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ANALYZING ZONES FOR STANDING: ENHANCING VIBRANCY DURING PUBLIC EVENTS

Abstract

This study examines how parts of the public space that offer the possibility for standing contribute to vibrancy during public events. The aim of the paper is to investigate how different arrangements of temporary structures affect the positions of potential zones for standing and, therefore, the vibrancy of public spaces. Using Trg Slobode (Liberty Square) in Novi Sad as a case study, it investigates the connection between space for standing and staying and spatial dynamics during public gatherings. The paper emphasizes the key factors that shape the perception of lively space and point out the importance of its adaptability. These findings enhance understanding of functioning of public spaces during events, stressing the importance of creating vibrant environments that cater to visitors' diverse needs.

Keywords: vibrancy, public events, temporary structures, spatial layout.

ИСТРАЖИВАЊЕ ДИНАМИКЕ ПРОСТОРА ЗА СТАЈАЊЕ: ПОВЕЋАЊЕ ЖИВАХНОСТИ ТОКОМ ЈАВНИХ ДОГАЂАЈА

Сажетак

Овај рад испитује како дијелови јавног простора који пружају могућности за стајање доприносе живахности током јавних догађаја. Циљ је истражити како различити распореди привремених структура утичу на позиције потенцијалних мјеста за стајање и, самим тим, на живахност јавних простора. Користећи Трг слободе у Новом Саду као студију случаја, истражује се веза између простора за стајање и просторне динамике током јавних окупљања. Рад истиче кључне факторе који обликују перцепцију живахности и указују на важност прилагодљивости простора. Ова сазнања унапрјеђују разумијевање функционисања јавних простора током догађаја, истичући важност стварања живописних окружења која задовољавају различите потребе посјетилаца.

Кључне ријечи: живахност, јавни догађаји, привремене структуре, просторни распоред.

1. INTRODUCTION

To create the sense of vibrancy and urbanity in a public space, the presence of users is crucial, especially if they gather around the main area. Encouraging people to pause and spend time in urban spaces has multiple positive effects, including fostering vitality and diversity. The unique and unpredictable aspects of these spaces add to their value. Therefore, it's important to appreciate these differences by enhancing people's engagement. This fosters the prosperity of urban life and helps create a lively atmosphere in public spaces. As underscored by Ben Rogers, the greater the diversity and vibrancy of urban spaces, the more society tends towards equity, prosperity, and democracy. This assertion is deeply rooted in the fundamental definition of public space as an open, accessible, and democratic environment [1].

Standing in public spaces provides individuals with the chance to observe their surroundings and the ongoing activities in those communal areas. It is a universal phenomenon for people in cities worldwide to enjoy observing what's going on in shared spaces.

Engaging in public spaces is pivotal in shaping social dynamics and cultivating a positive ambiance. When individuals have the chance to stand and linger in public areas, the likelihood of spontaneous interactions and meaningful connections with others significantly increases. Given that "people attract people," it is more likely that cities with vibrant public spaces will attract citizens, tourists and other visitors [2]. This phenomenon can be attributed to the inherent sociability of individuals, as they naturally gravitate towards forming connections. The innate human desire for interpersonal interaction further underscores the importance of such opportunities in our social fabric, even despite the increased interest in virtual encounters.

Opportunities for encounters and daily activities in urban public spaces create possibilities for interpersonal contacts and relationships in public discourse, providing people with the opportunity to engage in communication and experience the activities of others in various forms [3]. By offering these opportunities, public spaces meet the innate needs of their users, enriching social life with vibrancy and dynamism. According to Cattell et al., engaging in social interactions within open urban spaces has the potential to offer respite from the monotony of daily routines, foster a sense of community, provide opportunities for maintaining established social connections or forging new ones, and positively influence people's tolerance levels and overall mood [4].

In connection with standing in public spaces and the vibrancy of these areas, Gehl's distinctions in degrees of contact intensity become particularly relevant [5]. When individuals stand in public spaces, they engage in a modest level of contact – a basic form of interaction. This act of standing can serve as a potential starting point for more profound connections, contributing to the overall vibrancy of the public space.

Standing provides opportunities for encountering others, observing their behavior, and listening to the surrounding activities. These interactions, even at a modest level, become integral components of the vibrancy of public spaces. Moreover, standing serves as a means of maintaining already established contacts, fostering a sense of community and continuity in the dynamic environment.

Public spaces, where people stand and interact, act as not only sources of information about the external world but also as wellsprings of inspiration and stimulating experiences. The diversity of contacts, from casual encounters to more profound connections, contributes to the richness and vitality of the public space, aligning with Gehl's insights on the varying degrees of contact intensity within the realm of social interaction [5].

Jane Jacobs asserted that urban planners and designers often fail to grasp that individuals are drawn to the presence of others. Instead, they tend to plan and design with the assumption that city residents seek scenes characterized by emptiness, order, and silence. Contrary to this assumption, she concluded that nothing could be further from the truth, asserting that places designed on such principles tend to be monotonous and uninspiring [6].

The motivations of people visiting public spaces are varied, yet consistently, a prevailing factor is the joy derived from observing others - their behaviors and activities [6]. Standing not only offers individuals the chance to immerse themselves in the events but also allows them to relish the ambiance alongside fellow visitors, potentially playing a role in shaping the unique identity of the place.

In the 1970s, William H. Whyte postulated that a public space becomes urban and invigorating when there are approximately 16.6 pedestrians within the observer's visual field [7]. This theory was empirically tested in small Norwegian towns, confirming that a scene with 14 to 20 people standing in the square creates the perception of an urban, stimulating public space (Figure 1). Gehl and Svarre expanded upon this experiment, directing 20 participants to stand around the square's perimeter,

while the remaining participants evaluated the impact on the square's vibrancy (Figure 2) [8]. The assessments indicated a significantly lower perception of vibrancy when participants were positioned farther from the center.

Figure 1. Participants of the experiment in the middle of the square.

Figure 2. Participants of the experiment around the perimeter of the square.

Gehl and Svarre's experiment serves as the foundational inspiration for our research. This paper initiates an examination of the dynamics of spaces for standing by means of thorough analysis, concentrating on the shifts in position and configuration stemming from diverse arrangements of temporary structures during public events. The overarching objective is to evaluate the influence of these variations on the vibrancy of public spaces. The study focuses on the main square in Novi Sad, known as Liberty Square. An array of events hosted here directly influences the Square's vitality and dynamism, shaping its ambiance and appeal.

Leveraging parametric design tools allows us to gather insights into the spatial capacity for accommodating individuals during public events. Nevertheless, simply pinpointing these surfaces does not furnish an understanding of the vibrancy within the public space. Consequently, this paper introduces a method that has been devised to assess and distinguish the degree of vibrancy within public spaces, building upon prior theoretical research.

2. METHOD

The method is based on empirically confirmed research, which suggests that greater separation from the center is interpreted as a reduction in vibrancy, while closer proximity is thought to enhance overall vibrancy.

The first step involves defining the boundary of the event space and determining the positions of the temporary structures. After that, attention is directed to defining access spaces and passageways between temporary structures to ensure efficient flow. These spaces are characterized by a low probability of being used for observation or participation in activities due to their primary function as access points to temporary structures or roads. Through the determination of access distances for each temporary building and adjacent passages, the spaces for standing are defined and demarcated. Within predetermined boundaries, the event space is divided into concentric circles, with each circle assigned a numerical value that indicates liveliness in that particular area (circular segments shown in Figure 3). Upon scientific analysis, it was found that vibrancy diminishes from the center to the periphery. Consequently, a value of 1 was assigned to the central circle. Due to the absence of a universally accepted methodology for measuring the vibrancy of a space, this study proposes to convert the qualitative data into a mathematical formula as follows:

$$\text{Vibrancy Level Value (VLV)} = 1 - \frac{\text{Distance from the Center}}{\text{Radius of the Public Space}} \quad (1)$$

This formula facilitates the incorporation of the distance from the center as a key factor in assessing the vibrancy across various sections of a space, and it can be further fine-tuned and adjusted to suit the unique characteristics of diverse spaces. The parameters and methodologies established in this manner are adaptable to address the specific requirements and features of a given public space.

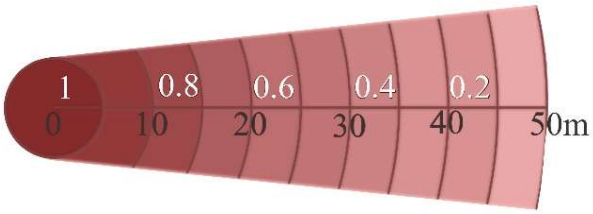

Figure 3. A visual depiction illustrating the correlation between vibrancy levels and their respective distances from the cfienter of a public space within a radius of 50 m.

Successive circles incrementally expand by 5 m in radius, culminating in a totacl of 10 circles with a final radius of 50 m as shown in Figure 3. Each of the ten concentric circles designated for spatial analysis delineates a zone with a distinct level of vibrancy, where the numerical vibrancy value decreases proportionally with the expanding distance from the center. Utilizing this model, the central circle, boasting a radius of 5 m, has been pinpointed as the area exhibiting the highest vibrancy, denoted with a value of 1. This central zone is deemed optimal for activities that demand heightened visitor interaction and engagement. The gradual enlargement of these circular zones corresponds to a diminishing level of vibrancy, ultimately reaching a value of 0.1 for the outermost circle. These outer circles are well-suited for activities requiring less engagement and provide ample space for visitors to unwind and relax.

These concentric circles overlap with the designated standing zones, allowing spaces for standing to span various vibrancy zones. Areas of zones smaller than 3 m^2 are automatically excluded from the calculation and are not depicted in the geometrical representation. This is because they are deemed insufficient for accommodating a group of people, which is a fundamental requirement for achieving the effect of lively space. The computed overlapping area for each zone is subsequently multiplied by the corresponding Vibrancy Level Value. The cumulative values derived from this calculation, based on the chosen arrangement of temporary structures, are then totaled. The resultant output is validated by recognizing that a higher value for a specific configuration of temporary structures signifies a more advantageous spaces for standing in terms of vibrancy. The described procedure is shown as a flowchart diagram in the Figure 4.

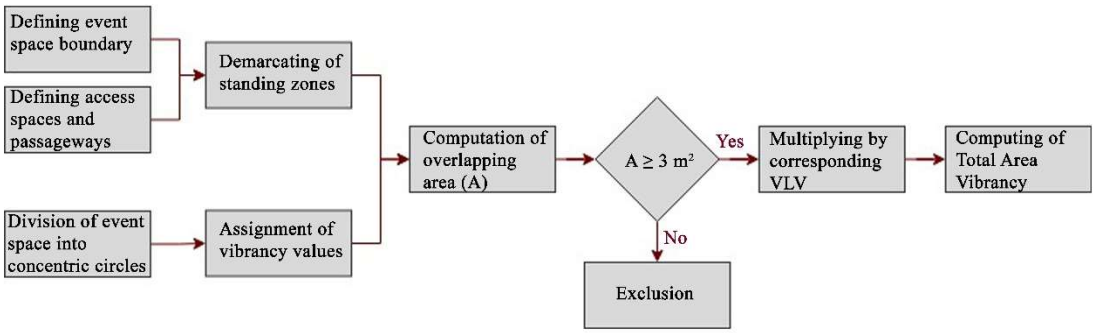

Figure 4. Flowchart diagram of the overall computational workflow

Analyses are performed using Grasshopper within the Rhinoceros.The workflow begins by importing a 2D model of the event space from AutoCad into Rhinoceros, ensuring an accurate representation of the physical dimensions and layout. Once the model is prepared, it's imported into Grasshopper for analysis. Grasshopper's parametric workflows are then utilized to define parameters and conduct calculations for vibrancy scores. After executing the analysis, Grasshopper generates visualizations and facilitates iterative design exploration. Finally, the refined design and analysis results are exported back to Rhino for documentation and presentation.

This approach empowers organizers to strategically design the event layout, optimizing spatial utilization and elevating the overall visitor experience. Furthermore, this methodology ensures a harmonious distribution of activities throughout the event, providing visitors with the flexibility to select zones that best resonate with their interests and engagement preferences.

3. RESULTS

The described approach was implemented at a specific public venue: Trg slobode (Liberty Square) in Novi Sad. Four distinct arrangements of temporary structures were utilized as realistic settings for applying this method during a public event. These four layouts employ space in distinct ways: Layout 1 combines linear and group arrangements, Layout 2 follows a linear format, Layout 3 adopts a group layout comprised of a single type of group containing 4 temporary structures, and Layout 4 employs two dominant groups - one comprising 12 temporary structures and the other consisting of 4 temporary structures (Figure 5). Consistency was maintained across each arrangement, with 36 temporary structures sharing identical base dimensions (2.5 m width and 3 m length).

The border of the analyzed area was defined based on the long-standing practice of setting up temporary structures in a certain part of the Square. A dimension of 50 m was taken as the radius of the public space, based on the dimensions of the Square and the defined border of the analyzed area. A distance of 2 m was allotted on each side of the temporary structures to designate space for standing. Figure 5 illustrates the geometry of the resulting zones for standing.

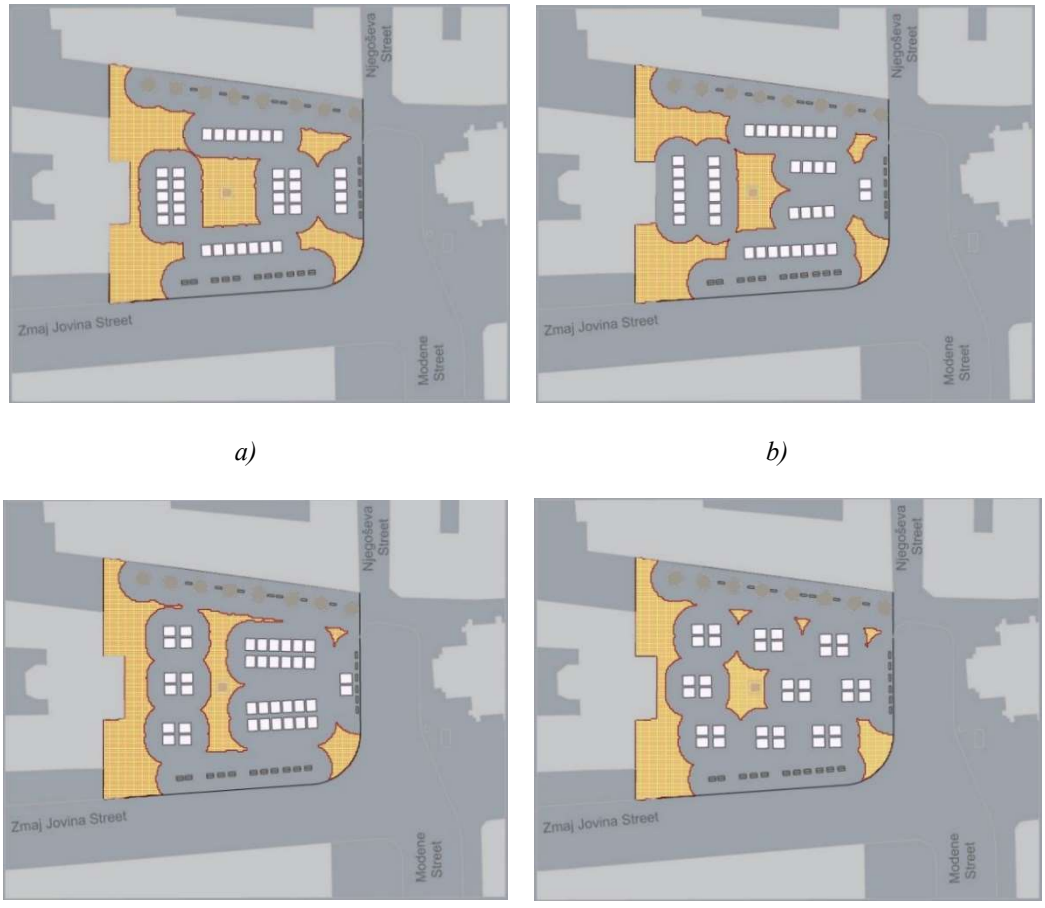

Figure 5. Display of the spatial configurations of standing areas for the following layouts of temporary structures:a) Layout 1 b) Layout 2 c) Layout 3 d) Layout 4

The method described, utilizing concentric circles, was applied to the standing surfaces obtained, as illustrated in Figure 6. This involved multiplying the overlapping area of the standing zone and the specific circular ring by its corresponding vibrancy rating.

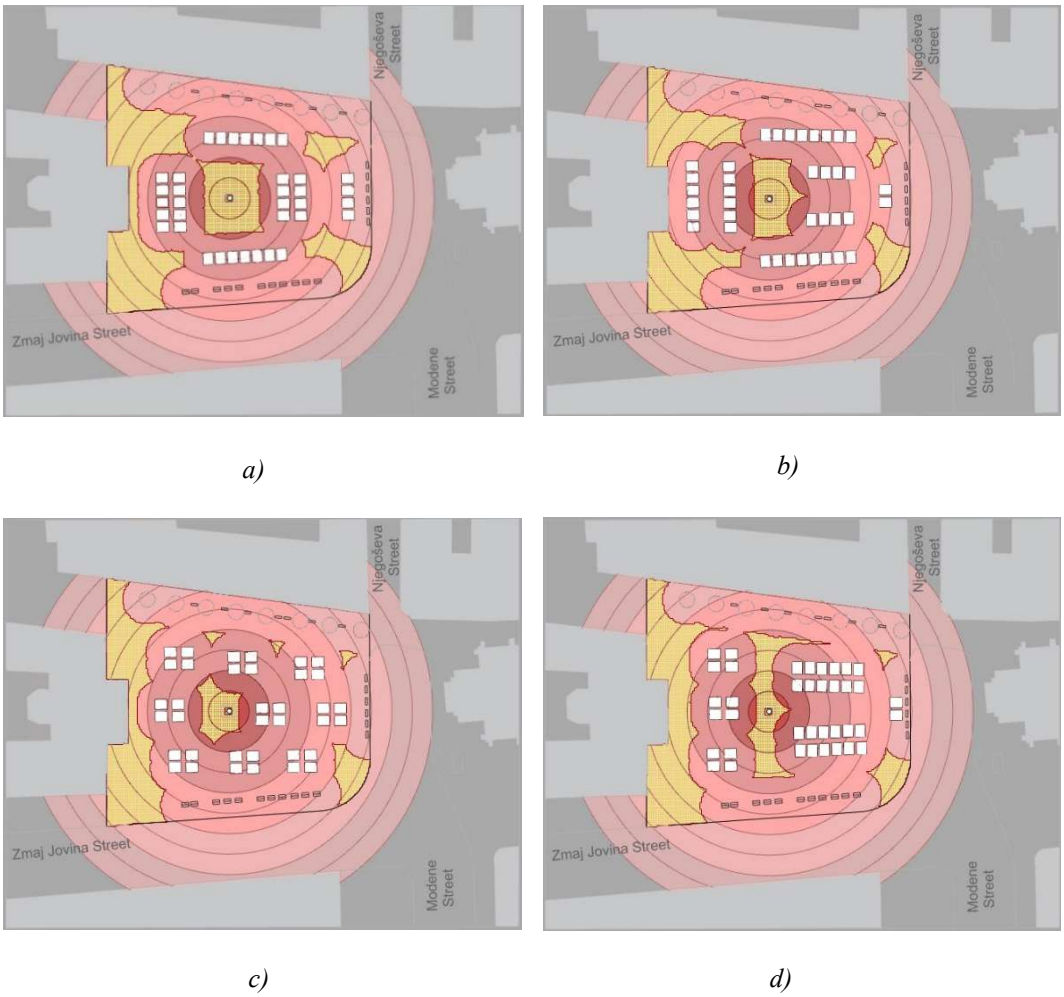

Figure 6. Application of the method utilizing concentric circles on standing surfaces for the following arrangements of temporary structures: a) Layout 1 b) Layout 2 c) Layout 3 d) Layout 4

The outcome of multiplying the overlapped area by the vibrancy rating was computed for each ring. These individual results were then summed up across all rings within a layout. As a result, four total area vibrancy values were generated for the four layouts, as depicted in Figure 7.

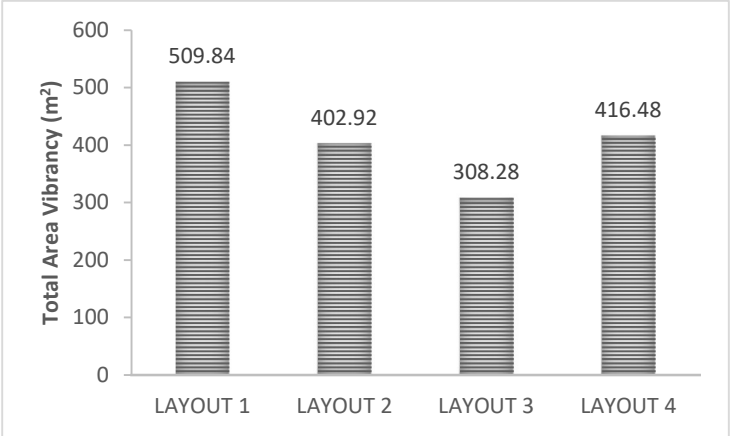

Figure 7. A graph showing the calculated total area vibrancy for each arrangement of temporary structures

These results depict the vibrancy scores achieved by implementing different configurations of temporary structures. Layout 1 attained the highest total area vibrancy score of 509.84 m^2, suggesting that this arrangement generated the most vibrant and lively atmosphere. In contrast, Layout 3 obtained the lowest score of 308.28 m^2, indicating a comparatively less lively environment. The disparity between these scores underscores the importance of considering layout configurations in enhancing vibrancy levels.

Layouts yielding higher vibrancy scores, such as Layout 1, may offer valuable insights into best practices for creating engaging and lively spaces. On the other hand, layouts with lower scores may prompt further analysis to identify factors inhibiting vibrancy and potential areas for improvement. Overall, the vibrancy analysis aids in understanding the impact of layout configurations on the perceived vibrancy of spaces, facilitating informed decision-making in design and planning processes.

4. DISCUSSION

In contrast to existing studies on vibrancy in public spaces [2, 9, 10, 11], our approach is distinguished by the examination of the impact of different layout configurations of temporary structures on vibrancy levels. In the expansive literature on urban vibrancy, little attention has been paid to the specific impact of temporary structures and their arrangement. Even those dedicated to temporary structures often explore the wider field of temporary urban interventions and their impact on urban vibrancy and regeneration.

The research conducted by Gehl and Svarre underscored urban design's role in nurturing vibrant public spaces, emphasizing factors such as pedestrian-friendly environments, diverse activities, and social interaction [8]. While Gehl and Svarre's work offers valuable insights into fundamental principles of urban vibrancy, its focus predominantly centers on permanent urban features rather than temporary structures. Conversely, our study contributes to this discourse by directing attention to temporary interventions, increasingly employed in urban spaces for diverse events and activities. Through the examination of various layout configurations of temporary structures, we provide specific insights into how these ephemeral elements may augment or diminish vibrancy levels in public spaces.

Nonetheless, it is imperative to acknowledge the limitations of our study relative to existing research. For instance, our investigation was confined to a specific public venue and temporary structure arrangements in Novi Sad. Although this confinement facilitated a precise analysis within a controlled environment, it may constrain the generalizability of our findings to other contexts. Furthermore, while our vibrancy analysis methodology yielded substantive quantitative data, its refinement and validation through comparative studies and interdisciplinary collaboration could be advantageous.

In summary, while our study furnishes valuable insights into the nexus between layout configurations of temporary structures and vibrancy levels, it serves as a point of departure for further exploration and refinement. By assimilating insights from extant research and embracing interdisciplinary methodologies, future investigations can deepen our comprehension of vibrancy in public spaces and engender more efficacious urban design and planning strategies.

5. CONCLUSION

The values obtained from this analysis should not be regarded as absolute or definitive. However, they hold significance when comparing results across various spatial arrangements for several reasons. Utilizing these values enables an assessment of the efficiency of one layout relative to others. This aids in making well-informed decisions and identifying best practices.

The limitations of the described method include challenges in accurately determining the center of public space, particularly when this central position lacks strict geometric definition. Additionally, the standing areas and configurations of temporary structures have not been subjected to verification or real-world testing by visitors, thus remaining theoretical concepts. Furthermore, they encourage further research that would take into account the impact of specific temporary structures on attracting a larger crowd to their surroundings, thus including the key factors influencing gatherings.

In light of these limitations, it becomes evident that there is ample room for refinement and expansion in future spatial analyses. By incorporating a more comprehensive understanding of crowd behavior and spatial dynamics, future analyses can offer even greater insights and utility for urban planning and design endeavors.

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