

Perception-Oriented Micro-Urban Landscape Renewal Strategies: A Case Study in Adelaide

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Abstract:

As urban population density increases and large-scale public spaces become scarce, micro-urban green spaces such as small parks, alleyways, and interstitial parks play an increasingly important role in the everyday lives of cities like Adelaide. In Adelaide, recent public investments in projects such as Bowden Park and the River Torrens Linear Park indicate a growing interest in transforming fragmented urban space. This study proposes a perceptually oriented regeneration strategy for micro-urban landscapes that focuses on sensory comfort, climate responses, and a human spatial experience. Using three case studies in Adelaide's city center, this paper integrates visual observations, spatial interpretations, and literature reviews to identify key factors influencing residents' perceptions. The results demonstrate that thermal comfort, multisensory stimulation, and ecological hierarchy have significant impacts on residents' behavior and spatial quality. The paper concludes by proposing an adaptive design strategy to guide the future regeneration of micro-landscapes, particularly in medium-sized cities with climate challenges.

Keywords: Micro-urban space; sensory design; thermal comfort; Adelaide; human perception.

1. Introduction

As urban population density increases worldwide, the shortage of large-scale public spaces is becoming more acute. Against this backdrop, micro-urban green spaces such as street corners, alleys, and small parks play an increasingly important role in the daily lives of city dwellers. These small-scale green spaces are often overlooked in traditional urban planning systems, but offer public benefits such as low cost,

flexibility, and easy accessibility, particularly in medium-sized cities like Adelaide. Despite significant interest in the physical form and ecological functions of these green spaces, the perceptions and emotional experiences of users have not yet been fully explored. Adelaide's climate is characterized by dry summers and frequently high temperatures. Therefore, design strategies for micro-spaces must consider not only ecological but also sensory aspects. Planners must consider how users see, feel, hear, and move within

space. This study proposes a perceptual approach that combines thermal comfort, sensory aesthetics, and behavioral mapping to improve the quality of life in micro-urban spaces.

This study examines two main questions: the first is how urban users perceive and interact with microgreen spaces in Adelaide's inner city, and the second is what design strategies can enhance the sensory comfort and ecological value of these small-scale urban landscapes.

2. Literature Review

2.1 Contemporary Micro-urban Spatial Design

Micro-spaces are typically smaller than 500 square meters and are in urban residual spaces, for example, between buildings, underpasses, and along alleyways. These spaces contribute significantly to psychological well-being, heat protection, and biodiversity conservation in compact cities. In Adelaide, recent public investments in projects such as Bowden Park and the River Torrens Linear Park indicate a growing interest in transforming fragmented urban spaces [1, 2].

However, as Soltani and Allan point out, the influence of micro-urban forms on behavior and mobility remains under-researched. Modernizing micro-spaces requires more than simply adding vegetation [3]. It requires a deep understanding of how users perceive and inhabit the space in real time. Frank and Stevens describe these interstices as "loose spaces," where user interaction breaks down the boundaries of formal planning and reveals the city's potential [4].

2.2 Perceptual Landscape and Human Experience

The theories of Kevin Lynch and Juhani Pallasmaa emphasize the role of multisensory design in shaping spatial identity. Lynch introduced the concept of "imaginability," the ability of a place to be remembered or recognized. Pallasmaa extended this concept to embodied space, emphasizing touch, temperature, sound, and materiality in the architectural experience. Rasmussen also emphasized that architectural space unfolds through physical experience, not just visual aesthetics [5]. These ideas are particularly resonant in micro-spaces, where proximity and human scale enhance sensory interaction.

2.3 Climate Adaptation and Thermal Comfort

In Adelaide, urban densification and hard surfaces have exacerbated the heat island effect. Liu et al. demonstrated the influence of urban morphology on outdoor thermal

performance [6], while Wong et al. and Visvanathan et al. highlighted the importance of vegetation and green spaces for thermal mitigation and comfort enhancement [7, 8]. Indicators such as UTCI and PET are often used to quantify thermal comfort, which directly impacts occupant length of stay and satisfaction. Olgay's bioclimatic concept also highlights the spatial value of thermal control in architecture and its impact on indoor comfort [9].

2.4 Behavioral Mapping and Space Use

Understanding space use is essential. Behavioral mapping, as explored by Motazedian, reveals occupant movement patterns and microclimate preferences [10]. Even subtle differences such as shade or sun can influence people's behavior in small urban environments. Soltani and Allan found subtle features such as tree canopy cover and road width influence choice [3]. This highlights the importance of perceptual and behavioral data for design decisions. Jan Gehl further argues that designs that encourage sitting, lingering, and social interaction are essential for high-quality public life [11].

3. Methodologies

This study adopts a qualitative, design-led methodology focused on site-based spatial interpretation and visual reading. Given the practical limitations of large-scale surveys or real-time behavioral tracking, the research integrates field documentation, environmental mapping, and comparative literature to explore the perceptual and ecological performance of selected micro-urban spaces in Adelaide.

3.1 Research Approach

The approach combines spatial interpretation, typological comparison, and designer-based observation. Rather than relying on user-generated data, the study draws on tools and secondary sources to assess perceptual cues and ecological features in micro-spaces. Inspired by the idea of "the designer as observer," it argues that site experience, environmental indicators, and urban morphology offer rich insights into design affordances and user engagement.

3.2 Case Selection

Based on the criteria of small size, recent design interventions, and proximity to urban circulation, three micro-urban sites in central Adelaide were selected for analysis: Whitmore Square/Iparrityi, Rymill Park/Murlawirrapurka, and Hindmarsh Square/Mukata. Each site offers distinctive spatial configurations and sensory attributes that shed light on how users experience and navigate micro-scale

environments.

Whitmore Square, or Iparrityi, is in the southwest quadrant of the Adelaide CBD, as shown in Fig. 1 below. The square features mature trees, layered vegetation, and open grass fields interspersed with upgraded seating and pathway surfaces. Named to honor the Kaurna woman Iparrityi, the space holds cultural significance, which adds a narrative dimension to its perception. Although spatially open, the park maintains a sense of enclosure due to the tree canopy and perimeter vegetation. This balance between openness and refuge supports both visual orientation and thermal comfort. The material contrasts between soft grass, warm-toned timber seating, and cool concrete paths also enhance tactile and visual variety, contributing to an enriched sensory experience.



Fig. 1 Shaded green lawn and mature trees at Whitmore Square (Photo credit: Original)

In contrast, Rymill Park—also known by its Kaurna name Murlawirrapurka—is situated on the eastern fringe of the CBD and contains a lake, shaded tree-lined promenades, and recreational amenities (Fig. 2). The southern lakeside path forms a popular node where water, planting, and seating converge. This site exemplifies how proximity to

water can modulate micro-climate while also enhancing auditory and visual perception. Seasonal changes are especially pronounced here, with autumn leaves and spring blooms accentuating the visual richness, while summer shade provides thermal refuge. The design encourages lingering through spatial layering and diversified edge conditions that alternate between openness and shelter.



Fig. 2 Lake side path with seasonal foliage in Rymill Park (Photo credit: Original)

Hindmarsh Square, or Mukata, positioned in the heart of the city, is defined by its symmetrical layout, axial paths, and central sculpture, as seen in Fig. 3. Despite its formal structure, the space accommodates multiple user groups—office workers on lunch breaks, tourists passing through, and pedestrians commuting between blocks. The square is encircled by busy roads, making acoustic perception a critical factor in user experience. Hard paving dominates the space, though recent updates to seating and the presence of tree canopies along the edges attempt to soften its otherwise rigid appearance. The contrast between central exposure and shaded periphery creates differentiated thermal zones, influencing both the duration and nature of use within various subspaces.



Fig. 3 Central sculpture and edge shading in Hindmarsh Square (Photo credit: Original)

Together, these three cases highlight how micro-urban green spaces—though modest in scale—accommodate complex interactions between environmental stimuli, cultural identity, and spatial behavior. Their varying degrees of enclosure, material articulation, and ecological layering serve as essential clues for designing perceptually rich and climatically adaptive micro-landscapes.

3.3 Data Sources and Techniques

To understand the spatial and perceptual characteristics of these sites, the following methods were used: First, Google Street View timeline analysis (2013–2024) to track changes in vegetation, materials, and usage patterns; Second, field photography and sketching to document micro-climatic conditions, seating preferences, and sensory elements; Last, comparative visual analysis to assess material contrasts, ecological layering, and visual permeability.

4. Findings and Design Translation

Preliminary observations suggest that users prefer shaded areas and seating near vegetation, especially in summer. Asphalt surfaces are generally avoided during warm periods. Sound—both traffic noise and natural cues like bird-song—significantly affects perceived tranquility. Spaces with multiple sensory elements (e.g., colorful plants, water features, moving shadows) exhibit longer user stay times. In contrast, exposed hardscapes without shading see the least engagement. These findings indicate that micro-upgrades must prioritize sensory shading, acoustic

buffers, ecological layering, and material tactility to enhance perceptual quality.

Integrating perceptual frameworks into micro-space design offers a critical shift in how I approach urban renewal. Rather than focusing solely on visual aesthetics or fixed typologies, designers must consider adaptivity, multisensory feedback, and seasonal variation. Rafat et al. argue that landscape urbanism is most effective when ecological logic and human use intersect—an idea supported by this study [1]. Wong et al. further highlights that climate adaptation and human comfort are not mutually exclusive [7]. Shading, evapotranspiration, and visually soft planting strategies address both ecological and sensory needs, particularly in climate-vulnerable regions like Adelaide. This dual functionality enhances spatial resilience.

5. Conclusion

Through qualitative site-based research, this study provides evidence-based guidance for improving the livability and function of micro-urban spaces. It demonstrates that even modest interventions—such as adding shade, diversifying materials, or enhancing sensory contrast—can greatly influence user experience. A perception-oriented approach brings renewed attention to the emotional, climatic, and embodied dimensions of public space. By embedding sensory awareness into design thinking, planners and landscape architects can foster stronger connections between people and place. Such design not only improves spatial comfort but also enhances users' sense of belonging and attachment to place, especially in dense or transitional urban settings. Furthermore, integrating cultural narratives into small-scale interventions can enrich local identity and elevate the experiential value of everyday environments.

Future research could expand on seasonal change, nighttime perception, or sensor-based feedback systems. More broadly, interdisciplinary collaboration—combining landscape architecture, environmental psychology, and climate science—will be vital for refining and scaling perception-oriented strategies across urban contexts. Ultimately, perception-oriented design is not about beautification alone, it is about creating experiences. Well-considered micro-renewals can become restorative, connective, and sensory-rich moments embedded within the larger urban structure.

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