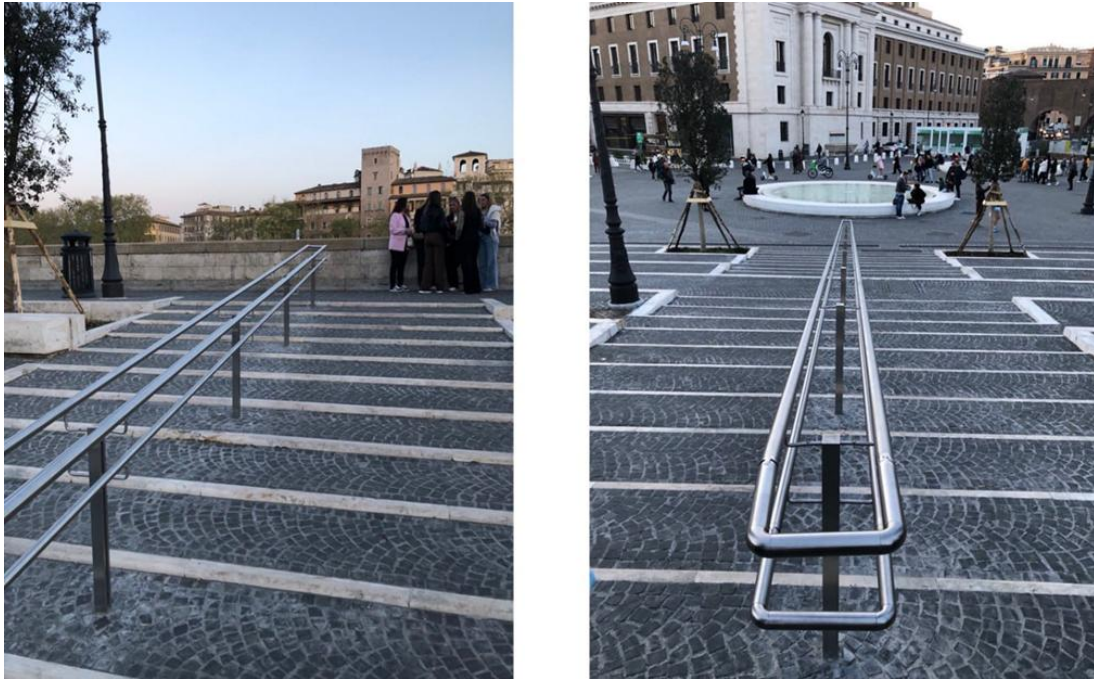


Fig. 25. Milan (Italy). Public lifts in public spaces (Larysa Bridnia, 2025)



Fig. 26. Kyiv (Ukraine). Universal public toilet on Mykhailivska Square. (Larysa Bridnia, 2025)



Fig. 27. Paris (France). Universal public toilet (Larysa Bridnia, 2025)



Fig. 28. Odessa (Ukraine). Universal playground (Larysa Bridnia, 2025)

Let us consider some examples of comprehensive solutions to the issue of inclusivity in public spaces, using specific historical cities and sites as examples.

2.3.2. EFFECTIVE PRACTICES FOR ENSURING THE ACCESSIBILITY OF PUBLIC SPACES IN HISTORICAL CITIES: THE EXAMPLE OF IASI (ROMANIA)

In modern urban studies, inclusion is central because it determines the quality of interaction between people and the environment in which they live. As a multifunctional social organism, a city cannot develop sustainably without taking into account the needs of all population groups, regardless of their social, ethnic, cultural or physical characteristics. The principle of inclusion involves creating conditions in public spaces that ensure equal access and the opportunity for every resident and visitor to participate fully in urban life.

Inclusion is particularly important in historic cities, as they are bearers of cultural memory and at the same time have to adapt to modern challenges. An example of such a city is Iasi, one of the oldest and most important cultural centres in Romania, which combines a rich historical and architectural heritage with the intensive development of public spaces. Today, Iasi is considered not only a university and spiritual centre, but also a model city that integrates various types of inclusion into its environment.

The aim of this study is to reveal the significance of inclusion in the public space of the historic city of Iași, taking into account its typology and impact on contemporary urban development. The task is to define the theoretical foundations of an inclusive approach, analyse its practical implementation in the urban environment, and compare it with pan-European trends.

It is important to note that inclusion in urban space is part of European urban policy. Documents from the Council of Europe and UNESCO emphasise the importance of cultural diversity and accessibility as key factors for sustainable development. In particular, the European Charter of Cities (1992) defines public spaces as key centres of social integration, and UNESCO's Creative Cities programme emphasises the need to engage cultural resources to create an inclusive environment.

Thus, the theoretical foundations of inclusion combine social, spatial and cultural aspects, allowing it to be considered a strategic principle for the development of historic cities, including Iasi.

The inclusiveness of public spaces in Iasi was largely due to religious diversity. The city has preserved many temples and religious buildings: Orthodox monasteries, Catholic churches, Armenian churches, and synagogues. Each of the religious communities not only built their own shrines, but also took an active part in shaping the urban space through educational, charitable, and cultural institutions.

This created a multi-layered environment where the cultural heritage of different peoples became an integral part of urban life. Within the city, religious centres served as a kind of "communication hub" where residents interacted regardless of their origin. This tradition laid the foundation for the modern understanding of inclusion as a principle of coexistence.

The historic squares, parks and boulevards of Iași have a long tradition of serving as inclusive spaces (Fig. 2.3.15). Piața Unirii, for example, has been a venue for fairs, celebrations and mass events for centuries. It was a place of interaction between different social groups, emphasising the openness of urban space.

Copou Gardens, one of Romania's oldest parks, has been a symbol of social inclusion since the 18th century, serving as a space for walks, relaxation and cultural gatherings. The existence of such facilities shows that inclusion in Iași is not just a modern trend, but has deep historical roots.

The combination of ethnic diversity, religious diversity and educational initiatives has contributed to the formation of a tradition of tolerance in Iași. The city's public spaces gradually became places where not only social needs were met, but also the principles of equality and mutual respect took root. It is this tradition that has become an important foundation for the city's modern inclusive development.

Social inclusion in public spaces involves creating conditions for the equal participation of different social groups in city life. This refers not only to physical presence in certain spaces, but also to the opportunity for interaction, exchange of experience, communication and cultural enrichment. In contemporary studies of urban spaces, social inclusion is seen as a factor in reducing social inequality and forming a common identity among city residents.

Social inclusion in Iași is actively implemented through cultural events. Every year, dozens of festivals are held in the city, among which *the Festival of Light (Festivalul Luminii)* occupies a special place, uniting residents in a symbolic act of togetherness. Another important event is *the International Literature and Translation Festival (FILIT Iași)*, which attracts participants from all over the world and creates an atmosphere of intellectual dialogue. Such events promote interaction between different social groups and give new meaning to public spaces. Festivals transform squares, parks and streets into open spaces for shared activities, which is a hallmark of an inclusive urban environment.

Cultural and ethnic inclusion in Iași has deep historical roots. For centuries, the city has been known as a centre where numerous ethnic and religious communities coexisted. Romanians, Jews, Armenians, Greeks and other communities have shaped the city's unique image, bringing their own cultural practices, traditions and symbols to it. As a result, Iași has become a "crossroads city" where public spaces reflect diversity and serve as a place of cultural interaction.

The cultural heritage of national minorities is actively integrated into the public environment of Iași. Preserved Jewish synagogues, Armenian and Greek churches, memorials and cultural centres not only have historical value, but also serve as spaces for contemporary inclusion. They are open to visitors, serve as platforms for dialogue and remind us of the tradition of multinationalism.

One example is the Great Synagogue of Iași, which is the oldest in Romania and today serves not only a religious but also a cultural and educational function. Such sites form the "inclusive topography" of the city, where cultural memory is transformed into contemporary practices of interaction.

Spatial and physical inclusion in the urban environment is based on the principles of *universal design*, which ensures the accessibility of urban spaces for all population groups, including people with disabilities, people with reduced mobility, parents with children, and the elderly. This concept includes not only technical solutions (ramps, lifts, tactile systems) but also a comprehensive approach to the organisation of space that

takes into account various scenarios for its use (Figs. 29, 30, 31).

For historic cities such as Iasi, spatial and physical inclusion is particularly important, as it is necessary to combine the preservation of authentic architecture with modern accessibility requirements.



Fig. 29. Iași (Romania). Urban spaces. Smooth solution to the city's relief. (Marina Omelianenko, 2025)

The central part of Iasi, which includes the Palace of Culture, Unirii Square and the streets of the historic quarter, is an example of the gradual integration of barrier-free solutions. The city has implemented:

- installation of *ramps and lowered kerbs* at intersections;
- installation of *tactile paving systems* for people with visual impairments;
- *modernisation of pedestrian areas* to meet the needs of people with reduced mobility.

A distinctive feature of Iasi is its desire to preserve the aesthetic value of historic streets, combining authentic paving and architectural elements with new accessible infrastructure solutions.

An important aspect of spatial inclusion is the organisation of mobility. Public transport in Iasi is gradually being modernised: low-floor buses and trams are appearing, and stops with shelters and information boards are being installed. This creates more convenient conditions for people with disabilities and elderly residents to use transport.

The development of cycling infrastructure, walking routes and parking facilities also contributes to greater mobility, which is an important element of physical inclusion.

The principles of accessibility are being actively implemented in parks and recreation areas in Yassiv. For

example, in Kopou Gardens, pedestrian routes have been modernised to allow people in wheelchairs to move around freely. The botanical garden has convenient stairs with handrails and viewing platforms for different categories of visitors. Thus, the green spaces of Iasi serve not only for recreation but also for social inclusion, ensuring accessibility for all age and physical groups of the population.

Despite significant progress, issues of spatial and physical inclusion in Iasi remain relevant. Among the main challenges are the adaptation of narrow historic streets and buildings that were constructed without taking into account the needs of people with limited mobility. At the same time, the city is demonstrating a commitment to the gradual integration of inclusive practices into public spaces, in line with European urban planning trends.



Fig. 30. Iași (Romania). Lifts at the entrance staircases. (Marina Omelianenko, 2025)



Fig. 31. Iasi (Romania). Lifts on the descents into underground passages. (Marina Omelianenko, 2025)



Fig. 32. Iasi (Romania). Information signs. (Marina Omelianenko, 2025)

Educational inclusion is manifested in public lectures, exhibitions, and science fairs held in open spaces of the city – in squares, parks, and near the Palace of Culture. Such initiatives provide access to knowledge for broad segments of the population, regardless of their level of education or social status. Public spaces in Iasi take into account the needs of different age groups. Sports and recreation areas are created for young people, while quiet parks, benches and convenient walking routes are provided for the elderly. The multifunctional nature of the spaces is important, as it allows different generations to interact in a shared environment.

Iasi's experience can serve as an example for other historic cities in Eastern Europe that seek to combine cultural heritage with the requirements of modern inclusion. The development of barrier-free spaces and creative innovation zones is particularly promising.

Inclusion in the public spaces of the historic city of Iasi is a multifaceted process that encompasses social, cultural, spatial-physical, educational, and gender-age dimensions. The city demonstrates successful examples of integrating different population groups into a shared space:

- squares and parks act as social integrators;
- cultural and ethnic symbols shape an environment of tolerance;
- infrastructure solutions ensure accessibility for all;
- the university environment and creative hubs promote innovative inclusion;
- attention to the needs of different generations and gender groups strengthens social cohesion.

Thus, Iasi can be seen as an example of a historic city that harmoniously combines heritage and modernity, creating an inclusive environment for all residents and visitors. This proves that inclusion is a key factor in preserving the viability and attractiveness of historic urban spaces in the 21st century.

2.3.3. THE PRACTICE OF INVOLVING STUDENT VOLUNTEERS TO ENSURE THE ACCESSIBILITY OF PUBLIC SERVICE FACILITIES IN THE CITY OF KYIV (UKRAINE)

The example below is an educational project carried out among interested student volunteers who sought to investigate the accessibility of service establishments (bank branches) for people with special needs. The experiment was based on an audit of the spatial environment of one of the branches of Ukrgasbank in Kyiv. Barriers were identified and practical recommendations were developed covering physical accessibility from the outside, the information environment, services and digital interaction. At the time of the survey, the entrance area of the Ukrgasbank branch did not meet the accessibility criteria in accordance with DBN V.2.2-40:2018. Access to the premises was only possible via a staircase, without a ramp as the main means of access. The only alternative was a vertical lift, the technical design of which did not ensure safe operation or the possibility of independent use by persons with musculoskeletal disorders. (Fig. 33). The lift design was potentially dangerous: the moving parts of the guardrail rose vertically and could trap a person's hand. The controls had no tactile or contrasting markings, and there were no warning visual signals.

The route to the entrance did not contain tactile landmarks or guide strips, the stairs were not marked with contrasting colours, and the handrails did not meet regulatory requirements: they were too short, without horizontal extensions or duplicates at the lower level. The entrance doors have fittings that are difficult to use for , are not automated, and cannot be opened easily from a seated position.

Thus, the entrance area did not provide conditions for independent and safe access and required a comprehensive redesign in accordance with the principles of universal design.

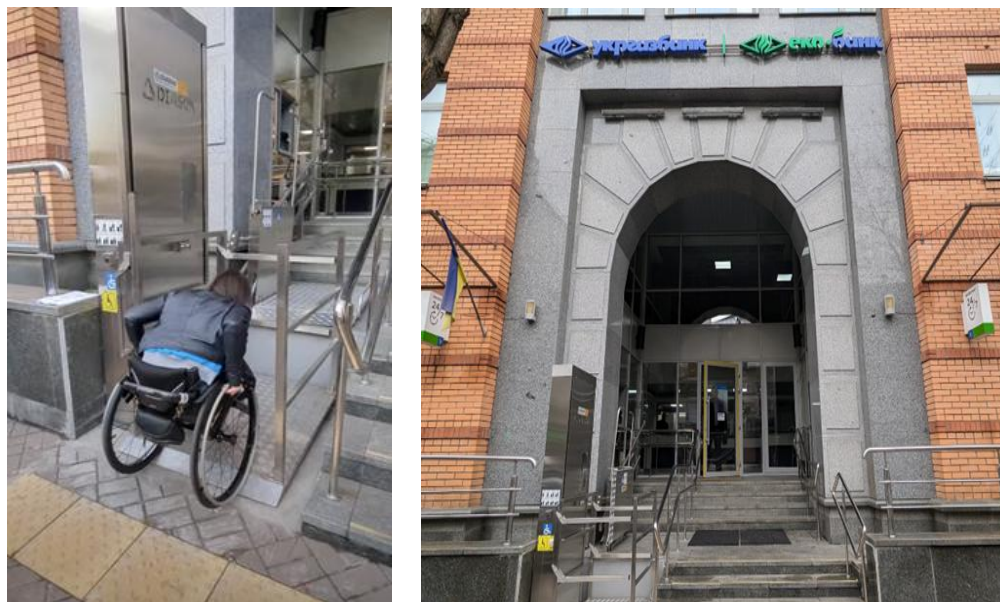


Fig. 33. Kyiv (Ukraine). Ukgasbank building. Entrance area. (Mykhailo Kinayluk, 2024)

A group of volunteers developed a plan to modernise the entrance area of the Ukgasbank branch, as well as some of the rooms inside. The proposed modernisation model provided for a comprehensive improvement of accessibility in terms of spatial organisation, service interaction, information environment, content and digital infrastructure. The approach was based on the principles of universal design, with an emphasis not only on compliance with standards but also on functional efficiency.

It was planned to redesign the entrance area with the installation of a ramp in accordance with DBN V.2.2-40:2018: with a reduced slope, intermediate horizontal platforms, double handrails (including on the lower level), contrasting visualisation and tactile marking of the beginning/end of the steps. It was proposed to retrofit the doors with automatic closers and accessible fittings. (Fig. 34). The project provides for the implementation of a unified visual navigation system in accordance with the principles of universal design and the provisions of DSTU ISO 21542:2021. In particular, navigation elements are duplicated in text, graphic and tactile formats, adapted for users with visual impairments and cognitive information processing difficulties. Signs and plaques with zone names use sans serif fonts, sufficient line spacing, contrast (minimum 70%) and Braille duplication. They are placed at a height of 1200–1400 mm from the floor, in compliance with the requirements for readability from a seated position (Fig. 35). Inclusive practice involves not only adapting the physical environment, but also transforming service interaction. As part of the project, a communication model was developed that focuses on the needs of users with different types of impairments — sensory, cognitive, motor, or combined.

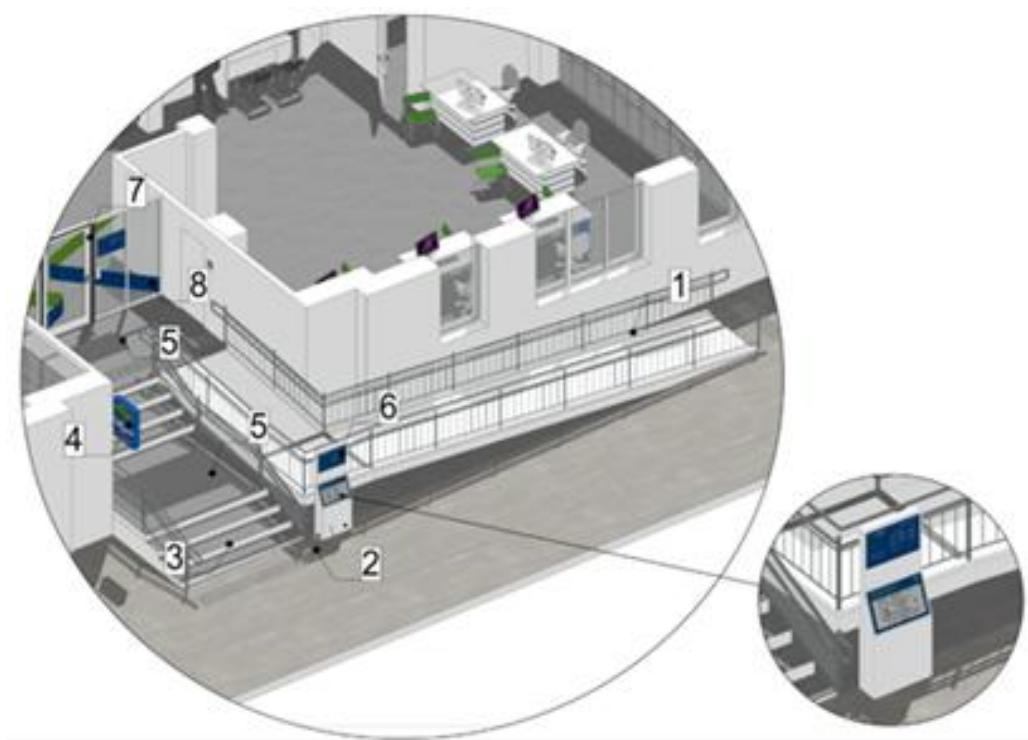


Fig. 34. Kyiv (Ukraine). Ukrgasbank building. Entrance area. Adaptation project (Authoring team of the volunteer group. Participant: Mykhailo Kinayluk, 2024)

1. Ramp instead of lifts. 2. Warning tactile strip. 3. Stairs with risers of a different colour. 4. Sign with the bank's logo. 5. The dirt-proof grate serves as a tactile strip. 6. Stand with the work schedule and mnemonic diagram. 7. Entrance swing doors with automatic opening function. 8. Marking of the transparent facade.



Fig. 34. Kyiv (Ukraine). Ukrgasbank building. Entrance area. Visual and navigation information project. (Authoring team of the volunteer group. Participant: Mykhailo Kinayluk, 2024)

The emphasis is on creating a tolerant service environment that takes into account the principles of dignity, privacy and autonomy. In addition, the staff received algorithms from the project participants for accompanying clients within the banking space, taking into account their needs for support, guidance, non-verbal interaction or ensuring a comfortable pace of service. The focus was primarily on the transition from "assistance etiquette" to the creation of a psychologically safe service environment that takes into account the customer's need for independence, dignity, and privacy.

An important aspect of bank accessibility is the ability to use ATMs for customers with various impairments — vision, motor skills, cognitive perception, and spatial orientation. Taking into account the principles of the ADA and the requirements of the DBN, it was envisaged to lower the height of the screen to a level accessible from a wheelchair, to use a contrasting keyboard with raised markings and Braille, and to introduce voice guidance with the option of connecting headphones. It was also recommended to increase the system timeout, provide sufficient space for manoeuvring in front of the device, and equip the approach with tactile guide strips. It was suggested that the operating instructions be duplicated in large print and understandable language with visual markings. Particular attention was paid not only to technical compliance, but also to the intuitive clarity of the interface.

Overall, the value of this project lay not only in the end result — the development of recommendations for improving the accessibility of public services for people with special needs — but also in the very approach to forming interested groups of volunteers: students, teachers, and practising architects who would help address issues of accessibility and inclusiveness in public spaces. Moreover, inclusiveness was not viewed simply as the sum of technical adaptations, but as a systemic logic of interaction with space and people. The project model covered all levels of user experience — from physical access to tactile navigation, from service contact to digital interface. The proposed approach can be adapted to different types of institutions.

2.3.3. METHODOLOGY AND EFFECTIVE PRACTICES FOR ENSURING THE ACCESSIBILITY OF PUBLIC BUILDINGS IN HISTORICAL CITIES ON THE EXAMPLE OF THE TERRITORY OF THE NATIONAL RESERVE "SOFIA KYIVSKA" IN KYIV (UKRAINE)

The accessibility and inclusiveness of historic urban spaces is one of the central issues in contemporary architectural practice. The complexity of the task lies in the fact that most cultural heritage sites were built at a time when there were no technical or social requirements for inclusion. Narrow portals, steep slopes, high steps, and lack of navigation all make such spaces inaccessible to people with disabilities, parents with prams, the elderly, and many other visitors [40, 41]. However, today, inclusion and accessibility are defined as a strategic direction of Ukraine's state policy, enshrined in the National Strategy for the Creation of a Barrier-Free Environment by 2030 [3], as well as in the current state building codes [42]. For architects, this means that working with historical heritage cannot be limited to preserving the authentic architectural

environment, but must include the development of innovative solutions to ensure equal opportunities for all visitors [43].

The National Reserve "St. Sophia Cathedral" is a unique laboratory for finding a balance between authenticity and accessibility. It is one of the most valuable cultural heritage sites in Ukraine, with exceptional historical, architectural and cultural significance. It includes the ensemble of buildings of St. Sophia Cathedral with the surrounding area, which contains architectural monuments from different eras: St. Sophia Cathedral, the Refectory Church, the Bell Tower, the Metropolitan's House, the Bursa, the Brotherhood Building, the Consistory, and the Zaborovsky Gate [44]. In addition to the main complex, the reserve also includes other notable architectural monuments: the Golden Gate, St. Andrew's Church, St. Cyril's Church, and the Sudak Fortress, which is currently located in the temporarily occupied territory of Ukraine [45].

Its status as a UNESCO World Heritage Site and active visits by tourists from all over the world make the task of inclusive adaptation particularly relevant [44]. The formation of the reserve's territory took place gradually, beginning in the 11th century. It underwent a particular transformation in the 17th–18th centuries, during the Cossack Baroque period, when a large-scale reconstruction and expansion of the monastery complex was carried out. The historical multi-layered nature of the complex's formation has led to the complexity of its current spatial organisation and created a number of challenges for ensuring accessibility.

In modern conditions, the territory retains a number of architectural barriers: uneven surfaces, relief differences, and a lack of adequate infrastructure necessary for visitors with special needs. At the same time, for St. Sophia Cathedral, accessibility is not only a matter of physical convenience, but also a symbolic aspect: a space open to all citizens regardless of their abilities [40, 44].

The St. Sophia Cathedral National Reserve pays considerable attention to social inclusion, creating conditions for equal access to cultural and educational programmes for all categories of visitors. Cultural events are regularly held on its territory with the participation of international organisations that promote tolerance, exchange of experience and integration of different communities into cultural life [44]. Thanks to such initiatives, the reserve creates an environment that is sensitive to the needs of visitors, ensuring their active participation in cultural processes. This approach complies with modern European standards in the field of cultural heritage preservation and contributes to the formation of a socially responsible and inclusive cultural community [44].

The existing main entrance, the Bell Tower, is accessible to all visitors, while the entrance on the side of the South Passage Tower is designed for people with disabilities who arrive by car [43]. This approach not only ensures physical access to the territory but also creates an atmosphere of openness and equality.

An important project that has been implemented is the renovation of the public toilet to meet the needs of people with reduced mobility. A specially equipped "Parents and Children Room" has been created, which has become a necessary innovation for families with infants. A cabin for people with reduced mobility was

installed. Information signs were manufactured and installed using universal design principles, and the area between the public restroom, the refectory and the bell tower was landscaped in accordance with accessibility standards. Modern lighting and comfortable benches for resting were installed. All this creates conditions for a more comfortable stay for visitors, setting examples of "small solutions" that do not destroy the historical environment but significantly change the perception of space (Fig. 35).



Fig. 35. Kyiv (Ukraine). Reconstruction of a public toilet to meet the needs of people with reduced mobility on the territory of the St. Sophia National Reserve (Oksana Kovalskaya, 2025)

However, the measures implemented are only the first stage. Currently, the UkrNDIproektrestavratsiya Institute has developed a comprehensive project for the inclusive transformation of the territory, which is designed to provide a systematic solution to the problems of information accessibility and to promote the fuller involvement of all categories of visitors in the cultural life of the National Reserve "Sofia Kyivska". One of the key areas of the project is the installation of tactile strips for people with visual impairments. These will connect public transport stops on Sophia Square with the main entrance to the complex, ensuring safe access and convenient movement around the territory [44] (Fig. 36).

When restoring architectural monuments such as museums, it is not always possible to provide full physical access to all premises. Therefore, the principle of "reasonable accommodation" is applied, whereby special facilities are provided for visitors with disabilities, such as viewing rooms, cafes, recreation rooms and cloakrooms. The museum may also provide the opportunity to view exhibits online or through virtual tours [40; 44].



Fig. 36. Kyiv (Ukraine). Diagram of tactile strips for people with visual impairments on the territory of the St. Sophia Cathedral National Historical and Cultural Reserve and St. Sophia Square. (Authoring team. Participant – Oksana Kovalskaya, 2025)

For example, during the restoration of the Consistory building on the territory of the St. Sophia Cathedral National Reserve, it was decided to provide access for people with reduced mobility only to the basement, where there are special rooms for working with people with disabilities, a café and a bathroom. To this end, a scissor lift was installed in the lobby, the entrance from Volodymyrska Street was adapted for all groups of visitors, a standard ramp and vestibule were installed, the edges of the steps were highlighted in contrasting colours, and tactile strips help people with visual impairments to orientate themselves and move around safely.

The Metropolitan's House plans to organise an entrance for people with disabilities at the rear of the building; access to it will be provided by a ramp that connects to the internal passageways and leads to the main exhibition rooms. In the case of St. Sophia Cathedral, unobstructed access for visitors in wheelchairs is provided — an organised entrance that allows access to the main areas of the cathedral without the need for additional aids (Fig. 37). For the Refectory, it is also planned to organise an entrance area with a ramp, which will ensure independent entry and evacuation for all categories of visitors. In the Bread House, it is planned to lower the level of the entrance area in order to eliminate thresholds and create an unobstructed transition from the outside to the inside (Fig. 38).

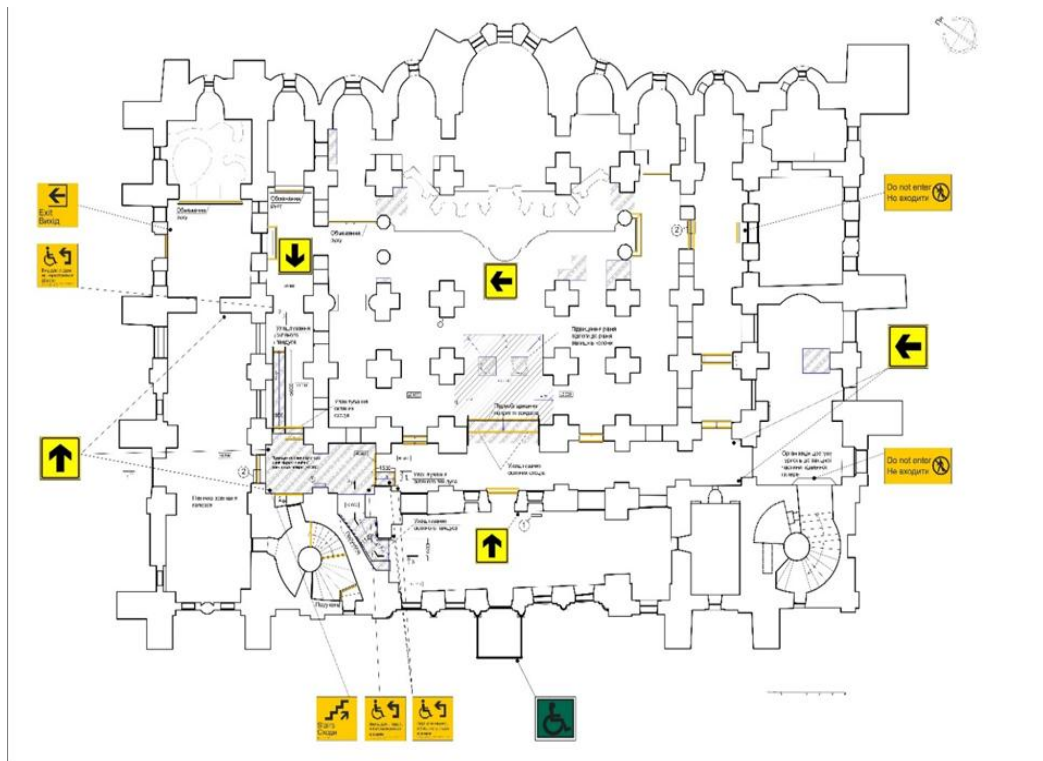


Fig. 37. Kyiv (Ukraine). Scheme of inclusive solutions: St. Sophia Cathedral. (Authoring team. Participant - Oksana Kovalskaya, 2025)

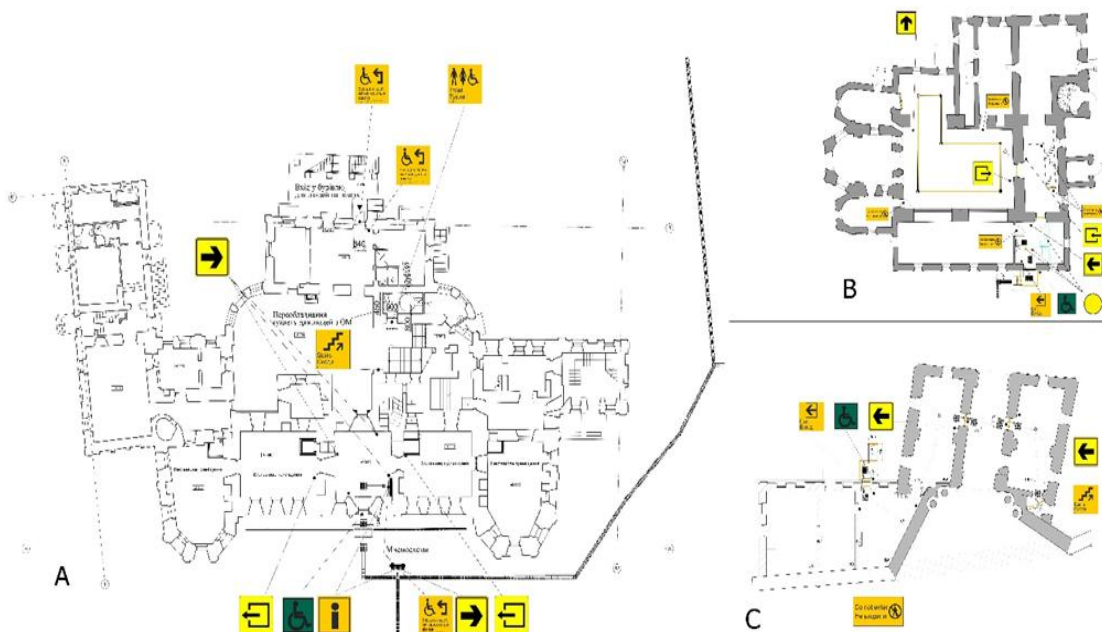
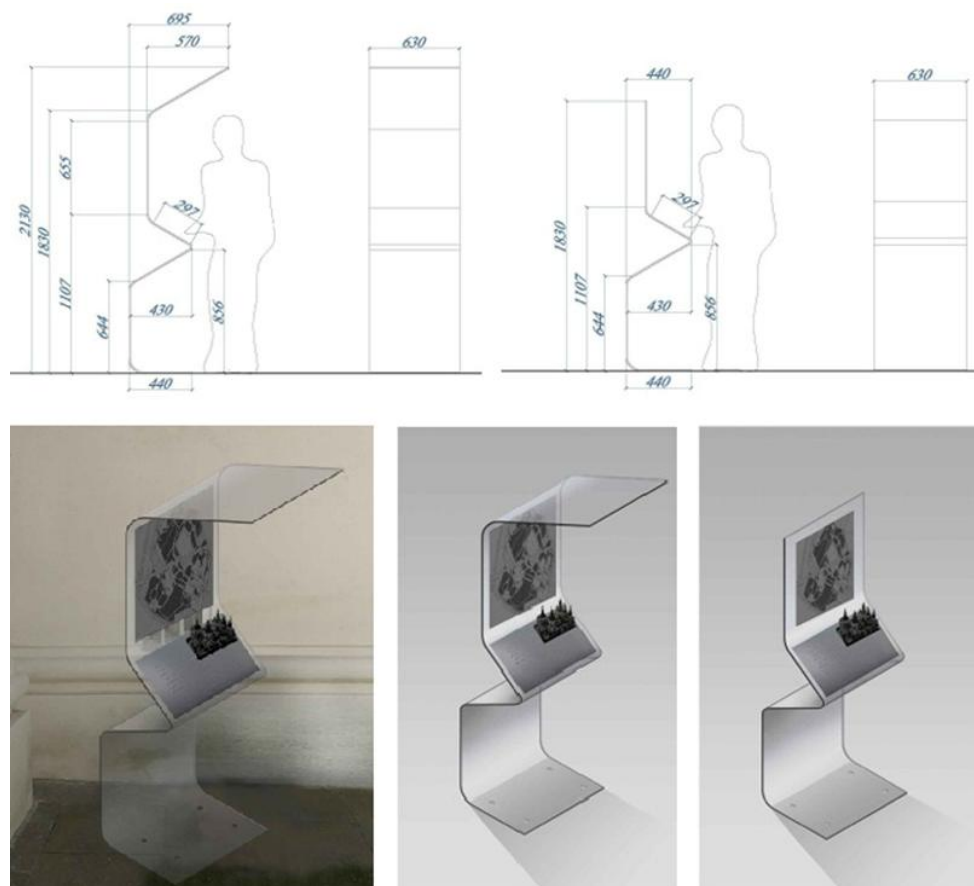


Fig. 38. Kyiv (Ukraine). Scheme of inclusive solutions: a – Metropolitan's House, b – Refectory Church, c – Zaborovsky Gate. (Authoring team. Participant – Oksana Kovalskaya, 2025)

Everywhere on the approaches to buildings and along the main routes, there is a flat, hard surface with minimal joint thickness for comfortable movement of wheelchairs and prams, and intersections and steps are marked with contrasting edges and tactile indicators. At the entrance to each building and at key intersections of the territory, mnemonic diagrams and information signs (with raised markings and Braille where appropriate) will be installed to guide visitors on the route, available services and places to rest. These information carriers are designed in accordance with the principles of universal design and clear navigation.

All of the solutions described are designed and implemented according to the principle of minimal interference with the authentic structure of the monuments: ramps and ramps are integrated in such a way as not to distort the appearance of facades and squares, and technical elements (lifting platforms, handrails, tactile strips, signs) are designed to be as removable as possible or made of neutral materials. The implementation of approaches to each building is accompanied by the marking of routes and the installation of mnemonic diagrams, which will ensure clear and safe navigation for people with visual impairments, as well as for accompanying persons with other needs [45] (Fig. 39).



*Fig. 39. Kyiv (Ukraine). Options for mnemonic diagrams on the territory of the St. Sophia Cathedral National Reserve.
(Authoring team. Participant — Oksana Kovalskaya, 2025)*

Methodologically, it is important to note that the solutions proposed by Ukrproektrestavratsiya are in line with European practices for integrating accessibility into protected historical environments. The principle of "minimal intervention" is applied here: all structures (ramps, lifts, navigation elements) are mobile or easily removable, which allows the authenticity of the monument to be preserved. At the same time, the use of modern technologies (digital audio guides, interactive navigation systems) reduces the need for physical intervention. This creates a balance between heritage protection and ensuring human rights to access cultural values [44].

Within the reserve, the complex includes other monuments that require adaptation. *St. Andrew's Church*, part of the National Reserve "St. Sophia of Kyiv", is a unique monument of Baroque architecture and an example of a space with a particularly complex relief. The steep ascents

of Andriivsky Uzviz create serious obstacles for people with mobility impairments, complicating access to the church [45] (Fig. 40).

The adaptation project includes a bunch of solutions to make sure you can safely get to and into the building. They're planning to put in two lifts on the porch: one sloped and one vertical, so visitors in wheelchairs can get up the steps and get to the viewing platform. For convenience, two ramps will be installed: one will lead to the entrance to the church, the other to the auxiliary premises [45]. The porch already has a flat and solid surface with anti-slip properties, without damage or defects, ensuring safe movement for all categories of visitors, including people with musculoskeletal disorders and parents with prams. The proposed set of measures complies with the principles of universal design, combining technical means (lifts, ramps) with an ergonomic environment, which will contribute to the inclusion of the church in the barrier-free cultural space of the historic centre of Kyiv [45].

The St. Cyril's Church in Kyiv, located on the territory of the St. Cyril's Monastery, is one of the oldest architectural monuments of the Kyivan Rus' era. The area around the church has been specially prepared to meet the needs of all visitors, including people with disabilities [46]. The paths and ramps have a solid, even surface and a non-slip texture, without defects or cracks, ensuring comfortable and safe movement. The paving materials used do not crumble and do not create additional barriers, which is fully in line with the principles of barrier-free space design. The convenient access for motor vehicles makes the area accessible to visitors with reduced mobility (Fig. 41).

The project provides for the installation of a ramp at the side entrance to the temple, which will allow wheelchair users to enter without obstruction. This will continue the practice of inclusive tours, which is already being implemented in the form of programmes for people with disabilities and military personnel with PTSD. Thanks to the combination of cultural and architectural value with practical solutions for visitors, St. Cyril's Church is an important element of the modern barrier-free cultural space of Kyiv [46].



Fig. 40. Kyiv (Ukraine). Diagram of the installation of lifts on the porch of St. Andrew's Church. (Authoring team. Participant - Oksana Kovalskaya, 2025)

The Golden Gate is also integrated into the city's inclusive route and serves as an example of combining authenticity with new accessibility standards. The surrounding area has level pavements and footpaths with a solid, non-slip surface that is free of damage, ensuring safe movement for different categories of visitors [46]. The paving materials used do not create additional difficulties for wheelchair users or those with prams. This creates a comfortable environment that meets modern requirements for barrier-free space. In addition, thanks to the inclusion of the Golden Gate in the network of tourist routes in the historic centre of Kyiv, this site has become an example of inclusive tourism, providing equal opportunities for all visitors while contributing to the preservation and promotion of historical heritage [46].

Compliance with these principles not only allows for the fulfilment of the requirements of the State Building Standards and the provisions of the National Strategy for the Creation of Barrier-Free Space by 2030, but also develops a new culture of treating heritage as a space open to all [40; 46].

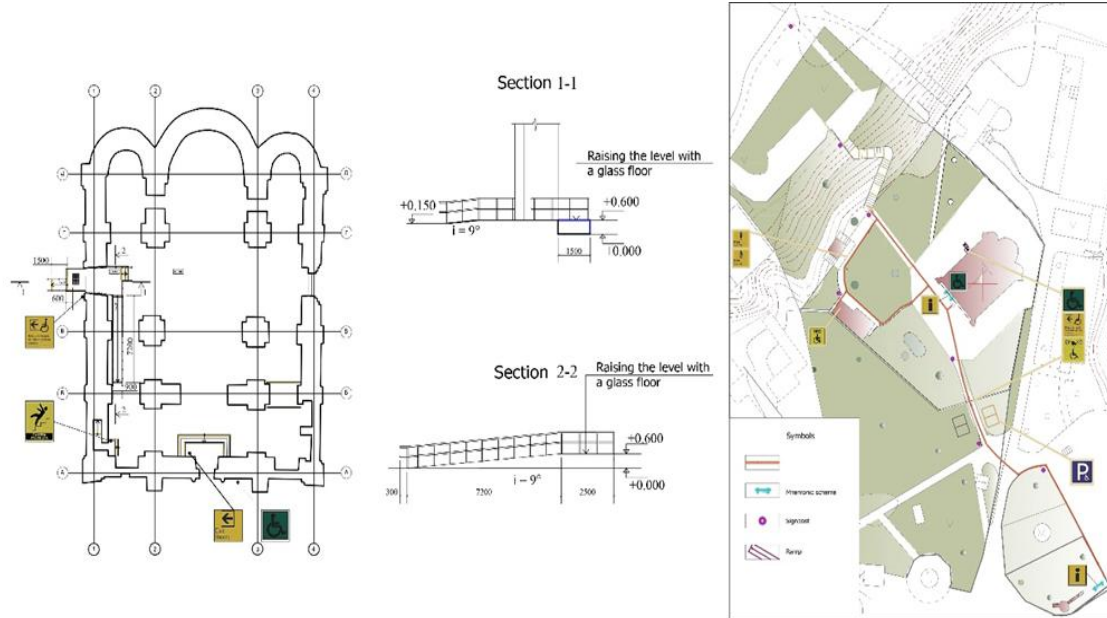


Fig. 41. Kyiv (Ukraine). Diagram of inclusive solutions in the Kyrylivska Church. Diagram of the installation of tactile strips for people with visual impairments on the territory of the Kyrylivska Church. (Authoring team. Participant - Oksana Kovalskaya, 2025)

Thus, the territory of St. Sophia Cathedral and related objects (St. Andrew's Church, St. Cyril's Church, Golden Gate) become an example of effective practices for creating barrier-free public spaces in the context of historic cities. Their transformation opens up new perspectives for the development of architectural education: future specialists have the opportunity to study a unique example where the preservation of authenticity is combined with the principles of inclusion, and cultural heritage is transformed into a space of equal opportunities [46].

3. METHODOLOGY AND EFFECTIVE PRACTICES FOR ENSURING THE INCLUSIVITY OF PUBLIC SPACES IN HISTORICAL CITIES.

3.1. CURRENT REQUIREMENTS FOR INCLUSIVITY OF PUBLIC SPACES

In recent years, there has been a noticeable shift in the focus of global architectural and urban planning practice from ensuring "barrier-free" access, i.e. the technical provision of physical accessibility to public spaces, to a broader concept of *inclusiveness*. Accessibility has traditionally been associated primarily with the physical ability to enter a space (using ramps, lifts, lowered kerbs, tactile elements), while *inclusiveness* goes far beyond purely architectural solutions. It is about the perception of certain citizens by their environment, their "inclusion" in the public life of the city through public spaces or their "exclusion". It is about the feeling of safety and comfort of the space for all its participants, about whether different groups of people feel welcome, visible, heard (this applies not only to people with certain physical or mental disabilities, but also to the elderly, families with small children, migrants, people without a fixed place of residence, etc.). It is also about whether their participation in the formation, transformation and management of the space is ensured. An inclusive public space is considered to be one where not only physical barriers are removed, but also practices of exclusion – social, economic, cultural, political – are actively eliminated.

For Ukraine, the issue of inclusion in public spaces is particularly acute, as the number of people with disabilities and injuries due to the war is increasing significantly, and the social and age diversity of users of urban spaces is growing. Ukrainian state building standards set requirements for the minimum level of accessibility of public spaces, but do not exhaust the issue of inclusion as a value of the modern community and its functioning.

The inclusiveness of public space can be defined as the ability of a space and its associated practices, rules and services to ensure the full participation of different population groups in community life, without discrimination, stigmatisation or unjustified barriers. In fact, inclusiveness is a combination of accessibility, safety, comfort, representation and opportunity for participation, not just compliance with building standards.

An inclusive public space not only provides the opportunity to use it, but also offers another dimension: it enables the process of co-creation, where residents, including vulnerable groups, are not just "users" but also "co-authors" of the space. When addressing the issue of ensuring the inclusiveness of space, it is necessary to answer certain questions: who should be included? (which population groups actually use this space); how equal are the opportunities for these groups? (is any of these groups being marginalised); do they all have the opportunity to participate in dialogue, co-management, and decision-making?

At the same time, historic cities have their own particular challenges when it comes to inclusion. Public spaces in historic cities are not just streets and squares, but carriers of multi-layered memory: architectural,

urban, social, symbolic. A significant part of such territories are included in the list of UNESCO or national heritage sites, which imposes strict requirements for the preservation of the authentic fabric of the city. At the same time, these same spaces are used daily by residents as places of movement, recreation, protests, celebrations, and everyday communication.

The 2011 UNESCO Recommendation on Historic Urban Landscapes (HUL) suggests viewing historic cities not as "open-air museums," but as a dynamic living organism (), where it is important to combine heritage protection with social and economic development and quality of life for residents. Street and square spaces, residential neighbourhoods, natural elements and the activities of local communities play a special role in this approach. This means that people should not only be able to reach the historic centre, but also that different population groups have the right to be present, recognise themselves in these spaces and influence their future.

In historic cities, the issue of inclusion inevitably faces the problem of monument preservation and the need to remove barriers – physical, informational, and social. Strict rules regarding the preservation of the authenticity of historic monuments often complicate the implementation of barrier-free routes, ramps, lifts, contrasting navigation, etc. It is necessary to strike a balance between preserving the historical value of monuments and ensuring the inclusiveness of public spaces in historic cities, while the requirement to preserve the authenticity of historical heritage is unquestionable.

We often encounter situations where accessibility elements that comply with regulations (massive ramps and handrails) visually and structurally destroy the historical image of a city or individual monument, causing resistance from restorers or the community. Or, conversely, a historic square or individual monument remains unchanged, but people with disabilities, elderly people, parents with prams, and tourists with cognitive impairments cannot fully enjoy them. To ensure balance, it seems appropriate to use minimally invasive and hidden solutions, hybrid routes and additional entrances, modern technologies, in particular, built-in lifts and platforms, digital guides, virtual tours and much more.

From the point of view of the inclusiveness of public spaces, historic cities must not only provide the opportunity to physically visit a particular landmark, i.e. get there (organise accessible transport and tourist infrastructure), enter, move around inside or around it, and obtain information about it (signs, audio guides, navigation maps), but also to resolve a number of issues related to the "inclusion" of the entire local population and tourists in the public life of the city. Even a perfectly accessible historical public space will not necessarily be inclusive if local residents feel "displaced" by the tourism industry, or if there is no room left for the memory of different communities, or if the rules of conduct, prices, and event formats are geared towards a narrow group of wealthy tourists or other "desirable" visitors.

Inclusiveness in this context includes additional dimensions related to the social inclusion of residents – the right to live, work and relax in historic centres, rather than being displaced from them due to tourist monoculture, rising prices and other aspects. In addition, there are issues of cultural inclusion – the right of different groups to see themselves in the "history of the city" through individual exhibitions, public art,

toponymy, festivals, commemorative practices and events, as well as ensuring the participation of local communities in decision-making processes regarding restoration, changes in the functional content of spaces, and their improvement. It is necessary to provide opportunities for local small businesses, creative initiatives, and social projects to be part of the economy of the historic centre, rather than merely serving the interests of global hotel, restaurant, and tourist chains.

Key requirements for the inclusiveness of public spaces in historic cities include joint planning that takes into account the interests of residents — "with them" rather than "for them." European projects aimed at improving access to cultural heritage demonstrate the effectiveness of co-creating solutions together with local communities. This involves holding various workshops and jointly testing new formats for using spaces and streets. It is important that vulnerable groups are represented in such processes, in particular people with disabilities, elderly residents, internally displaced persons, families with children, and cultural minorities. "Inclusive access" to cultural heritage can improve residents' attitudes towards tourism if they feel that they benefit from it and that they are part of the process. If the historic centre is transformed into an exclusively tourist "decoration", inclusion is violated. Therefore, inclusive policy involves: preserving the functions of everyday life in the historic centre (shops for locals, services, schools, public institutions); limiting excessive commercialisation and monoculture (only restaurants, hotels, hostels, souvenirs); supporting local cultural and social life. Historical spaces are also a stage for the development of local intangible heritage through the organisation of fairs, street performances, religious and community practices, protests, and commemorative events; creating conditions for the legal, safe and visible presence of different cultural and social groups in the city; supporting formats in which the voices of different groups can be heard (from local festivals to public discussions). The "sterilisation" of historic squares and streets for exclusively commercial functions should be avoided.

The principles of universal design in historic cities should be implemented through minimally invasive structures such as ramps, lifts and handrails that do not destroy the historic fabric. Barrier-free routes that combine authentic elements with modern inserts should be carefully thought out. Multisensory and multilingual interpretation systems should be used, including tactile models, audio guides, Braille, simple and understandable texts and explanations. It is important not to "standardise" all spaces, but to create a network of different levels of access where each user can choose a comfortable scenario – a physical route, a digital tour, a tactile model, etc.

For historic cities rich in historical and cultural monuments, the inclusiveness of public spaces is becoming a key tool for striking a balance between preserving the authenticity of monuments and the needs of modern residents and visitors. It is necessary to create a situation where heritage is transformed from an "object of display" into a resource for shared life and city development. Based on this, accessibility (barrier-free, informative, transport accessibility) is a necessary but basic step, while inclusiveness also requires community participation, cultural and economic justice, respect for different identities, flexible management and a willingness to change the space together with the city and its people.

3.2. BARRIERS THAT LIMIT THE INCLUSIVITY OF PUBLIC SPACES IN HISTORICAL CITIES

For historic cities rich in historical and cultural monuments, the inclusiveness of public spaces is becoming a key tool for striking a balance between preserving the authenticity of monuments and meeting the needs of modern residents and visitors. It is necessary to create a situation where heritage is transformed from an "object of display" into a resource for shared life and city development. Based on this, accessibility (barrier-free, informative, transport accessibility) is a necessary but basic step, while inclusiveness also requires community participation, cultural and economic justice, respect for different identities, flexible management and a willingness to change the space together with the city and its people.

Further analysis allows us to identify a number of barriers that have a complex impact on the level of inclusiveness of historic public spaces.

Social barriers. Social barriers encompass a set of ideas, values, and behavioural patterns that shape the perception of different groups in the urban environment. Negative stereotypes, insufficient awareness of the needs of people with reduced mobility, and general prejudices in society can transform into discriminatory practices or unconscious exclusion.

In historic cities, social barriers are often reinforced by local policies focused primarily on maintaining tourist appeal, commercial potential and a "canonical" historical image. Under such conditions, the needs of vulnerable groups — in particular people with disabilities, older people, parents with young children or representatives of minorities — are often overlooked and not properly taken into account when planning the development of central areas or making decisions on urban improvement.

An important component of these barriers is the level of community participation in planning and decision-making processes. When residents, local businesses and professionals involved in working with the historical environment do not understand the importance of inclusion or do not support its principles, even well-designed and well-funded initiatives may not deliver the expected results. Social attitudes set the framework of expectations for what public space should be, and professional and managerial decisions transform these attitudes into specific practices that determine the level of openness and comfort of the space for different groups.

Safety barriers. Safety and psychological barriers are related to how different population groups perceive public space in terms of risk, comfort, and predictability.

For many groups of residents, the quality of urban lighting, visibility of the area, the presence of people flows and the ability to quickly get help are decisive factors. For example, women may avoid poorly lit or isolated areas of the historic centre for fear of potential threats. Older people and people with disabilities often experience psychological discomfort in places with heavy traffic, chaotic movement of transport or large crowds, which can cause anxiety or disorientation.

Ensuring a sense of safety, predictability and psychological comfort is key to making public spaces feel open and welcoming. This includes thoughtful lighting, clear navigation, reducing areas of isolation, creating "visible" routes, and supporting social interaction, which together create the conditions for an inclusive historic urban environment.

Physical and infrastructural barriers. Physical and infrastructural barriers in historic cities affect not only the ability to move around, but also the level of participation in community life. Unlike the technical aspects of accessibility, these barriers in the context of inclusiveness determine who is actually included or excluded from the use of public spaces. Complex terrain, heritage restrictions and dense historical development create situations where even minimal elevation changes or narrow passages become factors of social inequality. For people with disabilities, parents with prams or elderly people, such spaces become "inaccessible zones", depriving them of the opportunity to participate in the cultural, social and civic activities of the city. Thus, physical barriers in the historical environment are not only a technical problem, but also part of a broader mechanism of social exclusion.

Information barriers. Once physical limitations have been addressed, users of historical spaces often find that information about routes, objects and services remains inaccessible — there are no Braille inscriptions, audio descriptions, sign language or multilingual materials. Such barriers do not prevent physical access to the space, but they limit its meaningful perception and orientation for people with different sensory and cognitive characteristics. Providing adapted navigation, tactile diagrams, and accessible digital resources is a relatively simple step that significantly increases the inclusiveness of the historical environment.

Symbolic and historical-memorial barriers. In global practice, symbolic and historical-memorial barriers arise in situations where urban space represents a limited or one-sided historical narrative that does not cover the experiences of different population groups. Monuments, place names, memorials, and architectural landmarks can reinforce certain ideological models of the past and thus create a sense of alienation or irrelevance among some users.

In Ukraine, these barriers are particularly pronounced due to the country's multi-layered history and the significant number of objects representing different — often conflicting — political and ideological eras. Monuments from the Soviet period, historical names, memorial complexes, and key symbolic spaces often carry meanings that do not correspond to the contemporary identity of local communities or the values of a democratic society. As a result, symbolic barriers are formed at the intersection of the legacy of the totalitarian past, the transformation of the national narrative, and the public demand for a more inclusive and representative urban space. Overcoming such barriers requires a delicate balance between preserving historical memory and creating an environment that reflects the values of a modern democratic community and recognises the diversity of experiences present in the urban landscape.

Political and institutional barriers. Political and institutional barriers are linked to a lack of political will, resources and coordination between the bodies responsible for managing the historical environment, transport and public amenities, which slows down the systematic implementation of inclusive solutions. Often, preference is given to short-term or visually prominent projects, as a result of which the level of

inclusiveness of historical spaces is determined not only by the quality of professional proposals, but also by the overall institutional capacity to implement them.

Institutional and legal restrictions on the historic environment. Institutional and legal barriers are caused by strict cultural heritage protection regulations, which limit the possibility of implementing even minimal accessibility solutions, such as ramps, lifts or navigation elements. Due to requirements for the authenticity of facades, materials and interventions in monuments, adaptation of the environment often becomes impossible, and until the regulatory framework becomes more flexible, legal conflicts will remain a significant obstacle to the inclusiveness of historical spaces.

Professional and practical barriers. Professional and practical barriers are due to the fact that inclusive design of historic spaces requires specialised knowledge that only a limited number of specialists possess. Many architects, restorers, and designers lack systematic training in universal design, particularly in cognitive, sensory, and social accessibility. This problem is exacerbated by insufficient coverage of inclusivity in educational programmes and the lack of clear industry standards adapted to the historical environment. In practice, decisions often depend on the client's position or time and financial constraints, rather than on professional approaches based on the needs of different user groups. The lack of established interdisciplinary cooperation and the lack of standard solutions lead to fragmentation and uneven implementation of inclusive changes.

Cognitive and conceptual barriers. Cognitive and conceptual barriers are a direct consequence of a lack of professional expertise and systemic knowledge in the field of inclusiveness. Misconceptions that accessibility boils down to ramps or the physical removal of barriers arise precisely when professionals and the community do not have sufficient information about the diverse needs of users. A lack of knowledge about the rights of persons with disabilities and the needs of persons with cognitive, sensory and psycho-emotional characteristics leads to the informational, navigational and emotional aspects of interaction with space being overlooked. This makes historical environments difficult to navigate, overloaded or, conversely, insufficiently understandable. Overcoming such barriers requires a change in the conceptual approach to design — a shift from focusing on the "average" user to taking into account the full spectrum of human diversity.

Environmental barriers. Environmental conditions — climate, precipitation, heat, pavement condition — can significantly limit the use of historical spaces: cobblestones become slippery in the rain, heat without shade makes it difficult for people with chronic illnesses to stay outdoors, and snow or ice without cleaning make routes impassable.

Time barriers are related to the incompatibility of the operating hours or activity of a space with the needs of different groups: late events exclude families with children, and early closing of institutions excludes working city residents. The duration of projects is also important: protracted inclusive interventions slow down the accessibility of changes for current users.

Mobile barriers. Mobile barriers arise when it is difficult to reach an inclusive space due to unsuitable public transport, remote stops or a lack of parking spaces for people with disabilities, which is particularly common in historic centres.

Financial barriers manifest themselves both in the lack of funds for the adaptation of historic buildings (expensive restoration work, special materials) and in the financial constraints of the users themselves, for whom visiting the historic centre may be too expensive. As a result, a space that is formally open to all becomes accessible only to the more affluent segments of the population.

A separate group consists of socio-cultural and identification barriers that arise as a result of the diversity of cultural, ethnic, gender, age and religious characteristics of urban communities and their unequal representation in the historical space.

Cultural and ethnic barriers. In many historical spaces, cultural representation focuses primarily on the traditions and symbols of the dominant group, which can create a sense of alienation for ethnic minorities and other cultural communities. Limited use of linguistic and cultural diversity in navigation, urban events, and the design of public spaces exacerbates this inequality and reduces the level of inclusion of different groups in city life.

Gender barriers. Planning decisions in historic spaces often ignore the needs of women and other gender groups, reducing their safety and comfort. The lack of adequate lighting, accessible services, and childcare infrastructure creates hidden inequalities in the use of space.

Age barriers. Older people face physical and cognitive difficulties in using historic centres due to the complexity of routes, poor legibility of navigation elements and a lack of places to rest, which reduces their mobility and comfort. Children and teenagers, in turn, are often left without safe and adapted spaces for leisure, as historic areas rarely provide infrastructure geared towards younger age groups.

Religious barriers. The uneven representation of symbols of different faiths or the existence of strict religious rules regarding the use of certain spaces can create a feeling of restriction or unwelcome for visitors of other faiths. Insufficient consideration of religious practices when organising urban events, setting schedules or arranging public spaces also reduces the level of inclusiveness, as certain groups are effectively excluded from full participation in the life of the historical environment.

3.3. INCLUSIVITY IN HISTORICAL URBAN SPACES: METHODOLOGIES AND EFFECTIVE PRACTICES FOR DESIGNING PUBLIC SPACES

3.3.1. ACCESSIBILITY AND INCLUSIVITY OF RECREATION AREAS IN THE PUBLIC SPACE OF HISTORICAL CITIES

Among the many components that play a role in building an inclusive city, urban recreation areas play a special role. City parks, embankments, squares, sports and playgrounds are important spaces for community life, where everyone can fully participate in social, economic and civic life without encountering barriers or discrimination. The design of these spaces must take into account the characteristics of all users and ensure accessibility, safety, usefulness and comfort for every person, regardless of their age, health, socio-economic status or cultural background. At the same time, effective planning of urban green areas must take into account the different ways in which they are used: for relaxation, stress reduction, physical or social activity.

In today's world, inclusion and safety are the foundation that architects must pay attention to when designing any space. However, this direction is relatively new for Ukraine, and the issue has been widely discussed in society since 2006, after the ratification of the Convention on the Rights of Persons with Disabilities. Since then, inclusive public spaces and organisations of various kinds have begun to develop in different cities across the country, helping to foster a culture of inclusivity in society. The trend of involving people with mental or physical disabilities in public life is the most widespread in Ukraine today, as the number of such people is growing every day in the context of the war in our country. This is a very pressing issue, and its resolution should be one of our priorities, although it is important to understand that inclusion is not limited to this.

For a park to be truly inclusive, it must have infrastructure that makes it easy to visit and use. The first inclusive elements in Ukrainian parks appeared on children's playgrounds thanks to the efforts of activists, philanthropists and district administrations. An inclusive playground is a play area, usually divided into several zones, which are adapted for comfortable play, movement and location for both children with disabilities and ordinary children of different ages. Its main task is to bring together children with different physical and mental abilities in a playful way, to integrate elements for children with disabilities into the general play area, creating conditions for their social rehabilitation and support.

In 2017, three playgrounds in Kyiv were equipped with inclusive elements: in Mariinsky Park, on Peizazhna Alley and in Shevchenko Park. Peizazhna Alley is a unique park located in the heart of Kyiv, on Starokyivska Hill, which, since its creation, has sought to create a space where everyone, regardless of age or physical ability, can fully enjoy its unique atmosphere, unusual art objects, panoramic views of the city, and feel the atmosphere of its history. In early autumn 2017, the playground on Peizazhna Alley was equipped with

inclusive swings and carousels that can be used by children in wheelchairs. The inclusive carousel is an excellent way to train the vestibular system. Activists also installed children's slides, xylophones for children with hearing impairments, made from a series of metal pipes that allow children to transmit different sounds, tactile panels for autistic children, panels for motor development, and play elements using Braille (Figs. 42, 43).



a) elements for developing fine motor skills, a sign language stand, a xylophone for children with visual or hearing impairments; b) a carousel that allows wheelchair access

Fig. 42. 43. Children's playground on Peizazhna Alley in Kyiv (Natalia Zdetovetska, 2025)

The paths on Peizazhna Alley have a smooth surface, which allows pedestrians with prams and people using wheelchairs to move around comfortably. It is also worth noting the presence of tactile elements and information stands for people with visual impairments. Fairytale sculptures placed on low pedestals allow children and people in wheelchairs to touch and interact with them, making the space more engaging and accessible. Wide passages between sculptures and other objects allow for comfortable movement, which is important for people with limited mobility and those who use wheelchairs. Unfortunately, accessibility is not provided throughout the entire park, and in many areas there are barriers in the form of high curbs and stairs that are not duplicated by ramps.

New inclusive elements of the playground in the capital's Mariinsky Park are the play elements "Stork's Nest" and "Voice of Flowers." The 1.5-metre swing is convenient for children with musculoskeletal disorders. Two "Voice of Flowers" tubophones allow children to "talk" at a distance of up to 20 metres, i.e. in different corners of the playground. This toy gives children with hearing impairments the opportunity to transmit different sounds and messages and play a variety of games.

The inclusive equipment includes various complexes: swings, slides, carousels, sports equipment and horizontal bars. All elements have been designed with special shapes and sizes to ensure maximum comfort for children. Wide ramps, additional handrails and reliable fasteners are used for wheelchair users,

while mobile tactile elements, sandboxes and play tables are used for children with visual impairments. Handrails and rings help children to always be the best in competitive games. The playgrounds have a unique appearance, and their equipment is safe, durable and unique in design. In addition to the playground itself, the space also provides a comfortable environment for parents, who spend a lot of time there, thanks to convenient benches and shade.

Compared to conventional playgrounds, inclusive playgrounds and sports grounds have a slightly larger area for free movement (the need to manoeuvre wheelchairs), a flat surface (hills for slides or other attractions are possible), and sometimes special soft flooring. The attractions on the playground are planned so that there are no bottlenecks, movement is comfortable, and any element of the playground can be approached conveniently and safely from all sides. Each element is used to its fullest potential for play and correction.

Today, it is also important for Kyiv to create sports grounds and recreation areas for people with disabilities and elderly residents of the city. First and foremost, there are plans to develop squares and parks located near medical facilities. Tactile strips will be created in these green areas, and ramps will be installed on all sections of paths with a slope of more than 5%. Wide pavements and paths (at least 1.8 metres) will also be built so that people in wheelchairs, on crutches or with walkers, as well as those with prams, can move around. The grounds will be equipped with safe and environmentally friendly street furniture, play equipment and sports equipment.

Given the trend of an ageing population in cities around the world, sports grounds or parks for older people are increasingly being designed with a special focus on the mobility limitations imposed by old age. Inclusive parks are particularly important for older people, as they not only promote active ageing, but also strengthen their social ties and encourage intergenerational interaction.

In Ukraine, the ageing of the population is exacerbated by the demographic crisis caused by the war. The most common leisure activity for Ukrainian pensioners is walking in courtyards and parks or spending time at playgrounds or sports grounds with their grandchildren. Nevertheless, a significant proportion of older people prefer not to leave their homes unless absolutely necessary, precisely because of the unfavourable and hostile urban environment. This is not only about the need to equip crossings with convenient ramps or lifts: the lack of benches, toilets, convenient navigation, and sufficient lighting make walking a real challenge for older people. The experience of designing health parks for the elderly in Spain, the country with the highest average life expectancy in Europe (84 years). According to the state programme, parques saludables are being created in every city in Spain: parks with adapted areas for physical exercise that allow older people to remain active without excessive effort while enjoying the fresh air.

The main elements of such a park are:

- rest areas with benches located in strategic places for resting during a walk;
- accessible communications: wide, level paths for free movement;
- shaded areas, protection from precipitation: pergolas and trees for comfort, covered gazebos;

- biomedical equipment: exercise machines designed to train joints and improve mobility;
- sufficient lighting for use at any time of day;
- availability of public toilets;
- clear and understandable navigation.

To encourage city residents to exercise, the Muevete health park in Busot, southern Spain, is designed so that people with no previous experience of exercise equipment can understand how to use it (Fig. 44). The equipment is designed for training balance, mobility, and maintaining and improving muscle tone, taking into account the needs of different target groups. It is easily accessible and safe to use, especially for users of prostheses or wheelchairs. Good lighting is also important, and the park is safe to visit in the morning and evening, even during the dark season.

Physical activity is key to healthy ageing. The use of biomedical equipment in parks by older people, or simply walking, can:

- improve mobility and balance, reducing the risk of falls.
- promote cardiovascular health and prevent diseases such as hypertension and diabetes.
- reduce muscle stiffness, maintaining flexibility and autonomy.

The benefits of such parks are also emotional. Contrary to stereotypes about older people's desire for solitude and contact exclusively with nature, academic research shows that loneliness is a major problem for this age group. It is the sharp reduction in social contact that leads to serious mental health problems, the most common of which today is dementia. Even casual communication in parks has a positive effect on the mental health of older people. Spending time with friends or family, or simply watching children play, prevents isolation and depression.



Fig. 44. Muevete Health Park for the Elderly in Busot, Spain (Natalia Zdetovetska, 2025)

City parks can also be a space for cultural activities. Yoga, dancing, and outdoor workshops are opportunities for socialising and maintaining mental activity. A well-designed park is also a space for different generations to meet and exchange experiences.

An example that demonstrates such intergenerational connections is the chess corner in Kyiv's Shevchenko Park. On average, several hundred regular players come here, mainly elderly people, but there are also quite a few young people. In general, they keep in touch, chat, arrange to meet, but even if you come alone and set up a chessboard, there will always be someone willing to play (Figs. 45, 46).

City parks can also be a space for cultural activities. Yoga, dancing, and outdoor workshops are opportunities for socialising and maintaining mental activity. A well-designed park is also a space for different generations to meet and exchange experiences. An example that demonstrates such intergenerational connections is the chess corner in Kyiv's Shevchenko Park. On average, several hundred regular players come here, mainly elderly people, but there are also quite a few young people. In general, they keep in touch, chat, arrange to meet, but even if you come alone and set up a chessboard, there will always be someone willing to play. The experience of organising cultural events is also interesting in this regard.

On the initiative of Kyiv residents, salsa parties, master classes and real battles between professionals and amateurs were regularly held on a voluntary basis in the park's open areas. Unlike numerous official clubs for those over 30, the popularity of open-air salsa was not so much due to the fashion for Latin American social dances themselves, but rather to the absence of segregation and the atmosphere of joy and freedom that united all participants and spectators regardless of age and ability. Older dancers felt completely at ease among the young people, who were also learning from older masters. Despite some problems with physical accessibility, Shevchenko Park remains a place where all city residents feel a sense of belonging and participation in community life.

Thus, involving older people in parks is a fundamental step towards building healthier and more connected communities. These spaces should not only offer opportunities for physical activity, but also promote social interaction and coexistence between generations. Parks that are accessible to older people benefit not only this group, but also create inclusive spaces for the entire community.



Fig. 45. Chess corner in Shevchenko Park. Kyiv, Ukraine. (Natalia Zdetovetska, 2025)



Fig. 46. Street salsa in Shevchenko Park in Kyiv, Ukraine. (Natalia Zdetovetska, 2025)

3.3.2. REVITALISATION OF THE OLD ARSENAL WAREHOUSE: THE KYIV FOOD MARKET SPACE

Kyiv Food Market is located in a renovated 18th-century military arsenal building and the surrounding area, which was redesigned and transformed into a multifunctional cultural and restaurant hub and urban leisure space as part of the project. The revitalisation process preserved the characteristic features of the historical and industrial architecture — the scale of the volumes, the rhythm of the facades, the materiality of the structures — while integrating modern elements that meet the new functional and social needs of the city.

The project involved transforming the original closed and isolated nature of the military facility into an open public space accessible to various user groups. As a result, the former industrial area was incorporated into the system of everyday urban life, becoming a place for social interaction, recreation, and cultural communication.

The revitalisation of the Kyiv Food Market demonstrates an effective approach to the adaptive use of historic buildings through functional rethinking without losing their authenticity. The new content of the space ensures its social openness, accessibility and multi-scenario use, which corresponds to the modern principles of sustainable urban development and social inclusion (Fig. 47).

3.3.3. INTERACTIVE MEMORIAL INSTALLATION: "MIRROR FIELD" IN BABYN YAR

One example of overcoming information barriers is the interactive audiovisual installation "Mirror Field" in Babyn Yar in Kyiv. "Mirror Field" is a memorial space dedicated to the memory of the victims of mass shootings by the Nazis during World War II. The composition consists of metal columns with bullet holes and a mirrored surface that reflects the sky and visitors. The mirrored surfaces reflecting the sky, combined with holes resembling bullet wounds in metal, create an effect of personal empathy and remind us of the fragility of human life. The space encourages silence and reflection on the tragedy, forcing us to think about the need to remember the bitter pages of history and prevent them from repeating themselves. The installation has become an innovative practice that draws visitors into memories of these tragic events and makes them more accessible and personal.



Fig. 47. Street salsa in Shevchenko Park in Kyiv, Ukraine. (Mykhailo Kinayluk, 2025)

The concept is based on the symbol of the "Tree of Life," common in many cultures and religions, which is embodied in the installation in the form of a round mirrored podium (diameter ~40 m) with 10 mirrored columns riddled with numerous bullet holes. The sound accompaniment enhances the impact: every hour, a special audio organ plays a sound, and voices read out the names of those shot in Babyn Yar. Next to the mirrored field are stone monocular figures (video monitors) where you can see and hear the stories of witnesses to the tragedy, as well as learn about the victims themselves — the information is duplicated in Ukrainian, English, Russian and Hebrew. This multimedia and multilingual approach overcomes both linguistic and emotional barriers. Instead of a traditional monument, there is an interactive installation that

engages visitors in an active experience of history. The visual expressiveness of the installation, in particular the mirrored surface and vertical columns, makes it a striking accent in the natural landscape. This unusual form of presenting a memorial space attracts the attention of even those visitors who are rarely interested in traditional monuments. Thanks to the combination of an unusual image and interactive elements, the installation creates an accessible and understandable environment, allowing a certain "immersion" in history. This approach lowers the barriers to perception and opens up the possibility for personal reflection on events. As a result, the space functions as a tool for social inclusion, attracting diverse groups of visitors.

In terms of the inclusiveness of public space at the site of historical events, the Mirror Field in Babyn Yar in Kyiv provides, on the one hand, spatial accessibility (the memorial is located in an open landscape with wide walkways that allow visitors, including people with limited mobility, to move freely) on the other hand, an informal, equal experience (the absence of raised platforms and fences promotes equality for all visitors in the space of memory — no one is "higher" or "lower" in terms of accessibility to the memorial space).

The memorial space also has a certain sensory and emotional inclusiveness — the mirrored surfaces of the columns act as a universal means of perception — the reflections draw people of different ages and cultural backgrounds into the overall panorama without the need for explanatory texts. The space is not overloaded with symbols or information, which makes it understandable and acceptable even for people with cognitive or emotional characteristics. The nature of the memorial's spatial design allows for the widespread use of expressive navigation elements (tactile routes, Braille inscriptions, audio descriptions) without disrupting the overall artistic and stylistic design. In general, the Mirror Field can be seen as an example of an inclusive memorial space, where accessibility is combined with an ethical, non-violent immersion in the historical memory of the city and the involvement of every person, regardless of their physical or sensory abilities, in the common public space (Fig. 48).

3.3.4. TEMPORARY CULTURAL TRANSFORMATION: THE MAIN NEW YEAR'S TREE ON SOPHIA SQUARE IN KYIV

The annual installation of the main New Year tree on Sophia Square in Kyiv illustrates an example of the temporary functional transformation of historical urban space with the aim of achieving social and cultural inclusiveness. Sofia Square is a landmark historical site, formed in the immediate context of St. Sophia Cathedral, a UNESCO World Cultural Heritage Site, which takes on a new role as a public centre of urban life during the winter holidays. The thematic design of the main Christmas tree often appeals to national identity and current social values, in particular through the use of blue and yellow colours, symbolic elements and visual images associated with Ukrainian culture and contemporary history. This approach helps to overcome social, psychological, and symbolic barriers, uniting the community around shared meanings. Thus, the temporary festive transformation of Sophia Square demonstrates the potential of historical urban

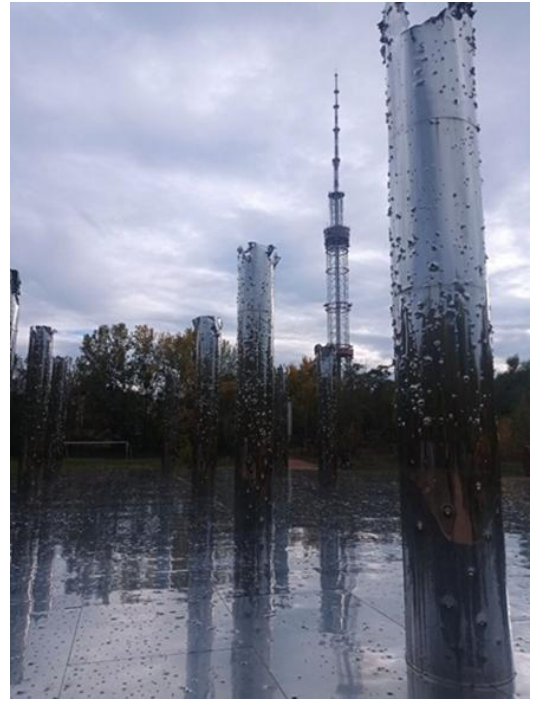


Fig. 48. Audiovisual installation "Mirror Field" in Babyn Yar. Kyiv. Ukraine (Mykhailo Kinayluk, 2025)



Fig. 49. Audiovisual installation "Mirror Field" in Babyn Yar. Kyiv. Ukraine. (Larysa Bridnia, 2021)

Common to all examples is the rethinking of historical spaces as belonging to contemporary society. Historical public spaces are taking on new life and meaning, capable of simultaneously satisfying the need to preserve heritage and the need to develop a vibrant urban environment. Thus, inclusive practices in historical spaces not only improve accessibility (physical and social), but also strengthen social cohesion, fostering a sense of shared ownership and responsibility for urban space among residents.

4. ANALYSIS OF PUBLIC SPACES IN HISTORICAL CITIES FROM THE POINT OF VIEW OF ACCESSIBILITY AND INCLUSIVITY - PROCEDURES, PROGRAMMES, DESIGN

4.1. PROCEDURE FOR ANALYSING PUBLIC SPACES IN HISTORICAL CITIES FROM THE POINT OF VIEW OF ACCESSIBILITY AND INCLUSIVENESS OF PUBLIC SPACES

Modern life poses extremely complex challenges for public spaces in historic cities: the pace of modern city life is constantly accelerating, the lifestyles of its residents and visitors are changing, and the variability of transit flows is increasing, depending on the trends and challenges of the modern city. The political situation, socio-economic processes, climate change, natural disasters, pandemics, wars – all of these inevitably affect the life of a modern city.

Globalisation, urbanisation processes, lifestyle changes, commercialisation, growth in tourist flows, and martial law are putting significant pressure on the fragile fabric of the historical environment. There is a fundamental conflict between the need to preserve authenticity and cultural heritage on the one hand, and the need to adapt spaces to modern functional, social, environmental and other requirements on the other. Ill-considered interventions, disregard for context, or a focus exclusively on commercial gain can lead to irreversible losses: the destruction of the historical landscape, the loss of the "spirit of place" (*genius loci*), social alienation, and the transformation of living historical urban centres into a kind of "tourist attraction."

Awareness of these threats highlights the need to develop and implement scientifically sound approaches to the analysis and transformation of public spaces in historic cities. Such analysis cannot be limited to purely regulatory requirements, aesthetic or architectural and art historical assessment. It must be comprehensive, interdisciplinary and systematic. Only a deep understanding of how a space functions, who uses it and how, what values it embodies and what problems it has, allows for the development of balanced and effective solutions for its delicate transformation.

The purpose of this guide is to present the methodological principles and programme for conducting a comprehensive analysis of public spaces in a historical environment in terms of their accessibility and inclusiveness. It is intended to be a tool for architects, urban planners, restorers, sociologists, local government representatives and community activists who seek the sustainable and harmonious development of historic centres. The guide examines the theoretical foundations of analysis, key principles and evaluation criteria, and describes research procedures, including data collection and the application of modern methods. The proposed approach is based on the belief that high-quality revitalisation of historic public spaces is only possible through a dialogue between the past and the present, where respect for

heritage is combined with concern for the needs of modern people and future generations.

A comprehensive analysis of public spaces in a historical environment is a multi-stage, systematic process that requires an interdisciplinary approach and the integration of various research methods. It cannot be reduced to a simple inventory of objects, but involves an in-depth study of space as a complex socio-cultural phenomenon where historical heritage, contemporary social needs and physical accessibility intersect. The peculiarity of such an analysis in a historical context lies in the need to find a balance between preserving authenticity and uniqueness and the need to adapt the space to modern functional, social and environmental requirements. The procedure for such an analysis must be structured and consistent to ensure objectivity, completeness of data and soundness of the final conclusions, which will form the basis for the development of revitalisation strategies or design solutions.

The development of an effective programme for analysing public spaces must be based on a solid theoretical and methodological foundation. This approach ensures the systematic nature of the research, allowing a transition from intuitive decisions to scientifically sound strategies aimed at sustainable urban development. The analysis of public spaces should include social and cultural dimensions, as well as economic, environmental and security factors.

Social aspects include analysing public spaces in terms of their role as arenas of public life in historic cities, places for social contact, communication and community building. Public spaces should promote social integration by providing opportunities for interaction between people of different ages, social status and backgrounds. In a historic environment, squares and streets often serve as venues for traditional celebrations, festivals and public gatherings, which strengthens social cohesion and a sense of belonging to the local community. A high-quality, inclusive, accessible and safe public space becomes a catalyst for informal social ties, which are the foundation of a healthy civil society.

From a cultural perspective, public spaces in historic cities are carriers and transmitters of cultural heritage. The architectural ensembles that surround them, monuments, paving, and landscaping elements are all part of the tangible heritage that reflects the history of the city. However, intangible heritage is no less important: historical events that took place here, traditions of using space, collective memories and local traditions. In this sense, public space acts as a source of reflection of national historical traditions and, at the same time, as a "stage" on which cultural identity is constantly recreated and reinterpreted. Preserving and emphasising these cultural layers is a fundamental task for ensuring the cultural sustainability of a city.

Modern public spaces in historic centres are a powerful source of local economic development. They increase the attractiveness of the area for residents, businesses and tourists. Properly designed, well-maintained and functional squares and streets stimulate the development of small and medium-sized businesses (cafes, restaurants, shops, galleries), creating new jobs. The unique atmosphere and aesthetic appeal of historic spaces are key factors in the development of tourism, which generates significant revenue for the local budget. In addition, investments in the improvement of public spaces directly affect the profitability and investment attractiveness of adjacent real estate.

Historical centres are usually characterised by dense development, which affects their environmental friendliness. Squares, parks, boulevards and individual green spaces, which are elements of the so-called "green infrastructure", contribute to improving the microclimate, absorbing carbon dioxide and reducing noise pollution in the city. Giving priority to pedestrians and cyclists in public spaces helps reduce dependence on private cars, which leads to lower air pollution and improves the overall state of the environment. The revitalisation of public spaces in historic cities, taking into account environmental principles, is a significant contribution to environmental sustainability and the health of the urban population.

Public spaces in a historic environment should be viewed as a complex at the intersection of social, cultural, economic and environmental interests. Their analysis and development is not simply a matter of improvement and compliance with certain regulatory requirements, but a strategic task aimed at ensuring a balanced and sustainable future for historic cities.

The revitalisation of historic centres is a complex process that requires a delicate balance between preserving heritage and implementing the changes necessary for modern life.

The role of modern technologies in revitalisation should be highlighted separately. Digital tools are becoming an integral part of the analysis and design process. A systematic review of current methodologies shows the growing use of digital methods to gain a deeper understanding of the existing situation and model future changes [48]. Geographic information systems (GIS) allow for comprehensive spatial analysis by overlaying layers of data on land use, population density, transport flows, and the historical and cultural value of objects. 3D modelling and virtual reality (VR) make it possible to visualise design proposals in their existing context, assessing their visual impact before construction begins. Analysis of big data obtained from mobile networks or social media can provide unique information about key trends in people's behaviour, their preferences and certain generalisations about the perception of space by different social groups.

In order for the analysis of public spaces to be objective and structured, it is necessary to define *a system of principles and criteria* by which they should be evaluated. These criteria allow us to decipher the concept of "quality" of space and define certain measurement and comparison parameters. These principles and criteria should form the basis for field surveys, sociological surveys and analytical work, and ultimately for the formation of technical design specifications. Let us try to formulate the key principles that summarise the current understanding of quality public space and define the corresponding evaluation criteria .

According to the authors, there are five key principles for the successful functioning of public spaces in historic cities, according to which it is proposed to analyse their current state and the possibilities for ensuring their accessibility and inclusiveness. These principles include: contextuality and authenticity; accessibility and inclusiveness; functionality; comfort and safety; identity and recognisability (Fig. 50).

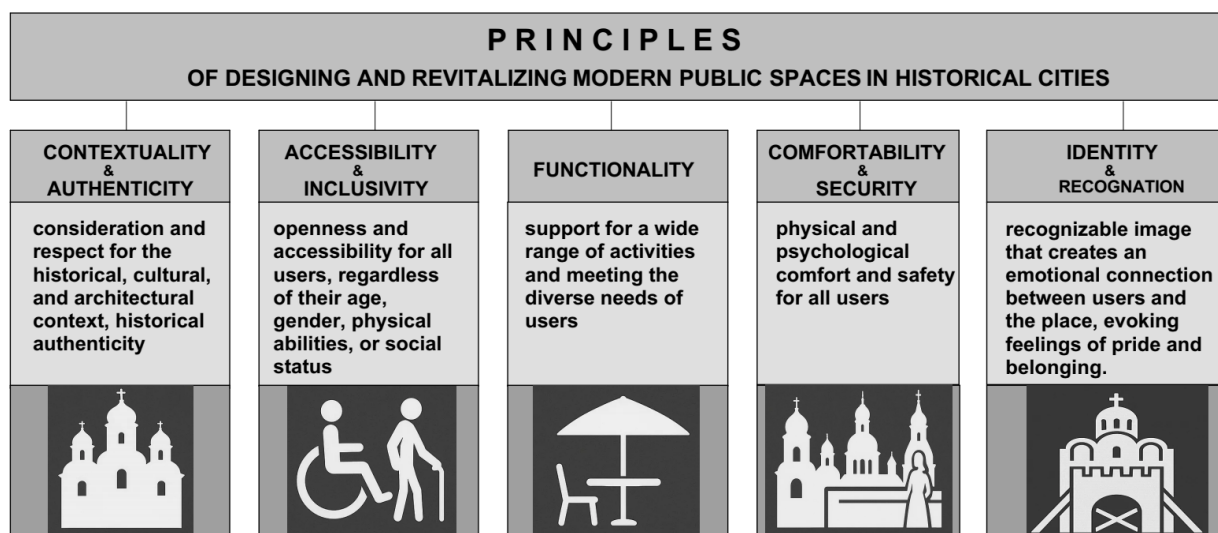


Fig. 50. Principles of designing and revitalising public spaces in historic cities. (Author's diagram)

The principle of contextuality and authenticity. This principle is decisive for the historical environment. It requires that any changes and innovations take into account and respect the unique historical, cultural and architectural context of the place. The design and revitalisation of historic public spaces according to this principle primarily involves preserving the historic planning structure and configuration of the space. It is also important to ensure a harmonious relationship between the space itself and its architectural surroundings (scale, consistency in style and materials). When analysing existing spaces, it is important to carefully study the condition and visual accessibility of the historical elements of public spaces (paving, street lamps, fountains, monuments, etc.) and to check that new landscaping elements are in keeping with the overall historical and stylistic character of the environment. It is also necessary to pay attention to so-called "visual noise" (inappropriate advertising, temporary structures, chaotic parking), which distorts the perception of the historical landscape and is an important negative factor for the successful revitalisation of such spaces.

The principle of accessibility and inclusiveness. This principle has been discussed in detail in previous sections of our guide. Indeed, it is extremely important that public spaces are open, accessible and welcoming to all user groups, regardless of their age, gender, physical abilities or social status. To summarise the previous conclusions, it can be noted that not only physical accessibility is extremely important, but also psychological, socio-economic, visual, transport and all other types of accessibility related to people's mental needs and characteristics. This is especially important for public spaces in historic cities, which are not only objects for observation, study and use by different groups of people, but also an important factor influencing their psychological well-being, national self-identification, socialisation and other mental manifestations.

The principle of functionality. Adherence to this principle involves supporting a wide range of activities and meeting the diverse needs of users of public spaces. Monofunctional spaces, whose activity is limited to certain hours or seasons, are undoubtedly less sustainable and viable. When assessing public spaces in terms of their suitability for active use, attention should be paid to criteria such as: the availability of areas for various possible activities for space users — areas for active (sports, games) and passive (contemplation, reading, communication) recreation. Another important component is the availability of basic amenities: seating, litter bins, public toilets, drinking fountains, Wi-Fi. Attention should also be paid to their quality and suitability for the historical surroundings.

It is also important to have the possibility of multifunctional use of various elements (for example, wide stairs can serve as amphitheatres, and curbs can serve as seating areas), flexibility and adaptability of the space, i.e. the possibility of using it for various temporary events (fairs, concerts, exhibitions). The activity of the space throughout the day and year should be checked: does the space remain attractive and lively in the evening, in winter, on weekdays?

The principle of comfort and safety. People spend time in places where they feel physically and psychologically comfortable and safe, and therefore this principle is a basic prerequisite for the success of any public space. When analysing the condition of a space with a view to improving it, attention should be paid not only to physical comfort (the presence of shaded and sunny areas, protection from wind and precipitation, the quality and ergonomics of street furniture), but also on the environmental friendliness and safety of the space (sufficient lighting at night, absence of dark, neglected corners, good visual permeability), noise level, air quality, cleanliness and tidiness of the territory.

Traffic safety can also be considered an element of space safety: clear separation of pedestrian, bicycle and vehicle traffic, safe crossings, etc. We should also not forget about the subjective perception of safety by users of the space: fear of aggression from other participants, other social groups, marginal elements, and so on.

For Ukraine, after the start of the war, security factors related to possible bombings, shelling and other threats characteristic of martial law have become particularly important. The availability of shelters (stationary and mobile), the availability of metro stations, their accessibility, openness and safety are becoming important criteria for the compliance of public spaces with security requirements.

The principle of identity and recognisability. A successful public space must have a strong, positive and recognisable image. It is the presence of such an image (outline, silhouette) that creates an emotional connection between users and the place, evoking feelings of pride and belonging to a particular community. Such recognisable elements are not necessarily historical monuments; sometimes they can be natural landscapes or modern additions (sculptural elements, Ferris wheels and other visual or functional accents). The presence of unique features and landmarks makes the space more recognisable and aesthetically appealing. The quality of such design elements is also important, especially when it comes to modern additions.

An extremely important factor, which is difficult to quantify, is the ability of a space to evoke positive associations and memories in users. There are practically no specific criteria for its objective assessment, but important components that positively influence such qualities can be design elements and art objects related to local traditions and national culture, close to the historical environment, or, conversely, modern inclusions of art elements that contrast with the historical environment (in which case their quality is particularly important). The degree to which the image of a space is reflected in the media, art, tourist guides, etc. also has a significant impact on the recognisability of public spaces.

Applying these principles and evaluation criteria when analysing public spaces in a historical environment allows for a structured and comprehensive "diagnosis" to be carried out, identifying its strengths and weaknesses, determining its potential for development, and formulating clear tasks for further revitalisation.

An effective procedure for analysing public space in terms of accessibility and inclusiveness allows the abstract data obtained to be transformed into a concrete understanding of how the space functions, how it is perceived and used by people, and what hidden potentials and conflicts it contains. The process of analysing existing public spaces can be divided into *five interrelated stages*: preparatory work, data collection, data analysis (using various methods and digital tools), interpretation of results, and formulation of recommendations.

The preparatory stage involves defining the problem, setting the boundaries and determining the object of the study. The preparatory stage is fundamental to the entire analysis process, as it is at this stage that the foundations for the future study are laid, and its focus and scope are determined. The key tasks of the preparatory stage are to clearly define the territorial and thematic boundaries, as well as the object and subject of the analysis.

The first step is to formulate existing or potential challenges related to a given public space in a historical environment. Problems may relate to physical deterioration (damaged surfaces, outdated equipment), social dysfunction (low attendance, antisocial behaviour, existing or potential conflicts between user groups), loss of historical and cultural identity (unsuccessful modern interventions, commercialisation), environmental problems (insufficient greenery, noise, etc.) or economic inefficiency (decline in tourism potential, decline of adjacent commercial facilities). Based on the identified key issues and the overall objective of the analysis, research questions and working hypotheses are formulated, which will be tested during the analysis.

The next important step is to define *the boundaries of the study*: territorial, temporal and thematic (Fig. 51). Territorial (spatial) boundaries involve clearly delineating the study area on a map. This can be a single square, street, neighbourhood or an entire system of interconnected spaces in the historic core of the city. It is important to define not only the "core" of the study (e.g., a specific area), but also the "buffer zone" — the surrounding areas that directly affect the space (the facades of buildings that form its perimeter, the surrounding streets that generate pedestrian traffic, visual connections with dominant features, etc.).

An equally important factor for historic public centres is time limits: it is necessary to define the historical period of particular interest for analysis, as well as to outline the time frame for field surveys (taking into account daily, weekly and seasonal fluctuations in activity). The thematic boundaries of research into public spaces in a historical environment in terms of accessibility and inclusiveness include the identification of certain key aspects on which the research will focus. It is impossible to study absolutely all aspects of such accessibility, and therefore it is possible either to identify all the key issues and barriers that can be studied separately later, or to select priority areas for analysis and focus in detail on its individual aspects.

The object of analysis of public space in a historic city in terms of accessibility and inclusiveness is the public space itself (square, street, park or their complex or ensemble) as an integral system. *The subject of the study* is the specific properties, processes and relationships within this object. For example, the object of analysis may be a specific square in a specific historic city, and the subject may be the structure of pedestrian flows and their connection with the location of service facilities. Or the object may be a historic street, and the subject may be the conflict between its transit and recreational functions.

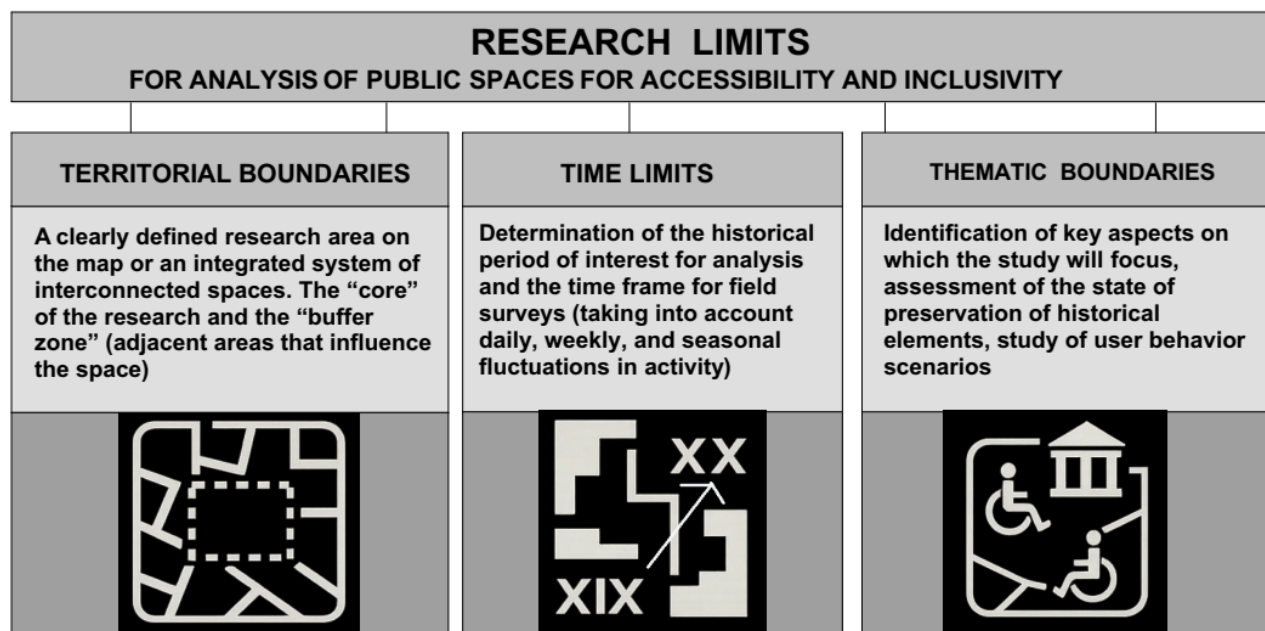


Fig. 51. Research boundaries in the analysis of public spaces. (Author's diagram)

At this stage, an interdisciplinary research group should be formed. The analysis of public space in a historical environment cannot be performed qualitatively by architects or urban planners alone. It is advisable to involve historians, art historians, sociologists, geographers, economists, ecologists and engineers in the research team. This approach ensures a comprehensive consideration of the problem from different points of view and avoids a certain narrowness and bias.

The preparatory stage should end with the development of a preliminary research plan (analysis of the public space or part thereof), the identification of the necessary resources (time, finances, equipment) and the agreement of the methodology with all interested parties (customers, local authorities, the community).

Once the conceptual framework of the study has been defined, *the stage of collecting source data* begins. This is one of the most labour-intensive stages, involving work with two main types of sources: theoretical (so-called "desk") research and field surveys. It is their combination that ensures the comprehensiveness of the analysis, as each type of data reveals different aspects of the space under study (Fig. 52).

Desk research is aimed at collecting and systematising existing information. It examines the context in which public space exists and allows its evolution to be traced. The main areas of desk research include: historical, archival and bibliographic analysis; analysis of the regulatory and legal framework, urban planning documentation, cartographic materials and statistical data.

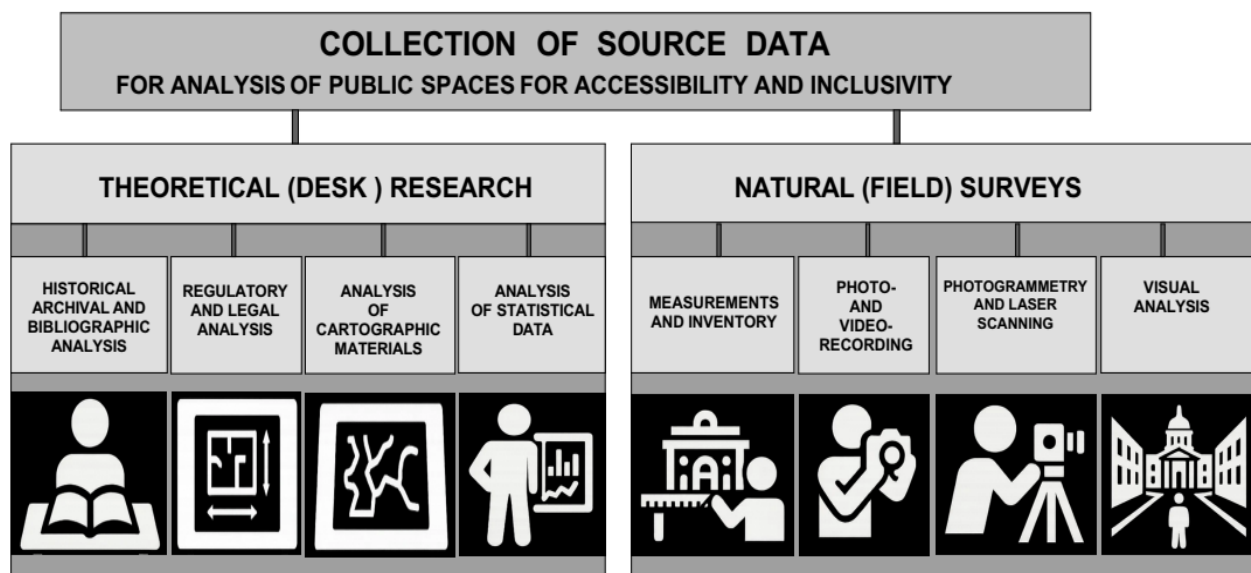


Fig. 52. Initial data for researching public space for accessibility and inclusiveness. (Author's diagram)

Historical, archival and bibliographic analysis involves working with archival documents, old maps, development plans, historical photographs, engravings, postcards, and written sources (memoirs, chronicles, newspaper publications, fiction). The goal is to study the stages of space formation, understand its primary function, identify lost elements, and trace changes in its morphology and significance for the city. This allows us to understand the "genetic code" of a place and its historical value.

Analysis of the regulatory framework and urban planning documentation: involves studying current laws on cultural heritage protection, monument protection zones, land use regimes, as well as norms and rules that define the requirements for ensuring the physical inclusiveness of public spaces. The city's master plan, detailed territorial plans, historical and architectural reference plan, state building standards, various

regulations, etc. are analysed. This provides an understanding of the legal restrictions and opportunities for any transformations in the space.

Analysis of cartographic materials: includes working with modern topographic plans, orthophoto plans, cadastral maps, thematic maps (transport, engineering networks, functional zoning schemes). These data form the basis for further spatial analysis and modelling. Collection of statistical data: involves processing demographic data (population size and structure of neighbouring areas), socio-economic indicators (income level, employment), tourism statistics (number of visitors, their origin), crime data, visitor statistics, etc.

Field research (field surveys) is aimed at collecting primary data directly in the territory of the public space under study. It allows us to record its current state and see how it lives and functions in real time. The main methods of field surveys include: inventory and technical survey; photo and video recording; photogrammetry, laser scanning and visual analysis (Fig. 4.1.3).

Inventory and technical survey: involves measurements, detailed description and assessment of the condition of all physical elements of the space: types of pavement, street furniture, lighting, landscaping, small architectural forms, orientation systems, accessibility elements (ramps, tactile tiles, etc.). The results are recorded in inventory records, on maps and in photographs.

Photo and video recording: this involves systematic filming of the space from different angles at different times of the day and year. Panoramic photography and aerial photography from drones are often used to obtain general views, as well as detailed shots of individual elements. Video recording can be used to analyse dynamic processes, such as pedestrian traffic. Photogrammetry, laser scanning and other means of digital recording of objects allow for very accurate scanning of the surroundings of public spaces and the creation of 3D models based on them. Visual analysis provides an expert assessment of the aesthetic and compositional characteristics of the space, determining points of visual perception and important angles. The silhouette of the buildings, the ratio of the height of the buildings to the width of the space, visual corridors and perspectives, the colour scheme of the facades, and the rhythm of the architectural elements are analysed. It also allows problems to be identified: visual clutter (excessive advertising, chaotic parking, non-compliance of various elements of the space with accessibility requirements).

The combination of data from desk and field research creates a multi-layered information base, as data from different sources complement and verify each other, creating a solid foundation for the next stage – in-depth analysis. The "raw" data collected at the previous stage does not in itself provide a complete understanding of public space. In order to obtain a specific result, it is necessary to apply analytical methods that will reveal patterns, establish cause-and-effect relationships, and understand underlying processes. The most effective approach in urban environment research is the use of mixed methods, which involves the integration of qualitative and quantitative analysis. This approach allows for a more complete, comprehensive and substantiated picture (Fig. 53).

Quantitative methods operate with numerical data and statistics, answering questions such as "how much?", "how often?", and "where?". Their strength lies in their objectivity, measurability, comparability, and ability to identify general trends in large samples. The main quantitative methods of analysing public spaces include: counting flows (systematic counting of pedestrians, cyclists and vehicles at key points in the space at different times of the day and days of the week), which allows you to determine the intensity of space use, identify the main routes of movement and "dead zones"; stationary observations of activity (recording the number of people engaged in various activities (sitting, talking, playing, eating) in specific areas of the space), which are collected at regular intervals and plotted on maps; questionnaires (surveys) (collection of standardised data from a large number of respondents using structured questionnaires); mapping of behavioural traces. Surveys allow for a quantitative assessment of satisfaction with the space, reveal the demographic profile of users, their preferences, the main scenarios for using the space, and identify barriers to ensuring its inclusiveness and accessibility (examples of possible questionnaires are provided in Appendix D.1). Mapping behavioural traces involves recording physical signs of space use (e.g., trampled paths on lawns indicate desired but missing routes), accumulations of rubbish, graffiti, etc., and identifying and recording problem areas for public space accessibility on a map.

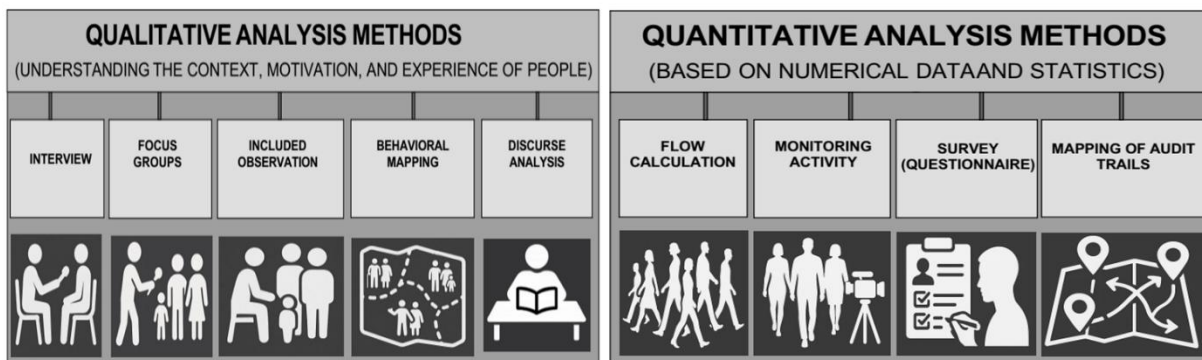


Fig. 53. Quantitative and qualitative methods of analysing public space in terms of accessibility and inclusiveness.
(Author's diagram)

Qualitative methods focus on a deep understanding of context, motivations, and people's experiences. They answer the questions "why?", "how?", and "what does this mean?". Although *qualitative data* cannot be statistically processed, it provides invaluable information about the subjective perception of space, its social significance and hidden factors. The main qualitative methods include: interviews (conversations with various users of the space (local residents, tourists, business owners), experts and government officials); discussions with focus groups; participant observation (when a researcher spends a long time in a space, observing social interactions, informal practices and the atmosphere "from within", sometimes participating in the life of the space); behavioural mapping; discourse analysis (analysis of texts related to public space — media publications, social media posts, official documents, advertising materials).

Unlike a questionnaire, an interview allows you to flexibly change the course of the conversation, ask clarifying questions, and get detailed, in-depth answers. A moderated discussion with a small focus group

(6-10 people) selected according to specific criteria (e.g., mothers with children, pensioners, young people) is an effective means of identifying common opinions, contradictions, and generating new ideas. *Behavioural mapping* is a kind of qualitative version of stationary observations, where the researcher does not simply count people, but sketches their exact location, posture, direction of gaze, interactions with other people and objects in detail on a map. This helps to understand how the design of a space influences behaviour. Discourse analysis allows us to identify dominant narratives, stereotypes, and ideological attitudes towards space (tourist attraction, object for commercial exploitation ("for profit") or as a place for people and recreation) [49].

The integration of these methods is a key aspect. Quantitative and qualitative data do not simply exist in parallel, but interact. For example, quantitative mapping may reveal that a certain part of the area is hardly used, while qualitative interviews with residents may explain the reason. Or a survey may show a high level of dissatisfaction with certain areas, while a focus group may reveal that the main problem is not benches or paths, but a sense of conflict between cyclists and pedestrians. Combining discourse analysis with spatial data, for example, can show how discussions of urban greening in the media correlate with actual changes in specific areas [48]. This comprehensive approach provides a deep and multifaceted understanding of public space, which is a prerequisite for developing effective solutions.

Use of digital tools and technologies. Modern analysis of the urban environment is impossible without the use of digital tools and technologies, which not only automate and accelerate data collection and processing, but also open up fundamentally new opportunities for analysis, modelling and visualisation of spatial processes. The use of modern technologies is an important component of advanced approaches to the revitalisation of historic city centres in terms of inclusiveness and accessibility [49]. In the context of public space analysis, geographic information systems (GIS), spatial analysis tools and 3D modelling play a crucial role.

Geographic information systems (GIS) are a powerful platform for the integration, management, analysis and visualisation of any spatially referenced data. GIS transforms static maps into dynamic databases where each object (building, tree, bench) has not only geographical coordinates but also a set of attributes (year of construction, condition, material, etc.). The main capabilities of GIS analysis for public spaces include: Overlay Analysis (which allows different thematic layers of data to be superimposed on each other to identify relationships. For example, you can overlay a crime map on a map of lighting in a space to test the hypothesis of a link between poor lighting and dangerous areas, or combine a map of playground locations with a map of child population density to assess their provision and accessibility); Proximity Analysis (which allows you to identify areas within walking distance of public spaces, transport stops, schools or cafes); Network Analysis (allows you to model pedestrian and transport movement along the existing network of streets and paths); Density/Hotspot Analysis (visualises the concentration of certain phenomena, identifies their key nodes and peripheral areas). [49].

Separately, we can highlight *spatial analysis tools* that complement the capabilities of GIS (Space Syntax

(a set of methods for analysing spatial configurations of street and road networks, for which integration indicators are calculated); 3D modelling and virtual reality (VR) - provide opportunities for more realistic visualisation and analysis; scenario modelling (3D models allow you to virtually "play out" various transformation scenarios: add trees, change the pavement, which helps to assess the visual impact of future changes on the historical environment before any transformations begin). Interactive 3D models and VR tours are a powerful tool for communicating with residents. Instead of complex drawings, people can "walk" through the future space, making the discussion process more inclusive and understandable. Data from mobile devices and sensors is increasingly being used (combined data from mobile operators can provide unprecedented information about the movement of large crowds around the city). Stationary sensors can automatically collect data on the number of people, noise levels, air quality, etc. The use of these modern digital methods significantly increases the accuracy, objectivity, and depth of analysis of public spaces [48].

Analysis and interpretation of results: from data to conclusions. The final stage of the analysis procedure is data synthesis. The research team brings together the results obtained using various methods: historical and archival findings, field survey data, survey statistics, in-depth conclusions from interviews, GIS analysis results, and spatial modelling. The main goal of this stage is to reveal a complete picture, identify points of intersection, confirmation or contradiction between different types of data. SWOT analysis is often used to structure the synthesised information and identify key problems and potentials. This tool allows the results to be systematised into four categories: Strengths (internal positive characteristics of the space); Weaknesses (internal negative characteristics); Opportunities (external factors that can be used to improve the space); Threats (external factors that can negatively affect the space). After structuring the data, key barriers and problems are identified and conclusions are formulated, patterns and cause-and-effect relationships are determined.

Conclusions should be clear, concise and directly answer the research questions posed in the preparatory stage. Each conclusion should be based on specific data obtained during the analysis. The final result of the analysis stage is the development of strategic recommendations. Unlike conclusions, which state facts, recommendations outline possible directions for improving the space based on the identified problems and potential of the public space. Recommendations can be strategic in nature, defining the overall direction of development; tactical, specifying concrete measures to ensure the accessibility and inclusiveness of public spaces; or political, relating to changes in laws, norms, rules, and governance.

An important element is *the correct visualisation of results*. Complex analytical data must be presented in an understandable and clear form for a wide range of stakeholders, from architects and officials to ordinary residents. To this end, thematic maps, diagrams, graphs, charts, infographics and 3D visualisations are used. High-quality visualisation is key to the effective use of analysis results and is a compelling argument in the process of making further management and project decisions.

4.2. PROGRAMME FOR ANALYSING PS IN A HISTORICAL CITY FROM THE POINT OF VIEW OF ACCESSIBILITY AND INCLUSIVITY

The transition from theoretical principles and individual procedures to the practical implementation of a research project requires the development of a clear and comprehensive analysis programme. The programme is a roadmap that systematises all stages of the research, determines their sequence, necessary resources and expected results, and transforms the complex task of analysing public spaces in a historical environment into a manageable, logical, consistent and effective process. Unlike a simple list of methods, the programme integrates them into a single system aimed at achieving a specific goal.

Formulation of the research programme's goals, objectives and hypotheses. The *research goal* is a generalised, strategic statement about the end result that the research team aims to achieve. The goal should be ambitious but achievable within the scope of a specific project. It serves as a guideline that unifies all further actions.

The *research objectives* are specific, measurable steps that must be taken to achieve the goal, which detail the goal and break its achievement down into separate analytical blocks. *The list of tasks for analysing public spaces in a historical environment may include:*

1. Conducting historical, archival, and bibliographic analysis to identify the historical evolution of a particular space, its historical function, and to identify lost elements and value characteristics.
2. Performing a comprehensive field survey of the object, including recording its current physical condition, functional zoning, transport and pedestrian flows, and amenities. Identifying existing barriers to accessibility and inclusiveness.
3. Researching the social aspects of the current use of the space by conducting sociological surveys, in-depth interviews, and structured observations to determine the behavioural characteristics, needs, and requests of different user groups.
4. Analysis of the spatial planning structure of the object and its connection with the surrounding buildings using urban planning analysis methods and GIS technologies.
5. Comparative analysis of successful practices in implementing accessibility and inclusiveness of similar spaces in other historic cities.
6. Synthesis of the data obtained and development of conceptual proposals, including functional, spatial and socio-cultural models for the development of the object.

Research hypotheses are well-founded assumptions about possible outcomes or relationships that the research should confirm or refute. Formulating hypotheses focuses analytical work on testing specific statements. Hypotheses are based on a preliminary analysis of the problem and existing theories and can determine specific directions for solving problems related to the accessibility and inclusiveness of space. Testing such hypotheses allows us to move from descriptive analysis to explanatory analysis, providing a deeper understanding of the cause-and-effect relationships in the functioning of public space.

Choice of methodology and tools. The research methodology determines its overall logic and strategy. For the analysis of public spaces in a historical environment from the point of view of accessibility and inclusiveness, it must be comprehensive and interdisciplinary, combining architectural, urban planning, sociological, historical, geographical, as well as economic and technological aspects. At the stage of selecting the methodology and tools, all qualitative and quantitative methods, or their individual elements described in the previous section, can be chosen for implementation. The key task is their integration. The research tools are a specific set of means used to apply the selected methods.

Programme implementation stages: schedule and resources. The effective implementation of a research programme to ensure the accessibility and inclusiveness of public spaces in historic cities is a complex and multifaceted task that requires clear planning in terms of time and an adequate assessment of the necessary resources. Planning transforms the research methodology into an operational action plan that allows you to control the progress of the project and ensure its timely implementation.

The stages of programme implementation follow a logical sequence, with the results of the previous stage serving as the basis for the next. Although some processes can be carried out in parallel, the overall structure is linear.

Here is a *generalised action plan* for ensuring the accessibility and inclusiveness of a specific historical public space:

1. *Preparatory stage* (1-2 months).
2. *Formation of an interdisciplinary research group* (architect-urban planner, sociologist, historian, GIS specialist).
3. *Finalisation of the research programme*: clarification of goals, objectives, and hypotheses.
4. *Conducting theoretical (desk) research*: collection and preliminary analysis of existing data (cartographic materials, master plan, historical references, previous studies).
5. *Development of tools*: creation of questionnaires, interview schemes, checklists for observations.
6. *Conducting a pilot study* (e.g., testing the questionnaire on a small group of respondents) to identify and correct shortcomings.
7. *Data collection stage* (field surveys) (2-3 months).
8. Conducting a *mass sociological survey*.
9. Conducting *in-depth expert interviews*.
10. Conducting a *series of field surveys* and observations at different times of the day, days of the week and seasons to record the dynamics of space use.
11. *Photo and video recording* of the object, aerial photography (if necessary and possible).
12. *Work in archives and libraries* for in-depth historical analysis.
13. *Data analysis and processing stage* (2-3 months).
14. *Entering questionnaire data into a statistical programme*, cleaning and analysing it.
15. *Transcription and coding of interview recordings* (thematic analysis).

16. *Digitisation and vectorisation of cartographic data*, creation of analytical layers in GIS.
17. *Systematisation of field survey and observation data*.
18. *Integration and cross-analysis of qualitative and quantitative data* to test hypotheses.
19. *Synthesis and conclusion stage* (1-2 months).
20. *Conducting a SWOT analysis* to identify strengths, weaknesses, opportunities, and threats for the development of the space.
21. *Formulation of key research conclusions*.
22. *Development of conceptual scenarios and recommendations* to ensure the accessibility and inclusiveness of public space.
23. *Preparation of final reporting materials*: analytical report, visualisations, presentation.

Creating a schedule is an important project management tool that allows you to track progress, identify delays, and coordinate the work of different team members. The next important step is team building and resource assessment.

Resources are divided into three main categories: *human resources*; *financial resources*; *material and technical resources*.

Human resources include: project manager (responsible for overall coordination, communication, and meeting deadlines); core research team (specialists in relevant fields: architect, sociologist, historian, GIS analyst, who directly perform analytical work); technical staff (interviewers for mass surveys, data entry assistants); consultants: narrow-profile experts (e.g., dendrologist, transport engineer) who are involved as needed.

Financial resources consist of: payroll (salaries for all specialists involved); operating expenses (office rent, utilities, office supplies); technical research expenses (printing of questionnaires, transportation costs for field work, payment for access to archives or databases); software (costs of purchasing or subscribing to licensed software (statistical packages, GIS, graphic editors)); unforeseen expenses: a reserve of 10-15% of the total budget.

Material and technical resources include: office equipment (computers with appropriate technical characteristics, printers, scanners); field equipment (photo and video cameras, voice recorders, tablets, GPS receivers, measuring instruments); access to information resources (libraries, archives, electronic databases).

Detailed *calculation of resources and budgeting* at the preparatory stage allows avoiding crisis situations during project implementation and ensures its stable financing.

Format for presenting analysis results for management decision-making. The ultimate goal of a comprehensive public space analysis programme is not the analysis itself, but the creation of an information base for making informed management, project and strategic decisions. Therefore, the format for presenting the results should be adapted to the needs of end users — local authorities, architects, investors

and the public. The information should not only be reliable, but also understandable, clear and convincing. The role of public spaces as the basis for sustainable urban development requires that the results of the analysis be presented in a format that promotes constructive dialogue and informed decision-making [49].

An effective reporting package usually consists of several components designed for different target audiences - a comprehensive analytical report (the most complete document containing a detailed description of the methodology, all stages of the study, a complete analysis of the collected data, tables, graphs and comprehensive conclusions). The structure of such a report should include: an introduction, a literature review, a description of the methodology, sections devoted to each block of analysis (historical, spatial, social, etc.), a synthesis of results, conclusions and recommendations, and appendices (questionnaires, interview questions, source data).

An executive summary is a short (3-5 pages) document that presents the key issues, main conclusions and most important recommendations of the study in a concise and accessible form. Such a summary is prepared for city leaders, deputies, potential investors — that is, decision-makers who do not have time to study the full report. The language of such a summary should be clear, concise, and free of highly specialised terminology. The emphasis is on practical implications and proposed actions. It is advisable to accompany such a summary with key visualisations (the most illustrative diagrams and maps).

Visual and cartographic materials include: analytical maps (GIS) (maps of functional zoning, pedestrian and transport accessibility, activity density, visual corridors, noise pollution, greening status [49]); infographics (graphical representation of statistical data (e.g., age structure of users, distribution of opinions on spatial issues, daily activity dynamics, etc.)); 3D visualisations and models (demonstration of the current state and possible scenarios for the transformation of space, including realistic visualisations of project proposals); photo collages and diagrams.

The public presentation of the research results can be held at public hearings, urban planning council meetings, meetings with residents — in a slide show (PowerPoint) that combines key points from the summary and the most striking visual materials. The presentation should be dynamic, understandable, and designed for a 15-20 minute speech, leaving time for questions and discussion. A properly structured and adapted presentation of the results transforms academic research into an effective tool for urban development, promoting transparency and involving all stakeholders in the decision-making process.

Analysing the accessibility and inclusiveness of public spaces in a historical environment is one of the most difficult and, at the same time, most important tasks of modern urban planning. These spaces are not just a collection of buildings and areas, but living socio-cultural organisms in which collective memory, community identity and the dynamic needs of the present are intertwined. The integration of historical, sociological, spatial-environmental, and economic analysis allows for a multidimensional understanding of the object, revealing not only visible problems but also hidden potentials and conflicts.

4.3. DESIGNING THE MODERNISATION OF PS IN A HISTORICAL CITY FROM THE POINT OF VIEW OF ACCESSIBILITY AND INCLUSIVITY. APPLICATION OF DIGITAL TECHNOLOGIES AND ARTIFICIAL INTELLIGENCE (AI) TO ENSURE THE INCLUSIVITY OF PUBLIC SPACES IN HISTORICAL CITIES

The application of digital technologies and the integration of artificial intelligence (AI) into architecture and urban design has evolved significantly in recent years, particularly with regard to the preservation and accessibility of historic spaces. Despite advances in preservation technologies, historical sites often pose extremely difficult challenges for architects in terms of ensuring their accessibility. Many of these sites are not equipped to accommodate people with different types of disabilities, which creates barriers to their full participation in cultural events and access to cultural heritage sites [51]. The integration of AI tools can play a crucial role in addressing these issues by creating an environment that is more inclusive for all visitors.

The current challenges of ensuring accessibility in historic cities are characterised by a complex interaction between the needs of inclusivity and the requirements of cultural heritage preservation. Traditional approaches to creating an accessible environment often conflict with the architectural and urban planning features of historic centres, creating a dilemma between modernisation and authenticity [52]. The physical limitations of historic buildings – narrow passageways, stairs, uneven surfaces – make it impossible to apply standard accessibility solutions without significant intervention in the structure of the buildings. At the same time, growing public demands for inclusiveness and international accessibility standards create legal and ethical pressure to expand the inclusiveness of public spaces.

Historic cities are characterised by a unique architectural fabric, formed over centuries without regard to modern accessibility standards. Their value lies precisely in the authenticity of their layout, materials and structural solutions [53]. The preservation of cultural heritage is regulated by international conventions and national legislation, which limit the possibilities for physical intervention. This creates a unique context where traditional accessibility solutions may conflict with conservation principles. The main challenge is to find solutions that do not violate the historical integrity of the sites but ensure usability for all categories of users. This requires creative approaches and innovative technologies [52].

Barrier-free urban environments represent a multidimensional concept that goes beyond the traditional understanding of physical accessibility. The modern interpretation includes physical, cognitive, sensory and informational accessibility, creating a comprehensive system of requirements for urban space [54]. Physical accessibility covers infrastructure elements such as ramps, lifts, wide passageways and tactile surfaces. Cognitive accessibility refers to the clarity of navigation, the clarity of information systems, and the ease of orientation in space. Sensory accessibility includes adaptations for people with visual or hearing impairments through sound signals, contrasting elements, and alternative information formats.

Digital technologies, in particular AI, offer opportunities to create "invisible" accessibility – solutions that do

not change the physical structure of objects but improve the experience of using them. Virtual tours, augmented reality, and intelligent navigation systems can compensate for physical limitations [55] .

Key AI technologies for improving the accessibility of urban spaces. Artificial intelligence can be represented in a complex of technologies that can revolutionise approaches to ensuring accessibility in historic urban spaces. Modern AI solutions cover a wide range of applications: from automatic speech recognition (ASR) to complex computer vision systems that can analyse architectural barriers and offer adaptive solutions [54]. Google Neural Machine Translation (GNMT) and Google Vision API demonstrate the potential to overcome language and visual barriers, which are particularly relevant in multicultural historic cities [54].

Computer vision enables automatic recognition of architectural obstacles, analysis of pedestrian flows, and identification of potentially dangerous areas. Image recognition technologies in cultural heritage sites [55] allow the creation of detailed virtual accessibility maps that take into account the specifics of historical sites. Speech processing, text translation, audio guides, and live communication contribute to the creation of intelligent information systems capable of providing personalised recommendations and instructions in different languages, taking into account the cognitive characteristics of users with various types of limitations.

Digital twins and metaverses in the context of historic cities. *Digital twins* — virtual copies of physical objects — are a revolutionary approach to modelling and managing accessibility in historic urban spaces. They allow for detailed accessibility analysis and provide familiarity with individual historical objects and complexes without the risk of damaging authentic historical structures [56] . Generative AI methods integrated with digital twins open up new opportunities for solving the problems of historic cities [57], allowing for the modelling of various scenarios for improving accessibility and assessing their impact on cultural heritage preservation. Digital twins are not just digital copies of physical systems and environments. This concept differs from other approaches to data analysis and visualisation in that they can integrate data from different sources in real time and evaluate future scenarios using advanced modelling. When applied in urban environments, DTs can lead to revolutionary changes in approaches to management, monitoring and future planning of modern cities. For example, in Rotterdam (Netherlands), a 3-D urban operating platform has been built that allows real-time energy usage data to be revealed and visualised in individual buildings, the city and the region as a whole.

Flanders (Belgium) is developing a traffic model as part of the DUET Digital Twins project, which estimates the expected traffic volume on adjacent streets when one or more streets are closed. The city of Utrecht (Netherlands) is also using digital twin technology to develop solutions for ensuring the mobility of the population and promoting a healthy urban lifestyle. In Barcelona (Spain), *Sentilo* software uses thousands of sensors installed in public places throughout the city to collect real-time data on various aspects of the urban environment: people flow, noise levels, temperature, air quality and many others. This data provides valuable information that is used to power AI-accelerated digital twins, which enable more efficient urban

planning, resource management, and organisation of public spaces. [59]

Metaverses create parallel digital spaces through extended reality (XR) technologies [58]. For people with disabilities, this opens up opportunities for virtual exploration of historical spaces that may be physically inaccessible to them.

Augmented reality (AR) and virtual reality (VR) allow for the formation of coexisting layers of the urban environment, creating collections of urban metaverses [56]. These technologies are particularly valuable for historic cities, as they allow for additional informational and navigational support without physically interfering with authentic structures.

International experience in using AI for cultural heritage preservation. Global practice demonstrates a growing trend towards the integration of artificial intelligence into cultural heritage preservation and management processes, and highlights the significant potential of these technologies for effective and less invasive conservation of historical objects. AI-based predictive research allows to anticipate restoration and preventive maintenance needs, which is particularly important for maintaining the accessibility of infrastructure in historic cities. 3D reconstruction using AI creates accurate digital models that allow virtual exploration of cultural heritage sites without compromising their authenticity [52]. The integration of AI in the built environment includes voice control, gesture-based interfaces, and other intelligent systems. The implementation of such systems significantly improves the accessibility of public spaces.

IoT-based interactive environments significantly improve the visitor experience at heritage sites [55] by creating personalised routes and adaptive information support. Image recognition technologies enable the creation of detailed audio descriptions for people with visual impairments. Practical studies of the experience of visiting heritage sites by people with various types of disabilities [58] provide valuable information about the effectiveness of AI solutions in real-world conditions. Multimodal interfaces enable interaction with systems through voice, touch and gestures, adapting to the individual needs and preferences of users with various types of disabilities.

Along with ensuring the inclusiveness of public spaces for people with special needs directly through virtual and augmented reality, multimodal interfaces, interactive environments, etc., the use of AI is also envisaged for monitoring the physical accessibility features provided in public spaces. Real-time accessibility monitoring systems use a set of sensors to track the status of ramps, lifts and other elements of accessible infrastructure. Automatic fault notifications allow problems to be resolved quickly and users to be redirected to alternative routes.

The city of Barcelona (Spain) can be considered one of the leaders in the application of modern AI technologies in Europe. Barcelona demonstrates one of the most advanced approaches in Europe to the integration of artificial intelligence (AI) technologies into urban planning and management. , the Barcelona Supercomputing Centre (BSC-CNS) , plays a key role in this process. It hosts the high-performance MareNostrum 5 complex, which is part of the European High Performance Computing Joint Undertaking

(EuroHPC JU) family of supercomputers. Interestingly, the computer centre itself, located in 2005 in the Torre Girona chapel with neoclassical architecture, built in the 1940s, not only serves as the most powerful computer centre in Europe, but was also voted the most beautiful data centre in the world in 2017. (Fig. 54) [59] .

An important component of the centre's scientific and technical research is the development of a digital twin of Barcelona, which makes it possible to assess potential changes in the urban environment and their impact on different social groups. Such a tool not only optimises transport infrastructure and energy consumption in buildings, but also ensures that public spaces are adapted to the needs of the elderly, people with disabilities and other vulnerable groups. Additional tools include the Sentilo system, which collects data from thousands of urban sensors, and the CALIOPE-Urban model, which predicts air pollution levels at the street level . The data obtained is integrated into digital models, facilitating more inclusive and scientifically sound decisions. In Barcelona, AI is used to analyse and improve the environment, where not only transport options are important, but also the availability of convenient recreation areas, clear navigation, and the absence of physical barriers. Urban projects include sensors in public spaces, voice navigation technologies, interactive services, and digital platforms that help people with different needs navigate the city.



Fig. 54. *Barcelona Supercomputing Centre (BSC-CNS), located in the Torre Girona chapel. (Photo: Cheah, J. (2024, October 31).*

The implementation of voice AI tools API allows people with disabilities to use public services through voice control and receive assistance in moving around the city. This increases the accessibility and inclusiveness

of public spaces, while adhering to the principles of data security and privacy. In Barcelona, digital twins of the city are used to model the impact of new projects on infrastructure accessibility (e.g., access to public transport, hospitals, libraries). These tools make it possible to assess which areas of the city are not covered by services or have accessibility issues in order to make informed decisions to improve the urban environment.

In Barcelona, special attention is paid to involving citizens in the development of algorithmic solutions. For example, as part of the Mercè project, city residents participated in the creation of computer models, assessing the quality parameters of more than 3,000 streets (including the presence of greenery, the width of pavements, and the accessibility of urban infrastructure). This contributed to the formation of more comprehensive models that take into account spatial characteristics and social perceptions of the urban environment (). In addition, Barcelona is actively involved in shaping the ethical framework for the application of urban AI. The Global Observatory of Urban Artificial Intelligence (GOUIAI) initiative, launched by Barcelona in collaboration with other European cities, emphasises the importance of digital rights, social justice and cultural sensitivity in the implementation of innovations. [59]. In addition to Barcelona (Spain), other notable global centres for the application of AI in shaping the accessibility of public centres include cities such as Singapore (a city-state in Southeast Asia), Gothenburg (Sweden), Fukuoka (Japan), and Las Rozas (Spain). These cities demonstrate different approaches, but they all focus on integrating AI to create inclusive, safe, and convenient public spaces for all residents. Singapore is known as one of the most digitised cities in the world. Here, AI is used to analyse the use of urban spaces, manage infrastructure, improve accessibility and optimise land use in densely built-up areas. AI also helps to optimise transport systems, reduce waiting times and improve safety, which has a positive impact on the accessibility of public spaces for all population groups [60].

In *Gothenburg, Sweden*, digital twins of the city with integrated AI avatars are widely used to help residents and visitors plan routes, navigate public transport and spaces, and familiarise themselves with accessible areas in advance. This reduces barriers for people with disabilities and increases their involvement in city life [61]. Digital twins in Gothenburg simulate the accessibility of public transport by creating virtual copies of the city where various scenarios for the use of transport and urban spaces can be simulated and optimised. Thanks to this technology, residents and visitors, including those with disabilities, can plan their routes in advance through AI avatars that provide step-by-step voice instructions, help track bus arrivals, find accessible platforms, and more. This significantly reduces the physical and mental barriers to using public transport, making travel more independent and comfortable for people with disabilities. At the same time, the city benefits from increased use of public transport and reduced demand for specialised services, promoting social inclusion and economic development.

Fukuoka City (Japan) – focuses on creating dementia-friendly spaces, making extensive use of digital twins and AI for personalised support, which helps people with cognitive impairments to maintain their independence and be more involved in community life. Through initiatives such as infrastructure design,

specialised programmes and training seminars on humanism, as well as digital twins that provide personalised support through AI-based avatars. Digital twins make cities more suitable for such people, which is an extremely important advantage, as the number of elderly people suffering from dementia accounts for more than 12% of the world's population, and this figure continues to grow. [61].

In Las Rozas, a suburb of Madrid (Spain), AI is used to analyse traffic and pedestrian movements using cameras, helping to optimise the use of urban spaces by local residents. Las Rozas is one of the testing grounds for researchers from the EU-funded AMIGOS initiative, which uses new technologies such as artificial intelligence (AI) and data analysis to improve the quality of life in congested cities. This initiative is closely linked to the EU's Cities mission, which aims to support 112 European cities in achieving climate neutrality and transforming them into smart cities by 2030. These cities are set to become innovation hubs for sustainable urban development. The cameras used by the AMIGOS team were developed by the Austrian Institute of Technology and are powered by AI. This allows them to quickly process monthly camera recordings and create an accurate picture of how urban spaces are used. The information collected helps urban planners redesign public spaces to meet real needs. [62].

Challenges and limitations. Despite all the positives, the integration of artificial intelligence (AI) into the design and planning of barrier-free architecture in historic cities faces a number of significant challenges and limitations. One of the main obstacles is the lack of resources needed to implement AI-based solutions. Financial constraints, material availability, technological infrastructure, and the necessary technical expertise all affect the feasibility of implementing these innovative practices in urban settings [63]. This is particularly relevant for small historic cities, where a lack of funding prevents the implementation of AI-based innovations. In addition, the implementation of AI in historic cities faces various technical challenges that can vary significantly across different public spaces. The main problem is the difficulty of collecting accurate data on historical objects without damaging them [52]. Traditional 3D scanning methods may be limited due to the delicacy of historical materials and architectural elements. A fundamental problem is finding a balance between the implementation of modern technologies and the preservation of historical authenticity. The visual impact of technological elements can disrupt the aesthetic integrity of historical spaces, even if they improve its accessibility.

There is a conceptual conflict between the dynamic nature of AI technologies, which are constantly being updated and adapted, and the static nature of historical heritage, which seeks to preserve its immutability. This conflict is particularly noticeable when using digital twins and metaverses [56], where the virtual world can compete with authentic reality. The risk of "technologisation" of historical space is that over-reliance on AI can change the way cultural heritage is perceived and interacted with. Visitors may focus more on technological capabilities than on the historical value of objects. Over-reliance on AI technologies may lead to a loss of the real experience of interacting with historical space. There is a risk that technology will become an end in itself, overshadowing the primary goal of preserving and interpreting cultural heritage. Furthermore, creating "fake" accessibility through virtual solutions may be seen by managers as a way to

avoid real investment in physical accessibility. While digital solutions have their value, they should not completely replace efforts to improve physical access where possible without damaging historical sites.

Ethical issues. Ethical considerations are paramount when implementing AI technologies, especially when it comes to historic public spaces and cultural heritage in general. There is ongoing debate about the ethical implications of AI use, particularly regarding issues of bias, misinformation, and the preservation of historical accuracy. Key ethical principles for the use of AI should include transparency of algorithms, fairness of access, and protection of user privacy [54]. The principle of transparency requires that AI algorithms that affect the accessibility of public spaces be understandable and verifiable. Users have the right to know how the system makes decisions about route recommendations or the information provided. This is especially important for people with disabilities, who may be vulnerable to algorithmic discrimination. Fair access means that AI solutions should not create new forms of inequality or exacerbate existing ones. Systems should provide equal opportunities for all users, regardless of their type of disability, technical literacy or economic status. Privacy protection is particularly critical when using sensor systems and collecting data on user movements. It is necessary to implement the principles of data minimisation, anonymisation and giving users control over their personal information.

Prospects for development. The prospects for the development of AI to ensure accessibility in historic cities are linked to the improvement of existing technologies and the development of new approaches. A priority area is the development of non-invasive data collection methods that will allow the creation of detailed digital models of historic objects without the risk of damaging them [52]. The development of specialised algorithms for collecting information in a historical environment is critically important. These algorithms must take into account the unique characteristics of historical architecture and adapt to non-standard spatial configurations. The integration of augmented reality with AI systems offers new opportunities for information support for people with various types of disabilities [56]. The development of tactile and auditory interfaces can significantly expand the accessibility of historical spaces for people with sensory limitations. In general, the application of artificial intelligence technologies significantly expands the range of opportunities for improving the accessibility of the urban environment in historic centres. The main areas of application for AI include: the creation of virtual models of historic cities (for monitoring transport and pedestrian flows, modelling possible processes for creating barrier-free environments, creating virtual tours and excursions); the use of digital twin technologies (for audiovideo support for people with various cognitive impairments and other processes); the introduction of voice AI tools (ensuring the use of public transport for people with disabilities through voice control, assistance in moving around the city); processing data from public discussions on various design solutions for the organisation of public spaces, and much more.

FINAL WORD

Our guide focuses not only on the streets and squares of historic cities, but also on the people who use them every day: mothers with prams, elderly people who are afraid of steep ascents and descents; people with disabilities in wheelchairs — and without; tourists who get lost among incomprehensible navigation; residents who want to love their spaces, not avoid them. And at the same time, it is old stones, street panoramas, silhouettes of temples and squares that preserve the memory of generations. It is the balance between living people and a delicate attitude towards heritage that is the accessibility and inclusiveness of modern public spaces in historic cities. The inclusiveness of historic public spaces is not just about ramps, standards and coefficients. Above all, it is a respectful attitude towards people, a willingness to see everyone as a full participant in urban life. We perceive accessibility as a foundation — the ability to enter, move around, and use — and inclusiveness as the next step, when a space not only allows, but invites, accepts, and supports.

Historical public spaces are like living people: they have character and mood, a complex past and an uncertain future, but they strive to continue living. And our task as architects, urbanists, and researchers is to carefully help them change so that each new gesture is honest about history and attentive to contemporary needs. We believe in the power of dialogue: between old and new, between experts and the community, between paper archives and digital models. For us, modern technologies, geoinformation systems, 3D models, and artificial intelligence are not ends in themselves, but tools that allow us to better see the invisible, predict the consequences of decisions, and model routes and scenarios for the use of space. They provide an opportunity to make the city more transparent to understand and more comfortable for those who were often "overlooked" in the past.

The Ukrainian context gives this topic particular significance. War is painfully changing our cities, adding new nuances to the word "inclusiveness" — safety, shelter, evacuation routes, spaces for support and recovery. We are writing about the inclusivity of historical spaces at a time when history itself is being made before our eyes. And we really want to believe that during the reconstruction, Ukraine will be able to turn this difficult page into an opportunity — to build cities where human dignity and respect for heritage become real, rather than declarative, priorities. This guide is not a definitive answer or a "one-size-fits-all" solution. We would be delighted if the approaches, methodologies, examples, and digital tools presented here become a resource for you in your studies, design work, research, and communication with communities. If even one square, street, or small park in your city becomes a little more accessible, friendly, and honest thanks to this, our work will not have been in vain. We would like to thank everyone who inspired us to do this work: colleagues, students, partners, and city residents who shared their experiences, difficulties, and dreams. We sincerely hope that after reading this book, you will slightly change the direction of your professional and personal outlook towards inclusive, sensitive, vibrant historical spaces that are open to everyone.

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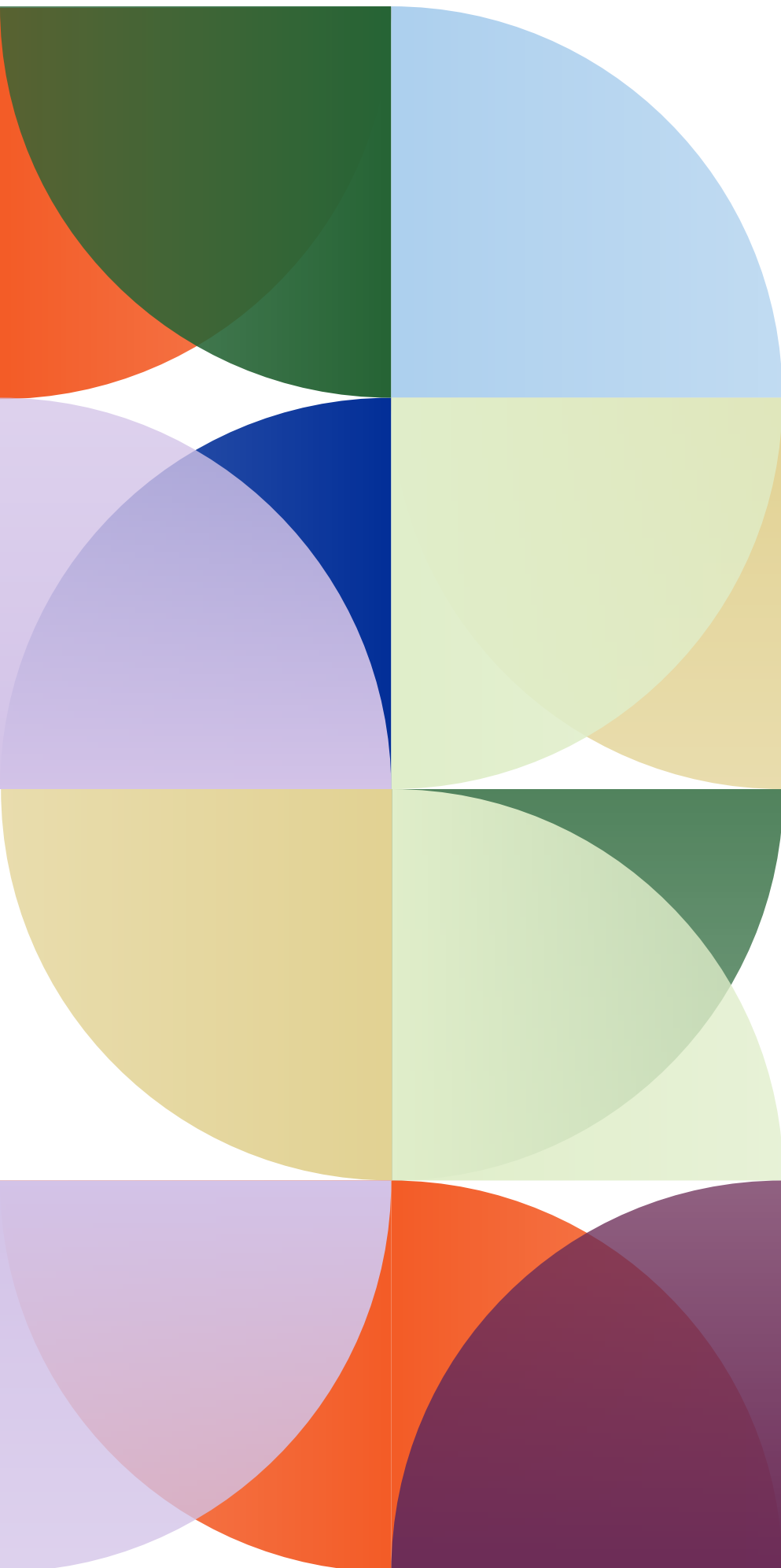
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