

The Role of the Characteristics of Urban Furniture and Equipment on the Quality of the Public Space of the Pedestrian Zone

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Abstract

Public spaces are complex structures that contain numerous elements formed by various influential forces such as social relations, spatial elements, contemporary tendencies of city life and many others. The quality of the city's public space determines the frequency of its use, the concentration of content and the intensity of the experience that a place will have on its users. The paper describes the results of research that indicate the influence of the characteristics of urban furniture and equipment as architectural and urban planning elements on the quality of public spaces in the city center. The systematization of the results of the comparative analysis of theoretical positions helped to form three groups of characteristics of architectural-urban elements: spatial, physico-morphological and functional. Through the conducted survey, the opinion of users of the pedestrian zone of Novi Sad was investigated regarding the importance of the researched group of public space elements on their experience of the place.

Keywords: Public Space; Urban Furniture and Equipment; Pedestrian Zone; Quality of Public Space; Architectural and Urban Elements.

1. Introduction

The public areas of cities represent the center of everyday life and as such provide a physical framework for overall public life. The physical structure of each settlement contains recognizable places that reflect the identity of the community. The subject of this research is urban furniture - one of the elements of public spaces that represent the forms of development of social relations in the city. The main reason for any study and aspiration to improve public spaces stems from their connection with users.

The basic problem of the research is defining and determining the characteristics of urban furniture and equipment as architectural and urban elements of public spaces, which, by building their physical framework, influence the character of the place. As structural elements that form public spaces, they are one of the main influential factors for experiencing an environment and forming an image around it. The paper deals with the connection of these elements with the character and quality of public spaces and the effects they have on the perception and ultimate experience they provide. The examination of urban furniture and its characteristics should determine its importance in the formation of high-quality public spaces and the way users access them. The two main dimensions of public spaces are physical (space) and social (activities) (Carmona et al., 2010), which is why the research of architectural-urbanistic elements, and within it also urban furniture, stands out as an important topic on which the physical dimension of space largely depends.

Two main hypotheses were formed through the following considerations:

- *hypothesis 1:* The quality of urban furniture, as architectural and urban elements of public space, affects the creation, improving the experience and image of a place.
- *hypothesis 3:* Urban furniture directly affects the character and quality of public spaces.

The comparative method was used in the parts of the research procedure in which the characteristics and influential aspects of urban furniture had to be defined, as well as the factors and indicators of quality should be singled out. In these parts, it was essential to systematize the obtained data and create causal links between the given areas. The historical method was applied in order to gain insight and confirm the spatial framework of the empirical part of the research, as well as to show the importance of the selected whole. Furthermore, it was necessary to highlight the social conditions of the city, through presenting development stages and changes in social, economic, ideological, cultural, and other relevant fields expressed by the people for whom it is primarily intended. These are indicators of the initial mindsets and awareness of the population that expresses its opinion about a given space. All available data, scientific and professional literature, laws and planning regulations, numerical and statistical data, as well as graphic documentation were analyzed and valorized. This is also the case with the processing of collected data in the empirical phase of research. As an empirical method in this dissertation, a survey was used to examine the opinions and attitudes of the people who use public spaces. The results were used to confirm the views concluded in the theoretical part of the research, once the causal analysis, systematization, and classification of research elements were done. The results provided information that indicates the connections between the physical-spatial characteristics of the space and the requirements and characteristics of users, as well as ways to perceive and experience public spaces. This was followed by

recommendations for the improvement and design of the place - which will be of high quality and become impressive representatives of the wider environment.

2. Urban Furniture and Equipment

Urban furniture may be the smallest element of architectural and urban design, but it is also the most numerous in a public space. This group of elements includes those that are placed in public spaces, are publicly available to everyone, aren't necessary but are desirable, and have highlighted aesthetics and functional parameters. The equipment elements therefore have the role of interior details and properties that shape the experience of the public space, providing it with comfort and recognition, thus influencing the user's perception and human scale of the place. When matched with the entire spatial framework in which it is placed, urban furniture creates a unique ambiance in the urban fabric. The study of public spaces recognizes its importance and writes that although they are not primary when structuring of space, nor are they the largest in terms of dimensions, the way of organizing public urban space depends on the functionality and characteristics and design of urban equipment, which determines the attractiveness of the space, meaning they represent extremely important factors in forming the overall image of the public space. (Mihaljevic et al., 2010) 2 The basic role of the furnisher is to provide public spaces with the necessary functionality, comfort, safety, aesthetics, attractiveness, scenery, and other quality factors. Urban equipment is an element with which users come into direct contact, and their availability and utility value, as well as visual qualities, can largely define the experience and image of a place.

When talking about urban furniture, Memluk says that elements for sitting, lighting, trash cans, signs, etc. most often in use and that functionality is the most important factor for choosing equipment. When it comes to furniture, variability can affect the interestingness of the space and enable its different uses because seating does not have to be on benches - walls or stairs can also be used for this purpose. The author recognizes sitting as one of the key elements of public space, because it allows users to stay in it, to observe, embrace, and enjoy the environment – this results in more time spent in a place. (Memluk, 2013)

Overall urban furniture should be carefully arranged in harmony with the whole design of the place and the architectural language of the built boundary. Pedestrian movement and activity zones should not be hindered by the disposition of equipment, so their arrangement should be an important topic when planning the space. Comprehensive furniture used as urban details and equipment contribute to the overall quality, but should not be dominant in the public space of the city.

The quality of public spaces is a link between architectural and urban planning elements and the experience of public space, because it is the intermediary through which a place is valued.

2.1 Characteristics of urban furniture and equipment

Based on the review of theoretical works and literature, three basic features were singled out that defined the properties and interrelationships at different spatial levels:

- Spatial features are those that determine the relationship between architectural and urban planning elements and the immediate environment. The influence of the position of the element, its visibility, the relationship between the scale and size of the element and the public space, etc., represent significant and noticeable features of each place.
- Physical-morphological features define the properties and interrelationships within the groups of microelements that make recognizable impacts on public space. It is possible to determine the influence of form, size, geometry, details, material, color, texture, composition, design, and other indicators that can be used for descriptions with all of them. (Shaftoe, 2008.)
- Functional features represent indicators that determine the direct connection with users because they satisfy their needs and enable the intended or desired activities of people in a public space. They can be understood as a connection between the users, their activities, and the space. (Alsumsam, 2017.)

As an architectural-urbanistic element of public space, urban furniture represents a group of diverse entities with various functions that complete the stay in a given environment. First of all, most of the numerous and diverse furniture has a direct impact on its value for the users of the space. Urban equipment and arrangements facilitate or supplement most of the activities that take place in public spaces. This group of elements consists of the physically smallest but at the same time the most numerous elements. They're often called urban details because their proportions can be much smaller structures, but their design or aesthetics are the most decorative elements of the space. Their number and repetition in a space affect the way the whole functions.

2.1.1 Spatial features

Spatial layout or organization is an important features that dictates how space will be used (Amen, 2021; Amen et al., 2023), "for different purposes, with different rules that reflect the needs, values and desires of a group or individual... it represents the match (or lack of it) of physical and social space."(Rapaport, 1977.). A thoughtful disposition can stimulate people's activities. Moreover, it can connect objects, natural elements, and ground floor

into a coherent whole and bring them closer to the users. A good disposition affects the sociological and psychological aspects of the environment because it is possible to encourage contact or provide a more intimate and private space. The function of the public space, its activities, the planned number of users, target categories and features of people on the one hand, and the purpose of the equipment on the other will all define the selection of the distribution method. The typology of the public space, its position in the urban fabric, and its importance set requirements for the required or optimal number of furniture. Conversely, the design and way of using the equipment impose its own requirements. The described influences of spatial layout can be divided into three main categories according to which urban details can be placed:

- pointwise - individually placed elements of equipment or furniture;
- group - linear or concentrically combined elements;
- superficial.

Elements that are in small numbers in one space, such as info-boards, maps, ephemeral aedicula, and the like, or those whose morphology allows simultaneous use by a large number of users, for example, spatial benches or fountains, are placed pointwise or individually. This mode of disposition for effect can create the emphasis on certain elements in the space - the creation of local, micro reference points, landmarks, and spontaneous meeting places. Individually placed elements can point out another element, object, part of the ground floor, or natural element or attract users and create a gathering place.

A group arrangement of furniture belonging to the same category or a combined arrangement of different types and functions in space can direct the movement or views, dividing the whole into zones/parts or enclosing parts of an urban fragment. Kevin Lynch thinks that "strings of markers help to recognize and facilitate the memory of the path." (Lynch, 1974.) The spatial arrangement also affects the way equipment and the entire space are used because it affects the degree of socialization and feelings of belonging, safety, inclusion, or exclusion from public activities that take place in a given place. Design-wise, group placement also allows different organization systems, and allows for them to combine them into geometrically clear shapes, expressed linear directions or amorphous. For example, linear benches define the extent to which their use will socialize the users, and the orientation will determine what the seated observers can see, directing the view to certain parts of the public space, selected facades, or activities. The lines formed by the lamps automatically become safe lines of movement in the evening parts of the day. The spatial frames of the pergola can form a linear passage that provides attractiveness when passing and becomes the dominant direction of movement. On the other hand, the increasingly common modern design of equipment implies the integration of several different elements of equipment and furniture, such as a bench, a bucket, a canopy, a planter, and a bicycle holder - and the geometric shape is always a more compact form that dominates the space with its structure. A variety of combinations is necessary because people's interests and activities are extremely opposite and require design, creativity, and transformability.

Surface-mounted equipment elements or those with individual extension and structure on the surface, occupy a larger area of space, thus turning into segments of the place. They are most often determined by some purpose or appearance, such as summer stages, canopies, plateaus, or urban stops that represent combinations of several functions of urban equipment. This way, specific units of space are obtained thanks to the equipment that was introduced and placed in a certain way - by appearing in the form of a flock (Lynch, 1974.), the effects that are mutually reinforced are achieved, and the message is conveyed more clearly and more strongly or attracts users.

Each functional group of urban furniture can be arranged according to any of the three described principles of spatial disposition, and the decision affects various aspects and the character of the whole. A good example of this is the canopy, which can become a place of gathering with its surface extension, while a linear arrangement can become the dominant direction of movement and direction. In the same way, linearly placed benches divide space, direct views and limit socialization, while surface-arranged benches encourage contact, gatherings, and stops.

The described influence of the spatial arrangement mainly relies on the utilitarian role of furniture in public spaces, while the aesthetic function also has an impact on the entire space. The stylistic design of the equipment can visually connect the elements of the urban fragment, making the urban furniture a connection between the user and the environment. This possibility is further increased by the fact that users have direct contact with the largest number of elements. The biggest contribution to the aesthetic function of urban details unifying the space and visually making it a whole comes from the selection of physical and morphological features, i.e. the design and projecting of equipment elements, their common features, and recognition. Style can be influenced by culture, social trends, technology, function, and aesthetic trends. (Kelly et al., 2018)

2.1.2 Physical and morphological features

This group of features presents materialization, color, texture, shape, and size, the variations of which are extremely numerous. The combinations of the aforementioned features are practically unlimited, as long as they are within the framework of human-sized design. Each of the mentioned features has a dual function in the final product of urban furniture - it must simultaneously satisfy the utilitarian and aesthetic requirements that this

architectural-urbanistic element should provide and which affect the quality of the environment in which it is placed. The fact that most of the equipment is primarily utilitarian and serves the people who use it commands special care during the process of planning and design. This ensures direct contact with the users and that every detail must be subordinated and adapted to them.

The choice of material should ensure functionality during use and comfort and safety during direct contact, be pleasant, withstand seasonal changes well, behave adequately under certain atmospheric influences, enable affordable and easy maintenance, durability, and more. When it comes to aesthetics, the material defines the stylistic features, indicates the spirit of the place and time, determines the unity with other elements, or stands out about them. Materials must be durable in outdoor conditions and weather changes. Sharp edges and corners should be avoided, due to the users belonging to different age categories and the various nature of the activities. When choosing a material and style, one must think about combining it with the architectural features of the space in which the element fits, and take a careful approach so that there are not too many different materials and that the furniture is coordinated throughout the space. (Whyte, 1980.) William H. Whyte claims that seating areas require careful planning, or they will never be used. He presents the idea of a movable chair, which could expand the possibilities, such as moving the seating area into the sun or shade, isolating or grouping, etc.

"Contrast versus harmony" as stated by Brolin (Brolin, 1988.), represents a good design approach and is an initial idea that has positive effects as a result. As color is a form of higher order communication, it is a good instrument in the hands of designers and planners and represents a significant stimulating component for the senses and an expressive one for design and ambiance. Textures or other specifics of the finish, such as gloss or matting, affect use, so they may contribute to safety, durability, recognition, or attractiveness. The choice of shape and size is dictated by the requirements of use and the high level of functionality that urban equipment wants to achieve. Access to design and almost limitless creative possibilities lead to a situation where a variety of designs can be used.

2.1.3 Functional characteristics

Urban equipment has two basic roles in the life of public space: utilitarian and aesthetic. Use value is primary when considering furniture because, without it, one can only talk about beautiful decorations in the space. The variety and multiplicity of functions are conditioned by the spontaneous and planned activities of people, which must be anticipated when arranging new or transforming existing urban spaces. Sitting, shelter, communication, hygiene and maintenance, information and advertising, culture and art, sales and business, and others, represent activities that continuously intertwine, alternate, or take place in parallel in public space. While selecting, designing, and positioning the furniture, a detailed analysis of the processes taking place is warranted to fully support daily needs with the equipment. It is noticeable that the multi-functionality of certain elements often appears spontaneously, so people sit on the edges of planters or fountains or they rest on lighting elements or protection of greenery.

3. Material and Methods

3.1 Research population and demographics of respondents

Within the theoretical part of the research, it was pointed out that one of the main features of public spaces is their availability and the fact that they belong to all potential users. Consequently, this is the reason to include the widest possible range of user structure in the research. The field research showed that the space of the given study framework is used by all usable structures. For perception research, and to gain insight into the collective experience of public spaces, it is necessary to include as many different structures as possible.

A prerequisite for filling out the questionnaire was full knowledge of the spatial entity and public spaces to which the questions refer. It was concluded that adequate answers can be given by users who are residents of Novi Sad, as well as those who stay there long enough or often have enough knowledge about the given spaces.

According to the last population census from 2011, the number of inhabitants of the municipality of Novi Sad was 341,625, with 307,760 people living in the city. (Republic Institute of Statistics - Republic of Serbia, 2012¹) Given that the pedestrian zone of Novi Sad, as the main center of social life, is experienced and used by all residents, a larger number (341,625 inhabitants) will be adopted as a reference.

Given that it was assumed that information about the individual experience can be presented by every person who knows the space, who has already been there or periodically uses it, the research population also includes daily migrations to the city, which include coming for work, education, tourism, and cultural offers, etc. According to the 2011 census, daily migrations to Novi Sad amount to 45,326 people, while research data from 2020, presented as part of a doctoral dissertation dealing with daily migrations, shows that the number is 40,279 people. Given the presented data, the number taken as the research population of potential users was 38.6951.

After defining the research population, the representative sample was determined. According to Feigel, a quality sample is a number that can represent the population. However, statistics do not offer precise tools for assessing

¹ The survey was conducted in 2022, when the most recent statistical data were from 2012.

representativeness. This makes experience gained from previous research necessary to determine the representativeness of the sample.

The method of determining the representative sample was carried out according to the recommendations given in the works of Thomas P. Ryan (Ryan, 2013.) and Fox et al. (Fox et al., 2009.) The parameters required for the calculation are the following:

- the size of the research population, for which the number of 386,951 potential users was adopted;
- confidence level, which represents the probability that the sample accurately reflects the attitudes of the population and the adaptation of the standard value for most research of 95%;
- margin of error (confidence interval), which represents the percentage of error that can exist in the sample (the smaller this value, the greater the confidence in the obtained research results), where a value of 5% was taken.

Based on the predefined data, with the help of the relevant online calculator, the value of the required research sample size of 384 respondents was determined to obtain valid results of the conducted survey.

Spaces in the city center are used by all age groups of residents. However, the research did not include children under the age of 15, because it was estimated that they would not adequately understand the structure of the question and the type of topic.

Table 1. The display of the number of inhabitants according to the age structure, adapted to the division corresponding to the survey

AGE CATEGORY	15-24	25-49	50-64	65+
NUMBER OF INHABITANTS	41 099	130 417	70 304	48 379

3.2 Structure of the survey questionnaire

After analyzing and valorizing the architectural and urban elements of the public spaces of the pedestrian zone and their influence on their design and experience, the next methodological procedure is a survey, which should show the views and opinions of the users about the defined elements and their characteristics. Specific users need to confirm the results of the intersection and synthesis of theoretical positions and the analysis of specific public spaces, through information about their experience. This is needed because, in addition to evaluation based on theoretical positions, it is necessary to "study how it is perceived by its residents." (Lynch, 1974.)

The questionnaire was created in two forms, the first of which was created using the Google Forms application (www.google.com/forms) and distributed electronically, via the Internet platform, while the second was distributed in printed form in person, in cases where respondents did not have access to the Internet. , or had difficulty using it, mainly as a result of the age category of the respondents.

4. Results

By analyzing the answers to questions related to urban furniture and its characteristics, insights and conclusions about the attitudes of users are formed. They are of exceptional importance for the participation of residents in shaping the city's public spaces. On the basis of their opinion, it is possible to look more concretely at the direction towards shaping high-quality public city spaces.

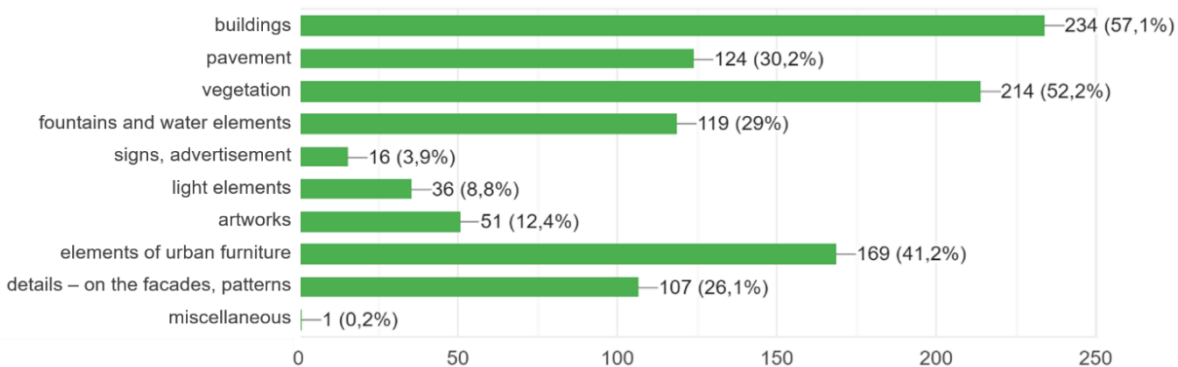


Figure 1. Statistical display of answers to question: *What are the most distinct elements in public space for you? (circle up to 3 answers)*

This question provides an insight into how users feel about the significant elements of public spaces, without referring to specific spaces. The respondents' opinions are to a greater extent the result of well-founded patterns, rather than individual opinions, because they do not require conjuring up images of specific spaces in their consciousness, rather they give an answer based on a general attitude about public spaces. The respondents were allowed to check up to three answers that agreed with their opinion, as well as to write options that were not

given. According to statistics, objects come first in importance with a share of 57.1% (234 answers). This is followed by vegetation with 52.2% (214 responses), urban furniture with 41.2% (169 responses), and paving with a share of 30.2% (124 responses). In the first four places, concrete groups of elements were singled out, while a smaller percentage of respondents chose options that represented the details of the space. Water features took a share of 29% (119 answers), followed by more information - on facades, and paving 26.1%; 107 answers). A much smaller percentage chose elements such as works of art (12.4%; 51 responses), lighting elements (8.8%; 36 responses), signs and advertisements (3.9%; 16 responses), while one respondent found ephemeral elements like festive carriages, themed fairs, etc. important.

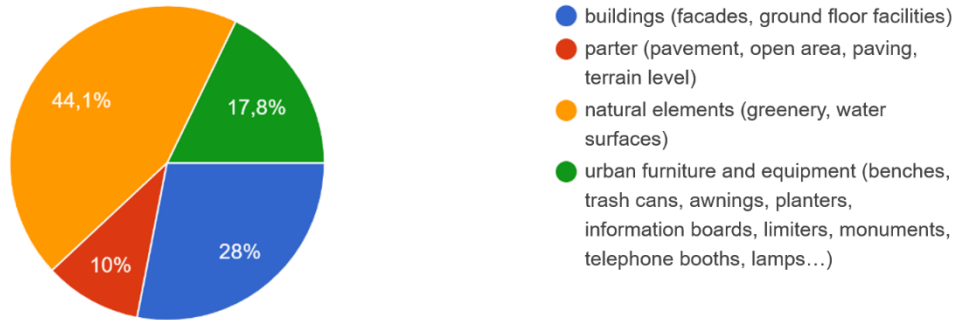


Figure 2. Statistical display of answers to question: *Which of the listed elements of the space contributes the most to your experience of the pedestrian zone's ambience?*

Arranging the answers to question provides insight into how users feel about the ambience of the entire pedestrian zone. Public spaces weren't singled out as specifics, but rather as a single unit. The respondents expressed their views on 4 architectural elements highlighted in the theoretical part of the research with the task of pointing out the most important ones for forming the ambient characteristics of the pedestrian zone. Natural elements stood out as the most influential element in 44.1% of cases (181 respondents), followed by buildings with a share of 28% (115 respondents), then urban furniture with 17.8% (73 respondents), and finally, the pattern turned out to be the least influential (10%; 41 respondents).

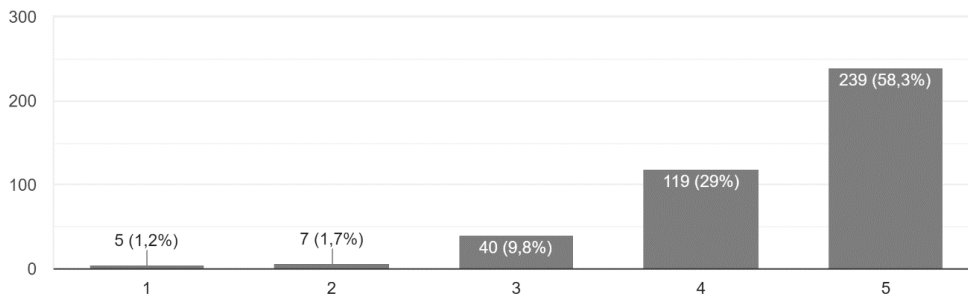


Figure 3. Statistical presentation of opinion assessment: *Existence of equipment for sitting and resting*

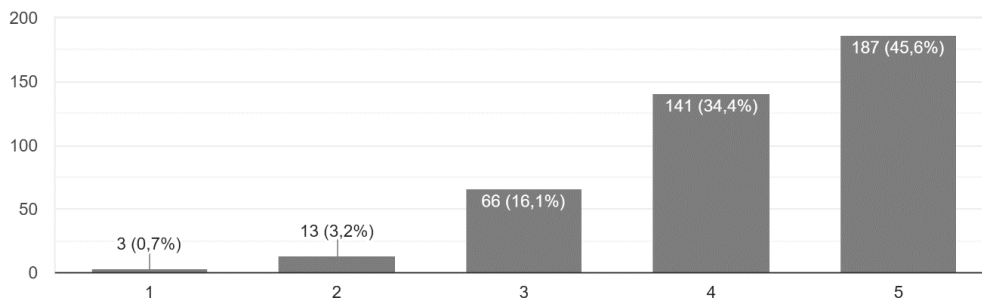


Figure 4. Statistical presentation of the opinion: *Existence of space lighting equipment*

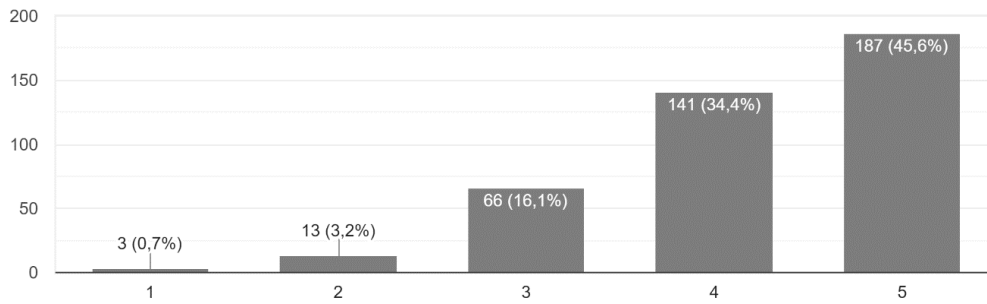


Figure 5. Statistical presentation of opinion assessment: *Existence of safety equipment (boundaries, fences, signaling)*

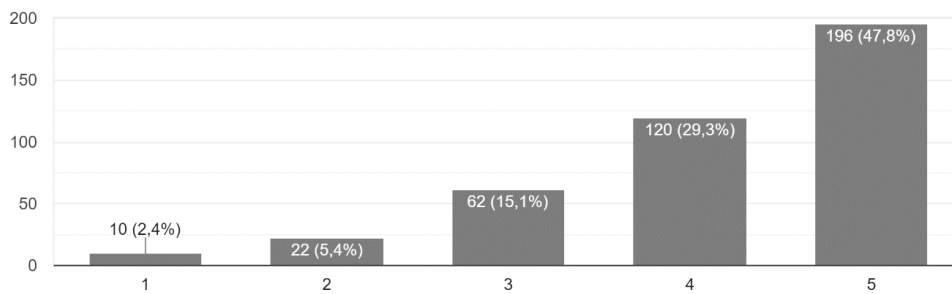


Figure 6. Statistical presentation of opinion assessment: *Existence of information equipment (info boards, road signs, inscriptions)*

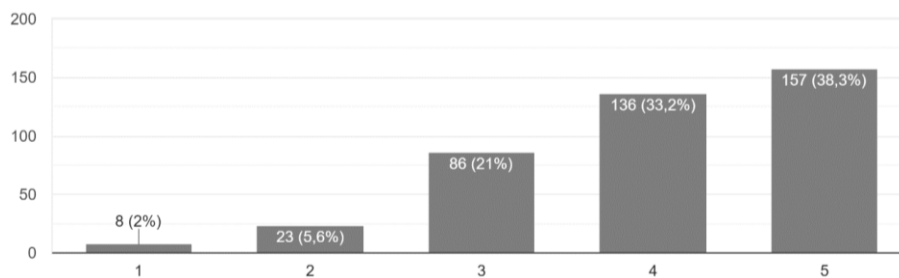


Figure 7. Statistical presentation of opinion assessment: *Existence of hygiene equipment (trash bins, containers)*

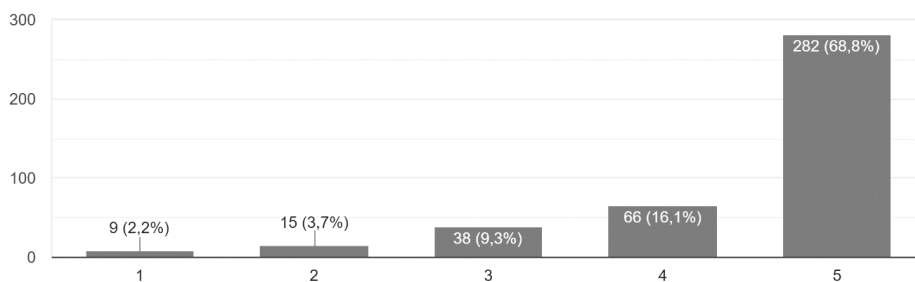


Figure 8. Statistical presentation of opinion assessment: *Existence of modern technological elements (solar wood, chargers, wi-fi points, digital info boards)*

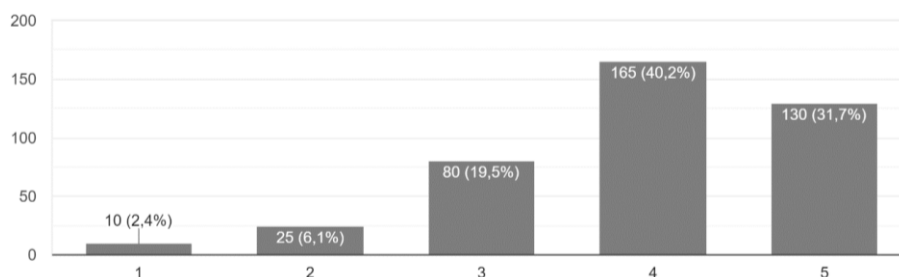


Figure 9. Statistical presentation of opinion assessment: *Disposition of furniture and equipment*

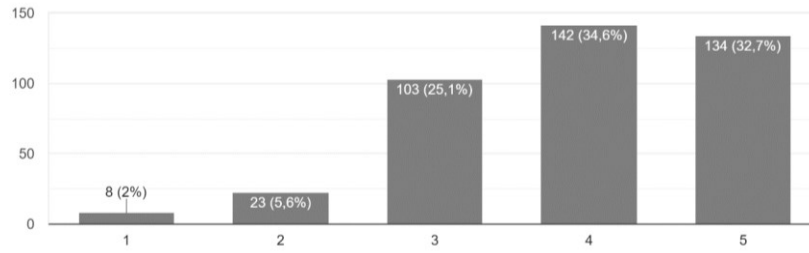


Figure 10. Statistical presentation of opinion assessment: *Design of furniture and equipment*

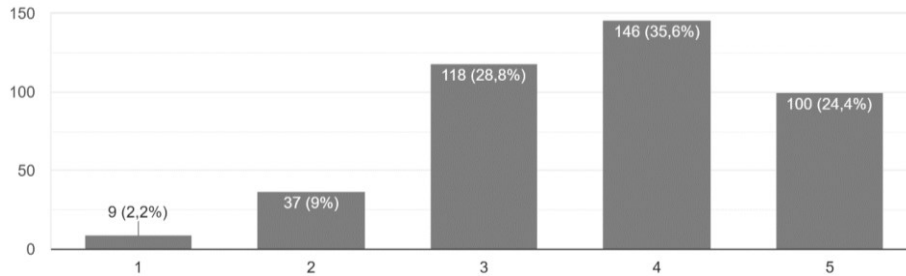


Figure 11. Statistical display of opinion assessment: *Material and color of furniture and equipment*

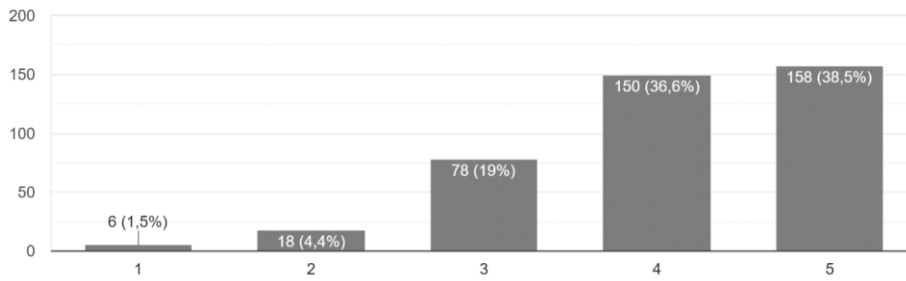


Figure 12. Statistical display of opinion assessment: *Comfort and ease of use of furniture and equipment*

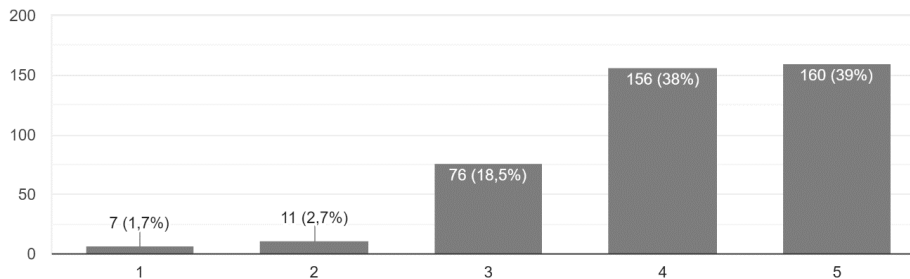


Figure 13. statistical presentation of opinion assessment: *Adequacy of lighting (illumination intensity, position, color...)*

Respondents found certain functional groups of furniture as an important factor for a positive experience of a space, with the share distributed as follows: extremely significant - 5 (seating - 58.3%, 239 respondents; lighting - 45, 6%, 187 respondents; security – 47.8%, 196 respondents; hygiene and maintenance – 68.8%, 282 respondents). The next most common rating for these positions was the level of significance (4), where the share was distributed as follows: sitting - 29%, 119 respondents; lighting – 34.4%, 141 respondents; security – 29.3%, 120 respondents; hygiene and maintenance – 16.1%, 66 respondents. The overall result given by the respondents shows that the existence of different types of urban furniture represents a significant factor for experience – they rated each offered group as significant and extremely significant in over 75% of cases. Regarding urban furniture used for information, the division between the two highest ratings is not as dominant as in the previous claims - the results in these categories are unanimous. The existence of these elements was rated as extremely significant (5) by 38.3% (157) of respondents, while 39.2% (136) of respondents chose significant (4). The respondents' opinions on modern technological elements in the public space are even more divided and gravitate towards partially significant (3). This is due to the share of that assessment appearing to be more significant than in the

previously mentioned functional groups (extremely significant - 27.8%, 114 respondents; significant - 27.1%, 111 respondents; partially significant - 25.4%, 104 respondents).

Respondents also considered the spatial arrangement to be an important characteristic, which can be seen from the share of high marks assigned to this position, significant (4) was chosen by 40.2% (165) of respondents and extremely significant (5) was chosen by 31.7% (130) of respondents.

When it comes to physical and morphological characteristics such as design, materialization, and color, the respondents' opinion is divided between extremely significant - 5 (design - 32.7%, 134; material/color - 24.4%, 100), significant - 4 (design - 34.6%, 146; material/color - 35.6%, 146) and partially significant - 3 (design - 25.1%, 103; material/color - 28.8%, 118). This indicates that the influence of this feature on the experience cannot be ignored. This warrants a conscious approach to how the elements of public space equipment are designed.

Functional aspects, ease of use, and comfort of urban furniture received a high rating with an equal share of extremely significant - 5 (38.5%, 158 respondents) and significant - 4 (36.6%, 150 respondents). A similar situation is seen with the adequate lighting of the space, where the distribution of ratings was divided as follows: extremely significant - 5 (39%, 160 respondents) and significant - 4 (38%, 156 respondents). According to the expressed opinions of the respondents, the total sum emphasizes the importance of these characteristics when it comes to user experience.

4. Discussions

All characteristics are categorized as significant (4) or extremely significant (5) to the greatest extent. This justifies their selection as important factors that influence the experience of an area, which was assigned to them in the theoretical segment of the work. At the same time, they confirm the initial hypothesis (H1) that the quality of architectural and urban elements of public space affects the creation, shaping, and improvement of the experience and image of the place. Ratings of no significance (1) and slightly significant (2) for all statements appear in a negligible number of cases (below 10%), so their share has no impact on the results. The respondents most visibly agreed with their views when answering questions related to natural elements in public spaces. Moreover, there was a uniform opinion regarding the importance of technologically advanced elements being present as an integral part of public spaces. This supports the starting hypothesis (H6) that the modern way of life affects the way of perceiving and reading public spaces.

The very existence of greenery and urban furniture is essential to the respondents to positively experience the space, while spatial characteristics such as layout; physical-morphological characteristics such as design, materialization, color, shape, etc., and functional characteristics such as the purpose of the facilities, contents, comfort, protection, etc. vary between the categories of dominantly significant (4) or dominantly extremely significant (5) when it comes to experiencing the place. The entire survey confirmed that, based on theoretical research, the introduced and defined architectural-urbanistic elements and characteristics significantly affect the experience of the space and forming an image of the place. The same goes for the conditions that exist between them and the public space, which occur during their participation or exclusion from the shaping of the full ambiance.

5. Conclusions

By overlapping all methods and levels of research, it was established that there are strong causal relationships between public space, its quality, applied architectural-urbanistic elements, and the characteristics of those elements. The second group of established connections is built by architectural-urbanistic elements and the process of perceiving the environment, which further directly results in the way the space is perceived and the image it forms among users. Indirectly, the quality gained through the features the components provided in a certain space also defines the experience and feeling of enjoyment or discomfort in the public space. A positive experience conditions a permanent and desirable image of the space, to which users are happy to return. Conversely, a negative one makes the space repulsive and unvisited. The quality from the perspective of an observer is determined by the intensity of use, the number of users, the dynamics of the application of activities, and the use of the contents of a public space.

It was stated that architectural and urban planning elements play a significant role in forming the quality of public spaces. Their existence in the space and the choice of their features represent indicators, without which the space could not be categorized as high-quality. Spatial, physical-morphological, and functional characteristics represent the main groups of properties of the components of the space, the presence or absence of which gives character to the place. The quality factors are directly related to the applied elements, while the quality assessment is reflected in the experience and image that the space demonstrates to the wider environment.

The public areas of a city are the physical framework for life in the community and dictate the rhythm and character of the entire public life of the city. The quality of these places and the diversity of their ambient characteristics create the city's identity, by forming a collective awareness of the importance of heritage, as well as the significance of progress and development. The spatial framework largely shapes the image of the place and reflects the social, political, economic, cultural, and technological influences and changes in society, making

recognizable public spaces part of its collective identity. In these cases, knowledge is the starting point for the perception process and affects the overall experience. Apart from the mentioned social influences, the perception of public spaces also depends on the features of the architectural and urban elements that form it.

The revision of all results and conclusions of the theoretical part of the research, along with their verification in the empirical phase, confirmed the initial hypotheses of this paper. The importance and role of architectural and urban elements of public spaces in forming the image of the city are shown as significant, especially when it comes to prominent public spaces that are used regardless of where the users live. Also, the stance that the architectural and urban elements of public spaces directly influence the character and quality of public spaces (hypotheses H3 and H3) was confirmed. Further, it's proven that their thoughtful use and orchestration influence the promotion of the place. As one of the features of a place, the variability of public space is significant in modern society from the aspect of social identification and exclusivity – it is conditioned by intense changes in social relations and lifestyle. The perception of space and the interrelationships that are established in it, influence the experience and form a global image of the place that is part of the collective memory, as well as that the modern way of life affects the way of perceiving and reading public spaces, also confirm the hypotheses set as the starting point of the research.

In its immediate and wider surroundings, Novi Sad is a significant representative of urban development and the initiator of many activities in all parts of life. The analysis of public spaces in the very core of the city, within its functional center and one of the most significant and most visited cultural-historical structures in the country, contributes to the systematization of significant data and indicators of the state and relationship toward public spaces. Streets and squares, chosen as spatial frameworks, contribute to the examination of how it's experienced depending on the way of use because the features of the space used for moving and stopping affect the way it is perceived. This changes the way and influences attention, maintaining its intensity and the effect of surprise and anticipation of novelties in the space. The applied analysis, based on field research and the study of the results and conclusions of previously conducted research, which dealt with these spaces or issues in the thematic framework of this dissertation, resulted in the evaluation of the existing state of selected public spaces and their impact on the experience and image of the entire ambient whole of the pedestrian zone Novi Sad. The same method can be used to examine and evaluate public spaces in other urban areas and settlements to gain an insight into the advantages, disadvantages, and potentials that the space – this can develop and influence the progress of the entire environment. The systematization of the data indicated the concrete state of the pedestrian zone and its elements and indicated the need for further steps to improve.

Surveying the users of the previously analyzed public spaces resulted in significant data derived from the opinions and attitudes of the respondents. Through participation, they provide valuable insight into the needs, preferences, and wishes of the community, which is the primary user and for which the public space exists. The views of the users and the results of the analysis of the existing situation are superimposed to obtain conclusions based on a layered view of the problem. One point of view was an assessment based on criteria and opinions derived from theoretical research, applied to specific spaces. On the other hand, the research included the opinions of a group of people who know the space, appropriate it with their presence, and shape it with decisions within the activities they carry out.

The research presented in this paper defined the basic groups of physical elements, which can present the features and their influence on the character and quality of the environment. An analytical approach enables insight into the state and valuation of these influential elements, which consequently point to the direction in which it should be transformed and shaped. To obtain a high degree of recognition and a strong identity of a space, we strive to carefully look at all the components of the place, so that the changes that come with the interventions give the desired effects. Adequacy of interventions is always a consequence of previously conducted analyses and research of key elements that influence the character of the environmental unit, as demonstrated by the research. The starting point needs to be the general determinants of space, which after systematization and collected results lead to planning action and thus provide the most adequate concepts and directions of development in terms of space and program, as well as the best results of the measures taken.

Analyzing the current state is the first step in learning, understanding, and planning the next, on the way to improving certain aspects of the entire space. To devise an adequate solution, each of the separate architectural and urban elements in the public space of the city requires a detailed research approach, determination of the state, shortcomings, and potential. After that, the obtained results serve as a guide to necessary and possible improvements. The diversity of the features a space has, its importance and impact on the users, as well as the spatial components, requires an individual analysis before planning interventions are approached.

Involving the community and the participation of users is an equally important approach to detecting problems, capacities, and strategic importance of certain topics in the public space. The collected views serve as an impulse toward determining the direction of action of the professional community. This involvement of users in the process provides the most significant feedback in the field of perception and experience, which cannot be seen, but only assumed through the analysis of the existing state. This approach applies to the design of public spaces in Novi Sad, but also to other urban and rural environments. This is due to the perception and experience of the

space changing based on defined social and spatial influences, which most often affect collective consciousness. For this reason, it is necessary to ask for the opinion of the people who are real users of the created environment in every new space - they carry within them the determinants of perception that are characteristic only for their community.

The current state of public spaces in the pedestrian zone of Novi Sad, their character and typology indicate the need and opportunities to improve the image of the entire city. One of the greatest potentials for influencing perception is the connection of public spaces and the creation of specific interactions between users and spaces, through the formation of attractive and unique ambient units, which create a dynamic character of the city's image. The most significant and attractive public spaces are located in the historic core of the city, in the pedestrian zone, which enables a thoughtful connection of ambient units in terms of space and program, additionally contributing to the legibility and recognition of the space. Contact, the physical and functional connection of representative typologies and public space, creates the impression of a unit dominated by historical, cultural, social, economic, and political significance and forms its identity.

Another, significant possibility for improvement is the design of each architectural-urban element, present in the space, as well as the plans to introduce new ones, functionally, morphologically, and spatially adapted to the defined needs. These elements have a dominant effect on the senses, as their characteristics can be consciously aimed at activating certain senses and sending impulses to the user's sensory apparatus. The pursuit of elements that have multiple effects on people's senses contributes to the complexity of the perceptual process and the layered experience of the place. Also, changing frames, and hypertrophy of importance by including and highlighting several different meanings, ways of reading space, symbolism, and messages carried by the place, affect the dynamics of perception, affecting the outcome, the experience.

- Public spaces require clear boundaries, which are provided by objects in the immediate environment that build urban elements, squares, streets and blocks. They represent the architectural face of the place and by carefully shaping their features determined by this research, they can define the ambience and the entire aesthetic and stylistic expression, which the research of the pedestrian zone of Novi Sad has shown. The design, composition and maintenance of the facade canvas are one of the two most important aspects. The others represent the content and functional characteristics available in the contact zone of the building and the public space.
- The ground floor should provide an adequate functional and design base for the other components of the space and the activities that take place in it. With careful treatment, it should bear the lines of movement and connections between meeting places and representative rappers of a whole. Through thoughtful arrangement, the ground floor level can contribute to perceiving the city and convey numerous messages of the development process through symbols and signs woven into the ground floor.
- Natural elements are the main indicators of pleasantness and comfort that public spaces can provide. Many aspects and potentials brought by the creative and thoughtful application of components from this group of architectural-urbanistic elements are shown, which will contribute not just to the microclimate conditions, aesthetics, and ambience, but also to the structure of the space, visual, psychological, and physical connections and divisions and many other effects.
- Urban furniture represents the most numerous, formatively and functionally diverse architectural and urbanistic elements. Because of these features, they have significant potential in the process of shaping ambient units. It requires a complex insight into the functioning of the public space and the development of activities in it to optimally treat the issue of equipment. The issue of function, spatial disposition, design, and number are topics that should be dealt with in detail during the process of transformation of existing and shaping of new public spaces.

When it comes to the senses of users, adequate treatment and inclusion of architectural and urban elements in the design of public spaces affect the dynamics of changing impulses. They define the ambient features and degree of attractiveness, thanks to the applied features of materials, color, size, shape, details, etc. The careful design of these spatial factors conditions the readability and significance of the unit and forms an identity in the collective consciousness. The research showed the complexity created by the connections between areas important for obtaining complete and correct conclusions. This requires the need for a transdisciplinary approach of experts from different fields should be highlighted when applying the conclusions and defining steps to improve the quality and experience of public spaces.

In the context of modern aesthetic and functional requirements of everyday life, the design of new forms of architectural-urban elements should strive to ensure the multi-functionality of certain elements, adequate combination, and application of materials. This should be done for both aesthetic purposes, and above all, for comfort, convenience, and functionality. The presence of technological achievements in all spheres of life is increasingly important, which dictates the need to modernize spatial components that support an accelerated lifestyle, information flow, and user perception, but also contribute to the attractiveness and modernity of the space.

The fact that planning and designing is a series of steps, with a logical and variable character, allows flexibility in the approach to designing interventions and freedom and creativity in design. This can help in finding the best possible solution for each space, adapted to the needs of the users and the requirements of the context. The planning of public spaces should be a project with a pronounced social dimension (Auge, 2000.), because the whole process involves the participation of several different actors in the form of interest groups, such as residents/users, management and administrative bodies, investors and market actors, experts, city institutions, cultural and artistic institutions and media.

In the context of a directed and planned formation of a global image of a place, public space, or city the topics of space branding and place promotion are research areas that can continue the attached study. These topics include completely new areas of marketing and looking at problems from a new angle, with the aim of projecting a certain way of perceiving, experiencing, and picturing a place even before physically staying in it – within this, the city spreads its influence beyond the boundaries of different spatial levels. The question is how architectural-urbanistic elements, as well as the quality factors defined in this work, change their role in the process of experience and image formation. The way this happens and the degree of involvement of the components defined by the paper represent a new and current field of research.

There is a potential to form design guidelines by extracting the conclusions as a practical contribution to the continuation of the research. It can come in the form of a manual that would include the selected architectural-urbanistic elements and their features and direct how their application can contribute to the adequate design of the space.

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Conflict of Interests

The Authors declares that there is no conflict of interest.

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