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INTRODUCTION

This volume brings together a diverse range of studies that primarily address issues related to urban space and contemporary directions in urban development. One of these studies is situated within the field of typomorphology and considers the urban landscape as a qualitative component of urban structure. By applying a comparative methodology, the study provides insights into the compositional identity of contemporary urban landscapes and the processes that shape them. Another study, focusing on urban grasslands, demonstrates that municipalities often lack spatially differentiated planning tools. Urban grasslands are increasingly promoted as a biodiversity-friendly alternative to conventionally managed lawns. Nevertheless, their implementation in Latvian cities remains fragmented and is rarely integrated into comprehensive green infrastructure planning. Historic market squares and town hall squares constitute an integral part of the urban environment and have traditionally served as important centres of urban life. Today, these spaces are gaining renewed significance as centres of cultural and social interaction and as strategically important places that contribute to urban vitality, social cohesion, and cultural identity. The interdisciplinary nature of urban research is further demonstrated by a study examining the spatial, geographical, and structural dimensions of the urban environment. Geography emphasises spatial patterns and the assessment of landscape quality, whereas urban studies focus on urban morphology, spatial composition, public space, and the human scale. Klaipėda, Lithuania's only ice-free seaport, is characterised by a historically multilayered urban environment. The interaction between the port, the historic city centre, and the ongoing transformation of waterfront areas contributes to a strong sense of place and a distinctive urban identity. A comparable perspective is presented in a study of Antalya, Türkiye, which examines processes of urban transformation and spatial expansion. In Latvia, a comprehensive method has been developed for identifying spatial landscape units to support landscape character assessment. The approach integrates geomorphological, land-cover, land-use, ecological, and cultural-historical data, complemented by field-based perceptual assessment. The use of timber as a construction material for small-scale architectural and design elements in public outdoor spaces is becoming increasingly widespread worldwide. Based on surveys conducted in eleven European cities, an assessment scale has been developed to facilitate a clearer understanding and comparison of the compositional criteria applied in different urban spaces. Finally, survey findings indicate that the majority of both adults and adolescents consider play and recreational elements appropriate for users of all ages. Nevertheless, preference is given to elements that encourage physical activity and are compositionally integrated with planting and vegetation.

PRIEKŠVārds

Izdevums apkopo daudzšķautņainu rakstura pētījumus, kas galvenokārt skar pilsētelpas jautājumus un attīstības virzienus. Viens no tiem ir veikts tipomorfoloģijas jomā. Šajā darbā pilsētas ainava tiek vērtēta kā pilsētas struktūras kvalitatīvs elements. Izmantojot salīdzinošo metodoloģiju, ir iegūti rezultāti, kas atspoguļo mūsdienu pilsētāinas veidošanās kompozicionālo identitāti. Savukārt, pētnieciskā darba rezultāts par pilsētvides zālieniem pierāda, ka pašvaldībām bieži trūkst telpiski diferencētu plānošanas rīku. Zālieņi arvien biežāk tiek popularizēti kā bioloģiskajai daudzveidībai draudzīga alternatīva. Tomēr to ieviešana Latvijas pilsētās joprojām ir fragmentāra un reti tiek integrēta visaptverošā zaļās infrastruktūras plānošanā. Neatņemama sastāvdaļa pilsētvidē ir vēsturiskajiem Tirdz. laukumiem jeb Rātslaukumiem, kuri vienmēr ir kalpojuši kā svarīgs pilsētas vēsturiskais centrs. Mūsdienās tie iegūst jaunu nozīmi kā kultūras un sociālās mijiedarbības centri - stratēģiski svarīgas vietas, kas veicina pilsētas dzīvotspēju, sociālo saliedētību un kultūras identitāti. Starpdisciplināras jomas kopības raksturs ir pierādīts pētījumā, kurš aplūko telpiski ģeogrāfiskos un urbānās struktūras aspektus. Ģeogrāfijas zinātne akcentē telpisko izteiksmi un ainavas kvalitātes novērtējumu, savukārt urbanisms akcentē pilsētvides morfoloģiju, kompozīciju, publisko telpu un cilvēka mērogu. Klaipēda ir vienīgā Lietuvas neaizsalstošā osta ar vēsturiski daudzslāņainu pilsētvidi. Osta, vēsturiskais centrs un piekrastes zonas transformācijas procesi veido spēcīgu vietas identitātes izteiksmi. Līdzīgs ir pētījums arī par Antāliju Turcijā un tās pilsētvides transformācijas un izplešanās procesiem. Latvijā ir izstrādāta visaptveroša metode ainavas telpisko vienību identificēšanai, lai atbalstītu ainavas rakstura novērtēšanu. Pieeja balstās uz ģeomorfoloģisko, zemes seguma, zemes izmantošanas, ekoloģisko un kultūrvēsturisko datu integrāciju, ko papildina uztveres novērtējums dabā. Koksnes izmantošana publiskajā ārtelpā kā arhitektūras mazo dizaina formu būvmateriāls, ir aizvien populārāks paņēmieni pasaulē. Apsekojot vienpadsmit Eiropas pilsētas, ir izveidota novērtēšanas skala, kas dod iespēju vieglāk uztvert katras pilsētelpas kompozicionālo kritēriju izvēli. Aptaujas rezultāti rāda, ka lielākā daļa gan pieaugušo, gan pusaudžu uzskata rotaļu-spēļu elementus par piemērotiem visiem vecumiem. Tomēr priekšroka tiek dota elementiem, kas veicina fiziskas aktivitātes, un kuri ir kompozicionāli bagātināti ar apstādījumiem.

Aija Ziemeļniece
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CONTENT

<i>Lina Panavaityė</i> FORMATION OF THE CONTEMPORARY TOWNSCAPE: POSSIBILITIES AND METHODS DOI: 10.22616/j.landarchart.2026.28.01	9
<i>Skaistė Vaivadaityė</i> FORMATION AND TRANSFORMATION OF THE MARKETPLACE NETWORK WITHIN THE URBAN STRUCTURE OF VILNIUS DOI: 10.22616/j.landarchart.2026.28.02	21
<i>Daiga Skujāne, Natalija Ņitavska, Madara Markova, Anete Lagzdina</i> URBAN GRASSLANDS FOR DIFFERENT CITY ZONES: A SCENARIO ASSESSMENT INTEGRATING PUBLIC PREFERENCES AND MANAGEMENT ASPECTS DOI: 10.22616/j.landarchart.2026.28.03	31
<i>Danielius Jurčiukonis, Dalia Dijokienė</i> CULTURAL LANDSCAPE RESEARCH: BETWEEN GEOGRAPHY AND URBANISM DOI: 10.22616/j.landarchart.2026.28.04	41
<i>Inesa Alistratovaitė-Kurtinaitienė, Dalia Dijokienė</i> THE DIALOGUE OF KLAIPĖDA'S URBAN DEVELOPMENT I. SHAPING OR PRESERVING THE HISTORICAL IMAGE OF THE PORT CITY DOI: 10.22616/j.landarchart.2026.28.05	50
<i>Madara Markova, Natalija Ņitavska, Daiga Skujāne, Simon Bell, Aija Ziemeļniece, Ilze Stokmane, Una Īle, Kristīne Vugule, Aiga Spāge, Iveta Lāčauniece</i> LANDSCAPE SPATIAL UNIT IDENTIFICATION METHOD FOR LANDSCAPE CHARACTER ASSESSMENT IN LATVIA DOI: 10.22616/j.landarchart.2026.28.06	60
<i>Emrah Yildirim, Meryem Atik, Mine Yuce, Reyhan Erdogan</i> URBAN LANDSCAPE CHARACTERS IN TERMS OF DESIGN COMPONENTS: ANTALYA, MURATPAŞA CASE DOI: 10.22616/j.landarchart.2026.28.07	70
<i>Una Īle, Ilze Stokmane</i> TIMBER-BASED OUTDOOR DESIGN SOLUTIONS IN NEW ZEALAND URBAN ENVIRONMENTS: MATERIAL PERFORMANCE, SUSTAINABILITY AND SPATIAL INTEGRATION DOI: 10.22616/j.landarchart.2026.28.08	80
<i>Ilze Stokmane, Dina Ozola</i> BEYOND THE PLAYGROUND: STRATEGIES FOR CREATING PLAYABLE URBAN FABRICS IN CONTEMPORARY CITIES DOI: 10.22616/j.landarchart.2024.28.09	91
<i>Egle Januskiene, Jurate Kamicaityte</i> THE HUMAN-NATURE RELATIONSHIP: COMPLEXITY OF THE PHENOMENON, HISTORICAL EVOLUTION AND ITS REFLECTION IN ARTISTIC WORKS DOI: 10.22616/j.landarchart.2024.28.10	101

FORMATION OF THE CONTEMPORARY TOWNSCAPE: POSSIBILITIES AND METHODS

Lina Panavaitė

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Abstract. This article discusses a comparative methodology for the territorial identification and assessment of contemporary urban landscape formation. The methodology was developed and adapted by the author of this article based on similar studies applied at a different level of design and the multi-criteria analysis method. The methodology consists of two parts evaluation and selection each of which is further divided into steps. The selection stage is intended for identifying areas of contemporary urban landscape development and determining their physical boundaries. The evaluation stage is intended to determine the potential scale of change in the contemporary developing urban landscape relative to existing structures comparing the potential value of the existing and emerging urban landscapes. It is important to note that the study is conducted within the field of typomorphology. In this work, the cityscape is evaluated as a qualitative component of the urban structure, whose overall value overshadows the value of any single specific object. This method allows us to approach urban design as a continuous process and to assess urban complexity, and, based on clear results, to determine the course of further urban design actions.

Keywords: modern townscape, heritage, urban structure, panoramic views, Vilnius

Introduction

The formation of the contemporary townscape – in an era characterised by perpetual flux – has emerged as a critical challenge for urban design practitioners and theorists alike. The free-market economy, coupled with profound socio-spatial transformations and, in certain European contexts, the erosion of sustained strategic planning frameworks, has significantly constrained the capacity to generate new urban ensembles or even entire territorial units with a unified characteristic. In fact, until the 21st century, urban development followed the economic, social, and political trends prevalent during a given historical period, as well as the possibilities offered by engineering advances; thus, each stage of urban development was embedded in the city's fabric. Today, development is rather haphazard and no longer linked to directed urban growth. To understand the key aspects of changes in the townscape one must look for pivotal turning points in the city's urban structure, the main one being the modernist movement that emerged at the end of the 19th century, challenging the traditional ideology of urban planning. The ideology of modernism was based on monofunctional urban zoning aimed at separating polluted industrial areas from residential districts. During this period, the concepts of the garden city, the industrial city, the linear city, and the radial city emerged, along with the idea of strict functional zoning. In the mid-20th century, as a reaction against modernist ideas, the "townscape" movement began in the United Kingdom, giving rise to townscape studies. During this period, T. Sharp and Hubert de Cronin Hastings (De Wolfe) wrote articles on this topic. A little later, they were joined by G. Cullen, who is probably the best-known author in this field of research today, and who examined changes in the city's internal spaces [7]. According to the author, "the environment is perceived by moving through it and experiencing distinct stages of movement." In other words, the environment is perceived as a sequence of characteristic stages in which different senses are engaged and different views are seen [4]. In his work, the author identifies such principles of inner townscape formation as closed perspective, orientation, protrusion and inclusion, constrictions, etc. Although G. Cullen's works have a strong foundation, they are difficult to apply in practical work. The challenges posed by the Modernist movement in the second half of the 20th century were compounded by the need for high-rise construction. This was particularly relevant for large cities, where political power was growing, land prices

were rising rapidly, and there was a lack of large plots for construction. Unlike the modernist movement, which faced public condemnation in many countries, the construction of high-rise buildings became inevitable, as it was in the interest of both developers and city authorities. Supporters of the townscape movement, in assessing the processes taking place, acted not only as an opposition but also spurred the need for regulation of urban structures, a need that remains relevant to this day. Particularly in the United Kingdom, townscape assessment holds a significant place in the history of urban design, planning, and conservation, and remains a key aspect, especially in bridging the perspectives of professionals and the public regarding the existing and future environment [13]. Building on previous research, between 1999 and 2003, Alan Reeve, Brian Goodey, and Robert Shipley proposed a combined methodology for assessing the townscape, according to which the visual image of a city can be understood and evaluated at four levels: pedestrian (local); street-length (neighborhood); elevated views (districts and above); and panoramic views (city and above) [13]. The aim of the methodology is to evaluate established criteria, which are divided into three main categories overall emotional quality, detailed morphological elements, and dominant site content and to record changes related to clearly defined elements of the visual scene. In 2017, K. Kropf proposed the Viewcue method a computer tool for urban analysis to achieve an objective understanding of the characteristics of the townscape [8]. The primary objectives of the tool are to identify elements of the urban image, characteristics of the townscape, and visual sequences. Methods such as Viewcone, Viewshed, and Viewsphere, which operate on a similar principle, are also used. In addition to these methods, various tools, such as parametric design and virtual city twins, are employed for the study and formation of urban structures. Interestingly, since the early 21st century, townscape studies have not been developed as an independent theory, but remain relevant as a tool for urban analysis, visual assessment, and the preservation of historical structures [3]. Returning to current issues, as cities develop and the need to advance the field of townscape research grows, it is evident that a great deal of attention in the design process is devoted to reconciling the wishes of communities and investors; as a result, the final outcome is not necessarily of high quality, but is tentatively acceptable to all interested parties. We must not forget the creative ambitions of individual

architects (a characteristic of post-Soviet countries seen, as seen in practice), where the frequent goal is to outshine one's colleagues rather than to create a unified, new type of townscape that could serve as a reflection of the era for future generations. It can be concluded that shaping the townscape under today's conditions is complicated, but possible under certain conditions.

When assessing the contemporary townscape, it can be said that it lacks a unified character and is most often a blend of building typologies, specific locations, architectural expressions, developers' intentions, funding allocated to projects, and so on. Thus, it can be viewed as a composite entity. However, even within this diverse context, it is possible to identify new types of structures that have emerged in recent times and will be discussed further clusters of high-rise buildings and hall-type buildings, characterized by unique morphology, high floor area ratios, and, in most cases, similar architectural solutions. These clusters of high-rise buildings often function as new city centers or major business districts. Naturally, these new structures emerge in strategically convenient urban locations, near major transportation hubs and thoroughfares, often on former industrial sites, undeveloped areas, or areas of low architectural value suitable for conversion, and very frequently near historic city centers. As a result, a noticeable trend is emerging that the expansion and development potential of these areas in Europe is most heavily influenced by the protection of adjacent, neighboring historic heritage sites and the requirements imposed on them, rather than as a structure representing a new era that can be developed in line with contemporary trends.

This article presents a methodology that complements previous studies of the townscape; it has two main objectives: the first is to determine the potential territorial scope of the townscape's formation, and the second recognizing that the contemporary townscape is often shaped at the expense of other structures to compare the value of new and old structures using various criteria, answering the question: which urban structure should be further developed the old or the new?

Material and Methods

Various analytical methods and evaluation criteria can be used to identify townscapes ranging from "field research," analysis of literature and iconographic material, surveys, etc., to the use of geographic information systems depending on the specific criteria for evaluating the townscape (morphology; the content of the area, its history; emotional quality, etc.). In this article, the townscape and the principles of its formation are examined from the perspective of urban morphology studies, leaving sociological and cultural aspects aside.

The methodology presented in this article consists of two key components: selection and evaluation. The selection stage is intended to identify areas of contemporary townscape development and to define their physical boundaries. This stage is necessary because the townscape, as a subject of study, is not classified as a unit of urban morphology but is defined by the totality of elements that characterize it. Thus, the objective of this stage is to establish the specific boundaries of the potential for contemporary townscape development, within which the subsequent stages will allow for the identification of the specific values of the territory, the possible extent of change, and the principles of its formation.

The assessment phase is designed to determine the potential scale of change in the contemporary, evolving townscape

in relation to existing structures. The objective of this phase is to demonstrate whether the urban planning principles underlying the proposed new townscape are, in various respects, more valuable than the existing development. The assessment is conducted in two directions, simultaneously evaluating the value of each block within the defined territory according to established criteria, both individually and in terms of each block's interaction with every other block in the territory. A comprehensive assessment of the territory is conducted by analyzing the immovable cultural heritage, architectural and urban planning quality, and technical condition within it. Photographs, plans, historical materials, and other resources are used to perform this assessment.

The selection phase consists of a quantitative and qualitative assessment of the city and is carried out in four steps:

1. A multi-criteria analysis is conducted to identify opportunities for the development of the contemporary townscape;
2. Data comparison;
3. Selection of potential areas;
4. An inter-site evaluation of the selected areas is conducted to identify the area with the greatest potential for townscape development.

The first step involves a multi-criteria analysis. As a formalised methodological framework, multi-criteria decision analysis emerged in the mid-twentieth century, though its conceptual antecedents trace to classical antiquity. It is extensively utilised across diverse domains, including political science, business strategy, information systems, urban planning, and environmental management. Within urban planning and allied disciplines, Jacek Malczewski played a pivotal role in advancing the application of MCDA, not only cataloguing its methodological variants but also demonstrating their operational integration within geographic information systems (GIS). According to the author, the GIS-embedded decision-making process comprises three sequential stages: intelligence, design, and choice [11]. Subsequent scholars have extended this work, documenting both methodological refinements and domain-specific applications. In the field of typomorphological analysis, Meta Berghauser Pont and Per Haupt provide a comprehensive exposition of multi-criteria spatial clustering in their seminal work *Spacematrix*. Their research interrogates the relationship between urban density metrics and key urban performance indicators – notably liveability and environmental sustainability. For example, by grouping various indicators spatially, the authors purposefully determine the morphotypes of development in different parts of the city. M. B. Pont and P. Haupt contend that the spatial matrix – encoding both absolute and relative values for any given urban locus – functions as an analytical engine: enabling the evaluation and articulation of latent spatial properties, and facilitating inference regarding associated socio-economic and political dynamics of urban form [2]. Critically, this methodology is scalable, applicable across multiple spatial resolutions – from the plot and block to the district and neighbourhood. The synthesis of volumetric variables across these scales yields both absolute metrics and relational indices, thereby revealing latent potentials and structural deficiencies within the urban fabric.

In this step, to determine the potential scope of change, we evaluate the current indicators describing the city's spatial structure and the planned indicators for the city's structure, which are set forth in documents regulating the city's spatial development, such as master plans, general plans, and others. A comparison of current situation data with the data

Table 1. Criteria for evaluating the selection of territories [created by the author]

Points	De facto ongoing transformation process	Development opportunities	Envisaged change in spatial planning documents	Influence of cultural heritage territories	Investment viability	Natural environment
3	Transformation actively in progress; development	Extensive undeveloped or underutilised land available, potential for conversion of territory	Transformation formally projected across majority or entirety of territory	Absence of immovable cultural heritage assets within territorial boundary	High investment viability	Territory lies entirely outside designated natural zones
2	Passive transformation process	Minimal development potential, possible conversion	Partial transformation of individual structures envisaged	Heritage assets present but exert minimal regulatory or morphological constraint on development	Moderate investment viability	Territory partially overlaps with locally restricted natural areas (local restrictions)
1	No active transformation; development process concluded	No development capacity, only conversion possible	Negligible or no transformation envisaged	Heritage assets exert significant regulatory, volumetric, or design constraint on transformation	Low investment viability / territory effectively developed	Entire territory subject to environmental building restrictions (restriction on building density)

set forth in these documents was chosen because, to date, they are the sole source regulating the long-term direction of urban development and the changes envisaged therein. The number of indicators assessed may vary depending on the desired outcome and the amount of available data. Indicators such as building height, average building height in specific zones, building intensity, building density, and others may be used. It is important to ensure that the territorial scope of the assessed objects matches in both cases, i.e., data on functional zones, groups of blocks, blocks, or plots may be used. The assessment is performed using GIS software. As a result, after grouping the selected indicators, the number of "townscapes" described by these indicators is determined. It should be noted that determining the number of clusters is a rather subjective choice; too few clusters generalize and homogenize similar indicators but areas with different characteristics and development periods, while too many clusters fragment the data and fail to identify specific clusters. The second step involves comparing the obtained data with the results of the multi-criteria analysis. The purpose of this comparison is to assess the territorial scope of potential areas of continuity and change in the established townscapes. In the third step, after comparing the data, areas that indicate potential changes in spatial structure are identified. It should be noted that this step also involves a qualitative assessment of the areas, as not all areas identified as potential areas of change in the results of the multi-criteria analysis may, in reality, be subject to change processes. Based on the established criteria, additional areas may be excluded, such as sites of immovable cultural heritage, areas already designated for comprehensive development in other documents regulating the city's spatial development, individual blocks whose development will not affect changes in the townscape, locations where the contemporary (or other planned) townscape has already taken shape, and so on. The exclusion criteria may vary in each case. In the fourth step, after identifying the areas oriented toward continuity, those oriented toward change are identified. If there is only one such area, this step is not performed; however, if there are multiple such areas and only one is

needed for the specific townscape development, an additional selection of areas is conducted. For this selection, six criteria were established in the methodology: the ongoing process of change, development opportunities vacant, undeveloped areas and the potential for conversion, anticipated changes in documents regulating the city's spatial structure, the influence of immovable cultural heritage sites (physical constraints on new development), investment attractiveness, and the natural environment (physical constraints on new development). Each criterion can be scored a maximum of 3 points. The criteria system is presented in Table 1. Following the assessment, the area with the highest score is identified as having the greatest potential for transformation. However, it is important to understand that when working in already developed urban areas where private property is involved, even the transformation of the selected areas will face certain challenges. As a result, it is necessary to conduct a further internal qualitative assessment of the area. In the second stage, once the target area for the development of the contemporary townscape has been selected, an assessment of the potential for change is conducted. To identify possible principles for shaping the townscape, it is necessary to understand the current situation, the possibilities for change, and the needs. The area is analyzed both as a whole and by examining its individual elements, determining their architectural and urban value, their interaction with one another, their implementation, and their technical condition. The methodology for assessing the potential for change was developed based on the methodology for evaluating the historical environment of Lithuanian cities used by V. Jurkštas [10], which was designed to assess the architectural quality of historic buildings. In his work, the author identified five evaluation criteria: compositional idea and compositional unity, stylistic features, scale and proportions, color, and the technical condition of the buildings. When discussing the evaluation criteria, V. Jurkštas clearly stated that the evaluation criteria do not have equal impact on architectural quality, yet they are united by a common trait their role in creating artistic value [10]. However, the evaluation of urban structures is more complex and multifaceted compared to

Table 2. Sample Evaluation Table [created by the author]

Quarter	A1	A2	A3	A4	A5	B6	B7	B8	B9	B10
A1		3	0	2	0	3	0	1	1	0
A2	3		0	0	2	0	1	1	0	3
A3	0	0		1	0	0	3	2	0	1
A4	2	0	1		3	1	1	1	2	0
A5	0	2	0	3		2	2	3	0	1
B6	3	0	0	1	2		3	2	1	1
Result	7	5	1	7	7	6	10	10	4	6
Average	1.4	1.0	0.2	1.4	1.4	1.2	2.0	2.0	0.8	1.2

Table 3. Criteria for the Evaluation of Cultural Heritage [created by author]

Points	Historical value – immovable cultural heritage object	Historical context
3	Valuable as an object, complex, or area	Forms a distinct townscape
2	Valuable in the urban environment	Provides conditions for the formation of a townscape
1	Partially valuable in the urban environment	Limited potential for townscape formation
0	Lacks value	Lacks potential

the evaluation of individual objects, due to the abundance of objects being evaluated and the fact that, in this case, it is not a specific building but the characteristic urban structure of a city district that is the object of value. Three principal groups of evaluation criteria (aspects) were selected for the assessment of the potential for change in urban structures:

1. Assessment of immovable cultural heritage sites.
2. Assessment of architectural and urban composition.
3. Assessment of the technical condition of buildings.

In addition, since the assessment is conducted for a specific territorial unit, the block has been selected as the comparative unit in the methodology to ensure a clear analysis and comparison of urban structures (Table 2). This is a clearly defined smallest urban unit with established building principles (building morphology). Once the general direction of the assessment and the unit of assessment have been established, the targeted assessment is conducted by evaluating the interaction of the blocks within the planned area with other blocks in the same area according to the identified criteria for assessing architectural and urban quality. The quality of urban formations (townscapes, complexes) is often linked to the uniqueness and authentic character of the place, as a result of which the specific evaluation criteria are determined according to the needs of the specific area being evaluated. In this case, it should be noted that the goal is complexity; therefore, criteria such as function, internal building structures, and the significance of the place ("spirit") are not examined.

A separate qualitative assessment is conducted for each group of evaluation criteria, with all evaluation indicators ultimately summed up. The higher the total score, the more similar the development characteristics of the areas (neighborhoods) are, and the greater the potential for shaping a contemporary townscape. In all cases, a numerical system (0–3 points) is established for assessing the quality of urban structures, and the evaluation characteristics defining each point are described.

In the assessment of immovable cultural heritage, sites, complexes, and individual objects within the boundaries of the area under review are evaluated. The potential of objects to shape the townscape and their integration into the scope of the contemporary townscape are evaluated, resulting in the establishment of two evaluation criteria for assessing heritage objects. The first criterion is intended to evaluate heritage objects based on their valuable characteristics,

as defined in the acts of the Council for the Assessment of Immovable Cultural Heritage, and their relationship with the urban environment in which they are located. The second criterion evaluates the context in which the object currently exists, addressing the question of whether the existing historic development has value and potential for continuity as a distinct townscape (Table 3).

The assessment of architectural and urban quality identifies the following five criteria: compositional unity, scale and proportions, visibility/contextuality, stylistic features, and color/materiality (Table 4). When assessing compositional unity, it is determined whether the buildings in the block are constructed according to a specific composition and whether the block's composition is consistent with the compositional principles of other blocks in the area under consideration. The assessment of scale and proportion is carried out by evaluating the relationship between the buildings within the block and, subsequently, the relationship between the blocks themselves. The assessment of visibility and contextuality is carried out by analyzing the relationship between the panoramic views and the plan structure from selected external and internal vantage points of the townscape. When evaluating the views, objects are distinguished based on their morphological structure, historical significance, and period. The purpose of analyzing external and internal vantage points (panoramic views of the contemporary, evolving townscape) is to determine which buildings in the area are fully discernible from the identified vantage points, and which "gets lost" against the backdrop of existing development and is difficult to identify or completely imperceptible. When evaluating stylistic features, the unity of character of specific buildings and the urban structures they comprise is emphasized. Color and materiality play a significant role in urban composition; it is precisely these elements that ultimately ensure the unified character of the planned structures and their recognizability based on stylistic features. When evaluating this aspect, the compatibility of urban structures with one another in terms of color and materiality is analyzed.

Finally, an assessment of the technical condition of the buildings (and the blocks they comprise) is conducted. The technical condition of buildings is an important criterion for evaluating architectural expressiveness. Although this does not determine architectural quality, areas dominated by buildings in poor technical condition are often perceived as unsafe, are home to lower-income segments of the

Table 4. Criteria for the Evaluation of Architecture and Urban Design [created by the author]

Points	Compositional unity	Scale and proportions	Legibility / contextuality	Stylistic features	Colour / materiality	Technical condition of buildings
3	Expressive composition	Good relationship of scale and proportions	Clearly perceptible in all situations	Clear representative of a style	Unified image	Very good / good
2	Clear, of medium expressiveness (with shortcomings)	Minimal deficiencies in the relationship of scale and proportions	Overall contextuality predominates	Compatible with adjacent development	Larger part harmonised	Average
1	Insufficiently expressive composition	Partial deficiencies in the relationship of scale and proportions	Local contextuality more evident	Lacking clear stylistic features	Smaller part (fragmented) harmonised	Satisfactory
0	Absence of composition	Significant discrepancies of scale and proportions	Out of context	Lacking any stylistic features	Incompatibility	Poor

Table 5. Technical quality evaluation criteria [created by the author]

Points	Technical condition of buildings
3	Very good / good
2	Average
1	Satisfactory
0	Poor

population, and are unattractive to investors. To assess the technical condition of buildings, data on the year of construction, building materials, and information about modifications made are used (Table 5).

The results of the methodology show that the neighborhoods with the highest scores are the most harmonious and can be considered to have the potential to become part of a vibrant townscape. The neighborhoods with the lowest scores indicate that these areas need to be transformed in order to achieve maximum aesthetic quality.

Results and Discussions

The city of Vilnius the capital of Lithuania was chosen as the subject of this study. It is distinguished not only by its rapid development and the most striking influence of contemporary architecture on the city's skyline, but also by its concentration of political, cultural, and scientific potential. The capital is not only the pride of the country but also a symbol of revolutions, suffering, and convictions, whose architecture reflects its values, and whose culture is better known and respected than that of provincial cities [9]. Speaking of Vilnius, it is situated in a unique natural environment, having preserved a unique topographical heritage the central part of the city, located in a valley, and the surrounding hills form a multi-layered townscape. It is precisely the central part that is the most characteristic area of the city, encompassing the Old Town, the New Town, and the new city center. The central part is surrounded on the upper terrace by modernist residential districts built during the Soviet era, whose mandatory construction left an ambiguous mark on the structures of all Lithuanian cities, while in Europe this style was merely a mannered possibility [6]. Beyond these lie areas of low-rise development the "subtownscape." These can be described as areas of degraded natural elements, lacking the features characteristic of an townscape transportation, engineering

infrastructure, public spaces, a system of maintained green spaces, and public, commercial, service, and educational facilities (schools, kindergartens, shops, etc.) [1]. Essentially, the city of Vilnius can be divided into three zones central, middle, and peripheral.

Today, the high-rise and hall-type buildings that define the contemporary townscape are concentrated in the central part of the city, near the main entrances to the city. Their development is fragmented, failing to form continuous structures with a unified character, and their territorial scope is undefined; therefore, to determine the extent of the development of such types of townscapes, a selection process was first conducted (Stage I of the methodology). In the first step, to identify existing and planned townscapes are used to conduct a multi-criteria analysis.

The assessment is performed using ArcGIS Pro software. In accordance with the laws of the Republic of Lithuania, the aforementioned building density indicators are determined for a plot of land; however, to enable the comparison of equivalent data, subsequent data grouping, and the presentation of specific values for multi-criteria analysis, the layer of functional zones defined in the general plan of the Vilnius City Municipality [16] the primary document defining the city's spatial development was selected for the layer of designated functional zones. Functional zones, like the structure of townscapes, are not composed of specific morphological units or groups thereof; however, unlike a townscape, which describes the characteristics of a territory, functional zoning indicates only the maximum scope of the territory's development. Following a multi-criteria analysis of the existing and planned structures in Vilnius, 15 townscapes were identified and described (Figure 1). The existing townscape structure of Vilnius is complex and diverse, reflecting different stages of the city's development. In many places, it could be described as chaotic. Meanwhile,

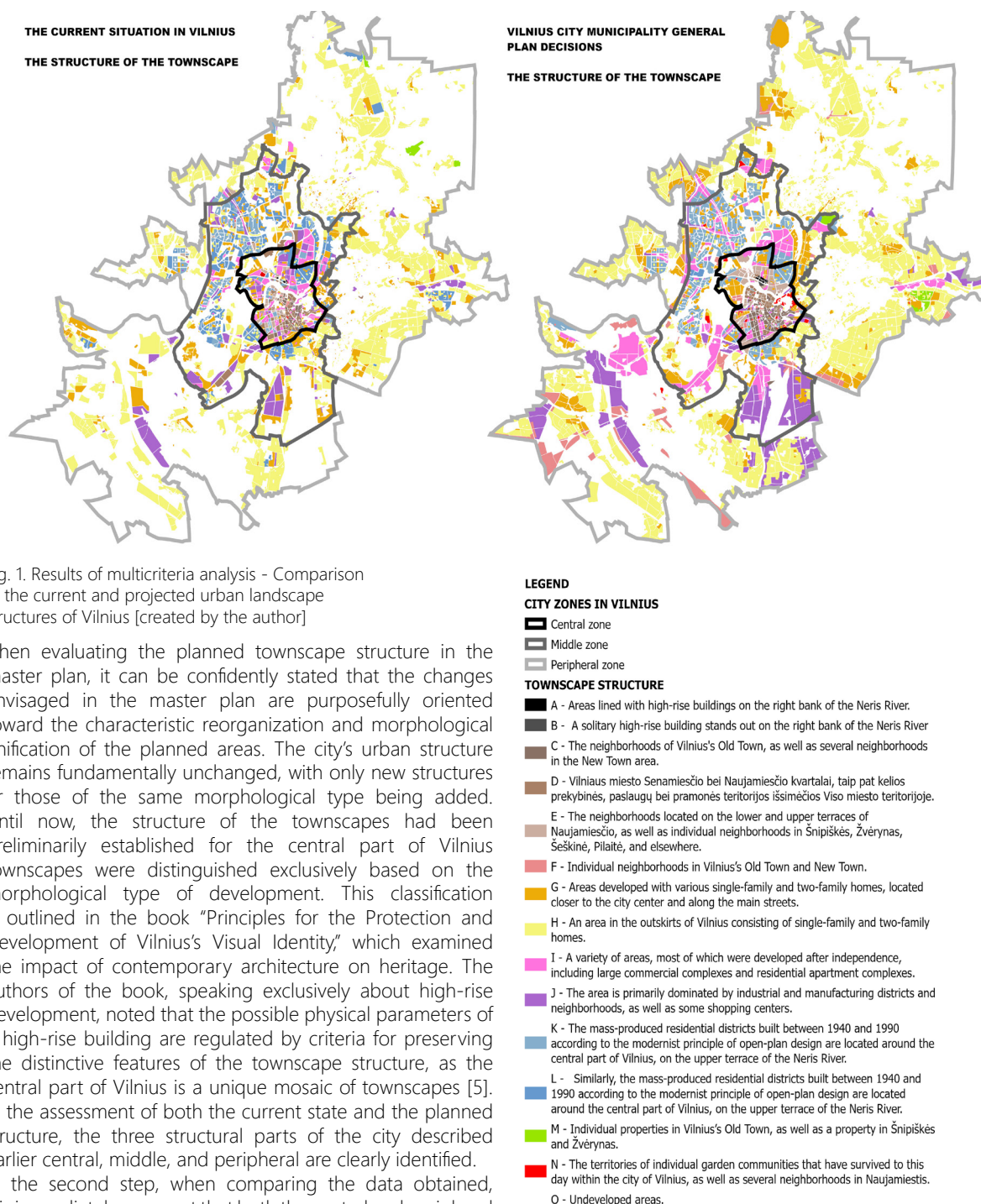


Fig. 1. Results of multicriteria analysis - Comparison of the current and projected urban landscape structures of Vilnius [created by the author]

when evaluating the planned townscape structure in the master plan, it can be confidently stated that the changes envisaged in the master plan are purposefully oriented toward the characteristic reorganization and morphological unification of the planned areas. The city's urban structure remains fundamentally unchanged, with only new structures or those of the same morphological type being added. Until now, the structure of the townscapes had been preliminarily established for the central part of Vilnius townscapes were distinguished exclusively based on the morphological type of development. This classification is outlined in the book "Principles for the Protection and Development of Vilnius's Visual Identity," which examined the impact of contemporary architecture on heritage. The authors of the book, speaking exclusively about high-rise development, noted that the possible physical parameters of a high-rise building are regulated by criteria for preserving the distinctive features of the townscape structure, as the central part of Vilnius is a unique mosaic of townscapes [5]. In the assessment of both the current state and the planned structure, the three structural parts of the city described earlier central, middle, and peripheral are clearly identified. In the second step, when comparing the data obtained, it is immediately apparent that both the central and peripheral urban zones are shaped by the principle of continuity through the densification or expansion of these areas. In the central zone, specifically in the existing Old Town and New Town areas, no major structural changes are anticipated, only the conversion or redevelopment of previously unused inner areas. The most significant change is visible on the right bank of the Neris River, in the new city center development area—a clear territorial structuring oriented toward a New Town-type building morphology mixed with high-rise and massive administrative buildings forming a perimeter-based central development. Structural changes are also visible in the northern part of the Žvėrynas district. By developing the city according to the principles established in the master plan, the indicators of average height, intensity, and density more than double. In the third selection step, areas oriented toward continuity

were rejected for further analysis. First, the city's central and peripheral zones were rejected, where development, as previously noted, is directed toward the continuity of existing townscapes. This leaves the central zone, where, however, not all areas are oriented toward potential processes of change; therefore, the following areas within this central zone are no longer considered (Figure 2):

- areas containing immovable cultural heritage sites that possess characteristics identifying the three-dimensional spatial structure of the townscape and valuable features describing them (in accordance with immovable cultural heritage legislation);
- areas in the central zone where, according to the results of a multi-criteria analysis, no change is anticipated, or where change is anticipated in individual blocks whose transformation will not affect the formation

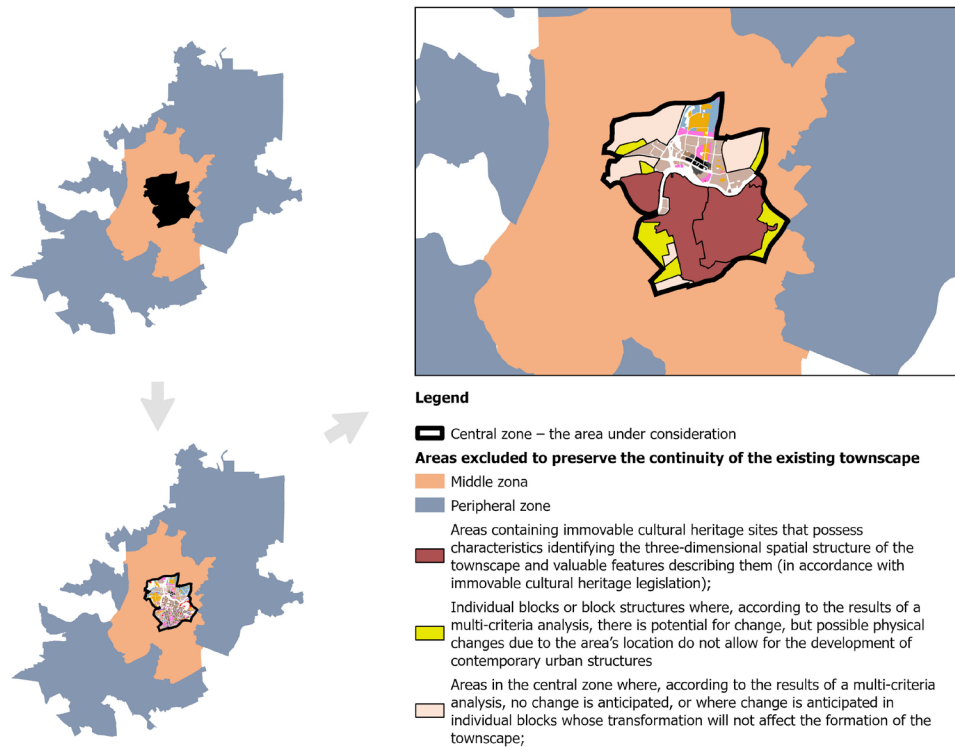


Fig. 2. Areas excluded to preserve the continuity of the existing townscape [created by the author]

of the townscape;

- individual blocks or block structures where, according to the results of a multi-criteria analysis, there is potential for change, but possible physical changes due to the area's location do not allow for the development of contemporary urban structures;
- townscapes formed before the 21st century modernist residential districts located in the central zone.

In the fourth step, after excluding all areas not under consideration, the area on the right bank of the Neris River and a small area on the left bank of the Neris, on the edge of the lower terrace of Naujamiesčio, remained for further evaluation. Although the area on the right bank of the Neris River is contiguous, its parts have different significance within the structure of the central area; therefore, for the final assessment of potential changes, it is divided into four smaller areas. To make the methodology easier and faster to apply in practice, in this specific case, the division is carried out taking into account the main arterial streets, the boundaries of Vilnius city districts, the nature of development envisaged in the Vilnius City Master Plan, and the comprehensive development potential of the area. The final assessment is conducted for 5 territories according to the criteria described in the previous section: the Business Triangle territory (A), the northern part of the Žvėrynas district (B), the southern part of the Šnipiškės district—the New City Center (C); the Northern Part of the Šnipiškės District (D), and the Southern Part of the Žirmūnai District along the Neris River (E) (Figure 3).

The territorial assessment reveals that the area exhibiting the highest potential for the formation of a coherent contemporary townscape is Territory C: the southern sector of Šnipiškės – designated as the New City Centre. Since circa 2000, this territory has undergone accelerated morphological restructuring (Table 6). Its southern quadrant is characterised by an emergent 'urban hill' – a concentrated cluster of high-rise towers and large-footprint administrative or commercial typologies. The northern quadrant accommodates a mix of institutional edifices and medium- to high-density residential blocks. Significant residual land remains

available for development, with parcels identified for adaptive reuse; municipal planning instruments project substantial revisions to building parameters. The principal constraint arises from the persistence of low-density, rural-derived fabric in the territory's central zone, certain features of which are classified as protected. In the book "Taking archaeology out of heritage" "heritage is defined as the negotiation of subjective and political identity, place and memory [17]. It is precisely when talking about Šnipiškės that the question arises whether heritage is real in this place or the result of political actions aimed at pleasing the public, since until 2024 only a few individual objects and the principle of building on one street were protected in this area. Once the potential territorial boundaries of the modern townscape have been identified, the process moves on to the second stage of the methodology: evaluation.

In the second stage, following a qualitative assessment of the area based on three key aspects immovable cultural heritage, architectural and urban quality, and technical condition the results addressed the question of which townscape is more valuable: the old or the new. The methodology specified that, to simplify the assessment, the entire area is divided into blocks; consequently, the area under study was divided into 60 blocks, and the qualitative indicators criteria describing these blocks are evaluated in relation to one another. The division into blocks is used to assess all three aspects.

A brief discussion of the results for each aspect reveals quite different outcomes. When evaluating immovable cultural heritage, it is evident that, from an urban planning perspective, the most valuable blocks are those with the highest number of heritage objects, complexes, or sites. After grouping the evaluation results, it became clear that the most valuable in this regard are the farmstead-style development areas in the central part of the study area (Figure 4). This is the historic part of the city known as Medinės Šnipiškės. For example, although the archaeological site of Vilnius's Old Town and suburbs covers a large area, it does not pose any obstacles to the development of new structures, apart from the need for additional research.

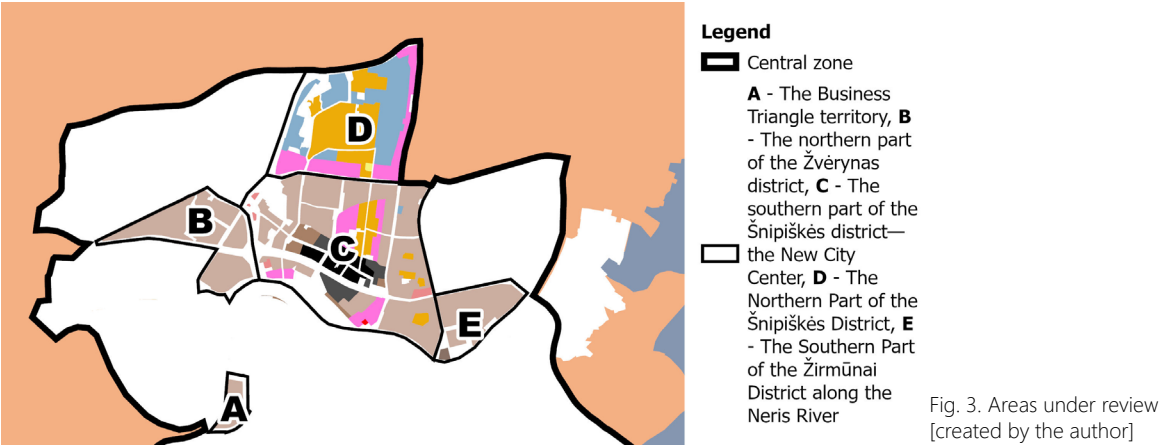


Table 6. Results of the territorial selection assessment [created by author]

Evaluation criteria	Territory A	Territory B	Territory C	Territory D	Territory E
1. Active transformation processes are underway, marked by the emergence of architectural interventions dating from the late 20th to early 21st centuries	1	2	3	1	2
2. Opportunities for territorial (external) expansion	1	1	3	3	2
3. Municipal master plans formally project significant morphological transformation across the territory.	1	3	3	2	3
4. The area intersects with designated immovable cultural heritage zones, introducing regulatory complexity.	3	2	1	3	2
5. Investment viability	1	2	3	2	2
6. Natural environment	1	2	2	3	1
	8	12	15	14	12

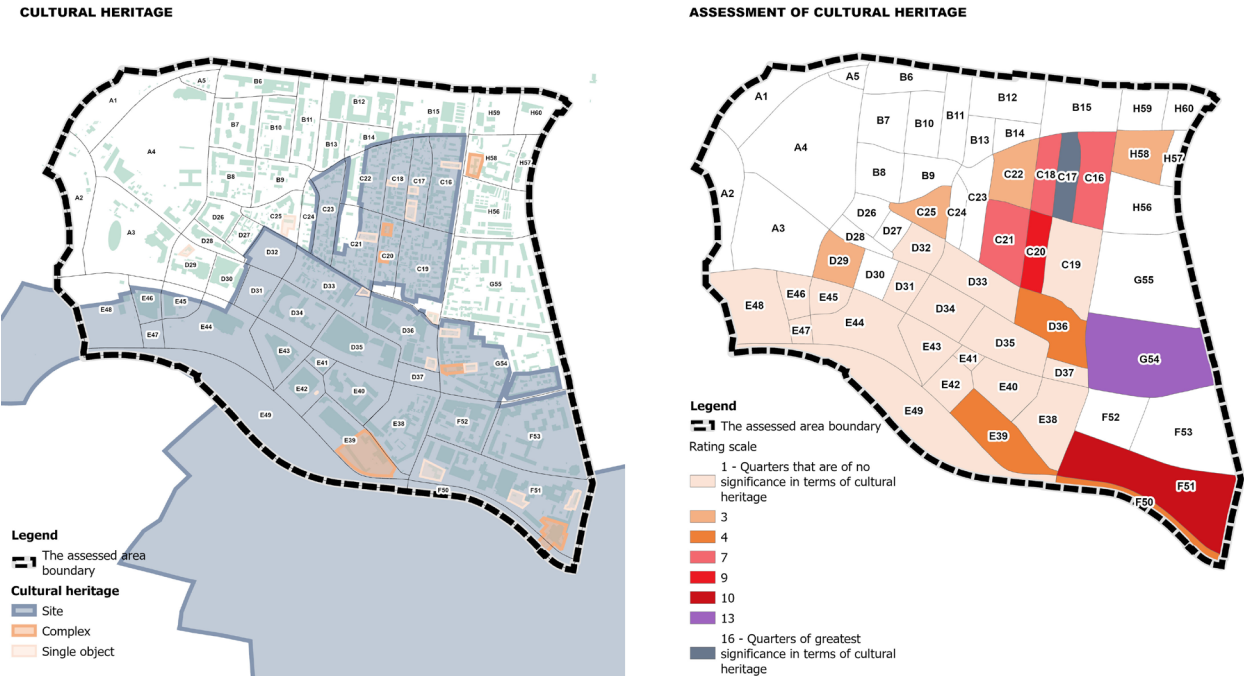


Fig. 4. Left: Cultural heritage sites within the study area; Right: Results of the assessment of immovable cultural heritage [created by the author]

In assessing architectural–urban quality, compositional unity – understood as the foundational principle of townscape coherence – derives from a consistent morphostructural logic, the hierarchical arrangement of vertical elements, the articulation of public space networks, and their proportional reciprocity with the surrounding urban context. Analysis of blocks within the study area indicates that compositional unity is confined to isolated, small-scale groupings; overall,

the territory lacks a unified compositional framework. Limited morphological affinity is discernible among clusters of high-rise development, and between administrative and multi-residential blocks in the northern sector. In contrast, the protected homestead fabric exhibits pronounced compositional fragmentation; only select street corridors manifest coherent formal expression. From the perspective of townscape formation, scalar and

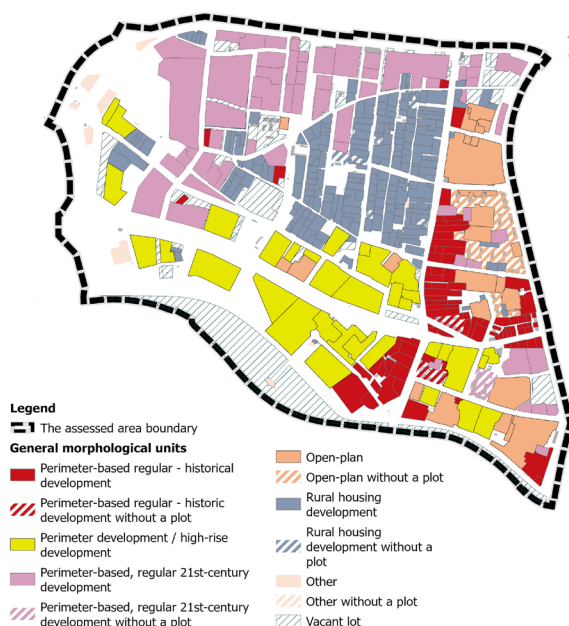
proportional relationships must be calibrated not merely between individual buildings, but across urban elements – blocks and their aggregations – to ensure volumetric, vertical, and spatial relationships remain perceptually intelligible and experientially coherent. The evaluation of scale and proportions showed that the interrelationship of blocks within the study area is poor. The volumetric ratio between high-rise enclaves and adjacent homestead zones approximates 1:10. There is no purposefully planned transition of heights between groups of blocks. Proportional inconsistency is further evident within individual blocks by multiple orders of magnitude. Nevertheless, strategic intervention – including targeted transformation zones and calibrated densification protocols – could facilitate scalar harmonisation across the majority of blocks.

The assessment of visibility and contextuality is important for determining the status of the townscape within the overall urban structure. As mentioned in the methodology section, the assessment was conducted by analyzing the relationship between the plan and the identified panoramic views and determining whether the objects in the selected neighborhoods are visible from both external and internal vantage points or are only visible locally from internal vantage points. The assessment is conducted from 4 external vantage points (Figure 5) and 30 internal vantage points. The structural elements depicted in the study are generalized, as the identification of specific objects is not possible due to the location and distance of the assessed territory within the panoramic view, since they are difficult to distinguish. In the case of Vilnius, the area under study is divided into 6 categories: areas of perimeter-based regular development prior to 1940; areas of perimeter-based central/high-rise development; new blocks of apartment buildings and administrative residential buildings with perimeter-based regular development on the northern side of the area under study; areas with farmstead-style development; neighborhoods or individual structures built according to the free-planning principle that clearly reflect Soviet-era architecture, as well as individual non-structural objects. The study results showed that in the analyzed panoramic views, high-rise buildings are clearly visible from all

4 external vantage points. Regarding the inner vantage points, these buildings are visible and dominant in all cases where they fall within the field of view. As background development and the general context, the areas of regular perimeter development on the northern side of the study area can be distinguished. The development in these blocks is also visible from all vantage points, but individual objects are difficult to distinguish due to the density of the buildings and their similar heights. From the inner vantage points, this development dominates over the farmstead-style development, but is not as prominent as the high-rise development. In some both external and internal panoramic views, individual buildings constructed according to the free-plan principle are identifiable, as well as several historic neighborhoods. Farmstead-style neighborhoods are identifiable only from internal vantage points, but are often obscured by adjacent development. When viewed from panoramic vantage points, the majority of the development on the eastern side of the study area is not visible, as these neighborhoods are obscured by other neighborhoods characterized by taller buildings and blend into the overall urban mass. Generally speaking, regarding the assessment of internal panoramic views, it can be stated that the panoramic views of no single street identify a single specific element of the urban structure; in other words, there is no clearly expressed internal townscape representing a specific era.

The requirements for the technical condition of buildings are defined by the laws of the Republic of Lithuania. These requirements are specifically tailored to Lithuania's climatic conditions; therefore, when conducting a similar assessment on another continent, they must be adapted to local conditions. The assessment of technical condition was conducted in accordance with STR 1.12.06:2002 "Intended Use and Service Life of a Building". The regulation specifies the service life of buildings based on construction materials. In terms of construction materials, brick and wooden buildings predominate in the area under consideration. On the right bank of the Neris River, in areas with high-rise buildings, monolithic concrete or reinforced concrete, reinforced concrete slabs, or blocks are primarily used. After assessing the technical condition of the buildings in the study

GENERAL MORPHOLOGICAL UNITS



ASSESSMENT FROM DESIGNATED VIEWPOINTS

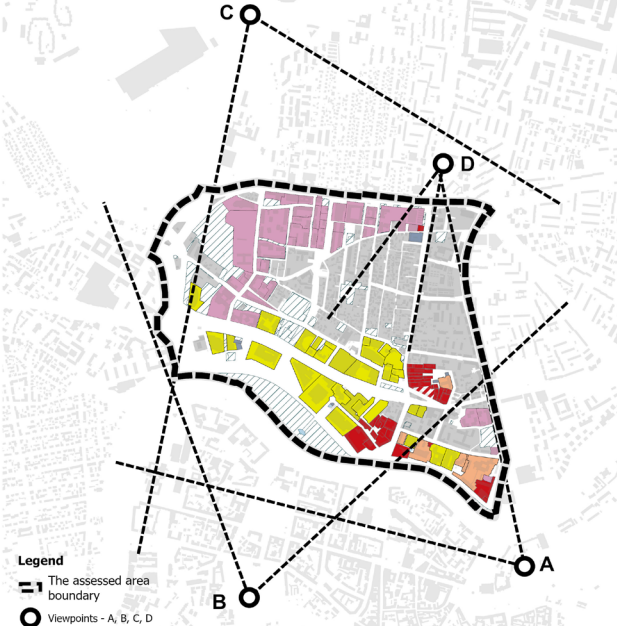


Fig. 5. Evaluation of visibility from external viewing points [created by the author]

ARCHITECTURAL AND URBAN DESIGN QUALITY

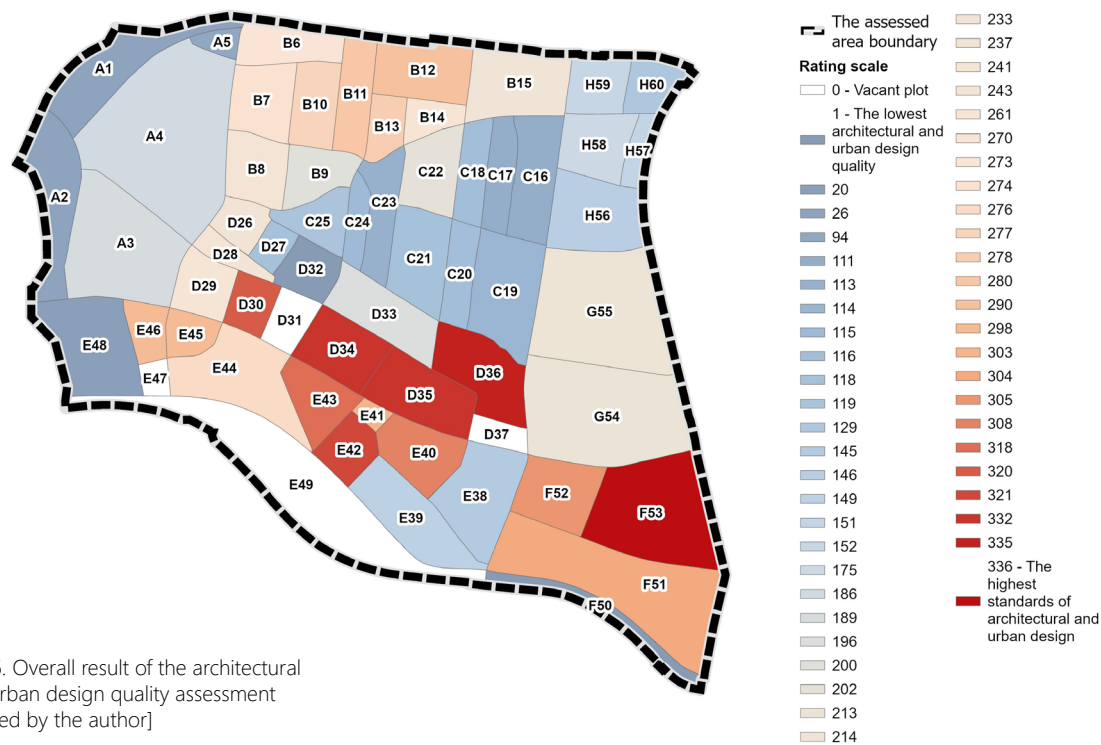


Fig. 6. Overall result of the architectural and urban design quality assessment [created by the author]

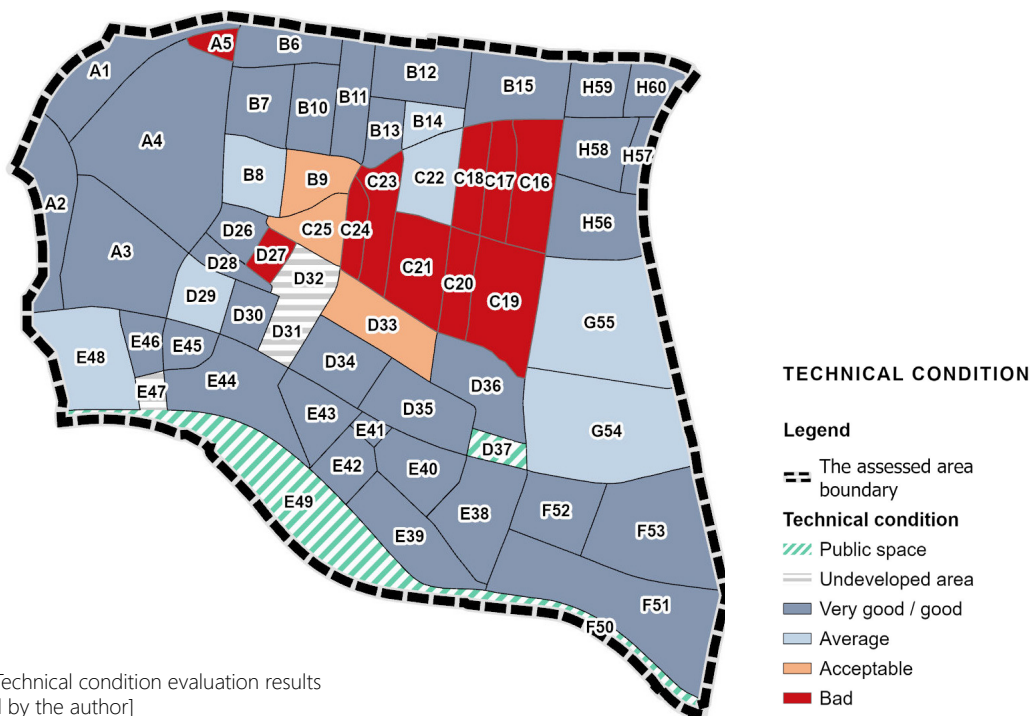


Fig. 7. Technical condition evaluation results [created by the author]

area based on the construction period and building materials, it became clear that the worst-conditioned areas are precisely the farmstead-style neighborhoods in the central part of the study area. The lifespan of wooden frame buildings is only 40 years, and the results show that the majority of the buildings were constructed before 1930, meaning the buildings have already exceeded their lifespan by as much as two times. Only a small portion of the buildings in the neighborhoods of this group have been renovated. A few isolated neighborhoods are in poor condition; the condition of the rest is average or good/very good. It is worth noting that the buildings in the poorest condition are single-family residential buildings owned by private individuals, while

those in the best condition are administrative, service, and commercial buildings that are regularly maintained, or new multi-family residential buildings (Figure 7).

After compiling the results, it became clear that the newly formed contemporary structures in the city center create significantly greater value compared to the existing areas of farmstead-style development. It is precisely the purposeful planning of these new structures that holds great potential for the emergence of a contemporary townscape, one that not only reflects current trends but also returns to the fundamental principles of urban planning. In subsequent planning stages, steps and measures such as specific zoning regulations or guidelines must be established to ensure the

smooth formation of a distinctive contemporary townscape. It should be noted that qualitative assessments can also be programmed into a GIS system, but this requires a sufficiently large amount of accurate data on each object, including all buildings in the area. In Lithuania, data is currently only just beginning to be made available for public use, so there is a possibility of systematizing this assessment in the future. Although townscape studies are a relatively new branch of urban morphology research, a considerable number of studies have already been conducted in this field. However, most studies focus on determining the spatial characteristics and visual quality of existing townscapes [3; 4; 8; 13; 14]. It is interesting to note that most of the reviewed studies focused on urban morphology, as suggested in the article, are comprehensive and quite complex. There are also other directions in townscape research that encompass the fields of geography and sociology. In Lithuania, a study on the assessment and modeling of townscape identity was conducted, in which the author defined townscape identity as a synthesis of subjective and objective identity, where the sense of place, the meaning of the place, individual elements, systems of elements, and the overall structure are distinguished as components of a holistic townscape identity [12]. Comparing the comprehensive method presented in the article with existing ones, it can be confidently stated that this method is oriented toward a significantly broader scope of townscape assessment, but provides less detail on specific site-oriented aspects, such as those presented in G. Cullen's study or in the street scene planning methodology by N. Nitavska, D. Skujāne, and M. Markova [14]. The study contributes to the field of townscape research by proposing a method for defining townscape boundaries, on the basis of which the townscape can be analyzed as a unit of urban morphology, as well as a rating system describing qualitative townscape criteria, with the aim of comparing the values of existing and emerging townscapes, on the basis of which further planning actions would be envisaged. The uniqueness of the study lies in the fact that the contemporary townscape is evaluated as a potential new type of townscape, rather than a threat to already established historical townscapes. The study proposes that a city's structure whether new or old, but distinctive is significantly more valuable than individual objects, even those designated for preservation.

Conclusions

1. Townscape formation is an ongoing, contingent process shaped by political, social, and economic dynamics, the cultural trajectory of the city, and the stringency of urban regulatory frameworks. In Vilnius, a relatively constant trajectory of townscape development – legible in the city's structural fabric – persisted until the end of the twentieth century. The twenty-first century ushered in an era of loosely regulated development, which precluded the emergence of typologically or stylistically coherent ensembles reflective of a unified historical period; concurrently, the proliferation of high-rise construction – while exhibiting certain shared formal and technical characteristics – triggered heritage-protection imperatives in adjacent zones, thereby constraining the permissible range of new structural typologies.
2. Analysis of the city's spatial characteristics reveals a critical flaw in current planning frameworks: they permit maximal development intensity and morphological diversity within singular territorial units, without prescribing compositional principles or requiring relational coherence between adjacent structures. To deliberately cultivate characteristic contemporary

urban structures, a robust methodological foundation must be established to guide their formation, alongside the precise delineation of target territories.

3. A methodology for assessing the potential for contemporary townscape development and continuity was developed and applied, using Vilnius as a case study, comprising two stages: defining townscape boundaries and evaluating the territory's transformation potential.
 - In the first stage, a multi-criteria comparative analysis was performed, and areas deemed unsuitable for coherent townscape formation were excluded according to predefined criteria; this identified the New City Centre – emerging on the right bank of the River Neris, with potential for physical expansion northwards towards Žalginio Street – as the most viable locus for contemporary townscape development.
 - In the second stage, a comparative assessment of existing and projected structures was undertaken; its findings further indicate that unified, continuous townscape formation in this area is feasible, and that a deliberately composed townscape would hold greater collective value than the preservation of isolated protected objects.
4. The uniqueness of this study lies in the fact that a segment of the contemporary townscape a combination of high-rise and hall-type buildings is viewed as a potential new type of townscape rather than a threat to already established historical townscapes
5. The study revealed that the current configuration of the New City Centre remains heterogeneous and lacks a coherent developmental trajectory, underscoring the necessity for townscape-specific design guidelines or, indeed, targeted regulatory instruments.
6. The methods presented in this paper can be successfully applied not only to the identification and qualitative assessment of contemporary townscapes but also to those of other types. Both methods and the proposed development models can be successfully applied in practical work.

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Kopsavilkums

Rakstā aplūkots mūsdienu pilsētvides ainavas veidošanās identificēšanas un novērtēšanas metodoloģija. Raksta autore metodoloģiju izstrādājusi un pielāgojusi, balstoties uz līdzīgiem pētījumiem, kā arī izmantojusi daudzkritēriju analīzes metodi.

Metodoloģiju veido divas daļas: atlase un novērtēšana, kur katrā no tām pētījumā ir iedalīta vairākos attiecīgos pētījuma posmos.

Atlases posma mērķis ir identificēt mūsdienu pilsētvides ainavas attīstības teritorijas un noteikt to fiziskās robežas. Savukārt novērtēšanas posmā tiek noteikts iespējamo pārmaiņu mērogs mūsdienu pilsētvides ainavā attiecībā pret esošajām struktūrām, salīdzinot esošās un topošās pilsētvides ainavas potenciālo vērtību.

Pētījumā pilsētas ainava tiek vērtēta kā pilsētas struktūras kvalitatīva sastāvdaļa, kuras kopējā vērtība pārsniedz jebkura atsevišķa objekta vērtību. Izmantotā metode ļauj aplūkot pilsētībūvniecisko projektēšanu kā nepārtrauktu procesu, novērtēt pilsētvides komplekso raksturu un, balstoties uz skaidri interpretējamiem rezultātiem, noteikt turpmāko pilsētībūvnieciskās projektēšanas darbību virzienu.

FORMATION AND TRANSFORMATION OF THE MARKETPLACE NETWORK WITHIN THE URBAN STRUCTURE OF VILNIUS

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Abstract. Marketplaces encompass much more than a commercial function – these spaces have always been essential parts of the fabric of urban structure and living. Today, they are taking on new roles as places of cultural attraction and social interaction. At the same time, marketplaces face challenges in their physical and functional restructuring, as well as in preserving their distinctive historical and cultural characteristics. The study analyses urban plans, historical literature, and the spatial aspects of Vilnius' marketplaces, as well as their social, economic and urban contexts. Based on ideas by Lynch, Sennett and Jacobs, marketplaces are interpreted as urban nodes – strategically important locations that contribute to urban viability, social cohesion and cultural identity. The study identifies the development and decline of marketplace network in the context of historical, political and economic shifts. The marketplace network within urban structure is analysed in different periods – historical, Soviet and contemporary Vilnius. The identified characteristics of Vilnius marketplaces allow for a comprehensive analysis of their transformations over time, encompassing different stages of development. A cyclical pattern of marketplaces can be observed in the city's structure, including initiation, growth, and peak, followed by a period of crisis or stagnation, after which marketplaces are either closed or undergo major changes. The study reveals the ability of markets to maintain their historical continuity and adapt to changing conditions. It emphasises the importance of urban continuity, where tradition becomes a basis for innovation. The significance of integration of markets into contemporary urban strategies, such as "15-minute city", is highlighted to develop a viable, inclusive and sustainable city. **Keywords:** development of marketplaces, urban nodes, 15-minute city, cultural identity, historical continuity

Introduction

In contemporary urban planning, cities are seen as multi-layered structures shaped not only by physical elements, but also social and economic relations [3; 6; 18; 24]. Throughout the development of urban planning, nodes with specific functional and symbolic value [1; 20; 13] have gained a certain role. Among such nodes are urban markets, historically developed spots of exchange, meeting and collective memory. Nowadays, they are seen not only as commercial spaces, but also factors of territorial resilience and social cohesion [3; 4; 17; 20].

Over time, functions, significance of markets within the city structure have changed depending on social, economic and political circumstances. Despite the growing interest in markets as urban public spaces [29], their urban development and functional transformations of the pre-industrial and industrial city of Lithuania have still been poorly researched. There is a lack of interdisciplinary analyses integrating urban morphology, social changes, and economic aspects to assess the role of markets as urban nodes in the city's long-term development.

The relevance of this research lies in contemporary trends of urban planning, such as 15-minute city concept, promoting the proximity of functions and decentralised urban structure [16]. In this context, marketplaces become potential multifunctional nodes, which can contribute to viability and sustainability of the city.

This article aims to investigate how markets functioned in the past as urban nodes in Vilnius and to evaluate the shift of their role within urban structure. The study employs historical, urban, and comparative analysis methods, examining urban plans, scientific literature, historical facts, and spatial data. In the first part, the theoretical framework is grounded in the urban structure models of Lynch (1960), Sennett (1990), and Jacobs (1961), allowing for the conceptualization of markets as urban nodes. The second part analyzes the development and transformation of the Vilnius marketplace network in the context of political and economic events, dividing into three main periods: the historical period (from the foundation of Vilnius to 1939, including the return of Vilnius

to Lithuania, corresponding largely to the pre-industrial stage of the city), the Soviet period (1940–1990, marked by Soviet industrialization), and the contemporary period (from 1990 onwards, marked by contemporary industrialization), based on urban plans from different periods. The third part presents the characteristics of Vilnius markets, summarizing key features such as their location within the urban structure, historical development, architectural characteristics, cultural value, and the organization of activities. According to architectural historian Marija Drėmaitė, following the work of Vaskela and Norkus, the main leap in Lithuanian industry occurred between 1918 and 1940, with a shift from extensive to intensive farming and the development of a modern agricultural industry [28, 150; 19].

I. Market as an urban node and a place saturated with cultural values: Theoretical background

Different development of pre-industrial and industrial towns does not allow them to be evaluated according to the same criteria, therefore the market development in these periods is analysed separately in the article. According to Kostof, the pre-industrial town was a relatively small formation (rarely exceeding 100,000 inhabitants), with unspecialised use of land, low social and physical mobility and society divided into elite and underclass. City centre usually is dominated by government institutions, religious buildings and elite residences [4, 304]. Whereas the rise of the industrial city was accompanied by fundamental changes of urban landscape: land became a source of income, property separated from its use, and assets became means of generating leasehold [4, 194]. Industrialisation in Lithuania began in the 1870s and 1880s; by 1939, with the outbreak of World War II, its scale had increased and become significant, and from 1944 onwards it shifted into socialist industrialisation [28].

The development of cities is most clearly revealed in urban plans, which show not only physical changes but also social and economic transformations. With this in mind, this article examines urban plans from different periods and the marketplace network reflected in them, assessing the

transformation of markets through urban, social, economic and political perspectives.

According to Lynch's approach (1960), markets are analysed as urban nodes – strategic locations of the city, where certain functions and physical elements are concentrated. Such nodes are formed, for example, at crossroads or enclosed squares. Sennett (1990) notices that in contemporary urban regions it has been increasingly meaningful to talk about nodes rather than centres or suburbs, reflecting the changing notion of urban structure and disappearance of linguistic system to describe the value of environment: "the centre is full of historical and visual meanings, while the node is deliberately neutral" [4, 268]. Considering the character of market operation, it can be stated that markets function as urban nodes, both in central and peripheral areas, where they contribute to the social cohesion and territorial resilience.

The layout of a market square is largely determined by the city's plan and street network, and in some cases, widened streets functioned as trading areas. Several factors influence the size and layout of a square: first, the city's economic capacity – in medieval towns, the main square often became the dominant commercial space due to its central location, associated with building density, land value, and accessibility; second, hierarchical status, determining whether it serves the entire city or only part of it; and third, specialization, where certain squares or streets focus on specific goods or services, forming a trade network. While shaping the physical structure of a square, these factors determine its role as a vibrant urban node, connecting community, social life, and the economy.

Such approach is in line with contemporary trends of urban planning, especially the 15-minute city concept. The term "15-minute city" (*la ville du quart d'heure*, in French) was suggested in 2016 by Moreno. He defined this concept as a new model of contemporary city, where a single centre has been replaced by several centres or nodes, equipped with all facilities necessary for modern life [16]. In contemporary 15-minute cities, marketplaces function as vibrant urban nodes, providing not only food and everyday goods but also fostering community interaction, social cohesion, and cultural activities. In this way, markets are integrated into the city's history and economic structure, contributing to local economic resilience and making the city more adaptable to social and economic changes.

Nodes also significantly contribute to urban viability, which is understood as an ability to remain and function over time [4, 437]. According to the Scottish Government (1998), town centre viability depends on the number of people visiting it at different times and in different places, while maintaining viability refers to the ability of the centre to attract investment for its maintenance, development and adaptation to changing needs [4, 442]. In industrial cities, viability becomes an issue for both, centres and district cores.

Nodes can become significant only when they accommodate certain clearly defined activities based on social or functional attraction [20, 20]. Starting with the mid-twenty century, urban planning has been dominated by solutions that impaired the relations among different parts of the city. Shopping areas have been separated from residential ones, suburbs planned as isolated housing areas, city centres have lost their residential function and become abandoned by night. It has been mistakenly assumed that repetition of identical urban units could allow for the formation of their interrelations, but all this has failed to ensure a coherent urban structure [20, 113].

Such functional segregation of urban parts has caused several major problems: firstly, it made the relations between

different functions economically costly; secondly, reduced opportunities for the development of network modules without any clear physical structure or specific location [20, 176]. Nodes failing to get integrated into a wider urban network can become parasitic – using urban infrastructure without contributing to its functional integrity. Therefore, as Jacobs (1961) and Lozano (1990) stated, it is necessary to strive for the spatial integration of other functions into the residential structures linking them as closely as possible to the residential environment [20, 108].

Marketplaces reflect the social lifestyle of their community, embody social and cultural values and contribute to the formation of cultural identity [5]. Combining traditions inherited from the past with contemporary urban and rural practices, their activities should be considered a form of intangible cultural heritage [30]. But due to urban development and loss of traditional functions, marketplaces have been losing their character, identity and significance as bearers of intangible heritage, which used to convey local residents' traditional behaviour and lifestyles. It is therefore important to preserve their regional and ethnic identity [26, 119].

Formed back in the Middle Ages, historical nuclei of contemporary cities are extremely important as monuments of material and spiritual culture of European nations [23, 140]. Historical marketplaces stand out by their strong *genius loci* based on unique local identity, which is shaped not only by the physical structure, but also historical, cultural and social experiences. Historical significance provides a place with the semantic depth thus consolidating its uniqueness in the urban fabric. The *genius loci* characteristic to a marketplace is essential for the discourse of urban regeneration and cultural preservation, because it is a core component in users' experience – for tradespeople, local community and tourists alike [29, 3]. The *genius loci* may decline, however, with the loss of heritage and its associated identity. Even small changes in the marketplace buildings or environment may essentially change its character, turning it into a replica of markets of different geographical regions and weakening its sense of local belonging. The *genius loci* of traditional markets consists of historical background, cultural diversity, sensory experiences and live interactions in community spaces. It is a place that exists not only on the physical level, but also via strong emotional and cultural connections [26, 121]. Market activities in squares gradually evolved into covered marketplaces, reflecting new social and economic needs. The first of these emerged in the 19th century, and by the early 20th century, some open markets were turned into trading complexes with permanent structures. These changes illustrate how marketplaces adapted to social, economic, and 20th-century cultural needs, while retaining their vitality, community functions, and integration into the urban network. Therefore, historic marketplaces should be seen not only as heritage sites, but also as living urban nodes, where urban identity, cultural continuity and needs of contemporary life are intertwined – their conservation and sustainable integration into the urban fabric becomes an essential condition for sustainable and viable urban development.

II. Development of Vilnius city markets

This chapter examines the development and transformations of Vilnius markets in the urban structure from the earliest historical periods up to the present day. The first section analyses the development of markets in the historical period (up to 1939) in the context of political and economic events. In the second section, by applying diagrams of selected periods

(the 2nd half of the 15th century, 16th century, 1859, 1906, 1942 and 1993), it is revealed how the location of markets and their incorporation into the urban structure have changed. Plans have been selected according to the historically significant urban turning-points and dating of available cartographic sources. They mark the important milestones in the transformation process of urban fabric:

- 2nd half of the 15th c. – formation of the main squares and first marketplaces in Vilnius;
- 16th c. – construction of the defence wall with gates; marketplaces located in the core of the city and its entrance points;
- 1859 – deconstruction of the defence walls and the extension of marketplace network to the peripheral districts;
- 1906 – decentralisation of markets, modernisation of the entire urban spatial structure;
- 1942 – outset of the soviet industrialisation; incorporation of suburbs, significant social and economic changes;
- 1993 – shift to the neo-liberal market economy; new functions of markets and their new relation with the urban structure; restoration of Lithuanian independence.

The third section analyses the situation of markets in contemporary urban structure of Vilnius, as for 2024; continuity, transformations and viability of Vilnius markets are evaluated in the present urban environment.

1. Development of marketplace network in the context of political and economic events until 1939

Establishment and closure of Vilnius historical marketplaces are closely connected to important political and economic changes in the city (Fig. 1).

Emergence and flourishing of markets (1430–1600)

In 1430–1500, important city formation processes took place in Vilnius. After the Magdeburg Law was granted in 1387, the development of Vilnius self-governance, trade regulation system and network of crafts started. Only the citizens of Magdeburg towns were considered to be townspeople; not all towns that received privileges of markets and fairs had Magdeburg rights [22, 128; 14]. This created conditions for more intense economic life and growth of urban lifestyles.

The first known market (without any official name) emerged in the Town Hall Square in 1432. The square became the main trading place for townspeople, where mundane economic life was concentrated. In 1797, the governance of the Russian Empire established a special Supervisory Commission to control the social and economic life in Vilnius. It initiated the relocation of main markets from the central parts to the peripheral city districts [2, 44]. The Town Hall market was removed in 1845, when the czarist city authorities decided to establish a theatre in the town hall [2, 45]. Nowadays, the square has a representative function as a cultural and public space in the city.

The period 1531–1600 represents the peak of the first cycle, during which early markets grew into a developed urban marketplace network. This period is distinguished for the active trade development and growth of marketplace network in Vilnius. Back then, the first specialised trade locations outside the central city square began to emerge. While Vilnius was the capital of the Grand Duchy of Lithuania (GDL), its economic ties with Hanseatic cities intensified, production and consumption of agricultural products increased. Among the newly established markets were Fish market (near St. Paraskeva Orthodox Church), where fish was sold, Užupis Market, which, as depicted in the 1889 picture by V. Slendzinskis, was a poor space for trade mostly in firewood, switches and brooms [7, 358], and Cattle Market. Emergence of these markets shows that trade in the city was becoming increasingly specialised, with different goods being sold in separate, especially designated places. This indicates the growing scale of trade and increasingly complex economic structure of the city. In the early 19th century, these markets were gradually closed: in 1802, as the Russian Emperor Alexander I was about to visit Vilnius, the city authorities began to clean up the city centre. By the decision of the Supervisory Commission, the Fish Market was moved from its former location near St. Paraskeva Church to the suburb of Užupis [2, 45]. In 1810, the Užupis and Cattle Markets were closed as well – due to the changing economic system and organization of trade in the city. Today, public cultural spaces have been formed in these locations: a square near St. Paraskeva Church, occasionally hosting craft fairs, on the site of the Fish Market; Užupis Square with famous Angel's

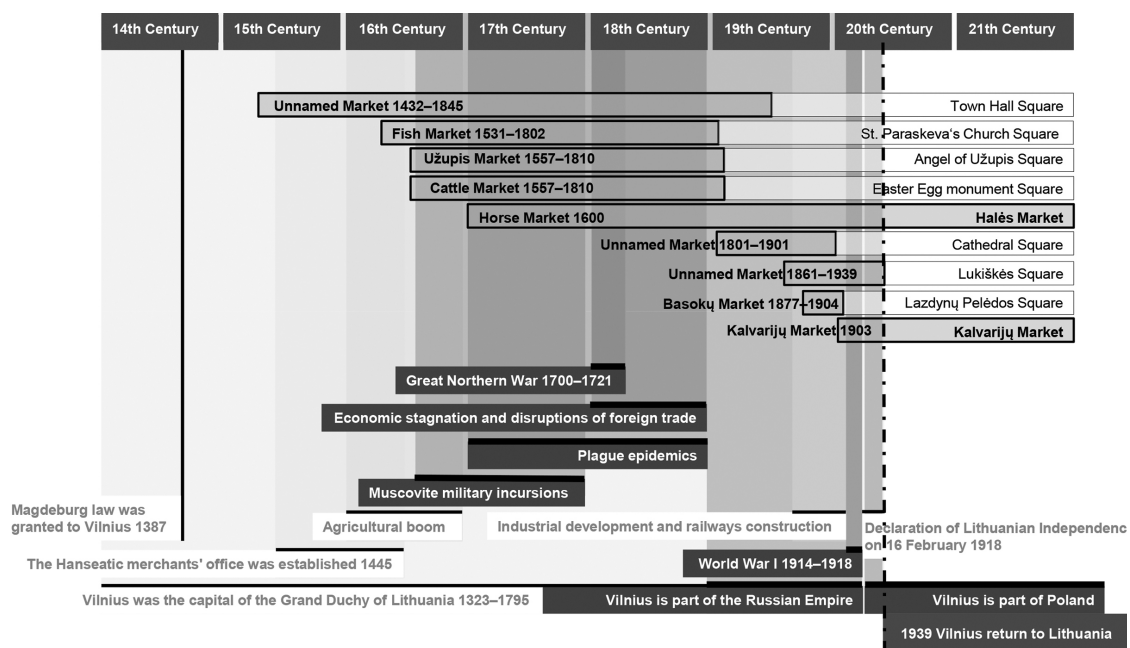


Fig. 1. Development of historical marketplaces in Vilnius in the context of political and economic events, from the foundation of the city to 1939 [created by the author]

sculpture in place of Užupis Market, and a representative square with the Easter Egg monument on the former site of the Cattle Market.

Period of Stagnation (1600 – 1800)

The period 1600–1800 marks the crisis and stagnation phase of the cycle, when political and demographic upheavals slowed the city's economic activity.

1600-1700 was distinguished by significant political and economic challenges. In the 17th century, Vilnius was devastated by invasions by the Muscovite armies and plague epidemics, which led to significant decline of population and weakening economic life. However, around 1600, the commercial infrastructure of the city expanded, with emergence of the Horse Market on the site, where the Halės Market stands today. Some sources indicate that a royal edict at the time authorised the establishment of a flea market in the Arklių Street, close to the city wall, at the turn near the Round Tower. The Arklių Street is mentioned in the documents as early as of 1556 and 1596 [2, 43]. Establishment of this market indicates the continuity of the network of specialised markets even in difficult historical circumstances. It is possible that after 1819, when the trade in other goods (including grain) was officially permitted there, the Horse Market was renamed to the Grain Market [2, 52]. In the blueprint of 1890, the square and nearby Bazilijonų Street were still referred to as the Horse Market Square, but from the 1890s, the name was finally replaced by the Grain (Bread) Square or market. [2, 52]. In the blueprints of the period of German occupation, as well as on postcards published abundantly at the time, the name "Halės" was found often: "Markthalle", "Markthallen", "Marktplatz". Whereas in the interwar period, the same name in Polish "Hale targowe" (Halės Market) was used, and it has remained up to this day [2, 54]. As indicated by the annals, this marketplace in official documents and press around 1960 was called the "Central Marketplace of Vilnius" rather than "Halės Market" [2, 137]. The former Horse Market is one of the few historical markets still in existence today and testifies the viability of the city's commercial traditions.

The beginning of the 18th century was marked by calamities, such as the Great Northern War (1700-1721), frequent plague epidemics, economic stagnation and disruptions of foreign trade. These crises had a deep impact on the life and economic development of the city. Nevertheless, the former markets continued to operate. Although no new markets emerged during this century, the continuous functioning of the existent ones shows a certain stability of trade structure of the city and its population's efforts to maintain trade connections even in difficult conditions.

Period of transformations and marketplace network formation (1801–1939)

During this period, a new cycle begins – a phase of concentration and major transformation of the city's commercial spaces, when marketplaces were relocated, consolidated, or replaced by modern public spaces.

In 1801-1900, as Vilnius became a part of the Russian Empire, the city underwent intense urban changes: industries grew, railways were built, new city districts developed.

During this period, 3 new marketplaces emerged. In 1801, after the demolition of the Lower Castle, an unnamed market near the Cathedral was founded; in 1861, another market was established in the suburb of Lukiškės; and in 1877, Basokų Market was founded on the site of the demolished Barefoot Carmelite convent. Emergence of these markets indicates the importance of growing outskirts and their adaptation to the

new economic and infrastructural conditions.

Today, these former marketplaces have been transformed into public spaces: a representative square near the Cathedral with the restored Grand Dukes' Palace; the Lukiškių Square replaced the former Lukiškių Market; and the Lazdynų Pelėdos Square formed on the site of the Basokų Market.

Nevertheless, during this period, many former markets were closed, such as, Town Hall Square, Užupio, Žuvies galo (Fish) and Cattle markets. This marks a significant transformation of urban commercial spaces and decline of the former market structure.

Between 1901 and 1939, Vilnius underwent several political changes. Until August 1915, it was part of the Russian Empire. During World War I, German forces occupied the city (August 1915 – December 1918). In December 1918, Lithuania declared independence, but Vilnius was taken by Polish forces in 1920 and remained part of Poland until 1939. These events made Vilnius a focal point of political tensions and shaped its urban and social development. During this period, the city's commercial infrastructure changed significantly, and many markets established in the 19th century were gradually closed [19].

This period saw the emergence of one of the largest still operating markets in Vilnius – Kalvarijų Market. Its operation started in 1903, before World War I. This was the first open marketplace of such scale in the Northern part of the city, founded to meet the needs of growing industries and suburban population. The market was famous for its large range of necessity goods and foodstuffs. Each year, on St. Casimir's Day, horses were traded in this market and purchased by the Polish army [9].

As mentioned above, all markets established in the 19th century were closed after losing their significance: in 1901, St. George Market was moved from the Cathedral Square to the Lukiškių Square [7, 128]; Basokų Market was moved to the former Grain Market place, situated a few hundred metres away; and, finally, on 6 February 1904, the market was closed, by the decision of the city governance [2, 51]. Lukiškės Market was operated until 1939. These changes were related to the concentration of the commercial centre in Lukiškės, where the market had secured its position as the main market in the city by the beginning of the 20th century.

In summary, it could be stated that positioning, specialisation and scale of Vilnius marketplaces had changed in line with the political breaking points, needs of the population and growth of the city: from market squares in the centre to the specialised markets on the outskirts. A cyclical model of marketplace development can be seen, including initiation, growth, and peak, followed by a period of crisis or stagnation, after which most marketplaces were closed or reorganized, leaving only Hales and Kalvarijos as the main markets after 1939. Most of the former markets eventually disappeared and were replaced by public spaces, but the remaining historical markets, such as Halės and Kalvarijų, testify the continuity of the commercial traditions of the city.

2. Marketplace network in the urban structure until 1939

Four phases in development of the historical town plan and the related changes of markets can be distinguished: the 2nd half of the 15th century, 16th century, mid 19th century (1859) and beginning of the 20th century (1906). The chronology of market emergence in Vilnius from the 15th to the early 20th century, along with their locations in the city, is shown in Figures 2 and 3. Markets are presented according to their status: those that emerged, were operating at the time



Fig. 2. Changes in historical markets in Vilnius in the urban structure, 15th–16th centuries [created by the author]

or have disappeared. This visualisation allows us to observe how the distribution and concentration of marketplaces have changed alongside the city growth and the transformation of its functional areas (Fig. 2).

By the end of the 15th century, the present Town Hall Square contained a market operating as an important commercial centre, in the very heart of Vilnius, near the main roads leading to Trakai, Polotsk and Medininkai [11, 44]. The city centre developed around this square, and these roads later became its main streets [11, 66]. According to Valionienė, who has studied the spatial structure of Vilnius, in 1390, the city had three centres: the Lower Castle and two nuclei – one covering the so-called Teutonic City and the other – so-called Ruthenian City with the surrounding areas. A process of spatial integration started in the Old Town, which continued throughout the entire 15th century, but did not bring any major reconstructions of the urban space. The marketplace became a centre connecting these two nuclei [12, 26]. By applying a complex approach to activities carried out in this district, its purpose can be identified: in modern terms, it could be described as the town's business management centre, or some kind of "a valley" that separated the residential districts [25, 168]. The marketplace in the present-day Town Hall Square, probably dating back to the 15th century, became a key element linking the entire city structure [25, 193]. The market didn't have any official name, but in some annals it is referred to as "imbarai" [2, 41]. This marketplace in Vilnius was for the first time mentioned in written annals as early as 1432 [25, 168]. Some scholars believe that the earliest market probably was located in the area of St. Johns' Church, where important roads from Ukmergė, Minsk, Polotsk, Vitebsk and Trakai crossed. Later, as the "Ruthenian" and "Teutonic" towns developed, the main market was moved to the Town Hall Square [2, 41].

The urban changes in the 16th century testify the growth and functional differentiation of the city. After Vilnius was surrounded by a defence wall in 1503–1522 [28], intensive construction began in the city core [11]. Urban development took place spontaneously, without following any predetermined plan or structures established already in the neighbouring Western countries [22, 40]. Specialised commercial zones began to emerge at the city gates and inside the wall. Such new marketplaces show not only territorial expansion, but also the differentiation of goods, as different kinds of goods were sold at different places. As

most notable 16th-century marketplaces can be named the Fish market, formed between the Town Hall Square and road to the castle, near St. Paraskeva Church, where the street naturally widened [11, 66]; Firewood Market (on the site of the present-day Halės Market), which was a specially-planned square of 104 fathoms in length and 66 in width [15, 23] (Pylimo Street was also wider on this spot, and it is a typical example of natural formation of commercial space, as is the case with the Didžioji Street running into the Town Hall Square [2, 44]); and Cattle Market, located in the suburb of Rūdninkai, outside the city wall [27, 8]. According to Lovmianska, it was a system of separate markets located along the main axis of the city – Pilies, Didžioji and Arklių streets. The system consisted of a Fish market near St. Paraskeva's Church, large market at the Town Hall, horse market (outside the city wall, close to the Round Tower) and small flea market nearby [25, 102]. Užupis market was located on two important roads leading to Antakalnis (via Marytė Margytė Street) and Lyglaukiai and Belmontas (via Polocko Street) [7, 358]. All markets were located on the main entrance roads to the city.

In the mid 19th century, Vilnius underwent rapid changes. In 1800–1805, most of its defence walls were demolished [28]. In late 19th century, under the influence of capitalism development, the growth of the city intensified even more [15, 27]. Marketplaces moved to periphery with some former ones disappearing for good and being replaced by public spaces. As one of the most important 19th century markets could be named the Cathedral Square Market, which emerged after the demolition of the Grand Dukes' Palace in 1799–1801. The square was paved over and became a trading place. By the end of the 18th century, St. George's Day fairs were held there [7, 128]. Lukiškės Market emerged in the middle of the 19th century as a part of the planned Lukiškės suburb. The Firewood and Hay squares were formed (124 x 79 fathoms), which were even and comfortable marketplaces [15, 23]. The marketplace arranged between the present Pamėnkalnis (also called the Tauras Hill) and Church of Saints Philip and James became the largest trading place in Vilnius [10, 8]. In 1861, the markets of firewood, hay, horses, grain and vegetables were functioning there [15, 27]. Basokų Market was situated on the site of the former Barefoot Carmelite Convent, on the northern side of the Lazdynų Pelėdos (former All Saints) Street, between Biržų and Arklių Streets [7, 208].

By the end of the 19th century, several historical marketplaces – Fish market, Cattle Market and Užupis Market – disappeared.



Fig. 3. Changes in historical markets in Vilnius in the urban structure, 19th–20th centuries [created by the author]

This indicates changes in the structure of the city centre and relocation of commerce in the newly developed districts.

At the beginning of the 20th century, in response to the new urban planning principles, hygiene requirements and increasing traffic, trade began to retreat from the Old Town centre. Most of the historical markets disappeared, with the exception only of the Halės Market. These changes reflect not only the relocation of commercial centre, but also modernisation of the entire spatial structure of the city. Vilnius began expanding into the suburbs, including Šnipiškės, which was connected to the city centre by two important streets going from the Žaliasis Tiltas, one leading to Ukmergė and the other to Verkių [7, 376]. Kalvarijų Market became an important commercial centre. It was formed in the area of Kalvarijų, H. Manto, Rinktinės and Turgaus streets. The exact date of its operation outset is unknown, but the market was explicitly mentioned in 1903, when arrangement of the market square started and the blueprint for a permanent structure was approved. In the interwar period, Kalvarijų Market became an important trading place, and during the Soviet times, when most of the trade was state-owned, it was a collective-farm market, selling agricultural goods from both collective and individual farms [2, 137; 8].

3. Marketplace network in the Soviet urban structure

Urban transformations of Vilnius and, specifically, the transformation of marketplace network, in the Soviet times are illustrated by the data presented in urban plans of 1942 and 1993, as shown in Fig. 4.

By the mid 20th century, the network of Vilnius markets was still quite concentrated in the historical part of the city, as seen in the 1942 plan. Two historical marketplaces have remained: Kalvarijų Market, operated since 1903, and Halės Market, founded around 1600. At that time, the location of markets was not influenced Soviet urban planning processes or the formation of residential neighbourhoods (microrayons).

The town plan of the late 20th century clearly shows a rearranged network of markets, with emerging new layout pattern. Markets were formed in the centres of newly developed residential neighbourhoods (microrayons), such as Justiniškės, Šeškinė, Karoliniškės, Lazdynai, Naujininkai, Baltupiai, while the Gariūnai market grew into one of the most important regional shopping centres. This marks a clear shift from a centralised to decentralised, locally accessible trading system. Markets have become an integral

part of the infrastructure of residential neighbourhoods (microrayons), reflecting both the urban and socio-economic change of the city.

In summary, it can be stated that changing location of marketplaces in Vilnius, from the 15th to the early 20th century, reflects the transformations of the city plan – starting with the trade concentrated at the historical core of Vilnius, near the town hall, to the gradual spread outside the town wall, to suburbs and, finally, into the residential neighbourhoods (microrayons). Comparison of the 1942 and 1993 plans reveals a structural turning point in the organization of the city's markets: a transition from historical concentration in the centre to a dispersed, district-oriented system. This change has been urban, as well as social: markets have become part of everyday life in residential districts, adapted to the residents' needs and associated with the planned vision of soviet lifestyle.

4. Situation of markets and their network in the contemporary urban structure of Vilnius

Currently, the distribution of markets across the main structural zones of Vilnius – the Old Town, and the central, middle, and peripheral parts [21] is shown in Figure 5.

The Old Town is a historical core, where the main marketplaces have been concentrated since ancient times. It still has the highest density of markets pointing to the origins and continuity of commercial life in the city.

Central area including the territories around the Old Town stands out by a dense network of markets dating back to the turn of the 19th- the beginning of the 20th century. Most of them have been developed strategically to satisfy the needs of rapidly growing population.

Middle area covers the urbanised parts of the city away from the centre, but still containing a dense network of residential districts and comfortable transportation. The marketplaces of this area are orientated to the daily needs of local population. The peripheral area includes both the middle zone and suburb areas. Although the density of markets is lower there, certain marketplaces stand out by targeting specific consumer groups or regional demand.

Contemporary marketplace network reflects the decentralisation of trade and development of small businesses. The largest markets currently operating in Lithuania are Gariūnai Market, which brings together over 10,000 small and medium-sized entrepreneurs, and the

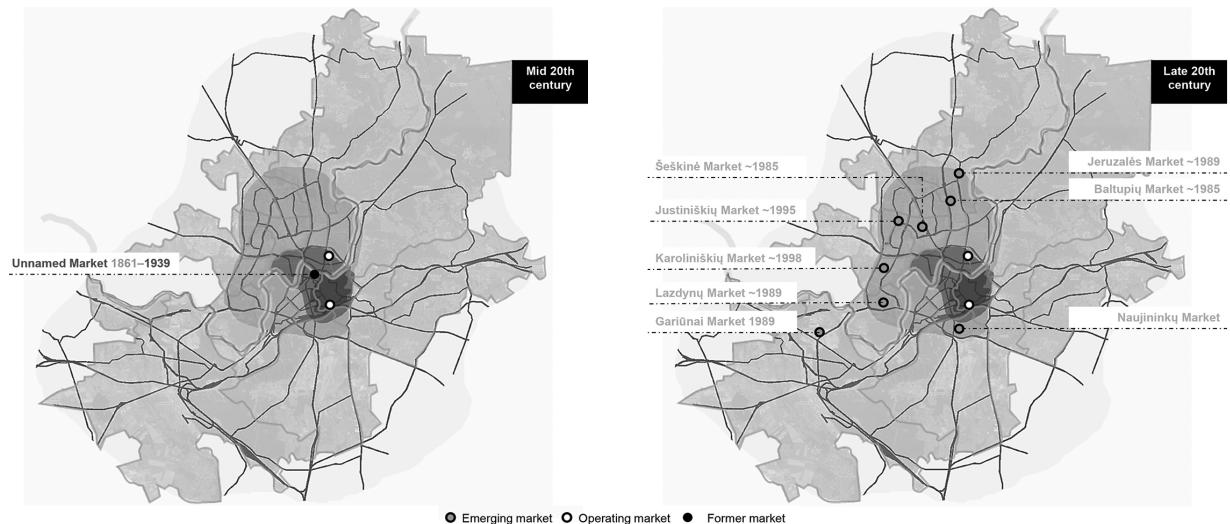


Fig. 4. Changes in the Vilnius market network in the Soviet period
 [created by the author]

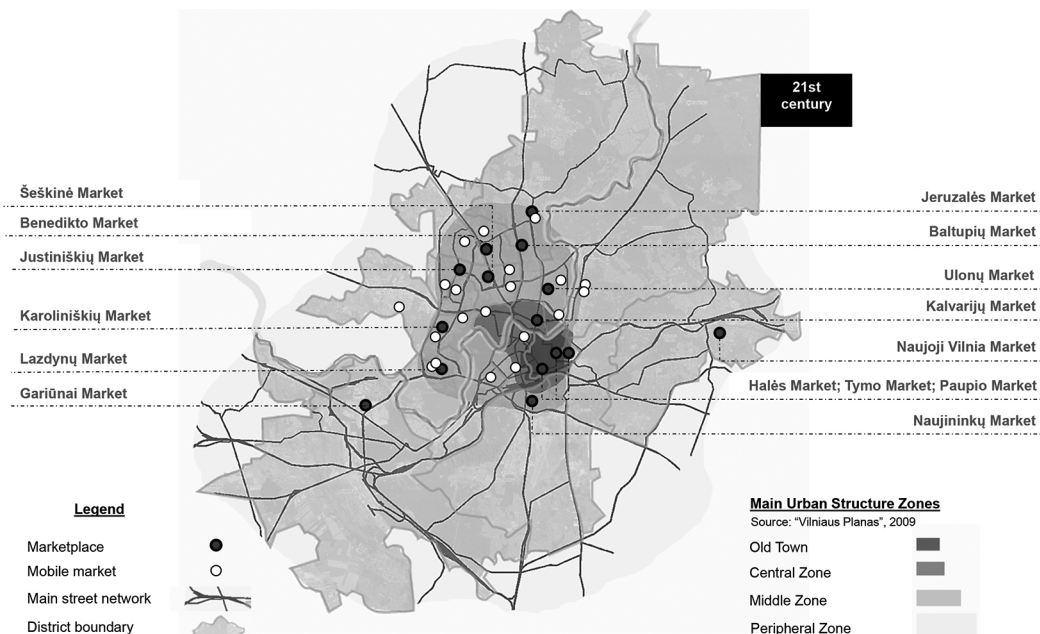


Fig. 5. Situation of the Marketplace Network in Vilnius, 2024
 [created by the author]

historical Kalvarijų and Halės Markets, which are important shopping places in Vilnius [28]. Mobile markets are mainly located in the central and peripheral structural areas, in response to the population's need for quick, convenient and local access to fresh produce.

In summary, it can be stated that the contemporary network of marketplaces reflects the decentralisation of commerce and growth of local businesses, with Gariūnų, Kalvarijų and Halės Markets still remaining the main shopping destinations. In conclusion, the development of Vilnius marketplaces reflects the city's economic expansions and recessions, political upheavals, and urban transformations. In prosperity periods, the number of markets increases, they tend to specialise and spread outside the city centre. During crises, wars or epidemics, commercial activity slows down or changes. Each market becomes a mirror of the society and economy, reflected in the urban fabric of a particular historical period. The network of markets developed over the centuries reflects the growth of Vilnius, complexity and spatial transformation of its commercial structure, from a centralised model in the Town Hall Square to specialised markets on the outskirts of

the city. The post-war and Soviet times saw the centralisation of markets, while the period of independence has witnessed the decentralisation and recovery of small businesses. Nowadays, traditional markets are concentrated in the Old Town as well as in the central and middle zones, while mobile markets are mainly found in the central and middle zones. In the middle zone (for example, in Fabijoniškės, Justiniškės, Pilaite, Naujoji Vilnia, Paneriai) mobile forms of trade predominate. Thus, the contemporary network of Vilnius markets reflects the historical continuity and adaptation to the contemporary urban structure and needs of the population.

III. Characteristics of Vilnius city markets

This chapter is based on the analysis of former and currently operating markets in Vilnius. Five main categories of features (location within the urban structure, historical development, architectural characteristics, cultural significance, and organization of activities) along with their respective criteria, have been identified. These aspects allow for a comprehensive analysis of market transformation from the 15th century to the present day, revealing their links to urban development,

social dynamics and economic changes.

The first section is dedicated to concise description of categories of features and applied criteria, while the second and third sections analyse marketplaces and their characteristics in different historical periods: historical, Soviet, and contemporary.

1. Main features and categories

The position within the urban structure is characterised by the neighbourhood, the structural area of the city, and the name and classification of the adjacent street. Urban neighbourhood indicates, in which urban district or unit of Vilnius a given market is located, based on data from the official interactive map administered by Vilnius City Municipality. A given market is assigned to one of the five main city areas (the historic core, historic suburbs, central, middle and peripheral area) by the structural area of the city and according to the data provided by the municipal enterprise Vilniaus vystymo kompanija (VVK). The name and category of the adjacent street helps to determine the proximity of the market to the main streets and their importance in the city's transport system.

Features of historical development cover the territory formation process of a given market and period of its operation. Five main aspects are assessed: 1) the outset of formation of a village, suburb or district, which indicates the age or period, when the territory was formed; 2) maintenance of the original urban structure and built environment, indicating whether the historical layout of the area was preserved prior to the market's establishment; 3) the outset of new urban structure and development defining the period, when the renovation or development of the territory was initiated, if any; 4) the year of foundation of a market, which refers to the date (exact or approximate), when the operation of the market started; 5) the year of closure indicating the date, when operation of the market was terminated (if it is no longer operational).

While defining the architectural attributes of marketplaces, it is important to find out, whether a given market has its own space and infrastructure, and if not, what infrastructure it has been using. It is defined what type of space the market operates in, and whether the marketplace contains a permanent building or uses temporary structures. Architectural attributes are used to define the physical environment of a given marketplace, based on five main criteria: 1) operation of marketplace in its own independent space and infrastructure, 2) the owner of the space, if the marketplace uses the infrastructure of another facility, 3) the type of commercial space (street, square, building, etc.), 4) the type of structure of the marketplace (permanent or temporary), and 5) the year of construction of the building, if any.

Features of the cultural significance include the recognition of a given marketplace in the context of culture and tourism. Two main aspects are identified: 1) data from the Registry of Cultural Property showing whether the marketplace and/or its territory is included into the Registry as a protected cultural item; 2) its presence on the official list of tourist attractions "Go Vilnius", which indicates whether the marketplace is presented as a recommended site for tourists. It is noteworthy that only a small number of marketplaces are included in the Registry of Cultural Property: out of 42 marketplaces, four are listed solely as sites, while only one—Halės Market—is included both as a building and as a site.

Features of the organisation of activities encompass the characteristics of commercial operations and distinguish four main aspects. 1) The type of activity indicates whether a given marketplace is permanent or mobile. 2) The functional type

defines the character of the activity – whether a market sells a variety of goods, such as farmers' produce or foodstuff, or functions primarily as a catering venue. 3) Opening hours indicate whether a market operates daily or only on specific days of the week. 4) Finally, the administrator specifies who is responsible for organising the markets operations.

2. Features of markets established until 1939

This section covers the historical period, from the foundation of Vilnius to 1939. Historical markets of Vilnius are closely connected to the urban, architectural and social development of the city. According to their location in the urban structure, the markets operated before 1939 mostly were situated in the Old Town and its historical suburbs – Užupis, Rūdninkai, the outskirts the New Town and Šnipiškės. They are identified as the historical core and historical suburbs, while the Kalvarijų Market is associated with the central structural area. Most of the markets were located along the main transport arteries – Polotsk, Kalvarijų, V. Šopeno, Pylimo, Arklių and other streets, and it indicates their strategic position in the city's transport network. Two unnamed markets and the so-called Fish market were operated in the historical core and the Halės Market – on the outskirts. The historical suburbs hosted the Užupis, Cattle, Kalvarijų markets and one more unnamed market. Out of these, the Halės Market (on the outskirts of the Old Town) and the Kalvarijų Market (now part of the central structural area) are still in operation.

Historical development shows that markets usually were situated near the main streets and infrastructure nodes. Their origins mostly date back to the 15th – 19th centuries, with many areas retaining their original urban structure (e.g. the Halės Market built in 1906). Many of them were founded in the 18th – 19th centuries, at the time of intensification of urban trade. Foundation and closure dates of markets stand in proof of their long-term existence – some markets, such as Halės, are still functioning, while others were closed in the interwar or Soviet period. According to transformation of architectural features, most markets were in possession of their own space and infrastructure, with trading taking place in squares, streets and specialised buildings. Halės, Basokų and Kalvarijų Markets were situated in marketplace buildings constructed in the 19th c. – the early 20th c. Whereas some other markets had no buildings of their own. Of the eleven marketplaces that operated until 1939, only Halės Market is listed in the Registry of Cultural Property, both as a building and as a site. Halės Market is also mentioned on the "Go Vilnius" tourism portal [8].

This indicates not only commercial, but also cultural significance of this market. Specialisation of historical markets closely correlated with their location. Many of them functioned as permanent trading spots specialising according to types of goods: fish, cattle, timber, brooms, broomsticks, horses, leather items, etc. Markets of mixed specialisation mostly were situated in the centre, near main crossroads and functioned as main shopping centres with wide variety of goods and intense flows of visitors. Markets situated further away from the centre (e.g. Basokų Market) tended to serve specific neighbourhoods or districts. Moderately specialised markets were located at the city gates. Over time, the functions of many markets expanded from specialised to mixed trade.

Historical markets have retained their architectural identity reflecting different stages of Vilnius urban development – from the Middle Ages to early 20th century. They functioned as important centres of city life, bringing together the residents, merchants and craftsmen.

3. Features of markets established during the Soviet period

The Soviet period in Vilnius marked a significant transformation of the city's urban and economic structure, which affected the marketplace network. Most historical markets were closed before the start of Soviet period, and the establishment of new trading places was centralized and state-regulated.

Most of the markets established during the Soviet period were located in the centre of residential neighborhoods and were well connected to the transport infrastructure. Their location were planned according to Soviet urban planning principles. They had no historical or cultural connection to the Old Town markets, but functionally met the needs of residents: they ensured accessible supply of goods in the new districts and served as local community trading centers.

Architectural solutions varied: some markets had marketplaces buildings, while others operated as open squares. Due to the centralized nature of the economy, market specialization was limited, usually focused on supplying basic goods (food, clothing, household items).

Markets from the Soviet period laid the foundation for the contemporary marketplace network. Later, during the independence period, they either transformed into place for mobile markets serving residential neighborhoods or were integrated into newly built contemporary market complexes. This period reflects urban development and adaptation to the conditions of the planned economy, although the markets were much less notable in terms of cultural or historical value.

4. Features of markets operating today

Markets that emerged after 1939—mainly during the Soviet period and the following decades—developed in response to changes in the urban structure, the growing needs of citizens, and the modernisation of the commercial system. Unlike the historical markets, these have no organic links to the city's historical development or cultural heritage, but are functionally adapted to the growing neighbourhoods, often afar from historical core. Architectural solutions for markets are varied: some, such as Tymo Market (established in 2006) and Paupio Market (2020), have their own buildings. They function in the central urban structure zones and are included in the Registry of Cultural Property as sites. Whereas many other markets – especially mobile farmers' markets - operate on shopping malls' sites, streets, squares or parking lots, with neither permanent structures nor engineering infrastructure. The middle urban structure zone is dominated by markets such as Šeškinės, Benedikto, Justiniškių, Karoliniškių, Lazdynų, Jeruzalės, Baltupių, Ulonų and Naujininkų, which were established between ~1985 and 2021. Some of them (e.g. Benedikto Market) are distinguished by expressive architecture and permanent structures, while others (e.g. Justiniškių, Lazdynų, Karoliniškių) are located on the parking lots of supermarkets (Maxima, Rimi, etc.) and therefore tend to be temporary or mobile. In peripheral areas (e.g. Naujoji Vilnia, Gariūnai), there are Naujosios Vilnios Market (2011) and Gariūnų Market (1989). The latter is distinguished by its size and significance, having become an informal economic centre operating as a multifunctional retail park.

Features of historical development show that most markets were established in transformed or newly urbanised areas, where no former urban structures remain. As a result, they are mostly unrelated to the urban historical heritage and only rarely included in the Registry of Cultural Property or official tourist routes. Mobile farmers' markets have become popular in Vilnius since 2000, as a flexible, temporary form of commerce supplying local production. They have been

operating in many neighbourhoods: Fabijoniškės, Justiniškės, Pilaite, Žirmūnai, Šeškinė, Lazdynai, Karoliniškės, Naujininkai, etc. Most of them are managed by the organisation Lietuviško ūkio kokybė, and trading takes place from one to several days per week. These small markets don't have a permanent infrastructure, but due to their location close to residential areas and shopping centres are easily accessible to local residents.

In summary, Vilnius marketplaces reflect the different stages of its historical and urban development - from the old markets at the historical core to modern mobile forms of trade. Two historical markets, Halės and Kalvarijų, have remained to the present day and are important for the Vilnius identity and cultural heritage. Whereas industrial-period markets that emerged after 1939 (mainly in the Soviet period and following decades) mark the functional spread of the city to its new districts. Although these markets usually don't have any historical or cultural value, their importance lies in ability to adapt to the needs of contemporary Vilnius residents. They reflect the dynamics of the city, are important for the local economy, food supply and social cohesion, and offer an alternative to standardised commercial centres, while maintaining a culture of contact, informal trade. The popularity of mobile farmers' markets after 2000 marks another step in the development of urban commerce: they are adaptable, mobile, focused on local, seasonal agricultural production. Such markets tend to be located in the middle or peripheral areas of the city, complementing to the network of permanent markets and responding to emerging needs.

Conclusions

Development of Vilnius marketplaces reveals that these spaces have always been essential parts of urban structure and fabric of life. They have satisfied the economic needs, formed social connections, strengthened cultural identity and retained historical tradition and memory. Markets have shaped the living history of the city from the times of the GDL to the present day, and the analysis confirms that they function as urban nodes having a significant impact on viability and identity of the city.

Based on Lynch's concept of nodes, markets are places, where vectors intersect and significant functions are concentrated, making them landmarks in the urban fabric. According to Sennett's theory, it is these nodes, rather than traditional centres, that reflect the dynamics of the modern city and the social interactions of its citizens, particularly through commerce and public life. Markets, functioning as nodes, maintain the functional viability of the city and connect different social strata, cultural practices and historical memory. Therefore, their role is important not only in urban, but also social and cultural aspects.

The network of Vilnius markets has developed dynamically – the locations, functions and structural integration into the urban fabric have changed. These changes were directly linked to political, economic and urban transformations. Each period reflects a different stage of the city transformation - from the localised markets in the Old Town to decentralised network in the Soviet and post-Soviet periods.

Emergence, disappearance or transformation of marketplaces have been closely connected to broader changes in the city: demolition of the defensive wall, industrialisation, principles of Soviet urbanism and transition to the neo-liberal market economy. This makes markets a reliable indicator of urban socio-economic transformation.

In the contemporary structure of Vilnius, markets often lose

their original functions, while taking on new roles: becoming cultural spaces, gastronomic attractions and places of social interaction. Their viability depends on their ability to adapt to changing urban lifestyles, and their transformation – on their ability to combine tradition and innovation.

Two remaining historical marketplaces – Halės and Kalvarijų – are of particular importance. They are not just architectural or functional relics, but rather urban symbols of the city's ability to maintain its historical continuity. As an indicator of urban viability and resilience, Halės Market reflects the transition of Vilnius from the GDL's capital into a modern European city. Historical challenges – wars, epidemics, industrialisation – didn't destroy the market, but encouraged its adaptation. Both, Halės and Kalvarijų Markets still function as living centres of historical memory.

Marketplaces should be seen not only as commercial facilities, but also important elements of local identity, public relations and coherent urban structure. Their integration into urban planning is in line with such contemporary trends as the "15-minute city" concept. Even upon changing consumption patterns and forms of trade, markets remain potential community hubs that promote social cohesion, micro-economic activity and cultural viability. Their purposeful incorporation into contemporary urban plans means not only functional, but also memory-retaining city, which maintains its human scale and historical coherence.

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Kopsavilkums

Pētījumā analizēti Viļņas pilsētas plāni, vēsturiskā literatūra un tirgus laukumu telpiskie aspekti, kā arī to sociālais, ekonomiskais un pilsēt būvnieciskais konteksts. Balstoties uz Kevina Linča (Lynch), Ričarda Seneta (Sennett) un Džeinas Džeikobsas (Jacobs) idejām, tirgus laukumi tiek interpretēti kā pilsētvides mezgļpunktī – stratēģiski nozīmīgas vietas, kas veicina pilsētas dzīvotspēju, sociālo kohēziju un kultūras identitāti. Pētījumā identificēta tirgus laukumu tīkla attīstība un lejupslīde vēsturisko, politisko un ekonomisko pārmaiņu kontekstā. Tirgus laukumu tīkls pilsētas struktūrā analizēts dažādos Viļņas attīstības periodos: vēsturiskajā, padomju un mūsdienu periodā. Identificētās Viļņas tirgus laukumu raksturiezīmes ļauj visaptveroši analizēt to transformācijas laika gaitā, aptverot dažādas attīstības posmus. Pilsētas struktūrā ir novērojams tirgus laukumu attīstības cikliskums, kas ietver to izveidošanos, izaugsmi un uzplaukumu, kam seko krīzes vai stagnācijas periods, pēc kura tirgus laukumi tiek slēgti vai piedzīvo būtiskas pārmaiņas. Pētījums atklāj tirgus spēju saglabāt vēsturisko pēctecību un vienlaikus pielāgoties mainīgajiem apstākļiem. Tajā uzsverta pilsētvides nepārtrauktības nozīme, kur tradīcija kļūst par pamatu inovācijām. Pētījumā īpaši akcentēta tirgu integrēšanas nozīme mūsdienu pilsēt plānošanas stratēģijās, piemēram, "15 minūšu pilsētas" koncepcijā, tādējādi sekmējot dzīvotspējīgas, iekļaujošas un ilgtspējīgas pilsētas attīstību.

URBAN GRASSLANDS FOR DIFFERENT CITY ZONES: A SCENARIO ASSESSMENT INTEGRATING PUBLIC PREFERENCES AND MANAGEMENT ASPECTS

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Abstract. Urban grasslands are increasingly promoted as biodiversity-oriented alternatives to intensively managed lawns. However, their implementation in Latvian cities remains fragmented and is rarely embedded within comprehensive green infrastructure planning. Municipalities often lack spatially differentiated planning tools that integrate public preferences, management regimes and long-term cost considerations. The paper addresses this gap, and the aim of the study is to develop a scenario-based assessment framework to identify suitable functional urban zones for urban grassland integration, using Jelgava, Latvia, as a pilot case, with a particular focus on those functional zones where municipalities could systematically incorporate urban meadows as elements of green infrastructure within thematic spatial plans for urban territories. The research combines prior survey data on public perceptions with spatial analysis and management modelling. Functional urban zones appropriate for urban grassland implementation were selected, and integration models were developed for each zone group, distinguishing between flowering urban meadows and extensively managed existing grasslands. The proportional coverage of grasslands within each zone was modelled through test planning, and lifecycle costs were calculated over a five-year period, including both establishment and maintenance regimes. Two city-scale integration scenarios were subsequently developed, enabling comparison between establishment-intensive and management-transition approaches. The results demonstrate that spatial differentiation is critical. Larger and more continuous grassland areas can be allocated in peripheral zones, particularly near natural territories, as well as in railway corridors and technical areas, while central streetscapes and residential courtyards require controlled proportions and clearly defined design solutions to ensure public acceptance. The study concludes that urban grassland integration should be framed as a reform of maintenance regimes embedded within municipal green infrastructure planning. By linking public perception, spatial typology and differentiated management practices within a scenario-based framework, municipalities can move beyond isolated pilot projects toward systematic, cost-efficient and socially acceptable implementation of urban grasslands across functional city zones. **Keywords:** urban meadows, a scenario-based assessment, public perception, city functional zones

Introduction

This article presents a study addressing urban grasslands as an emerging initiative in Latvian cities, examining their potential integration into urban green infrastructure planning as alternatives to conventional lawns. It analyses how their implementation across different urban functional zones can be aligned with public preferences and context-specific management frameworks to support long-term institutionalisation.

1.1. Grasslands as urban green infrastructure elements

A review of the literature on urban grasslands indicates heterogeneous terminology linked to differing conceptual and management frameworks. The term “semi-natural grasslands” denotes human-established grasslands in both urban and rural settings composed of species typical of natural grasslands [17; 31]. “Urban meadows” may include such species alongside ornamental perennials, annuals or biennials and grasses, or may consist exclusively of these plant groups. In contrast, “urban grasslands” functions as an umbrella term encompassing both regionally characteristic semi-natural grasslands and mixed-species urban meadows [27; 34; 40].

In Northern and Central Europe, semi-natural grasslands have undergone significant reduction due to agricultural intensification, land abandonment and afforestation. Introducing grassland systems into urban green infrastructure can therefore contribute to expanding ecologically valuable habitats while operationalising EU policy objectives related to biodiversity enhancement and climate adaptation in cities [11; 12]. Compared to intensively managed lawns, characterised by low species richness

and limited ecological resilience, urban grasslands provide superior ecosystem service performance [10; 17; 27; 31]. Structurally diverse vegetation composed of regionally adapted species increases plant richness and supports pollinators and predatory invertebrates; for example, semi-natural grassland analogues sustain higher abundance and diversity of bumblebees than frequently mown lawns and enhance biological pest regulation through ground beetle populations [26]. Urban grasslands also contribute to climate regulation and environmental quality. Their deeper root systems and higher biomass improve evapotranspiration, soil moisture retention and thermal buffering, strengthening drought resilience and mitigating heat stress [25]. Taller and more complex vegetation enhances particulate matter capture, especially in transport corridors [32], while emerging evidence indicates improved soil microbial diversity and substrate quality in species-rich grasslands [2]. From an economic perspective, reduced mowing frequency lowers fuel consumption, irrigation demand, fertiliser use and associated emissions [45], positioning urban grasslands as cost-effective long-term alternatives to conventional lawn regimes. Socially, they enhance landscape diversity, support environmental education and contribute to human well-being through increased contact with biodiverse environments. Overall, urban grasslands represent an evidence-based solution that integrates ecological, economic and social benefits within a single green infrastructure element. Their effective scaling, however, depends on governance capacity, adaptive maintenance frameworks and alignment with societal expectations regarding urban landscape aesthetics and management.

1.2. The role of public perception and participation in urban grassland implementation

Public perception is a critical determinant of the acceptance and long-term institutionalisation of urban grasslands. Landscape perception is shaped by sensory experience, social representations and the “psychology of place” [7;44], positioning grasslands not only as ecological habitats but also as cultural symbols. In Latvia, meadows are associated with traditional land use, midsummer (Jāņi) rituals and national identity; Bunkše [4] characterises them as iconic elements of the Latvian landscape, a status reinforced by regionally distinctive sites such as the Lielupe floodplain grasslands or the Randu Meadows [24]. Yet when introduced into urban environments, grassland aesthetics often conflict with entrenched norms of tidiness and control associated with intensively managed lawns. Empirical evidence shows that vegetation preferences are shaped by cultural conditioning and perceived safety: although natural elements are valued, residents frequently favour ordered landscapes over “wild” vegetation [30;47]. Concerns about insects, reduced visibility and neglect further reduce acceptance [3;22]. Acceptance is also spatially differentiated. Support tends to be stronger in parks and peripheral or less intensively used areas, while resistance increases near residential properties, reflecting “not in my front yard” dynamics [15]. Evidence from Stockholm illustrates this tension: lawns constitute roughly one third of residential outdoor space and are highly valued for recreation and social interaction [14], yet residents also express preferences for more diverse, sensory-rich environments. This suggests that integration of urban grasslands requires strategic spatial reconfiguration rather than wholesale lawn replacement. Within such frameworks, biodiverse perennial meadows can enhance perceived site quality and aesthetic value if their management remains legible. Prolonged flowering, coherent spatial structure and visible maintenance cues are therefore critical design attributes for securing public acceptance [39].

Participatory approaches can reduce resistance by framing urban grasslands as shared socio-ecological projects. In Estonia, the programme “Igaühe looduskaitse” (Everybody’s Nature Conservation), led by Eestimaa Looduse Fond, integrates policy engagement with practical management, including the “tule niitma” movement, which revitalises traditional mowing practices and mobilises citizens in biodiversity stewardship [16]. In Riga, the municipal urban meadow programme similarly collaborates with neighbourhood communities by involving residents in collecting native meadow seeds, establishing and maintaining grasslands, and providing locally adapted seed mixtures for private gardens. It also strengthens public ecological literacy through on-site signage explaining plant species and ecological functions [42;43]. Together, these initiatives show that structured participation combined with environmental education enhances ecological awareness, place attachment and long-term social acceptance of urban grasslands.

Public perception of urban grasslands is shaped by cultural symbolism, aesthetic norms, safety concerns and spatial context. Documented benefits include improved site quality, local identity, well-being and civic engagement [1;39]. However, aesthetic resistance, safety concerns, uneven environmental knowledge and lower acceptance near residential areas remain significant constraints. Effective implementation therefore depends on context-sensitive design, visible management and participatory communication strategies that align biodiversity objectives with socio-cultural expectations.

1.3. Urban grassland management practices and considerations

Urban grasslands are multifunctional systems with diverse objectives, including biodiversity conservation, pollinator support, recreation, aesthetic representation, ecosystem service provision and educational value [10;17;39;45]. These objectives determine design and maintenance regimes. Converting intensively managed lawns into extensively managed grasslands through reduced mowing follows a different ecological and financial trajectory than establishing newly sown urban meadows with a high proportion of flowering perennial species. The former relies on gradual diversification under nutrient limitation, whereas the latter requires deliberate soil preparation and targeted seed mixtures but may achieve faster structural and visual transformation.

Management intensity strongly shapes ecological outcomes. The Swedish “LAWN” project classified grasslands by mowing regimes across spatial scales to support environmental assessment and planning, though municipal budget integration remains complex [17;18]. Evidence from Central Europe shows that fertilisation and frequent mowing increase grass dominance while reducing legumes and structural heterogeneity, confirming nutrient reduction as a precondition for meadow development [23;46]. In Rennes, France, reducing mowing from 15–20 cuts per year to one significantly increased taxonomic, functional and phylogenetic diversity, whereas intermediate regimes yielded limited gains [9]. Delayed mowing and uncut refuges in Switzerland similarly enhanced species richness [5]. Thus, mowing frequency, timing and spatial heterogeneity are decisive for pollinator and invertebrate habitat continuity. Seed sourcing is equally critical. Locally sourced seeds are widely recommended to maintain regional genetic integrity and ecosystem resilience [13;38;42], yet such services are not universally available and often increase procurement costs and administrative complexity. In Estonia, Nordic Botanical OÜ applies a full-cycle model combining local seed production with site-adapted mixtures (e.g., dry calcareous, moist, shaded habitats) and management planning, improving ecological fit and resilience [28].

However, the operationalisation of these stages is frequently constrained by systemic barriers, including the absence of unified methodological standards, insufficient lifecycle financial modelling, aesthetic resistance to taller vegetation, knowledge gaps in soil preparation and seed sourcing and limited monitoring provisions embedded in maintenance contracts. Although evidence shows that reduced mowing and ecologically informed establishment enhance biodiversity and ecosystem services [5;9;23], long-term institutionalisation depends on integrating ecological, financial and governance instruments within municipal systems.

1.4. Urban grassland implementation initiatives in Latvia and key challenges

In Latvia, semi-natural grasslands are classified as dry, mesic and wet habitats, yet they constitute the country’s most threatened habitat type, covering only 0.7% of national territory [13;34]. Their persistence depends on continuous low-intensity mowing or extensive grazing to prevent shrub encroachment and woodland succession. During the 20th century, both distribution and ecological quality declined due to agricultural intensification in productive regions and abandonment followed by afforestation in marginal areas. In cities, the remaining fragments are primarily river floodplain meadows, often located within protected areas,

and constitute only a small proportion of urban green space compared to intensively mown lawns, which, according to evidence from other European cities, may occupy up to one quarter of total urban land cover [14].

Since 2017, the Latvian Nature Fund has promoted integration of native grassland species into urban green infrastructure, framing urban grasslands as biodiversity-enhancing and participatory elements [34;42]. The largest initiative is the "Urban Meadows" network in Rīga (launched 2021), implemented with the Latvian Nature Fund, Rīga City Council and neighbourhood associations. It includes 42 sites (13.7 ha), primarily created by enriching lawns with locally sourced perennial and grass species [42;43]. Located mainly in underused green areas and large parks, these sites follow annual management plans regulating mowing regimes and invasive species control, supported by a public digital map and on-site signage explaining ecological objectives, meadow plant species and maintenance principles. Comparable approaches have been implemented in other Latvian cities at smaller scales. In Cēsis, six "landscape meadows" were designated under binding municipal regulations in 2023, specifying one annual mowing without mulching, biomass removal, intensified mowing near pedestrian infrastructure and herbicide restrictions [8]. In Sigulda, ten naturalistic meadows established since 2019 through overseeding with native perennials or mixed-origin seed mixtures function as alternatives to conventional lawns and have received positive public feedback [35]. Public participation, seed collection, sowing, site selection and monitoring, has been integral, particularly in Rīga, while informational signage in all three cities supports education and social legitimacy [36]. Binding regulations in Rīga and Cēsis further define mowing frequency, biomass management, buffer zones and visual standards, though without detailed technical guidance on soil preparation or species composition [7;33]. Despite these advances, urban grasslands in Latvia remain predominantly pilot or site-specific projects in underused green areas and large parks rather than systematically embedded components of municipal green infrastructure. Broader application across functional urban zones would require strategic integration into planning frameworks and careful management of public perceptions, particularly in intensively used spaces where grasslands may be viewed as unmanaged.

1.5. Problem definition and research gap.

Study objective

Interest in urban grasslands as alternatives to conventional lawns and elements of urban green infrastructure is increasing not only in cities that have already initiated such projects, but also in those intending to do so in response to broader European Union sustainability and green infrastructure agendas. (e.g. the EU Green Infrastructure Strategy and the Biodiversity Strategy) [11;12]. Nevertheless, current initiatives are predominantly implemented as separate projects rather than as components of a comprehensive spatial strategy or integrated green infrastructure plans. As a result, municipalities lack systematic planning tools to determine which urban zones are most suitable for extensively managed grasslands, flowering urban meadows, or conventional lawns. Furthermore, practical cost-calculation tools for different establishment and long-term maintenance regimes remain underdeveloped, thereby limiting evidence-based decision-making.

These structural gaps form the basis of the present study, whose objective is to identify the urban functional zones

most suitable for the systematic integration of urban grasslands as standardised green infrastructure solutions within thematic spatial planning frameworks of Latvian cities. The study applies a scenario-based assessment focused specifically on those urban functional zones where urban meadows could be systematically incorporated through standardised planning and management approaches, integrating public preferences together with different urban grassland management practices. The city of Jelgava, Latvia, has been selected as a pilot territory, building on previous research on public attitudes toward urban grassland implementation in this municipality [37].

This study provides a transferable, scenario-based decision-support framework that can assist municipal planners in systematically integrating urban grasslands into spatial planning and green infrastructure strategies beyond project-based approaches. Given its regionally international scope, the results offer practical guidance for municipalities in other cities, both within and outside Latvia, with comparable territorial planning systems, socio-cultural contexts and climatic conditions, thereby supporting the harmonised implementation of nature-based solutions across similar governance and environmental settings.

2. Material and Methods

2.1. Research object

Jelgava, Latvia, was selected as the case study due to the availability of prior empirical survey data on public perceptions of urban grasslands, enabling an assessment of how these findings can be integrated into specific functional zones within the city's green infrastructure framework.

Located in central Latvia, Jelgava is the country's fourth largest city (60.3 km²; 54,834 inhabitants), with 16.4% of residents aged 0–14, 63.8% of working age, and 19.7% aged 65+ [29]. Its urban structure evolved from a medieval fortified town into an industrial and educational centre, accelerated by the Riga–Jelgava railway, which stimulated economic and spatial expansion [20]. After the destruction of approximately 95% of the historic fabric in 1944, post-war reconstruction under Soviet planning principles introduced wide streets and standardized housing, fundamentally reshaping the city landscape. The contemporary cityscape combines historical fragments with revitalising Soviet-era industrial areas [19;48]. Jelgava's spatial identity (Fig. 1) is defined by the Lielupe River and its islands, while the Platone, Svēte and Driksa traverse the city and the Iecava and Vircava mark its boundary. The flat topography (2.5–4.5 m above sea level) and high groundwater levels generate extensive spring floodplains within the Lielupe basin. Green infrastructure comprises forests and forest parks, parks and squares, and courtyard and street greenery [19]. Of the total area, 272 ha are open waters, 1264 ha forests, and 162 ha parks and squares. The NATURA 2000 site "Lielupe Floodplain Meadows" covers 271.5 ha (4.5% of the city territory) [20].

Current regulatory documents of Jelgava State City do not establish requirements promoting diversified planting structures; existing provisions are limited to maintenance regulations for municipal lawns. Although Jelgava currently lacks a dedicated green infrastructure plan and detailed regulations for planting design and maintenance, the city has expressed a clear commitment to advancing green infrastructure development. This orientation is reflected in the Joint Sustainable Development Strategy of Jelgava State City and Jelgava Municipality until 2034, which identifies the quality of the living environment, green infrastructure and urban aesthetics as key strategic priorities [20; 21].



Fig. 1. The spatial and green structure of Jelgava is shaped by natural assets, cultural and historical heritage, and Soviet-era residential neighbourhoods [author photo, 2020]

2.2. Method

To achieve the stated research objective, identifying the urban functional zones most suitable for the systematic and standardised integration of different types of urban grasslands, a scenario-based assessment approach was developed, integrating public preferences with management practice considerations across those urban functional zones where urban meadows could be incorporated as replicable green infrastructure solutions. The scenario-based assessment approach comprises several stages (Fig.2).

Stage 1. Selection of city functional zones for grassland implementation

The selection of urban functional zones was based on the municipal spatial development plan, which defines the city's designated land-use categories and functional zones [21]. The identification of zones suitable for urban grassland integration followed a set of structured criteria. First, priority was given to zones characterised by relatively homogeneous spatial and functional structures (streetscapes, green areas, multi-storey residential areas etc.), allowing for the development of standardised integration models that can be systematically incorporated into the municipal green infrastructure plan. Zones with highly heterogeneous spatial configurations, such as low-density private housing areas, commercial and service districts, and industrial territories, were excluded, as they typically require site-specific design solutions.

Second, within the selected zones, only areas containing continuous open space suitable for urban grassland establishment were considered. A minimum width of 3 m was required to ensure feasible establishment and long-term maintenance. In street landscapes, eligible sites were defined as those with at least a 5 m-wide green verge, allowing for a 3 m urban grassland strip combined with 1 m-wide intensively mown buffer strips separating pedestrian and carriageway zones. Third, protected nature areas were excluded from the analysis, as these territories are already subject to specific management plans, including provisions for semi-natural grassland habitats. Finally, where possible, preference was given to municipally owned land to ensure long-term management control and maintenance planning for the proposed urban grassland areas.

Stage 2. Grassland integration models for the selected urban functional zones, proportion in % of urban grasslands within the total area

Urban grassland integration models for the selected functional zones were developed based on the results of a prior public

survey conducted in Jelgava, Latvia [37], complemented by criteria identified in the scientific literature [7;15;17;39]. In the survey, respondents were asked to select one or more of three urban grassland scenarios, conventional, intensively maintained lawn, extensively maintained existing grassland, and newly established flowering meadow, considered acceptable for specific sites with defined functions in Jelgava [37]. In addition, the proportional coverage of urban grasslands within each functional zone was modelled. This was carried out through test planning and spatial calculations for three representative sites per zone. Rather than assessing individual land parcels separately, the analysis considered each functional zone as a coherent spatial unit. For each test site, the proposed urban grassland area was delineated and its percentage of the total zone area calculated. Based on these results, integration models were proposed for each functional zone, including the calculated percentage of urban grassland coverage (Table 1).

Stage 3. Calculation of maintenance costs for different types of urban grasslands within the selected functional zones

At this stage, establishment and maintenance costs for two types of urban grassland are calculated per hectare, based on current market prices, existing practical experience in implementation and management [7;13;42], and assuming a five-year maintenance period. For comparative purposes, maintenance costs for conventional lawns are also estimated. The cost calculations include:

- Type 1 - Flowering meadow: establishment either by removing the topsoil layer and sowing a local seed mixture, or by harrowing existing lawn areas and overseeding with a local seed mixture; management consists of mowing twice per season with biomass removal.
- Type 2 - Extensively managed grassland: transition from existing lawn without reseeding, reducing mowing frequency to 3 - 4 times per season.
- Conventional lawn: installation of a 15 cm fertile topsoil layer, with mowing on average 15 times per season and no biomass removal.

The cost assessment is based on average establishment and maintenance costs, assuming that variations in seed mixtures for urban grasslands do not substantially influence the overall cost structure. Similarly, soil preparation requirements were treated as comparatively uniform, since urban grasslands generally require nutrient-poor or non-enriched

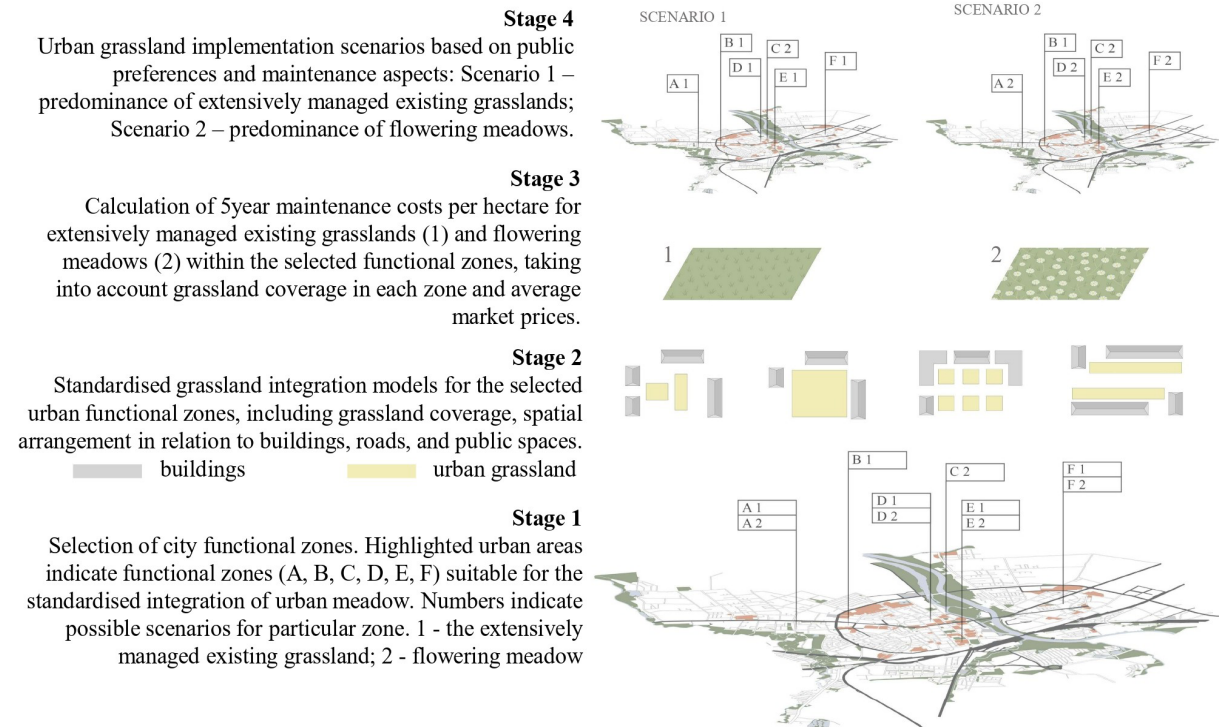


Fig. 2. Scheme of the scenario-based assessment approach and its stages, including the selection of functional urban zones for urban grasslands, integration models within the selected zones, cost calculations for different grassland types, and implementation scenarios based on public perception and maintenance considerations [created by the authors, 2025]

Table 1. Urban grassland integration models based on public survey results. Percentage coverage within each functional zone Results of the territorial selection assessment [created by the authors]

Selected functional zones within the Step 1	Urban grassland model based on survey results and literature review		Urban grassland coverage (%) within the total functional zone based on test planning layouts	Additional requirements
	Type 1 Flowering urban meadow	Type 2 Extensively maintained existing grassland		
Streetscape	X	X	up to 10%	Minimum width of 5 m, including 1 m-wide intensively mown buffer strips separating pedestrian and traffic zones.
Roundabouts	X	X	up to 80%	1–2 m-wide intensively mown buffer strip along the traffic zones.
Riverbanks	X	X	up to 80%	1–2 m-wide intensively mown buffer strip along pedestrian or traffic zones; a 2 m strip of natural riparian vegetation retained in immediate proximity to the water.
Nature and greenery areas	X	X	up to 50%	In less intensively used areas, a 1–2 m-wide intensively mown buffer strip along pedestrian routes and recreational spaces; integration into a coherent composition with existing vegetation and infrastructure; inclusion of environmental education elements (e.g., insect hotels, deadwood features).
Multi-storey residential courtyards	X	-	up to 10%	In less intensively used areas, a 1–2 m-wide intensively mown buffer strip along pedestrian routes, recreational spaces and carriageways; inclusion of environmental education elements (e.g., insect hotels).
Railway corridors, technical areas	-	X	up to 50%	Open access and safety zones to be maintained free of urban grassland vegetation.

soils rather than intensive soil improvement measures. Therefore, detailed technical specifications regarding seed compositions and soil preparation methods were considered beyond the scope of the present study. This cost assessment enables comparison of different establishment approaches and long-term maintenance regimes across urban grassland typologies.

Stage 4. Urban grassland implementation scenarios based on public perception and maintenance aspects

In the final stage, two scenarios for integrating urban grasslands into the city's green infrastructure are developed. These scenarios are based on the integration models defined for each selected functional zone and their associated management costs. The cost structure includes the selected

urban grassland type, establishment and maintenance costs per unit area, and total costs at the scale of the functional zone, calculated according to the previously determined percentage of urban grassland coverage within each zone. The scenarios are presented cartographically and accompanied by a comparative cost assessment. This enables evaluation of different integration models within individual functional zones, comparison of total scenario-level expenditures, and benchmarking against the establishment and maintenance costs of conventional lawns.

3. Results and Discussions

Application of the defined selection criteria in Jelgava resulted in the identification of following spatially and functionally homogeneous urban zone types suitable for standardised urban grassland integration: streetscapes (including roundabouts), nature and greenery areas (including riverbanks), multi-storey residential courtyards, railway corridors and technical areas (Fig. 3). Modelling of potential urban grassland coverage within these zones revealed a clear spatial gradient (Fig. 4).

The largest and most continuous grassland areas could be established in peripheral territories close to nature areas, as well as in railway corridors and technical zones, whereas central areas, streetscapes and residential courtyards, allowed only smaller, structurally controlled meadow elements. This pattern corresponds with research showing that roadside and infrastructural greenspaces can support distinct ecological assemblages when management intensity is reduced, while highly visible urban areas require stronger aesthetic legibility to secure public acceptance [9;17;39].

Following the methodological framework, two integration model types were developed for most functional zones (Fig. 5): (1) established flowering urban meadow and (2) extensively managed existing grassland. The developed models schematically illustrate the proposed urban grassland integration approaches in accordance with the conditions defined in Table 1, which describes the main requirements for urban grassland integration within the selected zones, including spatial placement, coverage percentage, the required width of buffer zones between urban grasslands and pedestrian or traffic areas, and the possibilities for incorporating additional environmental elements within

the meadow areas. In multi-storey residential courtyards, only flowering meadows were proposed. Survey results indicated a preference for visually structured and clearly recognisable meadow forms in close proximity to housing, reflecting broader evidence that public acceptance depends on perceived order and visible maintenance cues [37]; however, in socially sensitive environments, structural design and visual coherence remain critical. Consequently, flowering meadows in residential courtyards combine ecological function with aesthetic acceptability [15;39]. In contrast, railway corridors and technical areas, characterised by lower recreational use and reduced visual scrutiny, allow the application of extensively managed grassland in both scenarios. This approach is supported by evidence that reduced mowing frequency increases invertebrate densities and species richness compared to conventional regimes [5;9]. Based on the developed integration models, two city-scale urban grassland scenarios were prepared (Fig. 5 and 6). Scenario 1 is dominated by flowering meadows, except in railway and technical areas, where extensive grassland is maintained. Scenario 2 prioritises extensively managed existing grassland, retaining flowering meadows only in residential courtyards. This differentiation enables comparison between establishment-intensive and management-transition approaches, linking spatial distribution with lifecycle costs.

To enable further cost calculations of the proposed scenarios at the city scale, per-hectare cost estimates were prepared for a five-year period based on market analysis. For conventional lawns, only maintenance costs were included, amounting to 22,500 EUR/ha. For extensively managed existing grassland, with mowing reduced to 3 - 4 times per season, the total cost was estimated at 9,000 EUR/ha. For flowering urban meadows, costs included both establishment, through harrowing of the existing turf and overseeding with locally sourced meadow species, and subsequent maintenance, resulting in a total of 11,400 EUR/ha. Cost modelling over a five-year period demonstrated substantial economic differences between regimes. Compared with conventional lawns, the extensive grassland-dominant scenario is 60% more cost-efficient, while the flowering meadow-dominant scenario is 51% more cost-efficient within the five-year framework (Table 3). These findings are consistent with literature emphasising the reduced input requirements of meadow systems and their

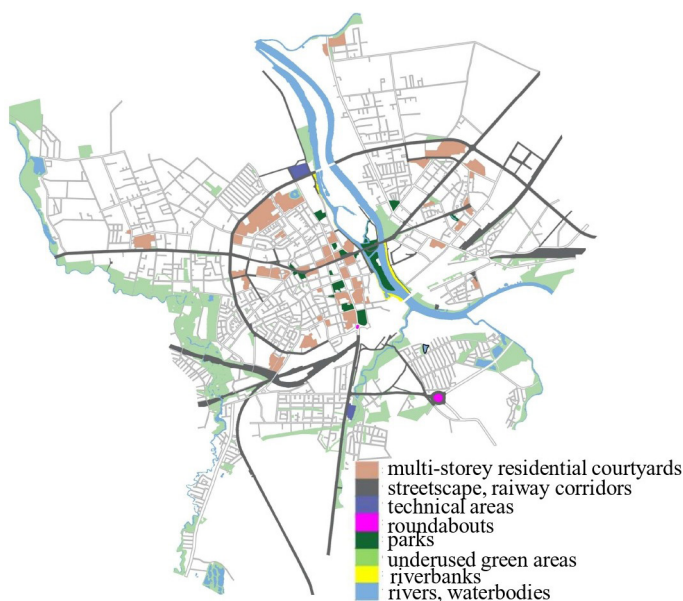


Fig. 3. Selected functional zones for urban grassland implementation in Jelgava city [authors' scheme based on [21]]

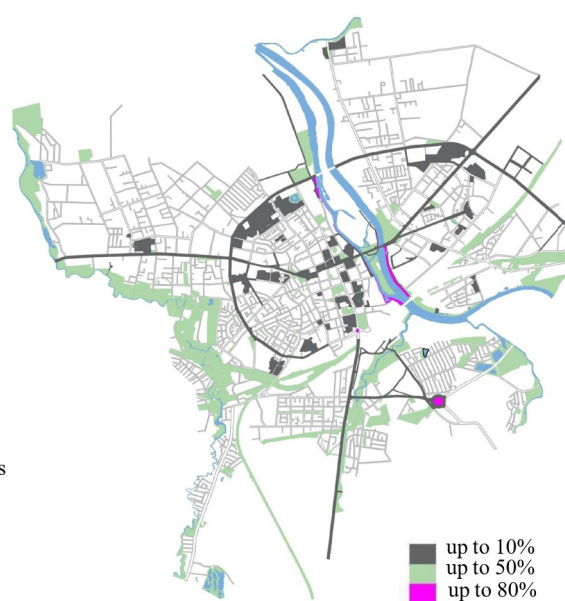
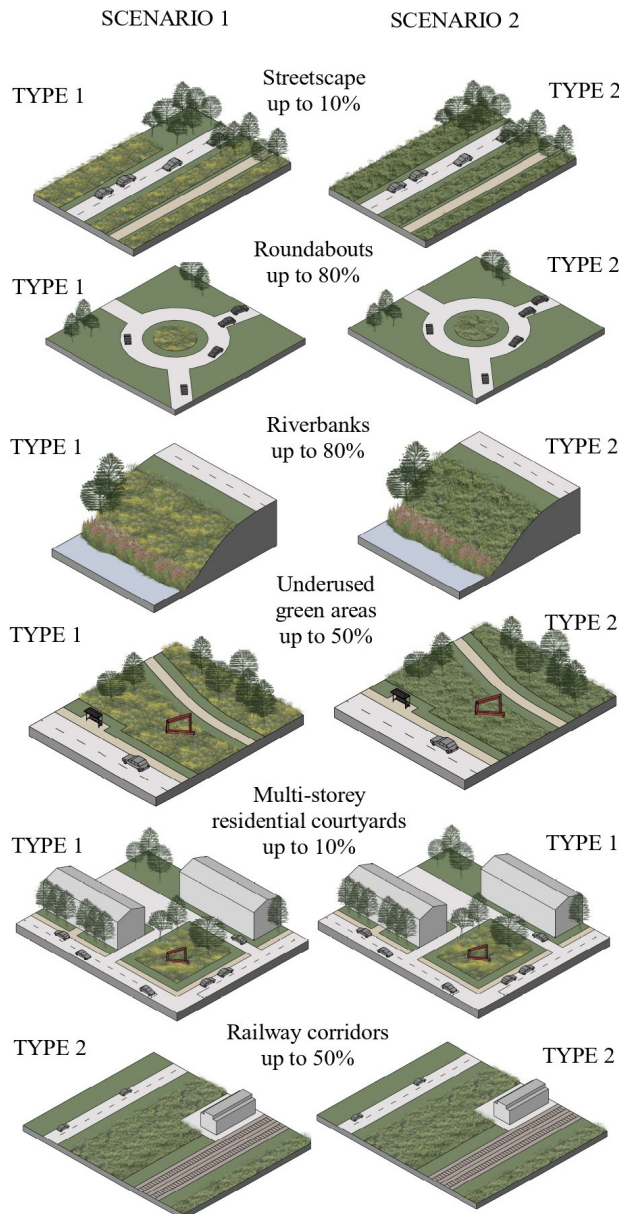


Fig. 4. Percentage of urban grassland coverage within the respective, selected functional zone [authors' scheme based on [21]]



lower long-term management costs [45].

The Jelgava modelling indicates that integrating public preference data with differentiated management regimes enables a scenario-based planning approach that systematically links spatial suitability (Fig. 3–4), typological integration models (Fig. 5), and city-scale cost implications (Fig. 6). The findings suggest that urban grassland implementation should be framed not solely as a design intervention, but as an adjustment of maintenance regimes within urban green infrastructure systems. In this context, reduced mowing intensity and zone-specific typologies function as operational variables influencing ecological performance, public acceptance and long-term cost efficiency.

To support long-term implementation, the success of urban meadows should be monitored using a limited set of practical and repeatable indicators. Core biodiversity indicators may include plant species richness, flowering cover, vegetation height, the proportion of native or target meadow species, and the abundance and diversity of key pollinator groups such as bees, butterflies, and hoverflies [9;10;15;23;40;46]. These indicators can be assessed through fixed vegetation plots, photo-point monitoring, and repeated transect walks during the flowering season. Management performance should also be documented, including mowing frequency, biomass removal, maintenance costs per hectare, and the occurrence of invasive or ruderal species. Where urban grasslands are located near transport corridors or other pollution sources, optional air quality monitoring could include measurements of PM_{2.5}, PM₁₀, and NO₂ concentrations, preferably applying a before and after comparison with control sites [25;32]. Such a monitoring approach would enable municipalities to relate maintenance costs to measurable ecological outcomes and, where relevant, additional environmental benefits. However, this

Fig. 5. The scheme of the standardised urban grassland integration models developed for the selected functional zones and their inclusion within two proposed scenarios.

Scenario 1 - the predominance of flowering meadows (Type 1); Scenario 2 - predominance of extensively managed existing grasslands (Type 2). The models are showing public preferences and management approaches, as well as the percentage coverage of urban grasslands indicated for each functional zone [authors' scheme, 2025]

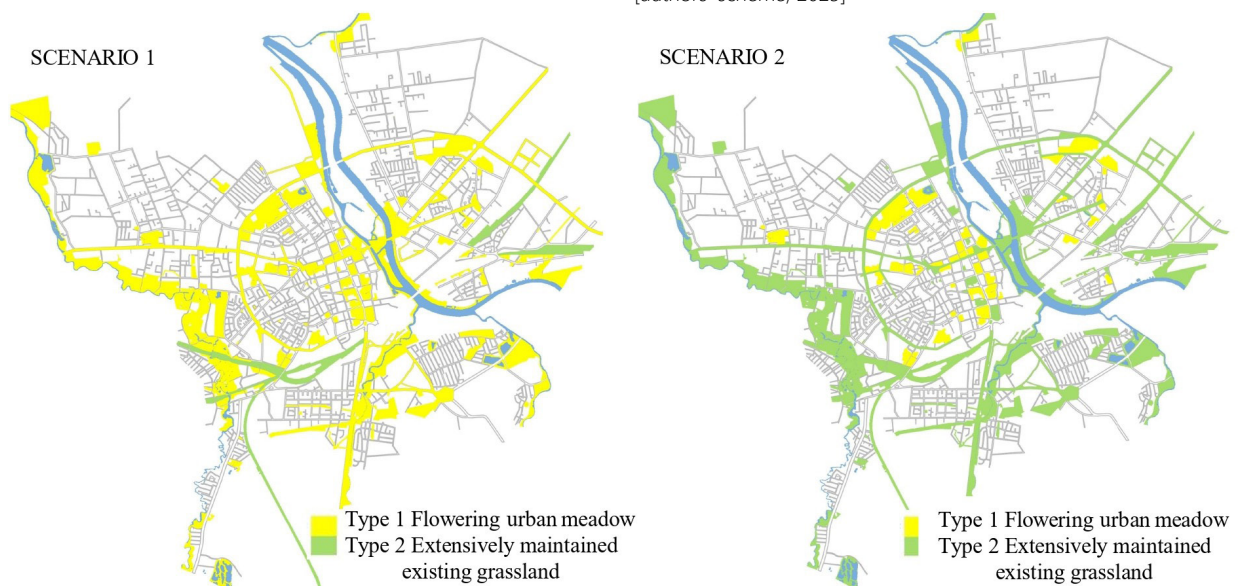


Fig. 6. Urban grassland integration scenarios for Jelgava city based on the selected functional zones and the developed integration models for those zones, taking into account public preferences and alternative management approaches [authors' scheme based on [21]]

Table 2. Costs of urban grassland integration scenarios within a five-year maintenance framework, EUR [created by the author]

Selected functional zones	Total area of selected functional zones (ha)	Urban grassland coverage within the total functional zone (% , ha)		Costs of urban grassland integrations scenarios with five-year maintenance (EUR)				Maintenance of existing conventional lawn (without implementation) (EUR)
				Scenario 1		Scenario 2		
Streetscape	161.30	10%	16.13	T1	183 882	T2	145 170	362 925
Roundabouts	2.35	80%	1.88	T1	21 432	T2	16 920	42 300
Riverbanks	8.41	80%	6.73	T1	76 722	T2	60 570	151 425
Nature and greenery areas	424.01	50%	212.00	T1	2 416 800	T2	1 908 000	4 770 000
Multi-storey residential courtyards	137.05	10%	13.71	T1	156 294	T1	156 294	308 475
Railway corridors, technical areas	112.84	50%	56.42	T2	507 780	T2	507 780	1 269 450
			Total		3 362 910		2 794 734	6 904 575

Type 1 (T1) - Flowering urban meadow; Type 2 (T2) - Extensively maintained existing grassland

type of monitoring is both financially demanding and labour intensive and may not always be feasible for municipalities to implement independently. Therefore, cooperation with scientific and research institutions specialising in this field is recommended.

Future research should further develop post-implementation evaluation approaches for urban grassland integration, including long-term resident perception monitoring under real management conditions across different functional urban zones. Such studies could assess how public acceptance changes over time in relation to vegetation structure, maintenance visibility, biodiversity outcomes and communication strategies [17;18;39]. In addition, further research could elaborate practical mechanisms for integrating urban meadow requirements into binding municipal planning and maintenance regulations, strengthening the role of urban grasslands as systematically implemented elements of urban green infrastructure.

Conclusions

The study indicates that urban grassland implementation must be simultaneously socially legitimate, ecologically justified and institutionally embedded. Public perception is spatially differentiated - support is higher in parks and peripheral areas, while resistance is more pronounced in residential contexts. Therefore, flowering meadows with visually clear management are more appropriate in socially sensitive zones, whereas extensively managed grasslands are suitable in low-use infrastructural areas. Participatory practices and educational measures strengthen acceptance and long-term legitimacy.

Management intensity is the primary operational variable determining ecological performance. Reduced mowing frequency significantly increases plant and invertebrate diversity and lowers long-term costs. Thus, transitioning from intensive lawn regimes to extensive management constitutes a functional adjustment rather than merely a design intervention. However, without integration into municipal green infrastructure plans and binding maintenance regulations, urban grasslands remain project-based and lack scalability.

The Jelgava case confirms that spatial typology enables structured integration. Homogeneous functional zones allow the application of standardised grassland models. Central and residential areas require controlled proportions and clear buffer design to maintain public acceptance. Peripheral zones provide the greatest potential for higher

coverage and ecological continuity.

Scenario modelling demonstrates that integrating public preferences with differentiated management regimes of urban grasslands allows cost evaluation at the city scale. Over five years, extensively managed grassland and flowering meadows are 60% and 51% more cost-efficient than conventional lawns. This indicates that economic feasibility supports, rather than constrains, implementation.

Urban grassland integration should be treated as a management reform embedded in green infrastructure planning. Spatial differentiation, reduced mowing intensity and regulatory incorporation are decisive conditions for achieving ecological improvement, public acceptance and long-term cost efficiency across functional urban zones.

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Kopsavilkums

Aizvien vairāk Latvijas pilsētu sāk ieviest pilsētas plavas kā bioloģisko daudzveidību veicinošu alternatīvu intensīvi apsaimniekotam tradicionālajam zālienam. Tomēr to ieviešana pilsētās ir fragmentāra, galvenokārt pilsētas plavas tiek īstenotas atsevišķu projektu un iniciatīvu ietvaros, nevis kā daļa no pilsētas zaļās infrastruktūras plāna. Pašvaldībām bieži trūkst plānošanas instrumentu plavu ieviešanai pilsētas konkrētās funkcionālajās zonās, kas ņemtu vērā gan iedzīvotāju vēlmes un uztveri, gan apsaimniekošanas un izmaksu jautājumus. Pētījums risina šo iztrūkstošo posmu, kā pētījuma mērķi izvirzot pilsētas plavām piemērotāko pilsētas funkcionālo zonu noteikšanu Jelgavas pilsētā, izmantojot scenārijos balstītu pieeju. Pētījumā apvienoti iepriekš veikto sabiedrības aptauju dati ar telpisko analīzi un apsaimniekošanas modeļēšanu. Pētījumā atlasītas pilsētas funkcionālās zonas, kurās iespējama pilsētu plavu tipveida ieviešana. Katrai zonu grupai izstrādāti plavu integrācijas modeļi, ietverot divas izveides un apsaimniekošanas pieejas – ziedoša pilsētas plava un ekstensīvi apsaimniekots esošais zālājs. Izmantojot kontrolplānojumus, modelēts plavu procentuālais īpatsvars katrā funkcionālajā zonā, kā arī aprēķinātas apsaimniekošanas izmaksas piecu gadu periodam izstrādāti divi pilsētas mēroga plavu integrācijas scenāriji, kas ļauj salīdzināt dažādas izveides un apsaimniekošana pieejas. Pētījuma rezultāti apstiprina telpiskā novietojuma nozīmi veiksmīgai plavu integrācijai pilsētā. Plašākas un nepārtrauktākas plavu teritorijas iespējams izvietot pilsētas perifērijā, dabas teritoriju tuvumā, kā arī dzelzceļa un tehniskajās zonās, savukārt pilsētas centrālajās teritorijās – ielu ainavtelpās un daudzstāvu dzīvojamo ēku pagalmos – nepieciešami skaidrāki un vizuāli atbalstāmāki risinājumi mazākās telpiskajās robežās, kas sekmētu pozitīvāku sabiedrības attieksmi. Pētījuma noslēgumā secināts, ka pilsētu plavu integrācija jāskata kā apsaimniekošanas režīmu pārveide, kas sistemātiski iekļaujama pašvaldību zaļās infrastruktūras plānošanā. Savienojot sabiedrības uztveri, funkcionālo zonējumu un diferencētas apsaimniekošanas pieejas scenārijos balstītā ietvarā, iespējams virzīties no atsevišķiem pilotprojektiem uz strukturētu, ekonomiski pamatotu un sociāli pieņemamu pilsētu plavu ieviešanu dažādās pilsētas funkcionālajās zonās.

CULTURAL LANDSCAPE RESEARCH: BETWEEN GEOGRAPHY AND URBANISM

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Abstract. This article examines the concept of cultural landscape and its application at the intersection of two spatial sciences: geography and urbanism. Firstly, it reviews the evolution of the concept from the works of 19th-century German geographers to contemporary international documents, revealing the semantic multilayeredness of cultural landscape and its theoretical transformation from opposition to natural landscape to a holistic phenomenon encompassing material and symbolic aspects. The paper then systematises the classifications of cultural landscapes proposed by different disciplines, combining international (UNESCO) and national (Lithuanian landscape geography and urban planning) examples and proposing an extensive classification scheme based on the degree of urbanization and the typology of settlements. The study is based on a theoretical analysis of the literature, a comparative analysis of international and national legal documents, and a comparison of the scales and methods of geography and urbanism. Two summarising tables were compiled, comparing the objects and methods of cultural landscape research in both disciplines according to the scale of the study (from global to micro-level public spaces). The results show that geography and urbanism “meet” at the national-mesoregional and urban scale, but differ in their analytical approach: geography is stronger in the field of spatial patterns, typologies, and landscape quality assessment, while urbanism is stronger in the analysis of urban fabric morphology, composition, public spaces, and human scale. The combination of these perspectives allows the cultural landscape to be treated as a common field of research, in which geographical studies provide a macro-level spatial “background,” while urbanism provide detailed solutions and interpretations of spatial experience. The conclusions of the article underline the need to strengthen interdisciplinary dialogue, which can be an important prerequisite for a coherent policy of cultural landscape protection, planning, and activation at different levels of spatial planning and design. **Keywords:** cultural landscape, genesis of cultural landscape, classification of cultural landscape, geography, urbanism

Introduction

Humans are probably the most significant life form altering the Earth's environment. Over the past centuries, and especially decades, various human activities have changed the Earth's surface, its depths, and its atmosphere in varying degrees. It is therefore not surprising that in recent years, more and more scientific fields have begun to systematically study the consequences of these activities. The consequences of global and local human activities on Earth are being studied by representatives of the physical and social sciences and even the arts.

In this article, the authors focus on the cultural landscape. A landscape that, without human involvement in its formation, would not be the way it is today. The relevance of this topic is only increasing, as the landscape created by humans and reflecting their coexistence with the environment is the dominant structure on our planet, with landscapes completely untouched by humans rapidly declining or almost disappearing. Therefore, it is clear that a deeper understanding of the subject and knowledge of its research methodology could provide a strong theoretical basis for contributing to the preservation, integration, or revitalization of a high-quality cultural landscape. This article reviews the origin and development of the term “cultural landscape,” discusses the disciplines that study cultural landscapes, and presents the proposals of different disciplines for the classification of cultural landscapes. The article focuses on two disciplines: geography and urbanism (planning and design). Geographers were the first to establish the concept of cultural landscape and, shifting from reasoning and descriptive research of cultural landscape to spatial planning practices, contribute to the formation of cultural landscape strategies at the national and regional levels. Meanwhile, urbanists operate on a smaller scale, which is more easily comprehensible to everyday human perception, and often have the strongest direct and most noticeable influence on the transformation of the landscape. By designing street networks, public spaces, building structures, green spaces, and everyday infrastructure, they materialize solutions

that shape people's spatial experience and social scenarios for landscape use, with the aim of modelling a people-friendly and functional environment. The article discusses and compares the objects and methods of cultural landscape research in both disciplines. It seeks to identify differences, commonalities, and opportunities for representatives of these fields to collaborate in an interdisciplinary context.

The article mainly analyses the topic in an international context, while reviewing the classification of cultural landscapes, presenting national examples and discussing Lithuanian practices.

The genesis and evolution of the term of cultural landscape

German geographers were the pioneers in using the term cultural landscape. The term cultural landscape (Originally written (in Old German): Kulturlandschaft, now in German: Kulturlandschaft) was first used in scientific literature by German geographer Carl Ritter [35; 41]. He used this term in 1832 in his work *Geography in Relation to the History of Nature and Mankind* (German: *Die Erdkunde im Verhältnis zur Natur und zur Geschichte des Menschen*), in which he described the history of the area northwest of Beijing (China) and its connection to the landscape. In the book, the cultural landscape is considered in opposition to wild forces, which include not only natural forces and disasters such as floods, but also barbarian tribes that oppose culture and destroy the cultural landscape through battles, creating wastelands. According to this view, the cultural landscape is not only a physical landscape created by humans, but also contains an important layer of civilizational culture. In some time later, in 1851, another geographer, Carl Vogel, used the term cultural landscape in the third volume of his geography encyclopaedia, *Geographical Landscapes* (German: *Geographische Landschaftsbilder*). In this volume, the works of various authors are presented under the following headings: mountain landscapes, plain landscapes, forest landscapes, and cultural landscapes. In the introduction

to one of his essays, Vogel mentions the term “cultural landscape,” but does not explain it or apply it in a context that would allow us to understand how he understands this term [41].

Another German geography professor who used this term was Joseph Wimmer, who sought to reveal the influence of geographical conditions and the natural environment when teaching history [6]. In 1885, Wimmer published a book entitled *Historische Landschaftskunde* (Historical Landscape Geography), in which he distinguished three types of landscape: historical natural landscape, historical cultural landscape, and historical political landscape. The description of these landscapes reveals the forces that shaped them: natural (e.g., water), cultural (e.g., land cultivation and urbanization), and political (e.g., man-made borders and boundaries between areas). In describing the cultural landscape, Wimmer emphasises the natural landscape that is changed by humans – how forests are replaced by vineyards, how areas are drained or irrigated, how infrastructure is built. However, Wimmer takes the position that the landscape created by humans beautifies the land, and he describes this landscape with very positive connotations [41; 58].

Probably the best known of the early users of the term “cultural landscape” was Friedrich Ratzel. Ratzel was a prominent German geographer, ethnologist, sociologist, one of the founders of the school of anthropogeography and a representative of geographical determinism. He participated in numerous expeditions and presented the findings of his research in several of his writings [38]. In 1878 Ratzel included the term “cultural landscape” in his two-volume work on the United States, in which he describes the natural features, society, and economy of the country. Cultural landscape is most notably mentioned in the second edition, which includes a chapter entitled “The Cultural Landscape of the United States” (German: *Die Kulturlandschaft der V. St.*). In this chapter, the author indirectly explains the term cultural landscape when he writes that footprints of human activity influence the character of the landscape. In other words, he emphasised that cultural landscapes are the result of human activity. In the same chapter, Ratzel describes the cultural image (German: *Kulturbild*) of the United States, which, according to him, has fewer culturally created elements than the “countries of the Old World” and these cultural elements are described as less permanent [41; 43; 44].

This term was introduced into the English-speaking world in the book “The Morphology of Landscape” in 1925 by Carl Ortwin Sauer, founder and professor of the Berkeley School of Geography. The cultural landscape became the main object of study at the Berkeley School of Geography and became the focus of the new cultural geography [25]. In the interwar period, this term was used by geographers and ethnologists in the Nordic countries [10; 25; 48; 51]. Since the 1970s, the term cultural landscape has become increasingly established in other disciplines and has entered the terminology of landscape and environmental management. For example, in Norway, architects, landscape architects, ethnologists, archaeologists, historians, botanists, zoologists, and agricultural economists adopted the term, and it became part of the vocabulary of agricultural policymakers as well as nature conservation and cultural management institutions [25].

In the 1990s, various international institutions adopted the term “cultural landscape” as a category of protection and began to use it in legal documents [25]. In 1992, the World Heritage Convention became the first official international document to recognize and protect cultural landscapes.

During its 16th session, the World Heritage Committee adopted guidelines for their inclusion in the World Heritage List and recognized that cultural landscapes are cultural values representing “creations of nature and of man together.” Cultural landscapes often reflect specific sustainable land use practices related to the characteristics and constraints of the natural environment in which they are located, as well as a special spiritual connection between humans and nature. The protection of cultural landscapes can contribute to modern sustainable land use practices and preserve or enhance the natural values of the landscape. Living traditional land use practices support biodiversity in many regions of the world. Therefore, the protection of traditional cultural landscapes contributes to the maintenance of biological diversity [56]. The United Nations Educational, Scientific and Cultural Organization (UNESCO) categorizes cultural landscapes into naturally formed (relict and evolving) and associative, with almost no material heritage in the environment, but only religious, artistic, or cultural connections with natural elements. Based on these categories, landscapes around the world are protected and sites are included in the World Heritage List [56].

In order to gain a deeper understanding of the concept of cultural landscape, it is probably best to consider its various definitions. For example, the geographical dictionary of Germany, the country where the term cultural landscape originated, states that “cultural landscape is a landscape formed mainly by anthropogenic ecosystems, which has a predominantly useful function. It is the opposite of a natural landscape” [31]. This approach shows that cultural landscape is understood more through the lens of landscape management (spatial planning). The dictionary of the German online architecture, planning, and design magazine *BauNetz* provides the following definition of cultural landscape: a type of landscape that is the result of long-term interaction between human activity and natural conditions. It is understood as a theoretical opposite to a landscape that (for the most part) exists without human influence (natural landscape). However, in the Anthropocene era, this dichotomy should be viewed critically, as human influence today is global [4]. Thus, the contemporary concept increasingly emphasizes the blurring of boundaries between cultural and natural landscapes and encourages us to view the landscape as a single complex.

Lithuania has developed a fairly strong school of landscape geography, whose representatives have contributed most to the disclosure of the theoretical aspects of landscape in the country. The *Explanatory Dictionary of Geography Terms*, published by a large team of scholars, provides the following two meanings of cultural landscape [1]:

- Cultural landscape – a landscape created by human activity and reflecting its coexistence with the environment, combining rural and urban landscapes into a whole and expressing the fundamental opposition of culture (civilization) to nature.
- Cultural landscape – the result of the harmonious coexistence of humans and the environment, as opposed to a landscape that does not meet quality criteria in part or in full (degraded landscape).

Thus, it offers two possibilities for interpreting the cultural landscape. The first (ontological) expresses that the cultural landscape is any landscape created by humans and classified according to its prevalence in different inhabited areas. The other approach (axiological) expresses that cultural landscape is only the result of harmonious coexistence between humans and nature. In other words, a negative

result, when humans, for example, destroy the landscape due to excessive urbanization, technogenic excess, or political and military cataclysms, when entire areas of the landscape suffer degradation, cannot be considered a cultural landscape; it can be called an acultural landscape [28].

According to the Dictionary of Urbanism [14], cultural landscape is defined as “land, and the memories, perceptions, stories, practices, and experiences that give it meaning.” This dictionary also refers to the UNESCO definition – “creations jointly made by nature and humans.” By giving the cultural landscape a perceptual (emotional and value-based) meaning rather than a structural (morphological) one.

Cultural landscape through the lens of different disciplines

As can be understood from the previous chapters, cultural landscape studies are characterized by a wide range of academic disciplines and their interaction – interdisciplinarity. On the one hand, this is because the cultural landscape itself contains both physical and symbolic aspects of human-environment interaction. On the other hand, the use of this concept is quite broad and there is no unified interpretation of it.

As mentioned in the first sections, the concept of cultural landscape was first used by geographers. Initially, when geography itself did not have clear branches of discipline and was more complex and descriptive, landscape (and cultural landscape) was one of the elements used to describe a territory, space, or region. Later, as separate branches (subdisciplines) of geography began to emerge, the branch of landscape geography appeared, one of whose objects of study is the cultural landscape. Although landscape geography is considered a complex branch of geography (encompassing aspects of both physical and human geography), landscape geographers traditionally treat cultural landscape in terms of its antagonism to natural landscape. Research in this field often examines the degree (level) of landscape culturalisation (anthropogenisation). Such research is partly related to the fields of environmental studies and landscape ecology, which examine human impact on the environment and aspects of landscape sustainability [39].

In addition, cultural landscapes have been analysed very significantly (perhaps most significantly) by representatives of cultural geography. Cultural geography analyses how human activities, symbolic meanings and social processes are integrated into the physical environment, transforming it into a cultural landscape. Such studies emphasise the interactions between space, power and identity, and landscape is understood as a “readable text” or ideological construct [13; 37]. Geographical research seeks to reveal how people have shaped the environment over time and how this environment affects social order, memory, and cultural narratives. Cultural geography is particularly interested in how space is symbolically constructed, how places acquire meaning, and how landscapes convey social codes. For example, landscape can be understood as a visual carrier of ideology: architecture, monuments, and land use can reflect national identity, historical traumas, or colonial narratives [15]. Geographers study how these elements interact with collective memory and political power. Mitchell argues that landscape is never neutral [37]: it’s a field of social struggles and ideological meanings. This perspective allows geographers to take a critical look at how certain groups assert their dominance through spatial control and cultural representation. This branch strongly reflects the importance of landscape in the fields of cultural studies and the humanities in general.

Anthropology also contributes to cultural landscape research, particularly through ethnographic methods that allow us to understand how local communities interpret, practice, and remember the landscape. For example, landscapes often function as carriers of cultural memory or sites of ritual [5]. Archaeology studies the material traces of culture in the landscape in order to reconstruct historical land use patterns, settlement structures, and the symbolic meaning of spaces [50]. History, and especially historical geography, analyses changes in the landscape over time, reconstructing how political, economic, and cultural changes have affected spatial structure [2]. Also, this group, it is worth mentioning art history, which examines the aesthetic, iconographic, and representational aspects of the cultural landscape, exploring how the landscape is depicted in art, photography, or cinema and what significance this has for the cultural imagination [15]. Architecture and urbanism play a very important role in cultural landscape research. Architecture examines how buildings, their forms and materiality fit into the cultural context of a place, how they express values, identity and collective memory [42]. Urbanism (urban planning and design) examines the structure of the urban landscape, planning decisions, spatial hierarchy, and the importance of public spaces for everyday life and social interaction [29; 34]. In addition, urban and suburban development, urban models, and historical transformations are important for analysing the dynamics of the contemporary cultural landscape. The analysis of the cultural landscape in an urban context primarily involves the study of the form and functional structure of the city through cultural processes. For example, Kevin Lynch, in his classic work *The Image of the City* [34], emphasises that the cityscape shapes the collective orientation, identity and emotional connections of residents to places in the city. Urbanists examine how historical spaces, architectural heritage, and symbolic places (e.g., squares, monuments, religious buildings) merge into contemporary urban structures, retaining their cultural significance or acquiring new functions [46]. The cultural landscape is also considered in urban planning practice through the interaction of spatial planning and heritage conservation. Planning documents increasingly emphasize the need to protect not only individual cultural heritage objects, but also the cultural space as a whole – the historical cityscape that reflects the development of the city and the interaction of its inhabitants with the environment [49]. This approach is closely related to UNESCO’s Recommendation on the Historic Urban Landscape [55], which promotes the integrated combination of a city’s cultural heritage, natural factors, and contemporary development.

Another key discipline that studies the cultural landscape is landscape architecture. Landscape architects can be considered a link between professionals in physical geography, and urban planners and designers, as their professional focus involves working with natural elements to create aesthetic and functional spaces, ranging from ecological processes to artistic expression. Landscape architects and architects-landscape theorists are particularly consistent in examining both the issues of urban landscape formation and transformation [21; 22; 23] and the values of rural landscapes, their protection, and sustainable management [8]. In this way, landscape architecture becomes an important theoretical and practical axis that helps to integrate ecological, cultural, and urban aspects of the landscape.

Classifications and typologies of cultural landscapes

As cultural landscapes are studied and modeled by many different disciplines, a wide variety of classifications can be

found in literature and practice. The categorisation of cultural landscapes depends on the specificities of the disciplines themselves and the objectives pursued in classifying territories or objects. An international example of this is UNESCO's categorisation of cultural landscapes. UNESCO distinguishes three main categories [53]:

- landscapes specially designed and created by humans, including gardens and parks, created for aesthetic reasons and often (but not always) associated with religious or other monumental structures or ensembles;
- naturally formed landscapes that were shaped by initial social, economic, administrative, and/or religious needs and have taken their present form under the influence of the natural environment. This evolution is revealed by the form and constituent elements of such landscapes. They are divided into two subcategories: relict (or fossil) landscapes are landscapes whose development ended in the past, either suddenly or over a longer period of time, but whose essential features and material form are still clearly visible today; a landscape that is still forming is a landscape that has not lost its active social role in contemporary society, is closely related to the traditional way of life, and has clear evidence of ongoing stages of evolution;
- associative cultural landscapes. The inscription of this type of landscape on the World Heritage List may be based on obvious religious, artistic, or cultural connections with natural elements, rather than on tangible cultural heritage, the expression of which may be insignificant or even non-existent.

The UNESCO classification of cultural landscapes into three main categories is conceptual rather than a morphological-functional division of landscapes. It was created by the World Heritage Committee in response to enable the evaluation of sites of very different origins and structures, in which natural and cultural elements are closely intertwined, according to uniform principles [54]. This scheme emerged in response to the need to include landscapes in the World Heritage List that could not previously be adequately assessed using traditional criteria for cultural and natural values, and became an important link between these two areas of heritage [17; 47]. By clearly distinguishing between deliberately designed parks and gardens, landscapes and sites that have been shaped by historical land use practices, and sites whose value is based on religious, artistic, or other symbolic meanings, both tangible and intangible heritage can be covered in a single system, emphasizing the long-term interaction between humans and the environment [53; 9]. Although some authors point out that this classification reflects European concepts of heritage and is applied differently in different regions [7], it is still widely used as a convenient orientation scheme that helps to describe the diversity of cultural landscapes in the contexts of spatial planning, heritage conservation, and landscape policy. The Lithuanian practice could be briefly discussed as a national example. Geographer and landscape planner Prof. Habil. Dr. P. Kavaliauskas discussed the classification of dualistic cultural landscapes in detail in his research. P. Kavaliauskas distinguishes between rural (the term "agricultural landscape" is used as a synonym for rural landscape) and urban-type (urbanised) cultural landscapes. According to P. Kavaliauskas' classification, urban-type (urbanised) landscapes are divided into city, town, compactly built-up large village and construction technical engineering complex landscapes [28]. Since urban landscapes have an international name – urbanised – the same principle can be used to give Latin-derived international names to its

landscape types: urban (Latin *urbs* – city), oppidumistic (Latin *oppidum* – town), magnarural (Latin *magnus rusticus* – large village), and techno-engineering landscape could be called industrial.

However, landscape can be classified not only according to the nature of its use, but also in terms of the temporal dimension. Architects and heritage researchers in particular use the term historical landscape in their research [16; 26; 36]. According to the Lithuanian concept of heritage conservation, historical landscape is understood as a complex of natural and anthropogenic elements that formed before the mid-20th century, including a network of roads, relief forms, greenery, water bodies, various buildings, historical land ownership and land use structures. In this system, the rural cultural landscape is considered a space that concentrates the material and spiritual forms of ethnic culture, regional differences, and living traditions. It is in the preserved clusters of rural heritage, known as historical landscape areas, that the cultural uniqueness of Lithuania's regions is most clearly evident. The best-preserved areas of historical cultural landscape are characterized by internal integrity and compositional connection with the structure of the natural landscape: their spatial organisation is determined by old towns (some of which have retained relics of the pre-Gothic period's planned structure), manor houses distinguished by their complex values, and hillforts that play a special spatial and semantic role, often closely related to the location of towns and manors. The connection between different parts of the landscape is strengthened by sacral buildings – churches, which often functionally and visually connect manor houses and towns, as well as other historical buildings, memorial objects, and small architectural forms, which become dominant features that structure the identity of a place [27].

Landscape architect Giedrė Ingrida Laukaitytė-Malžinskienė suggests classifying one of the potential types of cultural landscape—the peri-urban landscape—not only according to physical or natural landscape characteristics, but also according to the compositional potential of the landscape's natural expression, i.e., how different relief forms, open and closed spaces, and views affect the landscape as a whole as perceived by humans. Based on Gestalt perception theory and visual expression analysis, she distinguishes four groups of peri-urban landscapes: 1) potential of composition; 2) potential of internal exposure; 3) potential of external exposure; 4) background potential landscapes. Using the example of the Trakai district, this classification was applied in the district's master plan, distinguishing a restricted visual protection zone – the identity of the area, sensitivity to development, and the position, density, and height of new farmsteads are regulated [30].

In the field of urbanism and spatial planning in Lithuania, cultural landscapes are also classified in the Master Plan of the Territory of the Republic of Lithuania (LRBP) [32]. This classification has an applied aspect – it sets out the spatial development and conservation priorities for the country's landscape. However, it must be acknowledged that this classification is not universal and only takes into account the heritage protection aspect (based on the dominant cultural heritage objects and sites) and does not establish a general classification of cultural landscapes, but rather a classification of protected cultural landscapes. The LRBP distinguishes four types of protected cultural landscapes, considering the different heritage areas formed by anthropogenic activity: 1) archaic; 2) rural; 3) technical engineering; 4) urban (Fig. 1).

After briefly reviewing Lithuanian and international

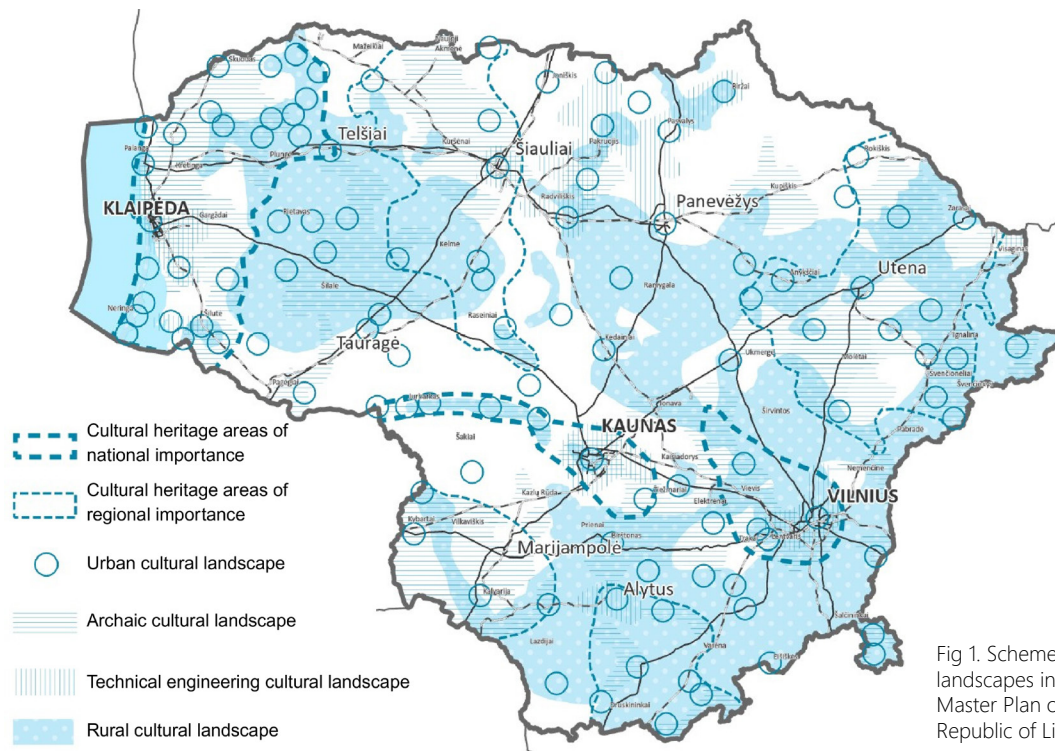


Fig 1. Scheme of protected cultural landscapes in Lithuania in the Master Plan of the Territory of the Republic of Lithuania (LRBP) [32]

classifications, the authors of this paper propose an extensive classification of cultural landscapes based on the degree of urbanization, typology of settlements, their hierarchy, and heritage protection characteristics (Fig. 2). This classification follows the principle that the main types of cultural landscape are:

1. urban-type (urbanised) landscape, which itself has different subtypes based on the landscapes of the city's structural parts:
 - a. cityscape (or urban landscape), which itself has different subtypes based on the landscapes of the city's structural parts:
 - i. historic urban landscape;
 - ii. historic suburban landscape;
 - iii. contemporary cityscape;
 - b. townscape;
 - c. suburban landscape;
 2. rural-type (ruralised) landscape, which is distinguished according to the degree of urbanisation and agrarisation:
 - a. rural landscape;
 - b. agricultural landscape (agrolandscape);
 - c. agrarianizing landscape – landscape of newly cultivated (just beginning to be cultivated) areas;
- One type of landscape, distinguished from the general principle of urban external systems:
3. periurban landscape (or landscape undergoing urbanisation), which is close to metropolitan areas of large cities but can no longer be considered rural – it is subject to greater urban influence (although this distinction is relative); Two special types of landscape:
 4. technical engineering landscape, which can sometimes be part of an urban landscape, sometimes more rural, but can also be considered a separate type of cultural landscape (e.g., large wind farm sites);
 5. archaic landscape, which is the landscape of former (often now abandoned) man-made areas, which partly overlaps with the associative landscape distinguished by UNESCO; the best example in Lithuania would be hillforts and their systems, which create a unique landscape that was once altered by humans but has now often been renaturalised.

Geography and urbanism: objects and methods of cultural landscape research

This article focuses on cultural landscape as an aspect of the physical environment, therefore the works of urban planners and geographers will be discussed in greater detail (excluding anthropological and cultural studies). First of all, these disciplines are similar in the sense that they are spatial sciences, as the object of study for both is space (alongside architecture, design, and other disciplines). In addition, both disciplines are similar in their interdisciplinarity and methodology, and thus their research tools overlap.

Although they have many points of convergence, there are also some differences. One of them is the scale (level) of the object of study, although it partly coincides (Fig. 3). Unlike geographers, who often apply landscape analysis in a broader (macro) spatial and regional dimension, urbanists focus on the micro and meso scales of the city, examining specific places—city blocks, street networks, squares, or neighbourhoods—as culturally constructed spaces [34; 40]. This also determines a different focus of analysis: geographers focus on the spatial dynamics of the landscape and the interaction between humans and nature, while urban planners focus on the cultural logic of spatial form and the impact of planning policy [19].

Cultural landscape morphology studies are a branch of urban and geographical research that seeks to analyse the form, structure, spatial distribution, and development of man-made landscape elements. In this case, morphology refers not only to the forms of physical elements—buildings, roads, fields, fences, and others—but also to their interrelationships, layout, and historical development [12]. One of the main examples of this research method is the analysis of urban morphology, which was established by the works of British geographer M. R. G. Conzen. Conzen proposed studying the landscape as a whole of spatially and historically formed “urban landscape units,” emphasizing the development of street networks, plot systems, and building types over time [12]. His approach has had a major influence on morphological studies in both urban and rural environments. Researchers following this method analyse landscape structures as a “readable text” whose form

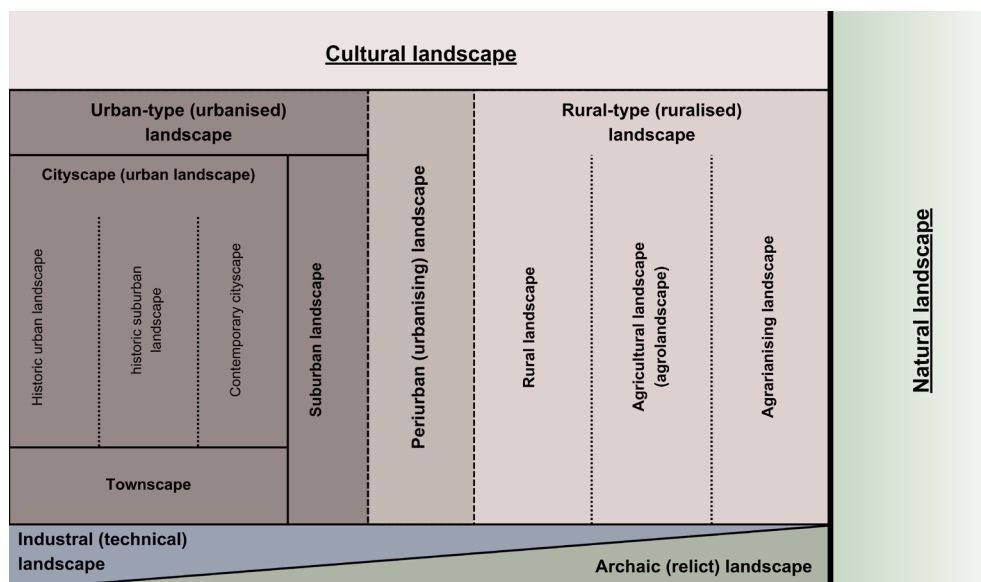


Fig 2. Classification scheme for cultural landscapes [created by the authors]

and layout reveal the historical functional context [57]. Geographers use various methods to study landscape morphology. These include cartographic analysis, which compares historical and contemporary maps to reveal changes in landscape elements over time [18]. Geographic information systems (GIS) allow not only for the visualisation and layering of data, but also for the quantitative analysis of spatial structure – e.g., how the size of plots, roads, or building density has changed [33]. Field research, including site observation, description, and photography, remains essential, especially when it is necessary to link form with function and local experience [24]. However, the most important object of geographical research (and at the same time the method) is the representation of the spatial structure of the cultural landscape – zoning and the description of those spatial principles and the recognition of linkages (patterns) (Table 1).

Urban research subjects also include both tangible and intangible aspects of the landscape. Physical elements such as the layout of buildings, their height, the typology of development, the street network, or public spaces are examined as components of the city's cultural identity [46]. Meanwhile, intangible aspects: collective memory, symbolic meaning, or local identity look at how city residents experience, interpret, and evaluate their environment [45; 52]. In recent decades, many urban studies scholars have examined the continuity and transformation of urban structures: how old structures (e.g., historic centres, industrial districts) are integrated into contemporary urban

development or replaced by new functional structures [11], in other words, the relationship between the preservation, integration, and revitalization of the cultural landscape.

The research methods used include both quantitative and qualitative approaches, often combined into mixed methodologies. One of the main methods is urban morphological analysis, which applies principles such as urban fabric studies, plot structure deconstruction, and typological analysis [40]. As in geographical research, cartographic analysis, historical maps, and visualisation of urban growth sequences are also applied. GIS tools allow for the analysis of functional distribution, movement flows, and spatial patterns [3]. Recently, systemic simulations, urban agent systems, and spatial models have also been used to design scenarios for the development of cultural spaces (which create cultural landscapes) [3].

In addition, one of the most popular urban methods in the world is urban reading, where the city is read as a text with its own syntax, semantics, and pragmatics. This method allows us to understand how forms not only affect functioning, but also symbolize political, social, or economic meanings [46]. In this way, the cultural landscape is analysed as a carrier of meaning, in which historical layers, community narratives and places of collective memory are concentrated [20].

As mentioned above, in addition to spatial analyses typical for geographers, representatives of urbanism also use urban practices (planning and design) in cultural landscape research, which reflect methods typical for artistic practices – sketching, urban modelling, while the value of the landscape

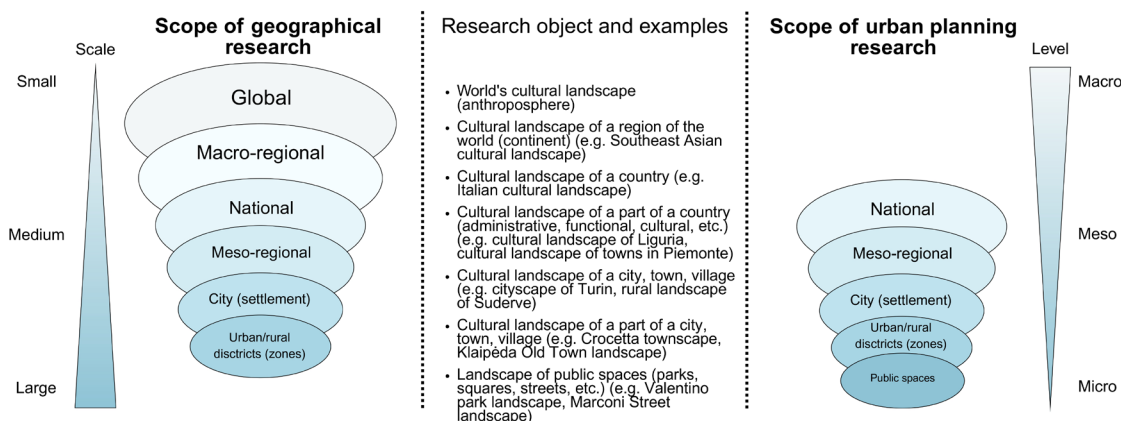


Fig 3. Scales (levels) of cultural landscape by discipline [created by the authors]

Table 1. Cultural landscape research and its methods according to scale in geography [created by the authors]

SCALE OF CULTURAL LANDSCAPE	GLOBAL AND MACROREGIONAL	NATIONAL AND MESOREGIONAL	URBAN/RURAL (ZONES)
THEMES (TOPICS) AND OBJECTS FOR RESEARCH ON CULTURAL LANDSCAPE	- concepts of cultural landscapes - global level of landscape anthropogenisation - regional landscape features (character) - spatial patterns of cultural landscapes worldwide	- typology and zoning of cultural landscapes - national and regional levels of landscape anthropogenisation - regional landscape features (character) - spatial patterns of cultural landscapes in the country, region - national and regional protection and quality assessment of cultural landscapes	- typology and zoning of the cultural landscape - technogenisation of the urban landscape - features (character) of the urban landscape - morphology of the cultural landscape - local protection of the cultural landscape and its regulation
METHODS AND TOOLS FOR RESEARCH ON CULTURAL LANDSCAPE	thematic analysis, geospatial analysis, cartographic method and GIS, maps, descriptive method, comparative method, regionalisation, spatial planning	thematic analysis, geospatial analysis, cartographic method and GIS, maps, zoning, systematisation, classification, descriptive method, comparative method, case studies, morphometric analysis of landscape (quantitative method), assessment of landscape quality (geo-qualimetric method), spatial planning	thematic analysis, geospatial analysis, cartographic method and GIS, maps, zoning, systematisation, classification, descriptive method, comparative method, case studies, morphometric analysis of landscape (quantitative method), assessment of landscape quality (geo-qualimetric method), spatial planning

Table 2. Cultural landscape research and its methods according to scale in urban planning and design [created by the authors]

SCALE OF CULTURAL LANDSCAPE	NATIONAL AND MESOREGIONAL	URBAN/RURAL (ZONES)	PUBLIC URBAN SPACES
THEMES (TOPICS) AND OBJECTS FOR RESEARCH ON CULTURAL LANDSCAPE	- concepts of cultural landscape - features (character) of cultural landscape of countries and regions - landscapes of towns/settlement systems - cultural landscape protection and its regulation - aesthetic potential of cultural landscape - cultural landscape in urban planning	- typology and zoning of the cultural landscape - morphology and features (character) of the cultural landscape (townscape) - protection and regulation of the urban cultural landscape (historical) urban landscape - urban green space landscape and landscape architecture - harmony between landscape elements and the urban fabric - urban integrity - landscape in spatial composition of city - landscape in urban design	- typology of cultural landscape at micro level - urban green space landscape and landscape architecture - harmony between landscape elements and urban fabric - urban integrity - landscape in the composition of public spaces - landscape in urban design - streetscape elements and urban design - landscape and its significance on a human scale
METHODS AND TOOLS FOR RESEARCH ON CULTURAL LANDSCAPE	thematic analysis, spatial analysis, cartographic method and GIS, maps, schemes, zoning, descriptive method, comparative method, historical analysis, case studies, spatial planning	thematic analysis, spatial analysis, cartographic method and GIS, schemes, classification, descriptive method, comparative method, historical analysis, case study, spatial planning, development of the ratio of solid mass to void space, modelling of linkages and interconnections, place reading method, participatory method	thematic analysis, spatial analysis, cartographic method and GIS, schemes, classification, descriptive method, comparative method, historical analysis, case study, spatial planning, development of the ratio of solid mass to void space, modelling of linkages and interconnections, place reading method, participatory method

is described using artistic means – composition, connections, relationships (Table 2).

In summary, it can be said that the main difference (in general terms) between the approaches of urbanists and geographers is not methodological, but analytical: urban planners are more oriented towards the analysis of cultural forms, planning structures, and architectural composition, while geographers emphasise the change in spatial expression and landscape concepts over time and space. The two disciplines complement each other: urban planners provide a detailed understanding of the form of the city, while geographers provide a broader spatial, sociocultural, and regional context.

Discussions and Conclusions

The notion of cultural landscape, which originated in the 19th century, is widely used in interdisciplinary research

today and covers a particularly broad spectrum of theoretical and methodological approaches. This article reconstructs the evolution of the concept, revealing its semantic ambiguity and theoretical transformation from the initial understanding as a phenomenon shaped by human activity in opposition to nature to the contemporary holistic interpretation, encompassing both material and symbolic aspects of landscape.

In analysing the classifications of cultural landscapes, it is highlighted that the prevailing approaches are based on both functional-spatial structure (urban, rural, agricultural, technogenic landscapes), as well as on the compositional aspects of the landscape and its value, historical, and aesthetic dimensions. The discussed classifications indicate the multifaceted nature of the concept of cultural landscape and the need to study it through various theoretical and

practical perspectives.

Considerable attention is paid to research methodologies. The article discusses two main disciplines: geography and urbanism, which, although different in their treatment of objects and scales of analysis, complement each other at the methodological and theoretical levels. Geographers study and plan the cultural landscape as a result of macro and meso transformations, using cartographic analysis and spatial patterns, while urbanists view it as an expression of cultural forms, planning and design structures, and architectural identity on a micro scale. Geographers capture, identify, and create a database, while urbanists carry out analyses with the aim of further modelling the environment surrounding humans.

A study of the scales and methods of cultural landscape shows that geography and urbanism essentially "meet" at the national-mesoregional and urban levels, but geography covers more global and regional patterns and typologies, while urban planning covers the micro-level of city parts and public spaces, which is closer to everyday human experience. The core methods of both fields are very similar (thematic and spatial analysis, cartographic methods, GIS, zoning, case studies, spatial planning), but geography stands out for its morphometric and geoqualimetric analysis and strong tradition of typology creation, while urban planning stands out for its urban modelling, search for the relationship between built-up mass and empty space, connections and links, "reading" of place, and participatory methods. This suggests that geographical research can provide urban planning with a macro-level background of spatial patterns, landscape value, and sensitivity, while urban planning research can enrich geography with insights into human scale, composition, and insights into the socio-aesthetic experience, especially in urban and suburban landscapes. The authors of the article intend to further develop the idea in future research and propose how to bridge these perspectives in interdisciplinary practice.

In conclusion, it can be stated that cultural landscape is a multi-layered phenomenon that may be relevant both to the academic community and to public policy (especially spatial) makers. This concept, examined through classification systems, disciplinary approaches, and methodological tools, enables a comprehensive understanding of the interaction between humans and the environment and forms the basis for sustainable landscape planning and management strategies.

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Kopsavilkums

Rakstā aplūkots kultūrainavas jēdziens un tā lietojums divu telpisko zinātņu nozaru ģeogrāfijas un urbānisma saskares laukā. Vispirms rakstā analizēta jēdziena attīstība no 19. gadsimta vācu ģeogrāfu darbiem līdz mūsdienu starptautiskajiem dokumentiem, atklājot kultūrainavas semantisko daudzslāņainību un tās teorētisko transformāciju no pretstata dabiskajai ainavai līdz holistiskam fenomenam, kas ietver gan materiālos, gan simboliskos aspektus. Turpinājumā sistematizētas dažādas zinātņu nozarēs izstrādātās kultūrainavu klasifikācijas, apvienojot starptautiskus piemērus, tostarp UNESCO pieeju, un nacionāla līmeņa piemērus no Lietuvas ainavu ģeogrāfijas un pilsētplānošanas prakses. Pamatojoties uz urbanizācijas pakāpi un apdzīvoto vietu tipoloģiju, rakstā piedāvāta paplašināta kultūrainavu klasifikācijas shēma. Pētījuma metodoloģisko pamatu veido zinātniskās literatūras teorētiskā analīze, starptautisko un nacionālo normatīvo dokumentu salīdzinošā analīze, kā arī ģeogrāfijā un urbānismā izmantoto pētniecības mērogu un metožu salīdzinājums. Pētījuma ietvaros izstrādātas divas apkopojošas tabulas, kurās abu nozaru kultūrainavas izpēti objekti un metodes salīdzinātas atbilstoši pētījuma mērķam no globālā līmeņa līdz mikrolīmeņa publiskajai ārtelpai. Raksta secinājumos uzsvērtā nepieciešamība stiprināt starpdisciplināru dialogu, kas var būt nozīmīgs priekšnoteikums saskaņotās kultūrainavas aizsardzības, plānošanas un iedzīvotāju politikas veidošanai dažādās telpiskās plānošanas un projektēšanas līmeņos.

THE DILOGY OF KLAIPĒDA'S URBAN DEVELOPMENT I. SHAPING OR PRESERVING THE HISTORICAL IMAGE OF THE PORT CITY

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Abstract. The paper explores the transformation of urban image in the context of global cities, focusing on Klaipėda, Lithuania's only ice-free seaport and a historically multi-layered urban area. The research addresses the challenge of maintaining local identity amid globalization and historical disruptions that altered urban development trajectories in the mid-20th century. These changes often led to the loss or radical transformation of cities' visual and structural identities. The study investigates how Klaipėda's image, historically shaped by its fortress origins, timber trade, and later port functions, is evolving today. The first impression of the city, especially for cruise passengers arriving via the Curonian Lagoon, is dominated by industrial port elements rather than its historical core. However, recent transformations – such as revitalization of industrial areas and the reconstruction of the castle tower in 2024 – signal a shift toward re-establishing historical identity. Research methods include long-term urban structure analysis, review of territorial planning documents, and application of a tested methodology for assessing urban landscapes and their relationship with new developments. The authors also draw on Lithuanian and international sources and their professional experience, complemented by feasibility studies conducted in 2022–2023. Results reveal that the southern horn at the mouth of the Danė River, a strategic entry point, plays a crucial role in shaping Klaipėda's identity. The analysis identifies principles for harmonizing heritage preservation with contemporary development, emphasizing the concept of “protect by developing.” Conclusions and recommendations advocate for a balanced approach: neither rigid preservation nor unrestricted transformation, but a strategy that integrates historical elements with new urban forms. This approach can strengthen Klaipėda's unique identity within the global network of port cities, ensuring that development enhances rather than erases its historical character. **Keywords:** urban morphology, waterfront redevelopment, place identity, historic urban core, seaport Klaipėda

Introduction

The urban image issue in the context of a global city remains particularly relevant, especially in countries where the course of cities' historical development was rerouted in the middle of the 20th century by tragic events, forced conditions or artificially introduced processes [3]. Such shocks have left a deep imprint not only on the urban structure of cities, their vitality and evolution consistency, but also on the overall image of the city, both locally and internationally. Experience shows that just a few decades are enough for a city to lose or fundamentally transform not only its visual image, but also its urban identity that formed throughout history.

In such forced conditions, cities are often transformed by means of new deliberately chosen symbols or signs that do not always match the previous character of the city and its possibilities [7; 8; 17]. Under the influence of globalisation, contemporary strategies of urban development are increasingly aimed at restoring or developing a unique local identity, giving a city prominence in a broader context [16]. Various urban development means are used for this purpose, which help to purposefully complement the spatial structure of the city, to form new visual elements and functional connections. These means affect not only the image of the city, but also its structural identity, which is reflected in the visually readable city view [16].

One of the first factors shaping the impression of a city is entering the city. It may happen by land, air or water. The latter entry is especially important for ports, i.e. cities that have historically formed by water for economic and defensive reasons. These territories, therefore, often become key to urban image creation. Today, such port access points are gaining symbolic value – they become part of the visual identity of the whole city.

Klaipėda is the third largest city in Lithuania and the only ice-free seaport of the country. It is one of the most significant hubs on the eastern coast of the Baltic Sea, which was historically inhabited by Lithuanians, however belonged to

Prussia and Germany for a prolonged period of time. The city is also considered to be the cultural centre of Lithuania Minor [19]. The beginning of Klaipėda is associated with the castle and defensive fortifications dating back to the 13th century, so initially the city emerged as a fortress. In the 18th century, with the increase in timber processing and trade, Klaipėda gained the image of a “mill city”, and since the turn of the 18th and 19th centuries – with the rapid expansion of the coastal area used for port needs – the city has established itself as a “port city” [18].

Today, when cruise ships arrive to Klaipėda through the Curonian Lagoon, the first impression of the city comes from functional elements of the port – cranes, industrial complexes, individual vertical buildings. The historical core of the city is currently difficult to recognise, but the situation is changing: the industrial areas on the New Town side are transformed into lively urban spaces, and the castle tower rebuilt in the Old Town in 2024 is becoming an important landmark. These processes have led to assumptions that allow a new look at the significance of the historical part of the city and open up an opportunity to rethink the image of Klaipėda.

The territory at the mouth of the river Danė, in one of the horns formed for entering the river, occupies a strategically significant position that shapes the identity of the city. The ongoing changes show that the image of the historic city is in the process of active transformation, which can fundamentally change the identity of this place and affect the image of Klaipėda in the global network of port cities. A question therefore arises: to what extent this historical place of city entrance from the lagoon should be subject to shaping processes and to what extent it should be preserved as it is? Is it worth restoring it on the basis of the former build-up and historical elements, with regard to adjacent processes, or on the contrary – preserving only what remains, without seeking to create a new image of the city gateway?

The authors of the article have been researching the urban

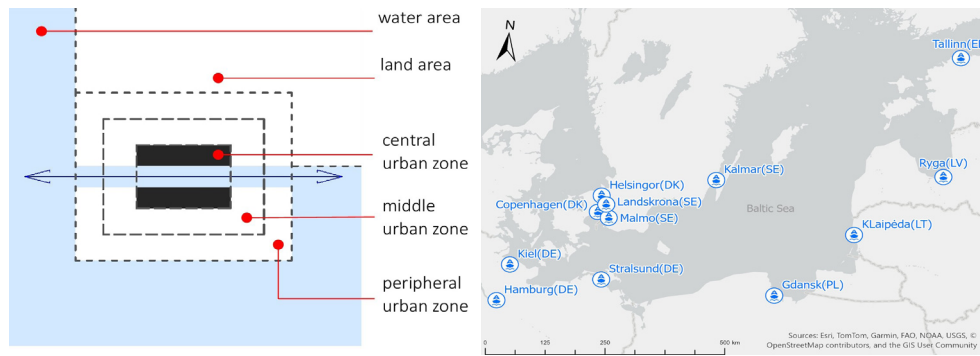


Fig. 1. Port city model and researched port cities in the Baltic Sea region [created by the authors]

structure of Klaipėda city for decades, and in 2022–2023 they prepared several development feasibility studies for the historical part of the city. These papers followed the global trends on the integration of urban development and heritage. Seeing these processes as contradictory often leads to conflict, but their harmonious combination can produce unique results that add to local identity. This is particularly important in multi-layered historical areas where a balance between heritage preservation and opportunities for new development is needed.

The authors dedicate two articles to the historical-urban issues of Klaipėda, which share a common principle – “protect by developing”. This first article addresses the issues of transformation of the port city image, which are related to the hypothesis: whether to shape while protecting or just to protect without shaping – and how this choice affects the changing image of the city. The aim of the article is to identify the urban build-up principles that should be used in the shaping of approaches to the castle site in order to determine whether it is necessary to continue with the structural elements of the city or to interpret them differently.

Based on professional experience and Lithuanian and international sources, the authors examine the development of the historical part of Klaipėda, paying special attention to the elements that formed the image of the city and the historical context of the city entrances. The relevant territorial planning documents are overviewed. The area in question, as an urban landscape that has formed and is still under formation, is analysed and assessed according to the sound methodology of the authors of the article [6], which has been applied for numerous times, also, the relationship between newly formed build-up and the characteristics of the external urban landscape is identified. The research results allow forming the principles and strategy of urban shaping of the area in question, i.e. the southern horn for entering the river Danė. The article is based on the 2023 study of urban development principles for the territory in Klaipėda at approaches to Priešpilio St. 6.

Study of port city entrance know-how

Due to the increased spread of technogenic elements and the increase in the area taken by the port itself, many port cities face port city image issues, where both cultural relations and economic interests intertwine. The master plan of the city of Klaipėda [11] specifies a task of management of immovable cultural heritage objects and urban areas “Highlighting identity features of Klaipėda as a fortress city”, which supposes an intention to explore what role the castle site plays in the image of the port. Is it part of the local identity? Is a detail of the image? How often this characteristic feature is highlighted in fortress cities today and how? For more detailed research, port cities similar to the relevant situation in Klaipėda were selected, main evaluation biases were determined and a comparative study was carried out.

Selection and research approaches

For the study of know-how, port cities in the Baltic Sea region that are close to Lithuania historically, culturally and geographically and meet the following criteria were selected:

1. Geographical location: cities by the open seacoast or channels connected to the sea; the coastal types characteristic of the Baltic Sea (skerry, scar, fjord, level, lagoon), which determined the location of the historical part and the silhouette formation, were assessed.
2. Image of fortress city: relationship between port territories and the central part, entrance directions, city model that allows for comparison of the silhouette significance and image creation.
3. Interaction of historical and new elements: relationship of the castle and the core with new structures, with regard to the character, visibility and context of the silhouette [2].
4. Highlights of the access to the centre: elements that shape the silhouette (historical and new), revealing the balance between heritage and new architecture [2].

According to these criteria, there are three types of ports:

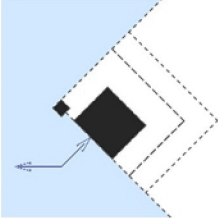
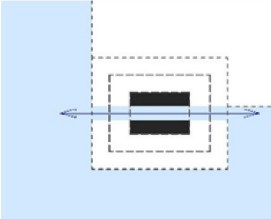
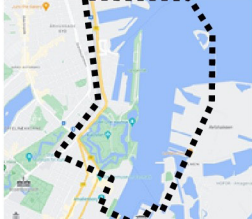
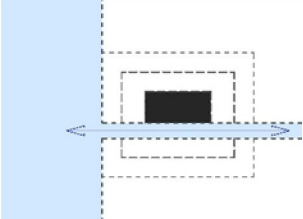
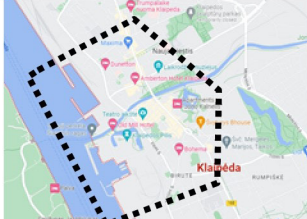
- I – the castle/historical centre dominates the panorama, new objects are built further away.
- II – the castle/historical centre is in the background, while the foreground is formed by contemporary architecture, taller buildings in strategically selected locations.
- III – no foreground formation (e.g. due to demolitions during the war), the city is in search of new solutions, build-up height is matched to valuable elements

Research and its outcome

12 port cities by the Baltic Sea were selected (Fig. 1). The selected port cities have been divided into two categories according to their country's political economic experience: that underwent various cataclysms during the 20th century and that did not. This is also reflected in their current silhouette:

- Smaller cities, which were less affected by various conditions, preserved a significant domination of the castle (Kalmar, Helsingør, Landskrona). In many cases, it acts as the element that shapes access to the city, kind of a gateway to the city.
- Largest cities (nearly metropolises), which have been spared politico-economic cataclysms, confidently signal the water-side gateway to their central area through new contemporary architecture, where either (1) the height of buildings matches the total background height, whereas the higher buildings are planned in strategically selected places as landmarks at a respectful distance (Malmö, Copenhagen, Stralsund); or (2) a new landmark is created, coming as unique and testifying to the city part value (Hamburg).
- Cities affected by politico-economic cataclysms.

Table 1. Most characteristic practical examples of the Baltic Sea port cities (markings: green – citadel of fortress city; yellow – historical core of the city; orange – quays accessible to the public; white – industrial areas not accessible to the public) [created by the authors]

Category I. The castle/historical centre is an active primary component of the panorama. Newly emerging objects are built at a distance from the central part of the city as not to create any competition.			
Helsingør (Denmark). Fjoldal coast, smooth terrain. The whole city silhouette is perceivable, with multi-layered character prevailing and a historical castle of the 15 th century as a dominant. The castle stands as a city gateway, therefore, the historical context is perceived in the first layer of the view.			
			
			
Category II. The castle/historical centre is a background component of the panorama, while the foreground is shaped by the 21 st century solutions and contemporary architecture.			
Copenhagen (Denmark). Fjoldal coast, smooth terrain. The silhouette perception is partial (fragmented), dominated by large objects, making the view monotonous. The city gateway is shaped by new, contemporary construction, while the historical context is perceived in the background.			
			
			
Category III. The foreground is not yet shaped (demolished during the war, etc.), the historical centre being a complex component of the panorama. As the city approaches the water, new solutions with contemporary architecture are being sought.			
Klaipėda (Lithuania). Lagoon coast; smooth terrain. The silhouette is monotonous, perceived gradually, dominated by technological objects, lacks the multi-layered character of the view. No city gateway has formed, access to the central part of the city is marked by the prominent new construction. The historical context is perceived in the background, while the foreground is in the shaping stage.			
			
			

Some have kept the richness of the silhouette (Riga, Tallinn, also Gdansk to some extent), while others suffered a major blow and lost most of their image and urban identity (Klaipėda).

Assessment of the city silhouettes and the significance of their historical parts in the context of the whole city makes it obvious that the historical part is visible in almost all silhouettes: either in the first or the second visual layer (Table 1). The water side view shows the castle site and city centre location, and the publicly accessible quay. In both smaller and large cities, castles and new buildings (created as landmarks) have become city symbols due to their sculptural character, i.e. objects that help identify the city.

The study of the territory and silhouette of each researched city makes it obvious that the historical part of the city is distinctive in the silhouette, standing out among other city parts. All port cities in the world undergo a change in the ratio of the city and port areas, only the timing of the process differs. These changes are very significant as the freed-up port areas are returned to the city: the public gets access to water, new jobs are created, raising the economic, cultural level of the city or city part. Change of function in these zones goes along with change not only in the planned structure of the territory, but also in the general image of the city, its spatial urban character.

In addition to the observations already made, the study of the Baltic Sea port cities allowed to notice the following trends in the transformation of port cities:

- The city silhouette changes along with the processes in the city – changes in the plan structure, transformation of social and cultural self-awareness and economic factors.
- The castle and/or historical centre is an active primary component of the panorama, shaping the identity of the city. Historical and newly created city landmarks are represented and placed differently, based on the city size and its international weight.
- Cities in countries that were and were not subject to political-economic cataclysms differ in the representativeness of their historical parts and richness of their silhouettes. However, the attitude towards the shaping and display of a valuable part of the city and its silhouette is similar, testifying to common cultural values and urban patterns.
- Multi-functional urban structures have formed or are purposefully developed on the coast of the port cities, with integration of representative objects, emphasising the significance of the area for the visual perception from the water.
- In general, when shaping the city silhouette, the priority is always given to the display of the historical and natural environment of the city.

Port city of Klaipėda and input data for urban research

Despite the tendency of cities to keep changing and transforming, a city and its people should keep signs of historical memory, as they are important and significant for the identity of the place and for the identification of the people with the place where they live. Therefore, every urban research begins with an overview of the historical urban development of the area, which focuses primarily on the broader context. Then the overview switches to its current urban structure, its elements and effective applicable documents on the development of the territory. This is done in search of the most prominent landmarks that shaped the city identity.

History

Historical urban development of Klaipėda city in historical plans is analysed both in general terms and with more focus on the structure in the mouth of the river Danė. The overall change in the panoramic view and silhouette of Klaipėda city is analysed (Table 2). This research has allowed to identify several clear periods of the city image [18]:

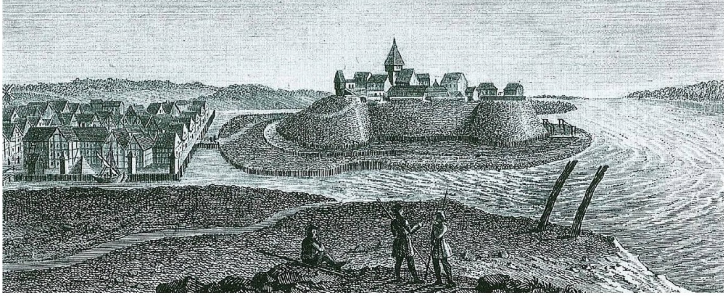
1) *fortress city* (from early times to the second half of the 18th century): this is the early development of Klaipėda, when the castle dominates the city structure – the city remained dependent from the authority in the castle till the 18th century. The changes in military warfare in Europe in the 15th and 16th centuries and the increased importance of artillery led to the development of defensive fortifications in Klaipėda. In the 17th century, the city gained the status of a fortress with a garrison and fortifications formed around. The city was considered an impregnable fortress for several centuries, but at the end of the 18th century its military role diminished, and in the 19th century its defensive structures underwent dismantling.

2) *mill city* (at the junction of the 18th and 19th centuries): at the end of the 18th century Klaipėda became an important centre of timber export in response to the increasing demand for construction timber. Due to favourable port conditions and low taxes, the timber processing industry grew rapidly, closely related to windmills. They shaped the silhouette of the Klaipėda coast and became a landmark of the city identity, depicted in the 19th century cartography. Later, technological change and the transformation of the industrial structure led to the disappearance of the mills.

3) *port city* destiny has been with Klaipėda from the very start of the city. Initially, the functions of the Klaipėda port were performed by the banks of the river Danė then, in the late 18th century, the coast also started to be used for industrial purposes – storage, sawmills, shipyards. This process expanded the port territory to the Curonian Lagoon, where the industrial port infrastructure took root over time. This development changed the city's relationship with water and separated public spaces from the coastal zone and fundamentally changed its spatial and social structure. The historical urban development of the build-up at the entrance to the river Danė, also known as the entry horns, in the city plans illustrates the past formation of the perimetric build-up and its street elevation on both banks of the Danė and the subsequent demolition of this build-up. And the views of Klaipėda panorama and silhouette convey the change of the whole city image (Table 2):

- Before the war, the view was that of a graceful, expressive city. The main elements shaping the silhouette were slender ship masts, pointed towers of churches and the castle, and the natural elements – the green areas. In the context of the entire city, the distinctiveness of the territory was created by the castle and later by the castle site, the lighthouse, navigation signs, natural environment.
- In Soviet times, the silhouette of Klaipėda changed drastically, becoming monotonous, lacking character. The main element shaping the silhouette and the image of the port city is cranes lined up along the coast, whereas historical vertical landmarks were destroyed, with only fragments of horizontal elements remaining, which are recognisable only in the plan, but are no longer identified in the city panorama or silhouette [20].
- The 21st century dominant element of the city image is the remaining industrial port and its attributes. The image of Klaipėda as a mill city is completely lost,

Table 2. Most characteristic historical silhouettes of Klaipėda city and horn formation fragments [5; 9; 12; 14; 15; 18]

Year	Panoramic view and silhouette, their shaping elements and dominants
1535	 View of Memelburg (Klaipėda) castle and the western part of the city with the mouth of the river Danė. Picture of 1535, copied by the painter Rosmässler from the painting by J. Klingenknecht, dated 1535, which was in the German St. John church in the Klaipėda Old Town till the fire of 1854. (<i>Alt- und neues Preussen</i> by Chr. Hartknoch, 1684). Though the view is from the riverside, the silhouette is clearly dominated by the castle.
1808	 View of Klaipėda from Smiltynė. The panoramic view is formed by small-scale residential houses and utility buildings; the silhouette is dominated by the rising church tower, windmills and larger warehouse buildings.
1902	 A capture of the characteristic silhouette of the city before the world wars. The foreground of the panoramic view is formed by the warehouse and residential buildings that are in parallel or perpendicular to the Curonian Lagoon; the background is formed by the castle rampart; the silhouette is dominated by church towers rising in the further background.
2022	 The foreground of the panoramic view is shaped by technological elements (cranes) of the industrial port, in the approaches to the territory in question – by fragments of the remaining historical build-up of warehouses and residential buildings, standing in parallel to the Curonian Lagoon, and buildings of the Lindenau shipyard; the silhouette has lost church towers and is dominated by the 21st century high-rise buildings K and D.

without any physical signs in its urban fabric, while the time of the fortress city is still reminded by fragments of the system of defensive fortifications and the castle territory.

Urban analysis of the current situation

Urban analysis of the current situation allowed to determine peculiarities of urban structure that formed in the approaches to the territory: characteristic morphological division, block structure, system of urban public spaces, main visual links and dominants (Fig. 2) [1; 11].

Examination of the principles of build-up and block structure

formation along the Danė (from the Castle Bridge toward the Curonian Lagoon) allows stating that no blocks are formed on both of its sides but detailed plans and tender papers provide for their future shaping. The perimetric linear character of the build-up is based also on the former build-up principle followed throughout the history.

The study of possibilities of public urban spaces shows that the approaches to the area in question are important for the whole city because the system of public urban spaces that consists of three significant elements – the castle site, the quays of the river Danė and the Curonian Lagoon – allows for the city's access to water and creates the exceptional

image of the port city, reminding also of the historical past of Klaipėda. These zones must not lose public access and multifunctionality.

The dominants and their influence zone in the area in question are adjacent to the zone of direct spatial influence of the horizontal highlight (the castle site). The area can be well observed from the upper terrace of the vertical highlight – building K – on the right bank of the Danė, from the observation deck in the tower of Blessed Virgin Mary, Queen of Peace Church that is slightly southeast, and from the rebuilt castle tower. In the future, the observation will also be possible from the tower of St. John's Church to be rebuilt. Therefore, shaping of the area must take into account its observability from the said vertical highlights.

Discussion of the visual links creation possibilities should also include emphasis that the territory can be viewed not only from the vertical dominants but also from ground level local observation sites. As the territory under design has the castle site and Paul Lindenau shipyard structures behind it, in shaping of the new build-up, the building volumes and their placement must ensure a possibility of fragmented observation of the said objects.

Documents

The area in question falls within Klaipėda Old Town territory (unique code 16075), adjacent to it are the Klaipėda castle site (unique code 10303), the Klaipėda castle and bastion complex (unique code 848), Paul Lindenau shipyard complex (code 25898), whereas on the other side of the Danė is the historical part of Klaipėda city called the New Town (unique code 22012). The following aspects of the new build-up relationship with heritage objects were, therefore, pointed out:

1. The newly suggested build-up can have an effect on those characteristics of heritage objects that are visible and observable from characteristic viewpoints. For the assessment of the suggested build-up, it is relevant to examine its relationship with the external urban landscape characteristics, as reflected in panoramas, silhouettes, and dominants/ensembles.
2. In forming the principles for newly suggested build-up, it is also important to take into account the categories of surrounding buildings and the valuable build-up typology, as named in the relevant statement of the Old Town Assessment Council. In the said document, the land plot under design is recorded as a changed non-shaped urban structure, consequently, new construction is possible here and, as there is a fragment of regular perimetric build-up next to it, continuing this type of build-up is recommended.

Territory planning documents [4; 11; 14; 15] indicate such tasks of management/preservation of immovable cultural heritage objects and urban locations: highlighting the features of the city identity; restoration of the characteristic silhouette, dominated by the castle and church towers; highlighting Klaipėda as a fortress city. The approved heritage management project (covering the area in question) allows new construction and the requirements set out in it should be followed.

Assessment of the territory and recommended principles for shaping it

One of the main imperatives in the assessment of the territory in question is the relevant relationship of newly shaped build-up with the external urban landscape characteristics, reflected in panoramas, silhouettes and dominants or

ensembles. The territory is, therefore, assessed according to the panoramic view analysis and assessment methodology, which has been developed and described by authors of this article [6]. Assessment sequence: (1) selection of relevant viewpoints of the territory; (2) description and assessment of observation sectors; (3) analysis of relevant panoramic views in terms of the distinctness of elements in a visible view, domination and obscuring of objects, visual links between objects, multilayered character of the panoramas; and (4) presentation of recommendations and the territory shaping principles.

Viewpoint selection

The selection of relevant viewpoints of the territory was based on the Klaipėda city viewpoints established for the first time [10], where different observation sectors produce a different silhouette and panorama quality. Viewpoints were divided into three categories: important for the whole city, revealing the Old Town value and viewpoints of local impact.

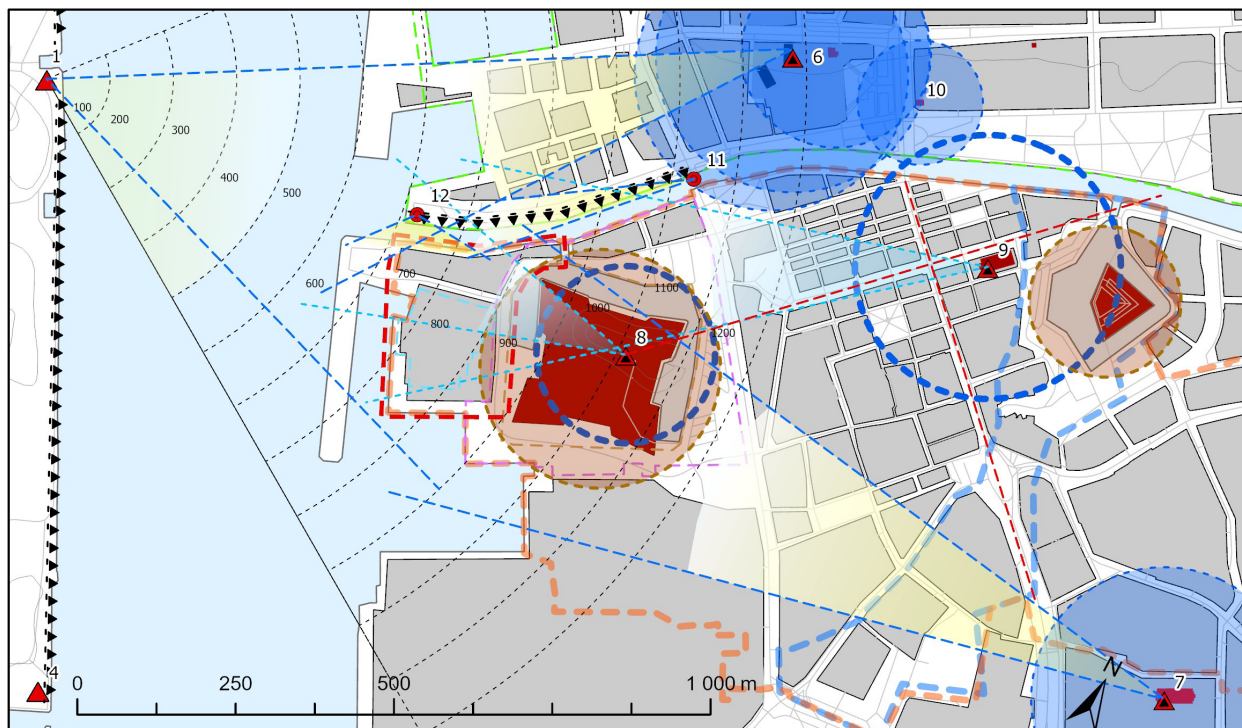
The current master plan of Klaipėda city provides for six main observations sites: four in Smiltynė (Meadow Horn, Ferry Terminals I and II, Yacht Club), Hagen Hill and observation deck planned in the castle tower. The Old Town visibility is limited by flatness of the area – broader views open only from Smiltynė, the Curonian Lagoon and some streets. The territory at Priešpilio St. 6 and 9 is well observable, however neither the Klaipėda master plan [11] nor heritage documents [13; 14; 15] indicate any specific viewpoint in it except for the observation sites marked in the castle and bastion complex plan. The authors of this paper suggest additional public viewpoints in public gathering places. 12 viewpoints were assessed in total, but for a detailed analysis 6 relevant points of two types were selected:

1. 4 points relevant for the whole city – from Ferry Terminal I in Smiltynė, from the Yacht Club in Smiltynė, the outdoor terrace of the cafe in the administrative high-rise K, the observation deck in the tower of Blessed Virgin Mary, Queen of Peace Church. They are for assessing the impact of the new build-up on the city panorama and on the relationship with the heritage. They can also be considered external (Smiltynė, ~600 m away from the territory) or internal (high-rise terraces, church tower, 500–1,250 m away from the territory).
2. 2 nominal points – from the Castle Bridge and from the North Horn of the Danė – are for assessing the relationship of the new build-up with the closest heritage objects, also changes in the silhouette and the quay build-up. They are on the ground and at a distance of 50–100 m and 350–400 m from the territory in question in the approaches to Priešpilio St.

Analysis of relevant panoramas

The analysis of relevant panoramic views and silhouettes involved examination not only of the view from a certain point but also of the territory plan. The panoramic views and the silhouette were analysed and their valuable elements were named: the distinctness of elements visible in the view, domination and obscuring of objects, possibilities and peculiarities of visual links between objects/areas and the character of the panoramic view. The examination followed the sequence that leads to consequences in the visual frame:

- Panoramas and silhouettes are divided into visual layers according to structural boundaries set in the territory plan or based on specific distances.
- The visual layer where the apparent object in question is located and its distance from the viewpoint are identified.



LEGEND

Visual dominants and accents

- Historical (< 20th century)
- Modernist (from 1950)
- Contemporary (21st century)

Public viewpoint category

- Global_external
- Global_internal
- Local_internal

Viewing sector field

- Existing from the 1st pier in Smiltinė, Taikos Church, from Pilies Bridge, the northern horn of the Danė River, building "K"
- Possible from St. John's Church and the Castle Tower

Other symbols

- Study area
- Water bodies
- Block structure

Visual connections and viewpoints

- Historical urban-structure compositional relationship
- View sectors toward the study area from: Pilies Bridge, Church of Peace, "K" Building, Northern horn of the Danė River, First Smiltynė Ferry Terminal
- Potential view sectors from Pilies Tower and St. John's Church
- Lines of visual points
- Zone of direct spatial influence of a vertical (existing) landmark (object height 3h)
- Zone of direct spatial influence of a vertical (perspectival) landmark (object height 3h)
- Zone of direct spatial influence of a horizontal (topographical) landmark (object height 3h)
- Distance from the First Ferry Terminal marked every 100 m toward the study area

Boundaries of the immovable cultural heritage sites

- Historic part of Klaipėda city, known as Naujamiestis (code 22012)
- Klaipėda Castle Site (code 10303)
- Klaipėda Castle and Bastion Complex (code 848)
- Paulius Lindenau Shipyard Building Complex (code 25898)
- Klaipėda Old Town (code 16075)
- Klaipėda City Bastion Fortification Complex (code 10457)

Fig. 2. Visual links and dominants [created by the authors using GIS]

▪ Peculiarities visible in the view are assessed in terms of their relationship with valuable elements of the view.

▪ Objects dominant in the view are pointed out.

Out of 6 viewpoints considered, this article presents the only one that is the most manifest illustration of the former historical entrance to the river and a possible city gateway from Smiltynė side. This view allows the sight of the entire western facade of Klaipėda with the most urbanistically mature part that is most representative of the city's history. Having assessed the technical information and the viewing sector itself, it was established that the visual frame (excluding the close-up and far-off layers) consists of 6 intermediate visual

layers. Although it is the whole city external point (outside the urbanised city part) and one of the low (lower terrace of the terrain) viewpoints, the view from there is perceived both as a silhouette and as a panorama. The latter is identified through different visual layers. The area under consideration is at the distance of 700–800 m from the point (layer I) and is observable at the angle of 180° (Fig. 3).

Distinctness of elements in the visible view: In layer I – the Danė mouth, entrance to the historical centre, P. Lindenau structure, port cranes. This layer is perceived best as it is on the 0.5 km distance boundary from the viewpoint, making its elements and their details clearly visible, therefore, in the

future its image as a city entrance – the gateway – is worth developing. In layer II – the castle site complex with the castle tower and the Laivītē territory with a new structure planned in it according to the project *Memel City* (0.5–1.2 km). In layer III – the Old Town core, the Friedrich Suburb, the future tower of St. John Church, the complex of buildings K and D (1.2–2.5 km, perceived as a background). Layers IV–VI are practically invisible due to the lowness of point; only the Musical Theatre tower (IV) and the Old Power Plant chimney (VI) can be distinguished.

In terms of *object domination*, it is currently difficult to distinguish the limits of the Danė side and the horn, as horizontal industrial architecture dominates here. P. Lindenau structure (on the right) and buildings K and D (on the left) dominate. The vertical of the currently rebuilt castle tower reinforces the Old Town perception, and the planned tower St. John's Church would accentuate it even more. Meanwhile, a new building of the port administration and Memel City (currently under preparation and construction) will reinforce the New Town perception. Such development on both sides of the river Danė basically changes the visual significance of the central part of the city.

In terms of the *visual links between objects*, the centre of the observation sector partly coincides with the mouth of the Danė, therefore, both sides of the Danė mouth – both the North Horn and the South Horn must be shaped as the hub serving as the city gateway. The area in question is purely an element shaping the South Horn, therefore, it should serve as the background for valuable heritage objects visible in layers II and III: P. Lindenau structure, the castle site with the rebuilt castle tower and the tower of St. John's Church that will accompany them in the future. It is important not to

overshadow these verticals and maintain the readability of heritage objects.

The *panoramic view* is multi-layered where the first layer is particularly important for revealing the urban structure variety and specifics. Its shaping requires purposeful and responsible solutions, therefore, preservation of the multi-layered character is a prerequisite for the development of the Danė mouth and the city gateway hub.

Urban shaping principles for the area

The territory at Priešpilio St. 6 and 9 is strategically important for the whole city as it enters the city historical core zone and is an element shaping the South Horn of the Danė mouth, which influenced the changing image of the city throughout history: from the fortress city and the mill city to the industrial port. In addition, this territory has a significant impact on the panorama, the silhouette and the very image of Klaipėda. Until the middle of the 20th century, the area was dominated by the perimetrical build-up, which greatly accentuated the river channel. The currently remaining vestige of the urban structure does not give the place a full image, therefore, the territory must be shaped to achieve a European city image. Based on the research described, the urban shaping strategy for the area under consideration – the South Horn of the Danė mouth – has been drawn up, recommending four main principles (Fig. 4):

- **Build-up type selection.** The newly formed build-up should be perimetrical as it was the type that historically developed in both horns of the Danė (until 1959) but disappeared later. The river has traditionally been treated as a street spatial corridor, so it is appropriate to maintain this principle on both sides of the mouth, too.

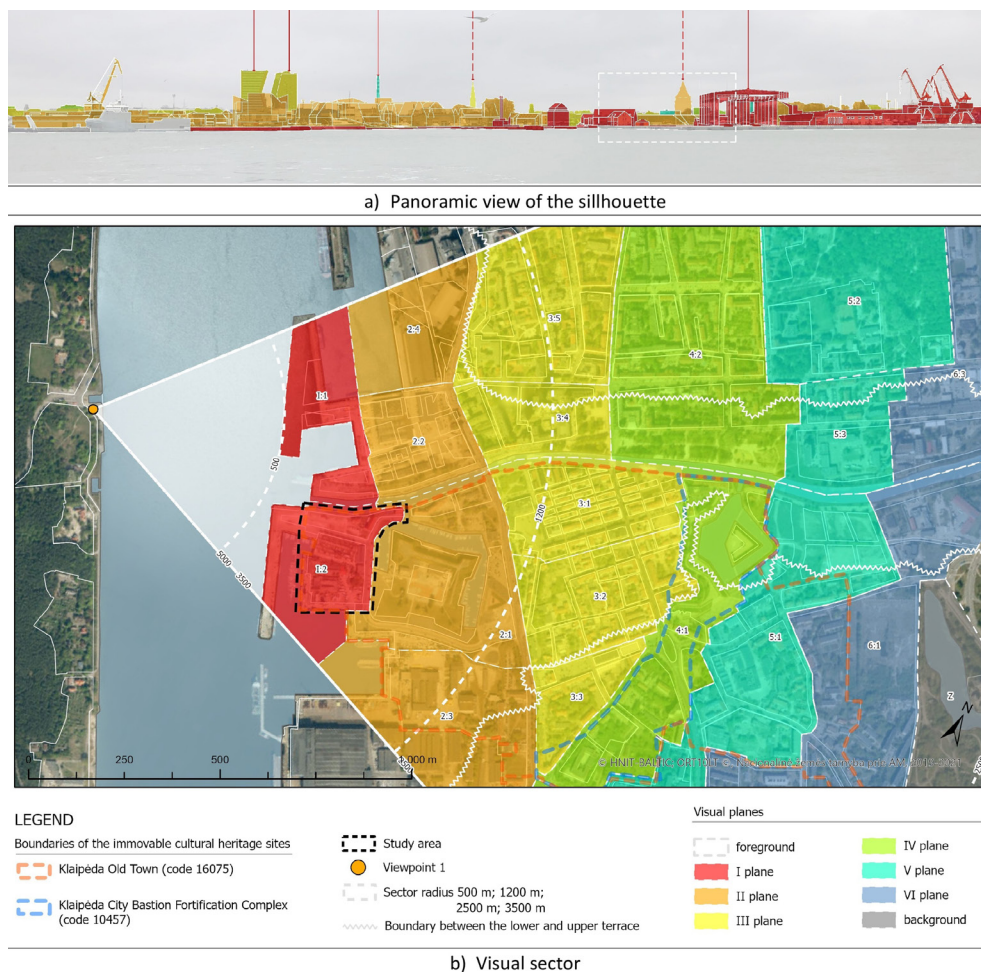


Fig. 3. Observation of the area in question from Ferry Terminal I in Smiltynė, its structure in the plan and in the view [created by the authors]

Volumetric-spatial solutions must respect the zone of visual influence of the dominants and not overshadow it.

- **Respecting the build-up height.** Two territory image options are possible: moderate background build-up or an expressive highlight of the river mouth as a gateway, while maintaining a respectful relationship with valuable dominants. The first option is based on historical features of the build-up and the second – on contemporary international practice of port cities. The tower must remain a dominant element (without exceeding 2/3 of its height) so as not to create competition with existing valuable properties and to keep the multi-layered character.
- **Shaping of the view layers.** Klaipėda city has a predominantly smooth terrain, therefore, in order to have multiple layers, buildings should become higher as they recede from the coast. It means that, in shaping of the new build-up, the volumes and placement of buildings must allow a fragmented view of the castle site and P. Lindenau shipyard structures and should not overshadow the visual layer behind or affect the one in front.
- **Introduction of multifunctionality.** The approaches to the new build-up must merge into the network

of public urban spaces created by the castle site, the quays of the Danė and the Curonian Lagoon, and the new build-up must ensure the viability of these spaces. Therefore, the creation of multifunctionality of buildings is a prerequisite for maintaining city life in this part of the city. This practice, when the quays of the central part of the city are accessible to the public and are as multifunctional as possible, is demonstrated by all the studied port cities of the Baltic Sea.

Discussions and Conclusions

In the port cities of the Baltic Sea region, **the distinctiveness of the city image in the context of other city parts is created by the silhouette of the historical part of the city.** All port cities in the world undergo a change in the ratio of the city and port areas, only the timing of the process differs. The changes that are taking place these days in potentially transforming areas in central parts are very significant, as these areas are given back to the public for city needs. The formation of access to water, creation of new jobs, raising the economic and cultural level of a city or city part are strategic priorities of cities in their central parts.

The city silhouette, as well as its image depend on various processes taking place in the city: change of the plan structure of the area, change of the social and cultural

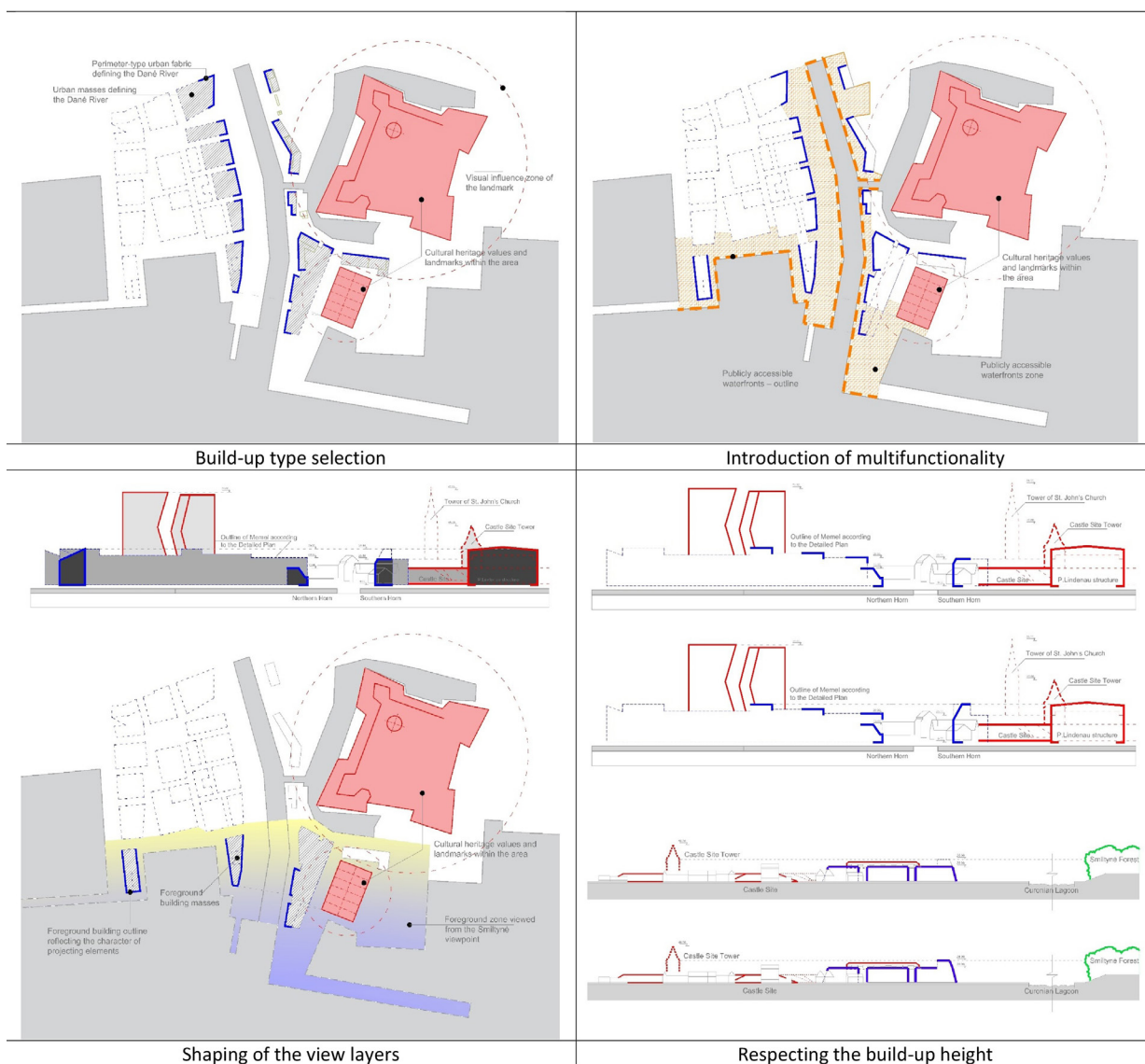


Fig. 4. Urban shaping strategies and principles for the area pertaining to: build-up type, multifunctionality, multi-layered character and height [created by the authors]

self-awareness, economic factors. Therefore, in shaping the city image, priority should be given to highlighting the city identity or even restoring it (if lost), bringing back the relationship between historical and natural environment.

The constant transformation of the city image, which directly depended on the change of economic activities and technologies, can be pointed out as the main feature of historical urban development of Klaipėda. Despite the tendency of Klaipėda to keep changing and transforming, **the city and its people should keep signs of historical memory**, as they are important and significant for the identity of the place and for the identification of the people with the place where they live.

Before the war, Klaipėda had the image of an elegant and expressive city. In the context of the entire city, the distinctiveness of the territory was created by the castle and later by the castle site, the lighthouse, navigation signs, natural environment. Currently, the image is different, its main forming element is cranes that line the coast. Restoration of the identity of this place requires **transformation of the image of the territory. It must be based on historical data, looking for a proper ratio between preservation and shaping.**

The guidelines for urban shaping of the area are dictated by the assessment of the urban context – **the relationship of the newly shaped build-up with the external urban landscape characteristics.** They are reflected by panoramas, silhouettes and dominants/ensembles. The assessment should include analysis of characteristic views and signs of multi-layered character in them, conditions of domination and highlighting of valuable objects, possibilities of the presence and/or creation of visual connections. The urban context of the area and its shaping are important in the system of urban public spaces that includes the castle site, the quays and the approaches to the lagoon, which create the character of the port city and historical memory connections. Therefore, **new objects that will appear must be of high artistic quality, visually integrated, not overshadow the visual layer behind them and not compete with historical and natural elements.** It is very important not to create the effect of competition with the existing valuable properties in the place and to keep multiple layers. The area is, therefore, subject to key urban structure principles: build-up type selection, build-up type regulation, shaping of the view layers, introduction of multifunctionality.

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Kopsavilkums

Rakstą analizėta pilsėtvės tēla transformācija globālo pilsētu kontekstā, īpašu uzmanību pievēršot Klaipēdai – Lietuvas vienīgajai neaizsalstošajai jūras ostas pilsētai ar vēsturiski daudzslāņainu pilsėtvės struktūru. Pētījumā aplūkots izaicinājums saglabāt vietējo identitāti globalizācijas apstākļos un vēsturisko satricinājumu kontekstā, kas 20. gadsimta vidū būtiski mainīja pilsėtas attīstības trajektoriju. Šādas pārmaiņas daudzviet ir izraisījušas pilsētu vizuālās un telpiskās identitātes zudumu vai radikālu transformāciju. Pētījumā analizēts, kā mūsdienās mainās Klaipėdas pilsėtvės tēls, kuru vēsturiski veidojuši pilsėtas kā cietokšņa pirmsākumi, kokmateriālu tirdzniecība un vēlāk – ostas funkcijas. Pirmo iespaidu par pilsētu, īpaši krūza kuģu pasažieriem, kuri Klaipēdā ierodas caur Kuršu jomu, galvenokārt veido industriālās ostas elementi, nevis pilsėtas vēsturiskais centrs. Secinājumos un rekomendācijās uzsvērtā nepieciešamība pēc līdzsvarotas pilsėtvės attīstības pieejas, izvairoties gan no pārmērīgi stingras vēsturiskās vides konservācijas, gan no nekontrolētas pilsėtvės transformācijas.

LANDSCAPE SPATIAL UNIT IDENTIFICATION METHOD FOR LANDSCAPE CHARACTER ASSESSMENT IN LATVIA

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Abstract. This research develops and applies a comprehensive method for identifying landscape spatial units to support landscape character assessment in Latvia. The approach is based on the integration of geomorphological, land-cover, land-use, ecological, and cultural-historical data, complemented by field-based perceptual evaluation. A national spatial database was created by compiling open geospatial datasets from state institutions and compiling them through GIS processing, including multi-scale data interpretation, overlay analysis, and refinement of boundaries. Three hierarchical levels of spatial landscape units were defined: landscapes - large-scale landforms, landscape areas, and landscape character areas - the latter representing the smallest and most perceptually meaningful units for planning and management purposes. Landscape character types were established using a combined classification of relief, land-use patterns, vegetation structure, mosaic complexity, and distinctive features such as wetlands, river valleys, or dune systems. In total, 15 landscape character types were identified and described, reflecting visually recognisable and homogeneous patterns in the terrain. Field surveys conducted in 2022 verified and refined the GIS-generated boundary delineations, while also documenting landscape perception and key visible characteristics within each landscape character area. The results demonstrate that boundary precision depends on scale and that landscape transitions often occur gradually rather than abruptly, particularly in mosaic or water-related landscapes. The applied GIS methods proved effective in ensuring spatial transparency, enabling simultaneous interpretation of multiple data layers and supporting iterative refinement through expert assessment. This study provides the first national-scale, perception-based identification of landscape spatial units for Latvia and establishes a methodological framework for future landscape planning, management, and policy development. The resulting classification and cartographic materials support differentiated planning solutions tailored to specific landscape character types and areas. **Keywords:** landscape character assessment, landscape character areas, spatial unit identification method

Introduction

Landscape, as a complex system, encompasses a wide range of scientific disciplines, including geography, archaeology, anthropology, ecology, and others. Each discipline formulates its own definition of landscape, emphasizing aspects that reflect its particular research interests. At the same time, landscape, as the living environment of people, brings together all these diverse fields, viewing landscape through the lens of human perception. Therefore, in the sections of this book, the definition of landscape used is the one provided in the European Landscape Convention: "Landscape means an area, as perceived by people, whose character is the result of the action and interaction of natural and/or human factors" [1].

Landscape is both a socio-economic and biological resource, as well as a living environment for people, reflecting cultural-historical values, traditions, and the more intangible qualities of landscape shaped by memories, associations, and the

representation of landscape in art, music, and literature. Considering the importance of human perception, the landscape quality objectives or the expectations set by different social groups toward a particular landscape play a significant role in landscape assessment [1; 2].

One of the key insights emphasized by European landscape researchers is that landscapes have no fixed boundaries. Therefore, there is no single prescribed approach for subdividing landscapes into smaller spatial units, and each country may apply its own method. Likewise, European and global experience show that incorporating the human-perception dimension into landscape assessment, as highlighted by the European Landscape Convention, requires a crucial consideration of scale when defining the smallest landscape spatial unit. This unit must be perceivable and understandable to people, while still retaining the holistic perception of the landscape. However, for strategic and

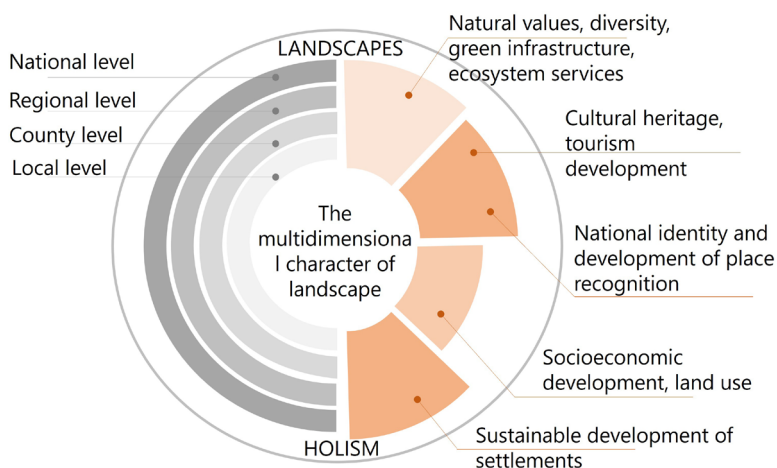


Fig. 1. Landscape as a complex system is defined by its multidimensional character and the diverse fields that shape it, by the holistic perception of landscape, and by the differing landscape quality objectives, namely, society's expectations toward the landscape at various planning levels [created by the authors]

integrated management purposes, the smallest landscape units are subsequently grouped into larger ones that reflect the physical-geographical, economic, and social specificities of a given region, characteristics that become visible in the landscape character (for example, intensive agricultural areas, coastal regions, etc.) [1; 3].

Despite the requirements of the European Landscape Convention, only a few countries across Europe (France, Italy, Switzerland, the Netherlands, Belgium, Great Britain, and Latvia) have a systematic knowledge of the landscape characters at the national or regional level [4]. In Latvia, landscape character assessment was done in the framework of the project „Sustainable management of land resources and landscapes: assessment of challenges, methodological solutions and proposals “(LandLat4Pol) [5].

When analysing the experience of European countries in landscape assessment and mapping, three fundamental principles can be identified:

- Assessment of the landscape as a “unified whole” (the holistic approach), which primarily includes methods related to human perception (both visual and cognitive) and public participation, while at the same time examining the landscape comprehensively through various additional dimensions.
- Characterisation and assessment of the landscape based on its geomorphological and ecological qualities and land-use patterns.
- Landscape assessment grounded in the statistical analysis of landscape elements or specific attributes, using a pre-defined value scale for each parameter.

It is important to the process of Landscape Character Assessment, and therefore to classifying and describing the landscape, to understand the distinction between landscape character types and landscape character areas. These terms need to be used correctly, and the differentiation between types and areas, identified at different levels in the hierarchy from national to local, needs to be understood.

Landscape Character Assessment (LCA) can be carried out at a wide range of spatial scales, from broad national overviews to detailed site-level studies. In practice, three

main levels are commonly distinguished. First, at the national or regional scale (approximately 1:250,000), major variations in landscape structure and character are identified, providing an overarching framework for more detailed assessments. Second, at the local authority level, for example, counties, districts, or unitary authorities, LCAs are typically undertaken at scales around 1:50,000 or 1:25,000, allowing the identification of specific landscape types and character areas. Because landscape patterns extend across administrative boundaries, methodological consistency between neighbouring jurisdictions is critical at this stage. Third, the most detailed assessments are conducted at the local or site scale, usually at 1:10,000 or finer, when evaluating specific sites, development areas, or projects. If needed, assessments may also be positioned between these levels or carried out at even more detailed scales [4].

Land use and landscape are closely interconnected. The landscape shapes or determines the type of land use by influencing the activities that can take place in a specific location, while land-use practices can also shape the landscape in return. When land use and landscape interact, they form distinct character areas. Landscape types can be identified through knowledge of the geophysical. Similarly, land use is characterized by dominant surface types, structural and/or historical patterns, and vegetation structures. By comparing land parcels across a region, it is possible to distinguish areas such as peatlands, grasslands, and arable land. Land use and landscape often intertwine, giving each area its characteristic distinctiveness and/or uniqueness [6].

When defining the boundaries of a landscape character study, it is essential to consider the wider geographic context rather than relying solely on administrative limits, as landscape patterns and visual relationships often extend across borders. Coordination with neighbouring areas, including reviewing or aligning their existing assessments, helps ensure that character units connect seamlessly and reflect shared vistas, landforms, and ecological linkages. The study area should also be adjusted to reflect the specific purpose of the assessment, such as renewable energy planning or protected area management, while still including adjacent zones that

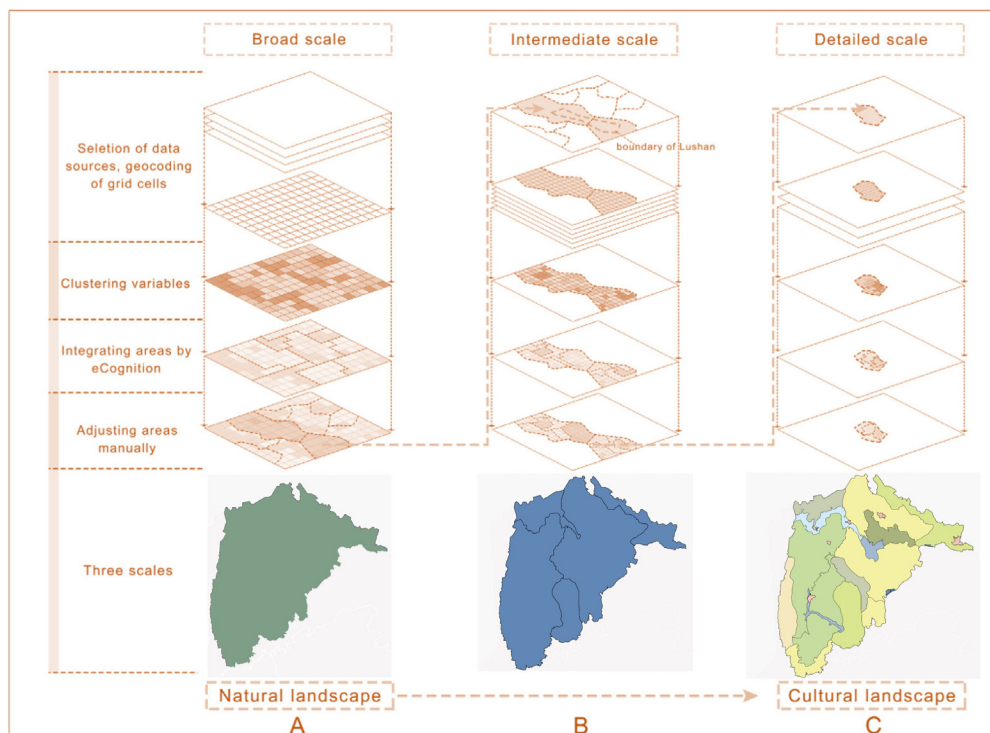


Fig. 2. Four steps/ processes to identify landscape character types and areas at three different scales, “Ziemeļvidzeme” example [created by authors, based on [7]

may influence or benefit from the landscape's visual and spatial qualities [4, 6, 8].

The identification of landscape character areas involves determining both their key features/characteristics and distinguishing transitions from surrounding or adjacent areas. To enable the use of qualitative landscape character information in planning and management, it must be associated with geographically bounded territories. Therefore, delineating landscape character units is essential, understood as structurally, functionally, and/or visually coherent areas to which differentiated protection, management, or planning regimes can be applied. It must be recognised that the precision of boundaries will vary depending on the assessment scale and level of detail [8; 9; 10].

Landscape boundaries are not always strictly definable. From the perspective of boundary theory, they can be regarded as transition areas. Landscape character is defined by context, and in many cases, clear boundaries between one landscape character (dominant) area and another are not perceptible, meaning delineation is based on the context relevant at a given moment. It may be said that the boundary between two landscape character areas occurs where it is least clear which character type dominates, since landscape is, in reality, continuous and character does not usually change abruptly (with exceptions related to certain geomorphological forms) [8; 9; 10; 11].

Method

The indicator groups included in the Landscape Atlas will be composed of hydro-geomorphological indicators (presence of water, characteristics of relief, etc.), natural potential indicators (protected nature areas, ecosystem complexity and diversity, green infrastructure, etc.), agricultural potential indicators, architectural and settlement evaluation, territorial development indicators (accessibility, building density and dynamics, etc.), intangible heritage indicators (including tourism characteristics), and others. These will be based on data from the Central Statistical Bureau of Latvia and on researcher-defined indicator groups with classified parameters.

Process includes:

- acquisition, editing, adaptation, and scaling of source data (including GIS);
- interpretation of overlays of selected landscape character layers; selection of criteria for identifying landscape types;
- characterisation of selected landscape types (at national, regional, and local levels);
- classification of attributes for the physical identification of landscape types and units;
- training on a unified approach to on-site landscape assessment;
- selection and field survey of pilot areas using a chosen identification checklist for assigning territories to defined landscape types;
- mapping of territories according to selected landscape types, definition, and description of local specificities.

In this research, used term "Landscape character types" is understood as distinct kinds of landscapes that are relatively homogeneous in character. Landscape character types are general in nature, as they may occur in different areas across various parts of the country; however, regardless of where they are located, they share similar overall combinations of geology, topography, drainage patterns, vegetation, historical land use, and settlement structures [5; 8]. And "Landscape character area" is defined as – a geographically delineated

area that is homogeneous concerning its relief characteristics and landform attributes [5; 12; 13].

A key prerequisite for defining spatial units is the compilation of available data on Latvia's landscapes, including their classification, the compilation of data formats, and the evaluation of spatial coverage and representation. A spatial database was created from the available datasets, forming coherent data groups on Latvian landscapes and the indicators characterising changes. This database serves as the basis for identifying different types and levels of landscape spatial units and for defining their mutual boundaries. The development of the landscape character type classification and descriptions was carried out by drawing on previous research conducted in Latvia and adapting it to the scale of the landscape area.

The next step involved the creation of cartographic material based on the collected data, ensuring spatial representation across Latvia. The processed information was digitalised and compiled into a unified spatial database to serve as the foundation for map production. Based on the processed datasets and the established landscape character type classification, initial cartographic material was prepared, outlining a potential division into landscape areas, identifying territories with different landscape character types, and marking their potential spatial boundaries.

This was followed by field surveys of the landscape areas. The surveys were conducted in 2022, with landscape assessment experts working in pairs. Fieldwork aimed to verify the correspondence of previously obtained and processed information to actual conditions, as well as to gather additional landscape-perception data that can only be acquired through direct site visits. In the landscape characterisation process, it is essential to confirm that the cartographic information corresponds to real-world conditions; therefore, this verification is carried out through field research. A field survey form is developed for this purpose, including a wide range of landscape-characterising parameters. Field surveys are also necessary to obtain information about landscape perception in a given area. The fieldwork is supplemented by on-site photographic documentation, which captures the character of each location and allows for later visualisation of the field observations, clearly demonstrating the qualities of each landscape spatial unit or the distinctive landscape-forming elements that differentiate it from adjacent units.

After the field surveys, the cartographic material of the landscape spatial units is refined. Based on the information collected during fieldwork, the previously prepared cartographic material is updated regarding the spatial arrangement of landscape units, including refining their boundaries according to the visual qualities of the landscape and its perception in the specific location. The refinement of boundaries begins with the landscape spatial units closest to the local scale (landscape character areas), and based on these adjustments, the boundaries of higher-level spatial units (landscape areas and landscapes – large-scale landforms (fig.3)) are also updated. To ensure efficient data processing, a geographic information system (GIS) approach was selected. This enables spatial transparency of all available data by simultaneously viewing and analysing the overlap of different spatial layers, as well as processing these data using various GIS software applications.

The compiled data can be categorised in several ways: by scale/resolution, by format, by data source, and by basic territorial data versus data generated through the landscape research process. The basic data consist of datasets provided by various institutions or downloaded from databases,

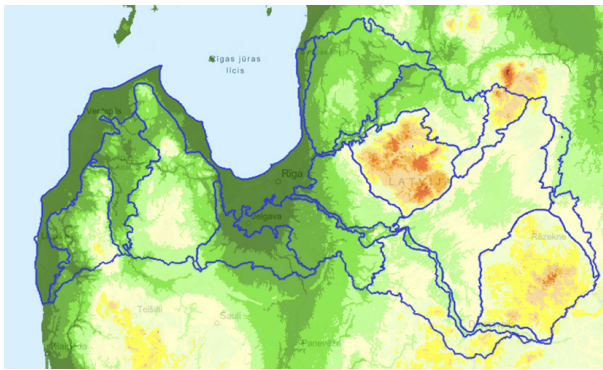


Fig. 3. Landscapes - large-scale landforms (in Latvian – *Ainavzemes*) [created by authors using, 14]

for example: land use, which is directly affected by human economic activities; natural and cultural heritage values; road and tourism infrastructure; water resources; and other characteristics. Detailed information on the datasets used in the production of the digital Landscape Atlas of Latvia can be viewed within the framework of the national research programme (2020–2023). Particularly useful are WMS services, which allow viewing current and the most up-to-date geospatial data published by different organisations. The map browser developed by the Latvian Geospatial Information Agency provides a wide range of maps as open data, from which the following were used in defining landscape character areas: geomorphology, administrative boundaries, and toponyms[15]. Latvian State Forests also offers open data in various layers, from which the following were used: relief (contour lines) and tourism information, including information on long-distance tourism routes – Mežtaka, Jūrtaka, and Ezertaka [16]. Land cover data were used from datasets produced within the frame of the Copernicus Land Monitoring Service [17]. Information on catchment basins and land drainage systems is available in the Melioration Cadastre Information System [18]. In Latvia, data on land-use types are compiled in the Geoportal, which serves as a single access point for Latvian geospatial information and services [19]. A diverse range of data on natural values was used from the nature data management system “OZOLS”, which stores information on specially protected nature territories, micro-reserves, protected species and habitats, management measures, tourism infrastructure in protected nature areas, biodiversity monitoring data, and other data relevant to nature conservation[20]. Data on cultural heritage were obtained from the “Mantojums” information system, which includes data on cultural monuments and protection zones [21]. Some layers are available from several of the sources above, and additional layers were later used in preparing detailed descriptions of the respective territories.

It is necessary to align landscape character areas with the spatial landscape units previously defined in Latvia, based on geomorphological criteria and land-cover distributions. The selected scale reflects both the level of territorial precision and the degree of generalisation. The accuracy of defined spatial landscape units depends on the scale and resolution of the available data. It is essential to acknowledge that details are lost in the process of generalization because their relative significance diminishes. The refinement of landscape land and landscape district boundaries was carried out by the Institute of Agricultural Resources and Economics (AREI) within the framework of the LandLat4Pol project. The initial delineation of landscape area boundaries was performed by AREI, with subsequent refinement by the Landscape Architecture and Environmental Engineering Institute of Latvia University of Life Sciences and Technologies.

Results

Landscape character area (in Latvian – *Ainavu areāli*)

One of the tasks of the National Research Programme project LandLat4Pol was to carry out the characterisation and assessment of Latvia's rural landscapes. In line with the emphasis placed on the landscape definition of the European Landscape Convention, it was established that the landscape characterisation must include the component of landscape perception, which significantly reduces the scale at which landscape spatial units have traditionally been studied. also corresponds with the contemporary understanding, highlighted in spatial development planning documents, that landscape represents the living environment of every individual, something that can be perceived, planned, and managed.

The landscape area was introduced as the lowest-level landscape spatial unit. A landscape character area is a spatial unit that a person is able to perceive and comprehend, and which is experienced as visually distinct from the neighbouring area (Fig. 4).

The main distinction of each landscape character area is defined by its landscape character type, which is shaped by landform, land cover, and land use. Additional differentiation is created by the specific features of each landscape character area, which are also easily perceivable, for example, the density of cultural heritage sites, the presence of particular habitats (swamps, biologically diverse forest areas, etc.), or the intensity of land management. At the level of landscape character area perception, it is essential to emphasise the connection with a specific, recognisable place or feature, as it is at this scale the scale comprehensible to people that the sense of belonging to a particular place develops.

However, it should be noted that the boundaries of landscape character areas are not always strictly definable, especially in mosaic landscapes, river or swamp landscapes, or landscapes with only subtly varying relief. Therefore, delineation is based on the contextual conditions present in the landscape at a given moment. It may be said that the boundary between two landscape areas is placed where it is least clear which landscape character type dominates, as in reality landscape is continuous and its character does not usually change abruptly (the main exception being the transition between forest landscapes and agrarian landscapes). In such cases, drawing a sharp line on a map does not reflect an actual boundary in nature. This needs to be taken into account later when the results of the landscape character assessment are evaluated and applied for landscape planning, management, or protection purposes. It is foreseen that the boundary zone of a landscape character area defined by a specific landscape character type is approximately 5 km wide, although this may change following more detailed GIS and field-based analysis. The division into landscape areas also facilitates territorial development planning and management, as it allows the identification of key issues and planning principles for each landscape character type group (for example, forest landscapes or river landscapes), followed by additional solutions tailored to the specific landscape character area with its unique characteristics (for example, an area with a high density of cultural heritage sites).

Given that human perception plays a crucial role in the identification of landscape character areas, the landscape character types used for characterising Latvia's terrestrial territory (including inland waters) within the research were developed based on what can be visually perceived and understood by people, excluding landscape components that are not perceptible for example, soil type, which influences

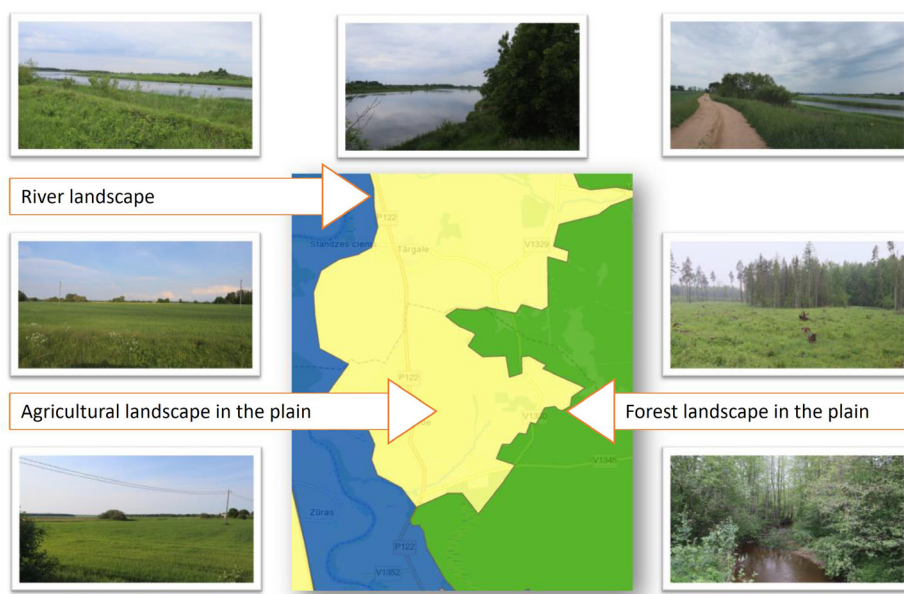


Fig. 4. Classification of landscape areas according to their visually distinctive landscape character types [Research Programme project LandLat4Pol]

Water and other landscapes		Plain terrain	Undulating terrain	Hilly terrain
↓		↓	↓	↓
River landscape	Agricultural landscape	Agricultural landscape in the plain	Agricultural landscape in undulating terrain	x
Lake landscape	Forest landscape	Forest landscape in plain	Forest landscape in undulating terrain	Forest landscape in hilly terrain
Swamp landscape	Mosaic landscape dominated by forest	Mosaic landscape in the plain dominated by forest	Mosaic landscape in undulating terrain dominated by forest	Mosaic landscape in hilly terrain dominated by forest
Dune landscape	Mosaic landscape in dominated by agriculture	Mosaic landscape in the plain dominated by agriculture	Mosaic landscape in undulating terrain dominated by agriculture	Mosaic landscape in hilly terrain dominated by agriculture

Fig. 5. Landscape character types used subsequently in the characterisation of Latvian landscapes [created by the authors]

land cover and land use but is not visually readable in the landscape.

In total, 15 landscape character types were identified (see Fig. 5), defined by the following components:

- relief;
- land cover and vegetation;
- land use;
- unique features (e.g., river landscapes, swamp landscapes, etc.).

Landscape character types

The landscape character types were determined by further differentiating agrarian and forest landscapes according to dominant landforms, as well as by separately identifying mosaic landscapes, where agrarian and forest landscapes interact with varying intensity. In the case of water-related landscapes, river landscapes and lake landscapes were defined, along with swamp landscapes and dune landscapes as additional categories. Urban landscapes form a separate landscape character type, for which a different approach to characterisation is required.

Characteristic features and key distinctions have been identified for each landscape character type, allowing the differentiation between the various types. Below, each defined type is described in more detail. The type that was excluded is the agrarian landscape in hilly terrain, since there is no such landscape type in Latvia. This was clarified following pilot field surveys.

Landscape in plain terrain

Agricultural landscape in the plain - a landscape character type dominated by agricultural landscapes, land used for farming. The structure of the agrarian landscape consists of extensive fields and meadows alternating with small, isolated forest patches and tree clusters; drainage systems are characteristic. Landscape elements with high visual and ecological value include rural settlements, farmsteads, and villages, as well as individual trees, tree groups, and avenues. Drainage ditches also form part of the landscape structure. Open and wide views dominate.

Forest landscape in plain - a landscape character type characterized by plain terrain and a high proportion of forest cover. Landscape diversity is determined by variations in tree species and age. The forest landscape structure consists of large forest massifs, within which agricultural land may appear as "islands." Landscape contrast is driven by diverse forest growth conditions. The character of the area is shaped by rides, roads, and drainage systems. Close-range, enclosed views dominate.

Mosaic landscape in the plain dominated by forest (forest cover > 50% compared to agricultural land) - a landscape character type where forest massifs and tree clusters alternate with agricultural land. The proportion of forested areas exceeds 50% relative to agricultural territories. Terrain is plain. Important landscape elements include farmsteads, natural meadows, and tree clusters. Views are predominantly short-range and enclosed, ending in forest massifs or farmstead clusters. Forest edges have an important role in

the landscape.

Mosaic landscape in the plain dominated by agriculture (agricultural land > 50% compared to forest) - a landscape character type where agricultural land alternates with forest massifs and tree clusters. The mosaic is formed by agricultural territories interspersed with forest stands, whose proportion is below 50% compared to agricultural land. Terrain is plain. Important landscape elements include farmsteads, natural meadows, and tree clusters. Medium-range views dominate, closing in forest massifs or farmstead clusters, especially when observed from open and elevated areas.

Landscape in undulating terrain, where characteristics are ridges and hills with gentle slopes and low relative elevation (<25 m), alternating with depressions.

Agricultural landscape in undulating terrain - a landscape character type dominated by agrarian land - agriculturally used areas. The landscape is homogeneous and open. Ridges are typically occupied by fields and pastures, while depressions contain meadows and tree clusters (up to 10% of the area). Some areas are drained. Farmsteads and villages are present. In some landscapes, parallel river networks occur. Open and wide views dominate, especially long-distance views from hilltops.

Forest landscape in undulating terrain - a landscape character type dominated by highly forested areas. Due to forest cover, the undulating relief is visible mainly in open areas (clear-cuts, natural openings) or along roads. Landscape contrast is created by diverse forest growth conditions. Rides, roads, and drainage systems shape the area. Farmsteads with adjacent agricultural land occur. Close-range, enclosed views dominate.

Mosaic landscape in undulating terrain dominated by forest - a landscape character type where forest massifs and tree clusters alternate with agricultural land. Forested areas exceed 50% of the territory. Forest edges, farmsteads, natural

meadows, and tree clusters are important elements. Views are short and medium-range, closing in forest massifs or farmstead clusters, especially when observed from open and elevated areas.

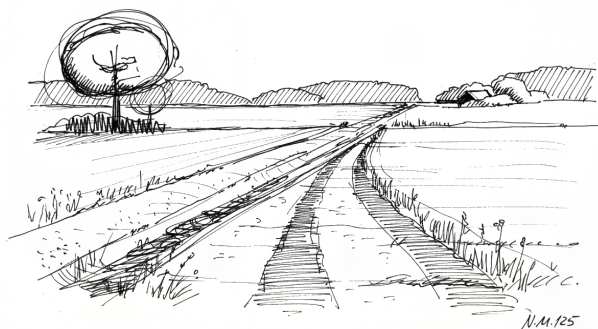
Mosaic landscape in undulating terrain dominated by agriculture - a landscape character type where agricultural land alternates with forest massifs and tree clusters. Forest cover is below 50% compared to agricultural land. Important landscape elements include farmsteads, natural meadows, and tree clusters. From higher, open areas, medium-range and wide views dominate, influenced by the scale of landscape mosaic perception. Forest edges play a significant role.

Landscape in hilly terrain

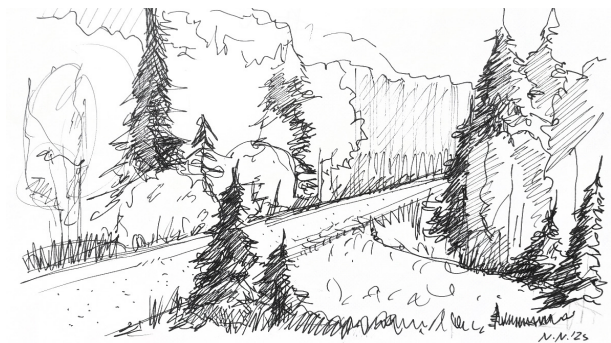
Forest landscape in hilly terrain - a landscape character type featuring relief typical of uplands - hills and hill ridges covered with forest. Hills and ridges are separated by depressions and broad, low-lying areas. Steep hill slopes are forested, while wet inter-hill depressions often contain meadows, swamps, or shrubland. Farmsteads with adjacent agricultural land occur rarely. Enclosed views dominate, ending in forest massifs. Long-distance views occur along road axes due to the expressive relief.

Mosaic landscape in hilly terrain dominated by a landscape character type with a fine-grained mosaic structure and high biological and landscape diversity. The alternating pattern of hills and depressions creates a large variation in soils, moisture, microclimates, and vegetation. The mosaic consists of forest stands (over 50% of the area) alternating with open agricultural land, mainly meadows and pastures. Steep slopes are forested; wet depressions contain meadows, swamps, or forests. Farmsteads blend into the landscape and do not stand out. Close-range, enclosed views dominate, with occasional wide and open views.

Mosaic landscape in hilly terrain dominated by agriculture



Agricultural landscape in the plain



Forest Landscape in plain



Mosaic landscape in the plain dominated by forest



Mosaic landscape in the plain dominated by agriculture

Fig. 6. Landscape character types used subsequently in the characterisation of Latvian landscapes



Agricultural landscape in undulating terrain



Forest landscape in undulating terrain



Mosaic landscape in undulating terrain dominated by forest



Mosaic landscape in undulating terrain dominated by agriculture

Fig. 7. Landscape character types in undulating terrain used subsequently in the characterisation of Latvian landscapes



Forest landscape in hilly terrain



Mosaic landscape in hilly terrain dominated by forest

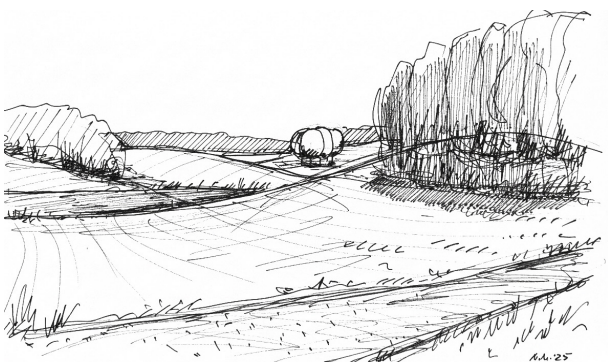
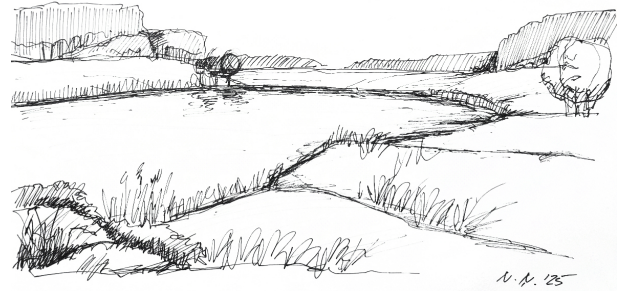


Fig. 8. Landscape character types in hilly terrain used subsequently in the characterisation of Latvian landscapes

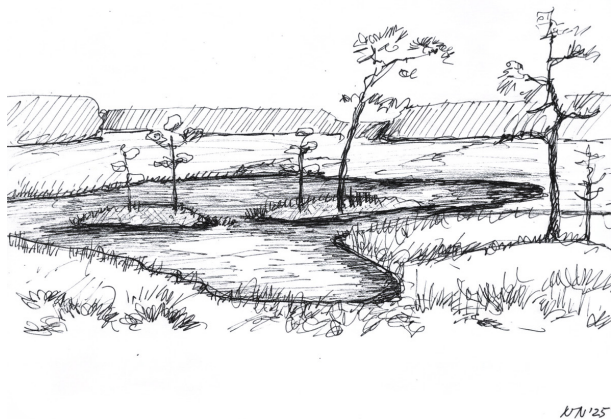
- a landscape character type with a fine-grained mosaic structure and high biological and landscape diversity. The alternating hills and depressions create strong contrasts in soils, moisture, microclimates, and vegetation. The mosaic consists of agricultural land (over 50 % of the area) alternating with forest stands. Use of open areas for farming is limited by steep slopes, fine-grained structure, and variable moisture. Gently elevated areas with favourable moisture are used for agriculture, while steep slopes and wet depressions are forested. Farmsteads are usually located near agricultural land and visually blend into the landscape. Wide and open views alternate with close and enclosed views. The landscape silhouette against the horizon is important.



River Landscape



Lake Landscape, including Wetlands



Swamp Landscape



Dune Landscape

Fig. 9. Other landscape character types used subsequently in the characterisation of Latvian landscapes

Other landscape types

River landscape (including ancient valleys and river valleys) - a landscape character type dominated by rivers and their valleys. River landscapes with gentle, indistinct banks, rivers have gentle valleys whose width greatly exceeds their depth. In plain terrain, rivers bordered by agricultural land or meadows clearly reveal their meandering (if preserved or restored). River landscapes with pronounced terraces and relief rivers are characterized by floodplain terraces. The valley floor consists of a floodplain, only partly occupied by the river channel. Riverbanks are mainly bordered by dense vegetation, forest massifs, and tree clusters with occasional open areas from which long views extend along the narrow, vegetation-framed river corridor.

Lake landscape, including Wetlands - a landscape character type dominated by a lake or visually and functionally connected lake chains. In uplands, relief consists of alternating hills and depressions, with lakes located in depressions, surrounded by meadows, forests, or tree clusters. In flatlands and lowlands, relief is plain, and lake shores are low and extensive. Shores are often swampy or drained. In some cases, polder systems have been created. Lakes may be visually hidden by forest massifs or dense shore vegetation. From certain locations, long and expressive view lines open towards the lake landscape.

Swamp landscape - a landscape character type dominated by swamps. Natural, undisturbed swamps are characterized by permanent or long-term water saturation, specific vegetation, and a unique landscape character. Terrain is plain or dome-shaped. Typical elements include bog pools and islands, hummocks, sparse pine or birch stands, and

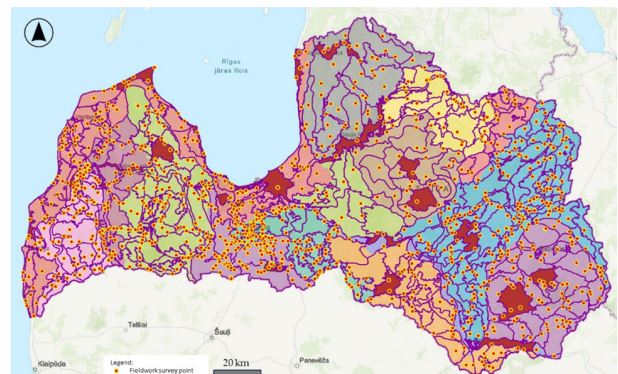


Fig. 10. Landscape character areas and field work points [created by the authors]

various sedge and moss species. Open, transparent tree cover shapes the view lines. Transformed, extracted swamps peat extraction areas have plain relief (sometimes at several levels). The landscape is open, structured by drainage ditches, technical access roads, and isolated buildings, with spontaneous vegetation in places. Some extracted swamps are used for agriculture (e.g., berry cultivation). Long open view lines dominate, ending in surrounding forest massifs.

Dune landscape - a landscape character type shaped by various dune forms embryonic dunes, foredunes, grey dunes, forested coastal dunes, and inland dunes. Dunes typically form ridge-like hills or hill chains.

Urbanized landscape (city) - urban areas as defined by the Law on Administrative Territories and Populated Areas. Villages, small villages, and farmsteads are considered elements within other landscape character types.

Conclusion

The scale of landscape character areas makes it possible to incorporate the dimension of human perception into landscape characterisation, which is essential for the subsequent use of the results in landscape planning and management approaches that aim not only to preserve natural values and cultural heritage, but also to enhance the quality of the human living environment. However, it should be noted that the scale of landscape character areas provides a conceptual and strategic framework for territorial development planning primarily, while the development of concrete solutions and tools requires a further level of detail in landscape spatial units. The selected GIS tools proved to be effective, providing spatial transparency of all available data by simultaneously viewing and analysing the overlap of different spatial layers, as well as enabling comprehensive data processing. This study provides the first national-scale, perception-based method for identifying landscape spatial units in Latvia, combining GIS-based analysis with field surveys to refine boundaries at a human-perceptible scale. The proposed three-level hierarchy of landscapes - large-scale landforms, landscape areas, and landscape character areas establishes a unified framework for planning, management, and landscape quality objectives at different administrative scales. The approach is replicable and can be adapted to other territories, depending on the availability and resolution of spatial datasets. The results can support territorial development planning, protected area management, cultural heritage evaluation, and green infrastructure strategies, enabling differentiated planning solutions tailored to specific landscape character types. However, limitations persist, particularly in mosaic and water-related landscapes where boundaries are gradual rather than abrupt, and therefore, additional field verification and stakeholder input remain essential. Future research should focus on improving indicator selection, incorporating long-term monitoring using digital survey tools, and developing participatory mapping approaches to strengthen public involvement in landscape character assessment and decision-making processes.

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Kopsavilkums

Šajā pētījumā izstrādāta un pielietota visaptveroša metode ainavas telpisko vienību identificēšanai, lai nodrošinātu metodoloģisku pamatu ainavas rakstura novērtēšanai Latvijā. Pieeja balstīta uz geomorfoloģisko, zemes seguma, zemes izmantošanas, ekoloģisko un kultūrvēsturisko datu integrāciju, papildinot tos ar lauka pētījumos veiktu ainavas uztveres novērtējumu. Izmantojot valsts institūciju nodrošinātās atvērtās ģeotelpisko datu kopas, tika izveidota nacionāla mēroga telpisko datu bāze. Datu apstrāde veikta ģeogrāfiskās informācijas sistēmas (GIS) vidē, ietverot dažāda mēroga datu interpretāciju, telpisko slāņu pārklājuma analīzi un ainavas telpisko vienību robežu precizēšanu. Tika noteikti trīs hierarhiski ainavas telpisko vienību līmeņi: ainavas – liela mēroga reljefa formas, ainavu apvidi un ainavas rakstura areāli. Ainavas rakstura areāli veido mazākās un no ainavas uztveres viedokļa nozīmīgākās telpiskās vienības, kas izmantojamas ainavu plānošanas un pārvaldības vajadzībām. Ainavas rakstura tipi tika noteikti, izmantojot kombinētu klasifikāciju, kurā ietvertas reljefa īpatnības, zemes izmantošanas struktūra, veģetācijas telpiskā struktūra, ainavas mozaikveida rakstura sarežģītība, kā arī specifiskas ainavas pazīmes, piemēram, mitrāji, upju ielejas un kāpu sistēmas. Kopumā tika identificēti un raksturoti 15 ainavas rakstura tipi, kas atspoguļo vizuāli atpazīstamas un relatīvi homogēnas teritorijas ainavas struktūras.

Pētījums sniedz pirmo nacionāla mēroga, ainavas uztverē balstītu ainavas telpisko vienību identificēšanas pieeju Latvijā un izveido metodoloģisku ietvaru turpmākai ainavu plānošanai, pārvaldībai un ainavu politikas izstrādei. Izstrādātā klasifikācija un kartogrāfiskie materiāli nodrošina pamatu diferencētu plānošanas risinājumu izstrādei, pielāgojot tos konkrētu ainavas rakstura tipu un ainavas rakstura areālu īpatnībām.

URBAN LANDSCAPE CHARACTERS IN TERMS OF DESIGN COMPONENTS: ANTALYA, MURATPAŞA CASE

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Abstract. Urban landscapes can be defined as an area with high building and population density and functions where a very significant part of the world's population lives. The character of urban landscapes is the combination of the features that differentiate a city both from its surroundings and others. Therefore, the concept of urban landscapes is critical to appreciation of their characters in the era of globalisation. The aim of this study was to evaluate the relationships between urban landscape characters and design components in Muratpaşa quarter of Antalya. We followed a holistic approach for the methodology, where urban land use patterns were classified and divided into subclasses and mapped, landscape characters and design components for each class were analysed simultaneously using Antalya Urban Development Plan, topographic maps, Google Earth Images, GIS data and site analysis. Study results showed that either ordinary or remarkable, urban landscape characters inextricably correspond design components. Although the city is concealed by buildings, the natural and biophysical features revealed "distinct" attributes in urban landscape characters. Muratpaşa has had inherent geographical properties such as Falez sea cliffs, Düden waterfall, Konyaaltı and Lara beaches, Lara sand dunes that simply emerge as remarkable landscape characters. According to spatial interpretation of key characteristics, coastline with escalating landforms has happened a genuine linear design component. Landscape character zone along the coastline with significant geographical qualities that unique to Muratpaşa, reflects unique sense of the region. This also corresponds to the fact that the city by the sea is more than urban proliferation but exceptional entity of natural evolution of earth's surfaces that conveys unique characters. Addressing the discourse which characters urban land uses bring, how those characters reconcile design components and effect the urban environment and how their spatial interpretation is significant is helpful to recognise urban design priorities and to protect distinct geographical and regional characteristics. **Keywords:** urban landscape, landscape character, design components, Muratpaşa, Antalya

Introduction

Landscape is a composition of natural and cultural features in the environment. European Council [7] ascertains that as perceived by people, landscape is an area whose character is the result of the action and interaction of natural and/or human factors, while Antrop [2] agrees that landscape is the sum of historical, cultural, and visual elements, as well as natural and physical features. Akdoğan [1] stated that landscape as the sum of lands, houses, hills, forests, lakes, production areas in an area; roads, agricultural areas, recreation areas and residential areas.

Owing to those interactions one landscape differentiates from others in terms of pattern, forms, characteristics where basic differences can be made as natural and cultural. Here, due to human nature interaction 'cultural' is explained of relating to culture [15].

Cultural landscapes are the multiple evidence of the evolution of human society over time, under the influence of social, economic, and cultural forces within a natural environment. [16; 20; 24]. International Union for Conservation of Nature (IUCN) indicated that cultural landscapes are "geographic areas containing cultural and natural resources and, in this context, wildlife and domestic animals, associated with a historical event or activity, or exhibiting various cultural and aesthetic values".

Cultural landscapes reveal societies, their pasts, lifestyles, cultures and their current relationships with the natural environment. The harmony of elements created by nature and humans, their historical and aesthetic value, their representation of the dominant natural elements particularly in cities in question. They offer diverse examples of human intervention over natural environment and can cover a range of elements from a single building up to a whole city.

Urban is regarded as a residential area where most of the population is engaged in trade, industry, services or administrative work [21]. Urban landscapes can be defined as an area with high building and population density and function as place for shelter, education, mobility, tourism and all kinds of services.

Partonomy of man is most evident over urban landscapes. Settings, economic activity and geography often shape the characters of a city. For instance cities located by sea or lake are called coastal cities, where dominance of touristic activity drives tourist cities. These cases can be multiples such as industrial cities, mining cities or port cities.

Design is a creative process and relates to many fields. Urban design deals with the function, form and composition of the cities regardless of being coastal, industrial etc. and often defines the aspects of buildings, spaces in between and overall characteristics of a city. Nevertheless, there are broader but often overlooked aesthetic associations in urban landscapes.

Urban design aims at improving quality of life by addressing a complete set of related issues such as planning residential areas and transportation policy, architectural design, economics, landscape architecture, and engineering, while urban landscapes are the results of design processes of different layers that are complex, evocative but deserve to be attractive.

Urban environment and natural environment rely on each other and promote each other, but also can promote the harmonious development of human settlements [25]. Here, good design is regarded as a fundamental element for sustainable environments that are aesthetic, desirable, safe and healthy for inhabitants. These features are most crucial in cities which eventually became the characteristics

of urban landscapes. Forms, lines, colors, textures are the key components in determining landscapes characters which already been defined by Swanwick [19], Turner [23], Heritage Council [11] as a set of distinct, recognizable, and persistent characteristics in the landscape. Mixed building forms, type of building blocks as well as street networks are the fundamentals of urban landscape characters where open green spaces, urban forests and parks are the dynamic interfaces in urban environments.

Urban landscapes are living spaces with a high density of people and buildings and stands out with its multiple functions. Whether exquisite or not, urban landscapes are our living spaces. However, the relationships between built environment and their surroundings determine the link between urban aesthetics and landscape characters.

Urban landscape character is the combination of the features that differentiate a city both from its surroundings and other cities. The diversity of urban land uses, especially natural and semi-natural areas, urban green open spaces, building masses, transportation networks are the main elements that define the character of a city. However, in previous studies, terms urban landscape characters and landscapes features are often confounded [30].

Urban morphology that deals with the character of urban spaces, is a substantial part of urban landscape characters [28]. Wang and Bochun [26] emphasized that the natural and semi-natural characteristics of the rural and agricultural areas around the city are among the most important characters of urban landscapes that need practical solutions. Zaleskiené and Vileniské [29] stated that although urban landscapes are very important in terms of aesthetic characters, but they do not receive enough attention. Land use models especially built areas, transportation networks, natural and semi-natural areas, and land patterns create urban landscape characters as well as giving a sense of space specific to the city [13].

On the other hand, as Hough [12] expressed that in the absence of discrete architectural styles, the landscape has become an expression of the regional character of that place. In a similar content, Zhang et al. [30] pointed that it is not yet clear whether the aesthetic characteristics of urban landscapes are related to people's aesthetic preferences and landscape practices. Therefore, decipherment urban landscape characters is important to see what are the distinct features of a city and to what extend they are related to design elements. Landscape has all features containing patterns of shape, structure, material, formation and function [17]. Urban landscapes are the compositions of large buildings, roads and infrastructure, open green public spaces, natural areas and all these urban land uses become the features that define the urban landscape characters. Either being a product through the processes of planning and design or not, each character of urban environment reflects the design components. Therefore, interpretation of urban landscapes and their spatial organisation would be helpful to understand what the characters are and to what extend they overlap and/or distinguish from the design components.

A shift from predominantly built urban environments into the wider landscape is needed because the scale is much bigger and man-made processes are complicated [6]. In this vein, landscape characters help us to understand our relations particularly with urban environment. We aim to comply with the research gap on spatial interpretation of the relation between urban elements, landscape character and design components. Accordingly, this study aims to analyse landscape characters in Muratpaşa of the Mediterranean city of Antalya and to understand what the characteristics of the

different forms in urban landscapes are and to what extend they are related to design components. In this respect, Muratpaşa provides an ideal setting for validating our approach on urban landscape characters as way of design components through key questions:

- What are the discourses between urban land uses and characters?
- Where and how geographic properties emerge on urban landscape characters?
- Which landforms have become core design components in the city?
- How a holistic approach can emerge from the spatial interpretation of urban landscape characters?

Material and Method

Muratpaşa quarter in Antalya has chosen for study site due to its diverse characteristics of urban landscapes. Located on the south-west of Turkey, Antalya is a coastal city on the Mediterranean with hot and dry summers and mild winters. Owing to its location and access to the sea (Figure 1), Antalya has been fastest growing city with population numbers in the county which play a pivotal role in the planning and development of the urban landscapes.

Muratpaşa quarter is the heart of the city, representing a gradual process of urban growth since the foundation of the city which goes back to Pergamons by the given order of the King Atallus II in around 200 BC for the most beautiful place to settle. Due to its vantage position, natural harbor, rich natural resources and being on the trade roads have brought privilege to the city. However, it was tourism that given rise to the urban development by 1980's that increasing migration for work brought high demand for housing.

Muratpaşa covers main typologies of urban landscapes and main cultural and natural characteristic that unique to city morphology. Besides high-rise buildings blocks and historic town centre, terraced coastline of Falez sea cliffs and beaches, Düden waterfall are amongst conspicuous landmarks in Muratpaşa.

Within the scope of this study, as the variables, we evaluated land use patterns (settlements, tourism sites, ...), landscape characters (topography, settlement type, ...) and design components (point, line, form, ...) simultaneously. Here we use Antalya Urban Development Plan, topographic maps, Google Earth Images, GIS data and site analysis. Urban land use classes were delineated in ArcGIS Programme, where, urban settlements were analysed more in detail and divided into subclasses, in order to see if settlement densities and building height differentiate the landscape characters. Then land use map was checked for the accuracy with

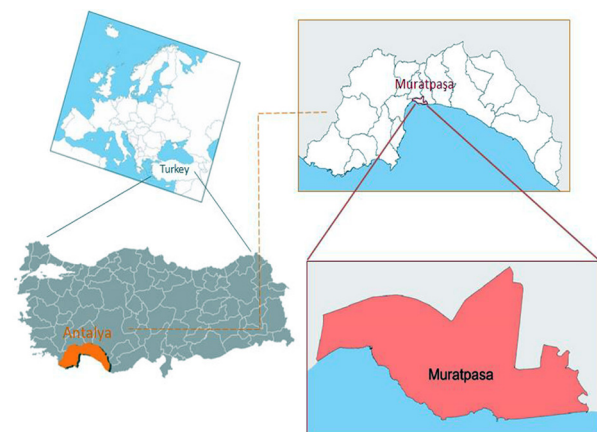


Fig. 1. Location of the study site [created by the authors]

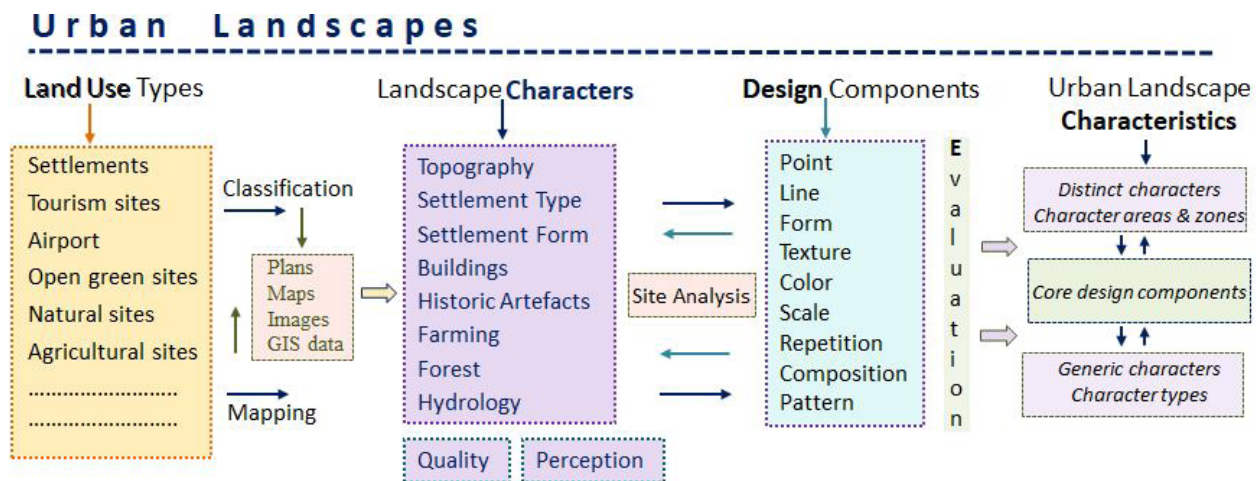


Fig. 2. Flow of the study [created by the authors]

Antalya Urban Development Plan. Site surveys for each land use patterns were carried out to understand their characters and design components according to Swanwick [19], Heritage Council [11], Tudor [22], Wascher [27], Turner [23], Kim and Pauleit [14], Atik and Ortaçesme [3], Atik et al. [4] and Bell [6]. Overall evaluations abled us to elucidate landscape character areas, zones and distinct characters besides generic characters and character types and their intact relations with core design components (Figure 2).

Hereby, referring to some of the landscape characters, form dealt with the shape of elements in the landscape which inextricably related to urban morphology. Texture is related to aesthetic feeling of the urban surface that often being linked to either natural or built elements. Pattern refers to the model or the arrangement of forms in the landscape. The size of the landscape refers 'scale' while 'security' as perceived aspect is being free from the risk from land use activities. Associated with the rarely found, 'rarity' explains seldom number of landscape elements [4].

Design components proclaim compositions of either natural or cultural elements in the landscape which involve into aesthetic features. According to Bell [6] and Atik et al. [5] point is marking position in space, line is the connecting element between two points, A configuration of the elements in the landscape emerges the composition, where colour is the

reflection and sensation of the light over landscape elements, while interval of equal or variable elements communicates the repetition. A set of objects and an arrangement of forms becomes the pattern (Figure 2).

Results

Urban landscapes in Muratpaşa

Muratpaşa is the very first quarter that Antalya was established around 400 BC by the Pergamon King of Attalos at Kaleiçi. Coastal cliffs of Falazes on both sides provided a hidden shelter for Kaleiçi harbour. Güçlü [9] stated, Antalya, which was a small town until 1940, gained an urban appearance with the opening of streets and the construction of transport networks. The city has witnessed different period through history, but it was after 1960's and 1980's urban development given rise around Kaleiçi.

Today, there are different land use patterns that form of urban landscapes characterised by high rise high density, high rise low density, low rise low density but extended public parks and urban green areas. However, tourism settlements in and around the Muratpaşa are result of huge demand for tourism. Since 1980's Antalya has become tourism capital of Turkey with number of hotels, bed capacities and visitor numbers. Antalya Airport that located in Muratpaşa serves as a hub for tourist destinations along east and west coasts of Antalya region.

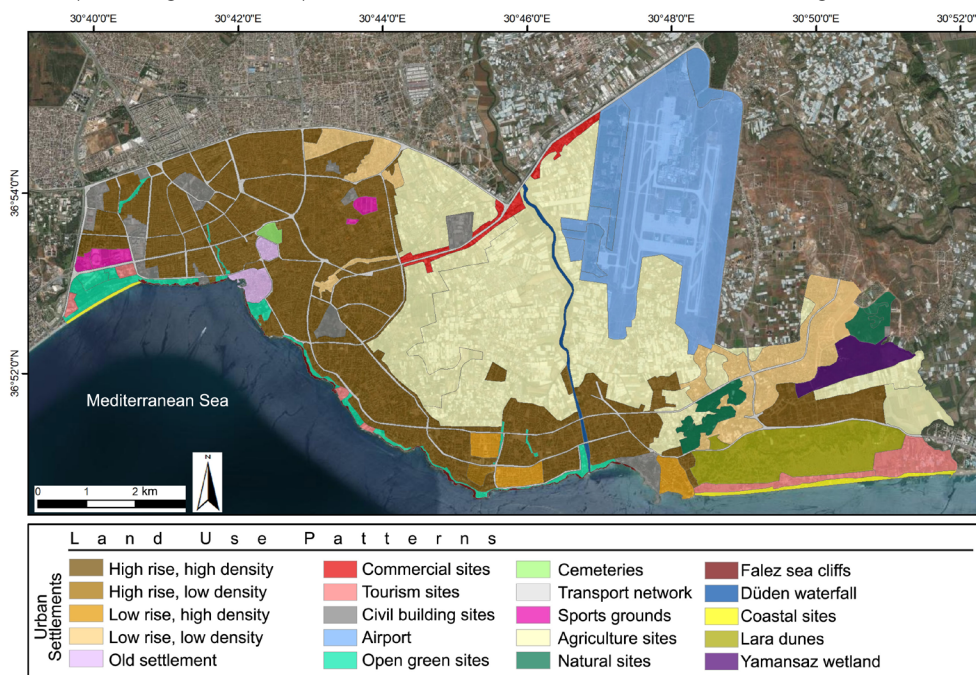


Fig. 3. Land use patterns, Muratpaşa [created by the authors]



Fig. 4. Landscape characters and design components of historic settlement, Kaleiçi [created by the authors]

Fortunately, some of natural landscapes, over which urban texture has flourished, are still exist in the city peripheries. Lara dunes and dune forest, Yamansaz wetland system, Falez sea cliffs, Konyaaltı beach are remnants of natural features in Muratpaşa. Owing to the fact that urbanisation took place either on natural areas and/or agricultural lands, Kircami is an exceptional case where agriculture and farming have been carried out even before the urbanisation. Urban open green sites and public parks are the pillars of the green network in the city (Figure 3).

Kaleiçi historic settlement

The name of Kaleiçi is derived from inner wall refers to its location where the city has grown within enclosed city walls. The historic town is located on a small harbour where the City was first established characterised by two-storey traditional and especially tiled gable roofed houses. The Mediterranean Sea, as a natural border forms the continuous "coast" line for Kaleiçi together with traditional houses originate an organic settlement form that is a rare example for Antalya (Figure 4) thus makes Kaleiçi historic and memorable and most visited site in overall region.

Kaleiçi was protected by two horseshoe-shaped walls, one by the sea and one by the land. Today, only a certain part of these walls, which have succumbed to urbanization and construction, still exist, and some landmarks in Kaleiçi such as Hadrian's Gate, Clock Tower, Hidirlik Tower and some wall ruins still exist as the surrounding elements of the historic quarter.

Landscape characteristics of Kaleiçi is based on slightly sloping topography, organic settlement which fitted into the natural harbour, traditional old buildings. With regard to design components sheltering frame of coastal morphology on a slightly sloping topography gives a rounding form a

strong pattern. Composition is quite diverse with settlement pattern and round forms fitted into a sinous coastline and harbor. Intact settlement form and historic character bring Kaleiçi historic and memorable qualities.

High rise-high dense settlement

High-rise buildings have been the sign of a heavily urbanized landscape and critically dissenting impact on the image and natural characteristics of the cities. Spatial composition of the urban landscapes often defined by high-rise buildings structured along the main transport network. One of the most densely populated section of Muratpaşa is 100.Yıl Street which is a strong linear feature within grid-formed settlement texture, which covers residential and commercial buildings. 100.Yıl with high rise-high dense settlement displays the urbanization character of Muratpaşa and Antalya after the 1980s, has a course textured urban structure with an average density of 10-storey concrete buildings.

Set on a flat topography with ordinary quality, 100 Yıl have the composition with residential buildings and plots in separate layouts that applied in full repetition (Figure 5). Linearity of the high-rise dense settlement comes from the straight street forms that create artificial corridors parallel to the coast like that brings grand scale and dominant pattern in a strictly geometric form.

Tourism sites

Tourism developments in Antalya has begun by 1970's and has become main economic activity for 50 years with both inner-city hotels and destinations on the urban peripheries. Ultimately, tourism infrastructure has been the main driving force particularly in the formation on the coastal zone taking the fact that setting on by the Mediterranean and shoreline has been for the priority for tourism investors.

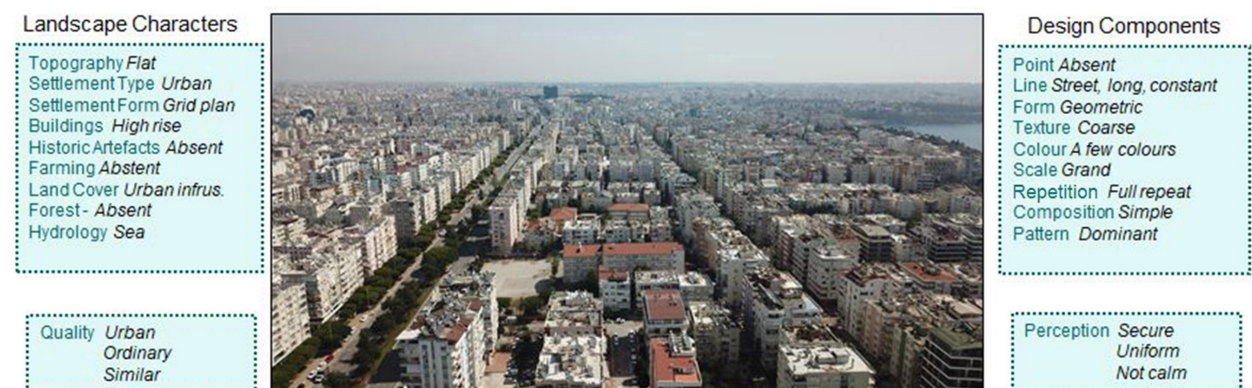


Fig. 5. Landscape characters and design components of high rise-high dense settlement [created by the authors]

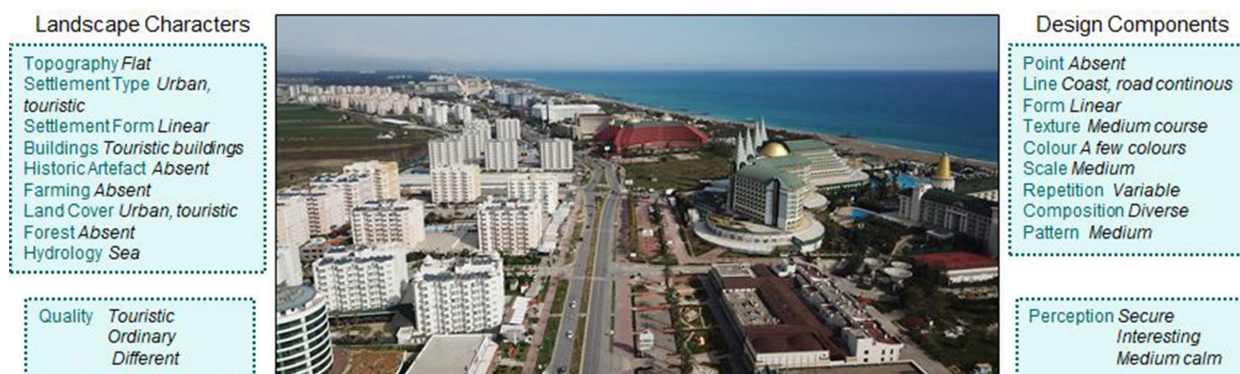


Fig. 6. Landscape characters and design components of tourism sites [created by the authors]

The urban tourism facilities, which started with the first examples of the Falez and Shreton inner-city hotels in the 1980s, and extended to further peri-urban areas, especially in the 1990s-2000s. Kundu, on the east corner of Muratpaşa dedicated as tourism destination by 2000's with high hotel capacities and huge tourism infrastructure just on the outskirts of the city, has become another city along the eastern shores. Kundu, is characterised by tourism facilities along the coast and multi-storey residential areas just behind the coast, exhibits a linear feature by the "coast" where the urban tourism area meets the Mediterranean and the main transport line. The line effect, which is natural on the coast and artificial on the highway, has brought about the formation of a linear settlement texture in the area in question (Figure 6). Except from some thematic hotel buildings high-rise structures typically define the urban and touristic with ordinary quality where design components meet diverse composition due to enclosing gardens and shoreline of the touristic accommodations.

Open green sites

Taking the fact urbanisation has shifted on the natural areas and farming lands after the 1980's, Muratpaşa has a diversity of open green site ranging from agricultural areas, streams and waterfalls, valley corridors, cemeteries, and public parks. Atatürk, Düden and Kararalıoğlu parks are the most important open green spaces in Muratpaşa, set by the Mediterranean (Figure 7). Falez Coastal Park provides connectivity between Düden and Karaalıoğlu parks as of natural border to the Mediterranean Sea. Except from Kaleiçi and some settlements by the coastline, Falez Park maintains opportunities for the

protection of both urban and coastal biodiversity as well as landscape diversity and urban aesthetics.

One of the most important and largest open green spaces in Muratpaşa and Antalya, is the Atatürk Cultural Park, is the outcome of landscape design project that implies on natural ground of Falezes which contains both cultural and native vegetation, makes a valuable contribution to the city in terms of species diversity, landscape diversity and habitat diversity. The park has been the most important social and cultural venue of the city with its congress, conference, exhibition halls and international film festival of Golden Orange. Atatürk Cultural Park, which has formal and geometric patterns in its design, has a diverse composition with its maquis and rock vegetation on cliffs.

Landscape characters simply diversify flat urban green space to steep coastal cliffs attached by many hardscape applications of ornamental pools, stages, large public activity grounds and single storey buildings. However, design components range from lines of central axes, geometric form of public grounds and small scale of structures and buildings to diverse composition (Figure 8).

Natural Landscape in Muratpaşa

Lara dunes

Sand dunes are rare coastal formations that require very long processes to form. Meaning 'a single sand grain' Lara coastal dunes and coastal forests are one of the most important natural areas left on the urban periphery of Antalya. During the urbanization process and especially after the 2000s, commercial business structures built for daily businesses on the coast and especially the promenades along the coast



Fig. 7. Open green sites; Atatürk Kültür (a), Düden (b), Karaalıoğlu (c) parks [created by the authors]



Fig. 8 Landscape characters and design components of open green sites [created by authors]



Fig. 9 Landscape characters and design components of Lara dunes [created by the authors]

have eliminated the ecological connectivity between the coastal dunes and offshore dune forest.

Even though blocked by the main road and public infrastructure, a natural coastline and dune system has been rare and pivotal coastal habitat for urban flora and fauna, witnessing Antalya's natural coastal land long before the urbanization. Referring to landscape characters, existence of dunes forest, mahhia and coastal dunes are unique geographical values, with a rare and memorable quality. Natural line of continuous coast together with artificial lines of roads and paths become a design component of linear form where scale is wide, composition is diverse and repetition is variable with natural elements (Figure 9).

Düden waterfall

The only waterfall in Antalya that has remained up to today and is still in exists within the city core, is the Düden Stream, which flows from the Taurus Mountains with numerous natural branches and flows into the Mediterranean Sea from a height of 40 meters. It is known that there were many waterfalls like Düden on the Falez sea cliffs up until the 1960-1970's but these water features disappeared under the shadow of urbanization.

Düden Park is set up where Düden stream exactly meets the Mediterranean Sea on the limestone cliffs and has been a landmark of the city. Owing to landscape characters Düden stream and its waterfall create a line effect both horizontally and vertically and geographically rare quality. Again Düden with strong pattern has linear form both horizontal and vertical dimensions in wide scale and diverse composition (Figure 10).

Falez sea cliffs

The coastal cliffs formed on limestone rocks represent a geological structure specific to the Antalya region.

In Muratpaşa city center, their height can reach up to 45 meters and create a platform overlooking to Taurus Mountains and Mediterranean Sea. Falez sea cliffs, continues for approximately 12 km between Lara dunes and Konyaaltı beaches, are also defined as high coastal tabletop landforms. The cliffs, which were formed as a result of the precipitation of calcium bicarbonate in the surface waters coming from the Taurus Mountains over thousands of years, are also considered a natural heritage. The vegetated sea cliffs along the Mediterranean limestone Falez also support unique plant communities. Thanks to their steep form reaching 90% slope Falez adds variety to Antalya's coastal landscapes with vertical sea, coast, cliff and platform-top terraces.

With regard to landscape characters steep topography, high-rise buildings and linear settlement form parallel to coastline create a curving linear form on a continuous line along the coast, strong pattern and protruding structure as of design components (Figure 11).

Konyaaltı beach

Konyaaltı beach has been one of the natural symbols of Antalya and one of the few beaches in the world that accessible for all in the heart of the city. Lying uninterruptedly on a 7 km long pebble coast, Konyaaltı beach can reach approximately 70 meters wide meets with open green areas, Calabrian pines forest (*Pinus brutia*), woodlands and preserved examples of native macchia vegetation.

Owing to landscape characters, Konyaaltı beach is rare and memorable in terms of its coastal structure and one of the most visited places by the people of the city and visitors.

Its inspiring and peaceful character resembles with design components of continuous and curving form, fine texture due to combination of sea, coastline, pebble beach and green vegetation with diverse composition and strong pattern (Figure 12).



Fig. 10. Landscape characters and design components of Düden waterfall [created by the authors]



Fig. 11. Landscape characters and design components of Falez sea cliffs [created by the authors]

Agricultural sites in Muratpaşa Kircami

Kircami is the largest agricultural region within the urban fabric in Muratpaşa. While traditional land use patterns and agricultural activities continue with greenhouse, fields and gardens and orchard production, it is also still possible to see glimpses of rural settlements of with semi-detached village houses in the heart the city. Typically covered by greenhouses, other farming practices are mixed but predominantly both arable irrigated patterns of small-scale fields bounded by irrigation and drainage channels and hedges of native vegetation.

While greenhouses, fields and gardens exhibit an intertwined structure with geometric patterns, a small number of natural plant patches and maquis islands provide significant benefits for both urban and agricultural biodiversity. Irrigation channels define the boundaries of large parcels and at the same time form the "lines" in the landscape. Kircami, which contains all examples of cultural, traditional, agricultural, rural and natural features.

Referring to landscape characteristics dispersed houses between farming lands create organic settlement form with village houses on a flat topography that have traditional and memorable quality as well as interesting and tranquil. Design components on the other hand are geometric form, fine texture with rich and diverse composition and strong pattern. Irrigation channels add linearity to the settlement dividing farming plots (Figure 13). Kircami maintains food security for urban population and acts as buffer zone against high-rise building urbanisation as well as open green spaces of the urban environment.

Discussion and Conclusion

The landscape associates people and place [17]. These associations have been most intact in urban landscapes which are the results of planning and design processes of

different layers that are complex, evocative but deserve to be attractive. Urban design, which aims to create livable human settlements by a proper and comprehensive organization of the multiple functions of cities, is generally outlined by the manifold nature of the urban landscape.

Since built areas in cities represent a large part of the urban landscape, they play an important role in landscape characters. Whitehand [28] emphasized the terms 'landscape' and 'character' stand out not only for their various uses, but also have their distinct and context-specific uses. Landscape analysis, on the other hand, as Güremen [10] suggested aims design-based solutions for complex cultural landscapes by understanding their aesthetic features and characteristic. Analysis of the lines, colors, textures and proportions that form the surfaces of spaces in urban environments are important in determining the state and identity of the urban environment.

Landscape provides a systematic basis for understanding the spatial patterns and process we see around [18]. Hereby, urban landscapes contain structures, history, knowledge and characters. Either ordinary or remarkable, urban landscape characters inextricably correspond design components in the city environment. In other words, any intervention that taken as a process of urbanisation generate a character either similar or completely different than the existing ones. As expressed by Whitehand [28], there is a need for comparative study of approaches and practical applications in explicating concepts that related to urban landscapes and their characteristics.

In the case of Muratpaşa District, the relationships between urban landscape characters and design components were evaluated. Overall settlement patterns in Muratpaşa are typically urban which were shaped mainly by residential and commercial buildings. Hereby, landscape characters are defined by the building height and density which have become the design components of geometric forms, course texture, full repetition, continuous lines. As they



Fig. 12. Landscape characters and design components of Konyaalti beach [created by the authors]



Fig. 13. Landscape characters and design components of agricultural sites, Kircami [created by the authors]

are unresponsive to underlying topography, vegetation or hydrology their characteristics are simply generic by repeated built elements around the city.

In spite of these broadly similar combinations of urban settlements, Kaleiçi historic quarter has distinct characteristics owing to its precinct, organic settlement form, traditional houses, its responsiveness to natural harbour and underlying topography. Concerning to design components, Kaleiçi distinguishes from other urban contexts with round forms, diverse composition, strong pattern and medium scale (Figure 14) that initiates a singular townscape in different size, density and spatial configuration that fitted into biophysical layout of the natural harbour and historic identity.

Although the city is concealed by buildings, the results have shown that natural and biophysical features revealed "distinct" attributes in urban landscape characters. Muratpaşa has had inherent geographical properties such as Falez sea cliffs, Düden waterfall, Konyaalti and Lara beaches, Lara sand dunes that simply emerge remarkable landscape characters. Falez sea cliffs as the part of geology which become a matter of topography by escalating platform rising up to 45 meters instantly from the sea level. Düden stream and waterfall linked with hydrology and geology, are the natural corridor born from the Taurus Mountains and fall into the Mediterranean ostentatiously from the Falez cliffs. Lara dunes, dune forest and beach have been vulnerable landforms of a long geological process since last glacial age. They are significant habitats interplaying between sea and the territory (Figure 14).

Types of open spaces greatly vary around the cities depending on the planning decisions, economic activities and presence of protected nature. Native and non-native vegetation as well their multiple compositions in open, green sites, small valleys are the most important and distinctive natural and biophysical features that distinguish unbuilt sites from the building masses.

In respect to landscape characteristic parks, urban green sites and remnants of natural areas along the coastline in Muratpaşa; enclosing beaches Konyaalti and Lara on both sites and elevated Falez coastal cliffs in between represent unique "coastal landscapes" with open sea views and strong connections with Mediterranean. Ultimately coastline from east-west delineates a landscape character zone' with distinct characteristics that unique to Muratpaşa, Antalya which have biophysical, natural, geological, historical and perceptual associations with Mediterranean Sea (Figure 14). Landscape character zone with significant geographical qualities that unique to Muratpaşa, reflects unique sense of the region. This also corresponds to the fact that the land by the sea is more than human interpretation but remarkable entity of natural evolution of earth's surfaces that shape and characterise the Muratpaşa urban landscapes.

The arable lands in the periphery of the cities are critical for food security of urban population. In this vein, natural, semi-natural and particularly agricultural areas within and around the city as of unique characters should be given special attention in the planning and design of the city [8]. Kircami sector in Muratpaşa where farming and agriculture activities have been carried out in the very close proximity of the city centre embodies a specific character area as a hub of food production. What makes Kircami unique is its position and individual rural characteristics as opposed to prevailing urban structure.

Referring to design elements lines, planes and volumes all have shapes [6]. As of the configuration of elements in the landscape, shape plays a key role in the demystification of characters [5]. Except from Kaleiçi historic settlement, forms in urban settlements are usually geometric, while the texture is coarse due to dense intervals of concrete buildings. On the other hand, the Mediterranean Sea shore in the form of a beach, dune or cliff, whether it is urban cultural, natural or natural, the "coast" has become the most important

	<i>Diverse, round</i>		<i>Geometric, simple</i>		<i>Coarse, dominant</i>
Historic settlement <i>Organic form, memorable</i>		High rise, high density urban <i>Grid plan, ordinary</i>		High rise, low density urban <i>Mixed used, ordinary</i>	
	<i>Complex, small</i>		<i>Complex, strong</i>		<i>Linear, variable/lev</i>
Low rise, high density urban <i>Flat, ordinary,</i>		Low rise, low density urban <i>Dispersed, ordinary</i>		Tourism sites <i>Urban, touristic, ordinary</i>	
	<i>Linear, wide</i>		<i>Wide, round</i>		<i>Linear, strong</i>
Antalya Airport <i>Infrastructure, flat</i>		Lara dunes <i>Isolated, important</i>		Düden stream and waterfall <i>Memorable, impressive</i>	
	<i>Continuous, wide</i>		<i>Curving, strong</i>		<i>Diverse, medium</i>
Lara Dunes Natural sites <i>Dune, dune forest, rare</i>		Falez sea cliffs <i>Steep, rare, inspiring</i>		Yamansaz wetland <i>Natural, interesting</i>	
	<i>Continuous, curving</i>		<i>Diverse, medium</i>		<i>Wide, fine texture</i>
Konyaalti Coastal sites, beaches <i>Flat, rare, inspiring</i>		Urban open green sites <i>Formal, cultural, tranquil</i>		Agriculture sites <i>Rural, organic, traditional</i>	

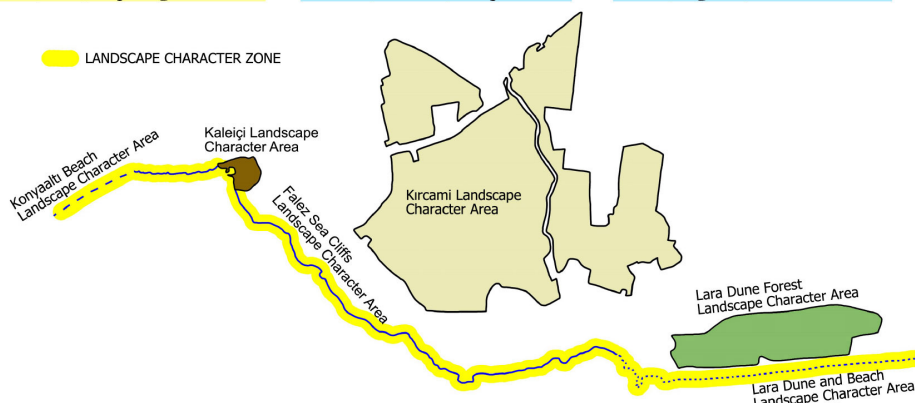


Fig. 14. Key characteristics of urban landscapes and character areas in Muratpaşa [created by the authors]

defining “line” element. According to spatial interpretation of key characteristics, coastline with different landforms has happened a genuine linear design component (Figure 14). Crop patterns, land uses, and seasonal features define the distinctive, prominent colors of fields, buildings, and other elements in the landscape [5]. However, because most urban elements are static, and colour has become the expression of complexity artificial surfaces in urban environment. As in the Muratpaşa example, whether simple or diverse, composition makes it possible to bring together and simply explain the parts of the whole urban form.

Scale is important in the understanding visual landscape quality and distinct characteristics. Even small-scale elements in urban landscape may play key role in elucidating different attributes. For example, although Kaleiçi has small in scale however, its site-specific identity deserves to be landscape character area that symbolises Antalya.

Arrangement of patterns in urban landscapes can be fabricated by different settlement densities, roads, electric lines, tourist accommodations or fences, parks and gardens (Figure 14) while streets and building blocks in residential areas often stand out with rough texture, dominant and complete repetition.

Urban areas are physical settings where a very significant part of the world’s population lives. Therefore, the concept of urban landscapes are critical to appreciation of their characters in the era of globalisation. We applied a holistic approach to address the discourse which characters urban land uses bring, how those characters reconcile design components and how geographic properties effect the urban environment. Although urban proliferation is identical by ordinary city fabric, geographic attributes such as coastline, intact forests, dunes or waterfalls convey individual character and identity to urban landscapes.

Data availability

The data that has been used is confidential.

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Kopsavilkums

Pilsētvides ainavu var definēt kā teritoriju ar augstu apbūves un iedzīvotāju blīvumu, kurā koncentrējas daudzveidīgas funkcijas un dzīvo ļoti ievērojama pasaules iedzīvotāju daļa. Pilsētvides ainavas raksturu veido pazīmju kopums, kas konkrēto pilsētu atšķir gan no tās apkārtnes teritorijām, gan no citām pilsētām. Tādēļ globalizācijas laikmetā pilsētvides ainavas jēdziens ir īpaši nozīmīgs, lai izprastu, novērtētu un saglabātu pilsētu individuālo raksturu un identitāti.

Pētījuma mērķis bija izvērtēt savstarpējās sakarības starp pilsētvides ainavas raksturu un dizaina komponentēm Muratpašas (Muratpaşa) apkaimē Antālijā.

Pētījuma metodoloģijā tika izmantota holistiska pieeja: pilsētas zemes izmantošanas veidi tika klasificēti, iedalīti apakšklasēs un kartēti, savukārt katrai klasei vienlaikus tika analizēts ainavas raksturs un dizaina komponentes. Analīzē tika izmantots Antālijas pilsētas attīstības plāns, topogrāfiskās kartes, Google Earth satelītattēli, ģeogrāfiskās informācijas sistēmas (GIS) dati un teritorijas apsekojumu rezultāti.

TIMBER-BASED OUTDOOR DESIGN SOLUTIONS IN NEW ZEALAND URBAN ENVIRONMENTS: MATERIAL PERFORMANCE, SUSTAINABILITY AND SPATIAL INTEGRATION

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Abstract. Timber occupies a different position in the public realm of Aotearoa New Zealand than it does in most of Europe. It is not principally a warm accent applied to a mineral substructure but a load-bearing, surface-forming and space-defining material, used continuously across decks, edges, seating, terracing and shelters. This paper reports the second phase of a comparative field study of timber in public outdoor space. The first phase surveyed eleven European cities from Oslo to Barcelona; the present phase applies the same photographic and assessment protocol to Wellington, New Zealand. The method combines structured photographic documentation with visual condition assessment and comparative analysis of the standards and chemicals regulation governing outdoor timber in each region. Three arguments are developed. The New Zealand approach is material-led: the timber deck is the public ground plane, and seating, steps and thresholds are generated by folding and thickening that plane rather than by placing discrete furniture on a hard surface. In the surveyed European cities the same operation appears, but almost exclusively within one typology, the harbour bath and its sun deck, while the remainder of the public realm reverts to timber as an applied accent on mineral construction. Because that pattern holds across the full latitudinal range of the European sample, and in small cities as well as capitals, it cannot be read as an adaptation to the northern climate or to municipal budget; it is a design and procurement convention, and therefore open to change. Comparable service lives are reached by different routes: New Zealand makes a fast-grown, non-durable plantation softwood serviceable through a prescriptive hazard-class treatment system, whereas European practice relies on naturally durable species, modified timber and constructive protection, in part because the most effective preservatives have been progressively restricted. Reclaimed timber occupies a narrow but instructive niche: it is technically and narratively attractive, but its use in the European public realm turns less on the gesture of reuse than on the documented provenance of the source stream. In both surveys, observed condition correlated more strongly with detailing than with species or treatment class, and the decisive detail is the junction: how timber meets timber, steel, concrete and ground determines durability, reparability and the prospects for material recovery more than the specification of the board itself. That is the finding most readily transferable to Baltic conditions.

Keywords: timber, public outdoor space, landscape architecture, material performance, New Zealand

Introduction

Discussion of timber in the built environment has, over the past decade, been dominated by buildings. Mass timber, cross-laminated panels and their embodied-carbon performance have generated a substantial comparative literature, and the argument for substituting biogenic for mineral materials is now familiar to any practitioner [23]. The outdoor public realm has received far less systematic attention. Decks, promenades, steps, seating, edges, retaining structures, play elements, shelters and boardwalks are rarely the subject of technical research, even though they are exposed to conditions more severe than most building envelopes, are replaced more often than any part of a building, and are the parts of the built environment that citizens actually touch.

This asymmetry has consequences. Outdoor landscape elements sit in the harshest categories of every classification system in use, whether the five European use classes of EN 335 [10] or the six New Zealand hazard classes of NZS 3640 [25]. The assumptions that make timber comfortable in a building, namely long service life, sheltered conditions and a stable moisture content, do not transfer automatically to a bench standing in salt spray. At the same time, outdoor timber is where material choice becomes public experience. The temperature of a surface under the hand on a cold morning, the acoustic quality of footfall on a deck, the way a material greys unevenly with orientation, the way it invites people to sit down where no bench was drawn: these are not incidental properties. They are among the strongest arguments for the material, and they are almost entirely absent from the life-cycle literature.

New Zealand offers an unusually clear case for examining what a timber-led public realm looks like in practice. Its

plantation estate is overwhelmingly one fast-grown species. Radiata pine (*Pinus radiata*) accounts for roughly ninety per cent of the planted production forest area, on an estate of about 1.82 million hectares [19]. The species has low natural durability and therefore depends almost entirely on preservative treatment for exterior use, an arrangement codified in a national hazard-class system that is unusually prescriptive and unusually well understood by specifiers, contractors and merchants alike [3, 24, 25]. Treated structural timber is stamped with its class, and the classes are common vocabulary on any building site. The result is a design culture in which exterior structural timber is a cheap, local and entirely normal default rather than a premium gesture or an environmental statement.

Wellington sharpens the case further. The city occupies a reclaimed harbour edge exposed to the winds funnelled through Cook Strait, with high salt loading, frequent wind-driven rain, significant seismicity and an ultraviolet regime considerably more aggressive than that of comparable northern-hemisphere latitudes [18]. Over roughly three decades its waterfront has been rebuilt as a continuous public promenade linking a sequence of precincts [29], in which timber has been used as the primary spatial material rather than as a finish. Projects such as Waitangi Park [17] and North Kumutoto [16] have established what local practitioners describe as a waterfront vernacular of simple, exposed, robust and frankly industrial construction, drawing on the memory of the working wharf that preceded it. The North Kumutoto pavilion, a matrix of vertical timber battens on a lattice structure hovering above a heavy hardwood deck, was designed explicitly as an analogue of the pohutukawa

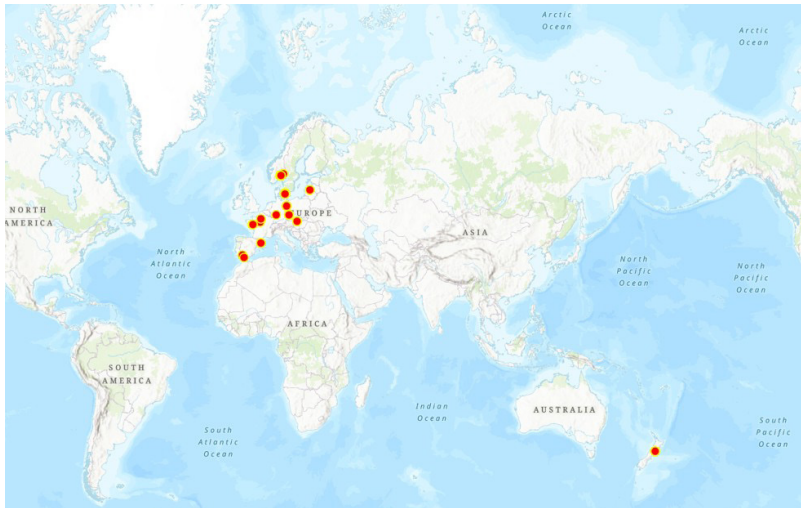


Fig. 1. Distribution of the surveyed locations. The European sample spans nineteen degrees of latitude and both metropolitan and small-city administrations, allowing climate-driven and convention-driven patterns to be distinguished. Survey locations mapped by the authors [Basemap: Esri Topographic. Sources: Esri, TomTom, Garmin, FAO, NOAA, USGS, © OpenStreetMap contributors, and the GIS User Community]

tree, filtering rather than excluding wind and rain [4]. The present paper continues a line of comparative field research into timber in public outdoor space. An earlier phase examined the use of timber in the built fabric of Copenhagen from the standpoint of visual and aesthetic quality [13] and analysed contemporary trends and diversity in wood-based public amenities, again with Copenhagen as the principal case [28]. Those studies established the European baseline used here, which the wider survey reported below extends across several further cities: a public realm in which timber is valued, in places actively promoted by municipal architecture policy, and applied with considerable typological variety, but applied nonetheless, as a material added to a predominantly mineral urban fabric. The question that motivated the present phase was whether that pattern is a necessary consequence of the northern climate and the European regulatory setting, or a design convention that could be otherwise. Wellington offers a place where it demonstrably is otherwise. The aim of this paper is to characterise how timber is used in outdoor public amenities in New Zealand urban environments, and to establish what is genuinely transferable to European, and specifically Baltic, practice. Five questions organise the work. What kinds of element are made in timber, and what typologies recur? Where in the city are they placed, across the range of park, street, square, waterfront, courtyard and play settings? At what extent does timber appear in each, from a single object to the whole ground plane? For what use is it intended, and how is it actually occupied? How is the timber joined, both to itself and to the other materials it meets, and what kinds of construction do those junctions produce? And, across all of these, how do these elements perform visibly under coastal-urban exposure, and where do the New Zealand and European approaches converge and diverge? The study is therefore concerned with the diversity of timber use rather than with its frequency: with the range of what the material is asked to do in public space, and with the settings in which each role appears. The novelty of the study lies less in any single observation than in the connection of three layers usually treated separately: the regulatory layer of standards and chemicals restrictions, normally the province of wood technologists; the technical layer of species, treatment, detailing and weathering, which belongs to building science; and the spatial and experiential layer, which belongs to landscape architecture. Practising designers must reconcile all three in a single specification, and the argument advanced here is that the reconciliation, rather than any layer taken alone, is what distinguishes the New Zealand case.

Materials and Methods

The study uses a qualitative, case-based comparative design carried out in two field phases. It combines photographic field documentation with structured visual assessment, comparative document analysis of standards and regulation, and typological interpretation of spatial organisation. No destructive testing, moisture measurement or laboratory analysis was undertaken, and the material claims made here are accordingly restricted to what is visually verifiable in the field or established in the cited technical literature.

The first phase covered European practice across a wide latitudinal, climatic and administrative range. Documentation was carried out in eleven cities: Copenhagen, Oslo, Helsinki and Tallinn in Northern Europe; Paris and Nantes in Western Europe; Berlin, Frankfurt am Main, Prague and Nitra in Central Europe; and Barcelona in Southern Europe. Copenhagen and Oslo were treated as the primary cases and have been reported separately [13, 28]; that material is re-examined here against the New Zealand evidence rather than restated, while the remaining cities are used comparatively and are published here for the first time. The composition of the sample is analytically important rather than incidental. It runs from Oslo at almost sixty degrees north to Barcelona at forty-one, that is from a climate with a long frost season to a Mediterranean one with none, which makes it possible to separate what in European practice follows from climate from what follows from convention. It also pairs capitals and large metropolitan centres with Nitra, a small regional city, so that the observed patterns can be tested against differences of budget and administrative capacity as well as of latitude.

The second phase applied the identical protocol in Wellington, New Zealand, in February 2026, along the central waterfront promenade and in adjacent central-city open spaces. Because both phases share the same observers, the same recording protocol and the same assessment scale, differences between the two bodies of material can be read as differences in practice rather than as artefacts of method. Figure 1 shows the distribution of the surveyed locations.

Each documented element was recorded through a consistent sequence of four views: an overview showing the element in its spatial context and its relation to circulation and edge; an assembly view showing junctions, fixings, visible substructure and drainage gaps; a close surface view showing weathering, checking, wear polish, fastener staining and coating condition; and an interface view recording timber-to-ground, timber-to-metal, timber-to-concrete and end-grain conditions.

Every site was visited by two assessors, who agreed each element's condition on the spot and entered it into

a structured questionnaire in the ArcGIS Survey123 application. Each record captures site and setting type, classified as park, street, square, waterfront or promenade, courtyard, playground or other, together with element type, apparent species or product, apparent treatment or modification, contact class, the structural configuration of the element, the materials the timber meets at each junction, the junction and fixing type, the extent of timber in the element, ranging from a discrete object through a bounded surface to the whole ground plane, the intended and the observed use, visible defects and an overall condition rating, together with its coordinates and photographs. Condition was assessed on a five-point ordinal scale adapted from the rating conventions used in wood durability field trials [30], running from sound through slight, moderate and severe change to failure, and applied only to visible attributes. Because deterioration below grade cannot be assessed without probing, elements in ground contact are reported as not assessable below grade. Species and treatment identifications are visual and were not confirmed by sampling. Digital capture in the field was chosen for three reasons: it enforces a consistent record across cities and phases, it removes the transcription step between field notes and analysis, and it produces a geolocated dataset that can be analysed spatially and published as an openly readable map rather than as a table. Sampling was purposive and directed at maximum variation. The objective was not to inventory every amenity element in a city, nor every timber element within it, but to capture the widest observable range of timber applications and of the settings in which they occur. Elements were therefore selected to span the setting types listed above, the range from object to surface, the range of intended uses, and the range of construction and junction types, so that the resulting record supports comparison of what timber is used for rather than estimation of how often it is used.

The regulatory comparison draws on primary documents. For New Zealand these are NZS 3602 and NZS 3640 together with Clause B2 of the New Zealand Building Code, which sets the durability periods that exterior elements must achieve [20, 24, 25]. For Europe they are EN 335 on use classes and EN 350 on the classification of natural durability [10, 11], together with the chemicals instruments that now effectively govern specification, namely the Commission Directives restricting arsenic compounds and narrowing the approved applications of other wood preservatives, together with the ongoing restriction work under REACH [6, 8, 9]. This layering matters: in Europe, chemicals law rather than construction standards have become the binding constraint on what a landscape architect may specify.

Four limitations should be stated, the first of which is also a deliberate sampling decision. Both phases were carried out in the warm season. This was chosen intentionally, because outdoor amenities are used most intensively by residents and visitors in warm weather, and several of the qualities this study is concerned with, namely how a surface is sat on, leaned against and occupied, are only observable when the space is in use. The cost of that choice is that each survey is a snapshot which captures condition rather than rate of change, and that the winter behaviour of the northern European elements, including snow clearing, grit and de-icing salt, is recorded through its traces rather than in operation. Second, because the two assessors agreed each rating on site rather than recording independently, the data represent a consensus judgement and do not permit inter-assessor variability to be quantified. Third, the ages of elements were inferred from published project documentation and cannot

always be established precisely, which weakens any inference from condition to service life. Fourth, and following directly from the purposive sampling strategy, the dataset has no denominator. It records the range of timber applications encountered but not the proportion of a city's amenity stock that they represent, so no claim is made about how common timber is in any of the surveyed cities, and depth of coverage varies between them. The study accordingly claims analytical rather than statistical generalisation, in the sense that it proposes transferable principles rather than representative frequencies.

Results and Discussion

Timber as the ground plane

Six typologies recur across the Wellington sites, and they are best understood as a sequence rather than a list, because each grows out of the one before it. The first and most consequential is the continuous deck used as public ground plane. Large horizontal areas are surfaced in timber boards rather than in stone, concrete or bound gravel, and the deck is not attached to a building or confined to a special zone; it is simply the ground on which the city walks. Board direction indicates the line of movement, and a change of board module or gap width marks a threshold as effectively as a change of paving material would elsewhere (Fig. 2).

From the deck comes the second typology, the folded plane, in which the surface lifts, tilts or steps to become a seat, a viewing terrace, a ramp or a stair without any change of material. Seating here is not an object placed on a surface but the surface itself deformed, which yields a high ratio of usable sitting edge to square metre, removes the visual clutter of separate furniture objects, and permits a range of postures that a fixed bench does not (Fig. 3).

The third typology extends the same logic to the water. Where public space meets the harbour, the edge is thickened into steps, platforms and ledges that allow people to descend towards the water rather than merely look at it. Timber is the appropriate material here for reasons that are physiological before they are aesthetic: its low thermal conductivity means it is neither burning nor freezing to the touch, and its surface is forgiving enough that people sit, lie and climb on it without hesitation (Fig. 4).

Fourth are the shelter and canopy structures, which are deliberately incomplete. Light, permeable batten assemblies provide partial shade and partial shelter rather than enclosure; the designers of North Kumutoto have described the intent as embracing the elements rather than controlling them, and the pavilion is accordingly not waterproof by design [4]. Timber's capacity to be assembled as a screen or filter rather than as a wall is what makes that position architecturally available (Fig. 5).

Fifth are the retaining, terracing and ground-forming elements, in which heavy sections are stacked to hold soil, form planting terraces and negotiate level change. This is the typology in which ground contact, and therefore the highest hazard classes, is unavoidable, and it is also where reclaimed material most often appears. Sixth are the freestanding elements: seats, bollards, edge rails, wayfinding supports, bin surrounds, balustrade infill and play components (Fig. 6), almost always fabricated for the site and detailed to match the larger elements around them. Freestanding objects are therefore not absent from the Wellington record; what distinguishes it is that they share the section sizes, fixings and surface treatment of the ground plane they stand on.

Read against the setting categories used in the survey, the striking feature of the Wellington record is how little the role



Fig. 2. Continuous timber deck as public ground plane, Wellington waterfront. Board direction indicates the line of movement; the gap module governs drainage and drying rate [photo by the authors, 2026]



Fig. 3. The folded plane: deck surface stepping to form seating and viewing terrace without change of material. The section, rather than an added object, produces the sitting edge [photo by the authors, 2026]

of timber changes as the setting changes. The same material, in the same structural role, carries the waterfront promenade, the park terrace, the street edge and the play surface, and the recorded extent sits at the surface end of the scale in each. What shifts between settings is section size and degree of exposure, not the decision about what the material is for. That constancy is what allows a single design logic to be read across an entire public realm, and it is the point at which the New Zealand and European records diverge most clearly. Four spatial operations follow from it. Continuity: one material carries the pedestrian from promenade to terrace to seat to water edge, so that continuity of material substitutes for the hierarchy of paving types that European public space design conventionally uses to signal function, and the signalling is done instead by geometry. Softness within robustness: these are hard-working, structurally frank and visibly industrial spaces, yet the surface a body meets is warm and slightly yielding. Weather as programme rather than adversary, expressed in shelter that is partial by intention. And cultural grounding, the operation with no European equivalent, since New Zealand public-realm projects work within the Te Aranga principles, which are outcome-based principles founded

on Maori cultural values and directed at enhancing mana whenua presence, visibility and participation in the design of the physical realm [2]. In Wellington the same orientation appears in the city's own waterfront policy, which states that Māori cultural presence on the waterfront should be an active one, showing a living culture with a focus on waka culture, and which identifies the lagoon as the site for a waka shelter and related cultural activities [29]. Within such a framework material choice is not neutral: timber connects to the working harbour, to the waka landing and to place-based narrative in a way that imported stone or precast concrete does not, and the framework gives that connection institutional weight rather than leaving it to the designer's discretion. The nearest European analogues, arguments from regional vernacular and heritage continuity, are real but weaker and more easily set aside under procurement pressure.

Exposure, junction and detail

Wellington's exposure regime combines wind-driven salt spray, high wind pressures carrying abrasive particulate, frequent wetting followed by rapid drying, and a severe ultraviolet flux. The last is routinely underestimated by northern-



Fig. 4. Occupiable water edge in heavy timber. Low thermal conductivity and a forgiving surface make timber the appropriate material where bodies meet the harbour edge [photo by the authors, 2026]



Fig. 5. Permeable batten canopy. Partial shelter as design intent: the structure filters wind, rain and light rather than excluding them [photo by the authors, 2026]

hemisphere specifiers reading latitude alone: comparative measurements across mid-latitude monitoring sites found peak ultraviolet intensities at a New Zealand site exceeding those at comparable North American latitudes and altitudes by 41 ± 5 per cent, attributed to lower ozone amounts, a cleaner atmosphere and the closer Earth–Sun separation of the southern summer [18]. For material degradation the relevant quantity is annual dose rather than summer peak, so the practical difference is smaller than that figure suggests, but photodegradation of surface lignin, coating breakdown and greying do proceed faster than European experience at the same latitude would predict.

Against that background, the clearest finding of both phases is that visible condition correlated far more strongly with detailing than with either species or treatment class. Drainage and drying rate dominate: elements with generous board gaps, ventilated substructures and unobstructed drying paths were in visibly better condition than nominally identical elements in which a nosing, a flush junction or an abutting planter had created a trap. This is consistent with the logic of the European use-class system, in which the critical distinction within exterior above-ground exposure is between limited wetting with rapid drying and prolonged wetting [10], and it means that a poorly detailed element in a high treatment class will routinely be outlived by a well-detailed element in a lower one. End grain is where failure begins: cut ends, notches, bolt holes and mitred junctions showed the earliest and most severe checking and staining across the entire survey, and where preservative-treated timber is cut on site the treated envelope is breached and the

untreated core exposed [3]. In a landscape context, where site-cutting is unavoidable and end grain is frequently left upward-facing, this is a first-order design decision rather than a construction detail.

Because the survey recorded what the timber meets at every junction, the two bodies of material can be compared not only by what is built but by how it is put together. Four junction conditions recur, each with a different failure mechanism and a different design attitude. Timber-to-timber junctions in the Wellington projects are predominantly mechanical, visible and generously dimensioned: boards laid on joists at open gaps, heavy sections stacked, bolted or coach-screwed, with the fixing treated as part of the visual language rather than concealed. Nothing observed depended on adhesive and very little on proprietary hidden clips. The consequence is repairability, since a single board or member can be replaced without dismantling its neighbours, which is what makes a timber ground plane maintainable at city scale; the corresponding weakness is the number of penetrations, each a route for water into the section and, in the salt zone, a site of corrosion staining.

Timber-to-steel junctions carry most of the structural work, with galvanised or stainless brackets, plates, shoes and pins transferring load where timber is weakest, at bearings, post bases and cantilevers. The recurring good practice is that the steel lifts the timber clear of the wet zone so that end grain never stands in water, and that the two materials meet across a drained or ventilated gap rather than face to face; where that gap is absent, the junction traps moisture at the point of highest stress. Metal specification proved to be a durability



Fig. 6. Freestanding timber elements in Wellington's public realm: seats, bollards, edge rails, wayfinding supports, bin surrounds and play components. Almost all are fabricated for the site and detailed to match the larger elements around them [photo by the authors, 2026]

decision rather than an ironmongery one, since copper-based preservatives in contact with insufficiently specified metals accelerate corrosion, and the resulting stains are read by the public as decay long before any structural loss occurs. Timber-to-concrete and timber-to-ground junctions are where the two regions diverge most sharply. New Zealand practice, backed by a treatment system that certifies timber for direct ground contact, is comparatively relaxed about putting the material into the ground, and the hazard class rather than the detail carries the risk. European practice, having lost much of that chemistry, displaces the risk into the detail by interposing metal, raising bases onto plinths and keeping timber clear of soil and splash. Read side by side, the two records describe the same problem solved once with chemistry and once with geometry.

The construction types these junctions produce differ correspondingly. The Wellington record is dominated by the ventilated deck on a joist substructure, extended horizontally to whatever size the space requires, and by the stacked or crib assembly of heavy sections for terracing and level change, with lighter batten screens and lattices for canopies above. All are site-fabricated, additive and open-ended. The European record contains the same deck construction, but alongside a large population of composite assemblies in which timber is a facing on a steel or concrete frame, and of factory-assembled units delivered complete. Those assemblies perform well and often look better for longer, but they are difficult to repair in part, and at end of life their materials are hard to separate, which is the practical reason why the circularity argument for outdoor timber is won or lost at the junction rather than in the specification of the board.

Three material strategies coexist across the Wellington projects: treated plantation softwood in the appropriate hazard class as the economic default for substructures and secondary elements; dense durable hardwood where wear, span or civic prestige justify the cost [16]; and thermally modified radiata pine, developed domestically as a preservative-free alternative, in cladding and decking. On the last, one qualification deserves emphasis because it is frequently obscured in marketing material: European field trials found that after seven and a half years in ground contact the thermally modified materials tested classified

as slightly durable to not durable, while the same materials above ground classified as very durable to moderately durable [30]. Thermal modification is an above-ground solution. Finally, weathering is an aesthetic phenomenon before it is a structural one. Radiata pine decking checks and cups, pronounced on flat-grain boards and markedly less on vertical-grain and modified products, while heavy hardwood decking weathered to a uniform silver-grey that was consistently legible as intended patina rather than neglect. The distinction between designed and undesigned greying is largely a matter of orientation, detailing and uniformity of exposure across a single element, and it is compounded by a quality no cast material offers: high-traffic timber surfaces develop a burnished wear polish that records use. That reading is not only the designer's. Wellington's waterfront policy describes the evidence of use and of industrial and maritime wear as irreplaceable indicators of the history of the area, and the physical traces of age and occupation as its collective memory [29].

Element rather than ground: the European field phase

Set against Wellington, the European material resolves into a clear pattern, and the pattern is not one of absence. Timber is abundantly present in the surveyed cities, in several of them actively promoted by municipal architecture policy, and it appears in a wide range of amenity types [28]. What differs is its structural and spatial role. Across the sample the dominant condition is timber applied to a mineral substructure: slatted seating on steel or concrete frames, timber tops on cast bases, cladding to retaining walls, decking laid as an inlay within a matrix of paving. The ground plane remains stone, asphalt or concrete, and timber marks the places where the design invites the body to stop (Fig. 7).

The most significant result of the European phase is that this pattern is stable across the whole range of the sample. It is as evident in Barcelona, where there is no frost, no snow clearing and an outdoor season several months longer, as it is in Oslo, Helsinki or Tallinn, and as evident in Nitra as in Berlin or Paris. The accent paradigm therefore cannot be explained as an adaptation to a hard winter climate, nor as a function of municipal budget. It is a design and procurement convention, which is precisely why it is open to change.

One typology is the exception, and it is instructive. In the



Fig. 7. The European accent paradigm: timber applied to a mineral substructure as catalogue seating and inlaid decking, with traces of winter maintenance at the deck-to-paving interface [photo by the authors, 2025]



Fig. 8. Oslo: harbour bath and sun deck. The one European typology in which the timber surface becomes the ground plane and folds to produce seating, steps and water edge [photo by the authors, 2025]

harbour bath, the urban swimming platform and their associated sun decks, the European projects do exactly what the Wellington waterfront does everywhere: a continuous timber surface becomes the ground, then folds into steps, benches, ramps, diving platforms and water edges without changing material, and is occupied in a range of postures that no bench affords. The Copenhagen harbour baths and quayside decks and the Oslo bathing and promenade decks of the inner fjord are the closest European relatives of the Wellington waterfront (Fig. 8), and comparable water-edge decks recur elsewhere in the sample. Their existence matters, because it shows that the material-led move is neither climatically impossible nor regulatorily forbidden in Europe. It is programme-restricted, and the restriction runs along the setting categories themselves: where the brief is bathing or a water edge, European practice designs the ground plane in timber; where the brief is a street, a square or a park, the recorded extent drops back to the object end of the scale. In the European record the role of timber is a function of setting, whereas in the Wellington record it is not.

Three further observations bear on the comparison. What varies with latitude is the deterioration mechanism rather than the role of the material: in the northern part of the sample, winter maintenance leaves traces that have no Wellington equivalent, including grit abrasion, localised splintering along snow-clearing routes and staining from de-icing salt at the deck-to-paving interface, and slip resistance is treated as a design problem in a way it is not in Wellington; in Barcelona these are replaced by ultraviolet degradation and heat, so that shading, species selection and coating maintenance carry the weight that winter detailing carries in the north. Second, bespoke and catalogue solutions coexist throughout the sample, and the balance between them is not what separates the European record from the Wellington one. Site-specific timber elements are common, and in the Nordic cities they are the norm along waterfronts, where seating, steps, decks and edges are fabricated for the location and fitted to terrain, water level and use. What distinguishes the European record is therefore not that its elements are less individually designed, but that even the bespoke ones are conceived as elements: timber is shaped with considerable invention within a bounded object or zone, while the surrounding ground plane stays mineral. Third, in the newer waterfront and harbour-side quarters considerable stretches of the timber-surfaced public realm are delivered and maintained by developers rather than by the municipality, which affects both specification and maintenance cycle and connects this material question to the wider discussion of privately owned publicly accessible space [27]. Across the whole sample, timber-surfaced space is consistently more recent than its surroundings, more often associated with regeneration and event-driven programming than with the permanent civic ground plane, and consistently the material most visibly appropriated for informal occupation, particularly by young people [14].

Two routes to the same durability

Both regions begin from the same physical logic. Both classify exposure severity before choosing a material, through the six New Zealand hazard classes or the five European use classes, and both draw the same distinction between above-ground exposure and ground contact [10, 25]. Both recognise, at least in their technical literature, that constructive protection outranks chemical protection in determining realised service life. Both credit timber as a renewable, carbon-storing substitute for mineral and metallic materials, and the

Table 1. Timber in the public realm: comparative conditions in New Zealand and Europe
 [construction by the authors from the two field phases and the standards cited in the text]

Dimension	New Zealand (Wellington)	Europe (surveyed cities)
Dominant resource	One fast-grown plantation softwood (<i>Pinus radiata</i> , ca. 90% of planted production forest), low natural durability, locally abundant	Diverse resource: spruce, Scots pine, larch, oak, plus imported durable hardwoods; wider species choice and cost spread
Route to durability	Prescriptive national hazard-class preservative treatment (NZS 3640); CCA approved for all hazard classes, alongside copper azole and ACQ at H3.1-H5	Natural durability (EN 350), modified timber and constructive protection; CCA use restricted from 30 June 2004 to industrial impregnation and specified professional uses, not public sale
Binding constraint on specification	Building Code durability requirements (Clause B2) and the hazard-class standards	Chemicals law (Biocidal Products Regulation, REACH) more than construction standards
Climate stress profile	Salt spray, extreme wind, high UV dose, frequent wet-dry cycling, negligible freeze-thaw	Freeze-thaw and de-icing salt, prolonged winter wetting, lower UV dose, slower drying, longer moisture residence
Design position of timber	Primary spatial and structural material; forms the public ground plane	Usually a secondary or accent material applied to a mineral substructure; decking confined to designated zones
Design of elements	Site-specific and fabricated, and continuous with the ground plane	Site-specific and catalogue solutions coexist; bespoke design is common, but conceived as bounded elements rather than as ground
Cultural frame	Indigenous design principles (<i>Te Aranga</i>) institutionalised in the design process	Heritage, regional vernacular and craft traditions; no equivalent binding framework
Reclaimed timber	Reuse of heavy sections culturally accepted; fewer regulatory obstacles	Reuse constrained less by the material than by documentation: service history and treatment must be establishable
Maintenance model	Periodic board replacement within an explicitly repairable system	Expectation of low-maintenance, long-warranty product performance

comparative life-cycle literature on buildings supports that credit, with a review of one hundred case studies reporting embodied energy for timber buildings on average 28 to 47 per cent below that of concrete and steel equivalents respectively, though the magnitude depends heavily on end-of-life assumptions and on how biogenic carbon is accounted for [23]. And both, in their better projects, accept visible weathering as legitimate rather than defective.

The divergence begins with what is available and what is permitted. New Zealand has one abundant, cheap, fast-grown and non-durable species, and has built a comprehensive treatment system around it. Under NZS 3640 chromated copper arsenate is approved as a treatment for all hazard classes, on the grounds of broad-spectrum effectiveness against insects, wood-destroying fungi and marine borers, alongside copper azole and alkaline copper quaternary, which are approved at H3.1 to H5 [3, 25]. Europe has a more diverse resource but has progressively narrowed the same chemistry. Commission Directive 2003/2/EC restricted the use of arsenic compounds in wood preservation from 30 June 2004, following a scientific opinion that identified risks to human health from the disposal of CCA-treated wood and, in particular, risks to children from its use in playground equipment; CCA type C remains permitted only for industrial vacuum or pressure impregnation, and the treated wood may be placed on the market only for specified professional and industrial uses, not for sale to the public [9]. The two regions reached different conclusions about the same substance rather than possessing different information about it. New Zealand assessed the public-health aspects of CCA-treated timber in playgrounds and residential buildings in 2003, and the regulator concluded that a formal reassessment under the Hazardous Substances and New Organisms Act was not necessary, while endorsing activities directed at minimising exposure [22]; the national agency states that the research it commissioned found it extremely unlikely that the health

of adults and children would be affected by contact with treated timber around the home and in playgrounds [5]. There is accordingly no New Zealand legislation restricting the use of CCA-treated wood to particular end uses [22], and the material remains in ordinary use in decks, landscaping, retaining walls and playground structures. The European restriction, by contrast, followed a scientific opinion that weighed disposal pathways alongside direct contact, and identified risks to children from playground equipment specifically [9]. The divergence is therefore one of risk judgement and of regulatory scope, not of a substance permitted in one region and unknown in the other. What follows from it is that European practice has had to substitute species selection, modification and detailing for chemistry across the whole of the public realm, a more demanding and more expensive design problem which nonetheless produces knowledge the New Zealand system has had less need to develop. Table 1 sets out the principal differences.

Reuse and reusability in landscape elements: potential and challenges

Two distinct propositions are often merged under the heading of circularity, and the survey material makes it useful to separate them. The first concerns timber that has already served: reclaimed sections entering a landscape project from an earlier use. The second concerns timber that is placed with its next use in mind: material specified and assembled so that it can be recovered intact when the element it belongs to is altered or removed. The first was observed in the surveyed public realm as a minor but recurring practice, in heavy sections used for edging, terracing, seating blocks, bollards and level change, where dimensional heft and an evident earlier life are legible in the finished element. The second is not directly observable at all, since reusability is a property of an assembly that only becomes apparent when the assembly is taken apart. Both belong in the same discussion, and

outdoor landscape elements are an unusually favourable setting for both.

The potential rests on three characteristics of this class of element. Structurally, most public-realm timber components are modest: spans are short, loads are distributed, and consequences of local failure are limited and visible in advance, which makes material of uncertain but conservatively estimated capacity easier to accommodate here than in a building frame. Materially, reclaimed heavy sections are frequently favourable in their own right, since old-growth or long-seasoned timber tends to be denser, more dimensionally stable and slower to absorb water than fast-grown plantation stock. And constructionally, as the preceding section described, these elements are already assembled mechanically, at accessible junctions, in a form intended to be repaired board by board; an assembly that can be repaired can in principle also be dismantled and its members recovered.

The challenges fall into two groups. The first is informational. Mechanical properties of reclaimed timber cannot be assumed; grading rules for recovered material are absent or immature; hidden metal is common; the service history is frequently unknown; and established certification routes do not exist. The documented consequence is that practice tends to downcycle recovered timber rather than reuse it at equivalent function, and that reuse is easiest where a designer works from the material outwards, letting the geometry of the element follow the sections that are actually available rather than specifying dimensions in advance and searching for stock to match [12, 15, 21]. The same logic can be applied prospectively, since the information that is missing from reclaimed material is information that a designer is able to record at the moment of construction.

The second group concerns the chemical history of the material. Timber that has spent a first service life outdoors has usually been preservative-treated, and the treatment determines what a second use may be. Several preservative systems have had their approved applications progressively narrowed in the European Union, including a prohibition on treated wood in playgrounds and in other outdoor places for public enjoyment or where skin contact is likely [8, 26], and the reuse and secondary use of wood treated with certain substances has itself been the subject of restriction proceedings, with residential landscaping among the secondary applications considered [6]. Traceability is the operative issue rather than the material as such: it has been recommended that treated wood carry permanent marking so that its origin remains identifiable throughout its life [1], and where a service history cannot be established, an element is difficult to place in the settings where landscape architects most often want it, namely those involving skin contact, food contact or children's play.

Taken together, these conditions suggest that the constraint on circularity in outdoor timber is documentary rather than technical, and that it is largely within a designer's control at the point of specification. Recording species, section, treatment and fixing type for the elements now being built, and preferring reversible mechanical connections, single-material assemblies and a limited range of repeated section sizes, addresses prospectively the same gaps that make present-day reclaimed stock difficult to use. This is consistent with the direction of European circular economy policy, which places emphasis on the design stage as the point at which the recoverability of construction materials is determined [7], and it locates the question in the same place as the durability question examined earlier: in the junction and in

the specification rather than in the material itself.

What transfers, and what does not

The Wellington evidence does not support importing New Zealand's palette or its chemistry. Radiata pine is not a European resource, and the treatment regime that makes it work is precisely what European chemicals regulation has narrowed. What transfers is the design logic, and the harbour baths of Copenhagen and Oslo are the proof that it can be built in a Nordic climate under European rules; the task is to release it from the bathing programme and apply it to the ordinary ground of squares, waterfronts, courtyards and park edges. Five propositions follow:

- Design the ground plane in timber, not only the objects standing on it. The largest experiential gain comes from the surface, not from the bench.
- Generate furniture by deforming the surface. Folding, thickening and stepping produce more sitting edge and less clutter than the same budget spent on discrete objects, whether catalogue or bespoke.
- Specify by exposure micro-zone rather than by project. A single plaza may contain conditions equivalent to EN 335 use classes 3.1, 3.2 and 4; treating them identically guarantees premature failure in the worst zone and over-specification in the best.
- Design the junction first. Mechanical, reversible and accessible fixings; drained and ventilated interfaces; metal shoes and raised bases where regulation has removed the chemistry that once permitted direct ground contact; and explicit treatment of site-cut end grain. Durability, repairability and material recovery are all decided here.
- Let the material grey, and say so in the specification. Uncontrolled greying reads as neglect; uniform, designed greying reads as patina, and the difference lies in orientation, detailing and managed client expectation.

One research gap limits every argument made here. The comparative life-cycle literature on timber substitution is almost entirely building-focused [23]. Outdoor public-realm elements have different geometry, shorter and more frequent replacement intervals, higher treatment intensity per unit volume, and different end-of-life pathways, since preservative-treated timber is commonly excluded from both energy recovery and material recycling streams. There is at present no adequate body of life-cycle data for landscape-scale timber elements as distinct from buildings, and that is where a follow-up study to this paper should be directed.

Conclusions

Timber in New Zealand's urban public realm functions as a primary spatial material rather than as an applied finish. It forms the ground plane, and seating, edges, thresholds and shelter are generated by deforming that plane rather than by placing furniture upon it. This is a design position, not a consequence of climate or resource, and it is available to European practice.

Observed condition was governed more by detailing than by species or treatment class, and the decisive detail is the junction. Drainage and drying rate, end-grain protection and fastener specification accounted for most of the visible variation between elements. Wellington builds with visible, mechanical, generously dimensioned fixings and site-fabricated assemblies that can be repaired a board at a time, and places timber in the ground on the strength of its treatment class; the European record contains the same deck construction alongside a large population of composite and factory-assembled elements that perform well but are

difficult to repair in part or to separate at end of life. Since durability, reparability and material recovery are all decided at the junction rather than in the choice of board, the junction is where an outdoor timber strategy should be designed first. In the surveyed European cities timber is abundant, varied and in places policy-supported, but it is applied to a mineral substructure rather than forming the ground. The single systematic exception is the harbour bath and its sun deck, where European practice does precisely what Wellington does throughout. Because the accent paradigm holds across the whole range of the European sample, from Oslo to Barcelona and from capitals to a small regional city, it cannot be attributed to the northern climate or to administrative capacity. The material-led approach is neither climatically impossible nor regulatorily forbidden in Europe; it is confined to one programme, and that confinement is a convention rather than a constraint.

New Zealand and European practice converge on a shared physical logic of exposure classification, constructive protection and renewable material substitution, but diverge in resource base, chemical regulation, procurement culture and the institutional standing of indigenous design principles. The divergence is best understood as two routes to a comparable service life rather than as a difference of competence or ambition.

Outdoor landscape elements are a favourable setting both for reusing timber and for building in a way that keeps timber reusable, because their structural demands are modest and their assemblies are already mechanical and accessible. The binding constraint is documentary rather than technical: species, section, treatment and fixing type determine what a second use may be, and that information is absent from most recovered stock while being fully within a designer's control for the elements now being built.

The outcome transferable to Baltic and Northern European cities is accordingly a design logic rather than a material palette: a surface-led conception of public space, specification by exposure micro-zone, assemblies designed for replacement, and detailing substituted for the chemistry that regulation has withdrawn. The absence of life-cycle data for landscape-scale timber elements remains the most significant gap in the supporting evidence.

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Kopsavilkums

Rakstā apskatīta koksnes izmantošana Jaunzēlandes pilsētvidē, kur tai ir atšķirīga loma salīdzinājumā ar praksi lielākajā daļā Eiropas valstu. Atšķirībā no Eiropas, kur koksne visbiežāk kalpo kā dekoratīvs pilsētvides elementu apdares materiāls uz cieta (minerāla) seguma bāzes, Jaunzēlandē tā funkcionē kā nesošs, virsmu veidojošs un telpu strukturējošs materiāls, kas plaši izmantots vienlaidus klājos, krastmalās, sēdvietās, terasēs un nojumēs. Šis pētījums ir turpinājums autoru iepriekš veiktajam salīdzinošajam lauka pētījumam par koksnes pielietojumu publiskajā ārtelpā. Pirmajā pētījuma posmā tika apsekotas vienpadsmit Eiropas pilsētas (Kopenhāģenas un Oslo rezultāti ir publicēti iepriekš), savukārt šajā posmā, izmantojot to pašu metodoloģiju, pētīta Vēlingtonas pilsētvidē, tādējādi nodrošinot savstarpēji papildinošu datu kopu.

Pētījuma metodoloģija ietver strukturētu fotodokumentāciju un vizuālu materiāla stāvokļa novērtējumu, kas apvienots ar standartu un koksnes aizsardzības ķīmisko līdzekļu normatīvā regulējuma salīdzinošo analīzi. Pamatojoties uz iegūtajiem datiem, izvirzītas trīs galvenās atziņas. Pirmkārt, Jaunzēlandes pieeja ir "materiāla vadīta": koka klājs veido publiskās ārtelpas pamata plakni, bet sēdvietas, pakāpieni un līmeņu maiņas tiek veidotas, šo plakni transformējot un telpiski pielāgojot, nevis izvietojot atsevišķus labiekārtojuma elementus uz cieta seguma. Otrkārt, lai gan abos reģionos tiek sasniegts līdzīgs koka elementu kalpošanas laiks, tehnoloģiskie risinājumi atšķiras. Jaunzēlandē plaši izmanto ātraudzīgu un dabiski zemas izturības plantāciju priekš, kuras ilgmūžība tiek nodrošināta ar nacionālo koksnes apstrādes un bīstamības klašu sistēmu. Savukārt Eiropā, ņemot vērā pakāpeniskos ierobežojumus iedarbīgāko antiseptiķu izmantošanai, aizvien biežāk tiek izvēlētas dabiski izturīgas koku sugas, modificēta koksne un konstruktīvās aizsardzības metodes. Treškārt, otrreizēji izmantotai koksnei ir specifiska, taču nozīmīga niša; neskatoties uz tās tehnisko, estētisko un vēsturiskā stāsta pievilcību, tās plašāku pielietojumu Eiropas publiskajā ārtelpā galvenokārt ierobežo nepieciešamība pēc dokumentētas materiāla izcelsmes un informācijas par iepriekš izmantotajiem ķīmiskās apstrādes līdzekļiem.

Analizējot iepriekšējā pētījuma posma datus, secināts, ka Eiropas pilsētās koksne publiskajā ārtelpā tiek izmantota plaši, taču galvenokārt kā apdares materiāls virs minerālas pamatnes, nevis kā autonoma seguma plakne. Šī tendence ir novērojama visās apsektotajās pilsētās neatkarīgi no to mēroga, ziemas klimata specifikas (piemēram, sala vai sniega tīrīšanas nepieciešamības) un pašvaldību budžeta iespējām. Vienīgais sistēmiskais izņēmums ir rekreācijas zonas pie ūdens, piemēram, peldvietas un to saulīšanās klāji, kur Eiropas prakse ir analoģiska Vēlingtonas krastmalas risinājumiem. Tas parāda, ka "materiāla vadīta" pieeja Ziemeļeiropā nav nedz klimatiski neiespējama, nedz normatīvajos aktos aizliegta; tā ir tradicionāla prakse, kas piesaistīta specifiskai pilsētvides funkcijai, nevis objektīvs ierobežojums.

BEYOND THE PLAYGROUND: STRATEGIES FOR CREATING PLAYABLE URBAN FABRICS IN CONTEMPORARY CITIES

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Abstract. In contemporary urban development the quality of public open space, opportunities for social interaction and residents' well-being have gained importance, while sedentary lifestyles, social isolation and generational segregation have become pressing concerns. In spatial planning, however, playfulness has remained associated almost exclusively with children's spaces. This paper examines how play elements are integrated into public open space beyond the conventional playground, tests public attitudes towards such integration in Latvia, and proposes an operational framework for design. The study combines a literature review with a purposive comparative analysis of nine international cases and a questionnaire survey of 139 respondents in sixteen Latvian cities across three age groups. Roger Caillois's four categories of play *agôn*, *alea*, *mimicry* and *ilinx* are operationalised as spatial design categories and cross-tabulated with four development domains. The comparative analysis indicates that playfulness operates at three non-substitutable levels – policy, process and form, and that the most spatially ambitious cases generate play without dedicated equipment. The survey shows that a large majority in both the adult and adolescent groups regard playfulness as intended for all ages, but that preference is weighted towards elements affording bodily movement and multifunctional greenery over sound-based interactive elements, indicating that internationally celebrated solutions are not uniformly transferable.

Keywords: playful city, ludic urbanism, public open space, sustainability, play typology

Introduction

Public open space is not merely physical infrastructure; it is a social, cultural and emotional space in which the values, habits and everyday experience of inhabitants are reflected, and its design has become an instrument that shapes daily routines, emotional experience and the capacity for interpersonal engagement. Within it, play occupies an ambiguous position. It is universally acknowledged as beneficial, is protected as a right of the child in international law, and is routinely provided for in municipal budgets. Yet that provision is overwhelmingly channelled into a single spatial type, the fenced and standardised playground, aimed at a single user group and offering a narrow repertoire of activity.

The relevance of the question is underscored by social and demographic pressures: rising sedentary behaviour, social isolation, and the segregation of generations in the urban environment. Playfulness has traditionally been associated almost exclusively with children's spaces, thereby neglecting the need of adults and older adults for stimulating and unstructured recreation. Contemporary planning discourse, by contrast, increasingly emphasises inclusive environments that dismantle social barriers and support intergenerational contact, and the deliberate integration of playful and interactive elements into public open space has been identified as an effective means of reducing stress, promoting physical activity and strengthening a sense of belonging.

In the Baltic context this shift is only beginning. The development of public open space in Latvian cities has in recent years increasingly foregrounded human experience and community need, yet the integration of playful design approaches remains a recent and under-researched area: attention has been directed principally towards infrastructure quality, safety and visual appearance, while elements that stimulate play, creativity and dynamic social interaction have received considerably less consideration.

Since Huizinga's *Homo Ludens* [17], and more directly since Stevens's formulation of the ludic city [39], a body of theory has argued for the reintegration of play into everyday urban space, translated into practice through initiatives such as Playful City USA and the Playable City programme. What remains underdeveloped is the intermediate level – an operational instrument that allows landscape architects and

planners to determine which kinds of play a given public open space affords, which are absent, and by what spatial means the absent ones might be introduced. Existing guidance tends either to remain at the level of general principle or to descend directly to catalogues of equipment.

The aim of this study is to establish how play elements are integrated into public open space, how such integration is perceived by potential users in Latvia, and on that basis to propose a framework for the design of playful public open space.

Theoretical background

The concept of play

Play is a significant mechanism of culture, of social relations and of environmental production, its definitions are diverse and at times contradictory. It may be approached as a means of development or as an activity valuable in itself [39]. No consensus on a single definition has been reached, but descriptions consistently identify several criteria: play is instinctive and intrinsically motivated, spontaneous, pleasurable and voluntary [14]. It has traditionally been dismissed as trivial, something children do by virtue of their immaturity and grow out of, and yet play is among the highest achievements of the human species, alongside language, culture and technology, none of which would have been possible without it [46].

The terminology is unstable across languages. In Latvian, *rotaļa* and *spēle* overlap and may both be rendered in English as either *play* or *game*. Dravniece [9] locates the distinction in the presence of rules: *spēle* denotes a rule-governed activity with defined content, an objective and an element of competition, whereas *rotaļa* covers both play in general and children's creative and symbolic play in particular. This has methodological consequences for the survey reported below, since the two terms elicit different mental images. Comparable difficulty exists in English: Sutton-Smith [40] attributes the definitional disagreement to the diversity of play forms, players, and settings, and proposes seven "rhetorics of play" – progress, fate, power, identity, the imaginary, the self, and frivolity – as persistent cultural discourses rather than categories of activity.

Huizinga [17] examined the concept across languages,

singling out from Greek *paidia*, children's play and play in general, and *agon*, the contest; and from Latin *ludus*, covering play, recreation, contest, theatrical performance and games of chance. *Ludus* becomes the central motif of his argument that the human being is not only *homo sapiens* but also *homo ludens*. Caillois [3] set out both to extend and to correct Huizinga, arguing that his account was too broad in some respects and too narrow in others, notably in excluding games of chance. Caillois classifies games not by outward features but by the psychological attitude of the player, distinguishing four categories – *agôn*, *alea*, *mimicry* and *ilinx* – and superimposing on them a continuum from *paidia* to *ludus*. These four categories constitute the analytical framework of the present study.

The developmental significance of play is well established across the life course. Its role is sufficiently significant that the United Nations Convention on the Rights of the Child recognises rest, leisure and play as rights of the child [44], a provision transposed into Latvian law [30]. Play has been described as the earliest form of human communication [28], and engagement in play during early life enables adults to orient themselves more effectively within changing environments [37]. During play the nerve signals generated by the body form pathways supporting neural development [24]; play with sounds, invented words and rhymes supports the phonological awareness underpinning early literacy [46]; shared play develops communication, cooperation, empathy and self-control [24; 31]; and play develops emotional regulation and resilience [12; 32] while counteracting boredom, anxiety, loneliness, and depression [23]. In the urban environment these effects extend across all age groups, genders and economic strata [41], and, critically for the present argument, introducing playfulness does not require purpose-built grounds: it can be integrated into settings not primarily intended for play, such as pavements, steps, water features, and street furniture [20].

Play in the designed landscape

Playfulness in landscape architecture is generated both by deliberately designed spaces and by spatial elements that stimulate spontaneous activity irrespective of their original purpose [39; 41; 18]. Its history in the designed landscape is long and continuous (Fig. 1).

Archaeological evidence attests to play from the Palaeolithic onwards, such as dice, gaming sticks, boards and ball-game materials, while excavations in ancient China, Peru, Mesopotamia and Egypt have revealed miniature models most probably used as toys, together with depictions of people playing in urban space [46]. From ancient Egypt onwards a playful atmosphere was deliberately created in the designed landscape: the gardens of Egypt and Persia were furnished with water basins that tempered the microclimate while functioning as playful mirrors. In ancient Greece, competition *agon* stood at the centre of civic life, and the first evidence of play integrated into the urban fabric survives there in the form of gaming boards incised into steps, paving and other stone structures in sanctuaries including the Acropolis [27]. In Rome, *ludi* were central to public entertainment and the amphitheatre was reproduced across the empire as an instrument of collective identity [38]. Medieval urban life was bound to the ecclesiastical calendar, which absorbed pagan rituals and seasonal festivals and provided occasions for collective play [2]; compulsory archery practice generated dedicated settings in the village landscape that served military ends while providing entertainment [26; 19].

In the Italian Renaissance garden, playfulness and dramatic effect were integral to design [5]. Water jokes were the characteristic

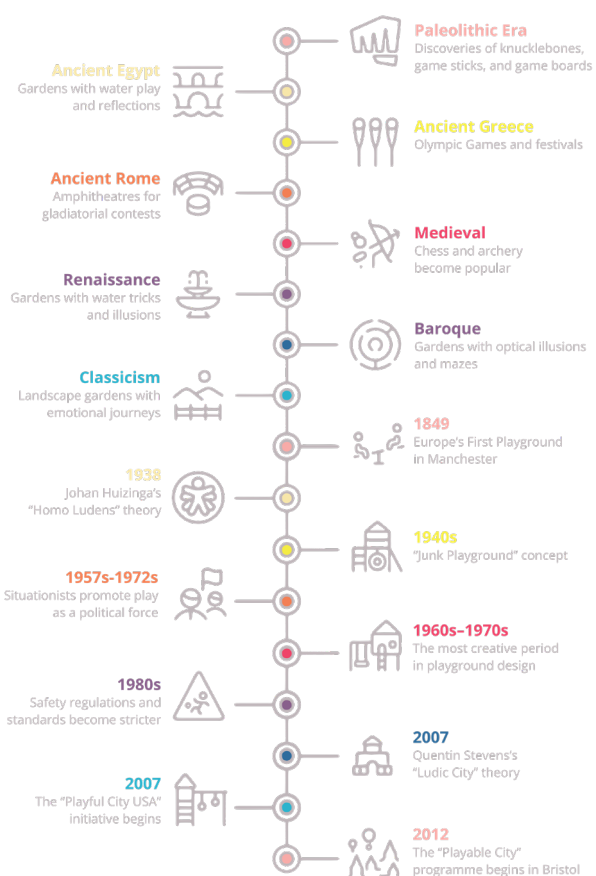


Fig. 1. Tracing the Development of Play Environments
 [created by the authors]

device: at the Villa d'Este in Tivoli a concealed fountain in the Grotto of Pomona was fitted with two jets, so that blocking one caused the other to strike the face of the curious visitor, while the water organ produced music from water flowing through pipes [35]. In the Baroque period gardens became stages on which illusion prevailed: Le Nôtre employed false perspective to compress or extend apparent distances and modelled terrain so that the main axis appeared to stretch into infinity, while canals hosted water spectacles and staged battles of miniature ships [6]; the labyrinth created a physical and mental journey requiring the visitor to make choices [8]. The English landscape garden developed playfulness into a choreography of experience, composing the garden as a sequence of pictorial scenes along a predetermined route that deliberately alternated dark plantings with sudden sunlit prospects [33].

For centuries children played unsupervised, chiefly in the street. The playground emerged in the 1840s (Fröbel's first sandpit, and in 1849 the first documented European playground in Queen's Park, Manchester, equipped for cricket, bowling and ball games and intended for adults as well as children), motivated primarily by safety, and from the 1880s spread in the United States partly as an instrument for integrating immigrant children [7]. Growing motorisation in the early twentieth century made street play unsafe and became the principal justification for construction, while timber apparatus gave way to mass-produced metal structures. Criticism of uniformity produced Sørensen's *junk playground* in the 1940s, and the 1960s and 1970s are regarded as the most inventive period in playground design, when landscape architects produced singular solutions unconstrained by prescriptive codes; from the 1980s, liability and safety concerns imposed standardised regulation [7].

This trajectory matters for the present study: over roughly a century and a half, play was progressively concentrated

into a single, separately regulated spatial type, reversing the historical condition in which playfulness was distributed throughout the designed landscape.

From the ludic city to the playable city

Homo Ludens established play as constitutive of culture, arguing that ritual, contest, judicial procedure, art and literature are generated through play, and warning that modern civilisation was losing the spirit of play [17]. The work inspired the Situationists, who reconceived playfulness as a political force for recovering freedom and creativity and introduced the *dérive*, *psychogeography* and *unitary urbanism* [13; 39]. Building on both traditions, Stevens [39] developed the ludic city: one function of urban public open space is to host informal, non-instrumental social interaction, and playful activity responds to the affordances of space but arises equally as a reaction against its constraints. Cities must therefore retain loosely defined space that may appear redundant, since any site affords more uses than its design anticipated.

From the early twenty-first century these ideas entered policy. Playful City USA, launched in 2007, challenged municipalities to rethink the city from the child's perspective and marked a practical step from the theoretical ludic city to an implemented playful city [20]. The Playable City programme, begun in Bristol in 2012, mobilises smart-city infrastructure to produce sociable urban experiences and positions itself as a critique of the conventional smart-city paradigm [25]. Playfulness further intersects with tactical urbanism [42], the child-friendly city [43], cities for people [10], and the sustainable, resilient and inclusive city [4].

Materials and Methods

The study is qualitative and exploratory, conducted in four stages: a literature review establishing the concept of play and its historical manifestations; a purposive comparative analysis of nine international cases; a questionnaire survey of public attitudes in Latvia; and the synthesis of an operational design framework. A narrative rather than systematic review was selected because the subject spans archaeology, cultural theory, developmental psychology, planning policy and design practice, and because a substantial part of the relevant material (municipal strategy documents and design office publications) falls outside indexed academic databases. Cailliois's [3] four categories were adopted as the analytical framework for both the case analysis and the interpretation of survey preferences. Three considerations motivated the choice. The categories classify play by the attitude of the player rather than by the outward form of the activity, which makes them transposable across cultures, ages and equipment types; they encompass non-competitive play and therefore avoid the bias towards measurable athletic performance that characterises much conventional provision; and an attitude-based classification is compatible with affordance-based reasoning in design, since each attitude implies a set of environmental properties a site must possess for that attitude to be adopted. The transposition itself forms part of the contribution of this paper: Cailliois developed his typology to classify games, not places.

Nine cases were selected purposively against five criteria: the project is completed and in operation, or the policy formally adopted; playfulness is an explicit and documented intention; the set covers three scales of intervention: municipal policy, programmatic intervention and permanent spatial design; the set covers three site typologies: squares, waterfronts and post-industrial territories; and documentation is publicly

available in English or in translation. Each case was analysed for the mechanism by which playfulness is produced, rather than described formally, and coded for the dominant Cailliois categories it affords.

The questionnaire survey was conducted among residents of sixteen Latvian cities: Riga, Cēsis, Valmiera, Jelgava, Bauska, Jūrmala, Tukums, Dobele, Saldus, Kuldīga, Talsi, Liepāja, Līvāni, Rēzekne, Krāslava and Daugavpils. A total of 139 responses was obtained: children aged 7–12 ($n = 23$), adolescents aged 13–17 ($n = 26$) and adults aged 18 and over ($n = 90$; 65 women, 25 men). Three instruments were used, adapted to each group; the children's questionnaire was administered on paper and electronically, the other two electronically, sharing the majority of their items and so permitting direct comparison. Instruments combined closed items, image-based forced-choice items presenting alternative design solutions for the same urban element, five-point rating items and open-ended questions, the latter analysed by inductive thematic categorisation. Participation was voluntary and anonymous; for respondents under 18 it was arranged through guardians or the educational institution.

Several limitations should be stated. The case analysis is desk-based, and case documentation is in part produced by the designers themselves. The cases are drawn exclusively from high-income Western European, North American and East Asian contexts. The survey used a non-probability convenience sample, is not statistically representative, is skewed towards women in the adult group, and has a children's subsample small enough that a single response shifts a proportion by more than four percentage points; response counts also varied between items, and bases are given below where they differ from the group total. Image-based items measure stated preference rather than observed behaviour.

Results

International experience

City-scale strategies. In Bristol, the Playable City movement treats digital infrastructure as a medium of play: *Stop, Smile, Stroll* converts a pedestrian crossing into a thirty-second interlude in which a camera responds to the waiting user with a compliment, music and a filtered video; *Urbanimals* projects motion-responsive animal figures onto surfaces throughout the city; *Street Pixel* converts paving into light- and sound-responsive panels. The interventions are low in capital cost, reversible, and dependent on continuous maintenance [29]. In Rotterdam, playfulness is embedded in municipal policy rather than in objects: the vision *Kom op naar buiten!* prescribes measurable requirements including universal accessibility, meeting places along frequently used routes, provision for several target groups in any space exceeding 1,000 m², and a minimum of 25 % undesignated free space within play and sports areas [11]. In Dublin, A Playful City operates through co-design conducted in the everyday settings of residents rather than in institutional venues, with the effect that inhabitants author the design brief; *Love Our Laneways*, the *Portlaoise Active Travel Zone* and *Beat Seats*, a set of xylophone-like benches designed by a teenager, illustrate the approach [36].

Squares and waterfronts. *Superkilen* in Copenhagen uses play as an instrument of cultural integration: residents nominated more than one hundred urban objects from their countries of origin, distributed across a red activity square, a black square for quieter gathering and a green park, with boundaries between playground, street and rest area deliberately absent [1]. At *Alldgate* in London a continuous

Table 1. Comparative overview of the analysed cases [created by the authors]

Case, location, year	Scale and type	Mechanism of playfulness	Dominant play forms	Transferable principle
Playable City (Bristol, 2012)	Programme; digital layer	Responsive projection, sensing and sound in circulation space	<i>Alea, mimicry</i>	Play can be added to existing infrastructure without reconstruction
<i>Kom op naar buiten!</i> (Rotterdam, 2016)	Municipal policy	Quantified spatial standards	All four, indirectly	Playfulness is governable through measurable norms
A Playful City (Dublin, 2017)	Co-design	Brief authored by residents in their own settings	<i>Mimicry, agôn</i>	Relevance is a product of method, not object
Superkilen (Copenhagen, 2012)	Square	Resident-nominated objects; zoning removed	<i>Mimicry, agôn, ilinx</i>	Cultural identity as the content of provision
Aldgate (London, 2024)	Square	One continuous element deformed into many functions	<i>Agôn, ilinx</i>	One form replaces a set of single-purpose objects
WaveDecks (Toronto, 2009)	Waterfront	Wave geometry producing level change	<i>Ilinx, mimicry</i>	Play as by-product of structural form
LaLaport Toyosu (Tokyo, 2006)	Waterfront	Undulating ground plane; oceanic narrative	<i>Ilinx, mimicry</i>	Topography substitutes for equipment
Bridgeline Park (Shanghai, 2021)	Post-industrial	Retained fabric plus interactive water	<i>Alea, agôn</i>	Minimal intervention with retained identity
Tank Park (Auckland, 2022)	Post-industrial	Industrial components reused as apparatus	<i>Mimicry, ilinx, alea</i>	Heritage material as play material

orange ribbon deforms along its length into seating, a climbing bridge, exercise apparatus and a communal table [22]. The Toronto *WaveDecks* replace narrow promenade sections with timber platforms built out over the lake, their wave geometry generating amphitheatre seating, a 57 m bench and level change for climbing [45]; *LaLaport Toyosu* in Tokyo applies an oceanic metaphor across landform, furniture and lighting, the undulating ground plane producing enclosed pockets and slopes that operate as slides [21]. In the last two cases play is generated by topography, without conventional equipment.

Post-industrial territories. *Bridgeline Neighborhood Park* in Shanghai, on the site of a closed vacuum-flask factory, retains the chimneys as historical evidence while accommodating a market plaza, a community plaza with an interactive fountain, a 600 m running loop and a retained camphor avenue [15]. *Tank Park* in Auckland retains the tanks, pipes and valves of a former bulk-storage terminal; its *Play Line*, assembled from recycled industrial components and incorporating light, sound and water triggered by restored valves, converts the industrial residue itself into the play apparatus [16].

Four findings emerge from the comparison. First, playfulness operates at three distinct and non-substitutable levels: policy, process and form. Rotterdam demonstrates the first, Dublin the second and the six design cases the third; interventions at the level of form alone remain isolated exemplars unless supported by a policy framework that requires them and a process that grounds them in local use. Second, in the most spatially ambitious cases play is generated without dedicated equipment, through landform, structural geometry, a single continuous element or retained industrial fabric; the conventional playground is one delivery mechanism among several, and not necessarily the most efficient in area or cost per user. Third, the deliberate removal of functional zoning recurs in the strongest square and waterfront examples,

indicating that indeterminacy is pursued as an objective and corroborating Stevens's [39] argument that loosely defined space is a necessary rather than residual component of public open space. Fourth, digital interventions offer reversibility and low capital cost but transfer expenditure to maintenance, and a non-functioning installation delivers no benefit while remaining physically present.

Public perception in Latvian cities

The most consistent finding of the survey is that playfulness is not perceived as a children's prerogative. Asked whether playfulness is intended for children, for adults, or for everyone together, 87.8 % of adults (n = 90) and 73.1 % of adolescents (n = 26) selected "for everyone together"; the remainder in each group attributed it principally to children, and no respondent in either group attributed it principally to adults. The children's group concurred: 76.2 % considered that adults can play in the same way as children. This stands in direct opposition to the prevailing allocation of play provision to a single age group.

The two older groups nonetheless associate playfulness with different values. Among adolescents it is most often linked to freedom and joy (54 %), followed by being together with others (27 %), childishness (15 %) and sport (4 %). Among adults the order is reversed: being together predominates (58 %), while freedom and joy is selected by 28 %. Playfulness is thus construed by adolescents primarily as emotional release and by adults primarily as social proximity – a difference with direct design consequences.

Preferred forms of activity likewise diverge (bases n = 26 and n = 89). Adolescents favour digital and intellectual activities (73.1 %) and creative activities (69.2 %), with constructive activities least selected (38.5 %). Adults favour intellectual (64 %), physical (60.7 %) and constructive activities (57.3 %),

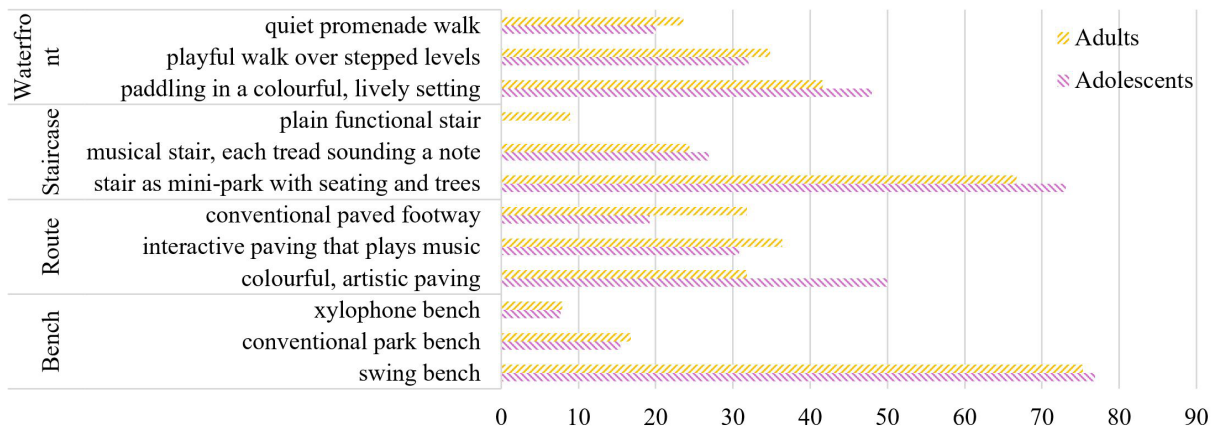


Fig. 2. Preference between alternative design solutions for the same urban element (%) [created by the authors]

with digital activities distinctly rare (28.1 %). Asked what kind of city they would choose, both groups placed safety first (adolescents 88.5 %, adults 73.3 %) and greenness second (76.9 % and 60.0 %); in both groups a predictable city was the least desired option (3 %), corroborating from the demand side the finding that indeterminacy is a design objective.

Image-based forced-choice items produced a consistent and, for the argument of this paper, unexpected pattern (Fig. 2).

The swing bench – an element affording bodily movement, and thus *ilinx* – was the single most preferred solution across both groups, and the staircase conceived as a miniature park was similarly dominant. By contrast, the two sound-based interactive elements were the least preferred options in their sets, the xylophone bench attracting under 8 % in both groups. Rating items confirmed the pattern: the rope net received the highest mean rating (adolescents 4.38, adults 4.32), followed by the mist fountain (4.08 and 4.30) and the slide as an alternative to stairs (4.23 and 3.74).

Among children ($n = 23$), no single category of game dominated, indicating diverse and undifferentiated interest. Two findings are of direct design relevance. Asked whether a ready-made playground or a self-invented game using whatever is at hand is more fun, 52.2 % answered that both are equally enjoyable, indicating that structured provision and opportunity for improvisation are complements rather than alternatives. Asked what most obstructs play in the city, 65.2 % identified the absence of friends or other children, well ahead of traffic volume or the lack of interesting objects: for this group the binding constraint on play is social rather than physical.

Open responses reinforced these results. Asked what makes a city boring, respondents produced five recurring categories: architectural monotony, emotional atmosphere, absence of greenery, lack of cultural activity, and acoustic conditions; boredom is constituted as a compound of visual, emotional, environmental, social and acoustic factors rather than the visual monotony that design responses usually address. Asked about the significance of play, respondents treated it as a source of emotional well-being, a social instrument overcoming barriers between age groups, and a developmental capacity sustaining creativity and flexible thinking into adulthood; play was consistently characterised as a universal human need across the life course.

A design framework for playful public open space

Competition (*agôn*) comprises play with explicit rules in which skill, agility or strength is tested, and may equally be directed against oneself (Fig.3). **Chance (*alea*)** introduces surprise and the pleasure of discovery, the outcome

determined by factors outside the user's control (Fig.4).

Simulation (*mimicry*) rests on the capacity to pretend, to assume roles and to enact events outside everyday reality, allowing public space to become a stage (Fig.5).

Vertigo (*ilinx*) rests on the pleasure generated by movement, speed, rotation and swinging, when accustomed equilibrium is disrupted (Fig.6). Because this last category deliberately operates at the threshold of controlled instability, its implementation is inseparable from risk management: fall heights, impact-attenuating surfacing, clearance zones, and maintenance regimes must be resolved in accordance with applicable safety standards, the design task being to preserve perceived risk while eliminating hidden hazard.

Play in public open space supports four clusters of development outcomes. **Physical** development is served by climbing structures, unstable surfaces, inclined planes, changes of level and spring-mounted elements, and even by graphic markings on pavements that introduce brief interludes of movement in users with no conscious intention of playing. **Social** development arises where elements attract several users at once: rotating structures, jointly turned cylinders and swinging platforms oblige cooperation to generate motion. **Cognitive and creative** development is activated by mechanisms responding to particular sequences, by chalk walls and perforated panels, and by optical illusions that resolve only from a particular viewpoint. **Sensory and emotional** experience is produced by contrasting textures, materials of differing thermal behaviour, wind chimes and water sounds, reflective surfaces and presence-responsive lighting.

The intersection of the four play forms with the four domains yields a matrix (Table 3) which may be used diagnostically, to identify which combinations an existing public open space already affords and which are absent; and generatively, to derive a programme of elements covering the full range rather than defaulting to the physical *agôn* combination that predominates in conventional provision. Applied to the analysed cases it explains their differing reach: Superkilen and Tank Park populate three columns across three rows, whereas a standard equipment-based playground typically populates a single cell.

Principles and scales of implementation

The matrix specifies which forms of play a public open space should afford; it does not specify where in the city or at what scale they should be introduced. Five principles govern integration, each traceable to specific evidence in this study rather than asserted as general good practice.

Accessibility. Play must be attainable by everyone irrespective

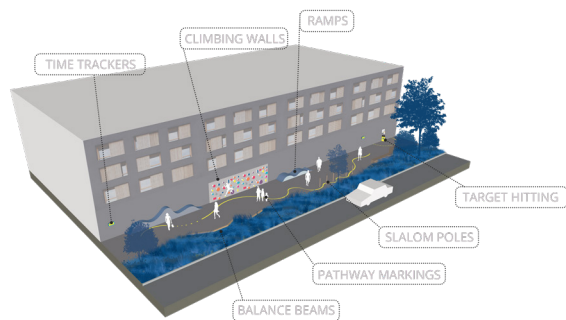


Fig. 3. Conceptual application of competitive (Agon) elements in the urban environment [created by the authors]

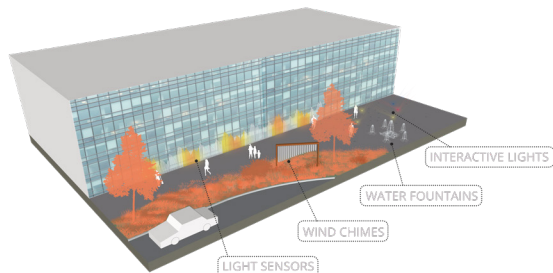


Fig. 4. Conceptual application of chance (Alea) elements in the urban environment [created by the authors]

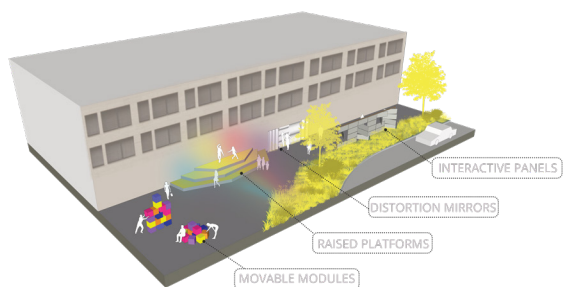


Fig. 5. Conceptual application of simulation (Mimicry) elements in the urban environment [created by the authors]



Fig. 6. Conceptual application of vertigo (Ilinx) elements in the urban environment [created by the authors]

of age, physical ability or social status, which requires that playful elements be positioned along everyday routes – on pavements, in parks, in the spaces between buildings and wherever pedestrian flows concentrate – rather than in destinations reached only by deliberate journey. Rotterdam shows the requirement to be amenable to quantification; the survey supports it from the demand side, since the most cited obstacle to children's play was the absence of other children, a constraint that positioning within existing flows addresses and that additional equipment in isolated locations does not.

Safety. Safety is understood not as restrictive control but as considered spatial organisation within which people can explore and test their capabilities: well-overlooked areas, durable materials, controlled fall heights and impact-attenuating surfaces where required, and lighting adequate for the dark part of the day; of particular weight at Baltic latitudes. It also entails separating play from vehicular traffic. This must be distinguished from the zoning the strongest cases remove: the boundary to be maintained is that between play and traffic, not that between play and the other uses of public space. Conflating the two produces the fenced enclosure this argument seeks to move beyond.

Place identity. Play elements cannot exist in isolation from the character, history and social life of their setting, and solutions may draw on local traditions, materials, forms and motifs. *Superkilen*, where the content of provision is the cultural origin of the residents, and *Tank Park*, where industrial residue becomes the apparatus, demonstrate the principle in its strongest form: identity is not applied as decoration but constitutes the material of play.

Continuity with existing structure. Playfulness should extend the functional and spatial order of the city rather than compete with it, which also permits existing resources to be used, material where budgets are constrained. At *Aldgate*, *Toyosu* and the Toronto *WaveDecks*, play is a by-product of the primary spatial gesture rather than an additional layer of equipment.

Community involvement. Playfulness cannot be produced solely as a professionally prepared design solution; co-design workshops allow representatives of different ages and social groups to work jointly on a vision for a specific site through idea mapping, use scenarios and experimental prototyping. The involvement of adolescents deserves particular emphasis, since they are among the most intensive everyday users of public open space while their needs are among the least registered in planning. The Dublin cases show local relevance to be a product of the engagement method rather than of the object installed.

Small-scale interventions allow change to be introduced quickly and with modest resources. Playful markings and graphic elements integrated into pavements convert

Table 2. Operationalisation of Cailliois's categories as urban design affordances [created by the authors]

Category	Player's attitude	Spatial affordance sought	Representative elements	Principal risk
<i>Agôn</i>	Reliance on one's own ability; measurable outcome	Comparability, graded difficulty, visible results	Graded climbing walls, balance beams, sprint markings, target elements, reaction panels, timing sensors	Exclusion of lower-ability users if difficulty is not graded
<i>Alea</i>	Reliance on anything other than oneself	Unpredictability, responsiveness, surprise	Sensor-controlled fountains, responsive lighting, wind-driven bells, spinners, moving panels	Dependence on technology and maintenance
<i>Mimicry</i>	Temporary suspension of one's own identity	Ambiguity, open interpretation, loose parts	Abstract objects, unconventional seating, mirrors, distorting panels, movable blocks, projections	Over-specification, which forecloses interpretation

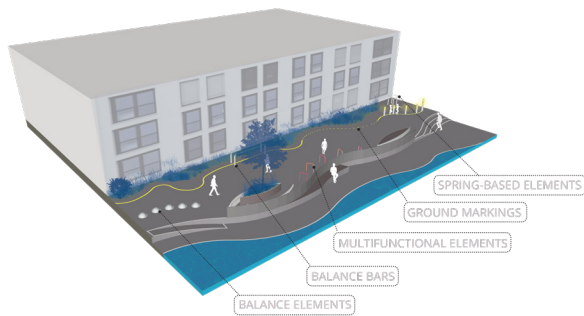


Fig. 7. Conceptual application of physical activity elements in the urban environment [created by the authors]

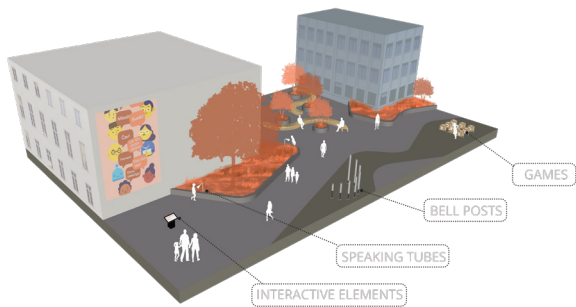


Fig. 8. Conceptual application of social interaction elements in the urban environment [created by the authors]

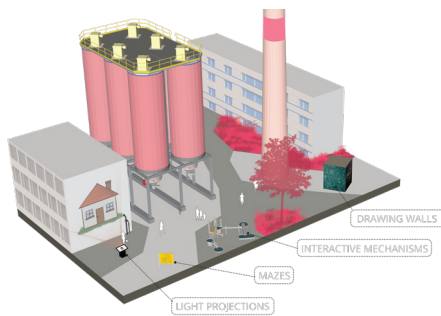


Fig. 9. Conceptual application of cognitive and creative elements in the urban environment [created by the authors]

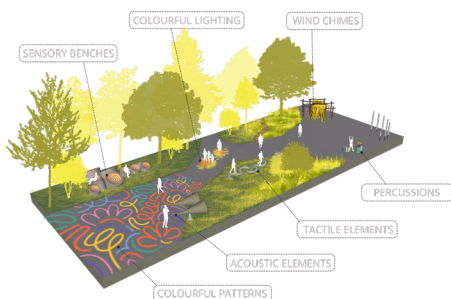


Fig. 10. Conceptual application of sensory elements in the urban environment [created by the authors]

ordinary movement into a playful experience, occupy no additional land and require no structural work. Mobile and movable objects (benches, modular platforms, timber blocks, improvised stage elements) permit residents to alter the arrangement of space, and are the principal spatial means of affording *mimicry*, since their openness to reinterpretation is precisely what they offer. Contemporary art elements operate as unexpected discoveries and introduce alea without dependence on technology. Interactive elements responding to movement, touch or sound provide immediate feedback and are effective where pedestrian flow is high, but the survey qualifies this category: sound-based variants were the least preferred options tested, and interactive solutions should therefore be introduced selectively, with movement- and light-responsive variants preferred in the absence of local evidence to the contrary. Beyond their intrinsic value, small-scale solutions function as pilots: temporary installations reveal how people respond before capital is committed, and the cost of establishing this is negligible relative to the cost of construction.

Large-scale strategies extend to the scale of the city as a whole, resting not on individual elements but on an integrated approach encompassing mobility planning, a network of public spaces and community involvement. Playful routes are the principal instrument: thematic or movement-oriented connections between significant points, linking schools with parks, residential districts with central squares, or cultural quarters with recreational areas, along which playful elements are distributed linearly rather than concentrated at a single point, so that they function as landmarks orienting the user. Three arguments from this study support the route as the organising device. The binding constraint on children's play is social rather than physical, and a route connecting schools with parks places play where children already move in numbers. Playful elements are most effective where they extend existing structure, and a route requires no new land. And the Portlaoise case demonstrates that a playful route can carry an additional policy objective, the shift of school journeys from car to active travel, which materially strengthens the case for funding.

A route strategy presupposes a network. In Latvian and wider post-socialist cities a substantial part of that reserve consists of the large, undifferentiated inter-block courtyards of the mid- and late-twentieth-century housing stock: extensive, centrally located, under-used and already embedded in daily pedestrian movement. Their ownership structure is an obstacle to conventional redevelopment but not to the small-scale and mobile interventions described above, which makes the courtyard the primary site at which the route network and the small-scale repertoire meet. At Baltic latitudes such a strategy must also address a long season

Table 3. Play forms and developmental domains: a matrix for design and analysis [created by the authors]

#	Physical	Social	Cognitive and creative	Sensory and emotional
Agôn	Strength, agility, coordination, reaction	Peer contact, spectatorship, rule negotiation	Strategy, self-assessment, goal setting	Achievement, self-efficacy
Alea	Reactive movement, timing	Shared surprise, spontaneous grouping	Anticipation, causal reasoning	Curiosity, delight, refreshment
Mimicry	Gesture, expressive movement	Role negotiation, collaborative narrative	Symbolic thought, narrative construction	Identification, emotional bond with place
Ilinx	Balance, proprioception, vestibular stimulation	Turn-taking, mutual encouragement	Risk assessment, bodily self-knowledge	Release, exhilaration

of darkness and snow cover: lighting performs a double function, extending usable hours and constituting a playful element in its own right, and provision should be weighted towards elements operating year-round, with winter treated as a design condition rather than an interruption.

Discussion

The case analysis and the survey converge on the central claim of this paper from opposite directions: the cases demonstrate that playfulness can be produced throughout the public realm by spatial means other than equipment, and the survey demonstrates that this is what people say they want. The near-unanimity of the finding that playfulness is "for everyone" indicates that the concentration of provision in children's facilities reflects planning convention rather than public expectation.

The survey also qualifies the case evidence in a way the case analysis alone could not. Two of the three sound-based interactive elements tested were the least preferred options in their sets, the xylophone bench attracting under 8 % in both age groups; significant because such an element, in the form of Dublin's Beat Seats, appears in the international literature as an exemplary intervention. The pattern that emerges is a preference for elements affording bodily movement and multifunctional greenery, and a comparative indifference to elements whose playfulness is delivered through sound. Whether this reflects cultural norms concerning noise in public space, a preference for solutions legible as useful, or the presentation of the images themselves cannot be determined from these data. The practical implication is that transferability cannot be assumed from international acclaim, and that temporary installation offers an inexpensive means of establishing local preference before construction.

The generational difference in the meaning attributed to playfulness carries a further consequence. Provision aimed at adolescents should prioritise autonomy, movement and unprogrammed space; provision aimed at adults should prioritise co-presence and settings supporting extended stay. Both readings can be accommodated in the same space, but not by the same element.

Three tensions warrant attention in application. The strongest cases pursue functional ambiguity, whereas the post-1980s regulatory framework presupposes designated, inspectable and certified equipment within defined zones; *ilinx* is where this tension is sharpest and, on the survey evidence, where demand is highest. *Agôn* is the most readily provided category and also the one most liable to exclude where difficulty is ungraded. And digital interventions convert capital cost into operating cost, so that in municipalities with constrained maintenance budgets a topographic solution may deliver a longer service life for comparable expenditure; a consideration reinforced by the low preference recorded here for technologically mediated sound elements.

Two limitations bear directly on interpretation. Reported play frequency differed sharply between adolescents, none of whom reported playing weekly or more often, and adults, over half of whom did; this is more plausibly attributable to the presence of children in adult households and to differing interpretation of the term *rotalāties* than to a genuine behavioural difference, and is the least secure result reported here. The sample is also a convenience sample, and image-based items measure stated preference rather than behaviour. Three lines of further research follow: observation-based validation of the matrix through post-occupancy evaluation; a representative survey capable of supporting inferential comparison between age groups; and dedicated investigation of the apparent aversion to sound-

based interactive elements, which is the most actionable and least explained result of this study.

Conclusions

Playfulness has been an instrument of landscape design since antiquity, distributed throughout gardens and public space rather than concentrated in a dedicated typology. The playground, which emerged in the mid-nineteenth century and was progressively standardised after the 1980s, resolved a real safety problem but reversed this historical condition. The contemporary playful city movement is best understood as a return to the earlier distributed condition under modern circumstances.

Comparative analysis of nine international cases shows that playfulness operates at three non-substitutable levels (policy, process and form) and that in the most spatially ambitious cases play is generated without dedicated equipment, through landform, structural geometry, a single continuous element or retained industrial fabric.

Survey evidence from 139 respondents in sixteen Latvian cities indicates that playfulness is not perceived as a children's prerogative: 87.8 % of adults and 73.1 % of adolescents regard it as intended for all ages. Current provision therefore reflects planning convention rather than public expectation. Among children, the principal obstacle to play was the absence of other children rather than any deficiency of equipment, which reframes provision as a question of location and programming rather than of specification.

Preference is weighted towards elements affording bodily movement and multifunctional greenery – the swing bench, the rope net, the stair conceived as a miniature park – and away from elements whose playfulness is delivered through sound, with the xylophone bench attracting under 8 % in both groups despite the international standing of comparable interventions. Transferability of celebrated international solutions cannot be assumed and should be tested before implementation.

Caillois's four categories can be operationalised as spatial design categories and cross-tabulated with four developmental domains. The resulting matrix supports both diagnostic assessment of existing public open space and generative programming of new space, and offers a corrective to the physical *agôn* default of conventional provision. At city scale, the playful route offers an organising device that requires no new land, places play where users already move, and can carry additional policy objectives; in the Baltic context the inter-block courtyard constitutes the principal spatial reserve for such a network, and seasonality must be treated as a design condition rather than an interruption.

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Kopsavilkums

Publiskā ārtelpa nav tikai fiziska infrastruktūra, tā ir sociāla, kultūras un emocionāla telpa, kurā atspoguļojas iedzīvotāju vērtības un ikdienas pieredze. Rotaļīgums tajā tomēr gandrīz vienmēr tiek novietots vienā telpiskā tipā – norobežotā un standartizētā rotaļu laukumā, kas paredzēts vienai lietotāju grupai. Raksta mērķis ir noskaidrot, kā spēles elementi tiek integrēti publiskajā ārtelpā ārpus tradicionālā rotaļu laukuma, kā šādu integrāciju vērtē potenciālie lietotāji Latvijā, un uz šī pamata piedāvāt ietvaru rotaļīgas publiskās ārtelpas projektēšanai.

Pētījumā apvienota literatūras analīze, deviņu starptautisku gadījumu salīdzinošā analīze un iedzīvotāju aptauja, kurā piedalījās 139 respondenti no sešpadsmit Latvijas pilsētām trīs vecuma grupās. Rožē Kaijuā (*Roger Caillois*) četras spēļu kategorijas agôn, alea, mimicry un ilinx operacionalizētas kā telpiskā dizaina kategorijas un sasaistītas ar četrām attīstības jomām, veidojot matricu, kas izmantojama gan esošās ārtelpas izvērtēšanai, gan jaunas telpas programmēšanai.

Gadījumu analīze rāda, ka rotaļīgums darbojas trīs savstarpēji neaizstājamajos līmeņos (politikas, procesa un formas), un ka telpiski vērienīgākajos piemēros rotaļa tiek radīta bez speciāla aprīkojuma, izmantojot reljefu, konstrukcijas ģeometriju vai saglabāto industriālo mantojumu. Aptauja liecina, ka 87,8 % pieaugušo un 73,1 % jauniešu uzskata rotaļīgumu par visām vecuma grupām domātu, taču priekšroka tiek dota elementiem, kas rosina ķermeņa kustību un ir daudzfunkcionāli un zaļi, nevis skaņā balstītiem interaktīviem risinājumiem. Tas norāda, ka starptautiski atzīti risinājumi nav vienmērīgi pārnesami un pirms ieviešanas būtu jāpārbaudāmi vietējā kontekstā.

THE HUMAN-NATURE RELATIONSHIP: COMPLEXITY OF THE PHENOMENON, HISTORICAL EVOLUTION AND ITS REFLECTION IN ARTISTIC WORKS

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Abstract. This study explores the connection between humans and nature, distinguishing childhood as the critical period of its formation. Based on these studies, it is argued that early experiences in nature determine not only the formation of an emotional connection with the environment, but also long-term human ecological awareness and psychological well-being. However, urbanization processes, loss of biodiversity and the reduction of natural spaces in cities weaken the opportunities to experience everyday connection with nature, which raises the need to study the cultural, historical and visual roots of this phenomenon.

In order to understand the cultural and historical context of this connection, a visual graphical analysis of historical works of art, revealing how nature, children and their interaction were depicted in various periods is conducted. European paintings and other visual sources created from prehistoric times to the 21st century are analyzed. The analysis aims to determine how representations of the relationship between people and nature have changed in various historical periods, what sociocultural meanings these images convey, and how they reflect broader societal changes. A literature analysis was also conducted to understand how the relationship between people and nature has changed over historical periods.

Artistic narratives reflect not only the change in the concept of nature, but also society's attitude towards the relationship with the environment. The analysis shows that from early images, in which nature is perceived as the source of human life, to urbanized modern images, the connection with nature is weakening. Based on the results of the study, it is concluded that the connection with nature experienced in childhood is the essential basis of the human-nature relationship, which has a long-term impact on emotional, cognitive, and social development. It is recommended to create more accessible natural spaces in cities, and apply urban strategies that help restore children's daily contact with the natural environment.

Keywords: connection to nature, children, forest, art, history

Introduction

The word nature comes from the Latin language word 'natura' (n.), which means "birth, character, nature". The word birth is important here, because nature, according to Mackeviciute [32], is the beginning of everything, in our case, the start of the evolutionary process. Those places where nature grows without human intervention, forests, fields with trees, plants, animals, are natural places. Berry et al. [5] described nature as an environment dominated by ecosystem processes and urban nature is associated with human intervention [14]. The definition of nature, according to Bratman, Hamilton and Daily, changes over time, it is debated whether nature is a social structure, or it exists itself in a stable and independent form [6]. Despite these differences, nature always played a crucial role in human lives, and man also played an important role in nature. Human life has always been and is dependent on natural resources: food, water, energy, climate change [6]. There is a reciprocal relationship between nature and human, from a cultural ecology perspective, it is understood as an equal interaction, most clearly manifested in cultural landscapes and the landscape is defined as the place where nature and humans interact [27]. People constantly interact with the landscape, discussing what they see there, what they know, but it is often forgotten that the environment is defined more broadly than usual, authors claim that it includes both cosmic influences and microscopic biological organisms [46]. Nature provides not only material benefits - many studies emphasize the benefits of nature for people like physical and mental health, cognitive functions, job satisfaction, decrease of crime and aggression, etc. [1; 6; 11; 42; 38; 50]. The authors also claim that nature determines human happiness [50]. Urban trees are important not only aesthetically, but also as a means of reducing the urban heat island effect and the associated heat stress [35]. Nature provide

benefits not only to people - forests are essential habitats for animals and birds, important for maintaining biodiversity and conserving species [25; 26]. Although there are countless studies showing the positive benefits of nature, the connection between man and nature is weakening, especially in the urban environment, there people are becoming more and more isolated from nature and wilder spaces [13]. The area of human - nature relationship is attracting growing attention because of urbanisation caused problems around the world. As Pietrzak claims, urbanization, decreasing number of forests are responsible for the urban population to become culturally distant from what is happening to the land, water, and endangered local wildlife, although people who still have a connection to nature also seek out natural places in urban environments [38]. Urbanisation, technical development, reduction of forest areas due to ongoing deforestation, loss of species and soil, food shortage, lack of experience with nature are claimed to increasingly distract people from natural environments [39; 43; 46]. Studies have found that the average American spends 90 % of his or her time indoors [6]. The decrease in connection with nature leads to the deterioration of a person's health [4], worsening of his emotional state, depression, and lower social activity of people [6]. This process, according to Basham et al., is called the gradual loss of direct nature experience.

Research shows that biophilic aspects are associated with positive emotions in urban environments [23]. Most construction in the cities consists of buildings and streets for cars to pass through, which are built regardless of the natural processes, that are decisive for the separation of man and nature [10]. The results presented by Samus, Freeman, Heezik, Krumme, and Dickinson show that the loss of this connection can have a negative impact on the environment

and human quality of life [43]. Due to the above-mentioned reasons, the importance and interest in the topic increases. More and more authors are raising questions about how to maintain a connection with nature, especially in an increasingly urbanized environment [4; 10]. As stated by Ritter and Dauksta, it is important to recognize the importance of forests for human identity [39]. A closer connection with nature indicates more significant environmental values and more active human behaviour related to nature conservation [10; 31], people who feel a connection with nature want to protect it [50]. According to Light, restoring the relationship between man and nature is one of the most important conditions for preserving nature [10], creating sustainable cities [4].

The aim of the study is to analyze the relationship between man and nature, its complexity and historical changes, as well as their reflection in works of art. This study also reveals the changing relationship between children and nature in different historical periods, since the relationship with the natural environment during childhood is the most important factor in a person's attitude towards nature in later life.

Methodology

This study used a mixed methodological approach, combining a systematic analysis of scientific literature and a visual content analysis of historical works of art, in order to assess the change in the concept of the human-nature connection and its representations in different historical periods.

Literature analysis: The search for the articles, by related topic, was conducted in Web of science database using the combination of keywords, based on eligibility and inclusion criteria: "connection with natur*" OR "relationship to forest" OR "natural spaces perception" OR "relation to green spaces" OR "relationship to natural environment" OR "make sense of natural" OR "connection with nature" OR "forest perception" OR "contact with natural" OR "connection to nature" AND human* OR people OR man OR woman* OR person OR society" (Web of Science Categories)". The search with exclusion has resulted in 372 documents, from the year 1995 to 2023. The number of articles increased in 2016, when 14 articles were published, to 2022 with 74. It is almost 20

percent of papers published during the entire period. Most of the papers were published by authors Fuller, Richard – 10, Gaston, Kevin J., who published 9 papers, and Richardson, Miles and Shanahan, Danielle, who published 7 papers on this topic. The categories vary from zoology to environmental studies, yet these studies are the widest, in this area 107 papers are submitted. Most of these publications were articles (319). 353 of these publications were published in English. These publications were analysed using open access software Cite space. Figure 1 shows the analysis of keywords by frequency. The 10 most used keywords were connectedness (count 57), health (count 47), benefit (count 44), scale (count 38), connection to nature (count 37), experience (count 36), green space (count 36), nature relatedness (count 34), conservation (count 31), biodiversity and environment (both count 27). The keyword analysis reveals, what aspects of relationship with nature are the most important and the main field of it is environmental sciences. After a quantitative analysis on the exclusion criteria (abstracts and titles of searched papers), 36 articles that investigate what does the relationship between human and nature means, why it is important, and how to maintain and preserve it were selected for qualitative analysis.

Analysis of historical paintings and visual material: To examine the historical development of human connection with the natural environment, a systematic visual content analysis of European artworks created between the Prehistoric times and 21st century was carried out. The material for the study was collected through an online search using Google, applying predefined keyword combinations ("landscape AND paintings" and "children AND city AND paintings") and searching in a historical books of art. In total, 117 artworks were selected for the analysis. The inclusion criterion required that each image depict at least one person in a natural setting or in proximity to identifiable natural elements. Following selection, the artworks were analysed in three stages: by prepared collage, focusing on how people, especially children, are visually represented in relation to their environment, what types of human–nature interactions are illustrated, and whether specific motifs reflect cultural attitudes toward childhood and nature during different historical periods. After preparing

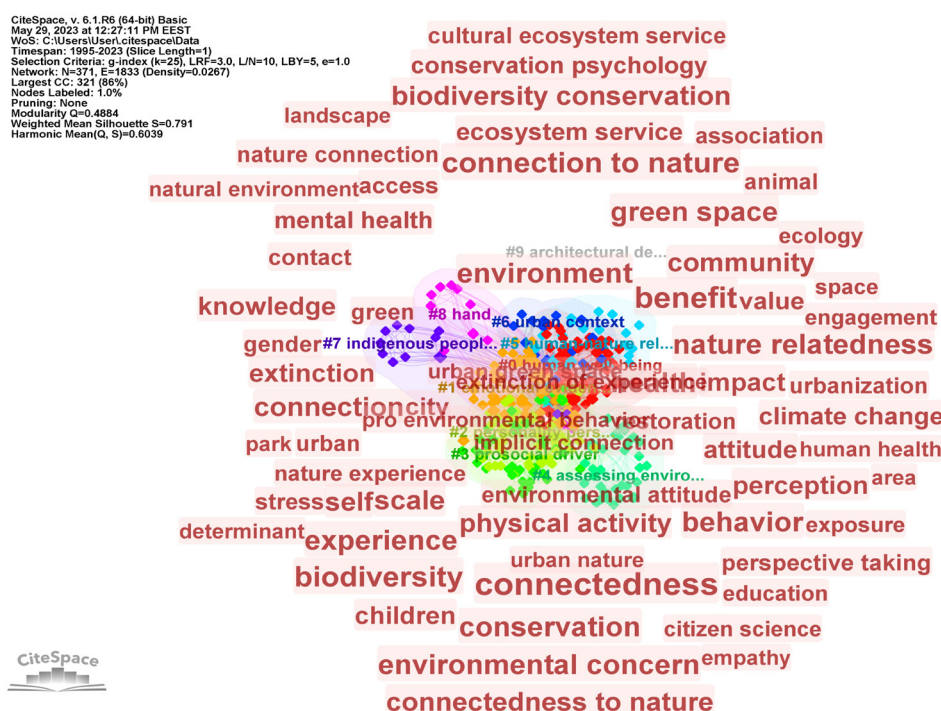


Fig. 1. Citespace analysis of bibliometric data from 353 publications provided by Web of science data search. The graph shows keywords by frequency, the threshold for the keyword's node is 10

the collage, an iconographic analysis was performed, during which:

- specific depicted objects were identified: people, plants, animals, landscape elements;
- the composition of the scene, the dominance of nature (e.g., dominant nature / nature as a background / urban nature) were determined;
- human activity was assessed: active play, exploration, passive presence, movement, observation;

Subsequently, a content category analysis was performed, in which a thematic category scheme was applied in order to assess the intensity of human-nature interaction.

Results. Literature analysis

The Concept of Connection to Nature

Many authors emphasize the importance of connection to nature [14]. Scientists have been increasingly interested in the relation to nature since the middle of the 20th century [18]. They define the connection with nature as the result of the process of biophilia, ecological development, when nature is perceived as a part of human being; a sense of belonging to a broad system of interactions between humans and the non-human world, in which human identity is revealed as a sense of unity with nature, that is, also, thoughts, experiences, behaviors, feelings of gratitude or states [17; 31].

Human connection with nature is a volatile feeling, it can change depending on various circumstances. A. Naess considers this connection to be a human ontological development process, when an individual regards nature as part of their own identity [17], is able to empathize with natural states. A. Leopold (1949) described this connection as person's perception as a participant in the broader biotic community. He considered the nonhuman part to be the earth, consisting of soil, waters, animals, and plants. He also encouraged fostering the relationship between man and nature, because then, according to him, people perceive themselves as a part of nature and take care of it more. Furness says that connecting with nature is returning to one's authentic self [17]. When describing the connection, people feel a sense of belonging to nature. Authors point out that the main definitions of connection with nature are integrating the natural environment into self-concept and experiencing oneself as belonging to nature. They distinguish dimensions of this connection with nature such as affective, cognitive and experiential. Other authors supplement these dimensions with philosophical, material, spiritual, well-being and cultural aspects [15]. Through these dimensions, according to the authors, the understanding of the relationship between man and nature is reflected.

Connection to nature (and forests) can be understood as a multi-dimensional human bond with natural environments that extends beyond material use and includes recreational, aesthetic, spiritual, cultural, and identity-related meanings. In this perspective, forests and natural areas are valued not only for their material benefits but also for recreation, aesthetic experience, spiritual and cultural well-being [20; 37]. These meanings are reinforced through cultural memory shaped by traditions, spirituality, and philosophy, including beliefs that forests and trees are sacred and that such experiences are transmitted through mythology and folklore [41]. Authors also note that spiritual experiences in forests may occur even outside formal religious frameworks, and that attitudes toward forests can express identification with a cultural community or a nation [39]. As Haggstrom suggests, this relationship is reflected in the ways people act in forest environments [18].

The perception and valuation of natural landscapes and forests

Being in nature, in the forest, we perceive the environment through our senses: by seeing changes in light, seeing changing colours of nature in different seasons, smelling the forest's scent, hearing the wind, birds, feeling contact with the ground, and temperature [18; 39]. All these sensations, according to the authors, cause different emotions. Hirschbeck points out that the two most important senses to perceive the forest are sight and hearing [30]. It is said that people especially appreciate the silence in nature when you cannot hear the car noise caused by civilization.

The perception of nature also depends on sociocultural factors and the person's mindset. According to Johnson, a forest photographer, hunter, and forester will perceive the forest differently due to their different experiences and expectations, individual characteristics [33]. According to Hirschbeck, our experience, attitude, needs, memories, values are important for understanding the forest [30]. The environment, its seasonality, weather, and places from which the landscape is observed are also important. The author distinguishes three layers of landscape perception: perception, when only the physical properties of the object are perceived; symptomatic, when a historical hint is given to the object, and symbolic meaning, when the object evokes certain feelings, for example, a sense of freedom.

The way a person identifies himself with nature is also important for the connection with nature [15]. The natural environment can cause both positive and negative emotions. These emotions affect our aesthetic experiences and experiences in nature [23], which can also cause fear or disgust [42]. A sense of security is very important for connection with nature [47]. The collision of people and wild animals, the anxiety of getting lost, invisible obstacles, crime, radical changes in the landscape, are indicated by the author as reasons for the distance from nature [5]. It is recognized that often this gap is determined by social, political, ideological norms or relations that do not allow people to see them as part of nature. The authors suggest that this connection is not preserved when a person focusses on "I" [16]. However, it is believed that people who have a greater connection with nature also maintain a greater sense of security in it [5; 47].

People can also have a negative impression of the forest if it is too transformed or too natural [37]. People see a forest with a lot of dead trees abandoned and neglected, and visible logging reduces the spiritual value of the forest. Hirschbeck says that urban dwellers prefer well-maintained urban forests that are not protected and have little biodiversity [30]. It can be assumed that urban areas that are not properly organized or abandoned are associated with insecurity because where there is a city, there must be human intervention. According to the authors, the most desirable urban landscapes are parks, composed of trees and open grassland, with rivers and lakes, and cliffs and caves that provide shelter [30].

Determinants of Connection to Nature

People can use and manage forests for large profits [36], the human relationship with the natural environment also depends on social, institutional, psychological and political environment [9]. Such cases often involve municipal forests, which are not maintained by residents but by local politicians. Here, forests are often managed only for profit [28]. Although Johnson suggests that humans, like animals, are innate in their adaptation to plant environments: as foxes instinctively know about caves, or birds about trees, so humans pay attention to unsafe places, colors, yet, according to Chang and others,

contemporary lifestyles have reinforced psychological and spatial separation between human living environments and nature [23; 33]. Other authors claim that if the distance from nature continues to increase, emotional connection to nature may decrease [3]. As a solution, they recommend creating biophilic cities that promote opportunities for natural experiences and to use biophilic design principles that would increase people's connection with nature and biodiversity.

Although the connection with nature is significantly influenced by social, institutional, and political contexts, it is practically realized through concrete human experiences in the natural environment. People encounter nature both passively, for example, by observing nature and actively, for example, by walking or picking mushrooms [8; 10]. People who have had experiences in such natural places as the coasts, mountains, forests claim to have felt the strength of nature in them, these places are perceived to be free of human control, in contrast to urban natural environments, which are seen as shaped and controlled by people [14]. Research shows that people's visits to places with greater natural value led to a stronger connection with nature, for example, comparing a greener urban area with a less green one, comparing rural with urban, protected or nonprotected areas [3; 21; 25]. As stated by authors, a stronger connection with nature is characteristic of those individuals who describe nature through personal experience (e.g., activities in nature, positive emotions) [22].

Man's relationship with nature varies depending on cultural and religious traditions. The prevailing anthropocentric environmental ethics in the West has led to the fact that man is considered superior to nature, and an instrumental value is given to nature. Such a dominant attitude separates people from the natural environment: anthropocentrism also leads to decreasing opportunities to experience nature, which leads to the "disappearance of experience with nature" and loss of connection [2; 46]. In the East, the relationship between nature and people was influenced by philosophical concepts such as Taoism, Confucianism and Feng Shui [23]. It was established that in Japan the forest is considered as subjective entity, and in Europe it is considered as objective formation [29]. In many parts of the world, especially among indigenous peoples, many ontological concepts do not separate a person from his or her environment [5]. For example, the American Indian community "huu-ay-at" believes that everything is one - animals, plants, and people. Their approach also leads to sustainable forest management [2].

A stronger connection to nature is associated with experiences in more valuable natural places and more active forms of interaction, yet this association varies across individuals. The connection with nature is influenced by human gender and many other people's characteristics [7; 40]. It is believed that men visit forests more often than women and have more diverse activities in them. Research also shows that encountering and learning about nature plays a very important role in connecting with nature. A person who knows nature better has a stronger connection with it [34], the living environment, cultural differences, dependence on the landscape, frequent or rare visits to the forest become important here [29]. The authors point out that the connection with nature is strengthened by a better knowledge of nature and contact with it in childhood [43], as well as the type of natural environment.

Childhood experiences as a basis for values of connection with nature

Connection with nature is particularly important in childhood, as it is during the early years of life that human values and attitudes towards the environment are formed. Childhood is a critical period when long-term habits and emotional connections are formed, so experiences with nature are particularly important at this time. If cities do not provide children with opportunities to experience nature, society's ecological awareness may decrease in the future. Research shows that children's time spent in green spaces has a direct connection with cognitive development, such as environment helps to improve working memory, algebra development, and motivation to learn [12; 19].

Research also shows that children who see more greenery relax more and experience less fatigue [29, 48]. Research confirms that the natural environment is an environment that is easier to process [45]. Children's attention focuses on natural elements such as trees, greens, flower beds and later on buildings, cars, and other urban buildings. Therefore, it is very important to create urban environments that encourage children's interaction with nature from an early age.

Childhood experiences in nature play a very important role in shaping children's long-term connection with nature [24]. Natural spaces — forests, meadows, rivers, various natural environments — provide a unique environment for free and creative play, which contributes to children's cognitive, emotional and social development. Natural spaces are suitable for children's play, which strengthens their connection with nature [43]. According to Haggstrom, forests have a more varied terrain, which leads to children's dynamic movements, the environment is more diverse in its forms, textures, and elements, which encourages exploring, touching, getting to know, encountering different biodiversity [18]. According to Klein, compared to other spaces, there are more opportunities for creative games in the forest environment, children gain more restorative experience here [44]. In the forest, unlike adults who run and walk more, children play cognitive, risky and imaginative games more. Collado and others argue that such positive and pleasant experiences in childhood promote interaction with nature in adulthood [40]. This leads to a greater desire to preserve biological diversity.

According to E. O. Wilson (1984), the biophilia hypothesis is characterized by an innate attraction to the natural environment, which is most active at an early age. The relationship with nature and forests in today's context is a complex matter, which determines many important moments, depending on the type of natural environment, the type of people, and access to the place. The fact that more people, especially children, spend most of their time in front of screens, perceiving information only by sight, without movement and other senses, could have major changes in our society, the natural environment, and its protection [3]. Children spend more time in schools, within the boundaries of the neighbourhood, and their perceived space changes drastically, from wide to narrow, limited by the gates of the school yard. However, the authors point out that it is important to have access to the forest, the natural environment, to maintain the connection [39].

It is still unclear what kind of natural environment in cities would encourage greater human-nature connection and human engagement and visitation [43]. This is a particularly important question because the connection between man, especially in his childhood, and nature can help create sustainable cities, which with increasing urbanisation these days is a guiding

principle for designers [4]. To prevent the connection with nature from being faded, it must be maintained constantly [17]. According to Fehnker, a 'connection to nature' involves 'knowledge about nature' [15]. This assumption indicates the need to study sociocultural factors as the need for nature education in children's lives. Knowledge and awareness of the benefits can contribute to greater willingness to conserve nature [50]. The nongovernmental organisation Outdoor Association, operating in Sweden since 1892, promotes life in nature and significantly shaped the outdoor educational experiences of many children [18].

Furness points out that childhood experiences can change and the connection with nature can be broken due to the characteristics of the environment in which one spends each day [17]. The authors claim that in a certain sense, biophilia is also a childish thing, because it can be lost when growing up, also children show a greater connection with non-humans [2]. Haggstrom points out that "connection to nature increases in childhood, dips in adolescence, and increases again in adulthood" [18].

Analysis of historical paintings and visual material ***The relationship between man and nature over historical periods***

The relationship with nature is said to have changed over historical periods. Based on this assumption, an analysis of art works - paintings, that focus on humans in a natural landscape - was carried out. After selecting paintings suitable for the topic, the purpose of the analysis was to prepare a collage from them (Fig. 2), and to determine how artists depicted man in nature and in the natural landscape, what was the relationship between man and nature, and how this relationship changed at different periods of time.

Haggstrom (2019) points out that there is an evolutionarily formed relationship between humans and the natural environment [18]. The authors indicate three main historical periods of forest use: the first period was dominated by hunting, gathering and shifting agriculture; in the second, the forest was used for agricultural purposes; in the third period, there was intensive use of the forest for industry [39]. In the early ages, the forest was an integral part of people's lives. The forest did not hinder society development and people did not have a significant impact on the forest ecosystem. Everything began to change, as people became farmers, and the forest became an obstacle to development - space was needed for cultivated fields, pastures, tools, buildings and structures, firewood. This led to a change in the relationship between man and nature.

This trend is also visible in works of art by the prepared collage. It was seen, that in prehistoric times, the focus of

men was on animals and hunting scenes (Fig. 1.1). Plants and forests were not depicted. This changes in ancient history, when plants begin to be depicted fragmentarily, and man appears in the center of attention (Fig. 1.2). Plants occupy the lowest place in the hierarchy structure, but at the same time they are the basis of everything for survival. A connection with animals was also seen, especially in ancient times when God was depicted as an animal. It can be assumed that a connection with prehistoric times was still present, which shows an important connection with animals. The animal was uncontrollable, so it was deified. Later, man tamed animals and became superior to them.

The division of areas into different residential areas of people also has its own history. The opposition between settlements and nature is already found in the Latin and Greek traditions, especially in the Middle Ages. In the Middle Ages and Renaissance periods, man retains the main position and is the dominant figure (Fig. 1.3.). In the Middle Ages, man is above nature, nature is depicted as dependent elements. During the Renaissance, nature became a background, but here we can see the separation of civilization and separation from nature. This period is dominated by religious-themed works depicting a virgin with a baby in her arms.

In the Middle Ages, forests were intensively used for practical social needs - forests were cut down, wood was needed for construction, shipbuilding and other economic activities [14; 39]. With the development of industry, changing wood to iron, later to steel, concrete, the need for forest resources decreased, but as the authors point out, this development also distanced man from nature. This utilitarian approach to the forest and the increasingly pronounced separation of civilization from the natural environment are also reflected in the analyzed paintings: nature is usually depicted as a resource subordinate to man or a secondary background. The human figure and plot dominate the compositions, and the landscape (including the forest) becomes a stage where human activity takes place, thus visually emphasizing the supremacy of man and the increasing distance from nature.

The analysis of selected paintings from the 17th–18th centuries show that during this period, the landscape in Western art established itself as an independent genre, closely related to broader historical changes. In the 17th century, the landscape was increasingly depicted as the main subject of the plot, and the human figure in the composition was reduced. The 17th century is also the time of man's return to nature. In the 18th century, during the Enlightenment, with the strengthening of the tradition of landscape formation of estates and parks [33], nature began to be idealized in paintings: the forest and landscape were constructed as an aesthetic, recreational and emotional space. Man is

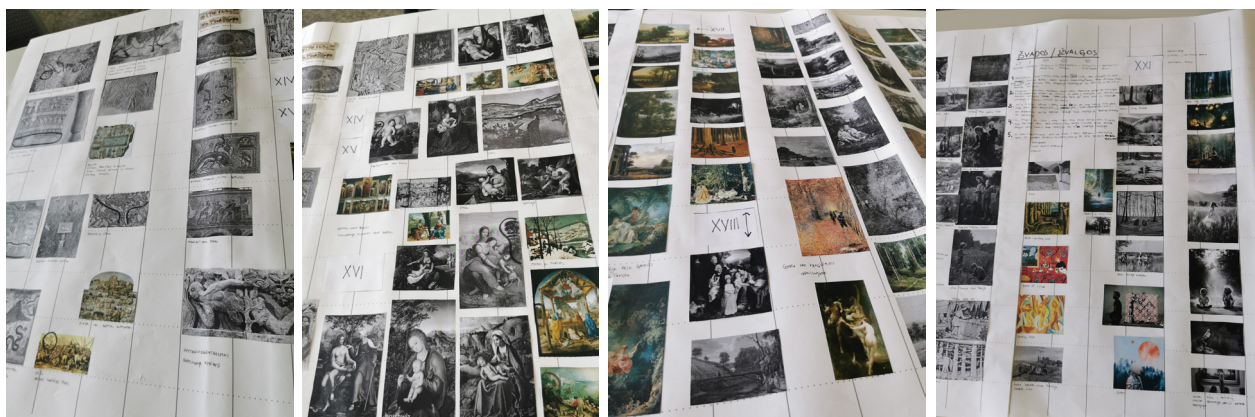
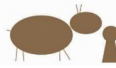


Fig. 2. Collage from paintings [created by the authors]

Table 1. The chronological change in the relationship between man and nature and its reflection in the works of art (paintings) [created by the authors]

No.	Period	The number of paintings	Predominant human activity	Characteristic composition	The pictorial diagram representing the relationship between man and nature
1.1	<i>Prehistoric times</i>	4	Hunting, tracking animals, survival. Man acts as part of nature	The focus is on animals and hunting scenes, the connection between man and nature is direct and functional. The human figure is very small, next to the animal; man is not dominant, he is dependent on nature.	
1.2	<i>Ancient times</i>	10	Religious rituals, mythological stories, daily work, early forms of agriculture. Man begins to dominate, but maintains a connection with the living environment.	Man becomes the central figure, while nature is depicted fragmentarily – plants, trees, hills perform a hierarchically lower, decorative or symbolic function. Man often has mythological significance, thus becoming the most important part of nature.	
1.3	<i>Middle Ages and Renaissance</i>	23	Religious contemplation, images of family and motherhood (Madonna with Child), agriculture.	Nature becomes the backdrop for the religious narrative, playing a secondary role in the paintings. Man dominates, nature envelops him as a backdrop.	
1.4	<i>XVII–XVIII c.</i>	29	Rest, children's games, exploration in nature, walking.	Nature (green form) becomes larger than man, man decreases, a "return" of man to nature occurs. During this period, nature becomes a unique aesthetic and emotional space. Man no longer dominates the composition – he is reduced in scale or completely recedes into the background. The forest and the landscape are idealized, depicted as a refuge and a place of rest.	
1.5	<i>XIX–XX c.</i>	35	Observation, wandering, reflection.	Nature remains important, but it takes on a psychological and symbolic function. The forest becomes a reflection of an emotional state. Man and nature become on a similar scale, but clearly separated. Nature is no longer dominant.	
1.6	<i>XXI c.</i>	16	Being in nature as an exception, not an everyday occurrence. A clear shift of human life into urban and digital space.	Nature often finds itself in the background or becomes fragmented, functioning as a memory, nostalgia, or symbolic backdrop, often conveyed through photography or virtual environments.	

no longer in the foreground – nature, the forest becomes a refuge, a place for recreation, it is idealized. This is reflected in compositions dominated by natural massifs, changes in light and atmosphere, and perspectives of depth, and man often became only an observer, traveler or vacationer, an experimenter of nature.

At the same time, the historically changed attitude towards childhood becomes evident in the paintings of the 18th century: the ideal of the family is taking shape, childhood is increasingly perceived as a separate stage of development, associated with education, the formation of morality and the idea of "naturalness". These cultural changes are also visible in the analyzed images: children begin to be depicted as independent participants in the natural space – playing, exploring, moving in the landscape, and their activities highlight a different, more direct and less socially constrained relationship with the environment than that of adults. In this way, against the background of the historical transformations of the 17th–18th centuries, the landscape in the paintings becomes not just a background, but a significant space of experience, and the figure of the child – an indicator of the intensity and nature of the connection with nature.

Although childhood as one of the stages of a child's development appeared only in the 18th century, it can also be seen in the analysis of paintings, many authors in their

works indicate the importance of childhood in creating a connection with nature [14; 18; 39; 43; 44; 49]. The authors suggest that exposure to nature in childhood leads to greater connectedness in adulthood. It is claimed that the connection between man and nature does not reflect the present, but the past. Research also shows that children who grew up in a rural environment had a greater connection to nature as adults [3]. Children are organically inclined to explore the environment, be interested in animals, plants, natural phenomena, therefore early interaction with nature helps to develop an emotional connection based on curiosity, a sense of security and dependent experience.

In the twentieth century, people again come to the fore, but a close connection with nature and the forest remains. During this period, art becomes symbolic, so natural elements often reflect the inner world of a human. Children are depicted as forest observers, researchers. The 21st century is the age of digitization when a person moves from the city to the digital world. Here you can feel the distance from nature, the forest. It becomes the background again. The industrial revolution shifted more and more people to the cities, which also affected the rhythm of people's lives. In the past, man had to follow the rhythm of nature, now he can survive without it. His daily life is limited to his workplace and home.

Conclusions

The depiction of humans in natural landscapes in Western painting reflects the historically changing relationship between humans and nature – from the early bond of unity and dependence, through the anthropocentric domination and instrumentalization of nature, to the modern psychological detachment and symbolic perception of nature, in which the forest becomes an indicator of these changes. In early periods, nature was perceived as an integral and often sacrificed part of human life, while in later historical periods, under the influence of the anthropocentric worldview, the development of agriculture, industrialization, and technologization nature gradually became subordinated, aestheticized or instrumentally used. This sequence of change is clearly revealed not only in the themes of paintings, but also in the compositional structure: the scale of the human figure, its position in the landscape, and in the change of the role of nature.

In the prehistoric period, man was depicted as an integral part of nature – images of hunting and animals dominate in paintings, while nature is not separated from human activity. In the period of antiquity, man becomes the central figure of images, while nature takes on a structured but hierarchically subordinate position. Plants and landscape elements usually perform a symbolic or decorative function. In the Middle Ages and the Renaissance, human dominance became even more established. Nature becomes the background of religious and social narratives. Civilization is separated from the wild environment. This period reflects the instrumentalization of nature. An important turning point occurs in the 17th–18th centuries – nature begins to function as an independent aesthetic and emotional space. The landscape and forest are idealized, the human figure in compositions is reduced or recedes into the background. In the 19th to 20th centuries, nature takes on an increasingly psychological and symbolic significance, and in the images of the 21st century, a clear technological and urban separation from nature is revealed. Nature is often reduced to a background, fragment, or symbolic image, and the direct relationship with it disappears. Contemporary works reveal the fragmentation of the natural environment and the dominance of the city. Conducted analysis of works of art helps us to understand that the human connection with nature is not a modern discourse, but a long-term part of human culture, which has changed along with social, religious, and urban changes. Artistic narratives reflect the values of society; therefore, their analysis provides an opportunity to understand how over time people's experiences in nature changed and what cultural factors have led to strengthening or weakening of this connection and substantiate the importance of childhood for creating a connection with nature. Artistic narratives reflect and reinforce broader social trends: from nature as a natural environment to nature as a deficient experience. However, to understand the weakening of the human-nature connection in modern urbanized societies, it is necessary to pay attention to the fact that this connection is not a random or late-emerging phenomenon.

Results suggest that a positive relationship with nature is directly related to childhood, it is a critical period in which an emotional connection with nature is formed. It is formed in early childhood, when the first direct sensations and contact with the external environment determine how a person will later understand nature and their place in it. The impact of nature experienced in childhood has a long-term significance for emotional and cognitive development, and early experiences often establish value attitudes that persist in

adulthood. In modern urbanization, children's everyday lives are increasingly moving away from natural environments, so the connection that used to form spontaneously now requires targeted support. It is this early connection that determines how a person will interpret nature in cultural and social systems, as well as how they will later behave in environmental contexts. The weakening of this connection may have consequences for the ecological future of society; therefore, its further study remains relevant and important. It is necessary to strengthen children's daily contact with various natural elements and ensure that this contact is not only visual, but also experienced through movement, play, and exploration.

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Kopsavilkums

Šajā pētījumā aplūkots cilvēka un dabas savstarpējā saikne, īpašu uzmanību pievēršot bērniem kā būtiskām tās veidošanās periodam. Balstoties uz līdzšinējo pētījumu atziņām, tiek uzsvērts, ka agrīnā bērnībā gūtā pieredze dabā nosaka ne tikai emocionālās saiknes veidošanos ar apkārtni, bet arī ilgtermiņā ietekmē cilvēka ekoloģisko apziņu un psiholoģisko labbūtību. Tomēr urbanizācijas procesi, bioloģiskās daudzveidības samazināšanās un dabisku teritoriju sarūkšana pilsētvidē ierobežo iespējas ikdienā veidot un uzturēt saikni ar dabu. Tas aktualizē nepieciešamību izziņāt šīs saiknes kultūrvēsturiskos un vizuālos pamatus. Lai izprastu cilvēka un dabas saiknes kultūrvēsturisko kontekstu, pētījumā veikta vēsturisko mākslas darbu vizuāli grafiskā analīze, pievēršoties tam, kā dažādos vēstures periodos attēlota daba, bērni un to savstarpējā mijiedarbība. Analizēti Eiropas mākslas darbi un citi vizuālie avoti, aptverot laikposmu no aizvēstures līdz 21. gadsimtam. Analīzes mērķis ir noteikt, kā dažādos vēstures periodos mainījies cilvēka un dabas attiecību vizuālais atspoguļojums, kādas sociokulturālās nozīmes šie attēlojumi ietver un kā tie atspoguļo plašākas pārmaiņas sabiedrībā. Papildus veikta zinātniskās literatūras analīze, lai izprastu cilvēka un dabas attiecību transformāciju dažādos vēsturiskajos periodos.

