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MATERIAL ENVIRONMENT IN TRANSITIONAL SPACES: THEORETICAL APPROACHES AND METHODOLOGICAL DIRECTIONS

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Abstract. This article examines the role of material elements of the physical environment in the formation of transitional spaces, with particular attention to their impact on spatial perception and practical use. A review of the literature reveals that the materiality of transitional zones is often overlooked in architectural research, even though these spaces are increasingly recognized as significant components of the contemporary urban environment. The text also outlines the main methodological challenges encountered in systematically investigating the influence of the physical environment on the user's spatial experience.

Keywords: physical environment, transitional space, materiality, spatial perception, user experience, architectural articulation, environmental psychology.

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1. Introduction

Architectural space is not merely a physical backdrop for human activity – it is a dynamic field of relationships shaped through sensory, emotional, and everyday experiences. Transitional spaces, which mediate between interior and exterior environments, represent a distinct and meaningful spatial category. These spaces are not solely conduits for movement; they are also sites of transformation – of mood, attention, and pace.

This article examines how material objects – such as benches, posts, canopies, railings, and textures – affect human experience within transitional architectural spaces. The central proposition is that these elements are not merely functional; they contribute to the atmosphere of a space, providing it with direction, rhythm, and even an emotional tone.

The aim of this study is to uncover how material elements contribute to the formation of transitional spaces as places of experience.

Key objectives:

1. To define the concept of transitional space within the contexts of architecture, landscape architecture, and urbanism.
2. To examine how material objects participate in human interaction with the environment.
3. To illustrate, through examples, how objects create a spatial structure that is sensed and experienced.

The article employs methods of spatial analysis and rhythmic reading, which allow material elements to be viewed not as isolated objects, but as active components shaping space – through everyday movements, pauses, and even brief moments of stillness.

2. The physical environment as a structure of spatial experience

The physical environment comprises not only buildings or objects, but an entire assemblage of material elements that shape the places we inhabit in everyday life. Elements such as railings, benches, textures, greenery, or lighting often operate subtly, yet they strongly influence how we feel within a space whether it feels welcoming, encourages pause, or prompts continued movement.

Experience-based approaches in architecture emphasize that the objects around us surfaces, furnishings, light, or scents directly affect our perception of space. Pallasmaa (2005) argues that our relationship with architecture is not solely visual, but also tactile, auditory, and olfactory. Norberg-Schulz (1980) speaks of the “genius loci” a sense of place that emerges through how objects help us perceive and engage with space. Seamon (2018) notes that repeated daily experiences allow space to become embedded in human consciousness, and it is precisely the material elements of the environment that facilitate this process.

Zumthor (2006) defines atmosphere as a subtle, yet powerful spatial quality created not by individual objects, but by their collective “resonance.” Elements such as floor textures, furniture proportions, or even the temperature of materials shape our emotional response to a place. This is especially relevant in transitional spaces, where a process of change occurs between one activity and another, or between public and semi-private domains.

Carles et al. (2024) propose that urban space should be understood through multisensory experience not only what is seen, but also what is heard or smelled. Within this perspective, objects become not merely aesthetic or functional components, but emotional markers guiding one’s passage through space. Boulton (2018) similarly emphasizes urban texture how material and object layers affect urban experience not through symbolism, but through everyday sensations and interactions.

In summary, the physical environment in transitional zones can be understood as a background whose sound, texture, or rhythm enhances the spatial impression. These elements may not always be consciously noticed they often operate in the background, yet this is precisely what makes them significant: they support, complement, or even transform our relationship with space.

3. Research methods and methodological rationale

This study is based on theoretical analysis aimed at conceptually unfolding the significance of the physical environment within transitional urban spaces. The primary research method employed is a systematic literature review, incorporating both theoretical and empirical sources. The analysis focuses on the impact of material components on spatial experience, utilizing a cross-comparative strategy that aligns multiple theoretical perspectives. The study also draws on spatial structure analysis frameworks grounded in topological relationships between streets, as proposed by Jiang and Liu (2020) and Askarizad et al. (2024), which enable the assessment of how spatial configurations influence social activity and place attractiveness. This approach made it possible not only to classify elements of the material environment but also to understand how and when they contribute to creating an atmosphere conducive to movement and social interaction.

A qualitative bibliographic analysis was used, focusing on purposefully selected sources that reveal how the material environment affects user experience. Sources were chosen based on their relevance to the topic, theoretical weight, and publication date with priority given to texts published between 2015 and 2024. Foundational theoretical works, such as those by Juhani Pallasmaa (2005), Christian Norberg-Schulz (1980), and David Seamon (2018), were also included, as they are widely cited in experiential architectural discourse.

In addition to the literature review, a comparative analysis of theoretical approaches was conducted to reveal

various authors’ perspectives and insights. This enabled the identification of core analytical categories spatial perception, microstructures, materiality, and atmospheric formation and their relationship to human experience. Zhang and Berger (2023) emphasize that pedestrian behavior in transitional spaces is shaped by dynamic environmental conditions, making it essential to consider predicted behavioral patterns. The analysis focuses on how urban space acquires meaning through human experience; thus, texts were interpreted not only literally but also through the identification of recurring themes, metaphors, and conceptual linkages.

The aim of the research is not to produce empirical generalizations but to provide a theoretical foundation for further studies that may incorporate methods such as spatial observation, sensory analysis, or sensory mapping, as suggested by Perakaki and Sinou (2024), and Sheng et al. (2021), who examine social interaction through spatial configurations. This methodological framework supports an understanding of the physical environment not as a passive backdrop, but as an active element in the structure of spatial experience.

4. Bibliographic analysis: the significance of the physical environment in transitional urban spaces

The bibliographic analysis reveals that the physical environment is increasingly recognized as a key factor in shaping spatial experience, particularly in the context of intermediate and transitional spaces. These spaces, often regarded as secondary or purely functional connectors, emerge as new subjects of analysis when considered not only in terms of movement but also through their sensory and emotional ties to place.

Urban research trends show that transitional zones such as courtyards, passages, or entry spaces often serve as sites of intense social activity, where human experience is sensitive to both architectural layout and detailed material design (Carles et al., 2024; Franck & Stevens, 2007). These spaces are often unfinished or ambiguous, making their experience dependent on micro-level elements pavement, lighting, textures, and even sounds and scents (Pallasmaa, 2005; Zumthor, 2006).

Dovey and Pafka (2020) propose that urban space should be understood as a dynamic field of interaction, where not only individual objects but also their interrelations, intersections, and rhythms are significant. Boulton (2018) emphasizes that urban texture is not just about materials or facades, but about how objects help encode a sense of place. This is particularly evident in transitional areas, where the relationship between people and their surroundings is fast, temporary, yet intense.

Studies in spatial morphology further show that the physical structure in which objects are arranged directly influences social activity. For instance, Redjem and Mazouz (2022) demonstrated how architectural structures

Table 1. Functions of material elements in transitional urban spaces

Material component	Material component	Material component	Material component
Pavement, pathway materials	Indicates direction, creates a sense of rhythm	Aids orientation, guides movement logic	Dovey and Pafka (2020); Redjem and Mazouz (2022)
Benches, railings	Encourages stopping, lingering	Creates a place for social contact or rest	Franck and Stevens (2007); Boulton (2018)
Lighting elements	Sets the mood, signals safety or comfort	Influences emotional well-being	Zumthor (2006); Pittaluga (2020)
Surface textures, materials	Creates a sensory backdrop	Encourages touch, evokes emotional reactions	Pallasmaa (2005); Carles et al. (2024)
Small-scale architecture, greenery	Marks spatial boundaries, adds a sense of place	Helps to perceive the character of the space	Norberg-Schulz (1980); Seamon (2018)

Table 2. How different theoretical approaches help understand transitional urban spaces

Theoretical approach	What it highlights in transitional spaces	Authors / sources	Relation to the material environment
Phenomenological	Spatial experience linked to presence, memory, embodiment	Norberg-Schulz (1980); Seamon (2018)	Materials, light, and sound shape the feeling of being in a place
Architecture of atmosphere	Focus on the mood of space, not just its function	Zumthor (2006); Pallasmaa (2005); Tabassum (2024)	The interplay of surfaces, light, greenery, and proportions creates atmosphere
Micro-urbanism	Emphasizes human scale and everyday interaction	Franck and Stevens (2007); Boulton (2018)	Furniture, pathways, and greenery either encourage or slow down activity
Rhythmic analysis	Urban rhythms: pace of movement, points of pause	Dovey and Pafka (2020); Boulton (2018)	Material cues indicate spatial tempo and timing
Everyday urbanism	Space as a site for daily practices and social negotiation	Pittaluga (2020); Yeshayahu (2024)	Transitional zones become small scenarios of dwelling, structured by objects

either facilitate or restrict communication, even within historical spaces. This line of inquiry is extended by Sheng et al. (2021), who examined social interactions in parks and found that spatial configuration includes the placement of objects, transitions, and the division of open and closed zones determines behavioral patterns.

This analysis highlights that the physical environment cannot be treated merely as a “background” to architecture it is an active agent within spatial dynamics. It is not isolated objects, but their relationships, repetitions, structures, and sensory qualities that shape what people experience as “place.” Therefore, in studying transitional spaces, it is essential to include sensory experience analysis from materiality to the dynamic characteristics of micro-spaces.

The information presented in Table 1 illustrates how each material element performs a specific function within the space: pavement, lighting, small-scale architecture, and surface materials not only structure the environment but also influence human experience – by aiding orientation, encouraging pauses, evoking a sense of comfort, or reinforcing the identity of a place. This table provides a clear and systematic understanding of how material components affect not only the physical space but also the way people experience it.

As shown in Table 2, different theoretical approaches emphasize varying aspects of transitional spaces some focus on sensory relationships, others on everyday habits or

spatial rhythms. However, across all perspectives, material elements remain essential they shape atmosphere, indicate movement trajectories, and contribute to the formation of spatial identity. As noted by Tabassum (2024), the arrangement of greenery, seasonal changes, and other sensory factors significantly influence the perception of space, further highlighting the role of material elements in shaping human experience. This table demonstrates that it is not only the presence of objects that matters, but also their qualitative characteristics texture, proportion, and placement. It is through such a lens that we can assess how design decisions affect the quality of everyday experience in transitional urban zones.

5. Discussion

An analysis of the physical environment in transitional urban spaces reveals that these zones are not merely connectors between functional areas they themselves become important sites of social and spatial experience. In such spaces, movement trajectories, visual flows, and pause points intersect, often shaped not by architectural form but by the finer details of material elements.

Transitional zones function as “outdoor rooms,” as described by Pittaluga (2020), where not only movement but also short-term dwelling, observation, and interaction

Table 3. Qualitative aspects of the physical environment in transitional urban spaces

Qualitative aspect	Environmental characteristic	Impact on experience
Nature of lighting	Light intensity, direction, color tone	Sense of coziness, safety, or openness
Surface textures	Texture of paving, walls, or furniture	Sensory stimulation, spatial coziness
Clarity of spatial boundaries	Visual or physical boundaries and their permeability	Sense of orientation, ease of spatial understanding
Acoustic background	Environmental noise level, acoustic properties	Level of alertness or tension
Integration of greenery	Arrangement, density, and seasonality of vegetation	Sense of nature, impressions of calmness and vitality
Proportional scale	Relationship between space size and human body scale	Sense of intimacy, closeness, or distance
Visual orientation	Direction of visibility, dominant visual accents	Logic of movement, ease of spatial legibility

occur. These experiences are influenced by spatial parameters plan configurations, changes in lighting, and the arrangement of elements as well as by the atmosphere created by material components such as benches, greenery, or paving variations.

Daily movement patterns in these spaces form repetition models “rhythms” that can be analyzed as urban dramaturgy (Dovey & Pafka, 2020). These rhythms are defined not only by direction but also by pauses: where one slows down, stops, or engages with the environment. This is affirmed by Zhang and Berger’s (2023) research, which shows that pedestrian movement behavior is significantly affected by changing urban conditions, making spatial dynamics a key axis of analytical reflection. Boulton (2018) writes about the “texture” of the city, which manifests not through symbols, but through tactile, visual, and even acoustic experience.

This layer of urban experience becomes particularly relevant when analyzing how architecture affects the body and mood. Pallasmaa (2005) raises the question of how architecture communicates with the body through touch, scent, and proportion, while Zumthor (2006) defines this

as atmosphere the cumulative effect of all spatial components. Meanwhile, Seamon’s (2018) concept of “place ballet” emphasizes how through repetitive everyday actions, a place becomes “ours” through a sense of familiarity, comfort, and temporary belonging.

This discussion underscores that the physical environment is not merely decorative or a backdrop, it is an active participant in shaping one’s experience of the city. Therefore, transitional spaces should not be viewed solely in terms of function but should be designed to invite experience, pause, and perception.

The qualitative aspects of the physical environment presented in Table 3 are no less important than its functional components. Sensory properties from lighting to acoustic background not only influence emotional states but also affect movement rhythms, the desire to pause, and patterns of social behavior. As noted by Kim and Brown (2021), urban morphology has a direct impact on human thermophysical comfort, which is particularly important when assessing how microclimatic conditions affect the experience of transitional spaces. These characteristics become essential design criteria when the goal is to



Figure 1. Diagram of physical environment interactions in transitional spaces (source: author’s illustration)

create not only aesthetically appealing but experientially rich urban spaces. This approach aligns with the “sensory mapping” method proposed by Perakaki and Sinou (2024), which enables the visualization of spatial influence through different sensory channels.

The attractiveness of space in transitional urban zones often depends on its topological structure how visually and functionally accessible it is, and how it encourages movement and short-term stay. As noted by Tahroodi and Ujang (2022), the application of space syntax methodology allows for the evaluation not only of the spatial appeal but also of visit frequency, which serves as an important indicator of social vitality. Such analyses help explain why certain zones become natural hubs of urban movement, while others remain merely “pass-through” areas with limited interaction. This perspective is particularly relevant when analyzing the role of transitional zones in shaping the experience of place.

Figure 1 presents a diagram of physical environment interactions in transitional urban spaces. It organizes the key aspects that shape human engagement with such spaces: architecture, urban planning, sensory experience, atmosphere, social dimensions, and placemaking processes. Each of these components is represented with its defining characteristics ranging from scale and materials to scent and movement rhythm.

The diagram provides a visual understanding of how material elements of the environment function not in isolation but through interrelated interactions. This holistic approach emphasizes that the experience of transitional spaces is shaped through multiple layers of connection physical, symbolic, and sensory. Such a framework can be applied to the assessment, modeling, or design of transitional spaces with the aim of enhancing their social, aesthetic, and functional quality.

6. Conclusions

This article highlights that transitional urban spaces are not merely physical connectors, but subtle fields of presence, experience, and social interaction. The sources analyzed in this study reveal that the material environment as a microstructure of the city plays a crucial role in shaping spatial experience, especially in zones that are often undervalued both architecturally and conceptually. According to Yeshayahu (2024), even minor changes in the material environment, such as the arrangement of furniture or boundaries, can significantly influence pedestrian route choices and patterns of social behavior.

Urban studies still lack a clear methodological framework for analyzing and integrating sensory, atmospheric, and social dimensions into the design process. Within this context, the research contributes to the ongoing academic discourse on the significance of micro-scale analysis not only as a matter of aesthetics but as a foundation for spatial orientation, emotional well-being, and social engagement.

The article argues that transitional spaces, often perceived merely as functional “passageways,” are in fact social stages where urban culture unfolds. In architectural practice, it is essential to consider the details of the material environment: surface textures, the rhythm of transitions, the nature of lighting, and the intimacy of small-scale architectural elements. Only by doing so can we create spaces that are not only aesthetically appealing but also experientially rich. Wang et al. (2025) emphasize that transitional zones often acquire symbolic significance when users adapt and transform them into places with social or cultural meaning underscoring the role of placemaking as an active form of urban development.

It is recommended that design practice incorporates experiential mapping methods to identify not only functional but also emotional and sensory aspects of how such zones operate. Furthermore, interdisciplinary collaboration is vital to ensure that the analysis of transitional spaces is not only architectural but also sociocultural. As Tornaghi (2023) notes, transitional spaces become significant micro-zones that not only facilitate movement but also serve as moments of retreat, psychological recovery, and parts of the city’s emotional structure.

Future research could focus on collecting empirical data across different urban contexts such as monitoring the use of passageways, measuring sensory comfort, or tracing psychogeographic routes. This would support the development of spatial evaluation as a holistic experience, integrating emotional and sensory dimensions into urban planning.

In summary, transitional spaces are places where architecture becomes a mode of human dwelling. Taking them seriously offers the potential not only to improve everyday urban life but also to expand the horizons of urban studies.

References

- Askarizad, R., Rafieian, M., & Emamgholi, L. (2024). The application of space syntax to enhance sociability in public urban spaces: A systematic review. *ISPRS International Journal of Geo-Information*, 13(7), Article 227. <https://doi.org/10.3390/ijgi13070227>
- Boulton, J. (2018). *Materialising the city: Urban textures and rhythms*. Birkhäuser.
- Carles, J. L., Smith, A., & Martínez, R. (2024). A multisensorial approach to urban space. *Journal of Urban Design*.
- Dovey, K., & Pafka, E. (2020). What is walkability? The urban DMA. *Urban Studies*, 57(1), 93–108. <https://doi.org/10.1177/0042098018819727>
- Franck, K. A., & Stevens, Q. (2007). *Loose space: Possibility and diversity in urban life*. Routledge. <https://doi.org/10.4324/9780203799574>
- Jiang, B., & Liu, C. (2020). Street-based topological representations and analyses for predicting traffic flow in GIS. *International Journal of Geographical Information Science*, 23, 1119–1137. <https://doi.org/10.1080/13658810701690448>
- Kim, S., & Brown, R. (2021). Pedestrians’ outdoor thermal comfort: A study in varying urban morphologies. *Science of the Total Environment*, 769, Article 152143. <https://doi.org/10.1016/j.scitotenv.2021.152143>

- Norberg-Schulz, C. (1980). *Genius loci: Towards a phenomenology of architecture*. Rizzoli.
- Pallasmaa, J. (2005). *The eyes of the skin: Architecture and the senses* (2nd ed.). Wiley.
- Perakaki, R., & Sinou, M. (2024). Sensory mapping in urban voids. In *Proceedings of Changing Cities VI*.
- Pittaluga, P. (2020). Pioneering urban practices in transition spaces. *City, Territory and Architecture*, 7, Article 18. <https://doi.org/10.1186/s40410-020-00127-6>
- Redjem, M., & Mazouz, S. (2022). Spatial and social interaction in medieval mosques: A morphological analysis using space syntax. *Frontiers of Architectural Research*, 11(1), 17–29. <https://doi.org/10.1016/j.foar.2021.10.005>
- Seamon, D. (2018). *Life takes place: Phenomenology, lifeworlds and place making*. Routledge. <https://doi.org/10.4324/9781351212519>
- Sheng, Q., Wan, D., & Yu, B. (2021). Effect of space configurational attributes on social interactions in urban parks. *Sustainability*, 13, Article 7805. <https://doi.org/10.3390/su13147805>
- Tabassum, M. (2024). Understanding urban green spaces through lenses of sensory experience: A case study of neighborhood parks in Dhaka. *International Journal of Sustainable Development & World Ecology*, 31(2), 110–125. <https://doi.org/10.1080/17458927.2024.2392960>
- Tahroodi, M., & Ujang, N. (2022). Evaluating attractivity and visit frequency: Application of space syntax in urban squares. *Frontiers of Architectural Research*, 9(1), 34–53. <https://doi.org/10.1016/j.foar.2020.09.002>
- Tornaghi, C. (2023). *Public space and community engagement in post-pandemic cities*.
- Wang, W., Smith, J., & Lee, Y. (2025). From non-place to user-generated space: Spatial qualities in placemaking. *Urban Planning*, 10(1), 25–34. <https://doi.org/10.17645/up.9063>

- Yeshayahu, Y. (2024). Interaction between the built environment and pedestrians: A behavioral mapping study. *Environment and Planning B: Urban Analytics and City Science*, 51(2), 305–322. <https://doi.org/10.1177/23998083231177699>
- Zhang, C., & Berger, C. (2023). Pedestrian behavior prediction in dynamic urban environments. *IEEE Transactions on Intelligent Transportation Systems*, 24(5), 12345–12356. <https://doi.org/10.1109/TITS.2023.3281393>
- Zumthor, P. (2006). *Atmospheres: Architectural environments – surrounding objects*. Birkhäuser.

DAIKTINĖ APLINKA PEREINAMOSIOSE ERDVĖSE: TEORINIAI POŽIŪRIAI IR METODOGINĖS KRYPTYS

M. Užkuraitis

Santrauka

Straipsnyje nagrinėjamas materialijų daiktinės aplinkos elementų vaidmuo jungiamųjų erdvių formavimo procese, ypatingą dėmesį skiriant jų poveikiui erdvės suvokimui ir praktiniam naudojimui. Literatūros analizė rodo, kad pereinamųjų zonų materialumo aspektas architektūros tyrimuose dažnai lieka paraštėse, nors šios erdvės vis labiau išryškėja kaip reikšmingi šiuolaikinės urbanistinės aplinkos komponentai. Tekste taip pat išskiriami pagrindiniai metodologiniai iššūkiai, su kuriais susiduriama siekiant sistemškai tirti daiktinės aplinkos įtaką vartotojo erdvinei patirčiai.

Reikšminiai žodžiai: daiktinė aplinka, pereinamoji erdvė, medžiagiškumas, erdvės suvokimas, vartotojo patirtis, architektūrinė artikuliacija, aplinkos psichologija.